WATER UTILITIES CORPORATION

BOTSWANA EMERGENCY WATER SECURITY AND EFFICIENCY PROJECT

VOLUME 1 of 2:

MAIN ESIA REPORT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT FOR THE SELEBI-PHIKWE TO SERULE WATER TRANSFER SCHEME

(AN UPDATE OF THE PREVIOUS REPORT OF 2013)

APRIL 2020
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ACRONYMS

ACHPR  African Commission on Human and Peoples Rights
AIA  Archaeological Impact Assessment
ARV  Anti-Retroviral
BCL  Bamangwato Concession Limited
BEWSEP  Botswana Emergency Water Security and Efficiency Project
BGCGSE  Botswana General Certificate of Secondary Education
BOPA  Botswana Press Agency
BOS  Botswana Bureau of Standards
BOQ  Bill of Quantities
BPC  Botswana Power Corporation
CBO  Community Based Organization
CSO  Civil Society Organization
CD  Central District
CDC  Central District Council
CDDP  Central District Development Plan
CEDAW  Convention on the Elimination of All Forms of Discrimination Against Women
C-ESMP  Contractors, Environmental and Social Management Plan
CLO  Community Liaison Officer
CSO  Civil Society Organization
DDP  District Development Plan
DEA  Department of Environmental Affairs
DFRR  Department of Forestry and Range Resources
DFEIS  Draft Final Environmental Impact Assessment
DN  Nominal Bore
DNMM  Department of National Museum and Monuments
DSAP  Dam Safety Action Plan
DTRP  Department of Town and Regional Planning
DWMPC  Department of Waste Management and Pollution Control
DNWP  Department of Wildlife and National Parks
EA  Environmental Assessment
WBG  World Bank Group
EHS Guidelines  Environmental, Health and Safety Guidelines
EIA  Environmental Impact Assessment
EIS  Environmental Impact Statement
ERP  Emergency Response Plan
ESIA  Environmental and Social Impact Assessment
ESMP  Environmental and Social Management Plan
GBV  Gender-Based Violence
GISDW  Guidelines for International Standards of Drinking Water
GRC  Grievance Résolution Committee
GRM  Grievance Redress Mechanism
HIV  Human Immunodeficiency Virus
ICERD  International Convention on Elimination of all Forms of Racial Discrimination
IAP  Interested and Affected Parties
ILO  International Labor Organisation
IPV  Intimate Partner Violence
ISO  International Standard Organisation
ITCZ  Inter-Tropical Convergence Zone
JCB  Joseph Cyril Bamford Machines
Km/h  Kilometre Per Hour
MDGs  Millennium Development Goals
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>MFDP</td>
<td>Ministry of Finance and Development Planning</td>
</tr>
<tr>
<td>MLMWS</td>
<td>Ministry of Land Management, Water and Sanitation Services</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeter</td>
</tr>
<tr>
<td>m/s</td>
<td>Meters Per Second</td>
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<tr>
<td>NACA</td>
<td>National Aids Coordinating Agency</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>NSWCP</td>
<td>North-South Carrier Water Pipeline</td>
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<tr>
<td>NSP</td>
<td>National Settlement Policy</td>
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<tr>
<td>OP</td>
<td>Operational Policy</td>
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<tr>
<td>PAP</td>
<td>Project Affected Persons</td>
</tr>
<tr>
<td>PDL</td>
<td>Poverty Datum Line</td>
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<tr>
<td>PM</td>
<td>Particulate Matter</td>
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<tr>
<td>PMTC</td>
<td>Prevention from Mother to Child</td>
</tr>
<tr>
<td>Ppm</td>
<td>Parts Per Million</td>
</tr>
<tr>
<td>PSNo.</td>
<td>Pump Station Number</td>
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<td>RAP</td>
<td>Resettlement Action Plan</td>
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<td>RPF</td>
<td>Resettlement Policy Framework</td>
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<td>SADC</td>
<td>Southern African Development Community</td>
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<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>SHEA</td>
<td>Sexual Harassment Exploitation and Abuse</td>
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<tr>
<td>SES</td>
<td>Socioeconomic Survey</td>
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<tr>
<td>STI</td>
<td>Sexual Transmitted Infections</td>
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<td>TLD</td>
<td>Thermoluminescent Dosimeter</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNDRIP</td>
<td>United Nations Declaration on the Rights of Indigenous Peoples</td>
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<td>UNFPA</td>
<td>United Nations Population Fund</td>
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<tr>
<td>UPS</td>
<td>Uninterruptible Power Supply</td>
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<tr>
<td>uPVC</td>
<td>Unplasticized Polyvinyl Chloride</td>
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<tr>
<td>VAC</td>
<td>Violence Against Children</td>
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<tr>
<td>VCs</td>
<td>Vulnerable Communities</td>
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<tr>
<td>VCP</td>
<td>Vulnerable Community Plan</td>
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<tr>
<td>VDC</td>
<td>Settlement Development Committee</td>
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<td>WAB</td>
<td>Water Apportionment Board</td>
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<td>WAVE</td>
<td>Women Against Violence Europe</td>
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<td>WBPS</td>
<td>World Bank Pump Station</td>
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<tr>
<td>WMA</td>
<td>Wildlife Management Area</td>
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<td>WSRP</td>
<td>Water Sector Reforms Programme</td>
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<td>WUC</td>
<td>Water Utilities Corporation</td>
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<tr>
<td>ToR</td>
<td>Terms of Reference</td>
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<tr>
<td>ZAB</td>
<td>Zaire Boundary Layer</td>
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GLOSSARY OF TERMS

**Air Pollutant:** Any substances in air that could, in high enough concentration, harm human beings, other animals, vegetation, or material. Pollutants may include almost any natural or artificial composition of matter capable of being airborne.

**Air Pollution:** the presence of contaminating or pollutant substances in the air that do not disperse properly and interfere with human health or welfare or produce other harmful environmental effects.

**Beneficiaries:** Individuals, communities, and/or organizations expected to benefit from the project or program.

**Capillary Action:** The ability of a liquid to rise through narrow spaces within a medium, such as soil.

**Compensation:** Payment in cash or in kind for an assets or resource that is acquired or Affected by a project at the time the asset needs to be replaced.

**Cattle Post:** An unfenced rangeland where there are central watering points. The cattle owners do not usually reside in the cattle-post but have their employees' (cattle herders) families living there.

**Destitute Person:** An individual who, due to disabilities or chronic health condition, is unable to engage in sustainable economic activities and has insufficient assets and income sources, or an individual who due to old age, mental or physical disability, emotional or psychological disability or Being a terminally ill patient, and having no means of support, is incapable of engaging in an sustainable economic activity and has unreliable and limited sources of income.

**Dump:** A site used to dispose of solid wastes without environmental controls.

**Emission:** Pollution discharged into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities, from residential chimneys; and from motor vehicle, locomotive, or aircraft exhausts.

**Environmental and Social Assessment (ESIA):** An instrument to identify and assess the potential environmental and social impacts of a proposed project, evaluate alternatives, and design appropriate mitigation, management, and monitoring measures.

**Exposure:** A potential health threat to the living organisms in the environment due to the amount of radiation or pollutant present in the environment.

**Empowerment:** The expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives. In its broadest sense, empowerment is the expansion of freedom of choice and action. It is a participatory process which places or transfers decision-making responsibility and the resources to act into the hands of those who will benefit. This can include (i) capacity building for stakeholder organizations; (ii) strengthening legal status of stakeholder organizations; (iii) stakeholder authority to manage funds, hire and fire workers, supervise work, and procure materials; (iv) stakeholder authority to certify satisfactory completion of project and establish monitoring and evaluation indicators and (v) support for new and spontaneous initiatives by stakeholders.
Environmental and Social Impacts: Any change, potential or actual, to: (i) the physical, natural, or cultural environment, and (ii) impacts on surrounding community and workers, resulting from the project activity to be supported.

Gender: Refers to the socially constructed roles ascribed to males and females and the resulting socially determined relations. These roles are learned, change over time, and vary widely within and across cultures. Gender is one of the key entry points for social analysis/assessment. It is important to understand the social, economic, political, and cultural forces that determine how men and women participate in, benefit from, and control project resources and activities. A good analysis would highlight gender specific constraints, risks and opportunities.

Gender Based Violence: an umbrella term for any harmful act that is perpetrated against a person’s will and that is based on socially ascribed (i.e. gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private. The term GBV is used to underscore systemic inequality between males and females (which exists in every society in the world) and acts as a unifying and foundational characteristic of most forms of violence perpetrated against women and girls.

Grievance Procedures (including Grievance Redress Mechanism or GRM): The processes established under law, local regulations, or administrative decision to enable project-affected people, property owners and other displaced persons to redress issues related to acquisition, compensation, or other aspects of resettlement or pertaining to social and environmental concerns and issues related to the implementation (and all phases) of the project. In Bank funded projects, such procedures are implemented at project-level to address project-level concerns and issues, and improve sustainability and community engagement in the project, but does not preclude the use of other administrative processes.

Groundwater: The supply of fresh water found beneath the Earth’s surface (usually in aquifers), which is often used for supplying wells and springs. Because groundwater is a major source of drinking water, there is growing concern about areas where leaching agricultural or industrial pollutants or substances from leaking underground storage tanks are contaminating it.

Involuntary Land Acquisition: The taking of land by Government or other Government agencies for compensation, for the purposes of a public project against the will of the landowner. The landowner may be left with the right to negotiate the amount of compensation proposed. This includes land or assets for which the owner enjoys uncontested customary rights.

Kgosi: Traditional leader or chief of a ward/settlement (Plural is DiKgosi).

Kgotla or Customary Court: Name given to the place for community meetings and customary court hearings in a ward/settlement (Plural is Dikgotla).

Kgotla Meeting: A public meeting held at the Kgotla, in the presence of a Kgosi or his representative. All individuals are encouraged to speak freely and openly as it upholds the idea of equality.

Kitsisong: Setswana meaning Information or Knowledge

Land: The surface of the earth consisting of soil and things permanently attached to surface, including land-based natural resources such as forests. This is the general rule, but the extent of ‘land’ differs from country to country. In this context, land refers to agricultural and/or non-agricultural land and any structures thereon whether temporary or permanent and which may be required for the Project.
**Land Acquisition**: The process of acquiring land under the legally mandated procedures of eminent domain. This includes all methods of obtaining land for project purposes, which may include outright purchase, expropriation of property and acquisition of access rights, such as easements or rights of way. Land acquisition may also include: (a) acquisition of unoccupied or unutilized land whether or not the landholder relies upon such land for income or livelihood purpose; (b) repossession of public land that is used or occupied by individual households; and (c) project impacts that result in land being submerged or otherwise rendered unusable or inaccessible.

**Land Expropriation**: The compulsory taking of land by the State, in exercise of its power of eminent domain. The process whereby a person is compelled by a public agency to alienate all or part of the land and fixed assets s/he owns or possesses, to the ownership and possession of that agency, for a public purpose, in return with compensation at replacement value.

**Livelihood Restoration and Rehabilitation**: A term often used to describe the process of re-establishing lifestyles and livelihoods following resettlement.

**Monitoring**: The process of repeated observations and measurements of environmental and social quality parameters to assess and enable changes over a period of time.

**Moserwa**: Singular for a person who is Basarwa (San). In this project they meet the criteria of Vulnerable Community as per WB OP4.10.

**Project Affected Person or Persons (PAPs)**: Any person or persons who, for reasons of the involuntary taking or voluntary contribution of their land and other assets under the project, result in direct economic and or social adverse impacts, regardless of whether the said Project affected persons physically relocate. These people may have their: i) standard of living adversely affected, whether or not the Project Affected Person must move to another location; ii) right, title, interest in any house, land (including premises, agricultural and grazing land) or any other fixed or movable asset acquired or possessed, temporarily or permanently, adversely affected; iii) access to productive assets adversely affected, temporarily or permanently; or iv) business, occupation, work or place of residence or habitat adversely affected.

**Permeability**: The rate at which liquids pass through soil or other materials in a specific direction.

**Permit**: An authorization, license, or equivalent control document issued by an approved agency to implement the requirements of an environmental regulation; e.g., a permit to operate a wastewater treatment plant or to operate a facility that may generate harmful emissions.

**Potable Water**: Water that is safe for drinking and cooking.

**Public Consultation**: The process of engaging affected people and other interested parties in open dialogue through which a range of views and concerns can be expressed in order to inform decision-making and help build consensus. To be meaningful, consultation should be carried out in a culturally appropriate manner, with information in local languages distributed in advance.

**Radiation**: Any form of energy propagated as rays, waves, or steams of energetic particles. The term is frequently used in relation to the emission of rays from the nucleus of a tom.

**Recycle/Reuse**: The process of minimizing the generation of waste by recovering usable products that might otherwise become wastes. Examples are the recycling of aluminium cans, paper and bottles.

**Resettlement Action Plan (RAP)**: The document in which the responsible entity specifies the procedures that it will follow and the actions that it will take to mitigate adverse effects,
compensate losses, and provide development benefits to persons and communities affected by
an investment project. RAPs are prepared by the Government to address such impacts. RAPs
contain specific and legally binding requirements to be abided by to resettle and compensate the
affected party before implementation of the project activities causing adverse impacts.

Rehabilitation or Livelihood Assistance: The provision of development assistance in addition
to compensation such as land preparation, credit facilities, training, or job opportunities, needed
to enable project affected persons to improve their living standards, income earning capacity and
production levels; or at least maintain them at pre-project levels.

Runoff: That part of precipitation, snowmelt, or irrigation water that runs off the land into streams.

Smoke: Particles suspended in air after incomplete combustion of materials.

Solid Wastes: No liquid, non-soluble materials, ranging from municipal garbage to industrial
wastes that contain complex, and sometimes hazardous, substances. Solid wastes include
sewage sludge, agricultural refuse, demolition wastes, and mining residues. Technically, solid
wastes also refer to liquids and gases in containers.

Socioeconomic Survey (SES): An accurate survey of the project-affected population. The
survey focuses on income-earning activities and other socioeconomic indicators.

Stakeholders: All individuals, groups, organizations, and institutions interested in, and potentially
affected by a project, and/or having the ability to influence a project.

Violence Against Children (VAC): Physical, sexual, neglect or negligent treatment of children
under the age of 18. Violence against children can manifest itself almost anywhere (in the home,
within the community and at the work place.

Vulnerable Community or Communities: A term that refers to those who meet the criteria of
OP 4.10 (Indigenous Peoples Policy of the World Bank) in Botswana. They are social groups with
identities that are often distinct from dominant groups in their national societies, are frequently
among the most marginalized and vulnerable segments of the population. As a result, their
economic, social, and legal status often limits their capacity to defend their interests in and rights
to lands, territories, and other productive resources, and/or restricts their ability to participate in
and benefit from development. In line with the World Bank’s Indigenous Peoples Policy (OP4.10),
vulnerable communities refers to a distinct, vulnerable, social and cultural group possessing the
following characteristics in varying degrees: (a) self-identification as members of a distinct
indigenous cultural group and recognition of this identity by others; (b) collective attachment to
geographically distinct habitats or ancestral territories in the project area and to the natural
resources in these habitats and territories; (c) customary cultural, economic, social, or political
institutions that are separate from those of the dominant society and culture; and (d) an
indigenous language, often different from the official language of the country or region.

Vulnerable groups or individuals: Those who by gender, ethnicity, age, physical or mental
disability, economic disadvantage, religious affiliation, social status or other characteristics may
be more adversely affected by project impacts including. Vulnerability denotes a condition
characterized by higher risk and reduced ability to cope with shock or negative impacts. It may be
based on socio-economic condition, gender, age, disability, ethnicity, or other criteria that
influence people’s ability to access resources and development opportunities.

Vulnerable Communities Plan (VCP) (Indigenous Peoples Plan): As a compliance measure
with OP4.10 on Indigenous Peoples, a Vulnerable Community Plan (VCP) is prepared for any
investment project which affects Vulnerable Communities. In this project, the term Vulnerable
Communities will be used to mean those communities who meet the criteria of Indigenous
Peoples under OP 4.10. The Plan is designed to reflect culturally appropriate benefits and processes and is based on the full consideration of the options preferred by Vulnerable Communities affected by the project in a consultation process that respects the principles of free, prior and informed consultation leading to broad community support. The Plan also includes provisions which ensure that institutions responsible for Government interaction with Vulnerable Communities should possess the social, technical and legal skills needed to carry out proposed development activities. Elements of a VCP include an assessment of the legal framework, collection of baseline data, examination of land tenure, strategy for local participation, design of mitigation measures and activities, assessment of institutional capacity, an implementation schedule and a system for monitoring and evaluation.

**Water Pollution:** The presence of enough harmful or objectionable material to damage water quality.
EXECUTIVE SUMMARY

A. Background

The Government of Botswana through Water Utilities Corporation (WUC) is undertaking the Botswana Emergency Water Security and Efficiency Project (BEWSEP) with funding from the World Bank. The Selebi-Phikwe to Serule Water Transfer Scheme is a sub-project under this project. The environmental and social policies of the World Bank (WB) require the project to conduct an Environmental and Social Impact Assessment (ESIA) with an Environmental and Social Management Plan (ESMP) in line with World Bank’s Operational Policy Procedures and Standards.

B. BEWSEP Description and Development Objective

The Proposed Development Objective (PDO) of the project is to improve availability of water supply in drought vulnerable areas, increase the efficiency of WUC and strengthen wastewater management in selected systems. The project is organized under three components:

Component 1: To improve availability of water supply and efficiency  
Component 2: To improve wastewater and sludge management  
Component 3: Sector reforms and institutional strengthening

The BEWSEP has been classified by the World Bank as Category ‘A’ because one of the sub-projects (Mambo Waste Water Treatment Plant, MWWP under component 2) is likely to have significant adverse environmental and social impacts which are sensitive, diverse and unprecedented. The key risk is potential environmental impacts likely to be generated from rehabilitation and expansion works at the WWTP. However, the Selebi-Phikwe sub-project is classified as a Category B because it is expected that most of the infrastructure development will be in-situ rehabilitation and upgrading and that new pipelines will be placed within existing rights of way.

Project Description of Selebi-Phikwe Water Transfer Scheme

The Selebi-Phikwe to Serule Water Transfer Scheme sub-project serves to improve potable water supply to the six beneficiary villages of Mmadinare, Serule, Gojwane, Moreomabele, Topisi and Damuchojenaa settlement as a long-term water supply solution. For the sub-project to function and be sustainable it is dependent on existing infrastructure, as well as WUC's capacity to construct, operate and maintain the scheme. Importantly the existing infrastructure associated with the scheme has to be in a condition to support the added demands and the following were assessed to be critical:

- Water source, namely Letsibogo Dam
- Transmission pipeline between the water source and the water treatment plant and the Water Treatment Plant (WTP) in Selebi-Phikwe.

Hydrological assessment of the Dam undertaken under 2004 Selebi-Phikwe Master Plan assured that demands for the project could be met and that the raw water quality from the Dam routinely measured by WUC was found to be of good quality except for turbidity during rain fall season (increased flow into the dam). WUC has prepared a Dam Safety Action Plan, for which the remedial works are being implemented by WUC with follow ups by World Bank. The pipeline transferring water from the dam to the water treatment plant is undergoing refurbishment by WUC in readiness for this sub-project with planned completion date for the refurbishment works in May 2020. The WTP was expanded in 2013 to a capacity of 37.5 Ml/day. This expansion took into consideration the anticipated demands of the Selebi-Phikwe Mine and for the Selebi-Phikwe Water Supply Transfer Scheme sub-project. See Due diligence (Annex ZE) on the above infrastructure.
C. Justification/Rationale of Sub-Project

The sub-project will supply enough quantities of treated potable bulk water to the populations of six settlements in the long term for the next 20 years (i.e. up to 2040). The settlements currently face water shortage problem and at times have gone for days without water supply. This project is to supply water on a sustainable basis to improve the quality of life of the beneficiaries.

D. Sub-Project Activities

a) Pre-Construction
- Preparation of detailed design
- Preparation of ESIA and ESMP, Resettlement Action Plan and VCP reports
- Land Acquisition
- Tendering and Award of Contract for a contractor
- Establishment of contractor’s office

b) Construction

Pipe Work
- A total of one hundred and thirty (130) kilometres long underground uPVC pipes of sizes ranging between 90 mm and 355 mm connecting the settlements of Mmadinare, Damochujena, Gojwane, Serule, Moremabele and Topisi to the existing water treatment plant located in Selebi-Phikwe.

Pump Stations
- Three (3) pump stations (one in Selebi–Phikwe and two in Serule village).

Elevated Tanks
- Five elevated tanks in Topisi (600 m³), Serule (1000 m³), Moreomabele (180 m³), Gojwane (800 m³) and Damochujenna (300 m³).

Resevoir Tanks
- Two ground concrete reservoir tanks in Serule (2000 m³) and Mmadinare (6000 m³) and one 750 m³ circular collector/balancing reservior tank in Selebi-Phikwe.

Telemetry and SCADA System
- Installation of a communication system

c) Decommissioning After Construction
- Dismantling of installations and contractor’s office
- Cleaning up and removal from site all waste materials
- Rehabilitation of site to near its original state
- Transportation of materials away from site
- Consultations of all relevant authorities and beneficiary communities

d) Operation and Maintenance
- Management of the water transfer scheme
- Monitoring of water quality and pressure
- Maintenance of reservoirs, tanks and their fences
E. Project Location

The sub-project pipeline is in Central District starting from Selebi-Phikwe township in the eastern part of the country, then proceeds to Mmadinare village, followed by Damuchojenaa settlement and to Serule village, crosses the Francistown to Gaborone A1 Road and the railway to Gojwane settlement, then proceeds to Moreomabele in the southern part and ends at Topisi village. The water will be transferred through pipeline from Selebi-Phikwe along the road and railway reserves to the beneficiary villages. Map 1 below shows the location of the sub-project.

Map 1: Aerial Map of the Locations of Beneficiary villages of the Sub-project

F. Project Beneficiaries

The beneficiaries of the water supply scheme for this subproject are communities and households of four settlements and two settlements. These are Mmadinare, Serule, Gojwane, Moreomabele, Topisi, and Damuchojenaa. The investment is to improve water supply for about 29,840 beneficiaries.

G. Project Commencement and Estimated Cost

The project preparation has started with civil works expected to begin at the end of 2019 following due diligence to procurement and social and environmental impacts and risks. It will take 18 months to construct at a cost of about P307 million (US$30 million). The defects liability period after construction is 12 months. The estimated budget for the ESMP is P8,599,700.00 (US$859,970.00).
H. Assessment of Project Alternatives

The “No Project” Alternative
The no project alternative was rejected because the intended sub-project objective of providing improved water supply to the 29,840 beneficiaries of Serule, Damuchojenaa, Gojwane, Moreomabele, Topisi, and Mmadinare villages would not occur. A no project scenario would not address the problem of inadequate or no water supply and would not improve access to potable water (Annex N) in these settlements. This would compromise human health and well-being. They will continue to receive low quality water from boreholes. Long queues at the public water standpipes are common and will likely continue without this project. As such, this alternative was rejected.

Project Alternative/Choice of Design Options
The decision to go ahead with the project was chosen to provide improved water supply to the 29,840 beneficiaries of Serule, Damuchojenaa, Gojwane, Moreomabele, Topisi, and Mmadinare villages. This will address the problem of inadequate or no water supply and would improve access to adequate bulk potable water (Annex N) in these settlements. Queues at the public water standpipes will curtail or reduce drastically. This alternative was therefore accepted.

After the selection of the chosen project alternative, two alternatives within the chosen option were assessed. These were for the sustainable supply of water and the other for a pipeline route between Serule village to Gojwane settlement.

a) Alternative Sources of Potable Water Supply for Mmadinare village
Two alternatives were considered. These are improvements to the Water Treatment Plant (WTP) at Mmadinare village for supplying Mmadinare village and supplying all beneficiary villages from the treatment plant at Selebi-Phikwe township. The assessment indicated that it would be prohibitively expensive to upgrade the Mmadinare WTP and that the Selebi-Phikwe WTP has available capacity (Annex ZE) to treat and supply water for use by all the beneficiary communities. The option to improve upon the Mmadinare WTP was therefore rejected.

b) Serule-Gojwane Pipeline Route Corridor
As a consequence of subsuming the originally designed Serule to Gojwane pipeline route by the A-Cap Resources mine concession, three alternative pipeline corridor routes were identified and assessed. These were:

Alternative 1 uses the railway reserve from Serule and turning at km 13 from the railway line and then using the earth road to join the Gojwane-Serule road outside the A-Cap concession area.

Alternative 2 uses the railway line reserve from Serule and then turning at km 19 to the west which leads straight to the tank by using passages between fields.

Alternative 3 uses the A1 Road reserve and then turning along the tarred road which leads to Gojwane Settlement and using a cut line which leads to the water tank.

Selected Option: Alternative 1 is the route with the least properties to be affected and the shortest, and therefore the least negative environmental and social impacts and lowest cost, was selected. This route uses the railway reserve of the northbound railway line from Serule to Gojwane.
I. Rationale for the Environmental and Social Impact Assessment (ESIA)

The purpose of this ESIA is to evaluate and mitigate potential environmental and social risks and impacts at the Selebi-Phikwe to Serule Water Transfer Scheme sub-project sites. The assessment examines ways to prevent, minimize, mitigate, or compensate for adverse environmental and social impacts, and to enhance positive impacts throughout project implementation. It supports environmental and social sustainability throughout the lifecycle of project implementation and beyond. The ESMP will address potential project impacts, including those for vulnerable and marginalized groups and individuals, propose mitigation measures, costs, and responsibilities for mitigation and monitoring. It is a requirement of the World Bank that for any project financed by Bank, a comprehensive ESIA with an ESMP study should be carried out. It is also a requirement under the Botswana Environmental Assessment Act, 2011. In addition, the World Bank Group Environmental, Health and Safety (WBG EHS) Guidelines are applicable to the project, with the following specific guidelines to be adopted and utilized by the contractors and other project implementers: The General Guidelines and the industry sector guidelines for Water and Sanitation. Under the General Guidelines the Environmental, Occupational Health and Safety, Community Health and Safety Construction and Decommissioning are relevant.

J. Methodology

The following mixed methodology was employed in carrying out the ESIA:

- Engagement with consulting engineers to advise on the review of the project design.
- Review of relevant international, regional and national policies and legal framework, as well as World Bank Safeguard Policies and other instruments.
- Review of literature relevant to the project.
- Consultations with relevant stakeholders, including the communities, non-governmental organisations and interested and affected parties (IAP) were undertaken and in the two settlements where vulnerable communities which meet the criteria under OP 4.10. Consultations were in line with the principles of free, prior and informed consultations leading to broad community support.
- Consultations were done through Kgotla meetings (community meetings), focused group discussions, household surveys, letters with questionnaires, individual (one-to-one) meetings and telephone conversations. Selection of the stakeholders consulted was based on the level of their involvement in the project and their potential to be affected by the project (especially where their land, other assets and livelihoods will be adversely impacted).
- Seven consultation sessions were held at different locations. The consultations were conducted over a ten-day period. Summary of the issues and views that emanated from the various consultative sessions are discussed in Chapter 5, and Annex E
- List of people met are also detailed in Chapter 5 and Annex E.
- Site visits were also done by the environmental and social team of consultants team together with WUC.
- Based on the ESIA and in line with World Bank Safeguard Policies, a Vulnerable Community Plan (VCP) for Gojwane and Damuchojenaa Village, and an Abbreviated Resettlement Plan (ARP) have been prepared.

K. Environmental and Social Safeguards Laws and Policies Relevant to the Project

Table 1: World Bank Policies Triggered

<table>
<thead>
<tr>
<th>World Bank Safeguards Operational Policy (OP)</th>
<th>Triggered by this Project</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP 4.01 Environmental Assessment</td>
<td>Yes</td>
<td>Initial evaluation has identified potential negative environmental and social impacts, thus, there is a need for an environmental and social assessment to ensure</td>
</tr>
</tbody>
</table>
appropriate mitigation measures are in place during all stages of the sub-project.

**OP 4.11 Physical Cultural Resources**
Yes

No sites of cultural or historical significance will be affected by the sub-project. However, there could be Chance Finds between Serule and Gojwane pipeline route. Procedures are therefore described in Annex U in case of any discovery.

**OP 4.10 Indigenous Peoples**
Yes

Two of the six beneficiary villages have Vulnerable Communities in this project, the Basarwa (San) in Damuchojenaa and Gojwane settlements. As per OP 4.10, an IPP (VCP) has been prepared for the two communities.

**OP 4.12 Involuntary Resettlement**
Yes

Two resettlement issues are to be resolved in Mmadinare and Topisi villages. Subsequently an Abbreviated Resettlement Action Plan (ARAP) has been prepared.

**OP 4.37 Dam Safety**
Yes

The sub-project source of Water is Letsibogo dam. Dam Safety Action Plan and Emergency Preparedness Plan have been prepared.

**OP 7.50 Projects on International Waterways**
Yes

This policy is triggered at project level.

### Table 2: Botswana Environmental and Social Safeguards Policies and Laws Relevant to the Project

<table>
<thead>
<tr>
<th>Legislation/Policy</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment Act, 2011</td>
<td>Guides the preparation of the ESIA and ESMP to meet the requirement of Botswana. Also guides the consultation process of interested and affected parties (public participation).</td>
</tr>
<tr>
<td>Tribal Land Act (1968) and Tribal Land (Amendment) Act (1993)</td>
<td>Provides legal management of tribal/communal land in Botswana and indicates that land management in tribal areas is transferred to the Land Board</td>
</tr>
<tr>
<td>Domestic Violence Act, 2008</td>
<td>Seeks to prevent and protect survivors of violence especially GBV survivors.</td>
</tr>
<tr>
<td>Factories Act, 1979</td>
<td>Seeks to ensure the welfare, health and safety of workers and the beneficiary community members. It also seeks to ensure the safety of machinery used in the project site.</td>
</tr>
<tr>
<td>Monuments and Relics Act, 2001</td>
<td>Protects archaeological and cultural sites within the project area.</td>
</tr>
<tr>
<td>Affirmative Action Framework for Remote Area Communities</td>
<td>Is aimed at promoting equity in the remote area communities (RACs). Provides support and protection of indigenous knowledge, promotes social inclusion of people living in recognized remote area settlements, both individually and/or as a family in the development of the country. Ensures that there is development infrastructure in the recognized remote area settlements for the RACs so that they are able to participate meaningfully in the economic and social development of their country.</td>
</tr>
<tr>
<td>Revised National Policy on Destitute Persons (2002)</td>
<td>National Policy on Destitute Persons aids poor and vulnerable households by ensuring that they are food secure, that their children attend school and have all the educational necessities. It also ensures that they have decent shelter and are economically secure through the additional cash transfer.</td>
</tr>
<tr>
<td>Botswana National Settlement Policy (1998)</td>
<td>Establishes a settlement hierarchy, based on the population and the size of its catchment area. Damuchojenaa and Gojwane settlements falls under Tertiary III within the hierarchy, the category includes; a population range of 500-999.</td>
</tr>
<tr>
<td>Children’s Act, 2009</td>
<td>Provides for the promotion and protection of the rights of children, their wellbeing, including promoting their physical, emotional, intellectual and social development; and their protection from all forms of abuse.</td>
</tr>
</tbody>
</table>
Revised Guidelines for Implementation of Ipelegeng Programme, (2012) - (Labor Based Public Works Programme)

It is part of a poverty eradication strategy spearheaded by the State President. This programme provides temporary employment to unemployed citizens in their different settlements. They work in their community projects for six hours a day and receive monthly wages of P567 (USD57). This programme provides social protection for the poor and the unemployed.

### Table 3: International Treaties and Conventions Relevant to Vulnerable Communities

<table>
<thead>
<tr>
<th>Treaty/Convention</th>
<th>Relevance to Vulnerable Communities</th>
</tr>
</thead>
<tbody>
<tr>
<td>ILO Convention 169 on Indigenous and Tribal Peoples (1989)</td>
<td>This international Convention spells out that self-identification as Indigenous Peoples is essential for determining the groups to which the provisions of this Convention apply. It also emphasizes inclusive decision-making of Indigenous Peoples in matters that affect them, and recognizes the cultures, traditions of Indigenous Peoples. Governments shall have the responsibility for developing, with the participation of the peoples concerned, protect the rights of these peoples and to guarantee respect for cultures.</td>
</tr>
<tr>
<td>African Commission on Human and Peoples Rights Working Group on Indigenous Peoples Report on Indigenous Peoples in Africa (2005)</td>
<td>This regional report helps elucidate the understanding of Indigenous Peoples in the African context, which does not mean ‘primordially’ (those who were here first) but those who have persistent marginalization and disadvantage to perpetuate their livelihoods, distinct cultures and languages within the mainstream of society, and whose livelihoods, identity and cultural survival depend on access to ancestral lands, territories and natural resources.</td>
</tr>
<tr>
<td>UN Declaration on Rights of Indigenous Peoples (2007)</td>
<td>The UN Declaration affirms the minimum standards for the survival, dignity, security and well-being of Indigenous Peoples. It delineates the individual and collective rights of Indigenous Peoples, including rights to cultural and ceremonial expression, identity, language, employment, health, education and other issues. It &quot;emphasizes the rights of Indigenous peoples to maintain and strengthen their own institutions, cultures and traditions, and to pursue their development in keeping with their own needs and aspirations&quot;. It &quot;prohibits discrimination against indigenous peoples&quot;, and it &quot;promotes their full and effective participation in all matters that concern them and their right to remain distinct and to pursue their own visions of economic and social development&quot;.</td>
</tr>
<tr>
<td>African Union Agenda 2063</td>
<td>This is Africa’s strategic framework that aims to deliver on its goal for inclusive and sustainable development and is a concrete manifestation of the pan-African drive for unity, self-determination, freedom, progress and collective prosperity pursued under Pan-Africanism and African Renaissance. The goal is to prioritise inclusive social and economic development, continental and regional integration, democratic governance and peace and security amongst other issues aimed at repositioning Africa to becoming a dominant player in the global arena.</td>
</tr>
<tr>
<td>Sustainable Development Goals (SDGs)</td>
<td>The Sustainable Development Goals (SDGs) (or the Global Goals), are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. These 17 Goals build on the successes of the Millennium Development Goals (MDGs) and include new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. The goals are interconnected – often the key to success on one will involve tackling issues more commonly associated with another.</td>
</tr>
</tbody>
</table>
L. Archaeology

An Archaeological Impact Assessment (AIA) study was undertaken for this sub-project in compliance with Botswana’s Monuments and Relics Act as well as fulfilling the requirements of the World Bank’s OP 4.11 policy. The report has been presented in Volume 3 of this Report. The AIA study was to determine whether the proposed project would have any potential negative impacts on archaeological or cultural resources. From the AIA study, no archaeological resources were encountered along and around the pipeline routes, as well as the pump station and reservoir sites. An AIA report was produced and submitted to the Department of National Museum and Monuments (DNMM). Following review of the report, an approval was granted on 2nd September 2013.

After the approved AIA, another study was undertaken for the realignment of the pipeline route between Serule and Gojwane. An AIA Report detailing the findings was submitted to the DNMM and a conditional approval granted on the 22nd October 2018. Copies of consent for both conditional planning are presented in Annex C.

M. Dam Safety

The sub-project’s water source is Letsibogo dam; earth core filled constructed in 1997. The dam spillway length is 300 m, crest level height of 32 m with active storage of 102 Mm$^3$. At project appraisal, the Bank reviewed WUC’s 2015 Annual Dam Safety Reports and the Policy and Procedure Statement – Dam Safety. It was concluded that some remedial/safety improvement works should be undertaken, and sufficient dam safety and maintenance programs be put in place. The remedial actions included refurbishment of monitoring instruments and preparation of a dam safety and maintenance program. A Dam Safety Action Plan (DSAP) was prepared to support compliance with OP 4.37. As recommended in the DSAP Inspection Reports, Emergency Preparedness Plan (EPP) and Dam Instrumentation and Monitoring Plan are being prepared and implemented. A work plan to address remedial works has been prepared. The plan is being implemented by WUC, with follow ups by World Bank. Emergency preparedness training is planned from late 2019 to early 2020.

N. Social Assessment of Vulnerable Communities of the Project

Under the Selebi-Phikwe to Serule Water Transfer Scheme, people of Sesarwa (San) ethnicity were found to be living as communities in the settlements of Gojwane and Damuchojenaa. Individual Basarwa were found in settlements like Serule but those were living there for employment purposes but returning to their original communities during the holidays. They were not present in the other settlements of Topisi, Mmadinare and Moreomabele.

The Basarwa communities in Damuchojenaa and Gojwane settlements were screened against the criteria of OP 4.10 and were found to meet the characteristics in varying degrees as a distinct social and cultural group, despite changes in their traditional livelihoods and cultural practices as a result dislocation from their lands and cumulative impacts of various policies on them:

a) **Self-identification**: They self-identify as members of a distinct Indigenous cultural group and are recognized as such by others in national, regional and international contexts. This is because they still identify themselves as Basarwa and have not forgotten their ancestral history.

1 According to some national organizations representing Basarwa in Botswana, they find the term Basarwa derogatory as it is an imposed term and would prefer the term “Bakhwe” be used. However, the two communities that were consulted for this project preferred the term Basarwa, and will be referred to as such here. In addition, “San” is a generic term and the distinct linguistic groups among the San designate themselves by their own name, as for instance, Khwe,
b) **Collective attachment to ancestral lands or geographically distinct habitats**: The Basarwa in the project area have formed a collective attachment to the land they currently occupy, even though historically the project area would not be considered their ancestral territories. Since the early 1900s, many Basarwa left their lands because they were transformed into large cattle farms and national parks such as the Central Kalahari Game Reserve (1961) and the Kalahari Gemsbok National Park (1931)\(^2\). Despite ancestral land loss, the Basarwa in these two settlements formed a collective attachment to land they currently occupy.

c) **Distinct customary cultural, economic, social, or political institutions**: They still practice hunting at a small scale as they must apply for a permit to hunt for example guinea fowls and other game, and they still gather wild fruits and tubers for their consumption and selling any surplus left. They still practice their ancestral dance of ‘*tsutsube’*. They still teach their children this dance and even take them to the western side of the country to learn their ancestral dances. In addition, they still practice ‘*botsetsi*’ to commemorate the transition of a girl to womanhood at first menstruation, as well as rites of passage for boys who are maturing into manhood. In addition, there are traditional healers in both settlements who provide healing through prayers to the gods and herbs or traditional medicine, and some practice their traditional religions in addition to Christianity.

d) **Distinct language or dialect**: The Basarwa speak their distinct dialect, Sesarwa, a click-based language that differs from other languages in the country.

Basarwa in Damucojenaa live with other tribal groups but they are largely concentrated in a specific geographical location in the settlement (i.e. have their own ward) which is adjacent to the project line however none of the community members will be physically or economically displaced. The same applies to Gojwane, the Basarwa have their own ward and the pipeline passes through that ward to the new tanks line boundary of the Lethakane Uranium Mine to the south and north, and within the railway reserve of the northern bound railway line. Then along an existing road which later joins the Serule-Gojwane gravel road.

In view of the above, the Basarwa are considered as Vulnerable Communities as per OP 4.10 and are included in the project preparation, implementation and monitoring. Any potential adverse impacts emanating from the project were identified and mitigated, meeting local and international requirements and good practice in line with OP 4.10. A Vulnerable Community Plan (VCP) has been prepared and will be implemented in connection to this ESIA/ESMP.

**O. Social Baseline of Beneficiary villages**

i. **Population**

As at the last census in 2011, the population rates for the six beneficiary villages are as follows:

1) **Mmadinare**: 12,086 (51.7% women; 33.1% between 0-14 years of age; 6.5% over 65 years old)

2) **Damucojenaa**: 1079 (56.8% women; 48.9% between 0-14; 4.7% over 65 years old)

3) **Serule**: 3,241 (50.7% women; 34.8% between 0-14; 6.5% over 65 years old)

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Nharo, ‡Khomani, etc. However, as noted above, some communities still prefer to use the term Basarwa. The project will use the term preferred by the community. See Albert Barume, *Land Rights of Indigenous Peoples of Africa* (Copenhagen: IWGIA, 2014), p. 12.

\(^2\) IPPF for the World Bank funded project, Human-Wildlife Conflict Management in Northern Botswana (2016).
4) **Gojwane:** 1,499, (51% women; 44.6% between 0-14; 4.7% over 65 years old)  
5) **Moreomabele:** 602 (51.9% women; 38.5% between 0-14; 6.5% over 65 years old)  
6) **Topisi:** 1,545 (49.7% women; 39.8% between 0-14; 7.0% over 65 years old).

**ii. Poverty Levels**

According to Statistics Botswana (2015), amongst the beneficiary villages, those with the highest poverty levels are Gojwane and Damuchojenaa settlements (which also has vulnerable communities). The levels are as high as 33 percent and 48 percent respectively (see **Table 4** below). These are higher than the national poverty rate of 16.3 percent. The high poverty levels could plausibly be due to the high unemployment levels as nearly 90 percent of residents are employed in the temporary government work program, Ipelegeng (labour public works program) where those enrolled in the program are paid a monthly wage for the two-month duration of the work program. As such, unemployment stands as high as 90 percent given the high enrolment numbers for this program.

**iii. Governance**

The tribal and political administrations of all the six settlements are similar. Tribal leadership is headed by a Kgosi (tribal chief) who gains this position through birth right. Governance at the level of local tribal and Indigenous communities (VCs) is through the system of Kgosi (traditional chiefs) and Kgotla meetings, a system with origins in Tswana custom that is recognized and regulated by the Bogosi Act. The Kgotla is the meeting place for dispute resolution, as well as for discussions regarding matters of concern to the community, including development initiatives. While such institutions of local governance are appropriate to many communities in the country, this system of governance differs from that of the Basarwa, which were traditionally organized around a system of clans and elders. Each settlement also has a Settlement Development Committee (VDC) whose members are elected by the members of the community. The communities also elect members to represent them on local Councils and at the National Assembly. The Kgosi in Damuchojenaa and half of VDC members are Basarwa. Prior to the gazetting of the settlements as the vulnerable communities, governance was administered by their leader who also gained this position through birth right, without central Government assistance or intervention in the governance of these settlements.

**iv. Livelihoods and Employment**

The main livelihood in Selebi-Phikwe was mining (industrial). However, the mine has now closed contributing to high unemployment rates in the region. Currently, the main livelihood activity in the beneficiary villages are arable, livestock farming and gathering of natural resources which are sold in times of need. However, given the very high unemployment rates, between 8.8 and 28.8 percent as shown in **Table 4** most people in the beneficiary villages are employed by Government through the Ipelegeng (labour public works program) and are paid a monthly wage. This scheme employs people on a temporary basis. In the settlements of Serule, Damuchojenaa, Gojwane and Moreomabele, harvesting and sale of veld products, among other activities are common. The pipeline route would not affect the livelihoods of any of the settlements nor the vulnerable

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3 An Act to re-enact with amendments the provisions related to Bogosi and matters incidental thereto or connected therewith. CAP 41:01, Act 9, 2008. The Bogosi Act is defines the office of *bogosi* or “chieftainship” among Botswana's various tribes. The act was written in response to the Balopi Commission recommendation that the Constitution of Botswana replace all references of the word “chief” to the Setswana word *kgosi*. The Bogosi Act replaces the earlier Chieftainship Act of 1987.

4 Unemployment according to Statistics Botswana, refers to a person of working age (15-64 years) seeking gainful employment but unable to find a job.
community members as it will mainly be laid within the road reserves where the land is planned for laying of services.

The settlement with the highest unemployment is Damuchojenaa with 28.3 percent as can be seen in the table on selected social indicators which is higher than the national percentage of 18.7 percent. Prior to the shutdown of the Copper Nickel Mine in October 2017, the economy of Selebi-Phikwe township was driven by mining (a town near Damuchojenaa). Given high unemployment following the closing of the mine, this project intends to draw on unskilled (general laborers) and skilled (machinery operators, engineers, etc) labor from this area.

v. Ethnic and Linguistic Composition

The Bangwato tribe is the main ethnic group in all six settlements. However, settlements such as Gojwane and Damochujenaa have communities of Basarwa who meet the criteria of Vulnerable Communities as per World Bank’s OP 4.10. A Vulnerable Community Plan (VCP) has been prepared for these communities. Most people in these settlements are multilingual. They speak mainly Setswana, and some speak English together with other languages (Table 4). Basarwa in Gojwane speak Sesarwa (the language of Basarwa) while only a few speak Sesarwa in Damochujenaa (most likely due to intermarriages, the language is seen as backward, and Setswana language taught and used as a common language of Botswana).

vi. Access to Social Services

All beneficiary villages and settlements have a primary school and a health facility. In addition, Serule village, Mmadinare village and Selebi-Phikwe township have senior secondary and junior secondary schools respectively. The junior and senior secondary schools have boarding facilities for students who come from nearby settlements including members of the vulnerable communities. Government provides transport to the schools especially for the vulnerable community members’ children at the beginning and end of every term of school. They are also supplied with school uniforms, private clothing, bedding, monthly toiletry, monthly food baskets if they are renting accommodation, rental money and all other educational expenses such as transport money and school levies. This is in line with the Remote Area Development Programme which targets vulnerable communities living in settlements. Twelve years of basic education comprising seven years of primary education (7-13 years of age), three years junior secondary education (14-16 years of age) and two years senior secondary education (17-18 years of age) is accessible to all beneficiary villages.

vii. Literacy

Over 50 percent of residents of the beneficiary villages are illiterate. Selebi-Phikwe has the highest literacy rate of 92.1 percent, most likely because it is a town with a high rate of educated people (skilled labor) who had come to seek for various job opportunities. One with the lowest literacy rates is Gojwane with 50 percent. The primary school enrolment rate in all settlements is above 90 percent, and school completion rate is about 98 percent for Damuchojenaa at primary school level. Educational attainment rates post-primary school were not available.

viii. Health

The health facilities provide basic health care such as health education, pre-natal and post-natal care, child welfare services, outpatient treatment of minor health issues, immunizations, sexual reproductive services and HIV and AIDS Services (provision of Anti-Retrovirals (ARVs) and PMTCT (Prevention of Mother to Child Transmission). These services are provided free of charge to every citizen including the vulnerable community members. The common health issues within the project area include communicable diseases such as HIV/AIDS which in Selebi-Phikwe has a prevalence rate of 41.6 percent, one of the highest rate in the country. Other health conditions in
this region include respiratory illnesses such as asthma and other communicable diseases from viruses (like shingles) and fungus (ringworm) leading to skin ailments. Social issues include community conflict such as affray. Alcoholism and substance abuse is also prevalent, especially in the two communities where Basarwa are present. Alcoholism is prevalent among the youth and the elderly for both males and females. Teenage pregnancy is also prevalent, as well as gender-based violence aggreviated by alcohol consumption.

There are traditional healers in the beneficiary villages. They provide healing through prayers to their gods and use of herbs or traditional medicine. Some of these traditional healers are Basarwa (in Gojwane and Damuchojenaa). Some of the traditional doctors sell their herbal concoctions in large bottles along the main roads to make a living (i.e. traditional medicines that are believed to address sexual performance concerns in men).
## Table 4: Selected Social Indicators of Project Settlements

<table>
<thead>
<tr>
<th>Project Locality</th>
<th>Predominant Livelihoods</th>
<th>Poverty Levels (%</th>
<th>Average HIV Prevalence (%)</th>
<th>Predominant Ethnic Group</th>
<th>Predominant Language Spoken</th>
<th>Have a Primary School</th>
<th>Have a health Facility</th>
<th>Unemployment Rate (%)</th>
<th>Literacy Rate (%)</th>
<th>Primary School Enrollment Rate</th>
<th>School Completion Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selebi-Phikwe</td>
<td>Prior to the BCL mining closure mining in October 2016, Now it is commerce and services</td>
<td>11</td>
<td>41.6</td>
<td>Mixed</td>
<td>Setswana, Sebirwa, English</td>
<td>Yes</td>
<td>Yes</td>
<td>10.8</td>
<td>92.1</td>
<td>97.7</td>
<td>-</td>
</tr>
<tr>
<td>Mmadinare</td>
<td>Ipelegeng, agriculture (arable farming, livestock and fishing)</td>
<td>27</td>
<td>17</td>
<td>Bangwato Babirwa</td>
<td>Setswana, Shona, Sebirwa English</td>
<td>Yes</td>
<td>Yes</td>
<td>14.6</td>
<td>85.5</td>
<td>96.2</td>
<td>-</td>
</tr>
<tr>
<td>Damuchojenaa</td>
<td>(Vulnerable Community as per OP4.10) Ipelegeng, livestock rearing and arable Farming</td>
<td>33*</td>
<td>16.9</td>
<td>Bangwato Babirwa and Basarwa</td>
<td>Setswana, Shona, Sesarwa Kalanga Sebirwa English</td>
<td>Yes</td>
<td>Yes</td>
<td>28.3</td>
<td>76.3</td>
<td>98.8</td>
<td>98</td>
</tr>
<tr>
<td>Serule</td>
<td>Ipelegeng, sale of natural resources such as firewood, thatch grass, and mophane worms, agriculture (arable farming, livestock and fishing)</td>
<td>25</td>
<td>17</td>
<td>Bangwato Batswapong Basarwa</td>
<td>Setswana, Setswapong</td>
<td>Yes</td>
<td>Yes</td>
<td>11.7</td>
<td>64.5</td>
<td>96.1</td>
<td>-</td>
</tr>
<tr>
<td>Gojwane</td>
<td>(Vulnerable Community as per OP4.10) Ipelegeng, livestock rearing and arable farming, sale of natural resources such as firewood, thatch grass, and mophane worms.</td>
<td>48*</td>
<td>16.9</td>
<td>Bangwato Batswapong and Basarwa</td>
<td>Setswana, Setswapong, Sesarwa, English</td>
<td>Yes</td>
<td>Yes</td>
<td>11.5</td>
<td>50.0</td>
<td>93.6</td>
<td>-</td>
</tr>
<tr>
<td>Moreomabele</td>
<td>Ipelegeng, livestock earing and arable farming, sale of natural resources such as firewood, thatch grass, and mophane worms</td>
<td>38</td>
<td>16.9</td>
<td>Bangwato Batswapong</td>
<td>Setswana, Setswapong</td>
<td>Yes</td>
<td>Yes</td>
<td>19.6</td>
<td>53.7</td>
<td>96.9</td>
<td>-</td>
</tr>
<tr>
<td>Topisi</td>
<td>Ipelegeng, livestock rearing and arable farming</td>
<td>32</td>
<td>16.9</td>
<td>Bangwato Batswapong</td>
<td>Setswana, Setswapong</td>
<td>Yes</td>
<td>Yes</td>
<td>8.8</td>
<td>51.0</td>
<td>92</td>
<td>-</td>
</tr>
</tbody>
</table>

- Data not available from responsible authority
*This number is most likely high in actual fact given that nearly 90 percent of residents of employable age are enrolled in the government workfare program
P. Significant Findings on Baseline Environment

Biophysical

- There are no protected trees along the proposed pipeline route or the reservoir tanks and pump station sites. Much of the project route is dominated by different associations of Mophane and Mokoba trees, while the key species of the association are **Combretum apiculatum** (Mohudiri) and **Acacia tortilis** (Mosu). Other species along the route include **Grewia Spp** and **Kirkia acuminata** (Modumela).

- Much of the pipeline route is covered by sandy material of low plasticity, varying in depth of between 0.2 and 2.0 m. The sand covers decomposed residual gravels, mostly with low to moderate plasticities. Sporadic rock outcrops were encountered throughout the proposed route alignment but these amount to less than 5 percent of the total excavation where blasting may be required at such sections.

- Molodi Wellfield, within the project area, contains three (3) boreholes and supplies water to Serule village and the surrounding settlements of Moreomabele, Topisi and Gojwane. The Wellfield is situated 30 km west of Serule village.

- The pipeline will traverse the Letlhakane, Serule and Masokobale Rivers. These rivers are ephemeral and only contain surface water during the rainy periods. The aquatic life within the rivers could not be determined to enable assessment of the impacts of the project activities on them as there is no available data. Given this situation, the precautionary principle is to be applied when works are being undertaken within the rivers.

- The rainy season is in summer months with January and February generally regarded as peak months.

- The project area generally has no significant wildlife. Occasional sightings of ‘smaller’ wildlife species are encountered along this route especially along the bushy area between Serule and Gojwane settlements.

- There is currently no concern of significant air quality deterioration as there are no major industrial establishment in the project area save for Bamangwato Concession Limited Mine in Selebi-Phikwe township which has been closed down. Potential impacts on air quality will depend on how effectively the Contractor manages the suppression of dust during the civil works.

- The recorded noise levels by use of a sound level metre (SL 4014) depict a typical rural character of a quite area. The noise levels recorded at the various water tanks are between 37 and 59.6 dB.

- A detailed study on exposure of radiation on the communities of Serule and Gojwane settlements have been undertaken by Sci Rand Consulting (Pty) Ltd, a specialist consulting firm on radiology and public safety. They were commissioned by A-Cap Resources who are the owners of the Letlhakane Uranium Mine, near Serule village. The study indicates that the average dose rate of radiation was found to be 0.3 µSv/h outside the mining concession area, around Serule and Gojwane Settlements, while in the mining area itself it was between 0.3 and 0.67 µSv/h, which are within acceptable limits.

  The report further states that water samples taken in Gojwane and Serule villages indicated significantly lower concentrations of radon. However, it was found that Gojwane’s water sample contained an enhanced $^{238}$U activity with concentrations of 343m Bq/L. This underscores the importance of the water transfer scheme.

Q. Study Findings

1. The project was welcomed by the beneficiary communities as they have been and currently are experiencing a water deficit over many years.

2. No protected tree species are found along the pipeline route or at the proposed locations of the water storage tanks.
3. The section/segment of the pipeline route which was originally designed to follow the road from Serule to Gojwane settlement and has been subsumed by the Letlhakane Uranium Mine to be operated by A-Cap Resources. Consequently, the pipeline has to be re-routed outside the mine concession area.

4. There is a change in the jurisdiction of land administration over Gojwane and Serule. These two settlements were formally under the jurisdiction of Paje Sub-Land Board and now under the jurisdiction of the Tonota Sub-Land Board.

5. There was a skirting observed at the Selebi-Phikwe Train Monument Site, where there is an old locomotive, about 200 m from the existing connecting chamber. The skirting to the south of the train monument site is likely to be affected as the proposed pipeline route will traverse this area.

6. A private commercial plot was to be affected in Mmadinare village by the initial project design. The design has been altered during the inception stage to reduce adverse impacts on a portion of two developed plots - one being a hotel. The pipeline was re-routed, to the opposite side of the road, in order to utilise land that has not been developed and thereby reduce impacts on the commercial enterprise and reduce compensation costs.

7. Portions of an undeveloped Settlement Development Committee (VDC) plot at Topisi village and a private property in Mmadinare village will be affected by the proposed pipeline route. The affected part at Topisi is about 366.179 m² of 4,858 m² of the total plot area, this constitutes about 7.5 percent of the total land area. An *Acacia tortilis* (mosu, hairy umbrella thorn) tree of about 200 cm girth will also be felled on this plot to make way for the pipeline to the tank. In Mmadinare 220.042 m² out of 8,816 m² of the land is to be expropriated. This constitutes about 2.5 percent of the entire land holdings. An Abbreviated RAP (ARAP) has been prepared covering both properties that are to be expropriated.

8. Extensions of the sites for the construction of tanks at three existing plots need to be undertaken. New land rights for two new plots need to be undertaken at Gojwane settlement and Selebi-Phikwe township.

9. The closure of the Selebi-Phikwe Mine will potentially avail both skilled and unskilled workers to the project.

10. There are populations in Damuchojenaa and Gojwane settlements who are considered as vulnerable in line with OP 4.10. A VCP has been prepared and reported in a standalone document in compliance with the Bank policy on Indigenous Peoples.

11. The project will require construction materials in terms of gravel/sand for backfill and bedding purposes. In terms of bedding material, the geotechnical report indicated that half of the upper materials tested and a small proportion of the lower materials meet the proposed specification for bedding materials. However, it will still be necessary to import gravel/sand to augment those found *in situ* in excavated areas. Should a need arise for the requirement of creating a borrow pit to excavate materials then an environmental impact assessment will have to undertaken for the borrowing of material. A borrow pit will only be needed if the materials cannot be sourced commercially, from an operation that has all the required licenses/permits/clearances to operate, including an environmental authorisation.

12. The pipeline route will potentially impinge on the following natural and man-made features during construction:
   - 3 main ephemeral rivers and 35 small streams
   - 31 culverts
   - 11 bridges
   - 4 major road crossings including the A1 Road
   - 6 rail crossings
   - 15 sign boards
   - 2 private plots to be partially affected
   - A number of trees (>200 cm girth) but none is protected
Proposed pipeline will cross the North-South Water Carrier Pipeline at location (X 580429.54 Y 7569831.43) near the Mmadinare - Selebi-Phikwe junction along the Selebi-Phikwe to Serule road.

R. Potential Environmental and Social Adverse Impacts and Proposed Mitigation Measures

The project will result in several negative and positive impacts/risks on the receiving environment and society. From the assessment undertaken, the moderate and highly significant impacts are detailed below.

Potential Positive Impacts

- Improved aesthetical appeal of water tank and reservoir sites
- Creation of temporary and long-term employment for both skilled and unskilled labor. Employment of as much labor as possible from beneficiary villages (at least 60 percent of unskilled labor force) with consideration for members of vulnerable groups capable of performing same duties.
- Boost to the local economy (Increased livelihood opportunities)
- Sustainable supply of good quality water and a stable water pressure
- Improved hygiene and health

The potential negative impacts and their proposed mitigation measures are presented in Table 5:

Table 5: Potential Negative Impacts and their Proposed Mitigation Measures

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential Negative Impacts</th>
<th>Proposed Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-CONSTRUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land acquisition</td>
<td>Involuntary resettlement of two project affected parties. One in Mmadinare village and the other in Topisi village</td>
<td>Prepare and implement an Abbreviated Resettlement Plan (ARAP).</td>
</tr>
<tr>
<td>Identification of a site for a contractor’s office and establishment.</td>
<td></td>
<td>Ensure mitigation measures to address GBV/VAC and other measures to prevent exacerbation of social issues such as alcoholism and substance abuse, affray and teenage pregnancy are put in place (such as Codes of Conduct).</td>
</tr>
<tr>
<td><strong>CONSTRUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Construction Activities.</td>
<td>Riverine bank erosion and siltation</td>
<td>- Work along the river bank should be carefully guided with strict adherence to the usage of designated access road/routes and quick restoration of any disturbed areas.</td>
</tr>
<tr>
<td>- Land clearing for servitude.</td>
<td></td>
<td>- Opening up of trenches, pipe laying and backfilling of the trenches across the river banks should be undertaken in the shortest time possible, preferably in a day to reduce the risk of riverbank collapse and resultant siltation.</td>
</tr>
<tr>
<td>- Excavation (trenching),</td>
<td></td>
<td>- Reasonable compaction should be achieved along the river bank to minimise onset of or prominence of any erosion features.</td>
</tr>
<tr>
<td>layng of Pipes and Backfilling</td>
<td></td>
<td>- Once the pipeline is secured within the river bed, all scrap metal, waste paper and other waste should quickly be removed from the river bed and around it.</td>
</tr>
<tr>
<td>- Building of tanks and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>reservoirs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Decommissioning old tanks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Potential Negative Impacts</td>
<td>Proposed Mitigation Measures</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Transportation of various project materials</td>
<td>Disturbance of soil stability</td>
<td>- Excavated soil should be heaped and used for filling trenches. Any excess soil should be used to control erosion in vulnerable areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Any trenches which are dug out should be quickly filled and compacted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Construction trucks and machinery should use designated access routes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compaction should be undertaken to the required design specifications and approved by the engineer.</td>
</tr>
<tr>
<td>Noise pollution</td>
<td></td>
<td>- All project machinery and vehicles should be properly serviced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fit machinery and heavy duty equipment with silencers to minimize noise generation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Project operations should strictly be undertaken during the daytime.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Workers should be provided with noise protection gear including ear plugs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Works shall only be carried out during daytime to limit noise nuisance.</td>
</tr>
<tr>
<td>Dust pollution</td>
<td></td>
<td>- Construction machinery and equipment should be switched off when not in use to avoid unnecessary idling of the engines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- All haul trucks for transporting earth materials and spoils should be covered as per directive from Department of Waste Management and Pollution Control to prevent the emission of dust during transportation of materials. Covering of material in transportation by tapourlene is highly recommended.</td>
</tr>
<tr>
<td>Vibrations due to blasting and excavations works</td>
<td></td>
<td>- A pre-blasting survey should be made of all buildings, fences, and services in the area to be blasted. Where possible colour photo documentation should be used in order to assess any subsequent compensation claims for blasting related damage.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Blasting should be designed such that the Peak Particle Velocity (PPV) is kept to the minimum using the current best practice.</td>
</tr>
<tr>
<td>Land pollution (both solid and liquid waste)</td>
<td>(Would affect the Vulnerable Community members as well)</td>
<td>- Avail waste bags or containers to move with the construction team along the pipeline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- All non-hazardous solid waste generated must be disposed of appropriately at the nearest landfill or refuse dump site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Where spoil is contaminated, this should be collected for remediation at the soil hospital within the Contractor’s office.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Following successful remediation, this should be collected and disposed off by a licensed and registered company that deals with hazardous waste collection and disposal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- All waste materials should be sorted out first such as contaminated rubble, metal, wood and other waste materials so that they are disposed of appropriately.</td>
</tr>
<tr>
<td>Change in direction of surface runoff/altering drainage patterns</td>
<td></td>
<td>- Regular inspection of excavated site to check direction of flow of surface run off.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Redirect surface flow to original direction or channel of flow.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Compensate all owners of any property damaged.</td>
</tr>
<tr>
<td>Activity</td>
<td>Potential Negative Impacts</td>
<td>Proposed Mitigation Measures</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>All Construction Activities</td>
<td>Conflicts and grievances</td>
<td>- Promote active community participation and provide adequate information to prevent misunderstanding.</td>
</tr>
<tr>
<td>- Land clearing for servitude</td>
<td></td>
<td>- Insure for third party/ public and private properties that are damaged.</td>
</tr>
<tr>
<td>- Excavation (trenching),</td>
<td></td>
<td>- Implement the Grievance Redress Mechanism.</td>
</tr>
<tr>
<td>- Laying of Pipes and Backfilling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Building of tanks and reservoirs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Decommissioning old tanks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Activities</td>
<td>Increase in new infections of HIV/AIDS and STDs</td>
<td>- The Contractor and WUC will provide continual education and awareness on Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/ AIDS) and Sexually Transmitted Infections (STIs). The awareness should include behavioural change on alcoholism and substance abuse.</td>
</tr>
<tr>
<td>- Contractor code of conduct is a requirement under the bidding documents.</td>
<td></td>
<td>- No alcohol should be sold or brought on the project site.</td>
</tr>
<tr>
<td>- Contractor to engage a GBV Service Provider to conduct an awareness talk periodically (monthly) on GBV, and their prevention and to provide services to GBV survivors and perpetrators.</td>
<td></td>
<td>- There will be regular awareness and education sessions for all workers, including new workers as they come in.</td>
</tr>
<tr>
<td>- A Gender Base Violence (GBV) and Violence Against Children (VAC) Compliance Team to be formed as per World Bank’s Guidelines as presented in Annex S.</td>
<td></td>
<td>- Inclusion of Codes of Conduct in the Contractor ESMP and a requirement in bidding documents with periodic awareness and sensitization training.</td>
</tr>
<tr>
<td>- Ensure women have equal opportunity to be hired as this could help address the problem of younger women getting into relationships for financial support and being abused in that process.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- A Gender Based Violence (GBV) and Violence Against Children (VAC) Compliance Team to be formed as per World Bank’s Guidelines as presented in Annex S.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Contractor and its subs and all workers are to be sensitization of Codes of Conduct and Action Plan for Preventing Gender Based Violence (GBV) and Violence Against Children (VAC) throughout the implementation of the project.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- All workers will sign codes of conduct: Codes of Conduct and Action Plan for Implementing ESHS and OHS Standards, and Preventing Gender Based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Potential Negative Impacts</td>
<td>Proposed Mitigation Measures</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td></td>
<td>Violence (GBV) and Violence Against Children (VAC). See Annex S, Volume 2 for complete codes. - Inform and sensitize the community about the GRM and specific procedures for reporting instances of GBV and VAC. - Engage Botswana Police and Area Social Worker in sensitization and awareness on GBV/VAC to ensure they are aware of procedures in place and need for survivor-centered procedures and to participate in community and worker training. - Engage Ministry of Youth Empowerment Sports and Cultural Development and the Gender Affairs Department for feedback on procedures and to participate in community and worker training and awareness programmes.</td>
<td></td>
</tr>
<tr>
<td>Construction Activities</td>
<td>Potential accidents and injuries (Occupational Health) <em>(Would affect the Vulnerable Community members as well)</em></td>
<td>- Develop and implement specific procedures and protocols in line with applicable WBG EHS Guidelines for all workers. - Provide workers with relevant personal protective equipment. - Training of workers on health and safety protocols, the use of safety gear, etc.</td>
</tr>
<tr>
<td>Construction Activities along the Serule to Gojwane section.</td>
<td>Exposure of radiation to workers working within the Serule-Gojwane Section of the pipeline <em>(Would affect the Vulnerable Community members as well)</em></td>
<td>- An induction exercise on radiation protection needs to be undertaken for all workers prior to the commencement of civil works at Damuchojenaa, Serule and Gojwane settlements. - In addition, monitoring of occupational radiation exposure to workers who would be working along the affected pipeline route should be undertaken using Thermoluminescent Dosimetry badges. - In the event of overexposure to radiation, the affected worker should be removed from site and taken to the nearest hospital for requisite treatment.</td>
</tr>
<tr>
<td>Construction Activities</td>
<td>Damage to land and personal properties</td>
<td>- Provide adequate information to the public for self-protection. - Install warning and safety signs - Compensate all those expected to be adversely affected by the project such as taking up land, removal of fences, damage to properties (loss of livestock). - Ensure the GRM process is known by the community and is functioning.</td>
</tr>
<tr>
<td>Construction Activities</td>
<td>Accidents involving humans and livestock <em>(Would affect the Vulnerable Community members as well)</em></td>
<td>- Workers Ahead signs should be placed at least 100m on either approach along roads running parallel to the pipeline routes. - Ensure all scaffolding is inspected by competent person(s) before use. - Appropriate PPE including safety harnesses, safety nets and helmets should be provided and the use of these should be enforced. - Implement good housekeeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from footpaths.</td>
</tr>
<tr>
<td>Construction Activities</td>
<td>Cracking of houses/structures due to blasting and or vibrations</td>
<td>- Take a pre- and post-blasting pictures of all structures with a reasonable distance of 500 m radius to determine effects of blasting.</td>
</tr>
<tr>
<td>Activity</td>
<td>Potential Negative Impacts</td>
<td>Proposed Mitigation Measures</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
| Construction Activities | Damage to public utility services | - Map out all utilities within the road/railway reserve and avoid damage.  
- Area for excavations should be marked on the ground for direction of the operator. |
| Construction Activities | Blockage of access to properties (Would affect Gojwane Community members) | - Community members should be informed at least a day before possible blockage of access.  
- The period of blockage should also be communicated. No access should be blocked for more than a day. |
| Construction Activities | Potential Archaeological finds (Potential burial sites between Serule and Gojwane Settlements) | - Institute Chance Find Procedures in the case of cultural property is found Annex U.  
- Inform relevant parties of the Chance Find Procedures and apply where applicable. |

**DECOMMISSIONING: POST CONSTRUCTION**

- Dismantling and transportation of materials and equipment,  
- Cleaning up  
- During decommissioning, all potential impacts on public and occupational health likely during construction, are also significant.  
- Waste generation will be higher.  
- Mitigation measures as per the construction phase.

**DURING OPERATION AND MAINTENANCE**

| Operation of the water transfer scheme. | - Increased water abstraction from the dam.  
- Deteriorating water quality and decline in water pressures  
- Wear and damage to:  
  - Water storage tanks  
  - Reservoirs  
  - Pump stations  
  - Water treatment plant | - Water abstractions monitoring  
- Public education and awareness training on water conservation  
- Water quality and pressure monitoring regime.  
- Maintenance Plan including routine checks for pumps, reservoirs, water treatment plant, water storage tank tanks and fencing. |

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**S. Social Inclusion of Women, Youth and Marginalised and Disadvantaged Groups**

i. **Disadvantaged Groups**

The Vulnerable Community (Basarwa) were identified through the Social and Community Development officers in the settlements of Gojwane and Damuchojenaa. However, there are other disadvantaged individuals who may be more likely to be adversely affected by the impacts of the project and/or more limited than others in their ability to take advantage of the projects benefits. These include children, elderly, destitute persons, persons with disabilities, women-headed households, persons with HIV/AIDS, the unemployed, among others.
During civil works for example such as open trenches, it will adversely impact on the movement of people by severing footpaths or roads within in the settlements. This will be temporary but requires consideration of vulnerable people. Crossing of trenches may therefore pose a risk to children, persons with disabilities, and the elderly. These have been considered in the mitigation measures. Consideration to employ persons from disadvantaged groups according to their ability in the project can contribute to inclusive project benefits.

ii. **Gender and Gender-Based Violence (GBV)**

Gender-Based Violence is an emerging social issue in Botswana. In rural areas instances of GBV have occurred in part due to cultural or traditional norms and underlying social conditions, however, these occurrences are not reported to the authorities. There is need for periodic education on GBV prevention to the workers and community members during construction.

GBV is deeply rooted in gender inequality, and while both women and men experience gender-based violence, most victims are women and girls. GBV can cause economic, physical, social and emotional harm to an individual, for example, through property damage and restriction of access to resources, impact their personal health and safety, can lead to social exclusion, and foster dependency on their partners for all material needs which can often perpetuate the cycle of violence.

In view of the above, this project will provide special consideration to employ women during civil works to help empower them and provide economic independence.

iii. **Violence Against Children (VAC)**

The following risks exacerbates the possibility of VAC and harm to children more generally:

- Employing children below the age of 14 by the Contractor and allowing children to sell to the workers during school hours. Botswana’s Employment Act defines the minimum age of employment as 14 years, *when the child is not attending school*. The Act states that he/she may be employed on *light work not harmful* to his/her health and social development. The child should work for a maximum of six hours a day and 30 hours a week. While adults work for eight hours a week and not more than 48 hours a week.
- Using children for personal or financial advantage by both contractors and employees.
- Harassing children, including sexual exploitation and physical or sexual violence.
- Putting children’s health and safety in danger by not protecting trenches that are close to where they play their homes and within the built-up area.

The Children’s Act, 2009 is the principal law for the protection of all children in Botswana and it defines a child as anyone who is below the age of 18 years. This project will not employ children under the minimum age of 14 and will be monitored to ensure compliance. In addition, to strengthen and protect children against possible violence, the *Codes of Conduct and Action Plan for Implementing ESHS and OHS Standards, and Preventing Gender Based Violence (GBV) and Violence Against Children (VAC)* will be rigorously applied and will be included in the Contractor’s ESMP (Annex S outlines the procedures for addressing GBV and VAC) and in all bidding documents.

iv. **The Youth in Beneficiary villages (Including Youth of Vulnerable Communities)**

According to the Statistics Botswana, 2011 Population and Housing Census, the total youth population is estimated at 26 percent (that is the age cohort between the ages of 18-35 years). Most of the unemployed are the youth and particularly those just coming out of school. The
challenges they face include limited job opportunities, inadequate employable skills, and limited access to productive assets particularly those in the vulnerable communities. The high rate of unemployment causes frustration, dejection, desperation and dependency, and the situation has left the youth in a vicious cycle of poverty that daily erodes their confidence and hopes for a prosperous and meaningful future. Consequently, they tend to abuse alcohol and drugs and thus are increasingly being involved in crime and delinquency. The implementation of this project should facilitate employment to the youth, both men and women.

T. Estimated Budget for Implementation of ESMP

It is estimated that the mitigation measures at the pre and construction stages will cost a total of P8,599,700.00 (US$ 859,970.00) which is about 2.8 percent of the total project cost.

Table 6: Estimated Budget for Implementation of ESMP

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Time Frame</th>
<th>Budget (Pula)/USD</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Capacity Building</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Capacity building of WUC Officers in Environmental and Social Safeguards</td>
<td>Throughout Project</td>
<td>P100,000.00 (USD 10,000)</td>
<td>WUC</td>
</tr>
<tr>
<td></td>
<td>Capacity building of Stakeholders (such as Contractors, Community and other stakeholders involved in ESMP on issues such as GBV, VAC etc.)</td>
<td>Within first 3 months of project implementation</td>
<td>300,000.00 (USD 30,000) (Hiring of venues, stationary, resources for workshops, food, for capacity building on issues such as GBV, VAC etc.)</td>
<td>WUC</td>
</tr>
<tr>
<td>2.</td>
<td>ESMP Implementation, Monitoring, Evaluation and Reporting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regular monitoring of Project site and activities</td>
<td>Entire project period, of 18 months and defect liability of 12 months – monthly</td>
<td>1,575,000.00 (USD 157,500.00) (Monitoring by Environmental and Social Safeguards team.)</td>
<td>WUC (part pre-funded by engagement of environmental/social consultants)</td>
</tr>
<tr>
<td></td>
<td>ESMP implementation of mitigation measures</td>
<td>Before and during construction</td>
<td>3,260,000.00 (USD 326,000.00)</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>ESMP implementation of mitigation measures</td>
<td>During operations and maintenance annually</td>
<td>Borne out of WUCs Regular Operational Cost.</td>
<td>WUC</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GRM Implementation Costs</td>
<td>Pre-construction, Construction and Decommissioning</td>
<td>953,000.00 (USD 95,300.00) (Table 41)</td>
<td>Contractor and WUC</td>
</tr>
<tr>
<td></td>
<td>VCP implementation Costs</td>
<td>Pre-construction, Construction and Decommissioning</td>
<td>1,290,000.00 (USD 129,000.00)</td>
<td>Contractor and WUC</td>
</tr>
<tr>
<td></td>
<td>Sub-Total</td>
<td></td>
<td>P7,478,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 percent contingency</td>
<td></td>
<td>P1,121,700.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>P 8,599,700.00 (US$ 859,970.00)</td>
<td></td>
</tr>
</tbody>
</table>
U. Roles and Responsibilities for ESMP

The implementation of this ESMP will be the overall responsibility of WUC, and more specifically, the Project Implementation Unit. The Contractor to be appointed will implement most of the mitigation measures proposed in the ESMP. Some institutions have also been recommended in the ESMP to administer the project to achieve its objectives and minimise adverse impacts. These include the communities, Tribal Administration of all the beneficiary communities, the safeguards monitoring team (Earthtec Consultancy (Pty) Ltd), and the various district Councils under whose jurisdiction works will be undertaken. These Councils are the Palapye/Serowe Administrative Authority, the Tonota and Bobirwa Sub-District Councils and the Selebi-Phikwe Town Council.

Other Government institutions to implement specific monitoring and implementation roles according to their mandate include the Ministry of Youth, Empowerment, Sports and Culture for the engagement of the youth in the development process of especially the vulnerable communities and the Ministry of Health and Wellness through their District Health Management Teams who are responsible for educating communities on all health issues including, communicable and non-communicable diseases. The World Bank will supervise the implementation of the project’s environmental and social instruments and will assist with technical capacity building. In addition, WUC will provide technical support and participate in training and sensitization of stakeholders to enhance understanding of the national and the Bank’s environmental and social safeguard instruments.

V. Grievance and Conflict Resolution

A Grievance Redress Mechanism is necessary for addressing the concerns of Project Affected People and other stakeholders. It is anticipated that some of these concerns may include eligibility criteria, compensation entitlements for loss of livelihood and use of land.

The mechanism for grievance redress includes:
- Provision for the establishment of a Grievance Redress Committee (see GRC members below)
- Multiple grievance uptake locations and multiple channels for receiving grievances
- Fixed service standards for grievance resolution, include adjudication process and process of handling situations related to gender-based violence/sexual exploitation and abuse
- Prompt and clear processing guidelines (including reviewing procedures and monitoring system)
- A time frame for responding to grievances
- A reliable and effective reporting and recording system
- Procedure for assessing the grievance
- Grievance escalation process

The grievance redress mechanism is designed with the objective of solving disputes at the earliest possible time before they escalate. In addition, World Bank OP 4.12 emphasizes that the PAPs should be heard and as such, they must have access to a fair, transparent and accessible means to address their concerns and views related to the project. Furthermore, the mechanism should be effective in addressing projects at project-level so that grievances are not referred through the court system for resolution, especially since the court system may not be financially accessible to all and may add cost and time burdens.

During the implementation phase of the Project, the mechanism for grievance redress shall include:
• Provision for the establishment of a grievance redresses committee with a sitting allowance budgeted for the Grievance Redress Committee (GRC) members.
• Multiple grievance uptake locations and multiple channels for receiving grievances (project hotline, project website, Facebook page, WhatsApp blasts, WUC Project Implementation Unit (PIU), office, Kgosi and VDC, grievance box at the Kgotla).
• Fixed service standards for grievance resolution which include adjudication process.
• Prompt and clear processing guidelines: including reviewing procedures and monitoring system (see flow chart)
• A time frame for responding to grievances (see flow chart on GRM chapter)
• A reliable and effective reporting and recording system (grievance register, complaints logbook – hard copy)
• Procedure for assessing and responding to the grievance

A Grievance Resolution Committee will be established with a clear term of reference. Membership would comprise of:

- Project Contractor
- Land Board Representative
- WUC Representative
- Two Local Representatives (One man and one woman. In Vulnerable Communities, at least one representative of the VC)
- Project Liaison Officer 1 (Safeguards Social Development Consultant)
- Project Liaison Officer 2 (Safeguards Environmental Consultant)
- Community Liaison Officer (Secretary)
- NGO representing Basarwa (e.g. Kwedom Council, San Youth Network)

The WUC PIU Safeguards Team Members will attend meetings when there is a matter that requires their urgent attention.

A Grievance Redress Mechanism for conflict prevention and resolution has been devised in consultation with the affected communities. **Table 7** below shows the GRM Process.

**Table 7: Grievance Redress Mechanism Process**

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Description/Required Action</th>
<th>Completion Timeframe</th>
<th>Responsible Agency/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Receipt of complaint</td>
<td>Document date of receipt, name of complainant, nature of complaint and means of complaint</td>
<td>1 day</td>
<td>PCU (Community Liaison Officer)</td>
</tr>
<tr>
<td>2.</td>
<td>Acknowledgement of grievance</td>
<td>By letter, email, phone, WhatsApp Facebook</td>
<td>1-5 days</td>
<td>PCU (Community Liaison Officer)</td>
</tr>
</tbody>
</table>
| 3.   | Screen and establish the foundation / merit of the grievance | Visit the site; listen to the complainant/community; assess the merit  
  If it is a minor complaint, then will decide a resolution and communicate this to the complainant and seek from the complainant if this is acceptable. If not move to next stage. | 7-14 days           | GRC members including the Project Community Liaison Officer, complainant or his/her representative |
<p>| 4.   | Implement and monitor a redress action | Where complaint is justified, identify and carry out the redress                          | 21-30 days or at a time specified in | Community Liaison Officer, Social and Environmental Safeguard Specialists to |</p>
<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Description/Required Action</th>
<th>Completion Timeframe</th>
<th>Responsible Agency/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Inform complainant and community (use of community boards, newspaper, radio, what’s app group, Facebook page) to inform community of grievance outcome and solicit response from complainant if claim has been fully addressed or not.</td>
<td>Where complainant is not satisfied, inform complainant of escalation process. If satisfied or not, ensure grievance logbook is updated.</td>
<td>1-2 days after making a decision on a grievance by the GRC</td>
<td>Community Liaison Officer</td>
</tr>
<tr>
<td>6.</td>
<td>Extra intervention for a dissatisfied scenario</td>
<td>Review the redress steps and conclusions, provide intervention solution</td>
<td>2-4 weeks of receiving status report</td>
<td>MLMWS, Project Coordinator, Social and Environmental Officers (PIU), and GRC to review and react</td>
</tr>
<tr>
<td>7.</td>
<td>Judicial adjudication</td>
<td>Take complaint to court of law</td>
<td>No fixed time</td>
<td>Complainant</td>
</tr>
<tr>
<td>8.</td>
<td>Funding of grievance process</td>
<td>WUC logistics and training, redress compensation, court process</td>
<td>No fixed time</td>
<td>WUC</td>
</tr>
</tbody>
</table>

W. Conclusion

The water transfer scheme is expected to have overall beneficial impacts on the beneficiary communities including the vulnerable communities in Gojwane and Damuchojenaa and the district at large as it intends to supply water in a sustainable manner to the beneficiary villages, which currently face severe water shortages. All identified adverse impacts such as the deterioration of air quality and change in land use are either preventable or could be minimised through the mitigation measures proposed.

The sub-project takes the concerns and views of project affected persons seriously and is committed to implementing fair, transparent, accountable and effective mitigation measures to address them, according to the institutional requirements of the World Bank.

The ESMP will form part of the contract and tender documents for engaging the Contractor to ensure that the provisions are costed and implemented as is the requirement under the enhanced Standard Bid Documents for World Bank-funded projects. The ESMP will be disclosed to communities for feedback and following clearance from the Bank it will be publicly disclosed both in-country and the World Bank’s external website.
1.0 GENERAL INTRODUCTION

1.1 Background

The Government of Botswana through Water Utilities Corporation (WUC) is undertaking the Botswana Emergency Water Security and Efficiency Project (BEWSEP) with funding from the World Bank. The Selebi-Phikwe to Serule Water Transfer Scheme is a sub-project under this project. The environmental and social policies of the World Bank (WB) require the project to conduct an Environmental and Social Impact Assessment (ESIA) with an Environmental and Social Management Plan (ESMP) in line with World Bank’s Operational Policy procedures and standards.

1.1.1 BEWSEP Description and Development Objective

The Proposed Development Objective (PDO) of the project is to improve availability of water supply in drought vulnerable areas, increase the efficiency of Water Utilities Corporation (WUC) and strengthen wastewater management in selected systems. The project is organized under three components:

Component 1: To improve availability of water supply and efficiency;
Component 2: To improve wastewater and sludge management;
Component 3: Sector reforms and institutional strengthening.

Although the Botswana Emergency Water Security and Efficiency Project has been classified as Category ‘A’, this sub-project is classified as a Category B because it is expected that the majority of infrastructure development will be in-situ rehabilitation and upgrading and that new pipelines will be placed mostly within existing rights of way.

Project Description of Selebi-Phikwe Water Transfer Scheme

The Selebi-Phikwe to Serule Water Transfer Scheme sub-project serves to improve water supply to the beneficiary six settlements of Mmadinare, Serule, Gojwane, Moreomabele, Topisi and Damuchojenaa settlement as a long-term water supply solution. The objective of the project is to ensure supply of enough potable drinking water for the populations of these beneficiary villages over the next 20 years.

This document updates a previously prepared Environmental Impact Assessment (EIA) report undertaken for this sub-project and approved by the Department of Environmental Affairs (DEA) on 11 June 2014. The EIA, however, lacked the social assessment component to complete it to be an Environmental and Social Assessment report (ESIA). The update of the ESIA report has been undertaken to comply with the World Bank Safeguard Policies specifically, Environmental Assessment (OP 4.01), Physical Cultural Resources (OP 4.11), Indigenous Peoples (OP 4.10) (hereafter referred to as Vulnerable Communities) and Involuntary Resettlement (OP 4.12). Based on this, a Vulnerable Community Plan (VCP) and an Abbreviated Resettlement Action Plan have been prepared.

In addition, the World Bank Group Environmental, Health and Safety Guidelines (WBG EHS Guidelines) are applicable to the project, together with the sector specific Water and Sanitation Guidelines.

5https://www.ifc.org/wps/wcm/connect/0d8cb86a-9120-4e37-98f7-cfb1a941f235/Final%2BWater%2Band%2BSanitation.pdf?MOD=AJPERES&CVID=jkD216C
1.2 Rationale of THE sub-Project

The project will supply sufficient treated potable bulk water to the populations of six settlements in the long term for the next 20 years (up to 2040). The settlements currently face water shortages and sometimes have no water supply for days. This project aims to supply water on a sustainable basis to improve the quality of life of the estimated 29,840 beneficiaries.

1.3 OBJECTIVES of the ESIA and AIA Study

a) Assess the environmental and social risks and impacts of the proposed works and its associated infrastructure and provide mitigation measures in an ESMP.

b) Undertake a due diligence study to identify any gaps with respect the existing facilities, namely the water source, the pipeline from the water source to the water treatment plant and the water treatment plant itself, and WUC’s institutional capacity to operate the scheme according to best practice.

c) Develop and execute effective public consultations throughout the lifecycle of the sub-project, especially during implementation. Organize and conduct stakeholder meetings on a periodical basis up to the end of the project. This is to ensure that the stakeholder meetings have representatives from vulnerable communities and others; and are accessible and inclusive (gender, age, persons with disabilities, culturally appropriate, etc.)

d) Prepare a RAP in accordance with the prepared and approved RPF.

e) Conduct an AIA and submit the final report to the Department of National Museum and Monuments for approval.

f) Establish which of the communities in the sub-project meet the criteria of Vulnerable Communities as per OP 4.10 which will inform the VCP.

1.4 PROJECT LOCATION

The sub-project pipeline route is in the Central District starting from Selebi-Phikwe township in the eastern part of the country, then proceeds to the beneficiary villages being Mmadinare village, followed by Damuchojenaa settlement and to Serule village, crosses the Francistown to Gaborone A1 Road and the railway to Gojwane settlement, then to Moreomabele in the southern part and ends within Topisi village. The investment is to improve water supply for about 29,840 beneficiaries. Maps 1 and 2 show the location of the sub-project.

Selebi-Phikwe is a mining town and is the third largest town in Botswana. It is situated in the eastern part of Botswana, about 415 km by road from Gaborone, and about 150 km south-east of Francistown. The town is accessible by a tarred road to the east of the Gaborone – Francistown road at Serule junction.

Six Beneficiary Villages:

1) **Mmadinare village** is located in the Bobirwa Sub-district, 15 km North West of Selebi-Phikwe and about 340 km north of Gaborone.

2) **Damuchojenaa settlement** is located about 30 km east of Serule village and is accessible by a tarred road that branches off from the Selebi-Phikwe-Serule road.

3) **Serule village** is accessible by tarred road from all the three towns. Moreomabele and Topisi villages are about 15 km and 30 km, respectively, south of Serule village along the Gaborone-Francistown road.
4) **Gojwane settlement** is situated about 15 km north of Serule village and is accessible by a gravel road from Serule and also accessible by a tarred road from the Gaborone-Francistown A1 Road.

5) **Moreomabele village** is also in the Central District about 15 km south of Serule village along the Gaborone-Francistown Road.

6) **Topisi village** is also situated in the Central District and 30 km respectively south of Serule village along the Gaborone-Francistown Road.

**Map 2: Beneficiary Villages in the National Context**

**Map 3: Water Pipeline Route between Beneficiary Villages**
1.5 Methodology of ESIA Study

1.5.1 Literature Review

A desktop review of existing literature related to the environmental and socio-economic characteristics of the sub-project area was undertaken to appreciate the existing conditions of the proposed sites and to contextualize how the project area would be affected by the implementation of the sub-project. A review of World Bank and Government of Botswana's legislation, vision, policies, plans, programmes relevant to the implementation of the proposed project was undertaken.

1.5.2 Public Participation (Consultation with Interested and Affected Parties)

Public consultations were held in the form of community meetings. These were held in compliance with Section 7(2) of the Environmental Assessment Act (2011) for all the settlements. These consultations were inclusive, accessible and participatory. In communities with presence of vulnerable communities, consultations were in line with the principles of free, prior, and informed consultation leading to active participation of the communities and broad support for the project. This has been detailed out in Chapter 5.

The views of those affected or interested in the project informed the identification and evaluation of both social and environmental impacts and have been considered in the formulation of mitigation measures and the development of the ESMP. Additional consultations will be held individually with selected interested parties such as national and local level organizations representing Basarwa interests, youth and women.

1.5.3 Field Survey

Field studies were undertaken to complement the baseline information obtained through literature review. During the field survey two techniques were used to collect information. Observation by consultants and completion of field checklists. Information collated included:

- Biophysical characteristics of the project area
- Land use information and whether any land belonging to the communities would be impacted by works
- Information on properties likely to be affected by the project for which a RAP would be needed.
- Livelihoods of communities
- Language spoken by beneficiary members.

Gojwane and Damuchojenaa were identified as having Vulnerable Communities, and a household survey was undertaken using random choice method. A total of thirty respondents/households were selected and interviewed in each settlement.

An Archaeological Study in relation to OP 4.11 of the pipeline route as well as the pump stations, elevated tanks and ground reservoir tanks was also undertaken in 2013 and 2018. Copies of both conditional planning consents are presented in Annex C (Vol. 2). Chance Find Procedures are presented in Annex U (Vol. 2) to further guide the contractor during construction phase of the project.

1.5.4 Impact Assessment

Qualitative methods were used to assess the social and environmental impacts that are anticipated to emanate from the implementation of the project. This was assessed based on the severity, duration, spatial scale and the probability of occurrence of the impact. The impact
was then judged to be low, moderate or of a high significance. This then determined the extent of mitigation measures required and the need for monitoring of the moderate and high environmental and social significant adverse impacts.

1.6 Scope of ESIA

The scope of the ESIA covers the pipeline route corridor, sites for the construction of pump stations, ground reservoir and elevated water tanks, their immediate environments (within 200 m of the site) and the social aspects, including the risks and impacts, to the beneficiary communities.

1.7 MAJOR findings on developments and changes since previous ESIA

The update study revealed the following significant findings which have design implications:

- The Selebi-Phikwe Mine closed down in October 2017. This closure will subsequently avail to the project, a number of workers both skilled and unskilled. Community consultations indicated a need for employment by the community, given the high unemployment rates in the project area.
- The segment of the pipeline route corridor which was originally designed to follow the gravel road from Serule village to Gojwane settlement has been subsumed by Letlhakane Uranium Mine to be operated by A-Cap Resources. Consequently, the pipeline corridor has to be re-routed outside the mine concession area.
- At the Selebi-Phikwe Train Monument Site, about 200 m from the connecting point or existing chamber, the construction of a skirting/sidewalk around the monument was observed. The project will not result in any need to move the monument; however the skirting/sidewalk to the south of the monument may be affected as the proposed pipeline route from Selebi-Phikwe to Serule traverses this section. The Selebi-Phikwe Town Council’s Department of Parks and Recreation were consulted regarding this development. The Department recommended that all affected properties should be reinstated to their original state upon completion.
- In Mmadinare village, as per the previous design, two developed plots (one being a lodge) were to be partially affected. It was suggested and agreed during the engineering design inception stage that the pipeline route corridor should use the land opposite the lodge. By this recommendation, only one private commercial plot is to be partially affected. This will minimise impacts and reduce expropriation related issues as there is less development along this side of the road.

1.8 Public Disclosure

- This ESIA will be disclosed to the affected communities and all affected stakeholders as of April, 2020 following World Bank clearance. The method of disclosure will be a presentation to the communities in a format and language accessible to them. Hard and soft copies will be made available to the VDC, Kgosi, contractor, CLO and will be uploaded on WUC’s website, as well as on the World Bank’s website. There will also be a phone number that will be given to the VDCs and which will also be listed on the WUC website which the public can call to request a copy.
2.0 PROJECT DESCRIPTION

2.1 Description of the Existing Water Supply System

a) Mmadinare village

Mmadinare village water supply is provided by a dedicated water treatment plant which draws raw water from Letsibogo or Shashe dams depending on which one is in use. Over recent years, Mmadinare village has had high growth in infrastructure (notably the Senior Secondary School) and population, due its proximity to the mining town of Selebi–Phikwe. This has consequently strained the treatment capacity of the treatment plant.

b) Serule, Moreomabele, Topisi and Gojwane settlements

Serule village and surrounding settlements of Moreomabele, Topisi and Gojwane are supplied by Molodi Wellfield situated 30 km west of Serule village. The wellfield comprises three boreholes which pump into a collector reservoir that gravitates water to Serule village. At Serule there are two pump stations, one for Topisi and Moreomabele villages and the other for Gojwane settlement. The pump stations are operated on alternate days. The three boreholes at Molodi Wellfield have a combined output of 390 m³/day. The Corporation's observations show that this output meets the demand for Serule village alone. There is a supply deficit of 130 m³/day for the whole integrated scheme. The deficiency is shared among the settlements leaving all the settlements with a water shortage problem. None of the reservoirs in all the four settlements fill up, resulting in some parts in all the settlements receiving low pressure to no water. The shortage means that the boreholes must run 24 hours a day resulting in frequent breakdowns and high maintenance. Furthermore, continuous over-pumping of boreholes negates good operational practice and potentially leads to aquifer deterioration. To remedy the situation, water is bowsed daily from Selebi-Phikwe township.

Plate 1 shows the dire water shortage situation at Gojwane settlement with community members in a long queue for water.

Plate 1: Gojwane Community Queuing for Water at a Public Standpipe

Source: Bothakga Burrow Botswana (Pty) Ltd (2018b)
The settlement of Damuchojenaa is supplied from two low yielding boreholes. The boreholes pump directly into the distribution system because the supply is not adequate to fill up the settlement reservoir. Continuous pumping of boreholes negates good operational practice and potentially leads to aquifer deterioration in terms of quality and yield. Water is bowsed from Selebi–Phikwe township daily to remedy the situation.

2.2 Proposed Sustainable Source of Water for the Project

The Selebi-Phikwe to Serule Water Transfer Scheme sub-project's functioning and sustainability is dependent on existing infrastructure, as well as WUC’s capacity to construct, operate and maintain the Scheme. As such a due diligence (Annex ZE) on the associated existing infrastructure was undertaken. The existing infrastructure associated with the Scheme includes the:

- Water source, namely Letsibogo Dam,
- Transmission pipeline between the water source and the water treatment plant and the
- Water Treatment Plant (WTP) itself in Selebi-Phikwe.

A hydrological assessment of the Dam undertaken under 2004 Selebi-Phikwe Master Plan assured that demands for the project could be met and that the raw water quality from the Dam routinely measured by WUC was found to be of good quality except for turbidity during rain fall season (increased flow into the dam). The Master Plan also recommended that the pipeline and the treatment plant be upgraded/refurbished. Currently the pipeline transferring water from the dam to the water treatment plant is undergoing refurbishment by WUC in readiness for this sub-project. The planned completion date for the refurbishment works is May 2020. The WTP was expanded in 2013 to a capacity of 37.5 Ml/day. This expansion took into consideration the anticipated demands of the Selebi-Phikwe Mine and for the Selebi-Phikwe Water Supply Transfer Scheme sub-project.

In addition WUC has prepared a Dam Safety Action Plan, for which the remedial works are being implemented, by WUC with follow ups by World Bank.

Also engineering design studies undertaken by Bothakga Burrow Botswana (2018c) found that the existing water treatment plant in Selebi-Phikwe has adequate capacity to meet the projected water demand for the project settlements in twenty years in 2040.

The Functional Design Specification report (2013) for the refurbished water treatment plant in Selebi-Phikwe confirms that total delivery of the plant is now 37,500 m³/day. Before closure of BCL mine the 2004 GIBB report stated that the high demand for Selebi-Phikwe will be 26,752 m³/day. This leaves spare capacity for the project settlements more than 10,700 m³/day. The water demand studies conclude that under a theoretical high demand scenario, the project settlements will require approximately 7,848.1 m³/day by the year 2040. This figure includes a 1.4 peak daily demand and 15 percent allowances for losses (Bothakga Burrow Botswana (2018)).

The water demand studies determined that by the year 2040 the water requirements for the settlements would be as shown in Table 8. Each of these settlements is experiencing severe water shortage and WUC is currently expending financial and human resources in bowsing water to the settlements to meet demand. Therefore, WUC identified the conjunctive use of the settlements’ underground water sources and surface water from the Letsibogo Dam, through Selebi-Phikwe Water Treatment Plant, as a long term (to 2040) water supply solution to the beneficiary villages.
The existing water sources for the affected villages includes multiple wellfields as well as Mmadinare village being specifically supplied by Letsibogo Dam via a dedicated treatment in the village. The boreholes will be rested and used as back water supply, if and when required Mmadinare Treatment Plant will be maintained and kept operational by WUC to ensure that it could be potentially be used in the future if needed.

Table 8: Projected Water Demand for the Project Settlements

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Total/Settlement/Day (m³)</th>
<th>Average Daily Demand With Losses (m³)</th>
<th>Peak Daily Demand With Losses (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mmadinare</td>
<td>3247.2</td>
<td>3734.28</td>
<td>5227.99</td>
</tr>
<tr>
<td>Damuchojena</td>
<td>205.5</td>
<td>236.32</td>
<td>330.85</td>
</tr>
<tr>
<td>Serule</td>
<td>877.6</td>
<td>1009.24</td>
<td>1,412.93</td>
</tr>
<tr>
<td>Gojwane</td>
<td>207.7</td>
<td>238.85</td>
<td>334.39</td>
</tr>
<tr>
<td>Moreomabele</td>
<td>86.3</td>
<td>133.76</td>
<td>187.27</td>
</tr>
<tr>
<td>Topisi</td>
<td>250.4</td>
<td>287.96</td>
<td>403.14</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>4874.7</strong></td>
<td><strong>5640.42</strong></td>
<td><strong>7,896.59</strong></td>
</tr>
</tbody>
</table>

Source: Bothakga Burrow Botswana (Pty) Ltd. (2018b)

2.3 SUB-Project Components

The main components of the works include the following:

- Connection to an existing valve chamber (proposed connection point) in Selebi-Phikwe township.
- Construction of a 355 mm diameter uPVC Class 16 gravity pipeline from the existing valve chamber (connection point) in Selebi-Phikwe to the proposed pump station (WBPS1) in Selebi-Phikwe to feed a proposed collector/balancing reservoir and the pump station.
- Construction of a 750 m³ RC circular collector/balancing reservoir 2.2 km from proposed connection point.
- Construction of a transfer pump station (WBPS1) equipped with two pump sets. One pump set dedicated to the supply to Mmadinare village and the other pump set for the supply to the other settlements. Each pump set will comprise three pumps – two duty pumps and one standby pump.
- Construction of a 315 mm uPVC Class 12 transfer pipeline from Selebi-Phikwe to Mmadinare.
- Construction of a 6000 m³ ground reinforced concrete reservoir at existing Mmadinare tank sites.
- Construction of a transfer pipeline from Selebi-Phikwe to Serule (DN350, PN16 K9 DI; DN315, uPVC Class 16).
- Construction of a 110 mm uPVC Class 9 branch off to Damuchojena Settlement.
- Construction of a 300 m³ elevated distribution tank at Damuchojena Settlement.
- Construction of a 200 mm uPVC Class 16 branch feed to the proposed 50 m³ collector tank/ transfer pump station to Moreomabele and Topisi villages.
- Construction of a booster pump station (WBPS3) at an existing site in Serule village to transfer water to Moreomabele and Topisi villages.
- Construction of a transfer pipeline from Serule village to Topisi village (DN160, mPVC Class 25; DN160, uPVC Class 16).
- Construction of a 110 mm uPVC Class 16 branch to Moreomabele village.
- Construction of a 2 000 m³ ground level storage reservoir at Serule distribution tanks complex.
- Construction of a pump station (WBPS2) at Serule distribution tanks complex which will feed the existing and proposed elevated distribution tanks.
- Construction of a 1000 m³ elevated distribution tank at Serule distribution tanks complex.
• Construction of a 110 mm uPVC Class 9 transfer pipeline to the proposed 400m³ elevated distribution tank at Gojwane Settlement.
• Construction of a 400 m³ elevated distribution tank at Gojwane Settlement.
• Construction of electrical power to the pump stations including stand-by generators.
• Installation of new telemetry and SCADA system for the whole project.
• Fencing of storage areas and tank stations.
• Decommissioning of old water storages tanks at Gojwane, Topisi and Moreomabele villages.

Figure 1: The Schematic Drawings for the Project

Source: Bothakga Burrow Botswana (Pty) Ltd (2018a)

2.4 PROJECT ACTIVITIES

The project activities to be undertaken at various phases of the project are shown in Table 9 below. This helps to identify the beneficial and negative impacts that could result in undertaking the activities. The risks associated with these activities are presented in the ESMP and appropriate mitigation measures provided.
<table>
<thead>
<tr>
<th>PRE-CONSTRUCTION</th>
<th>CONSTRUCTION</th>
<th>DECOMMISSIONING AFTER CONSTRUCTION</th>
<th>OPERATING AND MAINTENANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Preparation of detailed design</td>
<td>• Land clearing for servitudes</td>
<td>• Dismantling of installations and Contractor’s office</td>
<td>• Ensuring adequate water pressure</td>
</tr>
<tr>
<td>• Preparation of ESIA and ESIA, Resettlement and VCP Reports</td>
<td>• Excavation and filling up of trenches</td>
<td>• Cleaning up and removal from site all waste materials</td>
<td>• Ensuring good water quality</td>
</tr>
<tr>
<td>• Land Acquisition</td>
<td>• Cribbing</td>
<td>• Rehabilitation of site to near- original state.</td>
<td>• Maintenance of system and attending to problems such as pipe bursts, leakages</td>
</tr>
<tr>
<td>• Tendering and Award of Contract for a Contractor</td>
<td>• Thrust boring</td>
<td>• Transportation of materials away from site</td>
<td>• Community Consultation including VC</td>
</tr>
<tr>
<td>• Application for wayleave for using Road and Railway Reserve</td>
<td>• Laying of pipelines</td>
<td>• Community consultation including VCs</td>
<td>• Monitoring of Grievance Redress Mechanism</td>
</tr>
<tr>
<td>• Finalisation of all resettlement or compensation issues</td>
<td>• Building pump stations and tanks</td>
<td>• Monitoring of Grievance Redress Mechanism</td>
<td>• Monitoring of Project Site</td>
</tr>
<tr>
<td>• Employment of workers</td>
<td>• Decommissioning of old tanks</td>
<td>• Implementation of Safety and Health measures, including codes of conduct related to GBV/SHEA and child labor</td>
<td>•</td>
</tr>
<tr>
<td>• Employment of Community Liaison Officers</td>
<td>• Transportation of various project materials</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>• Identification of a location for a Contractor’s office.</td>
<td>• Putting up telemetry</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>• Implementation of Safety and Health measures, including codes of conduct related to GBV/SHEA and child labor</td>
<td>• Disinfection of pipes</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>• Acquisition of materials for environmental, health and safety measures</td>
<td>• Haulage of materials and equipment (sand, pipes, Machinery, etc.)</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>• Community consultation including VCs</td>
<td>• Transportation of workers</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td>• Monitoring and socialization of Grievance Redress Mechanism</td>
<td>• Provision of power to pump stations</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>• Fencing of site with palisade fencing for storage tanks and pump stations</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>• Community Consultation including VC</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>• Implementation of Safety and Health measures, including codes of conduct related to GBV/SHEA and child labor</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>• Monitoring of Grievance Redress Mechanism</td>
<td></td>
<td>•</td>
</tr>
<tr>
<td></td>
<td>• Monitoring of sub-project site for social and environmental risks and alignment with mitigation measures</td>
<td></td>
<td>•</td>
</tr>
</tbody>
</table>

Table 9: Anticipated Activities During Project Implementation
2.5 Detailed Location of the SUB-Project Components

The project is linear and includes construction of pipelines, as well as reservoir and storage tanks with three pump stations. The pipes will be laid within road and railway reserves at an average depth of 1.5 m requiring servitude of 3 m. It will need a 5 m wide corridor for construction and will be placed 2-2.5 m away from the edge of reserves as shown in the maps in Annexes H to M (in Volume 2) and described in Table 10. The location of the pump stations and tanks are described in Table 11. Except for the locations of Pump Station 1 (WBPS1) in Selebi-Phikwe and Gojwane Water Tank all the other pump stations and elevated tanks will use the sites for the existing water pumps or tanks.

Table 10: Location and Lengths of Proposed Pipelines

<table>
<thead>
<tr>
<th>Description</th>
<th>Pipeline Length (km)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selebi-Phikwe Township existing valve chamber – Serule village Water Tank (WBPS2)</td>
<td>58.7</td>
<td>Within the road reserve of Selebi-Phikwe –Serule Road and railway reserve at Serule railway station.</td>
</tr>
<tr>
<td>Mmadinare Junction (WBPS1) – Mmadinare village Water Tank</td>
<td>13</td>
<td>Within the reserve of Mmadinare Junction - Mmadinare village Road</td>
</tr>
<tr>
<td>Damuchojenaa Junction to Damuchojenaa Settlement Tank</td>
<td>7</td>
<td>Within the reserve of Damuchojenaa Junction to Damuchojenaa Road</td>
</tr>
<tr>
<td>Serule Water Tank (WBPS2) to Gojwane Settlement Water Tank</td>
<td>21.7</td>
<td>Boundary of the Lethakane Uranium Mine to the south and north, and within the railway reserve of the northern bound railway line. Then along an existing road which later joins the Serule-Gojwane gravel road.</td>
</tr>
<tr>
<td>Serule (WBPS3) to Moreomabele village Water Tank</td>
<td>14</td>
<td>Within the reserve of the A1 Road</td>
</tr>
<tr>
<td>Moreomabele village to Topisi village Water Tank</td>
<td>16</td>
<td>Within the reserve of the A1 Road</td>
</tr>
</tbody>
</table>

Table 11: Location of Pump Stations and Water Tanks

<table>
<thead>
<tr>
<th>Pump Station</th>
<th>Locality</th>
<th>Location</th>
<th>Capacity of Water Tank m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Station (WBPS1) and Ground Reservoir Tank</td>
<td>Selebi-Phikwe</td>
<td>Along Main Road in Selebi-Phikwe. New Site. (X:-82339.785 Y: 2430615.674)</td>
<td>2,000</td>
</tr>
<tr>
<td>Pump Station (WBPS2)</td>
<td>Serule</td>
<td>Within existing site for water tanks (X:-30157.2012 Y:2424089.1743) Plot extension required 487.0m²</td>
<td>3,000</td>
</tr>
<tr>
<td>Pump Station (WBPS3)</td>
<td>Serule</td>
<td>Within existing site for water tanks (X:-31983.5353 Y:2425893.1062) Plot extension required 498.2m²</td>
<td>2,000</td>
</tr>
<tr>
<td>Ground Reservoir Tank</td>
<td>Mmadinare</td>
<td>Within existing site for water tanks (X:-77666.75 Y:2421393.5) Plot extension required 1070.0m²</td>
<td>6,300</td>
</tr>
<tr>
<td>Elevated Water Tanks</td>
<td>Damuchojenaa</td>
<td>Within existing site for water tanks (X:-47596.936 Y:2422369.437)</td>
<td>470</td>
</tr>
<tr>
<td>Elevated Water Tank</td>
<td>Serule</td>
<td>Within existing site for water tanks (X:-47596.936 Y:2422369.437)</td>
<td>3,000</td>
</tr>
</tbody>
</table>
### Table 12: Settlement Storage Requirements

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Existing Storage (m³)</th>
<th>Proposed Capacity (m³)</th>
<th>Elevated/Ground Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mmadinare</td>
<td>2,500</td>
<td>6,000</td>
<td>Ground level</td>
</tr>
<tr>
<td></td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damuchojenaa</td>
<td>50</td>
<td>300</td>
<td>15 m elevated</td>
</tr>
<tr>
<td>Serule</td>
<td>250</td>
<td>2000</td>
<td>15 m elevated</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Gojwane</td>
<td>75</td>
<td>400</td>
<td>15 m elevated</td>
</tr>
<tr>
<td></td>
<td>75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moreomabele</td>
<td>180</td>
<td>300</td>
<td>15 m elevated</td>
</tr>
<tr>
<td>Topisi</td>
<td>50</td>
<td>300 x 2</td>
<td>15 m elevated</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bothakga Burrow Botswana (Pty) Ltd (2018b)

### 2.7 BLASTING

According to the Geotechnical Report, the minimum depth to refusal (depth to the rock) at the booster pump station and tank sites is 1.1 m. This means blasting will not be required during excavation at these sites up to a depth of 1.1 m.

As for the pipeline route, depth refusal ranges from 0, 2 m to 2.0 m. This means blasting may be required in some sections to achieve the desired depth. According to the design report, the pipeline will be buried to a depth expected to be enough to preclude damage from agricultural and surface traffic conditions as well as animals. The blasting regime should be approved by the Department of Mines. Transport and disposal of blasted rock materials especially in the built-up environment is of concern and has been addressed in the ESMP.

According to Bothakga Burrow (2018a) about 1,076,040 m³ materials will be excavated. Of the total material excavated (410,760 m³) would be rock excavation, 40 percent is expected to be rock.
2.8 BACKFill and Bedding Material

As the Geotechnical Report states, it may be necessary to import additional material, particularly river sand and crusher dust for bedding material. There is also a need to import suitable backfill material in some sections. As for the booster pump station and tank sites, the Report recommends all compacted material should be imported G6 quality or better. Alternatively, the in-situ material can be stabilized with cement to produce silcrete.

No borrow pits for backfill or bedding material has been identified. All imported construction materials should be sourced from commercial sources. Where new borrow pits must be opened, they must comply with EA Act, Monuments and Relics Act and Mines and Minerals Act (among others), as well as World Bank requirements.

2.9 Road Crossings

The 15 roads that will be crossed during the implementation of the sub-project are highlighted in Annex Y. The road crossings will require the preparation of relevant method statements which will have to be approved by the Department of Roads. According to the design report, the roads shall be crossed using thrust boring or pipe jacking methods. Environmental issues emanating from these construction methods is noise and appropriate disposal of spoil from the drilled holes.

All but three of the roads indicated in Annex Y will be crossed using pipe jacking. Thrust boring method is to be used where the pipe diameter is less than 200 mm. Where the pipe diameter is above 200 mm, pipe jacking method across the road will be employed. It will be very expensive to use thrust bore techniques for the crossing of local minor roads and access roads. Supervised cutting through the roads and reinstatement of layers and surfacing is suggested. Cutting through roads disrupts traffic movement and reinstatement of layers of the road may not revert to its original position or state.

Thrust boring is the trenchless method of driving a closed end pipe through the earth to form a pilot bore (Figure 2). The material is simply pushed out of the way or the head is left open and the soil is collected inside the pipe. Some small diameter models have steering capability achieved by a slanted pilot-head face and electronic monitoring.

![Figure 2: Example of Thrust Boring](image)

Pipe jacking is a method of laying underground pipes without digging a trench, in which the pipes are assembled in an access shaft and then pushed into position by a hydraulic jack. It allows the performance of trenchless construction methods to install pipes over several hundred meters in a straight line, with a bend or with multiple bends and can be especially useful for micro-tunnelling. Still, thrust and reception pits need to be dug or the project can
utilize existing manholes (Trenchlesspedia, n.d). Pipe jacking provides ground support and reduces potential ground movement.

2.10 Railway Crossings

A total of six areas have been identified where the pipeline route will be traversing the railway line that runs through the project route. Annex Z highlights the crossing areas as well as their GPS coordinates. The railway crossing will, however, require the preparation of relevant method statements which will have to be approved by Botswana Railways. Environmental issues emanating from this technique is noise and appropriate disposal of spoil from the drilled holes. The railway line will be crossed by cribbing. Cribbing (Plate 2) is the method of excavating or digging a trench or under cutting a railway line without disturbing the rail infrastructure. A cribber and cribbing bucket are normally used for this exercise.

Plate 2: Cribbing Bucket for Excavating Under Railway Tracks

2.11 Fencing

The site for the storage tanks and pump stations will be fenced off by using palisade fences (Plate 3). This is of high security and is to prevent livestock from getting to the water tanks and as a barrier for people entering the site to vandalise the water storage tanks and for their community safety.

Plate 3: Example of Palisade Fences to be Used for Fencing of Sites
2.12 Existing water pipeline crossing

The pipeline will cross the North-South Carrier Water Pipeline (NSCWP). It will cross at location (X 580429.54, Y 7569831.43) near the Mmadinare-Selebi-Phikwe junction along Selebi-Phikwe to Serule Road. Details concerning the NSCWP crossing at this location as sourced from the Contractor working on site at the time of visit are that the pipes have a diameter of 1200 mm and have been laid at a minimal depth of 1500 mm from ground level to top of pipe. To ensure that this pipeline is not damaged at this point, the new pipeline depth should not exceed 1000 mm.

2.13 River and Stream Crossing

The design outlines that pipelines will be reinforced at river crossings and short sections of concrete steel will be provided at these locations. During project implementation, the pipeline will traverse six (6) named rivers, five (5) un-named streams and eight (8) unnamed rivers. The coordinates of the features to be crossed are highlighted in Annex ZA. The water pipes will be submerged under the riverbed. Laying of the pipeline across the riverbed should be such that it does not cause riverbed scouring, riverbank erosion and stream/river diversion. This can be achieved by ensuring that the pipeline is well secured in the riverbed and the riverbanks are compacted after disturbance.

2.14 Pipeline Servitude and Depth of Excavation

The pipelines routes will have a reserve corridor of 3 m but will need a 5 m wide corridor for construction. The pipes will be laid at an average excavation depth of 1.5m. The pipes will be laid between 2 and 2.5 m from the edge of road reserves. Excavations and backfilling will be done using machines (excavators). Laying of the pipes in the trenches shall be with the use of JCB machines and the trenches backfilled. The trenches shall be compacted using machines.

2.15 Water Quality

Water quality is central to the project. Any contamination of the water to be supplied may result from rusting old reservoirs, residual old chemicals and wearing out water transfer equipment. In some cases, there may be residual salts within the pipelines. The Serule -Topisi segment has been singled out as one where pipeline replacement may be necessary. The water in this area is salty.

According to the design report, stringent water quality issues, specifically bacteriological quality, will be considered and monitored in accordance with the World Health Organization (WHO) published “Guidelines for International Standards of Drinking Water” (GISDW) in 1984 and the BOS 32:2015 Guidelines. WUC has in place water quality monitoring regime.

Consideration should also be given to constituent that may affect the quality of the water infrastructure such as corrosion caused by aggressive water. It may lead not only to damage of the infrastructure but can also increase the operations and maintenance cost due to frequent replacements. It is not likely, however, that the water may be contaminated with uranium as the water will not be exposed but passing through pipes.

2.16 POWER Supply

Power supply will be required at the proposed pump stations in Selebi-Phikwe and Serule for pump drives, reservoir level sensors, small power and external lighting and others. Power will also be required at the settlement distribution reservoirs for level sensors. Power will be sourced from BPC national grid stepped down by transformers to a nominal voltage of 400
volts three-phase or 230 volts single-phase at 50 Hertz for small power and lighting requirements and there will be provisions for diesel generator back-up and/or Uninterruptible Power Supply (UPS) at the pump stations. There are existing power lines that are about 50 m from the project areas.

### 2.17 Materials AND Equipment to be used

The material anticipated to be used for the works as well ensuring that the proposed mitigation measures are carried out for the protection of the environment and ensuring healthy and safe working conditions are shown in **Annex V**.

The project will require construction material such as sand for backfilling and bedding purposes. In terms of bedding material, the geotechnical report outlines that approximately half of the upper materials tested and a small proportion of the lower materials in the trench, meet the proposed specification for bedding materials. The geotechnical report however suggests that care should be taken to separate the less plastic soils from the more clayey and gravelly material during excavation and that an amount of overhaul can cater for sections where none of the material is suitable. It would however be necessary for river sand or crusher dust from commercial sources to be imported to meet the project requirements for bedding material.

With respect to backfill material, approximately two thirds of materials tested were suitable or marginally suitable for use as backfill material. The geotechnical report recommended that a nominal amount of overhaul be allowed to cater for importing suitable backfill material. No sources for construction material (river sand and borrow pits) have been identified yet. Excavated selected material would be used for purposes of bedding and backfill and any deficit is expected to be met from commercial sources. ESIA as per EA Act and associated statutes of Botswana and World Bank requirements will need to be undertaken for opening of new borrow pits.

### 2.18 Contractor’s office SITE OFFICE selection

The implementation of the project will require the establishment of a contractor’s site office. It will comprise structures to accommodate the following:
- Workshop for vehicle repairs
- Storeroom (for supplies and equipment)
- Fuel storage and dispensing area
- Pipes storage areas
- Carpentry shed
- Welding shed
- Offices including that of the engineers and environmental and social monitoring team
- Batching plant shed
- Car washing bays
- Power generator shed
- Stand for water (Jojo tank)
- Toilet and sanitation facilities
- Solid waste holding facility
- Contaminated soil remediation facility (soil hospital)
- First aid treatment kits

The following are criteria to be considered when selecting the contractor’s office site:
- No contractor’s office should be sited within a radius of 500 m of any sensitive receptor (e.g. schools, clinics, built up residential area, areas of community use such as grazing,
agriculture, etc.) to mitigate social risk, and within a 1 km radius of a protected area and at least 200 m from any surface water course.

• The site should be adequately drained and slope should be between 3-7 percent.
• Apply for surface rights from the Tonota Sub-Land Board in consultation with the Serule village Development Committee and Traditional Authority. Undertake assessment (if required) for the camp site/s as recommended by DEA and obtain approval.
• Limit clearing strictly to the allocated size of camp/s.
• Areas outside the project site which are disturbed due to construction activities should be rehabilitated following completion of work.
• Cleared vegetation should be heaped away from the road where they cannot interfere with traffic.
• The movement of construction vehicles should be restricted to designated access routes.

2.19 Waste Generation and Management

The types of waste likely to be generated during the various phases of implementation of the project and how they are to be managed are shown in Table 13 below.

Table 13: Waste Streams and Type to be Generated During Construction and their Disposal Methods

<table>
<thead>
<tr>
<th>Waste Streams</th>
<th>Type of Waste</th>
<th>Phase of Project</th>
<th>Storage Facility</th>
<th>Waste Disposal Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation (Mopane trees etc.)</td>
<td>G</td>
<td>C</td>
<td>Stockpile <em>in situ</em></td>
<td>Collection by community</td>
</tr>
<tr>
<td>Wastepaper (office)</td>
<td>G</td>
<td>Pre, C, D, OM</td>
<td>Black plastic dustbin/drums plastic bags</td>
<td>Collected to recycling facility or recycling company</td>
</tr>
<tr>
<td>Glass bottles</td>
<td>G</td>
<td>Pre, C, D, OM</td>
<td>Blue drums</td>
<td>Collected to recycling facility or recycling company</td>
</tr>
<tr>
<td>Aluminium (beverage) cans</td>
<td>G</td>
<td>Pre, C, D, OM</td>
<td>Green drums</td>
<td>Collected to recycling facility or recycling company</td>
</tr>
<tr>
<td>Pipes</td>
<td>Sp: H</td>
<td>C, D</td>
<td>Under a shed at Camp site</td>
<td>Re use/ Land fill</td>
</tr>
<tr>
<td>Soil/Spoil</td>
<td>I</td>
<td>C</td>
<td><em>In situ</em></td>
<td>Collection by people/Borrow Pit rehabilitation</td>
</tr>
<tr>
<td>Rock blastings</td>
<td>I</td>
<td>C</td>
<td><em>In situ</em></td>
<td>Collection by people/ Borrow Pit</td>
</tr>
<tr>
<td>Rock boulders</td>
<td>I</td>
<td>C</td>
<td><em>In situ</em></td>
<td>Collection by people/ Borrow Pit</td>
</tr>
<tr>
<td>Contaminated Soil</td>
<td>Sp:H</td>
<td>C</td>
<td>Construction Camp-Bunded Wall/ Container</td>
<td>Pre-treatment before disposal into environment</td>
</tr>
<tr>
<td>Rubble</td>
<td>G</td>
<td>C</td>
<td><em>In situ</em></td>
<td>Borrow Pit/ Landfill</td>
</tr>
<tr>
<td>Planks</td>
<td>G</td>
<td>C, D</td>
<td>Camp</td>
<td>Reuse/ Collection by people</td>
</tr>
<tr>
<td>Water for cleaning of pipes /disinfection</td>
<td>G</td>
<td>C</td>
<td>-</td>
<td>Allowing free drain of water into the environment (Moon lighting) but not into properties.</td>
</tr>
<tr>
<td>Tyres</td>
<td>G</td>
<td>C</td>
<td>Construction Camp Site</td>
<td>Collection by people/ Land fill</td>
</tr>
<tr>
<td>Human excreta</td>
<td>Sp: W</td>
<td>Pre, C, OM, D</td>
<td>Portable Toilet/Conservancy Tank</td>
<td>Waste Water Treatment Works (WWTW) at Selebi-Phikwe/ Palapye</td>
</tr>
<tr>
<td>Waste oil</td>
<td>Sp:H</td>
<td>C, D</td>
<td>Used oil drums /tank-the area must be bunded</td>
<td>Collected to recycling facility or recycling company</td>
</tr>
<tr>
<td>Waste Streams</td>
<td>Type of Waste</td>
<td>Phase of Project</td>
<td>Storage Facility</td>
<td>Waste Disposal Method</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------</td>
<td>------------------</td>
<td>-----------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Waste grease</td>
<td>Sp:H</td>
<td>C, D</td>
<td>Used grease drums</td>
<td>Collected to recycling or recycling company</td>
</tr>
<tr>
<td>Batteries</td>
<td>Sp:H</td>
<td>C, D</td>
<td>Put in a cage and must be bunded</td>
<td>Stored at workshop for collection by a contractor for recycling</td>
</tr>
<tr>
<td>Scrap materials, wires, tanks</td>
<td>G</td>
<td>C, D</td>
<td>Store at camp</td>
<td>Recycling by scrap metal dealers</td>
</tr>
</tbody>
</table>

**Note:** **Type of Waste:** I- Inert; G-General Waste; Sp: H-Special: Hazardous Waste; Sp: W-Special: Wet Waste **Phase of Project:** P- Pre-Construction; C- Construction; OM- Operation and Maintenance; D- Decommissioning

## 2.20 Estimated Cost of Construction

The cost of construction is estimated to be P 307,338,156.00 (US $30,733,816.00).

## 2.21 Estimated Commencement Date and Duration of Construction

The sub-project is estimated to commence in 2019 after due diligence to procurement and social and environmental safeguards. Construction is anticipated to take 18 months. The liability period after construction is 12 months. The design life of the pipelines and infrastructure is 20 years. These will be left in-situ as WUC has no intention of decommissioning the pipelines and the associated infrastructure.
3.0 ENVIRONMENTAL AND SOCIAL BASELINE FOR THE PROJECT AREA

3.1 Introduction

This chapter presents the existing environmental and social settings of the project area. The project area is situated in the Central District of Botswana and divided into six sub-districts: Serowe/Palapye, Tonota, Tutume, Bobirwa, and Mahalapye. The proposed water transfer scheme traverses the Bobirwa (Mmadinare and Damuchojena Settlements), Palapye/Serowe Administrative Authority (Topisi and Moreomabele villages) and Tonota (Gojwane and Serule villages) sub-districts. The pipeline starts from Selebi-Phikwe Township which is governed by the Selebi-Phikwe Town Council.

The methodology used in providing the description of the baseline data of the project site involved field visits to the site, a desktop literature review related to the environmental and socio-economic characteristics of the project area and a due-diligence study of the water source, existing pipeline to the water treatment works and the water treatment works itself.

3.2 Biophysical Environment

3.2.1 Topography

The project area is generally undulating with valleys where rivers cross. The Central District can be divided into two zones of altitude, the northeast, and the southwest. The lowest part of the district is located in the east along the Limpopo River. The lowest point in the country is the confluence of the Shashe and Limpopo Rivers (530 m above sea level). At the west of the Limpopo River, the land rises gradually to a height of approximately 1 200 m, which is the highest in the district being in the Shoshong hills north of Shoshong, Mokgware Hills between Kalamare and Serowe and the Tswapong Hills east of Palapye. Other small groups of hills are located north of Bobonong (Lepoloke Hills), south of Tutume (Makuta Hills) and the northwest of Mosetse (Kgwana Hills).

3.2.2 Geology

The proposed pipeline traverses some granitic outcrops especially between Mmadinare Junction and Mmadinare village water tank (Plate 4). Blasting may be required to achieve the desired depth of trench in these areas.

The geology of the district is complex in detail but in general terms, the eastern part of the district is formed in the basement complex with outcrops of younger rocks which can be classified as hills. The western part of the district is part of the Kalahari Desert with relatively recent deposits. This area is sandy hence its referral as sandveldt (CDDP, 2009).

Plate 4: A Granitic Outcrop Between Mmadinare Junction and Mmadinare Village Tank
3.2.3 Water Resources and Hydrology

Hydrologically, within the project area is the Molodi Wellfield which contains three boreholes that supply water to Serule and surrounding settlements of Moreomabele, Topisi and Gojwane. The Molodi Wellfield is situated 30 km west of Serule village.

Near Mmadinare village, over 3 km away north, is the Letsibogo Dam from which water is to be supplied to the beneficiary villages. Of prominence is the Lethakane River, which flows downstream of the dam. The pipeline route to Mmadinare village is to cross this ephemeral river. Other rivers to be traversed by the pipeline route are the Serule River which is along the Serule to Moreomabele pipeline route, and Masokobale River which is along the Serule-Gojwane route.

There is lack of data or information on the aquatic biology of the rivers to be crossed by the pipeline route. Despite this, the precautionary approach will be followed so as not to negatively affect the rivers during construction.

Consultation with the Mmadinare Fisheries Department indicates that there are no fishing activities at the locations within the rivers where the pipelines are to be laid. The rivers have widths between 5 and 35 m and are fairly flat with the beds filled up with sand. They are ephemeral and only contain surface water after heavy rains during the summer season.

3.2.4 Climate

The project area is characterized by variations in both rainfall and temperature with a semi-arid climatic condition. Rainfall occurs mostly in summer, during the months of October to April with a mean annual rainfall of 250 mm to 600 mm. There is a low degree of climatic variations throughout the Central District. The winter period (May to July) are dry and a cell of high pressure over the eastern Transvaal brings fine weather in the region, although moist air from Mozambique channel may occasionally penetrate inland bringing clouds and drizzle (CDDP, 2017).

a) Rainfall

Almost all rainfall occurs during the summer months while the winter period accounts for less than 10 percent of the annual rainfall. Mean annual rainfall figures range from around 350 mm to slightly over 450 mm in the southern part of the district. Drought conditions, defined as less than 40 percent of annual rainfall, occur on average one year in seven. Spatial variation of rainfall between settlements is also recorded.

b) Temperature

Temperatures exhibit high annual and diurnal ranges. There is a great deal of uniformity with the maximum temperature occurring during the summer months of September to March ranging between 30 to 32 degrees Celsius (°C), while minimum temperatures range from 15 to 20 °C. During the winter months maximum temperatures range between 25°C to 29 °C, while minimum temperatures range between 2°C to 13 °C with both ground and air frost possible in the early mornings between June and August (CDDP, 2009).

c) Solar Radiation

There is a fair amount of sunshine throughout the year (7-9 hours daily) with the highest sunshine hours occurring between the months of May and September. The months with the
least amount of sunshine are December and March. This is to be considered in the welfare of the workers in terms of PPEs and water demand for drinking.

d) Relative humidity

Relative humidity is highest during the early hours of the morning and lowest in the afternoon. Lower relative humidity is experienced in September (58 percent at 08h00 and 30 percent at 16h00) and high in March (72 percent at 08h00 and 45 percent at 16h00). The diurnal curve for relative humidity is a mirror image of that of temperature. In winter humidity is considerably less and can vary between 40 and 70 percent during the morning and falls to between 20 and 30 percent in the afternoon (CDDP, 2009).

e) Wind

The predominant wind direction is from the east and north east though a south easterly component is present in the summer months and influences the Indian Ocean air. In winter south-easterly winds accompany cold fronts. Calm conditions obtain 30 percent of the time. Despite the calm conditions, winds can also be experienced during rainy seasons particularly at the beginning and at the end of the rainy season. These winds are associated with thunderstorms and have the tendency of causing damage to property and causing wind erosion. Wind speed is highest in October and lowest between May and July. Mean annual wind speeds are between 9 and 12.5 km/h. Strong winds up to 120 km/h (25 m/s) have been recorded in the area.

3.2.5 Vegetation and Soils

The vegetation in the district varies from predominantly Mophane woodland in Tutume area in the north, Palapye in the central area and Bobirwa in the eastern to no grass or no vegetation at all in the salt pans. The Mophane tree presents good as well as affordable energy to the majority of the population in the district (CDDP, 2009).

No protected trees were found along the pipeline routes and the sites for the location for the reservoir tanks and pump stations. Much of the pipeline routes are dominated by a varying association of Colophospermum mopane (Mophane) and Acacia nigrescens (Mokoba) while the key species of the association are Combretum apiculatum (Mohudiri) and Acacia tortilis (Mosu). Other species observed along the pipeline routes include Grewia Sp, Kirkia acuminate (Modumela) and Combretum apiculatum (Mohudiri).

According to the geotechnical report the pipeline route is overlain mostly by low plasticity sandy materials varying in depth between 0.2 m and 2.0 m. The materials cover decomposed residual gravels, mostly with low to moderate plasticities (Sands Civil Services, 2013). As a result of low rainfall and high rates of evapotranspiration, the contents of organic matter, available nitrogen and phosphorous, which determine soil fertility, are low along the pipeline route. The sandy areas with thickness of more than 1 metre are potentially collapsible. This may necessitate the importation of material (gravel) during pipeline laying to stabilise the trenches.

Sporadic rock outcrops were encountered through some sections of the proposed pipeline alignment, but these amounted to less than 5 percent of the total excavation therefore some blasting may be required during excavation (Sands Civil Services (2013).

3.2.6 Wildlife

The project area generally has no significant wildlife. There are neither Wildlife Management Areas (WMAs) nor National Parks near the project site. Wildlife population has further declined
through displacement due to the establishment of settlements, livestock displacement, drought as well as poaching/hunting pressure (CDDP, 2009). As a result, only occasional sightings of ‘smaller’ wildlife species such as hare, ground squirrel and impala are encountered along this route especially along the bushy area between Serule and Gojwane Settlements.

3.2.7 Energy

Fuel wood constitutes a major component of the energy requirements for many households in the district. This has exacerbated deforestation as well as changing the vegetation composition especially near large settlements. The increase in usage of alternative sources such as gas and electricity is likely to ease pressure on this resource. In addition, it is expected that the introduction of permits for harvesting will help control overexploitation of fuel wood and enhance conservation of the resource.

3.2.8 Air Quality

There is currently no concern of air quality deterioration within the project area as there are no major industrial establishment except for the BCL Mine in Selebi-Phikwe which has closed.

A once off-air quality measurement for PM2.5 and PM10 were taken within the beneficiary villages on the 30 October 2018. The readings were recorded using a hand-held air sample meter. The measurements were taken at the receiving environment especially at residential areas located along the pipeline route. The points of reading were 5 m from the centre of the pipeline route where excavations will be undertaken. The recorded findings revealed that the air quality at the project site is below the thresholds (Annex ZB as stipulated by Botswana Air Quality Objectives as well as Threshold Limits for Common Air Pollutants).

Potential impacts on air quality will depend on how effectively the Contractor manages the suppression of dust during the civil works. The potential impact of the proposed project on local air quality will be much localised and will only pose a risk to immediate neighbours if not handled effectively. The potential impacts have been addressed in the ESMP.

3.2.9 Noise level

The recorded noise levels by use of a sound level metre (SL 4014) depict a typical rural character of a quite area. The noise levels recorded at the various water tanks are between 37 dB and 59.6 dB. Table 14 indicates the noise levels recorded, at different locations along the pipeline route. The noise levels were taken at 20-minute intervals from 7-15 August 2017, the conditions where clear sunny with partly cloudy and no wind. The noise level recorded was noticed to be within the required threshold of 85 dB for a construction site.

Table 14: Recorded Noise Levels

<table>
<thead>
<tr>
<th>Location</th>
<th>Recorded Noise Level (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L&lt;sub&gt;Minimum&lt;/sub&gt;</td>
</tr>
<tr>
<td>Topisi Water Tank entrance</td>
<td>38.9</td>
</tr>
<tr>
<td>Moreomabele Water Tank entrance</td>
<td>44.8</td>
</tr>
<tr>
<td>Serule Water Tank Site 1 (adjacent to A1 road)</td>
<td>49.4</td>
</tr>
<tr>
<td>Serule Water Tank Site 2</td>
<td>45.6</td>
</tr>
<tr>
<td>Gojwane proposed plot</td>
<td>35.5</td>
</tr>
<tr>
<td>Damuchojenaa Water Tank entrance</td>
<td>39.6</td>
</tr>
<tr>
<td>Mmadinare Water Tank entrance</td>
<td>41.8</td>
</tr>
</tbody>
</table>

Source: Field visit 7-15 August 2017
3.2.10 Radioactivity

A detailed study on exposure of radiation on the communities of Serule and Gojwane Settlements has been undertaken by Sci Rand Consulting (Pty) Ltd, a specialist consulting firm on Radiology and Public Safety. They were commissioned by A-Cap Resources Botswana (Pty) Ltd. who are the owners of the Letlhakane Uranium Mine, to be operated near Serule village.

The public radiological safety assessment study indicated that there are two sources of radioactivity. These are dust sources and water sources. The report recommended the use of either water or chemical surfactants for dust suppression. Factors such as wind speed, direction and dispersion cause radon dust to be transported from fugitive sources to the receptors. For water, the report indicates that only uranium originating from the waste rock dumps is considered as a potential source in ground water because it is the only radionuclide expected to be of significance due to its solubility and mobility in water systems. The report indicates that no impacts are expected during the operational phase of the mine but only during post closure.

A baseline study carried out indicates that that the exposure levels of radiation are lower than the thresholds. It further indicates that the general activity concentration levels are for K40, U238, Ra226 and Th232 compare favourably with the respective median activity concentration levels in the world namely 400 Bq/kg compared to 140-850 Bq/Kg for K40, 35 Bq/kg compared to 16-110 Bq/ Kg for U238, 35 Bq/kg compared to 17-60 Bq/kg for Ra226 and 30 Bq/kg compared to 11 -64 Bq/kg for Th232.

The average doses rate of radiation was found to be 0.3 µSv/h outside the mining concession area whiles in the mining area it was between 0.3 µSv/h and 0.67 µSv/h. The report further states that water samples taken in Gojwane and Serule villages for test indicated significantly lower concentrations of radon. However, it was found that in Gojwane settlement, the water sample contained an enhanced U234 activity with concentrations of 343m Bq/L. This makes the water transfer scheme to Gojwane Settlement more important and necessary to lessen dependency on boreholes.

3.3 Social Baseline

3.3.1 Introduction

Socio-economic data was gathered on population, housing, income poverty, employment, health and education enrolment, gender roles, water and sanitation amongst others. Gender based violence (GBV) was raised as a community concern among all settlements, as well as alcoholism and substance abuse. The community noted that GBV was prevalent among the youth, exacerbated by alcohol use and other factors.

3.3.2 General Social Characteristics Pertaining to All Settlements

3.3.2.1 Land Tenure and Allocation

Botswana land laws reflect longstanding principles of customary law. Botswana’s customary law permits tribal members with the right to be allocated residential, arable and grazing land based on their tribal membership. Tribal members are given land at no cost and have continuing rights to the land provided they use it in accordance with the purpose of the allocation.

6 K= Kalium; U= Uranium, Th= Thorium, Ra= Radium,Bq/kg = Radionuclides concentration.
Since independence in 1966, Botswana inherited three types of tenure: tribal land (48 per cent), State land (Crown lands, 47 percent), and freehold land (6 percent). Even though Botswana is still characterized by three types of tenure (tribal, State, and freehold), 80 percent of the population (both human and livestock) resides in tribal areas. Other rights to residential land are permanent and continuous, whilst individually cultivated land may be reverted to community land after harvest. Customary law permits the transfer of land among tribal members. The Tribal Land Act (1993) is almost wholly consistent with customary law but transfers the traditional land authority held by chiefs and headman to the Land Boards. The Tribal Land Act guides the management of tribal por communal land while the Customary Act guides tribal governance.

According to the 2015 Land Policy, in Botswana everyone is entitled to own land including women and minority groups; however, barriers remain to achieving this policy goal for women and non-dominant ethnic groups, among others. For example, during consultations, Basarwa noted barriers in filing applications for land as they require assistance. The percentage of land owned by women is 42 percent (58 percent held by men). Reasons for this discrepancy could include laws governing marriage and marital property which contain vestiges of the traditional presumption of male ownership over family and marital property.

3.3.2.2 Gender Relations

Rural settlements are heavily embedded in gender roles as it also intertwined into the traditional practices. It was observed during the site visits that traditional gender roles and division of labor are still part of everyday practices within all the beneficiary villages. Women and girl children generally do more domestic work whilst men and boys do more paid labor. Women and female children spend more time working both inside and outside the home, carrying a double burden of work, and often undertaking labor that is either not paid or paid not equal to men for similar work, exacerbating inequality and dependency on male household members. More recently, women have also started to engage in provision of manual labor, traditional areas of work occupied by men.

3.3.2.3 Child Welfare and Child Labor

In these settlements, there are instances of children who do not attend school especially those who live with their parents on farms. They primarily assist livelihoods undertaken by parents but with no financial remuneration. Most of the herders in the farms are of Basarwa ethnicity (vulnerable communities). Some of the reasons cited were due to parents not understanding the value of education (as they themselves were unable to attend and very few job opportunities in remote communities), or children are needed to support family livelihoods such as herding livestock in the local farms (cattle posts).

However, at the start of every academic year, the Social and Community Development Officer (S&CD) visits each settlement to locate children who are not in school to ensure they attend and they are provided with uniforms. Children are fed daily at school by a government school feeding program to improve their nutritional quality. However, children are not monitored to ensure they stay in school until they are found wandering in the settlement.

The Botswana labor law (Employment Act, 2010) states that the minimum age of employment as 14 years, which is consistent with the World Bank. A child under the age of 18 will not be employed or engaged in connection with the project in a manner that is likely to be hazardous.

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or interfere with the child’s education or be harmful to the child’s health or physical, mental, spiritual, moral or social development in line with both Botswanan law, the ILO and the World Bank.

3.3.2.4 Religion

The dominate religion in the beneficiary villages is Christianity (79 percent) of the entire population among all six settlements. Other major religion is the African Traditional Religion (ATR) and others with no religion at all. The Basarwa also practice ATR.

3.3.2.5 Access to Electricity

All the beneficiary villages are connected to the national electricity grid. The ability to connect to the power depends on the individual’s ability to pay for the service. Electricity bills to the rural areas or vulnerable areas are subsidized by Government. Prepaid meters are used for electricity supply to houses. This helps to regulate consumption and expenditure. Power from the national grid is mainly used for lighting at domestic level. It is also used for some commercial and industrial purposes in all the settlements.

3.3.2.6 Access to Community Facilities and Social Services

The community facilities in the beneficiary communities are shown in Annex X. Services provided are as per the National Settlement Policy which states that settlements must have a health facility, and a primary school. Higher order services such as secondary schools are found in Mmadinare, Serule and Selebi-Phikwe. Primary hospitals are found in Mmadinare village and Selebi-Phikwe. Police Stations are also found in Serule, Mmadinare and Selebi-Phikwe.

Except for Selebi-Phikwe, there are no banking facilities in the beneficiary villages. The settlements have post offices except for Damuchojenaa settlement (Basarwa are present here). The elderly collect their pension monies monthly from the post offices countrywide. Damuchojenaa has a mobile post office that brings pensions for the elderly, however, there are cases where the elderly need to travel either to Selebi-Phikwe or Mmadinare for their pension queries to be attended to effectively. This can be a challenge to the elderly may contribute to their exclusion and poverty.

3.3.2.7 Poverty Alleviation and Livelihood Schemes

The Government of Botswana provides support to the most marginalized groups in all settlements. These groups include the poor, needy terminally ill patients, people with disabilities, elderly and orphans and they receive Government support in the form of monthly family food baskets and other social assistance to sustain their livelihoods. Other Government initiatives that target poor persons in these communities include the Ipelegeng (Public Works Programme) and Poverty Eradication Programme (SLR Consulting (Africa) (Pty) Ltd and Ecosurve (Pty) Ltd (2015)).

In some of these settlements, underprivileged households receive livestock grants through the Rural Area Development Program (RADP). The elderly, (65+ years old), receive the old-age pension allowance every month.

a) Programme for Destitute Persons

In Botswana, destitute persons are classified as people who are socio-economically disadvantaged.
Minimum assistance to needy persons is provided by Government to improve their health, welfare conditions and to alleviate poverty. Eligibility for destitute benefits is targeted and conditional. For one to register as a destitute they are either required to come forward as individuals or they can be referred or nominated by family members, individuals or community leaders and assessed by social workers. Under this program, qualifying individuals are provided with food, cash payment, access to social services including rehabilitation, provision for funeral expenses, and shelter. All categories of destitute persons in all the settlements are exempted from payment of publicly provided services such as medical fees, school fees, water charges, service levy and electricity charges. Destitute persons are expected to exit the program once they have been provided with relevant skills, knowledge and the right attitude to engage in sustainable economic and social activities. All Basarwa living in settlements benefit from this program due to their vulnerability. Exit or graduation from this programme is a challenge in settlements such as Damuchojena, given the relatively limited access to jobs and economic opportunities.

b) Supplementary Feeding for Vulnerable Groups

The Supplementary Feeding for Vulnerable Groups programme is one of the oldest social safety nets established in 1966 at independence. Nutritional supplements are provided to some members of the communities. Beneficiaries include malnourished individuals and women of child bearing age from poor or low-income households. This program specifically targets pregnant and lactating mothers, nutritionally at-risk under-fives and patients suffering from tuberculosis. When a drought year occurs, supplementary feeding is provided to all under-fives as well as food rations for lactating mothers. However, in non-drought years, supplementary feeding is based selectively on the weight progression of the child. Students in all public primary and secondary schools in Botswana are provided with prepared free meals at schools to alleviate short term hunger thereby improving classroom learning.

c) Universal Old Age Pension Scheme

The Old Age Pension Scheme was introduced in 1996. Senior Citizens aged 65 years and above are offered a monthly allowance allocated by Government through post offices. The objective of this scheme is to help the elderly to sustain their livelihoods and as an effort to eradicate poverty. The monthly old age allowance currently stands at P400 (US$ 40).

d) Labor-Based Drought Relief Program (Ipelegeng)

Ipelegeng was started in the 1960s as a poverty eradication strategy spearheaded by the State President. This programme provides temporary employment to members of the community in various settlements throughout Botswana through temporary supplement to rural incomes through wages. Unemployed residents in Serule and Gojwane who have registered with the program are offered temporary manual work which is on a rotational basis among the community members in each settlement. Ipelegeng workers work for six hours and earn P547 (US $54.70) per month for the three months that they are enrolled for Ipelegeng workers thereafter receive nothing for the subsequent months as they are laid off to make way for others due to the rotational system of employment under this programme (SLR Consulting: 2015: 33-35).
Specific Baseline Pertaining to Selebi-Phikwe and Beneficiary Villages

3.3.3 Selebi-Phikwe Town

3.3.3.1 History

Selebi-Phikwe township came into being when copper and nickel minerals were discovered in two neighbouring settlements: Selebi and Phikwe. Nickel was unearthed in Selebi in 1963, and copper was discovered in Phikwe in 1966. Selebi-Phikwe Town was established in 1974 to service these two small mines. The mines closed in October 2017.

3.3.3.2 Population

The beneficiaries of the project in the town of Selebi-Phikwe are in Botshabelo ward. The population of Botshabelo as of the last national census is 13,271 (6,696 males and 5,183 females) (Statistics Botswana, 2011). In 2011, the entire population for the town was 49,411. There were 12,986 households in the town in 2011, with an average size of 3.09 persons (Statistics Botswana, 2011).

3.3.3.3 Ethnicity and Language

Selebi-Phikwe is ethnically diverse. It includes the Bangwato, the Kalanga, Basarwa (Bakhwe), Babinwa and Batswapong. The common languages spoken in the town are Setswana, Sebirwa and English. Basarwa here are not as a community with a collective attachment to land as per OP4.10 but are individuals who have come to work in Selebi-Phikwe and have a home to return to at the end of their employment.

3.3.3.4 Housing

The 2011 Population and Housing Census show that the town is characterised by detached and semi-detached houses as well as single rooms. The types of buildings reflect the use of more durable, modern construction materials (Statistics Botswana, 2011). Access to housing the type and quality depends on the individual’s ability to pay for it. However, there is Government housing assistance for all those who are registered as vulnerable community members.

3.3.3.5 Employment

Most people in the town are engaged in paid employment in professional jobs in sectors such as commercial and services. Other forms of employment are in the agricultural industry. Before the closure of the mines, a total of 5,826 out of 49,411 people were unemployed at a rate of 10.8 percent (8.8 percent men/12.8 percent women) (Statistics Botswana, 2015). The unemployment rate is believed to have now been exacerbated by the closure of the mine in October 2017. The current unemployment rate is unknown.

3.3.3.6 Income Poverty

The number of people who are poor or below the Poverty Datum Line (PDL) in Selibi-Phikwe is 11 percent of the population (Statistics Botswana, 2011). This is higher than other cities/towns (9.4 percent) but lower than the national average at 16.3 percent in 2015/16 (Statistics Botswana, 2015). According to the World Bank (2015), the poverty datum line is estimated as P486.75 (US $48.675) for males and P468.80 (US$ 46.88) for females per capita. In general, it is P1,371 (US $0.1 - 37.1 per household level. Income is received mostly from house rent followed by employment as there are few agricultural activities.
3.3.3.7 Education

There are two primary, two junior secondary one senior secondary school and a technical college in Selebi-Phikwe. School enrolment is at 62 percent preschool, 97 percent primary, 94 percent secondary and 23 percent tertiary (Statistics Botswana, 2011). The educational attainment rate could not be ascertained from the relevant sources.

3.3.3.8 Health

There is a health post in Botshabelo area and a primary hospital in Selebi-Phikwe township. Selebi-Phikwe is one of the settlements with the highest rates of HIV/AIDS in the country at 41.6 per cent (Kandla et al., 2012). It continues to pose a threat to the socio-economic development of the town because it does not allow those infected to live and work productively as they fall sick often fall sick with poor health conditions. The affected population ranges between 20–34 years of age and are mostly women (Botswana AIDS Impact Survey, 2013). The HIV prevalence rate is 25 percent for males and 29 percent for females. The two health facilities have capacity to test and provide anti-retroviral (ARVs) for free, as well as Prevention from Mother to Child (PMTC) which are obtained at any clinic or hospital.

It was reported during consultation with the primary hospital, that respiratory issues such as bronchitis and asthma were a common health issue among residents, most likely attributed to the air pollution from the copper mine which was recently closed.

3.3.3.9 Access to Water and Sanitation

The water supply service in the town is through piped water supply from Letsibogo Dam. Forty-five percent of the population have piped water indoors. Forty-seven percent accesses outdoor pipes, while seven percent draw water from communal standpipes or from neighbours.

There is adequate sewage disposal system; however, few people still use unsanitary methods. Seventy-two percent of the population have or use a flush toilet, twenty-seven percent use unimproved pit latrines and six percent use open defecation (Statistics Botswana, 2011). Waste is collected at household and institutional levels by the Town Council for disposal at the landfill site.

3.3.3.10 Political and District Administration

The Selebi-Phikwe Town Council comprises 16 representatives from the people from various wards within the township. The Council has the responsibility of administering and ensuring the development of the town. The town is divided into two constituencies and is each represented by a national level Member of Parliament.

3.3.3.11 Tribal Administration

Selebi-Phikwe is located on tribal land which is under the jurisdiction of the Bamangwato Tribal Authority. Governance at the level of local tribal and Indigenous communities is through the system of Kgosi (traditional chiefs) and Kgotla meetings, a system with origins in Tswana custom that is recognized and regulated by the Bogosi Act. The Tribal Administration is the responsibility of the Customary Court in each settlement. The Paramount Chief is the most superior authority in the tribal authority hierarchy and is represented at the sub-district level.

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8 The Bogost Act (CAP 41:01, Act 9, 2008), defines the office of bogosi or “chieftainship” among Botswana’s various tribes. The Act was written in response to the Balopi Commission recommendation that the Constitution of Botswana replace all references of the word “chief” to the Setswana word kgosi. The Bogosi Act replaces the earlier Chieftainship Act of 1987.
by the Senior Subordinate Tribal Authority. The seat of the paramount Chief is in Serowe Settlement, the capital of Central District.

The Chief expresses traditional authority after consulting with the tribe. The Chief’s responsibilities include arranging tribal ceremonies, assisting in preventing crime within tribal territory, informing the tribe about developments, promoting the welfare of his tribe as well as convening and presiding over Kgotla meetings. In Selebi-Phikwe each ward has a Kgosi and headman.¹⁹

3.3.4 Mmadinare Village

3.3.4.1 History of Mmadinare

The Mmadinare village was founded around 1900 by the Batalaote (farmers) when they gave up the settlement of the nearby Palapye settlement. The Batalaote (a tribe which is part of the Bamangwato) then settled and lived near the Makome hill and occupied the Kelele and Seboo wards in what is now Mmadinare. Those from South Africa settled and stayed near Maretemagolo hill and formed Manga and Matabi wards in Mmadinare. The royal families of Kelele and Seboo were relocated out of Mmadinare in 1908 by the colonial administration. They later settled in Senyawe which is located in North East.

3.3.4.2 Population

The population according to the last census in 2011 of Mmadinare village is shown in Table 15 (12,086 total population, 5,834 males or 48.3 percent and 6,248 females or 51.7 percent) (Statistics Botswana, 2011). There were 13,353 households in 2011, with an average size of 3.4 persons (Statistics Botswana, (2015b).

Table 15: Population Characteristics of Beneficiary Villages

<table>
<thead>
<tr>
<th>Beneficiary Settlement</th>
<th>Year</th>
<th>Sex (2011) (%)</th>
<th>Age Cohort (%). (2011)</th>
<th>Youth (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Men</td>
<td>Women</td>
<td>0-14</td>
</tr>
<tr>
<td>Mmadinare</td>
<td>2011</td>
<td>12,086</td>
<td>12,824</td>
<td>20,275</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>12,824</td>
<td>20,275</td>
<td>48.3</td>
</tr>
<tr>
<td></td>
<td>2040</td>
<td>20,275</td>
<td>48.3</td>
<td>51.7</td>
</tr>
<tr>
<td>Damuchojena</td>
<td>2011</td>
<td>993</td>
<td>1,079</td>
<td>1,763</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>1,079</td>
<td>1,763</td>
<td>43.2</td>
</tr>
<tr>
<td></td>
<td>2040</td>
<td>1,763</td>
<td>43.2</td>
<td>56.8</td>
</tr>
<tr>
<td>Serule</td>
<td>2011</td>
<td>3,241</td>
<td>3,772</td>
<td>5,284</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>3,772</td>
<td>5,284</td>
<td>49.2</td>
</tr>
<tr>
<td></td>
<td>2040</td>
<td>5,284</td>
<td>49.2</td>
<td>50.7</td>
</tr>
<tr>
<td>Gojwane</td>
<td>2011</td>
<td>1,499</td>
<td>1,642</td>
<td>2,301</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>1,642</td>
<td>2,301</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>2040</td>
<td>2,301</td>
<td>49</td>
<td>51</td>
</tr>
<tr>
<td>Moreomabele</td>
<td>2011</td>
<td>602</td>
<td>701</td>
<td>982</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>701</td>
<td>982</td>
<td>48.0</td>
</tr>
<tr>
<td></td>
<td>2040</td>
<td>982</td>
<td>48.0</td>
<td>51.9</td>
</tr>
<tr>
<td>Topisi</td>
<td>2011</td>
<td>1,545</td>
<td>1,788</td>
<td>2,519</td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>1,788</td>
<td>2,519</td>
<td>50.2</td>
</tr>
<tr>
<td></td>
<td>2040</td>
<td>2,519</td>
<td>50.2</td>
<td>49.7</td>
</tr>
</tbody>
</table>

¹ Census ² Projections ³ Figure obtained by social worker during 20 Feb. 2019 community consultation

3.3.4.3 Ethnicity and Languages Spoken

The predominant people of Mmadinare village are Babirwa and they mostly speak Sebirwa, Setswana and English dialects. The other ethnicities found in minority in the settlement include Bakalaka, Bangwato and Babirwa. Most residents are multilingual as English language is also spoken in the settlement.

3.3.4.4 Housing

The settlement is populated by mixed type of housing where both traditional and modern structures are common. The types of buildings reflect the use of traditional mud bricks and

¹⁹ A headman is subordinate to a Kgosi and responsible for a ward in a settlement.
thatch roofs as well as more durable modern construction materials. Residential households consist of both traditional and modern buildings in one yard, reflecting a typical Setswana household structure.

3.3.4.5 Employment

Those who have employment are engaged in paid work in elementary jobs such as housework, agricultural industry (arable, livestock and subsistence fishing in the Letsibogo dam) and drought relieve programs. However, there are also professional and technical workers who work for Government and private institutions in the settlement. Unemployment rate in Mmadinare village is at 15 percent with 18 percent for males and 21 percent for females of those who are working age (Statistics Botswana, 2017). According to official statistics, the settlement has 60.3 percent of persons of working age which means there will be a pool of available workers for employment during civil works.

3.3.4.6 Income Poverty

Twenty-seven percent of the population (3,551 people) are poor, defined as proportion of persons living below the poverty datum line (Statistics Botswana, 2015). This is higher than that of the rural areas of 24.2 percent. A large number depend on Government poverty eradication schemes such as Ipelegeng. Agriculture has declined in the settlement and this is shown by the reduced number of income received from the sector. Income is received mostly from rent (49 percent), followed by pension (42 percent), employment (39 percent), destitute allowance (38 percent) and Government rations at 38 percent (Statistics Botswana, 2015b).

3.3.4.7 Education

There are three pre-primary, six primary, two junior secondary and senior secondary schools in Mmadinare. According to Statistics Botswana, (2015b), school enrolment is at 42 percent pre-school, 97 percent primary, 94 percent secondary and 20 percent tertiary. However, data available does not present disaggregated data by gender and education completions rates.

3.3.4.8 Health

Mmadinare village has a primary hospital, a clinic and a home-based care committee. On health issues, life expectancy at birth is 61 years for males and 69 years for females. The child mortality rate is 7.7 percent primarily due to the HIV/AIDs pandemic where infected mothers do not enrol on the PMTC programme. According to the last (National Aids Coordinating Agency, 2013) HIV infection prevalence rate is 15 percent for males and 22 percent for females. Health care institutions in the settlement offer most health services and have the capacity to test and give out ARVs as well as PMTC.

Mortality rates are all lower than the national rate of 65 years for males and 70 years for females except for the child mortality rate which is higher than the national rate of 6.25 percent.

3.3.4.9 Access to Water and Sanitation

Seventy percent of the population have flush toilet, 21 percent use unimproved pit latrines and 3 percent use open defecation. Though minimal, open defecation is a health hazard as people are exposed to dirt, diseases and infections (Statistics Botswana, 2015b).

The water supply service in the settlement is through piped water supply from boreholes, 20.3 percent of the population have piped water indoors, 35.9 percent use piped outdoors while 15.6 percent draw water from communal standpipes or from neighbours (Statistics Botswana: 2011).
Waste collection is not well regulated at household level. Most households use rubbish pits for storing waste and dispose it by burning. Collection of waste by the district council is limited and sometimes residents pile it along the road to be collected by the Council.

3.3.4.10 Political and District Administration

Mmadinare village is under the Bobirwa Sub-district Council. The settlement together with Damuchojenaa and other ten settlements constitute the Mmadinare constituency. They elect one member to the national assembly. The settlement also is represented by one elected Councillor to the Sub- district Council. Mmadinare village houses the Sub-land Board. It forms part of the Selebi-Phikwe constituency who then elects their representatives to the national assembly.

3.3.4.11 Tribal Administration

The project area is located on tribal land which is under the jurisdiction of the Bamangwato\textsuperscript{10} Tribal Territory. It has a main Kgosi and Kgotla and smaller Kgotla led by headmen.

3.3.5 Serule Village

3.3.5.1 History of Serule

Serule is a settlement located along the road between Francistown and Palapye. This settlement was established from cattle post areas by inhabitants of Serowe and Selebi-Phikwe. The name Serule is derived from the Setswana word saying “serole setlhako”, which when translated, means "take off your shoes". The full contextual translation is “take off your shoes and run away from the lions and elephants" as wildlife was once abundant in the area. Serule is also known to be an important railway junction, with rail tracks leading towards the north to Francistown, South to Palapye, as well as east to Selebi-Phikwe. The construction phase of this railway line resulted in an influx of people into the area in search of employment opportunities. Some of the railway construction employees settled in the settlement thereby increasing the population size of the Serule cattle post area to a more defined settlement.

3.3.5.2 Population Characteristics

Serule has a population of 3,241 people (.50.7 percent women; 49.2 percent men). The age distribution shows that the settlement has a youthful population with 59.9 percent between 15-84 years. Serule has an average household size of about 3.3.

3.3.5.3 Ethnicity and Language

The dominant ethnic groups in the settlement are Bangwato, Batwapong and Kalanga (\textbf{Table 16}). Thus, making the dominate languages spoken being Setswana and Setswapong. However, during site visits it was observed that there are a few Basarwa living in the settlement near the kgotla. Basarwa here are not a community with a collective attachment to land as per OP 4.10 but are individuals who have come to work and have a home to return to at the end of their employment. Most residents are multilingual as English language is also spoken in the settlement.

\textsuperscript{10} Bamangwato refers to one of the eight “principal” Tswana chieftaincies of Botswana who live in the central district.
### Table 16: Selected Social Indicators

<table>
<thead>
<tr>
<th>Beneficiary Settlement</th>
<th>Unemployment Rate (%)</th>
<th>Literacy Rate by Sex</th>
<th>Predominant Ethnic Group</th>
<th>Predominant Language Spoken</th>
<th>Primary School Enrolment Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>Total</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>Damuchojenaar</td>
<td>28.0</td>
<td>28.7</td>
<td>28.3</td>
<td>76.0</td>
<td>76.5</td>
</tr>
<tr>
<td>Serule</td>
<td>14</td>
<td>6.9</td>
<td>11.7</td>
<td>62.7</td>
<td>66.1</td>
</tr>
<tr>
<td>Gojwane</td>
<td>28.7</td>
<td>11</td>
<td>11.5</td>
<td>45.3</td>
<td>47.7</td>
</tr>
<tr>
<td>Moreomabale</td>
<td>14.4</td>
<td>14.7</td>
<td>19.6</td>
<td>50.5</td>
<td>56.5</td>
</tr>
<tr>
<td>Topisi</td>
<td>7.8</td>
<td>10</td>
<td>8.8</td>
<td>52.8</td>
<td>49.1</td>
</tr>
</tbody>
</table>

*Source: Compiled from Statistics Botswana, 2015*

#### 3.3.5.4 Housing

Serule has a mixture of both modern and old housing structures. Most of the older structures are built the traditional way, with thatched roofing whilst the modern structures are built with more modern materials.

#### 3.3.5.5 Employment/Livelihoods

The main livelihood is farming where majority rely on it as the main economic activity. Arable farmers cultivate crops such as maize, sorghum, sweet reed, beans and groundnuts. These are done mostly on subsistence basis.

Many households in Serule rely on the harvesting and selling of veld products to sustain their livelihoods as they own little or no cattle. These veld products include firewood, wild fruits, thatching grass and Mophane worms. Women are more involved than men in the harvesting and selling of these products at the subsistence level. Mophane worms are harvested between the months of December and April annually. The income generated from the selling of Mophane worms is used for the purchasing of groceries and clothing. Others consume this product as part of their daily nutritional intake as a substitute to meat and because it has a high protein content.

Serule residents also collect firewood all year round. Firewood is used for cooking, lighting and heating purposes. Both men and women are involved in the harvesting of this product. The residents generate an income from the selling of firewood. Grass is harvested annually between the months of July and September. Grass is used as a roofing material, particularly for traditional houses.

Wild fruits such as Mogwana (false brandy bush) is also harvested and sold by women annually between April and May. Mogwana is also used by women for the brewing of
traditional beer (khadi) which is sold locally. When the natural resources described above are in season, children and women are found along the A1 Road selling these resources.

Because of the presence of the clinic, the railway line and police station in Serule village, formal employment is prominent in the settlement. There are therefore more Government workers in the settlement compared to the other beneficiary villages.

The unemployment rate is 11.7 percent as shown in Table 16. This is significantly lower than the national unemployment rate of 18.9 percent. Unemployment is higher amongst men than women as the women seek employment in the Ipelegeng Poverty programme whiles the men are not too eager to engage in the programme as they deem the salary is inadequate.

A-Cap Uranium Mine will soon open and it is anticipated that most of the residents of Serule Settlement will be formally employed in the mine, this will reduce unemployment and poverty in the settlement.

3.3.5.6 Income Poverty

About 25 percent of the population live below the PDL. This is above the national average rate of 19.3 percent. The main causes of poverty include unemployment, declining agricultural production and diseases. Table 17 illustrates poverty rates and the number of people living in poverty by settlements.

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Population Living in Poverty</th>
<th>Poverty Rate (Percentage of Total Population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topisi</td>
<td>609</td>
<td>32</td>
</tr>
<tr>
<td>Moreomabele</td>
<td>160</td>
<td>38</td>
</tr>
<tr>
<td>Serule</td>
<td>560</td>
<td>25</td>
</tr>
<tr>
<td>Gojwane</td>
<td>559</td>
<td>48</td>
</tr>
<tr>
<td>Damuchojenaa</td>
<td>514</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Statistics Botswana (2015c)

3.3.5.7 Education

Literacy in Serule is attained through a primary school and a boarding junior secondary school that are in the settlement. The schools offer a seven-year primary education and a three-year junior secondary education (ten years of basic education). Table 16 indicates that the literacy rate for Serule is 64.5 percent (at primary level) and the primary school enrolment is 96.1 percent, however, attainment rates could not be ascertained.

3.3.5.8 Health

Serule has a clinic and it provides mainly primary healthcare and outpatient services including general consultations, treatment of injuries and minor illnesses with serious cases referred to hospitals. Patients that need further health assistance are referred to Mmadinare primary hospital. Every citizen has access to medical care regardless of gender class and race.

Health issues in the settlements include HIV/AIDS, water borne and respiratory diseases and malnutrition. The Botswana AIDS Impact Survey (2013) shows the HIV prevalence rate of 16.4 percent for males and 17.8 percent for females in Central Serowe District which includes the settlements of Topisi, Moreomabele, Gojwane and Serule.
3.3.5.9 Access to Water Supply and Sanitation

Results from the 2011 Population and Housing Census show that in Serule, 302 households have access to water through communal taps, whilst 271 households have piped water outdoors (Table 18). Only 144 households out of 912 households have piped water connection in their houses. These statistics symbolize the amount of poverty that exists in Serule village as households cannot afford to have water connected to their houses.

Table 18: Access to Sanitation (Percentage of Households)

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Type of Sanitation System</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Own</td>
</tr>
<tr>
<td>Topisi</td>
<td>35.4</td>
</tr>
<tr>
<td>Serule</td>
<td>56.7</td>
</tr>
<tr>
<td>Moreomabele</td>
<td>29.8</td>
</tr>
<tr>
<td>Gojwane</td>
<td>50.8</td>
</tr>
<tr>
<td>Damuchojena</td>
<td>48.0</td>
</tr>
</tbody>
</table>

Source: Statistics Botswana, 2015c

3.3.5.10 Political and District Administration

Serule is under the jurisdiction of the Palapye/Serowe Administrative Authority. Serule village together with Gojwane Settlement elects a councillor who represents them at the districts level. At the national level the two settlements’ together with others are part of the Serowe-North Constituency and therefore they elect one member to the national parliament.

3.3.5.11 Tribal Administration

Serule village is also tribally under the jurisdiction of the Bamangwato Tribal Authority.

3.3.6 Moreomabele Village

3.3.6.1 History of Moreomabele

Moreomabele just like the other settlements was initially a cattle post for residents from Serowe and Palapye settlements who came from the Bangwato tribe. It was later gazetted into a settlement around the 1970s.

3.3.6.2 Population Characteristics

The population of Moreomabele as of 2011 was 602. It is the least populated settlement amongst the beneficiaries. The population comprise of 48 percent men and 51.8 percent women. The population growth of the settlement is 1.7 percent per annum. Table 15 indicates that the settlement is youthful with over 50 percent being in the age cohort of 14-64 years.

3.3.6.3 Ethnicity and Language

The predominant ethnic groups in the Settlement are the Bangwato and Batswapong. Thus, making the most common language spoken Setswana and Setswapong. Most residents are multilingual as English language is also spoken in the settlement.

3.3.6.4 Housing

Housing in the Settlement is mostly of modern design and make. However, traditional huts with thatch roof are found within the settlement.
3.3.6.5 Employment

Moreomabele is a small settlement with a high unemployment rate. As of 2011 population census the unemployment rate was 19.6 percent which is higher than the National unemployment rate of 18.7 percent. Like most rural areas in Botswana the most common form of employment is Ipelegeng (the Government Poverty Eradication Scheme).

Residents of Moreomabele also collect firewood all year round and Mophane worms when in season for sale. Firewood is used for cooking, lighting and heating purposes. Both men and women are involved in the harvesting of this product. The residents generate an income from the selling of firewood. Grass is harvested annually between the months of July and September. Grass is used as a roofing material, particularly for traditional houses. The civil works of the project will not in any way restrict access to these resources.

Wild fruits such as Mogwana (false brandy bush) is also harvested and sold by women annually between April and May. When the natural resources described above are in season, children and women are found along the A1 Road within their settlement to sell these resources. This area is outside of the project area.

3.3.6.6 Income Poverty

Table 14 illustrates poverty rates and the number of people living in poverty by settlements. Over 25 percent of the population live below the PDL. This is above the national average rate of 19.3 percent. The main causes of poverty include unemployment, declining agricultural production and communicable and non-communicable diseases.

3.3.6.7 Education

The settlement has a primary school (ages 6-12) which is within the settlement. Junior (ages 13-15) and senior secondary (ages 16-17) schools are located within the nearby settlements these are boarding schools therefore student from the settlement live on campus. During school breaks children from Moreomabele village are provided transport to come home for the holidays as is the case with all the beneficiary villages. The literacy rate (at primary school level) as shown in Table 16 is 53.7 percent

3.3.6.8 Health

Moreomabele has a health post within the settlement. The health post provides all services stated above, it is visited by a doctor every week to attend to patients that the nurses were not able to assist during the week.

The most common health issue in the settlement is the spread of communicable diseases such as viruses causing shingles and chicken pox, and fungus causing ringworm. Children, elderly and those with immune-suppressed conditions are the most vulnerable to such infections. However, this can be treated at the health post. The Government of Botswana provides vaccination against most communicable diseases through its various programmes in the health centres or clinics.

3.3.6.9 Access to Water Supply and Sanitation

About 99.3 percent of the entire population of Moreomabele has access to portable water. About 47.7 percent of the population use communal stand taps, 33.1 percent use piped outdoor, 13.2 use a neighbour’s tap, and 5.3 percent use piped indoors.
Only 76.8 percent of the population have access to sanitation facilities. Pit latrines are the most used ones in the settlement. It accounts for 31.8 percent of total access, flush toilet used by 2.6 percent. The remaining 24.2 percent of the population use other means of sanitation which may include the use of the bush.

3.3.6.10 Political and District Administration

Moreomabele village is under the jurisdiction of the Palapye/Serowe Administrative Authority. It is represented on the council by an elected member from both the settlement and Topisi village. The two settlements also form part of the Serowe-North Constituency which includes Serule, Moreomabele and Topisi villages. They together have an elected Member of Parliament at the national level.

3.3.6.11 Tribal Administration

The project area is located on tribal land which is under the jurisdiction of the Bamangwato Tribal Authority. The settlement has a Kgosi and headmen who attend to tribal and customary issues. There is a kgotla where community meetings are held. The settlement also has a Settlement Development Committee (VDC) as part of their Tribal Administration. The VDC is responsible for the development and welfare of the Settlement.

3.3.7 Topisi Village

3.3.7.1 History of Topisi

Like the other settlements, Topisi was a cattle post for residents of Serowe and in 1978 was gazetted as a settlement.

3.3.7.2 Population Characteristics

The population of Topisi in 2011 was 1,545. Of this population, 50.2 percent were men and 49.7 percent were women. Table 15 shows the distribution of the age cohort in the settlement and also indicates it is a youthful settlement with 52.0 percent of the population within the age cohort of 15-64 years. The percentage of the elderly (65+) in the settlement is the highest at 7 percent is the highest amongst the beneficiary villages. The population is expected to increase to 2,519 by 2040 which is the end of the planning horizon.

3.3.7.3 Ethnicity and Language

The dominant ethnic groups in the settlement are the Bangwato, Batswapong making the widely spoken language Setswana and Setswapong. Most residents are multilingual as English language is also spoken in the settlement.

3.3.7.4 Housing

Housing in the Settlement is mostly of modern design and make. However traditional huts with thatch roof are found within the settlement mostly inhabited by poor.

3.3.7.5 Employment

Topisi, like the other beneficiary villages, is a farming community. The residents practice pastoral and arable farming.

The unemployment rate in Topisi village is 8.8 percent, which is the lowest unemployment rate in the beneficiary villages. The Government also offers temporary employment through the
drought relief unemployment program (Ipelegeng) which is available in all settlements, towns and cities in the country.

3.3.7.6 Income Poverty

Topisi has the least recorded poverty rate as compared to the other beneficiary villages. Incidence of poverty is about 32 percent and exceeds the national average of 19.3 percent. The main causes of poverty include unemployment, declining agricultural production due to inadequate or unreliable rainfalls and both communicable and non-communicable diseases which impacts participation in the workforce.

3.3.7.7 Education

The settlement of Topisi has one primary school. Table 15 illustrates the literacy rate for Topisi. An average of about 51.0 percent of the population is literates. The settlement has an enrolment rate of about 92.0 percent which is lowest among all the beneficiary villages.

3.3.7.8 Health

Topisi also has a health post which provides pre-natal and neonatal care, child welfare services, outpatient treatment of minor health issues, immunizations and child care services, sexual reproductive services, health education, and HIV/AIDS services (including education and testing, and provision of ARVs and PMTC).

Life expectancy data is collected for districts as opposed to individual settlements. Under the Serowe/Palapye District, which includes Gojwane, Serule, Moreomabele and Topisi villages, life expectancy is 65 years for males and 68 years for females (national rates are 65 years and 70 years respectively). Under 5 years child mortality rate at the district level is 5.9 percent which is better than the national average at 6.25 percent.

3.3.7.9 Access to Water and Sanitation

About 97 percent of residents reported that they have access to water. Those with piped indoor water is 4.9 percent, piped outdoor is 26.8 percent, neighbours tap is 5.1 percent and communal type is 28.6 percent.

A total of 59.1 percent of the settlement have access to sanitation. These include the use of pit latrines, flush toilets, and ventilated improved latrines. The remaining 40.9 per cent do not have access to any sanitation facility.

In Topisi, 19 residents of the population own their own flush toilets and whilst 122 own pit latrines. The reason for this high number of people who own pit latrines is because there is currently no sewage in the settlement.

3.3.7.10 Political and District Administration

Topisi is under the jurisdiction of the Serowe/Palapye Administrative Authority. The settlement is represented on the council (authority) by an elected member from the settlement and Moreomabele village. The two settlements also form part of the Serowe-North Constituency which includes Serule, Moreomabele and Topisi villages. They together have an elected Member of Parliament at national level.
3.3.7.11 Tribal Administration

The project area is located on tribal land which is under the jurisdiction of the Bamangwato Tribe. The settlement has a Kgosi and headmen who attend to tribal and customary issues in the settlement. There is a Kgotla where community meetings are held. The settlement also has a Settlement Development Committee (VDC) as part of their Tribal Administration. The VDC oversees settlement development which includes community driven projects such as waste management, cleaning and supports implementation of government projects such as water provision, and social intervention projects and programmes.

3.3.8 Damucojenaa Settlement (Contains a Vulnerable Community as per OP 4.10)

Information provided here on the baseline for Damucojenaa settlement is supported by the consultations (i.e. focused group discussions, household surveys and public meetings) held in the settlement in connection with OP 4.10.

3.3.8.1 History of Damucojenaa

The name Damochujenaa according to Botswana Press Agency (BOPA).11 (2013,i) is a Sesarwa (language of the Basarwa) name translated in Setswana as 'Sedibana sa motho yo o seleme'. In English this translates to “a borehole that belongs to a person with a lisp or foreign language”.

The history of Damochujenaa dates back to the late 1800s and early 1900s when Bangwato Chief, Kgosi Khama III12 sent Mongwato (a man from the Bangwato Tribe) man named Motswirinyane and his grandfather Moshakge (the father of Gakebone Kebalipile) who was a (Mosarwa) San from Seleka in the Shoshong area to establish cattle posts near Damochujenaa at places called Sedibe and Boditela to herd his cattle and sheep.13 The Basarwa were among the first inhabitants of this settlement.

3.3.8.2 Population Characteristics

Data from Statistics Botswana indicates that Damucojenaa in 2001 had a total population of 781 and in 2011 the population was 107914. This therefore illustrates a 27.0 percent increase from the year 2001 to 2011. In 2011, 43.2 and 56.8 percent of the population were men and women respectively. It is the most youthful settlement of all the beneficiary villages with a total of over 95 percent below the age of 65 years.

Household sizes of the community members in Damucojenaa based on the survey carried out are on the average 6 people in each household. This is higher compared to the national average household size of 4.4. The reason for the high household sizes is largely based on cultural background, where little family planning is practiced, including prophylaxis.

3.3.8.3 Ethnicity and Language

12 Kgosi Khama III was the Kgosi of the Bamangwato people of Botswana, who made his country a protectorate of Great Britain to ensure its survival against Boers encroachment.
14 Figure obtained during 20 Feb. 2019 community consultation.
The household survey revealed that there are eight ethnic groups that are spread within the settlement of Damuchojenaa, the Basarwa forming the largest ethnic group at 46.7 percent (Figure 3). One of the reasons why there this settlement is culturally diverse is due to the proximity of Damuchojenaa to the mining town of Selebi-Phikwe where a copper and nickel mine is located. The mine attracted high levels of laborer during its operation. These laborers acquired land and houses in nearby settlements including Damuchojenaa. After the closing of the mine in 2017 most of them remained in the nearby settlements.

**Figure 3: Ethnic Breakdown of Damuchojenaa**

![Ethnic Breakdown of Damuchojenaa](image)

*Source: Field Survey, September 2018*

The most common language spoken in Damuchojenaa is Setswana. It was alluded to during the focus group discussions that the majority of the Basarwa living in the area, especially the youth, do not speak their native language as it has been lost through interactions with other tribes. They may speak their traditional language at home however this was not confirmed in household surveys. In consultations with the NGO San Youth Network, they indicated that the San youth in the Central and District of Botswana considers their culture and language as "primitive" and therefore do not endeavor to learn or speak it. This is because of historical discriminatory and prejudicial attitudes and beliefs about the Baswara which persist today. Most residents are multilingual as English language is also spoken in the settlement.

### 3.3.8.4 Housing

Damuchojenaa, has a mixture of both modern and traditional housing structures. Most of the traditional houses are built with mud and with thatched roofing whilst the modern structures are built with sand and concrete brick materials. Most of the modern houses built in the settlements are by the former workers of the mine in Selebi-Phikwe. About 97 percent of households (includes both Basarwa and other ethnic groups) interviewed own their houses.

### 3.3.8.5 Employment and Livelihoods

The main livelihood of the settlement is pastoral farming. They also collect natural resources such as grass, firewood and mophane worms for subsistence use and for sale. Most of the residents are also engaged in the Ipelegeng Government Programme. The pipeline route has avoided the pasture or grazing land located near the main road to avoid disruption of their livelihoods even though the community agreed that part of the grazing land could be used for the pipeline route.

Prior to other tribes settling in with the Basarwa, the Basarwa’s main livelihood was hunting and gathering, where they lived a nomadic life and survived on animals and fruits from the wild. They were able to live on and off their traditional lands and were subsequently severed from their lands and livelihoods as a result programs aimed at assimilating them into broader Botswana society as their livelihoods and ways of life were perceived to be less civilized and productive. This had led to the loss of their traditional livelihood.
While hunting is regulated by the government and a license to hunt is required, the livelihood of gathering of natural resources such as thatch, fruits and mophane still continues. The women and children gather these and sells them.

3.3.8.6 Income Poverty

From the survey conducted in the settlement, the most common occupation in the settlement was “Ipelegeng”, where the community members earn P567 (US $56.70) per month performing activities such as grass cutting, collecting waste from streets and roads and any other community requirements or labor-based jobs. In Damuchojenaa, the maximum monthly income was P 4,500 per month (US $450) with some having no income whatsoever. The mean monthly income in the Settlement was P 292.11 (US $2.92) per month which translates to P 9.42 (US$ 0.94) per day which is also below the World Bank’s revised International Poverty Line of US $1.90 (P 19.00) per day per capita.

3.3.8.7 Education

Damuchojenaa has one primary school offering classes from standard 1 to standard 7 (ages 6-12 years old). Upon completion students are then transferred to junior secondary school in Serule village, which is about 16 km away. The junior school has boarding facilities therefore children are accommodated on campus. Those who successfully complete junior secondary are taken to Mmadinare Senior School which is about 19 km away. Transport during term breaks is usually provided by the Social and Community Development (S&CD) officer for children to come home as well as to return to school.

Among all the beneficiary villages Damuchojenaa settlement has the highest literacy rate of 76.3 percent (at primary school level)

3.3.8.8 Health

The settlement has a health post which is serviced by two nurses, two health educators; two volunteers a cleaner and a driver. They as well have one ambulance. A doctor used to come every Friday to attend to health needs in the community that that nurses were not able to assist with, as well as to dispense ARV drugs to those who need them but has since been replaced by a Nurse. The community is referred to Mmadinare Primary Hospital for cases that are beyond the health post. In such cases transport is provided to the primary hospital. In the Bobonong Census Area where Damuchojenaa is found, life expectancy for males is 61 years and females 69 years. The child mortality rate is 7.7 per cent.

In Damuchojenaa there are approximately five traditional healers and of these three are Basarwa.

3.3.8.9 Access to Water Supply and Sanitation

Access to water is sometimes limited in the settlement. During site visits it was observed that some of the standpipes in the settlements were vandalised and out of use. A water bowser brings in water sometimes to the settlement. The community complained that sometimes they go for three weeks without water. This results in long queues at the standpipes when the water comes.

Each ward in the settlement has a litter disposal area of which the Ipelegeng works collect litter within the area and place them in a designated waste area. Pit latrines are the common type of sanitation used in the settlement.

3.3.8.10 Marital Status
Majority of the respondents are unmarried (approximately 32 percent are married, see Figure 3.2). Most are in inter-ethnic marriages. This could account for why Sesarwa (the Indigenous language) is not spoken by the youth. The community has a divorce rate of three percent. About 23 percent of those interviewed are in co-habitation relationships.

The Basarwa have cultural or traditional marriages but they often do not register them in civil administration.

3.3.8.11 Types of Vulnerability and Number

The World Bank definition of vulnerability refers to the probability or risk of being poor today or of falling into deeper poverty in the future. From the social assessment survey, the type of vulnerability facing the residents was ascertained. According to the social and community development officer based in the settlement, there are 123 registered extremely poor, orphans, persons with disabilities,\(^\text{15}\) and needy students\(^\text{16}\) as at September 2018. Out of these about 33 percent are Basarwa of which 93.1 percent are registered as extremely poor (Table 19).

These risks are therefore important to be identified to ensure inclusion in project risks and access to project benefits.

Table 19: Number of People and Vulnerability in Damuchojenaa Settlement

<table>
<thead>
<tr>
<th>Vulnerability Type</th>
<th>Females</th>
<th>Males</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely Poor</td>
<td>16</td>
<td>13</td>
<td>29 (27)</td>
</tr>
<tr>
<td>Disabled</td>
<td>2</td>
<td>4</td>
<td>6 (1)</td>
</tr>
<tr>
<td>Orphans</td>
<td>26</td>
<td>23</td>
<td>49 (6)</td>
</tr>
<tr>
<td>Needy Students</td>
<td>17</td>
<td>22</td>
<td>39 (6)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>61</strong></td>
<td><strong>62</strong></td>
<td><strong>123 (40)</strong></td>
</tr>
</tbody>
</table>

*Numbers in brackets represent number of Basarwa

Source: Social and Community Development Officer, Damuchojenaa, September 2018

3.3.8.12 Household Possessions

**Figure 4** below shows the most common type of properties owned by the community member’s in Damuchojenaa. As **Figure 4**, shows all the community members that took part in the survey owned cell phones. The second highest was radios at 50 percent. Only 1 participant owned a computer.

There is good cell phone network coverage by all the three networks providers in Botswana in this settlement. There are Mascom Kitso centres (service centres) which offer secretarial services such as photocopying, printing and internet access. All Mascom services such as SIM replacement purchasing of airtime and others can be done from these service points. Radio can reach the local radio channel frequencies in this settlement.

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\(^{15}\) This includes those with physical disabilities, including visual and hearing impairment.

\(^{16}\) Needy students are those who lack the financial means for uniforms, transport fees, food, among other things.
3.3.8.13 Political and District Administration

Damuchojena Settlement falls under the Bobirwa Sub-District (administrative district) jurisdiction. As previously indicated, the settlement together with Mmadinare village and other ten settlements constitute the Mmadinare Constituency. They elect one member to the national assembly. The settlement again together with Mmadinare village also elects one councillor as their representatives to the Sub-District Council.

3.3.8.14 Tribal Administration

The Settlement is also under the jurisdiction of the Bamangwato Tribal Authority. The settlement although is predominantly Basarwa, they have the same tribal institutions as the other beneficiary villages within the project area. Like all other settlements, it has a Kgosi (who is Basarwa and headmen who attend meetings on tribal and customary issues). There is a Kgotla where community meetings are held. The settlement also has a Settlement Development Committee (VDC) as part of their Tribal Administration institutions. The VDC members are elected by the community. The VDC initiates community and implements community development and welfare of the settlement. As part of the Tribal Administration, there is a land overseer, who works with the community and the Land Boards to allocate land for various purposes except for residential land use, which is the prerogative of the Land Boards.

3.3.9 Gojwane (Has a Vulnerable Community as per OP 4.10)

Information provided here on the baseline for Gojwane settlement is also supported by the consultations (i.e. focused group discussions, household surveys and public meetings) held in the settlement in connection with OP 4.10.

3.3.9.1 History of Gojwane

Gojwane settlement according to the oral testimony of the settlement Kgosi is a Setswana word meaning “small pond”. The Kgosi stated that during 1920 to 1950s, the Bangwato Chief Seretse Khama owned cattle posts in Serule and nearby areas such as Marulamantsi, Maphaiphai, Lekgaka and Tshosane. During that time, Basarwa who were living in the area went to work as cattle herders for Seretse Khama. Upon his death, some of the Basarwa went back to stay in Gojwane which they have formed a collective attachment even though it is not their ancestral land. They built permanent homes and settled.

It was gazetted and recognized in 1978 as a settlement. The presence of the Basarwa in the settlement has triggered OP 4.10 and hence a VCP has been prepared. It is one of the listed Remote Area Dwellers in Botswana and due to the social and economic factors in this area, community members are recipients of Government assistance programs as described above and in Chapter 4.
3.3.9.2 Population

The population of Gojwane settlement increased from 1,041 in 2001 to 1,499 in 2011. The population change was about 44.0 percent and growing at a rate of 1.7 percent per annum. The percentage of women and men in the settlement is respectively 51 and 49.

As shown in Table 16, the population distribution for Gojwane area indicates that the highest age group in the settlement is between the ages of 0-14 years.

With the presence of the A-Cap resources mine in Gojwane there is a higher chance that the population growth would increase as the mine will attract migrants looking for job opportunities.

Household sizes of the community members in Gojwane based on the survey carried out is on average 6 people. This is higher than the national average household size of 4.7. The reason for the high household sizes is based on the cultural background of residents.

3.3.9.3 Ethnicity and Language

The survey revealed that there are six major ethnic groups in the settlement. Basarwa make up the largest proportion of the total population in the settlement at 37 percent. The second highest is Bangwato at 33 percent, as can be seen in Figure 5.

Figure 5: Ethnic Groups in Gojwane

Source: Field Survey, September 2018

The most common language spoken in the settlement is Setswana this is since the settlement has a very diverse ethnic background. Most residents are multilingual as English language is also spoken in the settlement.

3.3.9.4 Housing

It was observed during site visits that there were more mud huts seen than modern houses. The reason for this cause could be the high poverty rate as well as the low-income rate within the settlement.

3.3.9.5 Employment and Livelihoods

Employment or Livelihood in Gojwane is similar to that of Serule village with the exception of formal employment in some Government Sectors. They are mainly farmers and they gather veld products and firewood and sell them.

Gojwane settlement is faced with high levels of unemployment. The unemployment rate for Gojwane as 11.5 percent (national rate is 18.7 percent). For men, about 11.7 percent and for women about 11.4 percent are below the International Poverty Datum Line (IPD).
The Government offers temporary employment through Ipelegeng. This program temporary employs about 90 percent of the workforce in Gojwane.

The A-Cap Uranium Mine will soon open and it is anticipated that most of the residents of Gojwane Settlement will be formally employed in the mine. This will most likely reduce unemployment and income poverty in the settlement.

3.3.9.6 Income Poverty

About 48 percent of the population live below the IPL. This is above the national average rate of 19.3 percent. It is the settlement with the highest poverty rates among the project beneficiaries. The main causes of poverty include unemployment and lack of opportunities, declining agricultural production and health of the workforce due to both communicable and non-communicable diseases.

3.3.9.7 Education

Gojwane has a primary school as per the National Settlement Policy (NSP). The school as of September 2018 had a total of 431 pupils (197 females and 234 males) and 21 members of staff. The school offers classes from reception (pre-school/nursery, ages 3-5 years) to standard 7 (ages 6-12 years).

As shown in Table 16 the literacy and school enrolment rates for the settlement are respectively 50.0 percent and 93.6 percent.

According to Statistics Botswana (2011), given low education attainment of parents and guardians and given poverty rates, children may work on farms to help with family income which perpetuates the cycle of low educational attainment.

Department of Tertiary Education Funding has a special dispensation or fund for Remote Area Dwellers People (RADP), poor children and orphans. The national score grade cut-off point at form five level to obtain Government sponsorship to tertiary level is 36 on the Botswana General School Certificate Examination (BGSCE). However, in the RADP for affirmative action settlements, with less privileged children and orphans, the grade cut-off point is lower at 31 in recognition of the dire challenges they face in these communities that may impact attainment rates and access to tertiary education. In this way, affirmative action is used to address generational poverty.

In 2018 Gojwane had approximately 100 pupils completing Botswana General Certificate of Secondary Education (BGCSE) is the final year of senior school (form 5). Out of the 100 pupils, 80 students performed well enough to proceed to tertiary schools, from the 80 only about 3 of these students were Basarwa.

3.3.9.8 Health

According to the nurse in charge at Gojwane Health Post, the predominant diseases in the settlement are HIV/AIDS. The most affected population ranges between 20–34 years of age and are mostly women.

The nurse indicated there is low condom use which contributes to high infection rates in the settlement. Teenage pregnancy is also prevalent in the settlement and contributes to school dropout and poverty.

For major health issues, patients in Gojwane are transferred to Selebi-Phikwe Primary Hospital or Nyangabwe Referral Hospital in Francistown.
The health post is electrified and is serviced by two nurses, three health educators, as well as three volunteers who are general assistants, a cleaner and a driver. The health post has one ambulance. A medical doctor visits the health post weekly and provides ARV drugs to those who need them.

Traditional medicine is also practiced in the settlement. There is an annual community festival to promote the use of traditional medicine. The settlement of Gojwane has approximately 15 to 20 traditional doctors, of these its unknown how many are Basarwa.

3.3.9.9 Access to Water Supply and Sanitation

In Gojwane, a majority of households (222 of 337) access water from communal taps, whilst 58 households have piped water outdoors. Only 15 households have piped water connection in their houses. An inability to pay for piped connection water service is a barrier to in-home water access.

Water supply is a problem in the settlement as demand is higher than the supply. This consequently results in long queues at public standpipes. The project is to bring a sustainable solution when completed.

The settlement has a landfill. Like Damuchojenaa, each ward in the settlement has a litter disposal area of which the Ipelegeng workers collect litter within the area and place them in a designated waste area. Pit latrines are also the common type of sanitation used in the settlement.

3.3.9.10 Marital Status

About 47 percent of those interviewed during the household surveys are single, 27 percent are married, and 20 percent are in co-habiting partnerships. Many of the intermarriages occur between the vulnerable community members (Basarwa) and Bangwato. Basarwa often cohabitate therefore they do not get legally (civic) married. According to their norms, once a couple has a child they are perceived to be married and if often leads to cohabitation.

3.3.9.11 Number and Types of Vulnerability

From the social assessment survey, the type of vulnerability facing the residents was ascertained and the numbers shown in Table 20.

According to the Social and Community Development (S&CD) officer in Gojwane, there are about 179 registered, impoverished, orphans, disabled, needy students and children in need of care. Of the registered vulnerable people, 54 percent are Basarwa.

Table 20: Vulnerability in Gojwane Settlement Disaggregated by Sex

<table>
<thead>
<tr>
<th>Vulnerability Type</th>
<th>Females</th>
<th>Males</th>
<th>Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Destitute Persons</td>
<td>40</td>
<td>19</td>
<td>59 (35)</td>
</tr>
<tr>
<td>Disabled</td>
<td>8</td>
<td>7</td>
<td>15 (7)</td>
</tr>
<tr>
<td>Orphans</td>
<td>14</td>
<td>19</td>
<td>33 (32)</td>
</tr>
<tr>
<td>Needy Students</td>
<td>39</td>
<td>33</td>
<td>72 (22)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>179 (96)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Social and Community Development Officer, Gojwane, September 2018

*Numbers in brackets represent number of Basarwa
3.3.9.12 Household Possessions Owned By Indigenous People (Vulnerable People)

Figure 6 below, shows the most common type of properties owned by community members' in Gojwane. All community members who took part in the survey owned cell phones.

Figure 6: Property Owned by Participants

![Property Owned by Participants](image)

Source: Field Survey, 2018

3.3.9.13 Political and District Administration

Gojwane Settlement is under the jurisdiction of the Tonota Sub-District Council. It is represented on the council by an elected member from both the Settlement and Serule village. The two settlements also form part of the Serowe-North Constituency which includes Serule, Moreomabele and Topisi villages. There together have elected Member of Parliament at national level.

3.3.9.14 Tribal Administration

The project area is located on tribal land which is under the jurisdiction of the Bamangwato Tribal Authority. The settlement although is predominantly Basarwa, they have the same tribal institutions as pertaining to the other beneficiary villages within the project area. Like all other settlements it has a Kgosi and headmen who attend to tribal and customary issues. There is a Kgotla where community meetings are held. The settlement also has a Settlement Development Committee (VDC) as part of their Tribal Administration. The VDC members are elected by the community. The VDC see to the development and welfare of the Settlement. As part of the Tribal Administration, there is a land overseer, who works with the community and the Land Boards in allocating land for various purposes except for residential land use, which is the prerogative of the Land Boards.

3.4 SOCIAL ASSESSMENT OF VULNERABLE COMMUNITIES OF THE PROJECT

Under the Selebi-Phikwe to Serule Water Transfer Scheme, people of Basarwa (San) ethnicity were found to be living as communities in the settlement of Gojwane and Damuchosjena settlement. Individual Basarwa were found in settlements like Serule but those were living there for employment purposes but returning to their original communities during the holidays. The other settlements of Topisi, Mmadinare and Moreomabele did not have them.

3.4.1 Assessment of OP 4.10 Criteria of San (Basarwa) in Botswana

Assessment of OP 4.10 Criteria of San (Basarwa) in Botswana

Brief historical background: Botswana is a culturally diverse country. The Constitution (1966) initially recognized eight major Tswana tribes (the Bamangwato, Batawana, Bakgatla, Bakwena, Bangwakets, Bamalete, Barolog and Batlokwa) and their hereditary chiefs were
guaranteed a seat in the Ntlo ya Dikgosi ("House of Chiefs"), an advisory body to Parliament.\textsuperscript{17} Further, the Chieftainship Act of 1933 defined “chief” and “tribe” by reference to the eight dominant Tswana tribes only. However, several other ethnic groups have recently obtained such official recognition such as the Basarwa (San). Most of these groups claim to be Indigenous, understood in this context as “here first” to Botswana and many of them live in marginal conditions and are considered vulnerable and marginalized. The Basarwa (San) have been historically excluded for their distinct cultural characteristics and livelihoods. Affirmative action policies have been necessary to ensure their survival, equality, and well-being. They are among the oldest peoples of Africa.\textsuperscript{18}

The Basarwa population is now about 50,000–60,000 at the national level, and encompasses a number of subgroups, including Ju/'hoansi, Bugakhwe, //Anikwe, Tsexakhwe, !Xoo, Naro, G/wi, G//ana, Kua, Tshwa, Deti, ‡Khomani, ‡Hoa, =Kao//aes, Shua, Danisi and /Xaisa. Basarwa communities reside in seven districts: The Southern, Kweneng, Kgatleng, Ghanzi, Kgalagadi, Central, and North West districts. Traditionally, the Basarwa were a semi-nomadic people who practised a hunter-gatherer and agro-pastoralist lifestyle, moving within designated areas based on the seasons and availability of resources, such as water, game and edible plants and had seasonal use to their traditional lands. The territory available to the Basarwa has shrunk over the last century through successive in-migrations, land use changes, development (including of Parks and other development enterprises) of both Government and other African tribal groups\textsuperscript{19}.

Their association with the land was based on complex intra-cultural negotiated systems and, because they had no formally recognized land tenure system, they were often considered by Government as having no land of their own (and therefore no rights to land).\textsuperscript{20} However, their land use is mostly for customary use and occupancy. Tribal customary law, primarily based on oral tradition, has been incorporated into the legal framework of Botswana since independence. Under the Customary Law Act, tribal customary law is valid to the extent that it “is not incompatible with provisions of any written law or contrary to morality, humanity or natural justice”. Customary law is administered by all courts of Botswana, when applicable, in cases involving tribal members, including by customary courts operating under the authority of Chiefs or Headmen. These customary courts derive their authority from oral tradition as well as from the Customary Courts Act. Customary courts have been developed in connection with the Kgotla system, which is a system for handling matters of concern to the tribe through community meetings, and which is based on Tswana custom.

After independence, the land security of the Basarwa further deteriorated and the Tribal Grazing Lands Policy (TGLP) — a large-scale land reform and livestock development program adopted in 1975 which virtually left no land “in reserve” for the Basarwa. It resulted in the removal of an estimated 28,000–31,000 people from the TGLP ranch areas, and their subsequent relocation in Government established settlements such as Damuchogenaa and Gojwane.

\textsuperscript{17} The House now consists of 35 members, up from its initial 15. Eight members are hereditary chiefs (kgosi) from Botswana’s eight dominant tribes. Another 22 members are indirectly elected and serve five-year terms. Of these, four are chosen from subchiefs in the districts of North-East, Chobe, Ghanzi, and Kgatleng. The remaining 5 members are appointed by the President of Botswana. They must be at least 21 years of age, proficient English speakers, and have not participated in active politics in the past five years. Chiefs may not belong to political parties. The House is an advisory body to the Parliament and has no legislative nor veto power. All bills affecting tribal organization and property, customary law, and the administration of customary courts go through the House before being discussed in the National Assembly. Members must also be consulted when the Constitution is being reviewed or amended. The body has the power to summon members of government to appear before it.

\textsuperscript{18} See Indigenous People’s Planning Framework for the Human Wildlife-Conflict Management (HWCM) in Northern Botswana Project (2016). In addition, research has shown that the ancestors of hunter-gatherer San are thought to have been the first inhabitants of what is now Botswana and South Africa. The historical presence of the San in Botswana, for example, is particularly evident in northern Botswana’s Tsodilo Hills region where stone tools and rock art paintings date back over 70,000 years and are the world’s oldest known art.

\textsuperscript{19} IPPF for HWCM in Northern Botswana Project

\textsuperscript{20} Ibid.
These settlements were part of the Government’s efforts to integrate Basarwa into wider society. The official policy goal was to enhance their development through the adoption of agriculture and cattle-raising as livelihood options as well as enhance their access to social amenities. However, while the settlements provide water, schools, and health posts, most Government projects have not fully succeeded in providing culturally appropriate sustainable livelihoods for them.

Damuchojenaa and Gojwane remain as settlements as per the Botswana National Settlement Policy of 1998. A remote area settlement must be not be less than 250 people or 50 households and the geographical location of such a settlement should be remote in the context of Botswana.

The Basarwa communities in Damuchojenaa and Gojwane settlements were screened against the criteria of OP 4.10 and were found to meet the characteristics in a varying degrees as a distinct social and cultural group, despite changes in their traditional livelihoods and cultural practices as a result dislocation from their lands and cumulative impacts of various policies on them:

a) **Self-identification:** They self-identify as members of a distinct Indigenous cultural group and are recognized as such by others in national, regional and international contexts. This is because they still identify themselves as Basarwa and have not forgotten their ancestral history.21

b) **Collective attachment to ancestral lands or geographically distinct habitats:** The Basarwa in the project area have formed a collective attachment to land they currently occupy, even though historically this area would not be considered their ancestral territories. Since the early 1900s, many Basarwa left their lands as their lands were transformed into large cattle farms and national parks such as the Central Kalahari Game Reserve (1961) and the Kalahari Gemsbok National Park (1931)22. Despite ancestral land loss, the Basarwa in these two settlements formed a collective attachment to land they currently occupy.

c) **Distinct customary cultural, economic, social, or political institutions:** They still practice hunting at a small scale as they must apply for a permit to hunt for example guinea fowls and other game, and they still gather wild fruits and tubers for their consumption and selling any surplus left. They still practice their ancestral dance of ‘tsutsube’. They still teach their children this dance and even take them to the western side of the country to learn their ancestral dances. In addition, they still practice ‘botsetsi’ to commemorate the transition of a girl to womanhood at first menstruation, as well as rites of passage for boys who are maturing into manhood. In addition, there are traditional healers in both settlements who provide healing through prayers to the gods and herbs or traditional medicine, and some practice their traditional religions in addition to Christianity.

d) **Distinct language or dialect:** The Basarwa speak their distinct dialect, Sesarwa, a click-based language that differs from other languages in the country.

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21 According to some national organizations representing Basarwa in Botswana, they find the term Basarwa derogatory as it is an imposed term and would prefer the term “Bakhwe” be used. However, the two communities that were consulted for this project preferred the term Basarwa and will be referred to as such here. In addition, “San” is a generic term and the distinct linguistic groups among the San designate themselves by their own name, as for instance, Khwe, Nharo, ‡Khomani, etc. However, as noted above, some communities still prefer to use the term Basarwa. The project will use the term preferred by the community. See Albert Barume, Land Rights of Indigenous Peoples of Africa. (Copenhagen: IWGIA, 2014), p. 12.

Basarwa in Damuchojenaa live with other tribal groups but they have their own ward which is adjacent to the project line even though there will be no physical or economic displacement of community members. The same applies to Gojwane, the settlement has three wards and the Basarwa are concentrated in one ward and the pipeline passes through that ward to the new tanks. This further shows their value of social capital and living together as a community.

In view of the above, the Basarwa are considered as Vulnerable Communities as per OP 4.10 and are included in the project preparation, implementation and monitoring. They were consulted extensively and appropriately over issues that affect them. Any potential adverse impacts emanating from the project were identified and adequately mitigated in relation to vulnerable community, meeting local and international requirements and good practice. A VCP has been prepared and will be implemented in connection to this ESIA/ESMP.
4.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

4.1 Introduction

This chapter provides a description of the existing national, regional and international regulatory frameworks including World Bank's Safeguard Policies which have a bearing on the design and implementation of the water transfer scheme. It also presents the institutions that have a role to play in the implementation and management of the project.

4.2 Acts of Botswana Relevant to the Project

a) Environmental

4.2.1 Water Works Act (1962)

An Act to provide for the constitution of water authorities in townships, to confer certain duties and powers upon such water authorities, to provide for the acquisition of existing waterworks and to provide for matters incidental thereto.

This Act is meant to encourage and protect water supply systems. Waterworks areas must be delineated and gazetted. Water Authority receives the water development rights and has the duty to develop a water supply system. The water authority effectively manages the monopoly of water supply. The Act empowers WUC to provide water supply services to the beneficiary villages as they have been declared as water works area. The Act also empowers WUC to protect the water transfer scheme against vandalism and the quality of water.

4.2.2 Water Utilities Act (1970)

An Act to provide for the establishment of a corporation to be known as the Water Utilities Corporation (WUC) for the supply and distribution of water. WUC is a state-owned enterprise established in 1970 through an Act of Parliament to provide water in urban areas. The mandate of the corporation was expanded in 2009 under the Water Sector Reforms Programme to include management of water and wastewater services in the settlements previously managed by the Department of Water Affairs and Local Authorities. The mandate of the Corporation is to provide portable and wastewater services throughout the country. This Act is relevant to the project as it demonstrates that WUC is the legal institution responsible for the design and implementation of the water transfer scheme.

4.2.3 Mines and Minerals Act (Act No. 17 of 1999)

The Act deals with licensing, registration and concessions with respect to mining. It also includes provisions providing that preference should be given to the employment of workers in Botswana and that suitable training should be provided for them consistent with provisions on safety, efficiency and economy.

A licence to operate a borrow pit will be required in the event that construction materials especially gravel/sand required for bedding and backfill material for laying of pipes will have to be sourced from a new borrow pit. The Act will not apply if the construction materials are obtained from licensed commercial sources.

4.2.4 Water Act, (1968)

The Act establishes the Water Apportionment Board (WAB) and makes provisions concerning rights in respect of water and related matters.
It declares all water as public and makes the pollution of public water an offense. Anyone wishing to discharge into public water would need to do so with permission from the Water Registrar. In addition, it introduces the issuing of water rights for use of public water other than for watering stock, drinking, washing and cooking or use in a vehicle.

Tampering or diversion of public streams by individuals also becomes an offense, unless granted permission through the issuing of a water permit. Part IV section 17 (1, iii) prohibits the pollution of water used in these activities to an extent that it causes injury, directly or indirectly to public health, animal and plant lives.

This Act is relevant as some sections of the proposed pipelines are to cross several public rivers/streams during construction. Should the rivers be tampered with, the WAB must be informed by the Contractor for permission. Should the Contractor seek water for construction by sinking boreholes, then rights of abstraction need to be applied for from the WAB.

**4.2.5 Atmospheric Pollution (Prevention) (1971)**

This Act is intended for the prevention of the pollution of the atmosphere by carrying out industrial processes. The Act seeks to control the emission of 'objectionable matter', which is defined in Section 2 as "smoke, gases including noxious or offensive gases, vapours, fumes, grit, dust or other matter capable of being dispersed or suspended in the atmosphere which is produced or is likely to be produced by any industrial process".

To minimize the quantity of pollutants generated by any industrial activity, the Department of Waste Management and Pollution Control and Botswana Bureau of Standards have developed standards of air quality indicating an allowable maximum measurement of major indicators of pollution such as Sulphur, particulate matter etc. as shown in Annex W.

During the construction phase of the project, considerable amounts of dust are likely to be generated due to the frequent movement of vehicles, machinery and hauling trucks to and from the site, as a result, appropriate mitigation measures should be put in place by the Contractor to control dust nuisance.

The implementation of the project is likely to trigger a decline in ambient air quality levels especially along the pipeline route that traverses built up areas within the beneficiary villages. Compliance to the Threshold Limits for Common Air Pollutants will have to be adhered to by the Contractor to ensure a safe working environment by implementing the mitigation measures recommended in this document.

**4.2.6 Environmental Assessment Act (EA) (2011) and Environmental Assessment Regulations (2012)**

This Act provides for environmental impact assessment to be used to assess the potential effects of planned developmental activities to determine and to provide mitigation measures for effects of such activities as may have a significant adverse impact on the environment to put in place a monitoring process and evaluation of the environmental impacts of implemented activities and to provide for matters incidental to the foregoing.

The sub-project according to the Act has been identified as an activity that requires that an ESIA/ESMP be prepared.

The regulations implement provisions of the Environmental Impact Assessment Act, 2011 with respect to, among other things, procedures for environmental impact assessment and public
participation, and registration and certification of practitioners. They also concern the compliance with Code of Conduct by practitioners.

The Environmental Assessment (EA) Regulations guided the preparation of the ESIA and the ESMP presented in this Report.

4.2.7 Noise levels: BOS 575:2013

Botswana has set permissible noise standards for specific environments. These are to be complied with by controlling noise generation activities and use of machinery. For this purpose, there should be continuous noise monitoring by the Contractor to keep to the thresholds of noise. The maximum permissible noise for specific environments is listed in Annex W.

The standard indicates that for monitoring purposes, measurement of noise shall be done at the receiving point. Measurement within buildings shall be done with windows and doors wide opened.

The standard is relevant to the project as it provides threshold limits for which noise exposure during project implementation should be measured against.

4.2.8 Monuments and Relics Act (2001)

The Monuments and Relics Act, Act No.12 of 2001, focuses on the preservation and conservation of areas and items of historical, architectural, archaeological and paleontological value.

The Act is of relevance to the sub-project as it governs the preservation and conservation of areas and items of historical, architectural, archaeological and paleontological value.

The undertaking of the sub-project follows Section 19 (1) and (2) wherein it is mandatory for any prospective developer to undertake both an archaeological and an Environmental Impact Assessment study (EIA pre-development impact assessment study). This has been done and archaeological watching brief has been recommended. This is with a condition which much be adhered to during civil works.

4.2.9 Factories Act (1979)

This Act regulates the conditions of employment in factories and other places about the safety, health and welfare of workers and for the safety and inspection of certain plant and machinery and for purposes incidental to or connected with the matters aforesaid.

It states that where grinding, sieving or any such process gives rise to dust, gas or vapour steps should be taken to prevent the accumulation of dust, vapour or gas, and requires the need for need for protective clothing.

The Act further states that where employees are exposed to wet conditions or any such environment liable to cause injuries, they should be provided with necessary suitable gloves, footwear, goggles, head or face coverings. Where electric welding is done, workers should be provided with safety spectacles to avoid exposure of the individual’s eyes to the electric arc flash.

The Act makes provision for the welfare of workers and stipulates the ratio of workers to portable sanitation facilities, of 1:25 for first 100 workers and thereafter 1:50 for remaining male and female workers.
Compliance to this Act is necessary to protect the health and ensure safety of workers throughout project implementation phase.

4.2.10 Road Traffic Act (1993) and its amendment of 2001

This Act regulates traffic and ensures road safety, among other things. Part VIII of the Act presents driving and other offenses relating to the use of vehicles on roads and their penalties. These include speeding, unfitness to drive, reckless, dangerous driving, and inconsiderate driving. This Act also addresses road signs, regulations, road markings, signals, and road traffic (speed limits for specified vehicles).

The Act is relevant to the project as vehicles are to be used for transportation of people and goods. The Act seeks to regulate the behaviour of drivers. It provides speed limits to be travelled on specific roads and fines to be paid when the provisions of the Act are contravened. Furthermore, it provides regulation on the size and font to be used for road signs which will be required during construction. Drivers hired to haul construction materials to and from the site during construction and operation of the infrastructure need to be sensitized on the importance of adhering to the Act.

4.2.11 Radiation Protection Act (2006) and Regulations (2008)

The Act provides for the safe use of atomic energy and nuclear technology. The Act applies to any person or body of persons whose undertaking involves, particularly, the production, processing, handling, use, holding, possessing, storage, transport, and disposal of natural and artificial radioactive materials and radiation devices in respect of any other activity which involves a risk or harm arising from radiation.

This Act is relevant to the project given that during construction employees may be exposed to radiation while excavating for the installation of the pipelines between Serule village and Gojwane Settlement, and possibly at Damuchojenaa Settlement and at the laboratory. Uranium is found at 1 m deep within the Serule-Gojwane-Damuchojenaa area.

This Act provides conditions of the licensee and regulations for the generation and management of radioactive waste. With relation to the safe handling of radioactive waste, the Act in Section 31 specifies that a person who is licensed to generate, keep or manage radioactive waste shall:

- Be responsible for the safe management of radioactive waste generated by the practice or source for which he or she is authorized.
- Appoint a technically competent person to be a Radiation Waste Management Officer to assist the licensee in the safe and efficient on-site management of radioactive waste.

This regulation addresses, among other things, safety precautions and requirements, inspection, protection from public exposure, management of radioactive waste, classification of radioactive waste, transport of radioactive materials and emergency interventions.

It states that employer shall ensure that all workers engaged in activities that involve or could involve occupational exposure, (Part V, Section 29-30) that:

- Occupational exposure is limited.
- Radiation safety is optimized in accordance with Regulations 20 and 21.
- Policies, procedures and organizational arrangements for occupational protection and safety are established to implement the relevant requirements of these regulations, and the resulting decisions on measures to be adopted for this purpose are recorded and made available to relevant parties, including workers.
Suitable and adequate facilities for radiation safety are provided, including personal protective devices and monitoring equipment, and management are made for their proper use. Arrangements are made to promote workplace safety culture and achieve adequate training of workers on radiation safety matters.

Section 33 indicates the issuance of PPEs to limit exposure. Section 34 outlines the responsibility of employees to assess level of workers and Section 36 details talks about health surveillance of workers.

The Contractor therefore needs to comply with the above particularly to protect the workers from radiation both in the field and in the laboratories. This especially needed when trenching around Serule, Gojwane and Damuchojenaa Settlements is being undertaken. It is reported by A-Cap Resources that uranium occurs just about a meter deep in those areas. Provision is made in the Act for monitoring of workers for radiation and it should therefore be complied with by the Contractor.

4.2.12 Herbage Preservation Act (1977)

This Act aims at prevention and control of bush and other fires. It prohibits the burning of vegetation on land that the servant does not legally own or have legal rights to without a written permission from the herbage committee. However, if one wants to burn vegetation on land that they legally own they are to give a notice of their intention to the herbage committee, the notice of intent should include the time at which the burning is to begin to all owners or occupiers of adjoining land and, where reasonably practicable, to a police officer or headman. The Act lists offences and penalties.

It is unlikely that this Act will be relevant to the activities of the sub-project. However, if cleared vegetation from along the pipeline route and water tanks sites will require burning, it would be necessary to obtain written permission from the herbage committee to burn the cleared vegetation at a safe designated area.

b) Social

4.2.13 Tribal Land Act (1968)

This Act establishes Tribal Land Boards. This Act transferred all the powers previously vested in a chief and a subordinate land authority under customary law in relation to allocation of land to the Land Board. Under this Act, the Land Board was established as an institution for managing all tribal/customary land. The Land Board grants customary land rights to all citizens of Botswana including members of vulnerable communities. Most of the vulnerable communities fall under the care of the area social worker, who after assessment and finds that a family of vulnerable community/individual has no land or place of residence, makes an application to the Land Board on their behalf for them to be allocated land urgently. Such applications are normally fast tracked by the Land Board, they do not follow the available queue. Upon allocation of land, a recommendation is then made to the District Council for such a family to be included for consideration under the Destitution Policy. The VDC or concerned community member can also alert the social worker about the existence such a family or individual if they were not identified during social assessments.

The Land Board also leases land under common law forms of tenure. Part V of the Act addresses specifically procedures for dealing with the application of expropriation for tribal land required for public purposes. Section 32 of the Tribal Land Act provides that land may be granted to the state for public purposes only if the President determines that the purpose for which it is acquired is in the interest of the public. The President possesses the power of
eminent domain for the expropriation of land. The President may acquire any real (immovable) property where the acquisition of such is necessary for public purposes. Section 33 (2) of the Tribal Land Act (1968) provides that compensation is payable when land is acquired for a project and the acquiring body is financially responsible for all aspects of the project; this includes payment for compensation to claimants. However, all resettlement, compensation and procedural requirements will be in line with the World Bank Involuntary Resettlement Policy (OP 4.12).

The Act is relevant to the project as it makes provision for the displaced to be granted the right to use another land if available and is entitled to adequate compensation. The Act makes it mandatory for the establishment of an assessment committee to assess properties to be affected by the project. An Abbreviated Resettlement Action Plan (ARAP) has been prepared and has considered the Act.

4.2.14 Tribal Land (Amendment) Act (1993)

The Act allows for the determination of land use zones in tribal areas. According to the Act, a Land Board shall after due consultation with the District Council determine and define land use zones within a tribal area. The Land Board shall not make grants of land for any use which conflicts with the use for which land is zoned. Land Boards may determine management plans for use and development of the zones.

This Act is relevant as the proposed ground reservoir tank to be located within Selebi-Phikwe Town and the Gojwane Settlement’s new tanks are all to be located on new plots/locations. The land use plan of the locations should conform to the planned use of the site to enable surface rights to be issued by the respective Land Board. If the proposed land use conflicts with the planned land use, then an application for change of land use needs to be prepared and submitted to the respective planning department of the affected district council.

Selebi-Phikwe is a town and a planning area and therefore has an approved land use plan. Gojwane does not have a land use plan as of yet as these have always been done for towns and cities only.

4.2.15 Acquisition of Property Act 1955

An Act to authorize the acquisition of property for public and other purposes, and for settling the amount of any compensation to be paid, or any matter in difference.

This Act empowers the State President to acquire any real (immovable) property where the acquisition of such property is necessary or expedient (a) in the interest of defence, public safety, public order, public morality, public health, town and country planning or land settlement or (b) to secure the development or utilization of that or other property for a purpose beneficial to the community. Compensation for such an acquisition is payable on agreed terms or in accordance with the provisions of the Act (s. 3).

In determining compensation, various considerations including the market value of the property at the date of service of the notice of acquisition are considered by the Assessment Board. If the market value has been increased by means of any improvements made within the year immediately preceding the service of the notice of acquisition, such increase shall be regarded unless it is proved that the improvement was made bona fide and not in contemplation of the property being compulsorily acquired under the provisions of the Act.23 In certain cases, compensation will be paid for loss of rents and profits.24 The decision of the Board respecting any compensation, or any question of disputed interest or title shall be final.

23 See s. 16 of the Act.
24 See s. 17 of the Act.
and conclusive as respects all parties upon whom notices have been served in terms of the Act.\textsuperscript{25}

In this sub-project, sections of two privately owned plots in Mmadinare and Topisi will need to be acquired as the pipeline route traverses the plots. The required land will need to be expropriated and owners compensated in accordance with the prescriptions of the Act and in line with World Bank Policy OP 4.12.

\textbf{4.2.16 State Land Act 1966}

The Act defines what constitutes “State Land” and provides for its disposal and incidental matters. “State Land” means unalienated State land and reacquired State land and includes any land outside Botswana ownership of which is vested in the Republic of Botswana. “Unalienated land” means any land in Botswana other than tribal land or land in the Borolong Farms or land within a township established under the Township Act.

The power to dispose of State lands is vested in the State President, whose power may be exercised by any person authorized by notice in the Government Gazette to do so.\textsuperscript{26} Any contract or other disposition, which does not comply with this requirement, would not be devoid of legality.

The relevance of the Act to the project is that Selebi-Phikwe is on State land. WUC must apply for the land title for the plot for the reservoir tank.

\textbf{4.2.17 Children’s Act, 2009}

The Children’s Act of 2009 provides for the promotion and protection of the rights of children, including promoting their physical, emotional intellectual and social development wellbeing.

As children are among the most vulnerable, the project will ensure due diligence to protect the rights and well-being of children. The safety of children will be also be addressed in this project through mitigation measures, for example, by putting barriers around trenches to avoid children from falling into them or playing in them, and workers will have training and sensitization to mitigate against sexual exploitation and abuse and their behaviour will be monitored.

\textbf{4.2.18 Domestic Violence Act, 2008}

The Act seeks to provide protection of survivors of domestic violence. According to the Act, domestic violence is defined as any controlling or abusive behaviour that harms the health or safety of the survivor including, physical abuse or threats, sexual abuse or threats, emotional, verbal or psychological abuse, economic abuse, intimidation and harassment. The Act lists penalties for those found to be in violation of the Act.

The project will conduct sensitization and awareness training to community members and project workers to mitigate against exploitative, abusive and gender-based violence, especially against women, children and elders. It will also provide a screening of social and legal services for survivors to access as part of the GRM. In addition, the Contractors ESMP and bidding documents will refer to the codes of conduct which are included in Annex S.

\textsuperscript{25} See s. 20 of the Act.
\textsuperscript{26} See ss. 3 & 4 of the Act.
4.2.19 Employment Act (2010)

This Act makes provision for regulating employment and labor issues regarding promoting harmonized relations between employer and employee. The Act specifically:

• Regulates the contracts of employment
• Defines categories of wages paid to employees
• Ensures that workers have rest periods
• Regulates employment of females and issues of confinement and maternity.
• Labor health areas
• Defines the minimum age of employment which is 14 years, when the child is not attending school. The Act states that he/she may be employed on light work not harmful to his/her health and developments. The child should work for a maximum of six hours a day and 30 hours a week. Whiles adults work for eight hours a week and not more than 48 hours a week.
• Rest periods and hours of work: The Act indicates that every employee shall be granted by the employee in every seven consecutive days, a rest period comprising at least 24 consecutive hours which period ordinarily be or include a Sunday.
• Employees are not required to work more than five consecutive hours without a period of rest which shall not be less than 30 minutes

The Act is of relevance to the project because workers will be employed to undertake civil works.

The contractor to be employed should comply with all the provisions of the Act when procuring labor for the project. Contracts of employment should be in writing. In addition, resting periods and wages should meet the minimum or better at the prescribed rate at the time of employment. All employment records must be kept. Despite the age limit of 14 years for employment as specified in the Employment Act of Botswana, the minimum age of 18 years as stipulated by the World Bank should prevail when procuring labor for the project. The Contractor should insure all workers on site particularly for Workman’s Compensation prior to civil works.

In terms of employment of women, the contractor is to allow maternity leave, pay maternity allowance and allow time for the mother to nurse the child.

c) POLICY, PROGRAMS AND STATEMENTS

4.2.20 Botswana’s Vision 2036 (2016) and the Sustainable Development Goals (SDGs)

The theme for Vision 2036 is “Achieving Prosperity for all”. It has four pillars which have been aligned with Global Sustainable Development Goals (2015). The four pillars are: Sustainable Economic Development, Human and Social Development, Sustainable Environment, and Governance, Peace and Security.

As the overarching objective of the project is to achieve or enhance human and social development of the people of the Botswana, this project is consistent with the sustainable development vision for Botswana and the global goals.

4.2.21 Botswana Land Policy (2015)

The overall goal of this land policy calls for improvement in the land administration and management, both from system, environmental and economic perspective. This should reduce conflicts at macro and micro levels, particularly the demographic and economic growth and environmental degradation. The object is to use land, conserve and protect it for future generations.
The policy is relevant to the project as the pipeline will be laid on land. This calls for conservation and sustainable development and protection of land rights for all land holders in the project. However, as noted during consultations, vulnerable communities expressed concerns (see 3.3.2.1 Land Tenure and Allocation).

4.2.22 Remote Area Development Programme (RADP) (2009)

The Remote Area Development Programme (RADP) was established in 2002, to target citizens of Botswana who live in settlements located far from centers of basic services and facilities. As described above, the targeted people are characterized by severe poverty, lack of income and education, have low literacy levels and depend on a deteriorating ecological resource base. Gojwane and Damuchojenaa settlements are amongst the areas identified as most affected with poor water quality and quantity.

The basic assumption of the programme was that the primary constraint to remote area development and poverty reduction was geographic location and inadequate access to basic social services. This meant that people living in these areas did not benefit from national development programme.

The overall goal of the RADP is to achieve sustainable social and economic development of the Remote Area Dwellers. Specifically, the RADP objectives are to:

- Undertake intensified development of remote settlements to bring them to a level of development comparable with the rest of other communities/settlements in the country.
- Promote production-oriented income and employment generating activities.
- Enhance Remote Area Dwellers access to land and other natural resources.
- Provide remote area dwellers with training and education to enable them to be self-sustaining.

Those who qualify for the support are Botswanan citizens and live in settlement with a population of 250-499; those who have inadequate water rights; people who have no real access to land and lack access to basic services such as education, health, banking services, extension, etc. They are then given five livestock (cattle) or fifteen goats, those who qualify for destitution are assisted through the destitution programme. Children who are Remote Area Dwellers (RAD) are provided food, toiletry, clothing, bedding, and transportation.

4.2.23 Government Housing Programme (Destitute Housing Scheme) (1980)

The Government Housing Programme under the National Policy on Housing in general sense is the Government’s measure and decisions designed to improve housing conditions for all citizens in both urban and rural areas.

The National Policy on Destitute Persons states that the “eligibility of destitute benefits is targeted and conditional eligibility is focused on individuals who are either self-identified or who have been identified and nominated by household members or community leaders or local organization”.

Once beneficiaries who are considered destitute have been identified, an assessment is carried out to determine the need. Those who are found to have no accommodation within that area are housed in destitute camps and provided with food until such time that they can sustain themselves. According to the Policy, where a destitute person has acquired a plot but is unable to develop it. Where a destitute person does not have a plot, the Department of Social and Community Development encourages such persons to apply for one and will
support their application to Department of Lands to prioritize the provision of housing for that person.

Destitute housing is provided in cases where such people are found to need shelter. This is in line with the Revised National Housing Policy (2000) that is; it is mandatory for district/town/City Council to provide basic shelter for destitute persons and to budget for and implement the programme.

This programme is also relevant to the project as Gojwane and Damuchojenaa settlements have been identified as remote as per the Government of Botswana and therefore qualify for this programme.

4.2.2.4 National Settlement Policy (NSP) (1998)

The National Settlement Policy (NSP) has established a settlement hierarchy, based on the population and the size of its catchment area. Gojwane and Damuchojenaa settlements fall under Tertiary III within the hierarchy, the category includes a population range of 500-999, serving a catchment area of 5 km radius. This covers about 20 percent of existing Remote Area Development Programme settlements.

According to this policy, basic infrastructure and services shall be provided to all settlements with a minimum population of 500 people. For a Tertiary III settlement the following services are provided: Health Post, primary school, Council water supply, Headman of records, Tribal police and police station, crop production office and animal health and production office, tertiary road, and radio transmitter.

Gojwane and Damuchojenaa settlements have been classified as RADP according to their population and remoteness. They are Tertiary III settlements and have all of the above-mentioned services. The settlements therefore qualify for Government assisted programs/projects for rural areas.

4.2.25 National Policy on Destitutes (2002)

Revised in 2002, the National Policy on Destitute aids poor households (provision of food). The registered destitute must make every effort to:
- Find employment if he or she is physical and mentally able
- Produce at least part of his or her food if physical and mentally able
- Take part in any activities sponsored by council staff aimed at his or her rehabilitation and financial improvement
- Use the assistance given only for the specified purpose.

This destitute policy is relevant to the project as destitute persons are found in all the beneficiary villages but most especially in Gojwane and Damuchojenaa. Destitute persons capable of working should be identified through the social and development officers in each settlement and employed in this project.

4.2.26 Affirmative Action Framework for Remote Area Communities (2014)

This framework was conceived to accelerate the implementation of the revised Remote Areas Development Program which is aimed at promoting equity in the remote area communities. The action framework is guided by the revised national policy for rural development.

The objectives of the framework are to:
1. Promote social inclusion of people living in recognized remote area settlements, both individually and/or as a family in the development of the country;
2. Provide development infrastructure in the recognized remote area settlements for the RACs to be able to participate in the economic and social activities of the country;
3. Enable RACs to build sustainable livelihoods, promote self-reliance and sustainable utilization of natural resources;
4. Enhance RACs access to social services, poverty eradication initiatives and other national development programmes;
5. Facilitate community participation of Remote Area Communities in community development initiatives; and
6. Enhance collaboration with Non-Governmental Organizations, (NGOs) / Community Based Organizations (CBOs)/ Faith Based Organizations (FBOs), Development Partners and Private sector on the development of Remote Area Communities.

The goals of the Affirmative Action Framework are aligned to the Rural Development Council’s. Five new focus areas:
1. Provision of basic services and Infrastructure development
2. Agriculture development and food security
3. Support and protection of indigenous knowledge
4. Rural entrepreneurial development
5. Harmonisation of social welfare programs

The Affirmative Action is relevant to the project as it supports conscious efforts for the employment of people from remote area settlements, promote water supply in remote areas and harmonises social welfare programmes. It therefore ensures special consideration is given to people from Damuchojena and Gojwane settlements during employment of people.

**4.2.27 Revised Guidelines for Implementation of Ipelegeng Programme (2012) Labor-Based Relief Program (Ipelegeng)**

Ipelegeng was started in the 1960s as a poverty eradication strategy. This programme provides temporary employment to members of the community in various settlements throughout Botswana through temporary supplement to rural incomes through wages. Unemployed residents in Serule and Gojwane who have registered with the program are offered temporary manual work which is on a rotational basis among the community members in each settlement. Ipelegeng workers work for six hours and earn P500 (US $45.00) per month for the three months that they are enrolled for. Ipelegeng workers thereafter receive nothing for the subsequent months as they are laid off to make way for others due to the rotational system of employment under this programme (SLR Consulting, 2015:33).

**4.3 WUC’s Safety, Health, Environmental and Quality (SHE) POLICIES and Procedures**

WUC has comprehensive, Safety, Health, Environmental and Quality policies (SHEQ) and procedures that guides all its operation and also regulates its Contractors to ensure that works done are within acceptable environmental principles and standards. The Policies and Principles among others cover the following:

1. Environmental Management
2. Water Conservation Policy
3. Environmental Impact Assessment Policy
4. Commitment and HSE Management Policy
5. Occupational Health and Safety
6. PPE Policy
7. Implementation and Operation of the HSE Management System (Contractor and Contractor Control)

WUC SHE’s policies and procedures are relevant to this project particularly during construction as it provides guidelines and procedures for environmental management. The policies apply to all those engaged by WUC for the safety delivery of works.

4.4 Regional and International Legislative Framework

4.4.1 World Bank (WB) Safeguards Policies Triggered

This chapter provides a description of the existing regional and international regulatory frameworks including World Bank’s Safeguard Policies and applicable WBG EHS Guidelines to the sub-project that have a bearing on the design and implementation of the water transfer scheme. These include the General Guidelines and the industry sector guidelines for Water and Sanitation. It also presents the institutions that have a role to play in the implementation and management of the sub-project. The policies are presented in Table 21.
Table 21: Environmental and Social Safeguards Policies:

a) Environmental Assessment, OP 4.01

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Operational Principles</th>
<th>Gaps and Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>To help ensure the environmental and social soundness and sustainability of investment projects.</td>
<td>1. Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts. Use sectoral or regional environmental assessment when appropriate.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>To support the integration of environmental and social aspects of projects into the decision-making process.</td>
<td>2. Assess potential impacts of the proposed project on physical, biological, socio-economic and physical cultural resources, including transboundary and global concerns, and potential impacts on human health and safety.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>Valuation of the environmental and social aspects of the project.</td>
<td>3. Assess the adequacy of the applicable legal and institutional framework, including applicable international environmental agreements, and confirm that they provide that the cooperating Government does not finance project activities that would contravene such international obligations.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>To evaluate the potential environmental and social impacts of the project.</td>
<td>4. Provide for the assessment of feasible investment, technical, and citing alternatives, including the &quot;no action&quot; alternative, potential impacts, feasibility of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions, and their institutional, training and monitoring requirements associated with them.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>To identify and manage the potential environmental and social impacts.</td>
<td>5. Where applicable to the type of project being supported, normally apply the Environmental, Health, and Safety Guidelines (WBG EHS Guidelines).</td>
<td>Both Botswana standards and WBG EHS General Guideline, and the sector specific guideline for Water and Sanitation will be applicable, whichever is more stringent.</td>
</tr>
<tr>
<td>To ensure compliance with environmental and social safeguards.</td>
<td>6. Prevent and, where not possible to prevent, at least minimize, or compensate for adverse project impacts and enhance positive impacts through environmental management and planning that includes the proposed mitigation measures, monitoring, institutional capacity development and training measures, an implementation schedule, and cost estimates.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>To engage stakeholders in the decision-making process.</td>
<td>7. Involve stakeholders, including project-affected groups and local non-governmental organizations, as early as possible, in the preparation process and ensure that their views and concerns are made known to decision makers and taken into account. Continue consultations throughout project implementation as necessary to address EA-related issues that affect them.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>To ensure effective public participation.</td>
<td>8. Use independent expertise in the preparation of EA where appropriate. Use independent advisory panels during preparation and implementation of projects.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>Objectives</td>
<td>Operational Principles</td>
<td>Gaps and Resolution</td>
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</tr>
<tr>
<td>Environmental Assessment, OP 4.01</td>
<td>that are highly risky or contentious or that involve serious and multi-dimensional environmental and/or social concerns.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>9. Provide measures to link the environmental assessment process and findings with studies of economic, financial, institutional, social and technical analyses of a proposed project.</td>
<td>No gaps identified</td>
<td></td>
</tr>
<tr>
<td>10. Provide for application of the principles in this Table to subprojects underinvestment and financial intermediary activities.</td>
<td>No gaps identified</td>
<td></td>
</tr>
<tr>
<td>11. Disclose draft EA in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.</td>
<td>No gaps identified. Public Disclosure is undertaken through Section of the EA, Act.</td>
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</tbody>
</table>
**b) Natural Habitats - OP 4.04**

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<tr>
<th>Objectives</th>
<th>Operational Principles</th>
<th>Gaps and Resolution</th>
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<tbody>
<tr>
<td><strong>Natural Habitats, OP 4.04</strong></td>
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</tr>
<tr>
<td>To promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.</td>
<td>1. Use a precautionary approach to natural resources management to ensure opportunities for environmentally sustainable development. Determine if project benefits substantially outweigh potential environmental costs.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>2. Avoid significant conversion or degradation of critical natural habitats, including those habitats that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>3. Where projects adversely affect non-critical natural habitats, proceed only if viable alternatives are not available, and if appropriate conservation and mitigation measures, including those required maintaining ecological services they provide, are in place. Include also mitigation measures that minimize habitat loss and establish and maintain an ecologically similar protected area.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>4. Whenever feasible, give preference to sitting projects on lands already converted.</td>
<td>No gaps identified</td>
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<td></td>
<td>5. Consult key stakeholders, including local non-Governmental organizations and local communities, and involve such people in design, implementation, monitoring, and evaluation of projects, including mitigation planning.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>6. Provide for the use of appropriate expertise for the design and implementation of mitigation and monitoring plans.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>7. Disclose draft mitigation plan in a timely manner, before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.</td>
<td>No gaps identified</td>
</tr>
</tbody>
</table>
## c) Indigenous Peoples OP 4.10

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Operational Principles</th>
<th>Gaps and Resolution</th>
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<tbody>
<tr>
<td><strong>Indigenous Peoples OP 4.10</strong></td>
<td>To design and implement projects in a way that fosters full respect for Indigenous Peoples’ dignity, human rights, and cultural uniqueness and so that they: (a) receive culturally compatible social and economic benefits; and (b) do not suffer adverse effects during the development process.</td>
<td>Botswana does not have legislation on Indigenous Peoples. Botswana Government does not recognize any specific group of people as being Indigenous Peoples in the country, maintaining that instead all citizens of the country are “Indigenous” or understood as those who are original to Botswana. However, this interpretation does not reflect the Bank’s or the ACHPR understanding of the term which does not necessarily mean those who were there first. Nevertheless, in its recent statement to the UN Permanent Forum on Indigenous Peoples (UNPFII) in April 2019, the Government of Botswana stated “the promotion and protection of human rights remains a top priority for the Government of Botswana. [And attaches] great importance to the 1948 Universal Declaration on Human Rights, Declaration on the Rights of Indigenous Peoples and other regional and international human rights Instruments”. As such, those of certain tribes such as the San (Basarwa) are considered as Vulnerable Communities as per the criteria of OP 4.10. Over 40 per cent of persons who meet the criteria of OP 4.10 are Basarwa and reside in Damuchojenaa and Gojwane settlements.</td>
</tr>
<tr>
<td>1. Screen early to determine whether Indigenous Peoples are present in, or have a collective attachment to, the project area. Indigenous Peoples are identified as possessing the following characteristics in varying degrees: self-identification and recognition of this identity by others; collective attachment to geographically distinct habitats or ancestral territories and to the natural resources in these habitats and territories; presence of distinct customary cultural, economic, social or political institutions; and an indigenous language.</td>
<td></td>
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</table>

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<tbody>
<tr>
<td>Indigenous Peoples OP 4.10</td>
<td>Settlements as revealed by a household survey undertaken as part of the social assessment for the VCP. The VCP has been prepared and submitted in a separate report. The Project will ensure that the requirements under OP 4.10 are fulfilled for the two communities where Vulnerable Communities are present.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>2. Undertake free, prior and informed consultation with affected Indigenous Peoples to ascertain their broad community support for projects affecting them and to solicit their participation: (a) in designing, implementing, and monitoring measures to avoid adverse impacts, or, when avoidance is not feasible, to minimize, mitigate, or compensate for such effects; and (b) in tailoring benefits in a culturally appropriate manner.</td>
<td>No gaps identified</td>
<td></td>
</tr>
<tr>
<td>3. Undertake social assessment or use similar methods to assess potential project impacts, both positive and adverse, on Indigenous Peoples. Give full consideration to options preferred by the affected Indigenous Peoples in the provision of benefits and design of mitigation measures. Identify social and economic benefits for Indigenous Peoples that are culturally appropriate, and gender and inter-generationally inclusive and develop measures to avoid, minimize and/or mitigate adverse impacts on Indigenous Peoples.</td>
<td>No gaps identified</td>
<td></td>
</tr>
<tr>
<td>4. Where a restriction of access of Indigenous Peoples to parks and protected areas is not avoidable, ensure that the affected Indigenous Peoples' communities participate in the design, implementation, monitoring, and evaluation of management plans for such parks and protected areas and share equitably in benefits from the parks and protected areas.</td>
<td>No gaps identified</td>
<td></td>
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<tr>
<td>5. Put in place an action plan for the legal recognition of customary rights to lands and territories, when the project involves: (a) activities</td>
<td>No gaps identified</td>
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<tr>
<td>Objectives</td>
<td>Operational Principles</td>
<td>Gaps and Resolution</td>
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<tr>
<td>Indigenous Peoples OP 4.10</td>
<td>that are contingent on establishing legally recognized rights to lands and territories that Indigenous Peoples traditionally owned, or customarily used or occupied; or (b) the acquisition of such lands.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>6. Do not undertake commercial development of cultural resources or knowledge of Indigenous Peoples without obtaining their prior agreement to such development.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>7. Prepare an Indigenous Peoples Plan that is based on the social assessment and draws on indigenous knowledge, in consultation with the affected Indigenous Peoples’ communities and using qualified professionals. Normally, this plan would include a framework for continued consultation with the affected communities during project implementation; specify measures to ensure that Indigenous Peoples receive culturally appropriate benefits, and identify measures to avoid, minimize, mitigate or compensate for any adverse effects; and include grievance procedures, monitoring and evaluation arrangements, and the budget for implementing the planned measures.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>8. Disclose the draft Indigenous Peoples Plan; including documentation of the consultation process, in a timely manner before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders.</td>
<td>No gaps identified</td>
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<tr>
<td></td>
<td>9. Monitor implementation of the Indigenous Peoples Plan, using experienced social scientists.</td>
<td>No gaps identified</td>
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</table>
c) Physical Cultural Resources - OP 4.11

<table>
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<th>Objectives</th>
<th>Operational Principles</th>
<th>Gaps and Resolution</th>
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<tr>
<td><strong>Physical Cultural Resources - OP 4.11</strong></td>
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<tr>
<td><strong>To assist in preserving physical cultural resources and avoiding their destruction or damage. PCR includes resources of archaeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic, or other cultural significance.</strong></td>
<td><strong>1. Use an environmental assessment (EA) or equivalent process to identify PCR and prevent or minimize or compensate for adverse impacts and enhance positive impacts on PCR through site selection and design.</strong></td>
<td>No gaps identified. It is undertaken under Archaeological Impact Assessment.</td>
</tr>
<tr>
<td></td>
<td><strong>2. As part of the EA, as appropriate, conduct field-based surveys, using qualified specialists.</strong></td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td><strong>3. Consult concerned Government authorities, relevant non-Governmental organizations, relevant experts and local people in documenting the presence and significance of PCR, assessing the nature and extent of potential impacts on these resources, and designing and implementing mitigation plans.</strong></td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td><strong>4. For materials that may be discovered during project implementation, provide for the use of &quot;chance find&quot; procedures in the context of the PCR management plan or PCR component of the environmental management plan.</strong></td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td><strong>5. Disclose draft mitigation plans as part of the EA or equivalent process, in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders.</strong></td>
<td>No gaps identified</td>
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</tbody>
</table>
### Involuntary Resettlement OP 4.12

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<tr>
<th>Objectives</th>
<th>Operational Principles</th>
<th>Gaps and Resolution</th>
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<tbody>
<tr>
<td>To avoid or minimize involuntary resettlement and, where this is not feasible, to assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.</td>
<td>1. Assess all viable alternative project designs to avoid, where feasible, or minimize involuntary resettlement.</td>
<td>No Gaps Identified</td>
</tr>
<tr>
<td></td>
<td>2. Through census and socio-economic surveys of the affected population, identify, assess, and address the potential economic and social impacts of the project that are caused by involuntary taking of land (e.g., relocation or loss of shelter, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected person must move to another location) or involuntary restriction of access to legally designated parks and protected areas.</td>
<td>No Gaps Identified</td>
</tr>
<tr>
<td></td>
<td>3. Identify and address impacts also if they result from other activities that are (a) directly and significantly related to the proposed project, (b) necessary to achieve its objectives, and (c) carried out or planned to be carried out contemporaneously with the project.</td>
<td>No Gaps identified</td>
</tr>
<tr>
<td></td>
<td>4. Consult project-affected persons, host communities and local non-governmental organizations, as appropriate. Provide them opportunities to participate in the planning, implementation, and monitoring of the resettlement program, especially in the process of developing and implementing the procedures for determining eligibility for compensation benefits and development assistance (as documented in a resettlement plan), and for establishing appropriate and accessible grievance mechanisms. Pay particular attention to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, Indigenous Peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation.</td>
<td>No Gaps identified</td>
</tr>
<tr>
<td></td>
<td>5. Inform displaced persons of their rights, consult them on options, and provide them with technically and economically feasible resettlement alternatives and needed assistance, including (a) prompt compensation at full replacement cost for</td>
<td>No Gaps identified</td>
</tr>
<tr>
<td>Objectives</td>
<td>Operational Principles</td>
<td>Gaps and Resolution</td>
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</tr>
<tr>
<td><strong>Involuntary Resettlement OP 4.12</strong></td>
<td>loss of assets attributable to the project; (b) if there is relocation, assistance during relocation, and residential housing, or housing sites, or agricultural sites of equivalent productive potential, as required; (c) transitional support and development assistance, such as land preparation, credit facilities, training or job opportunities as required, in addition to compensation measures; (d) cash compensation for land when the impact of land acquisition on livelihoods is minor; and (e) provision of civic infrastructure and community services as required.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td>6. Give preference to land-based resettlement strategies for displaced persons whose livelihoods are land-based.</td>
<td></td>
<td>No gaps identified will be guided by the RPF</td>
</tr>
<tr>
<td>7. For those without formal legal rights to lands or claims to such land that could be recognized under the laws of the country, provide resettlement assistance in lieu of compensation for land to help improve or at least restore their livelihoods.</td>
<td></td>
<td>Disclosure of the environmental and social statement is normally through the print media. The beneficiary communities are not consulted again for feedback. In resolving this, disclosure will be made to the beneficiary communities and the general public through a Kgotla meeting to be organized in the beneficiary communities after the draft ARAP has been reviewed by the WB.</td>
</tr>
<tr>
<td>8. Disclose draft resettlement plans, including documentation of the consultation process, in a timely manner, before appraisal formally begins, in an accessible place and in a form and language that are understandable to key stakeholders.</td>
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</tr>
<tr>
<td>9. Apply the principles described in the involuntary resettlement section of this Table, as applicable and relevant, to subprojects requiring land acquisition.</td>
<td></td>
<td>No gaps identified</td>
</tr>
<tr>
<td>10. Design, document, and disclose before appraisal of projects involving involuntary restriction of access to legally designated parks and protected areas, a participatory process for: (a) preparing and implementing project components; (b) establishing eligibility criteria; (c) agreeing on mitigation measures that help improve or restore livelihoods in a manner that maintains the</td>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td>Objectives</td>
<td>Operational Principles</td>
<td>Gaps and Resolution</td>
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<tr>
<td>Involuntary Resettlement OP 4.12</td>
<td>sustainability of the park or protected area; (d) resolving conflicts; and (e) monitoring implementation.</td>
<td>During implementation of some emergency projects, resettlement issues particularly compensation may not be completed before the commencement of civil works. The compensation exercise may be carried on during works. The resolution as already indicated, is that all affected people will have to be compensated or resettled before civil works commence as per OP4.12, upon clearance of the RAP by the Bank.</td>
</tr>
<tr>
<td>11. Implement all relevant resettlement plans before project completion and provide resettlement entitlements before displacement or restriction of access. For projects involving restrictions of access, impose the restrictions in accordance with the timetable in the plan of actions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Assess whether the objectives of the resettlement instrument have been achieved, upon completion of the project, taking account of the baseline conditions and the results of resettlement monitoring.</td>
<td>No gaps identified</td>
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</tbody>
</table>
### Dam Safety OP 4.37

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<tr>
<th>Objectives</th>
<th>Operational Principles</th>
<th>Gaps and Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>To assure quality and safety in the design and construction of new dams and the rehabilitation of existing dams, and in carrying out activities that may be affected by an existing dam.</td>
<td>1. Use experienced and competent professionals to design and supervise construction, operation, and maintenance of dams and associated works.</td>
<td>No gaps identified</td>
</tr>
<tr>
<td></td>
<td>2. Identify existing dams that can influence the performance of the project and implement necessary safety measures/remedial works.</td>
<td>No gaps identified, DSAP prepared and being implemented.</td>
</tr>
<tr>
<td></td>
<td>3. Use independent advice on verification of design, construction, and operational procedures and appoint independent panels of experts, as necessary.</td>
<td>DSAP prepared and being implemented.</td>
</tr>
<tr>
<td></td>
<td>4. Carry out periodic safety inspections of new/rehabilitated dams after completion of construction/rehabilitation, and take appropriate action as needed.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
4.4.2 **World Bank’s Environmental, Health and Safety Guidelines**

This section provides a description of the specific standard on health and safety to guide the project proponent throughout all phases of implementation of the project and provides guidance on mitigations measures. The Environmental, Health, and Safety (EHS) Guidelines of the World Bank Group are technical referenced documents, with the General and industry-specific Water and Sanitation Guidelines being applicable to this sub-project. Specific guidelines to be adopted and utilized by the contractors and other project implementers includes Environmental, Occupational Health and Safety, Community Health, and Safety, Construction and Decommissioning. The General Guidelines include several numerical emission guidelines relevant to the sub-project. These include Noise, Air Emissions and Ambient Air Quality and Radiological Hazards, amongst others. Also applicable to the sub-project are guidelines for occupation exposure to radiation along the Serule to Gojwane section. Acceptable effective dose limits for workplace for radiological hazards will be adhered to.

Complementary to the EHS Guidelines, the Environmental, Social, Health and Safety (ESHS) Enhancements for Standard Procurement Documents (SPDs) and Standard Bidding Documents (SBDs), with a new procurement framework, came into force in 2016 and 2017. The ESHS enhancements for SPDs and SBDs shall be applicable to this sub-project. The following is required for all bidders/proposers contractors and the relevant shall:

- Set out clearly the minimum expectations of ESHS performance from the outset, to ensure that all Bidders/Proposers are aware of the ESHS requirements;
- Submit as part of their Bid/Proposal an ESHS Code of Conduct that will apply to their employees and sub-contractors, and details of how it will be enforced. The suitability of the Code of Conduct will be assessed and discussed as part of the Bid/Proposal evaluation and negotiations;
- The successful Bidder/Proposer is required to implement the agreed Code of Conduct upon contract award;
- Submit, as part of their Bid/Proposal, ESHS Management Strategies and Implementation Plans required to manage the key ESHS risks of the project;
- The suitability of these strategies and plans will be assessed as part of the Bid/Proposal evaluation, and discussed during pre-contract discussions, as appropriate. These strategies and plans will become part of the Contractor’s project specific Environmental and Social Management Plan (C-ESMP);
- Particular conditions of the contract include provisions relating to the C-ESMP, include:
  - A requirement that the contractor shall not commence any Works unless the Engineer is satisfied that appropriate measures are in place to address ESHS risks and impacts;
  - At a minimum, the contractor shall apply the plans and ESHS Code of Conduct, submitted as part of the Bid/Proposal, from contract award onwards.

**d) INTERNATIONAL AND REGIONAL FRAMEWORKS**


28Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Occupational Health And Safety - 2.6 Radiological Hazards - Table 2.6.1
This Declaration affirms the minimum standards for the survival, dignity, security and well-being of Indigenous Peoples. It was adopted by the UN General Assembly on September 2007. It delineates and defines the individual and collective rights of Indigenous Peoples, including their ownership rights to cultural expression, identity, language, employment, health, education and other issues. It emphasizes the rights of Indigenous Peoples to maintain and strengthen their own institutions, cultures and traditions, and to pursue their development in keeping with their own needs and aspirations. It prohibits discrimination against them and it promotes their full and effective participation in all matters that concern them and their right to remain distinct and to pursue their own visions of economic and social development.

The Government of Botswana endorsed the UN Declaration in 2007 and stated at the 18th session of the UN Permanent Forum on Indigenous Peoples Issues (UNPFII) in April 2019, that: “Botswana continues to make significant progress in addressing the needs and concerns of marginalized communities, including issues relating to respect for cultural diversity, development programs, social services, land distribution as well as participation and consultation. As a result of our national policies and programmes, we have also seen great improvements in the areas of economic empowerment, access to decent shelter, employment and access to tertiary education, to cite a few. The promotion and protection of human rights remains a top priority for the Government of Botswana. We also attach great importance to the 1948 Universal Declaration on Human Rights, Declaration on the Rights of Indigenous Peoples and other regional and international human rights instruments.”

This water project in the beneficiary villages of Gojwane and Damuchojenaa where there are Indigenous Peoples or vulnerable communities requires the World Bank’s OP 4.10 to be triggered. The UNDRIP will guide the implementation of this project to mitigate adverse harms to the rights and well-being of Basarwa, and to ensure that they benefit from this project in line with the culture and priorities.


The African Commission on Human and Peoples' Rights, a sub-body of the African Union, adopted the report of the Working Group. This is the African Commission’s official conceptualization of, and framework for, understanding Indigenous Peoples, and as such it is an important African instrument for recognizing Indigenous peoples in Africa and improving their situation. In its report, the African Commission outlines key characteristics, which identify indigenous peoples and communities in Africa. The report emphasizes that the African Peoples who are applying the term “Indigenous” in their efforts to address their particular social situation are mainly hunter-gatherers and pastoralists, and in some cases, blended livelihoods to account for changes in circumstances due to land loss, the impacts of Government development initiatives, and other factors. The African Commission report emphasizes that the overall characteristics of groups identifying themselves as “Indigenous” Peoples include:

- Their cultures and ways of life differ considerably from the dominant society
- Their cultures are under threat, in some cases to the point of extinction
- The survival of their particular way of life depends on access and rights to their lands and the natural resources thereon
- They suffer from discrimination as they are regarded as less developed and less advanced than other more dominant sectors of society
- They often live in inaccessible regions, often geographically isolated
- They suffer from various forms of marginalization, both politically and socially.

The African Commission report concludes that this discrimination and marginalization threatens the continuation of Indigenous Peoples’ cultures and ways of life and prevents them from being able to genuinely participate in decisions regarding their own future and forms of development.
In line with the approach of the United Nations and the World Bank, the African Commission emphasizes the principle of self-identification, and stresses that the criteria for identifying Indigenous Peoples in Africa is not mainly a question of aboriginality (who was there first) but of the above factors of structural discrimination and marginalization.

The African Commission in its report also addresses the misconceptions around the term Indigenous peoples in Africa and states that the term and discourse of Indigenous Peoples should be understood as an avenue for the most marginalized to advocate their cause and not an attempt to deny any African his/her rights to their African identity.

This report is important as a guidance to understanding and addressing the needs of Basarwa in the context of this project so that they benefit equally from this project and provides an understanding of the applicability of “Vulnerable Communities” as per OP 4.10 in this project.

**4.4.5 UN Convention on the Rights of the Child (CRC)**

It reaffirms that since children are vulnerable to human rights violations, they need special care and protection. As Botswana is a signatory to this convention, no child is to be employed on this water project and due diligence is essential to ensure their safety, including protection from sexual exploitation and abuse.

**4.4.6 The Convention on the Elimination of All Forms of Discrimination Against Women (1979) (CEDAW)**

This Convention was acceded in Botswana in 1999 and establishes not only an international bill of rights for women, but also an agenda for action by countries to guarantee the enjoyment of those rights. The Convention provides the basis for realizing equality between women and men through ensuring women's equal access to, and equal opportunities in, political and public life. State parties agree to take all appropriate measures, including legislation and temporary special measures, so that women can enjoy all their human rights and fundamental freedoms.

This Convention is relevant to the project as women are not to be discriminated against during employment for temporary/permanent positions and skilled/unskilled labor or for any project activities and benefits.

**4.4.7 ILO Convention on Indigenous and Tribal Peoples, 1989 (No. 169) (ILO 169)**

While Botswana is not a signatory to the Convention, it is part of international law and will guide understanding of Vulnerable Communities to ensure they benefit from this project in line with their rights and priorities.

The Convention establishes responsibility for Governments to ensure Indigenous Peoples are not discriminated against and to Government socio-economic gaps that may exist between indigenous and other members of the national community, in a manner compatible with their aspirations and ways of life; that the social, cultural, religious and spiritual values and practices of these peoples shall be recognised and protected, and due account shall be taken of the nature of the problems which face them both as groups and as individuals; and that the integrity of the values, practices and institutions of these peoples shall be respected, and that they are properly consulted and able to participate in decision-making about decisions which impact them, among others.

This Convention is relevant to the project as Damuchojenaa and Gojwane settlements have the presence of Vulnerable Communities as per OP 4.10, and as such they are to be involved in the project planning, implementation and monitoring through engagement throughout all the phases of the project, in line with World Bank policy.
4.4.8 UN Convention on the Elimination of All Forms of Racial Discrimination (CERD)

This Convention addresses tackling all forms of racial discrimination, outlining the rights of racial and/or ethnic groups or individuals that need to be guaranteed if everyone is to have equal enjoyment of their human rights and fundamental freedoms.

Women who belong to marginalised racial or ethnic groups often experience discrimination differently than men. The ‘gender dimensions’ of racial discrimination have been increasingly recognised since the adoption of International Convention on Elimination of all Forms of Racial Discrimination (ICERD) and states parties are now required to incorporate gender analysis into their reports on the implementation of the treaty – which will include the relationship between Violence Against Women (VAW) and racial discrimination.

This convention is relevant to the project as no ethnic group and no gender is to be discriminated against during employment for temporary/permanent positions and skilled/unskilled labor or for any project activities and specific protections to mitigate against gender-based violence as a result of labor influx.

This statement further buttresses Botswana Government’s commitment in supporting Vulnerable Communities in Gojwane and Damuchojenaa settlements.

4.5 INSTITUTIONAL FRAMEWORK FOR PROJECT PREPARATION AND IMPLEMENTATION

4.5.1 Ministry of Land Management, Water and Sanitation Services

The Ministry of Land Management, Water and Sanitation Services is responsible for the management of land, water and related functions as well as the facilitation of housing and water delivery. The Ministry’s responsibilities entail:

1. National physical planning, which involves determination of optimal utilization and proper organisation of land space and development.
2. Administration of land and water in both the urban and rural areas which entails distributing the Land; developing policies that guide or address issues relating to access of land, tenure; title registration; land values; compensation; conflict resolution and compliance with covenants as well as ensuring availability of administrative and physical infrastructure and procedures.
3. Provision of services and information on cadastral surveying, mapping and remote sensing that lay the foundation for physical planning; land administration and development
4. Provision of service infrastructure to facilitate land development
5. Facilitation of the housing delivery involves coordinating and promoting the implementation of the National Housing Policy, which aims at ensuring that every citizen is decently housed.
6. Availing land for residential development; providing funding for development of housing for the low income groups; encouraging financial institutions to finance housing development; exploring innovative building technologies; partnering with the private sector to prove housing for Government employees, encouraging employees to have housing packages for their respective employees.
7. Promoting efficiency in the execution of the mandate and delivery of services to the public through information management and re-engineering processes.

The Ministry has the overall responsibility for the implementation of the sub-project, on behalf of the Borrower, it will do so through the established Coordinating Unit which will have overall
responsibility for coordination of Project activities, and consolidation of monitoring, reporting for the project. This will include preparation of a consolidated work plan, procurement plan, monitoring reports, financial reports, and other reports required for the sub-project.

4.5.2 Water Utilities Corporation (WUC)

The Corporation’s mandate is to supply potable water to all urban centres and settlements in the country, as well as managing wastewater under the Water Sector Reforms Programme (WSRP) instituted in 2009. The Corporation’s mission is to provide sustainable water and wastewater management services in a cost-effective and environmentally friendly manner to the economy.

WUC is responsible for the implementation of all subprojects under Components 1 and 2, which largely involve rehabilitation and augmentation of existing water and wastewater systems currently managed by WUC. In addition, it will be responsible for a subset of the institutional and capacity building activities under Component 3.

4.5.3 Department of Roads

The Roads Department within the Ministry of Transport and Communications is responsible for developing and maintaining the country’s road network. The department manages all the primary and secondary roads in the country. The roads have various servitudes or reserves depending on their level of service. The road reserves may vary from 61 m to about 30 m wide. It is designed (according to the urban design standard of Botswana) that infrastructure such water pipes are laid within the road reserve to service places of need.

Roads Department, therefore, plays a role as an institution to permit the laying of water pipes within its reserves, and thrust boring along the A1 Road following an application for a wayleave and submission of method statements.

4.5.4 Botswana Railways

Botswana Railways provides rail transportation services in the country. However, its services are limited to the southern and eastern parts of the country. Its railway lines have servitude of about 100m. It will therefore, provide land for laying of pipelines following an application for a wayleave and submission of a method statement for crossing of railway lines.

4.5.5 Department of Lands

The main purpose of the Department is to administer state land through the State Land Act, to regulate freehold land through Land Control Act and provide professional and technical advice on tribal land matters. The Department has four technical divisions that carry out its functions. The four divisions are Administration, Estates and Land Valuation, Land Inventory and Management, Land Use and Development.

The Department is to validate or approve all compensation values before they are paid out. They are also responsible for transferring land rights within State land. Selebi-Phikwe is under State Land. A site is to be applied for the construction of a water reservoir and a pump station. The Department is therefore to issue land rights to WUC for the laying of their pipelines and construction of PS 1 tanks which is within the town.

4.5.6 Ministry Of Youth Empowerment Sports and Culture Development
The Ministry of Youth Empowerment Sports and Culture Development exists to create an enabling environment that empowers the youth, develops sport and leverages the strength of our culture and heritage. This is done through their various departments within the ministry.

The Ministry through their offices in Selebi-Phikwe will provide awareness training in particularly in the vulnerable settlements to enable them take advantage of the various Government opportunities for funding for the youth in sports, business development and innovation.

4.5.7 Ministry of Nationality, Immigration and Gender Affairs: Department of Gender Affairs

The Department of Gender Affairs' role will be coordinate and facilitate capacity building gender-based violence, and promoting the development of gender sensitive sectoral policies and procedures

4.5.8 The Land Board(s)

The Land Board derives its statutory responsibilities to hold land in trust for the citizens of Botswana from the Tribal Land Act of 1968. The functions of the Land Board involves granting rights to use land, cancellation of the grant of any rights to use any land, imposition of restrictions on the use of tribal land, authorizing any transfer of tribal land and hearing appeals from decisions of Subordinate Land Board in respect of any of its functions conferred on such Sub-Land Boards. The granting and repossession of tribal land are carried out through the land board and in accordance with the provisions of the Tribal Land Act (1968).

The Mmadinare Sub-Land Board and Palapye Sub-Land Board are to assess the compensation values of partial plots to be expropriated in Mmadinare and Topisi villages respectively.

4.5.9 Land Tribunal

The Tribal Land Act was amended in 1993 to provide for the establishment of a specialized court to attend to appeals against the decisions of the Land Boards and for enforcement of the Land Board decisions. The Land Tribunal's official commencement date was the 13th of October 1997. Section 40 of the Tribal Land (Amendment) Act of 1993 provides for the establishment of the Land Tribunal to assume the responsibility of the Minister in adjudicating on appeals. Any party who is aggrieved by the decision of the Land Tribunal may appeal to the High Court on a point of law only.

The Land Tribunal is a three-member team chaired by a president. The president of the Tribunal is a qualified lawyer appointed in accordance with the provisions of the Public Service Act. The members are also appointed in terms of Public Service Act, on contract terms renewable for two terms. The Tribunal is also empowered to add two advisory members to assist, but not participate in decision making, in any matter before it that involves local cultural or traditional aspects or values.

The Land Tribunal is to mediate between the project proponent and the person that is aggrieved pertaining to land issues that concerns the project. The Land Tribunal is the last stage in the GRM for resolution of land conflicts in the project.

4.5.10 Department of Environmental Affairs

The Department of Environmental Affairs (DEA) within the Ministry of Environment, Natural Resources Conservation and Tourism is responsible for protection and improvement of the
quality and safety of the environment, to promote conservation and sustainable use of natural resources.

The Department is also responsible for receiving and reviewing of Environmental Impact Statements on environmental and social impacts of plans, programmes and projects. DEA will be responsible to ensure that mitigation measures for adverse environmental impacts are adequately implemented. This it would ensure through auditing of the project and receiving periodic monitoring reports.

4.5.11 Compensation Assessment Committee

The compensation assessment committee is set up by the respective Land Board Secretary and consists of the following:

Member of the Land Board (other than the Land Board Chairman) – who chairs the committee
  1. Land Board Secretary – Secretary
  2. Acquiring Authority
  3. Land Officer (Land Use) – Member
  4. District Agricultural Officer – Member
  5. Sub Land Board Chairman of the relevant area – Member
  6. Clerk of the relevant Sub Land Board
  7. Council Chief Technical Officer – Member
  8. Land Board Technical Officer – Member
  9. Land Valuer

A minimum of five members including a Land Valuer forms a quorum for a compensation and evaluation assessment exercise.

The compensation assessment committee would assess and evaluate properties to be affected and calculate the value of the compensation to be paid according to the requirements the Resettlement Action Plan in the case of this sub-project the Abbreviated Resettlement Action Plan.

4.5.12 Town and District Councils

The duty of the Councils is to exercise good governance and take responsibility for development in their areas of jurisdiction. Councils in Botswana are corporate bodies with distinct names by which they are established. In terms of Section 31 of Local Government (District Councils) Act and Regulation 32 of the Townships Act, Councils are to:

• Provide primary schools and other educational services in relation to primary education.
• Provide sanitary services for the removal and disposal of refuse.
• Safeguard and promote public health and prevent the occurrence of any outbreak or prevalence of any disease.
• Construct and maintain public roads and streets other than those constructed and maintained by the central Government.
• Act as fire authorities to maintain fire brigades and to be responsible for the extinction of fires and protect life and property in case of fire
• Control urban building design and standards
• Organize the collection, retention and where applicable, sale of lost cattle’s (Matimela)
• Establish, maintain and control markets.

The Councils also has Roads Departments that are responsible for roads at the district levels. Normally the roads are of tertiary levels as they are within the cities, towns or settlements. The road reserves vary between 45 m to as low as 15 m. As most of the settlements are not
planned or existed before plans were made most of the road reserves have been encroached upon. The councils are also to permit the use of their road reserves. The councils also have the Department of Environmental Health. The core business of the department includes the management of waste and inspection of factories.

The mandate of department which is to regulate health, safety and welfare of employees, and the safety of machines and plant, will be executed throughout Selebi-Phikwe to Serule Water Transfer Scheme. The Councils have a Social and Community Development Department which addresses social issues including taking care of vulnerable people in the society. The department can also help in identifying vulnerable groups or PAPs within the administrative districts (Table 22.)

**Table 22: Administrative Districts of Beneficiary Villages**

<table>
<thead>
<tr>
<th>Political Administration</th>
<th>Beneficiary Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonota Sub District Council</td>
<td>Gojwane, Serule</td>
</tr>
<tr>
<td>Palapye Administrative Authority</td>
<td>Moreomabele and Topisi</td>
</tr>
<tr>
<td>Bobirwa Sub District Council</td>
<td>Mmadinare and Damuchojenaa</td>
</tr>
</tbody>
</table>

### 4.5.13 Department of Occupational Health and Safety

The core business of the Department of Occupational Health and Safety includes providing overview of factory building plans for suitability of designs, registration of factories, inspection of factories and other places of work such as building operations and works of engineering construction; registration and inspection of plant and machinery e.g. passenger lifts, boilers, air receivers, cranes and lifting tackle etc. and legal action where there is a contravention of the law. The Department also disseminates information on occupational health and safety and it participates in the drawing-up of Botswana National health and safety standards.

The mandate of the Department is to regulate health, safety and welfare of employees, and the safety of machines and plant. This mandate will be executed throughout the sub-project through regular inspections of the construction site by the Department.

### 4.5.14 Department of Waste Management and Pollution Control


DWMPC will monitor waste management and pollution at the construction site; this will include the control and regulation of remediation of contaminated soil.

### 4.5.15 Department of National Museum and Monuments
The mandate of Department of National Museum and Monuments (DNMM) is to promote conserving, protecting and promoting Botswana's heritage. Archaeological Impact Assessment with its mitigation measures for the sub-project has been approved by DNMM. The AIA mitigation measures will be put in place to ensure the sustainability of this department's mandate.

The Department is to monitor the recommendations it has made in terms of archaeology for the project and would provide guidance during Chance Find

4.5.16 Botswana Police Services

The Botswana Police Service operates throughout the country and within the project area. They are mandated to protect life and property, prevent and detect crime, repress internal disturbances, maintain security and public tranquillity, apprehend offenders, bring offenders to justice, duly enforce all written laws with which it is directly charged and generally maintain the peace.

Selebi-Phikwe to Serule Water Transfer Scheme will depend on the police services to protect life and prevent crime and maintain security during the implementation of the project. Police stations are located in Selebi-Phikwe, Mmadinarre and Serule. All the di-Kgotla also have Police Officers to maintain the peace.

4.5.17 Department of Labor and Home Affairs

The mandate of the Department of Labor and Home Affairs is to promote gender equality, provide labor, occupational health and safety, civil registration, migration, citizenship and coordinate vocational training.

This department will handle all labor issues or conflicts between employer and employees throughout the implementation of the project.

4.5.18 Department of Road Transport and Safety

The mandate of the Department of Road Transport and Safety is to provide effective, efficient, reliable, affordable and sustainable safe road transport services which will meet the community, economic and environmental needs of Botswana. All vehicles and machinery which are to be used during construction of the project will be inspected for roadworthy by this department.

4.5.19 Department of Radiation Protection Inspectorate

The mandate of the Department of Radiation Protection Inspectorate is to administer the safe use of atomic energy and nuclear technology. The inspectorate is responsible for enforcing the following, amongst others:

- Occupational exposure control for protection of employees working with nuclear sources against adverse effects of radiation that can lead to cancer, sterility, and other associated illnesses;
- Public and environmental exposure control for protecting the public, flora, and fauna from short as well as long-term effects of ionizing radiation.
- Emergency preparedness and response for mitigating the effects of radiological emergencies that can result in injuries to people, contamination of the environment and damage to property.

The Department will be responsible for the monitoring of the exposure of workers to radiation by issuing TLD badges to workers and collecting them for analysis. Monitoring for radiation
exposure will be emphasised when installation of the pipelines between Serule and Gojwane and Damuchojenaa Settlements are being undertaken.

4.5.20 Central District Medical Health Teams (Medical Facilities)

During the implementation of the project, the mandate of the Medical Health Team within the project beneficiaries (Medical Facilities) will be to:

- Provide initial medical attention to all prospective employees, prior to employment
- Monitor the health of employees and advice on their fitness to perform their work
- Contribute to the protection of the health of persons present on site
- Provide emergency medical responses
- Assist in prevention and detection of occupational accidents and illnesses
- Assist in the prevention of work-related psychological problems
- Provide monthly education for HIV/AIDS and other diseases
- Provide condoms for the workers at the project site.

4.5.21 Settlement Development Committee and Tribal Administration

The host communities and beneficiary villages are to help shape the project, by providing adequate information on the prevailing socio-economic and environmental conditions of their settlements. They are also to assist in finding the affected PAPs, through their land overseer.

4.6 List of Permits/Approvals/Licence/Clearance Needed for Project Implementation and Institutions Responsible

The following permits, approvals, licences and clearances as indicated in Table 23 are to be obtained from institutions responsible prior to the project implementation:

Table 23: List of Permits, Approvals, Licenses and Clearances

<table>
<thead>
<tr>
<th>Type of Permits/Approvals/Licence/Clearance</th>
<th>Issuing Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval for civil works to commence</td>
<td>World Bank</td>
</tr>
<tr>
<td>Clearance for Archaeological Impact Assessment</td>
<td>Department of National Museum and Monuments</td>
</tr>
<tr>
<td>Clearance for Environmental Impact Assessment</td>
<td>Department of Environmental Affairs and the World Bank</td>
</tr>
<tr>
<td>Clearance for felling of trees</td>
<td>Department of Forestry and Range Resources</td>
</tr>
<tr>
<td>Wayleave to cross the railway line and use their reserves</td>
<td>Botswana Railways Authority</td>
</tr>
<tr>
<td>Wayleave to cross the national roads and use their reserves</td>
<td>Roads Department</td>
</tr>
<tr>
<td>Abstraction of water from boreholes and rivers and working within rivers.</td>
<td>Water Apportionment Board (DWA)</td>
</tr>
<tr>
<td>Water from main reticulation system</td>
<td>Water Utilities Corporation</td>
</tr>
<tr>
<td>Transport and machinery permits/road worthiness</td>
<td>Department of Road Transport and Safety</td>
</tr>
<tr>
<td>Mining License for Borrow Pit</td>
<td>Department of Mines</td>
</tr>
<tr>
<td>Type of Permits/Approvals/Licence/Clearance</td>
<td>Issuing Authority</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------</td>
</tr>
</tbody>
</table>
| Blasting                                  | • Botswana Police  
• Department of Mines  
• Respective Tribal Administration  
• Respective Council: Bobirwa Sub District Council, Tonota Sub District Council and Palapye/ Serowe Administrative Authority |
| All Land Rights for expropriation, servitudes, camp site and acquisition | Respective Sub Land Boards being Tonota, Palapye and Mmadinare |
| Waste Disposal                           | Department of Environmental Health of Bobirwa Sub District Council, Tonota Sub District Council and Palapye/ Serowe Administrative Authority |
| Laboratory Operation (soil lab)           | Radiation Inspection Protectorate |
5.0 PUBLIC PARTICIPATION AND CONSULTATIONS

5.1 Introduction

This chapter presents a summary of the outcome of public and institutional consultations that have been conducted. The consultations served several purposes which include informing the beneficiary villages and Interested and Affected Parties (including PAPs) about the project and obtaining their views and concerns about it. It provided a means of obtaining community opinion on anticipated impacts, as well as providing culturally appropriate mitigation measures.

5.2 Objectives of Consultations

The objectives of the community consultation process were to:

- Inform the beneficiary community, relevant stakeholders, and affected and interested parties of the proposed project and to seek their views regarding significant impacts of the project
- Ensure that important impacts are addressed, and benefits are maximized
- Reduce conflict through early identification of contentious issues
- Provide an opportunity for the public to influence project design in a positive manner (thereby creating a sense of ownership of the project)
- Improve transparency and accountability of decision-making
- Increase public confidence in the ESIA process and incorporate local and traditional knowledge that may be useful for decision-making

5.3 Methodology

The public was consulted in 2013 about the proposed project and EIA process. A notice of intent to consult with beneficiary communities within the entire project area and along the pipeline route was published in the *Mmegi* Newspaper after consultation with the Dikgosi (Chief) of the beneficiary villages regarding the dates and time for the meetings. The notice invited all interested and was published both in English and Setswana (*Annex D*). Kgotla (Public/Community) meetings were held after the expiration of the mandatory 21 days notification period. This was in line with the principle of Free, Prior Informed Consultation for Vulnerable Communities under OP 4.10 and requirements of the Environmental Assessment Act (2011).

To update the ESIA, another round of public consultation was organized (*Table 24)*.

**Table 24: Meeting Dates and Venues For New Consultations**

<table>
<thead>
<tr>
<th>Venue</th>
<th>Date</th>
<th>Time</th>
<th>Attendance</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Topisi Kgotla</td>
<td>7 Aug 2017</td>
<td>0800hrs</td>
<td>109</td>
<td>41</td>
<td>68</td>
</tr>
<tr>
<td>2. Moreomabele Kgotla</td>
<td>7 Aug 2017</td>
<td>1400hrs</td>
<td>98</td>
<td>45</td>
<td>53</td>
</tr>
<tr>
<td>3. Serule</td>
<td>8 Aug 2017</td>
<td>0830hrs</td>
<td>146</td>
<td>62</td>
<td>84</td>
</tr>
<tr>
<td>4. Gojwane Kgotla</td>
<td>9 Aug 2017</td>
<td>0830hrs</td>
<td>163</td>
<td>75</td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>20 Feb 2019</td>
<td>0900hrs</td>
<td>63</td>
<td>27</td>
<td>36</td>
</tr>
<tr>
<td>5. Damuchojenaa Kgotla</td>
<td>10 Aug 2017</td>
<td>0900hrs</td>
<td>184</td>
<td>94</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>20 Feb 2019</td>
<td>0900hrs</td>
<td>70</td>
<td>20</td>
<td>50</td>
</tr>
</tbody>
</table>
### Table 25: Meeting Dates and Venues for Previous (2013) Consultations

<table>
<thead>
<tr>
<th>Settlement</th>
<th>Date</th>
<th>Attendance</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mmadinare</td>
<td>10 June 2013</td>
<td>98</td>
<td>41</td>
<td>57</td>
</tr>
<tr>
<td>Damuchojenaa</td>
<td>10 June 2013</td>
<td>135</td>
<td>59</td>
<td>76</td>
</tr>
<tr>
<td>Serule</td>
<td>11 June 2013</td>
<td>101</td>
<td>40</td>
<td>61</td>
</tr>
<tr>
<td>Gojwane</td>
<td>11 June 2013</td>
<td>83</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>Moreomabele</td>
<td>12 June 2013</td>
<td>74</td>
<td>44</td>
<td>30</td>
</tr>
<tr>
<td>Topisi</td>
<td>12 June 2013</td>
<td>86</td>
<td>38</td>
<td>48</td>
</tr>
</tbody>
</table>

In addition to the community consultations, relevant Government and quasi-government, non-governmental organisations and private institutions were consulted.

The methods of consultation included the following:
1. Questionnaires for individual interviews. These were either faxed or administered in person.
2. Public (kgotla) meetings
3. Focused group discussions with settlement leaders and community based organisations.
4. Semi-structured interviews with stakeholder institutions and Non-Governmental Organisations.
5. Telephonic conversation
6. Email communication

The response rate was 100 percent.

#### 5.4 Stakeholders Consulted (Government and Corporate Entities) and Non-Governmental Organisations:

1. Botswana Railways Corporation
2. Roads Department
3. Botswana Power Corporation
4. Botswana Telecommunications Corporation Limited
5. Department of Radiation Protection Inspectorate
6. BoFinet
7. Orange
8. Mascom
9. Selebi-Phikwe Town Council
10. Bobirwa Sub-district Council (including the Social and Community Development Officer)
11. Tonota sub-district Council (including the Social and Community Development Officer)
12. Palapye/Serowe Administrative Authority
13. Mmadinare Sub-land board
14. Tonota Sub-land board
15. Palapye Sub land board
16. Department of Lands
17. Department of Forestry and Rangeland Resources
18. Department of Fisheries
19. Department of Water Affairs
20. Selebi-Phikwe Town Council
21. Bobirwa Sub District Council
22. Palapye/Serowe Administrative Authority
23. A-Cap Resources
24. Ministry of Youth Empowerment, Sport and Culture Development
NON GOVERNMENTAL ORGANISATIONS (NGOS)

25. Gender Links: Deals with gender and development issues
26. Tebelo pale Voluntary Counselling and Testing: Deals with HIV prevention, testing and counselling
27. Permaculture Botswana: Assists in poverty alleviation by promoting food security through backyard farming.
28. San Youth Network (SYNet): Promotes the culture and development of San/Barsarwa Youth in and around Botswana.
29. Gender Innovation and Development (GIDA): Advocates against GBVs, VAC and SHEA. Promotes women/ girl child empowerment.

5.5 OUTcome of CONSULTATIONS

5.5.1 Public Consultations (Kgotla Meeting)

Generally, the communities of the project settlements welcomed the proposed water transfer scheme and suggested that unskilled labor should be sourced from their settlements. However, they also articulated some concerns especially related to community safety and exacerbating social issues like alcoholism and teenage pregnancies due to labor influx. Summary of all consultation meetings held for the project are presented in Annex E.

The communities as well raised the following issues and concerns:

- Employment: Local people should be employed during construction. Hiring practices should be fair and transparent, including opportunities for women.
- Impacts to property: Number of the properties to be affected should be specified.
- Water availability: Will there be provision of adequate water supply? Water scarcity was cited as a key concern.
- Cultural Heritage and Sacred Sites: All graves located near the proposed water pipeline should be avoided.
- Resettlement/Compensation: Expropriation of properties to be affected should be specified.
- Regular consultation and community engagement: The project should cooperate with the community and consult progressively, including as it pertains to old graves and project updates.
- Environmental concerns: Earth materials should be sourced from the local and licensed sand and pit miners to empower them and minimize borrow pits in the area.

5.5.2 Institutions and Interested Parties and Project Affected People (PAPs)

All institutions consulted by use of letters and questionnaires responded. Minutes of the consultations with Stakeholders and IAP are appended to the report (Annexes E).

The key issues/suggestions raised from those consulted include the following:

- Set back distance from the road fence should be 10 m.
- Identify affected property owners and compile and submit land acquisition report to the land board for assessment on compensations before expropriation of land.
- Ensure all service providers whose services might be affected by the project, particularly within the road reserve are consulted.
• The service or utility providers also cautioned WUC that it is standard practice that when a developer affects/damages the infrastructure for service provision such as electricity poles and cables, telephone lines, water supply pipes etc.
• The developer must pay for the cost of relocation or damages. The developer needs to provide a map showing all services to be affected and submit it to the service provider. The service provider will, in turn, assess the services to be affected and provide a quotation to the developer for moving the services from the way of the project. Roads Department and Botswana Railways indicated that the project is located within the road or rail reserve, and then the developer should apply for way leave and provide a sketch map showing the position of the service in relationship with the road or rail to facilitate processing of wayleave.
• Ownership of the earth road from the railway line to Gojwane could not be established, as none of the road authorities neither national nor district could declare ownership. It is suspected to be a community initiative as the road was constructed according to the Kgosi of Gojwane to gain access to a water collecting point for their livestock which is found along the road.
• The project should assist in getting relevant personnel to train the vulnerable communities on skills development and financial management capacity training to enable VC’s to properly budget and allocate funds received from constituency sports and choral competitions on their priority needs.
• The project can engage with Local Enterprise Authorities (LEAs) to assist the vulnerable communities with writing business proposal to ensure that youth from the vulnerable communities stand a better chance in benefiting from Youth Development Funding.

A consultation matrix of the institutional consultations is presented in Annex E.

5.5.3 Non-Governmental Organisations (NGOs)

The following NGOs operating country wide were consulted with regards to the project and particularly with the Vulnerable Communities.

• The NGOs indicated that they are willing to work with the project when their assistance is needed.
• ISYNet indicated that the San/Barsawa’s located in the eastern part of the country or in the Central Region have their culture modernised through intermarriages. The chairman reported that most of the youth even feel shy to speak their Indigenous language in public as they feel their friends of different ethnicity look down upon it and see the language as backward. The organisation is however trying to preserve the language through education of the youth. This highlights the perception of discrimination and marginalization Basarwa continue face.
• GIDA indicated that, GBV is not a new social problem in Botswana but is occurs at the domestic level mostly in the rural areas. This however, it is often unreported due to traditional beliefs that men are superior to women whether in a relationship or not. There is however a recent awakening in Botswana on this problem. More awareness is to be raised on this particularly in the rural areas and the vulnerable communities where GBV, VAC and affray are rampant.
• Khwedom Council:
  o Indicated that the name ‘Basarwa’ is demeaning and so they would like the San in Botswana to be called Bakhwe/Mokhwe (Singular). [29]

[29] In consultations with the community, they preferred the term Basawara.
The Council also requested that the project documents should be shared with the Khwedom Council during disclosure and they would be able to give feedback on the document.

- Ensure that the Bakhwe people are the main priority during all stages of the project.
- Indicated that they would help with the implementation of the project when called upon.

- All the NGOs indicated that the beneficiary villages should gain from the project by employing the youth and women in particular, especially VC members who are among the most impoverished.
- They also indicated that the host settlements and workers should be educated on emerging social problems such as GBVs, VAC, SHEA and alcohol abuse, and that labor camps should not be located near the community.

5.5.4 The Focus Group Discussions and Household Interviews at Gojwane Settlement

5.5.4.1 Focus Group Discussions

On 5th September 2018, a focus group discussion with key informants of the settlement was undertaken in Gojwane. The list of all attendees is attached at Annex E. The main aim of the focus group discussion was to find out key details about the VC and gain a better understanding of the origins of the problems affecting the settlement in general and with the VC in particular. This is captured and reflected in Chapter 3 within the section covering the social baseline for Gojwane.

The vulnerable community was not consulted separately from the rest of the group because Kgosi and some members of the vulnerable community had expressed their discomfort in being singled out and explained that they did not want their social harmony and peace in their settlement to be disturbed by the consultations for this project. During Kgotla meetings in Gojwane, the Basarwa attendance was 37% on average. Women and youth focus groups were held and there were 50% average attendance by Basarwa for both focus group meetings.

Validation workshops for vulnerable communities plans were held on the 11 March, 2020 in all the four (4) wards in Damuchojenaa and the three (3) wards Gojwane settlements respectively before the documents were disclosed to further confirm and document the community’s support for the project.

The focus groups requested for assistance in terms of funding for the development of these community projects:

1. Assistance in developing a sports complex
2. Assistance with the communal pond for irrigation and provision of water for livestock
3. Construction of a library
4. Improvement of the preschool

The community was informed that the budget for the project was limited and therefore it would not be possible to provide for their proposed community projects under the scope of the sub-project. They were however, informed that these proposed community project lists will be shared with the sub-project contractor so that in the event that he wants to do a Corporate Social Responsibility project for the community, he may pick from the list but no promises were made. Even without the inclusion of these activities in the sub-project scope, when asked by the facilitators, the groups expressed their support for the sub-project given how central improved water services are to their livelihoods.
5.5.4.2 Challenges Faced by Vulnerable Community and Solutions Proposed by Community

The vulnerable community expressed through household surveys that they face the following challenges. They also recommended resolution to address them. The challenges they have cited in order of importance or priority are listed below and shown in Figure 7 and perception of resolution in Figure 8.

- Water shortages
- Unemployment
- Poverty
- Substance abuse
- Crime (stealing, substance abuse, etc) and civil cases (affray)

Figure 7: Problems Faced by Participants in Gojwane Settlement

![Figure 7: Problems Faced by Participants in Gojwane Settlement](image)

*Source: Field Survey, September 2018*

In resolving the identified problems of Gojwane the VC members stated that people from the settlement should be given priority during hiring in all phases of project implementation. Another solution to the problem of water shortage was that of connecting water to individual households to avoid queueing for water at public standpipes. They also indicated that the water pressure should be adequate so that water goes to all parts of the settlement.

Figure 8: Suggested Solutions to Problems Faced by VCs

![Figure 8: Suggested Solutions to Problems Faced by VCs](image)

*Source: Field Survey, September 2018*
5.5.5 The Focus Group Discussions and Household Interviews at Damuchojenaa Settlement

5.5.5.1 Focus Group Discussions

On the 5th September 2018, a focus group discussion with key informants of the settlement was undertaken in Damuchojenaa to learn about the history of the settlement and understand key challenges they experience, especially among the Vulnerable Community. This was captured in the Chapter 3 within the section covering the social baseline.

The Vulnerable Community was not consulted separately from the rest of the group because the Kgosi and some members of the vulnerable community had expressed their discomfort in being singled out and explained that they did not want their social harmony and peace in their settlement to be disturbed by the consultations for this sub-project. During Kgotla meetings in Damuchojenaa the Basarwa attendance was 46% averagely. Separate women and youth focus groups were held, and they were 50% average attendance for Basarwa in each.

During the discussion, it was said that the sub-project is likely to bring positive impacts into the settlement. Some of those positive impacts being employment to be created in the settlement during construction, and sustainable water supply during operation. The sub-project could also bring negative effects such as disruption of services and blockage of access during trenching.

At the end of the focus group, discussion community members discussed ways in which the project can assist the settlement and they are as below:

1. More educational facilities such as classrooms
2. Help assist in further developing the health post
3. Assisting orphans and destitute

The community was informed that the budget for the project was limited and therefore it would not be possible to accommodate their list for additional project benefits under the scope of the sub-project. The project team stated that these would be passed on to sub-project contractor in the event that for consideration of a Corporate Social Responsibility project for the community and no promises were made that these would be implemented. Even without the inclusion of these additional proposed benefits by the community, the focus groups expressed their support for the sub-project given how important improved water services are to their livelihoods and well-being.

5.5.5.2 Problems/ Challenges Faced by Vulnerable People and Proposed Solutions

The most common social challenges reported in Damuchojenaa through the household surveys are as follows:

- Unemployment
- Poverty
- Lack of assistance from Government

Figure 9 depicts further problems reported by the VC members. Proposed solutions of the VC members in resolving social problems are shown in Figure 10. Chief among them is to provide employment for them during construction of the project which will in turn reduce income poverty that is faced in the settlement.
**Figure 9: Problems Faced by Residents in Damucojena Settlement**

<table>
<thead>
<tr>
<th>Problems/Challenges Faced by residents in Damucojena</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>25</td>
</tr>
<tr>
<td>Lack of Recreational facilities</td>
<td>10</td>
</tr>
<tr>
<td>Lack of classrooms</td>
<td>5</td>
</tr>
<tr>
<td>Lack of government assistance</td>
<td>5</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>2</td>
</tr>
<tr>
<td>Poverty</td>
<td>1</td>
</tr>
<tr>
<td>Theft</td>
<td>1</td>
</tr>
<tr>
<td>Illness within the village</td>
<td>1</td>
</tr>
<tr>
<td>Long process to get government assistance</td>
<td>2</td>
</tr>
<tr>
<td>Lack of Access to Resources</td>
<td>2</td>
</tr>
</tbody>
</table>

**Figure 10: Suggested Solutions to Problems Faced by VCs**

<table>
<thead>
<tr>
<th>Preception of Resolution of Problems and Challenges within the village of Domucojena</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employ Residents of the village</td>
<td>30</td>
</tr>
<tr>
<td>Build better water infrastructure in the village</td>
<td>20</td>
</tr>
<tr>
<td>Organise training workshops</td>
<td>10</td>
</tr>
<tr>
<td>Reticulate water into the village</td>
<td>5</td>
</tr>
<tr>
<td>Help construct infrastructure within the village</td>
<td>5</td>
</tr>
<tr>
<td>Assist residents in receiving fair assistance from...</td>
<td>10</td>
</tr>
<tr>
<td>Bring investment into the Village</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Field Survey, September 2018
6.0 ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

This chapter presents a discussion on the alternatives which are available to the project design.

The Project Option

The Project Option entails that the proposed sub-project for the Serule-Phikwe Water Transfer Scheme will be implemented. This entails the augmentation of the water supply for all the beneficiary villages of Serule, Damuchojenaa, Gojwane, Moreomabele, Topisi, and Mmadinare. This will result in the improvement of water supplies in the settlement but will also come with such impacts as land degradation, dust generation, disruption of essential services such as traffic and potential accidents during the construction period of the project. An amelioration of the impacts would be addressed through mitigating measures and implementation of an Environmental Management Plan and including Codes of Conduct in the Contractor’s ESMP.

The No Project Option

The No Project Option entails that the proposed project for the Serule-Phikwe Water Transfer Scheme would not be implemented. This will mean that all the anticipated negative impacts associated with the project will not occur. These include the disturbance of soil and the social impacts including the spread of STIs. In the same vein, the impacts related to the intended project objective of improved water supply for the settlements of Serule, Damuchojenaa, Gojwane, Moreomabele, Topisi, and Mmadinare villages would not occur as well as some positive impacts such as the recruitment of local labor in the project. The water situation in this region will remain dire and communities will have to continuously live with inadequate and in some cases poor water quality. This situation is not desirable given impacts to human health and well-being. The subsequent analysis of alternatives and assessment of impacts proceeds on the basis that the project will be implemented.

The No Project Option was rejected because the intended project objective of providing improved water supply to the 29,840 beneficiaries of Serule, Damuchojenaa, Gojwane, Moreomabele, Topisi, and Mmadinare villages would not occur. In addition, the problem of inadequate or no water supply and improved water quality (Annex N) will continue in these settlements. They will continue to receive low quality water from boreholes and in some cases bosed from the borehole to a central point in the settlement. Queues at the public water standpipes are common and will likely to continue without this project. This will entrench poverty and deprive communities of access to water for the personal and material well-being. As such, this alternative was rejected.

6.2 Water Supply Alternatives for Mmadinare village

6.2.1 Alternatives for Mmadinare Water Supply

The Mmadinare village has acute water shortages due to the existing Water Treatment Plant failing to meet the demand. The following two alternatives were analysed, and cost benefit analysis used to compare them:

a) Alternative 1: Supplying Mmadinare from Selebi-Phikwe
b) Alternative 2: Upgrading the Mmadinare Water Treatment Plant
The Cost benefit analysis assisted the authorities to support decision making because it provides an evidence-based view of the issue being evaluated, without the influence of opinion, politics, or bias.

In this cost analysis, the capital cost estimates are based on current prices and costs for similar works and where appropriate, suppliers of pumps, pipes and other materials and actual tender rates from Contractors. The major components considered in the capital costs include transmission lines, pumps and pump houses, storage and packed water treatment plant.

The major components of the proposed scheme are as outlined below:

(i) Transmission Pipelines: Excavation, bedding, pipe laying, testing and disinfection, installation of valves and construction of chambers.

(ii) Pump/Booster Stations: Construction of pump/booster stations, pumping equipment, pipe work, electrical and mechanical works and telemetry.

(iii) Packaged Treatment Plant: Construction of concrete works, supply, install, test and commission of the Water Treatment Plant.

The prices include material costs, construction costs, Contractor’s charges, risks, insurance and other contractual requirements. An allowance of 10% has been allowed for contingencies.

Alternative 1: Supplying Mmadinare from Selebi-Phikwe

This Alternative consists of a gravity main from the existing valve chamber CC-CH2096 “T” in Selebi-Phikwe to the proposed pump station (WBPS No.1) at Chainage 2.2 km “T” in Selebi-Phikwe will feed the proposed collector reservoir and pump station at 2.2 km from the “T”.

This pump station will house two pump sets. One pump set dedicated to the supply to Mmadinare the other pump set for the supply to the other settlements. Each pump set will comprise three pumps – two duty pumps and one standby pump. The pumping main will follow the main Serule to Selebi-Phikwe road and then turn to follow the alignment of the main road to Mmadinare at distance approximately 12.8 km from the “T” and will terminate at the existing reservoirs in Mmadinare village.

Alternative 2: Supplying Mmadinare from Upgraded Mmadinare Water Treatment Plant

The desirability and cost of this alternative has been considered. The existing plant has a capacity of only 75 m$^3$/hour and it is reported that during school terms, its output can barely provide enough water to the new Senior Secondary School let alone the remaining schools and the other demands of the settlement.

A more detailed study of the possibility of tapping-off the raw water pipeline from Letsibogo Dam’s to Selebi-Phikwe WTP is required to assess the viability of this option as a possible solution. The expansion of the capacity of the WTP in Mmadinare will eliminate the need for the Mmadinare transfer pumps and pumping main proposed in Alternative 1.
6.2.2 Capital Costs of the Alternatives for Mmadinare Water Supply

The capital cost estimate is based on current prices and costs for similar works and where appropriate, suppliers of pumps, pipes and other materials and also actual tender rates from Contractors. The capital costs include Preliminary and General Costs, Price Escalations, Contingencies and Taxes.

The Capital Costs of the two Alternatives to supply water to Mmadinare village are given in Table 26.

Table 26: Capital Costs of Alternatives to Supply Water to Mmadinare village

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Alternative 1: Source being Selebi-Phikwe Water Treatment Plant</th>
<th>Alternative 2: Source being Mmadinare Water Treatment Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>CAPITAL COSTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Transmission Pipelines</td>
<td>P30,915,156.00</td>
<td>P11,884,081.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 3,091,516)</td>
<td>(USD 1,188,408)</td>
</tr>
<tr>
<td>2.</td>
<td>Pump/Booster Stations, complete with electro-mechanical equipment and telemetry and SCADA</td>
<td>P5,116,205.00</td>
<td>P3,916,205.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 511,621)</td>
<td>(USD 391,621)</td>
</tr>
<tr>
<td>3.</td>
<td>Packed Water Treatment Plant complete with electro-mechanical equipment.</td>
<td>0.00</td>
<td>P23,334,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(USD2,334,000)</td>
</tr>
<tr>
<td>4.</td>
<td>Chlorine Dosing Plant</td>
<td>0.00</td>
<td>P3,500,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(USD 350,000)</td>
</tr>
<tr>
<td>5.</td>
<td>Sub-Total</td>
<td>P36,031,361.00</td>
<td>P42,634,286.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 3,603,136)</td>
<td>(USD 4,263,429)</td>
</tr>
<tr>
<td>6.</td>
<td>Add 15% Preliminary and General Costs</td>
<td>P5,404,704.15</td>
<td>P6,395,142.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 540,470)</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Sub-Total</td>
<td>P41,436,065.15</td>
<td>P49,029,428.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 4,143,607)</td>
<td>(USD 4,902,943)</td>
</tr>
<tr>
<td>8.</td>
<td>Add 10% Contingencies</td>
<td>P4,143,606.52</td>
<td>P4,902,942.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 414,361)</td>
<td>(USD 490,294)</td>
</tr>
<tr>
<td>9.</td>
<td>Sub-Total</td>
<td>P45,579,671.67</td>
<td>P53,932,371.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 4,557,967)</td>
<td>(USD 5,393,237)</td>
</tr>
<tr>
<td>10.</td>
<td>Add 12% VAT</td>
<td>P5,469,560.60</td>
<td>P6,471,884.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 546,956)</td>
<td>(USD 647,188)</td>
</tr>
<tr>
<td>11.</td>
<td>TOTAL CAPITAL COSTS</td>
<td>P51,049,232.26</td>
<td>P60,404,256.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(USD 5,104,923)</td>
<td>(USD 6,040,426)</td>
</tr>
</tbody>
</table>

Source: Bothakga Burrow (2018b)

Outcome: Alternative 2 has higher capital costs.

The cost to construct the transmission pipeline for Alternative 1 is more expensive for the following reasons:
- The length for Alternative 1 is 12.8 km compared to 4.2 km for Alternative 2
- There is one railway crossing that requires pipe jacking
- There are two river crossings that are costly to construct

Alternative 1 will not require capital costs for the treatment plant and dosing plant because they are already available at the Selebi-Phikwe WTP.

6.2.3 Operation and Maintenance Costs of the Alternatives for Mmadinare Water Supply
Operation and maintenance costs have been determined in accordance with the recommendations of the DWA Water Supply Design Manual guidelines and considered annual maintenance costs of pipelines, pumps, pump houses, water treatment plant and other structures and annual operation costs of manpower, energy, fuel and lubricants, transport and other miscellaneous costs. The costs are as shown in **Table 27** for a ten (10) period which is the economic life of most equipment.

### Table 27: Operation and Maintenance Costs of Alternatives to Supply Water to Mmadinare village

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Alternative 1: Source being Selebi-Phikwe Water Treatment Plant</th>
<th>Alternative 2: Source being Mmadinare Water Treatment Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>MAINTENANCE COSTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Transmission Pipelines (@1% of installation costs)</td>
<td>P3,091,515.60</td>
<td>P1,188,408.10</td>
</tr>
<tr>
<td>2.</td>
<td>Pump/Booster Stations, complete with electro-mechanical equipment and telemetry and SCADA (@10% of installation costs)</td>
<td>P5,116,205.00</td>
<td>P3,916,205.00</td>
</tr>
<tr>
<td>3.</td>
<td>Packed Water Treatment Plant complete with electro-mechanical equipment (@1% of installation costs)</td>
<td>0.00</td>
<td>P2,333,400.00</td>
</tr>
<tr>
<td>4.</td>
<td>Chlorine Dosing Plant (@20% of installation costs)</td>
<td>0.00</td>
<td>P7,000,000.00</td>
</tr>
<tr>
<td>5.</td>
<td>Sub-Total</td>
<td>P8,207,720.60</td>
<td>P14,438,013.10</td>
</tr>
<tr>
<td>B</td>
<td>OPERATION COSTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Manpower (Plant Operators, technicians)</td>
<td>P6,000,000.00</td>
<td>P21,960,000.00</td>
</tr>
<tr>
<td>7.</td>
<td>Electricity</td>
<td>P41,085,360.00</td>
<td>P33,046,920.00</td>
</tr>
<tr>
<td>8.</td>
<td>Chemicals</td>
<td>0.00</td>
<td>P18,000,000.00</td>
</tr>
<tr>
<td>9.</td>
<td>Transport / Communications</td>
<td>P2,400,000.00</td>
<td>P4,800,000.00</td>
</tr>
<tr>
<td>10.</td>
<td>Sub-Total</td>
<td>P49,485,360.00</td>
<td>P77,806,920.00</td>
</tr>
<tr>
<td>11.</td>
<td>Add 35% Overheads</td>
<td>P17,319,876.00</td>
<td>P27,232,422.00</td>
</tr>
<tr>
<td>12.</td>
<td>Sub-Total</td>
<td>P66,805,236.00</td>
<td>P105,039,342.00</td>
</tr>
<tr>
<td>13.</td>
<td>TOTAL OPERATION AND MAINTENANCE COSTS</td>
<td>P75,012,956.60 (USD 7,501,296)</td>
<td>P119,477,355.10 (USD 11,947,736)</td>
</tr>
</tbody>
</table>

Source: Bothakga Burrow (2018b)

### 6.2.4 Cost Recovery and Impact on the Cost of Water

The cost recovery strategies should be guided by the current WUC pricing guidelines. The engineers put forward the following strategy of cost recovery as they believed that cost recovery is one of the key strategies for the economic sustenance of service delivery as every drop of water consumed will be accounted for and paid for. Bothakga Burrow proposed full Recovery of Capital Costs, Operation and Maintenance Costs including Energy Costs over a period of 10 years since this is the minimum economic life of the proposed project plant and equipment.

The Cost Recovery and impact on the cost of water of the two Alternatives to supply water to Mmadinare village are given in **Table 28**.
Table 28: Cost Recovery and Impact on the Cost of Water of the Alternatives to Supply Water to Mmadinare village

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Alternative 1: Source being Selebi-Phikwe</th>
<th>Alternative 2: Source being Mmadinare</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Capital Costs</td>
<td>P51,049,232.26</td>
<td>P60,404,256.40</td>
</tr>
<tr>
<td>2.</td>
<td>Operations and Maintenance Costs</td>
<td>P75,012,956.60</td>
<td>P119,477,355.10</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Sub-Total</strong></td>
<td><strong>P126,062,188.86</strong></td>
<td><strong>P179,881,611.50</strong></td>
</tr>
<tr>
<td>4.</td>
<td>Projected water production over 10 year period (m$^3$)</td>
<td>P18,846,000.00</td>
<td>P18,846,000.00</td>
</tr>
<tr>
<td>5.</td>
<td>Full recovery of Capital Costs, Operation and Maintenance Costs over a period of 10 years</td>
<td>P6.69</td>
<td>P9.54</td>
</tr>
<tr>
<td>6.</td>
<td>Current WUC Applicable Tariffs for domestic consumer category (minimum charges of &gt;5-15kl)</td>
<td>P11.65</td>
<td>P11.65</td>
</tr>
</tbody>
</table>

Source: Bothakga Burrow (2018b)

Improvements to the WWTP at Mmadinare village for supplying Mmadinare village and supplying all beneficiary villages from the treatment plant at Selebi-Phikwe Town. The assessment indicated that it would be prohibitively expensive to upgrade the Mmadinare WTP and that the Selebi-Phikwe WTP has available capacity to treat and supply water for use by all the beneficiary communities. The option to improve the Mmadinare WTP was therefore rejected.

6.3 Pipeline Route Alignment Alternatives

The pipeline route alternatives considered here are routing the pipeline through the road reserve and routing the pipeline outside the road reserve. The alternative considered in the preliminary design report is routing the pipeline outside the road reserve. A cursory look at the implications of pipeline routing reveals the following:

6.3.1 Alignment Outside Road Reserve

The alignment of the pipeline route outside the road reserve will affect the following:
1. Fields
2. Recreational plots
3. Fences
4. Boreholes
5. Borrow pits

6.3.2 Alignment Within Road Reserve

The alignment of the pipeline within the road reserve will remove in almost in their entirety, properties that will be affected by the project that lie along the Serule-Phikwe Road and along the A1 Road (Serule-Gojwane and Serule to Moreomabele, and Moreomabele to Topisi village).

However, the following will be affected by alignment within the road reserve:
1. Bus stops
2. Signposts
6.3.3 Properties To Be Commonly Affected By Both Alignments

However, both alignments will affect the following services/properties almost equally as they will need to cross them at some point, BPC lines and water pipelines.

It can be concluded therefore that routing the pipeline outside the road reserve will affect additional properties not associated with road reserves such as fields and residential plots. Detailed costing of relocation and compensation report has been undertaken in a RAP report.

Routing the pipeline within the road reserve means that when the road must expand, the pipeline will have to be at the cost of the service provider, in this case, WUC. Additionally, all the people benefitting from the water will have water supply disruptions as the pipeline displaced and rerouted to pave way for road expansion. WUC is not prepared to undertake either of the costs.

6.3.4 Alternatives Between Serule village To Gojwane Settlement

As a consequence of subsuming the originally designed (Annex Q) Serule to Gojwane pipeline route by the A-Cap Resources mine concession, three alternative pipeline corridor routes were identified and assessed. The route with the least properties to be affected and the shortest, and therefore the least negative environmental and social impacts and lowest cost, was selected. This route uses the railway reserve of the northbound railway line from Serule to Gojwane.

The SWOT (Strengths, Weakness, Opportunities, and Threats) Analysis has been used to evaluate the alternative routes and the Goal Achievement Matrix has been used to transform the qualitative analysis to quantitative analysis to make a choice of re-routing.

6.3.4.1 Comparison of Alternative Routes

Maps for the three alternative routes are shown in Annex R and are compared in Tables 6.4 and 6.5:

Alternative 1 uses the railway reserve from Serule and turning at km13 from the railway line and then using the earth road to join the Gojwane-Serule road outside the A-Cap concession area.

Alternative 2 uses the railway line reserve from Serule and then turning at km 19 to the west which leads straight to the tank by using passages between fields.

Alternative 3 uses the A1 road reserve and then turning along the tarred road which leads to Gojwane Settlement and using a cut line which leads to the water.
<table>
<thead>
<tr>
<th>STRENGTH &amp; OPPORTUNITIES</th>
<th>PARAMETER</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>River Crossings</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Vegetation Clearance</td>
<td>Vegetation to be cleared mainly within the railway reserve</td>
<td>Quite a few vegetation to be cleared</td>
<td>Vegetation to be cleared mainly within the railway reserve</td>
</tr>
<tr>
<td></td>
<td>Archaeology</td>
<td>Nothing significant</td>
<td>Nothing significant</td>
<td>Nothing significant</td>
</tr>
<tr>
<td></td>
<td>Acceptability by Client and Community</td>
<td>Highly accepted</td>
<td>Least accepted</td>
<td>Accepted</td>
</tr>
<tr>
<td></td>
<td>Length of Pipeline which has cost implication</td>
<td>Shortest (21.7 km)</td>
<td>Long (25 km)</td>
<td>Longest (28 km)</td>
</tr>
<tr>
<td></td>
<td>No of Properties to be Affected</td>
<td>None - Private</td>
<td>15 Private Farms</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Easy Access for Construction</td>
<td>Accessible</td>
<td>Difficult access</td>
<td>Very accessible</td>
</tr>
<tr>
<td>WEAKNESSES &amp; THREATS</td>
<td>PARAMETER</td>
<td>Alternative 1</td>
<td>Alternative 2</td>
<td>Alternative 3</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------</td>
<td>-----------------</td>
<td>----------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>River crossings</td>
<td>-</td>
<td>Many crossings</td>
<td>Many crossings</td>
</tr>
<tr>
<td></td>
<td>Vegetation clearance</td>
<td>-</td>
<td>100 m² of vegetation to be cleared</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Archaeology</td>
<td>Archaeological site but avoided</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Acceptability by client and community</td>
<td>-</td>
<td>Least accepted</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Length of pipeline and cost</td>
<td>-</td>
<td>Longer</td>
<td>Longest</td>
</tr>
<tr>
<td></td>
<td>Number of properties to be affected</td>
<td>Must acquire public land</td>
<td>More than 15 private fields</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Safety risks for residents and people</td>
<td>-</td>
<td>Very risky as wild animals could be within the uncleared areas</td>
<td>Working along the A1 Road is risky</td>
</tr>
<tr>
<td></td>
<td>Easy access for construction</td>
<td>-</td>
<td>Difficult access</td>
<td>-</td>
</tr>
</tbody>
</table>
The qualitative comparison of the methods above has been transformed to a quantitative one by using a Likert scale from 0-10, where 0 indicates a bad performance and 10 an excellent performance.

**Table 31: Evaluation Matrix for Selection of New Route**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Crossing (5)</td>
<td>7 (35)</td>
<td>5 (25)</td>
<td>5 (25)</td>
</tr>
<tr>
<td>Vegetation Clearance (10)</td>
<td>8 (80)</td>
<td>0 (0)</td>
<td>9 (90)</td>
</tr>
<tr>
<td>Archaeology (3)</td>
<td>8 (24)</td>
<td>8 (24)</td>
<td>10 (30)</td>
</tr>
<tr>
<td>Acceptability by Client and Community (10)</td>
<td>10 (100)</td>
<td>5 (50)</td>
<td>8 (80)</td>
</tr>
<tr>
<td>Length of Pipeline and Cost implication (10)</td>
<td>10 (100)</td>
<td>8 (80)</td>
<td>10 (100)</td>
</tr>
<tr>
<td>Number of properties to be affected (8)</td>
<td>8 (64)</td>
<td>2 (16)</td>
<td>10 (80)</td>
</tr>
<tr>
<td>Safety risks for residents and people. for (10)</td>
<td>8 (80)</td>
<td>2 (20)</td>
<td>4 (40)</td>
</tr>
<tr>
<td>Easy access for construction (5)</td>
<td>10 (50)</td>
<td>5 (25)</td>
<td>10 (50)</td>
</tr>
<tr>
<td>Total Score</td>
<td>69 (533)</td>
<td>35 (240)</td>
<td>56 (350)</td>
</tr>
</tbody>
</table>

Weight/Weighted

**OUTCOME:**

From the above analysis **Alternative 1** is chosen for re-routing the pipeline from Serule village to Gojwane Settlement.

6.4 Labor Camp SCENARIOS

A scenario in which a labor camp would be created was considered. This section presents the advantages and disadvantages of having a labor camp.

6.4.1 With A Labor’s Camp

**Advantages**

1) Increase in the market for local business resulting from an increase in population (influx of workers) and purchasing power.
2) Inculcation of new ideas for the economic and social growth of the communities.
3) Avoidance of transporting workers over long distances on a daily basis, which poses or make them vulnerable to risk of traffic accidents.
4) Workers will be more accessible, energetic and focused on work.

**Disadvantages**

1) Increase pressure on existing resources such as wood (for heating), water, health facilities, electricity and waste management facilities especially on the remote settlements such as Gojwane and Damuchojena (both are vulnerable communities), which has less absorptive capacity.
2) Potential Increase in social problems and community relations (such as sexual relations with community members, spread of communicable diseases through sexual contact, potential for increase in pregnancies, impacts on community relations, potential for conflict with community members due to disruption to social norms and relations).

3) Does not promote the renting of empty houses available in the project area especially at Selebi-Phikwe following the closure of the mine.

4) Potential social conflicts between workers and host communities. Such as fighting, competing for social services such as health, natural resources such as wood for heating amongst other.

5) Possible gender-based violence (GBV) and sexual exploitation and abuses (including of minors).

6) Possible increase in alcohol and drug use.

7) Waste water and solid waste generation may pollute water resources and the land.

8) Noise generation and community disruption (shouting, playing of loud music etc).

9) Will require strict management and behavioral change of the workers to suit the norms of the beneficiary communities.

6.4.2 Without a Laborer's CampSite

**Advantages**

1) There will be no or less pressure on existing resources such as water, health, electricity and waste management facilities.

2) Opportunity to tap into the local workforce.

3) There will be minimised increase in social problems, such as destruction of existing relationships, GBV, and spread of diseases.

4) The project beneficiary communities include about five urban/peri-urban areas which make it less difficult to find qualified local workers. The urban/peri-urban nature makes it more easily for the influx of workers mix with the local population.

5) Reduction of cost in providing a labor camp.

**Disadvantages**

1) Workers may arrive at work less energetic and less focused at work which could result in occupational injuries.

2) Other resources such as housing that are readily available in the project area may not be utilised leading to a great loss to boost the local economy and loss of income by house owners who mainly are the public.

After analysing the advantages and disadvantages of both alternatives, it is concluded that accommodation and labor should be sourced from the beneficiary villages. The first alternative was rejected because the beneficiary villages have availability of semi-skilled and non-skilled labor and that daily commuting from labor camp will be avoided. In addition, workers will have transportation provided to them by the contractor to the work site as a mitigation measure to avoid labor influx. The C-ESMP will include protocols for drivers to ensure safety of workers and vehicle quality (and safety) during commute in addition to other relevant OHS.

Further mitigation measures will include socialization and monitoring of the Codes of Conduct related to GBV/SHEA/VAC and ESHS, and their inclusion in the bidding documents and Contractor’s ESMP (C-ESMP).
7.0 IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS

7.1 Introduction

This chapter focuses on the identification and evaluation of potential environmental and socio-economic impacts of the sub-project. The impacts are identified for the construction, operational and maintenance phases of the sub-project as well as the decommissioning phases. Characterization of impacts as to whether they are positive, or negative, reversible or irreversible, short term or long term and the temporal and spatial boundaries of the impacts were made.

An assessment of the impacts was also undertaken to determine whether they are significant or insignificant to guide decision-making in the implementation of the project. A description of mitigation measures to ameliorate negative impacts and enhance positive ones was undertaken.

Decommissioning in this chapter means removal of construction materials and machinery from site and restoration after construction.

7.2 Methodology of Environmental and Social Impact Assessment

A qualitative approach has been used in this report to assess and manage environmental and social impacts. The assessment takes into consideration, the severity, duration, spatial scale and probability of the occurrence of the impact as shown in Table 32. These have been ranked on an ordinal scale to determine the positive or adverse impact levels. The point of the assessment is to determine the significance of the impact which has implications for decision making on the design of the chosen option of the project.

The significance of an impact is also dependent on judgments about what is important, probable, desirable or acceptable. It also interprets degrees of importance. The significance of an issue is determined by a threshold of concern, a priority of that concern, and a probability that a potential environmental and social impact may cross the threshold of concern. It has been described, and its meaning and required intervention are presented in Table 33.

Table 32: Criterion for Ranking (ordinal scale) and Description of Impacts

<table>
<thead>
<tr>
<th>SEVERITY/MAGNITUDE</th>
<th>DURATION</th>
<th>SPATIAL SCALE</th>
<th>PROBABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high/Don’t know</td>
<td>Permanent/beyond project closure</td>
<td>International</td>
<td>Definite/continuous/do not know</td>
</tr>
<tr>
<td>High</td>
<td>Long term/life of a project</td>
<td>National</td>
<td>Highly probable/frequent</td>
</tr>
<tr>
<td>Moderate</td>
<td>Medium term (4-40 years)/reversible over time</td>
<td>Regional</td>
<td>Medium/possible</td>
</tr>
<tr>
<td>Low</td>
<td>Short term/reversible</td>
<td>Local</td>
<td>Low</td>
</tr>
<tr>
<td>Minor</td>
<td>Immediate/quickly reversible</td>
<td>Site only</td>
<td>Unlikely/seldom</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
Table 33: Significance Level of Impacts

<table>
<thead>
<tr>
<th>Level of Environmental/Social Significance</th>
<th>Interpretation and Required Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Requires aggressive mitigation measures and strict monitoring or a change in design of project to avoid or reduce adverse significance impact.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Requires mitigation measures and monitoring to minimise adverse impacts.</td>
</tr>
<tr>
<td>Low</td>
<td>Require minor mitigation measures for adverse impacts with or without monitoring, or no monitoring.</td>
</tr>
</tbody>
</table>

7.3 Potential Impacts

The potential impacts which will result from the project have been identified for the pre-construction, construction, operation and maintenance as well as the decommissioning phases of the project. These are presented in Table 34.
Table 34: Potential Impacts Resulting from Various Phases of the Selebi-Phikwe to Serule Water Transfer Scheme

<table>
<thead>
<tr>
<th>Potential Biophysical/Environmental Impacts</th>
<th>PRE-CONSTRUCTION</th>
<th>CONSTRUCTION PHASE</th>
<th>OPERATION AND MAINTENANCE PHASE</th>
<th>DECOMMISSIONING PHASE (AFTER CONSTRUCTION)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Impacts</strong></td>
<td>Positive Impacts</td>
<td>Positive Impacts</td>
<td>Positive Impacts</td>
<td>Positive Impacts</td>
</tr>
<tr>
<td>1. Improved aesthetics of water tank and reservoirs’ sites</td>
<td>Positive Impacts</td>
<td>Positive Impacts</td>
<td>Positive Impacts</td>
<td>Positive Impacts</td>
</tr>
<tr>
<td><strong>Negative Impacts</strong></td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>1. Loss of vegetation</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>2. Disturbance of soil stability</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>3. Landscape degradation and visual intrusion</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>4. Soil and water contamination</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>5. Dust pollution</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>6. Noise pollution</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>7. Fire risk</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>8. Riverine bank erosion and siltation</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>9. Disturbance of soil stability</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>10. Landscape degradation and visual intrusion</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>11. Potential soil and water (river/streams) contamination (Pollution)</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>12. Dust pollution</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>13. Noise pollution</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>14. Fire risk</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>15. Change in direction of surface runoff</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>16. Trench collapse (Cave ins)</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
<tr>
<td>17. Altering drainage patterns</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
<td>Negative Impacts</td>
</tr>
</tbody>
</table>

1. Dust pollution
2. Noise pollution
3. Disturbance of soil stability/land pollution
4. Land pollution
<table>
<thead>
<tr>
<th><strong>PRE-CONSTRUCTION</strong></th>
<th><strong>CONSTRUCTION PHASE</strong></th>
<th><strong>OPERATION AND MAINTENANCE PHASE</strong></th>
<th><strong>DECOMMISSIONING PHASE (AFTER CONSTRUCTION)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential Social Impacts</strong></td>
<td><strong>Positive Impacts</strong></td>
<td><strong>Positive Impacts</strong></td>
<td><strong>Positive Impacts</strong></td>
</tr>
</tbody>
</table>
| **Positive Impacts** | 1. Creation of Short term/Long term Employment  
2. Boost to local Economy | 1. Creation of temporary employment  
2. Boost to local economy  
3. Provision of education and awareness on topical issues for beneficiary villages (such as on HIV/AIDs, GBVs, Financial Management etc.) | 1. Sustainable supply of good quality water  
2. Improved hygiene and health  
3. Creation of long-term employment  
4. Boost to local economy (Increased Livelihood Opportunities) |
| **Negative Impacts** | 1. Land acquisition/expropriation  
2. Increase in HIV/AIDS, STD and other Infectious diseases. (Community Health)  
3. Increased pressure on existing social and health facilities due to influx of workers  
4. Accidents and Injuries (Occupational Health) | 1. Potential cracking of structures (houses)  
2. Damage to public utility services  
3. Blockage of access into properties  
4. Traffic disruptions  
5. Traffic accidents  
6. Damage to land and personal properties  
7. Exposure of workers to radiation  
8. Increase in HIV/AIDS, STDs and other Infectious diseases. (Community Health) due to labor influx  
9. Increased pressure on existing social and health facilities due to influx of workers  
10. Accidents, ill health and injuries of workers (Occupational Health) | 1. Potential accidents and Injuries |
| **Negative Impacts** | 1. Potential injuries and poor health (Occupational Health)  
2. Increase in HIV/AIDS, STD and other Infectious diseases. (Community Health)  
3. Despondency on the loss of employment | 1. Potential injuries and poor health (Occupational Health)  
2. Increase in HIV/AIDS, STD and other Infectious diseases. (Community Health)  
3. Despondency on the loss of employment | 1. Potential injuries and poor health (Occupational Health)  
2. Increase in HIV/AIDS, STD and other Infectious diseases. (Community Health)  
3. Despondency on the loss of employment |
<table>
<thead>
<tr>
<th>PRE-CONSTRUCTION</th>
<th>CONSTRUCTION PHASE</th>
<th>OPERATION AND MAINTENANCE PHASE</th>
<th>DECOMMISSIONING PHASE (AFTER CONSTRUCTION)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Accidents involving human and livestock of beneficiary villages.</td>
<td>12. Disturbance of burial sites.</td>
<td>13. Potential for Gender Based Violence (GBV) and Sexual Harassment Exploitation and Abuse (SHEA)</td>
<td></td>
</tr>
</tbody>
</table>
7.4 ASSESSMENT OF IMPACTS AND PROPOSED MITIGATION MEASURES

7.4.1 POSITIVE BIOPHYSICAL IMPACTS

Impact 1: Improved Aesthetical Appeal of Water Tank and Reservoir Sites

Phase: Operation and Maintenance

The replacement of the worn-out mesh wire fences of the water storage tank sites with palisade fences and painted the corporate colours of WUC will be aesthetically pleasing and be an improvement visually. The palisade fencing will provide the necessary security to prevent access to the water tanks from any vandalism.

Assessment
This is of a high positive impact of a long-term nature but would have effect only at the site. It is of a moderate environmental significance.

Enhancement
The fence should be maintained at least once in a year. It should be inspected thoroughly at least once in a week. The communities should be educated to stop vandalism of the fences and water tanks.

7.4.2 POSITIVE SOCIAL IMPACTS

Impact 1: Creation of Temporary and Permanent Employment

Phase: Construction, Operation and Maintenance and Decommissioning

Short-term and long-term employment would be created during all phases of the project. It is estimated that a total of about 300 people both skilled and unskilled will be employed during the various periods of construction. Of these a total of about 180 people are estimated to be employed from the communities during various periods of construction. Additional measures will be in place in the hiring plan of the contractor to provide opportunities for employment for members of the community in the project area especially for unskilled labor, as well as measures to enhance opportunities for women and vulnerable groups and communities. This will include measures for transparent, fair and accountable hiring practices.

Long-term employment for approximately ten people is expected during operation and maintenance.

Assessment
This is of a high positive impact of a short to long term duration. The spatial scale could be from local to national as workers or staff members of the Contractor could come from anywhere in the country. The impact is of definite probability and assessed as high positive social significance especially if there are opportunities for employment for those who are disadvantaged and vulnerable.

Enhancement
Consideration of employment should be given to people from beneficiary villages especially women, vulnerable people who capable of performing duties. It is recommended that about 60 percent of those to be employed should come from the beneficiary communities including the VCs. The two communities where VC are present indicated employment opportunities in the project as an agreed project benefit with WUC under the VCP. The hiring will also include align with the VCP.
There should be transparent and fair hiring practices to mitigate against social conflicts due to perceived bias.

**Impact 2: Boost to Local Economy (Increased Livelihood Opportunities)**

**Phase: Construction, Operation and Maintenance and Decommissioning**

The implementation of the project will boost the local economy especially during construction. Business may develop in the beneficiary communities to take advantage of the presence of the influx of workers. Businesses may include, food vendors, clothes and work-related suppliers.

In addition, during operation the water may be used to create new employment avenues such as bottling and selling as well as for watering small scale backyard gardening (cabbage spinach etc.) for subsistence and probably also for sale.

**Assessment**

This is a high positive, long-term local level impact depending on the economic activity. The impact is of definite probability and assessed as moderate to high positive social significance.

**Enhancement**

1. Workers should be provided a resting place should be provided for them. A shed or should also be provided for community vendors (such as food provision) to sell items during construction near where works are taking place.
2. A decent location (i.e. centrally located, hygienic, shaded etc.) for vendors especially those for food should be provided.
3. The contractor should purchase some construction materials locally within the project area where they are available to boost local economies.
4. Household connection of water should be encouraged. Billing of water usage should be subsidised in the rural areas given high poverty rates.

**Impact 3: Provision of Education and Awareness of Topical Issues for Workers and Beneficiary Communities**

**Phase: Construction**

During construction, the project beneficiaries will benefit from numerous sensitization and awareness raising efforts be organised by the contractor and the project itself to increase understanding of project risks and to mitigate behaviours that can exacerbate such risks. This can be conducted via radio, in person talks with experts, posters, sign boards, brochures and leaflets. Topics include mitigation against SHEA/GBV, prostitution, and behavioural expectations of workers and community members. Educational opportunities to enhance skills development such as financial management, entrepreneurship and Government assistance programmes will also be provided.

**Assessment**

This is a high positive, long term impact at the local level within the project area. The impact is of definite probability and assessed as moderate positive social significance

**Enhancement**

1. A specialist (NGO, consultant or/and Government representative from one of the relevant ministries) will be engaged to conduct community awareness programmes on GBVs and HIV/AIDs and any topical national health issues for beneficiary communities including the settlements where Vulnerable Communities reside.
2. The contractor will have a monthly safety talk on issues relevant to the general well-being of workers.

**Impact 4: Sustainable Supply of Good Quality Water**

**Phase: Operation and Maintenance**
The completion of the project is highly likely to see the stable supply of good quality water for the residents of the beneficiary villages.

**Assessment**
This is a high positive local impact, lasting indefinitely as the project is not to be decommissioned after its life span.

**Enhancement**
1. Regular maintenance of the water system is required to ensure sustainable provision of water and pressure.
2. Constant monitoring of water is required to ensure that its quality is not compromised with and complies with BOS 32:2000
3. Residents should be educated on water conservation techniques.

**Impact 5: Improved Hygiene and Health**

**Phase: Operation and Maintenance**
With improved water supplies, the health and hygiene conditions of the people will improve. Communicable diseases which are often related to poor sanitary conditions such as cholera and diarrhoea will be significantly reduced. Additionally, this sub-project, when operational, negates the need for communities in Gojwane, Serule and Damuchojena to consume water obtained from boreholes which may contain radiation. The water source for the project, Letsibogo Dam, is not affected by radioactivity.

**Assessment**
This potential impact of the sub-project is positive and permanent as long as the project is operational and of high significance.

**Enhancement**
Community programmes to enhance hygiene awareness among residents should be implemented once a month.

**7.4.3 NEGATIVE BIOPHYSICAL IMPACTS**

**Impact 1: Loss of Vegetation**

**Phase: Pre-Construction and Construction**
Much of the landscape traversed by the pipelines are generally devoid of vegetation, as the pipeline routes generally follow along existing roads either within the road reserve or close to the road reserve in most cases. These are areas which are regularly cleared to maintain the road reserve or have long been cleared of vegetation to make a way for services or just to improve visibility along the road.

In some areas, however, the pipeline route traverses vegetated areas and there will be a need for clearance before the trenches are excavated. A case in point is areas close to the river bank, where due to the continuous presence of moisture, there is dense riparian vegetation.
like what is found at the Lethakane River Bridge. At least 28 trees with a girth of more than 200 cm were enumerated to be within the pipeline route.

In addition, vegetation will be cleared along the railway reserve from Serule to Gojwane. Most trees to be felled are not protected. They are mostly Mophane trees.

**Assessment**
This impact is a low negative environmental impact of a short-term duration. The impact is reversible as the vegetation may grow back. This will only affect the site where clearing of vegetation will take place. This will be clearing of a 5 m wide corridor. The impact is of medium probability and assessed as low negative environmental significance. As already alluded to, much of the pipeline routes are devoid of any significant vegetation. No unique endangered species were identified along the project route.

**Impact Mitigation**
1) The limits of the working areas should be marked on the ground. The works to be undertaken should be within this limit.
2) It will be important to avoid cutting some of the mature trees which fall on working areas.
3) Only areas directly affected by works should be cleared.
4) The movement of construction vehicles should be restricted to designated access routes.
5) Damaged areas should be rehabilitated after completion of construction at that site or location.
6) Cleared vegetation should be stockpiled at an agreed location with the ECO to allow the communities to harvest or collect them in a safe environment.

**Significance of Residual Impact after Mitigation:** Low

**Impact 2: River Bank Erosion and Siltation**

**Phase: Construction**
The pipeline will cross several rivers and streams, the most notable being Lethakane River. River and stream crossings may result in several impacts which include blockage of river flow resulting in flooding, river bank erosion and scouring, and effect on aquatic flora and fauna if the river has to be temporarily diverted to provide for construction works. The proposed design entails securing the pipeline on the river bed. Disturbed river banks may collapse resulting in sedimentation and siltation of the rivers and streams.

**Assessment**
This is a moderate negative, definite impact and of short-term duration. The impact is reversible with rehabilitation after construction. This will only affect the site within rivers/streams where trenching and pipe laying will be done.

**Impact Mitigation**
1. The Contractor should ensure that working on the river bank is carefully guided with the strict adherence to the usage of the only designated access road and quick restoration of disturbed areas.
2. Opening trenches, pipe laying and covering of the trenches across the river banks should be undertaken in the shortest time possible, preferably in a day to reduce the risk of riverbank collapse and resultant siltation.
3. Reasonable compaction should be achieved around these areas to reduce erosion.
4. Once the pipeline is secured on the river bed, all scrap metal, waste paper and other waste should quickly be removed from the river bed and around it.
**Significance of Residual Impact after Mitigation:** Low

**Impact 3: Disturbance of Soil Stability**

**Phase: Pre-Construction, Construction and Decommissioning**

The disturbance of soil stability will be caused by trenching and excavation to pave way for project developments and such as laying of pipelines, chambers and pumps. This will result in the excavation of significant amounts of soil. The disturbance of soil stability consequently weakens its structure and makes it prone to agents of erosion such as water and wind in disturbed areas. Soils along the project route are likely to be trampled upon by the movement of construction machinery including vehicles making them less productive.

**Assessment**

The disturbance of the soil is of moderate significance since most of the activities will be confined to the working areas (pipeline routes) and will be limited to the construction phase of the project (short term). With the implementation of appropriate mitigation measures, the impact is reversible.

**Impact Mitigation**

1. Excavated soil should be heaped and used for filling trenches. Any excess soil should be used to control erosion in vulnerable areas.
2. Any trenches which are dug out should be quickly filled and compacted.
3. Construction trucks and machinery should use designated access routes.
4. Compaction to the required level by the engineer.

**Significance of Residual Impact after Mitigation:** Low

**Impact 4: Landscape Degradation and Visual Intrusion**

**Phase: Pre-Construction and Construction**

Scaring of the landscape is by far the most visible impact resulting from the project. The opening of the trenches for the pipes and the heaping of rubble creates a profound footprint on the environment which is not aesthetically appealing. This is aggravated by the fact that much of the landscape is devoid of vegetation making any disturbance clearly pronounced and vivid.

**Assessment**

This impact is of a high negative, short-term nature. The impact is reversible with rehabilitation after construction. This will only affect the site where trenching and pipe laying will be done.

**Impact Mitigation**

1. The pipeline should be worked in sections, preferably 100 m sections, which should be dug out, and a pipeline laid, and the trench covered on the same day.
2. If for any reason, a section of the pipeline cannot be covered overnight, a red reflective tape/net should be used around the trench to warn people. These open trenches should be as short as possible, preferably not more than 100 m long. Those trenches close to residential areas should be fenced off to prevent people from falling into them.
3. Covering of trenches should be such that no visible depressions are left on the line of the trench.
4. Movement of machinery should be restricted to working areas and designated access roads.

**Significance of Residual Impact After Mitigation:** Low
**Impact 5: Potential Soil and Water Contamination**

**Phase: Pre-Construction, Construction, Operations and Decommissioning**

Soil and water resources contamination may be caused by oil and petrol spills from machinery and construction works. Water resources will be at risk from faecal contamination if no proper sanitation facilities are provided to construction workers. These sources of pollution although emanating at construction sites, have potential to affect distant places as they can be soaked into soils and migrate with ground water, or can be washed into rivers and affect downstream water users. Similar projects have shown that Contractors can have a large labour force upward of 100 workers. It is expected that the effect of using the ‘bush system’ will be quite significant in areas without public toilet facilities and the effects will persist long after project completion.

Possible soil and ground water contamination will come from oil leakages from transformers, oil spills from generators etc.

Water lines require to be flushed prior to the scheme's commissioning and at regular intervals during operation to remove accumulated sediments or other impurities that have accumulated in the pipes.

The major environmental aspect of water pipe flushing is the discharge of flushed water, which may be high in suspended solids, residual chlorine, and other contaminants that can harm surface water bodies.

**Assessment**

This impact is moderately negative. The risk of oil and fuel spillage occurring and inappropriate discharge of effluent from flushing could impact negatively on the soil and water (surface and groundwater) within the vicinity of the project area.

The extent of the damage will depend on the extent of spillage. The effects of spillages and water resources contamination can have both local and regional ramifications as these can easily migrate from their origin and can be persistent in the environment. This impact is highly probable and may be irreversible depending on the extent of pollution.

**Impact Mitigation**

1. Servicing of vehicles should be undertaken in workshops or specially designated area with measures to prevent soil contamination.
2. Vehicles should be maintained regularly.
3. Avail waste bags or containers to move with the construction team along the pipeline.
4. Mobile toilets should be provided for use by the workers at the stipulated ratio in the Factories Act.
5. Care should be taken when refilling generators with petrol to avoid spillages.
6. The base of the pump station should be paved in cement/concrete material.
7. Regular inspection of transformers should be done to detect any possible leaks and maintenance thereof to stop the leaks.
8. A soil hospital consisting of two partitions should be constructed to store and treat contaminated soil. The bunded area floor should be paved and the facility roofed. The soil hospital wall should be at least 1 m high and should be covered at the top. This facility should be approved by Department of Waste Management and Pollution Control.
9. There are no municipal sewerage system with adequate capacity nor stormwater system within the study area. As such, flush water should be discharged into the environment, avoiding sensitive areas (ecological, social, susceptible to erosion) and spreading the flow to avoid erosion.

**Significance of Residual Impact after Mitigation: Low**
Impact 6: Dust Pollution

Phase: Pre-Construction, Construction and Decommissioning
Movement and operation of construction machinery, site clearing by waste stripping and topsoil removal, movement of construction vehicles along gravel roads in the communities and opening up of trenches which will generate dust. Some of the project works are located close to homesteads especially those pipelines leading to water reservoirs within the settlements. Dust emanating from works in such areas will negatively affect residence living in proximity of such works.

Assessment
This impact is of a moderate negative impact and of short-term duration. The impact may not be reversible but can be minimised or avoided. This will affect the local area depending on the wind direction. The impact is definite along the gravel roads within the beneficiary villages.

Impact Mitigation
1. The workers on site should be protected against the dust by wearing nose masks as per construction code of ethics.
2. Working areas close to built-up environment should be water sprinkled several times during the day of works to suppress dust.
3. Vegetation in working areas should be cleared selectively, to minimize the dispersion of dust.
4. All plants and construction equipment should be maintained to the appropriate standards to ensure the exhaust emissions are minimized.
5. All construction vehicles should be tuned and maintained regularly to ensure the emission levels are kept within permissible levels.
6. All construction machinery should be in good working condition and engine switched off when not in use.
7. All construction haul trucks to be used for transporting stockpile and spoils should be covered as per directive from Department of Waste Management and Pollution Control to prevent the emission of dust during transportation of materials. The secure covering of material in transportation by tarpaulin is highly recommended.

Significance of Residual Impact after Mitigation: Low

Impact 7: Noise Pollution

Phase: Pre-construction, Construction, Operation and Decommissioning
Noise levels are anticipated to rise during the excavation of trenches and other project works due to the use of machinery. In addition, the movement of vehicles in and out of the site will cause noise. Some of the pipelines reticulating water into the settlements are routed close to residential areas, and as such noise from sub-project works will potentially affect the residents. Various noise levels to be anticipated are shown in Table 35.

During operation, the pump stations may generate noise of about 85 dB at source (empirical noise level of a typical pump station). This noise may, however, not affect any receiving environment at the World Bank Pump Station (WBPS) (1) and WBPS 3, located at the outskirts of Selebi-Phikwe township and Serule village, respectively.

WBPS 2 is located to the west of Serule village, within the built up area. There are residential plots to the south-east of the site. The closest house is about 20 m (Plate 5) away. The residents around the pump stations may be affected by operational noise from the pump station particularly at night when the threshold of noise is 45 dB. The threshold during the day
is 55 dB. The baseline noise at the closest residential plot was measured between 43 dB and 52 dB during the day.

**Table 35: Noise Levels Generated by Construction Machinery Under Normal Wind Conditions dB (A)**

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>The Distance between Plant and Observer</th>
<th>Typical International Standard</th>
<th>NEPA Limit (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 m</td>
<td>20 m</td>
<td>50 m</td>
</tr>
<tr>
<td>Loader</td>
<td>90</td>
<td>78</td>
<td>70</td>
</tr>
<tr>
<td>Bulldozer (excavator)</td>
<td>86</td>
<td>74</td>
<td>66</td>
</tr>
<tr>
<td>Pneumatic Hammer</td>
<td>86</td>
<td>84</td>
<td>78</td>
</tr>
<tr>
<td>Concrete Mixer</td>
<td>91</td>
<td>79</td>
<td>71</td>
</tr>
<tr>
<td>Concrete Pump</td>
<td>85</td>
<td>70</td>
<td>62</td>
</tr>
</tbody>
</table>

Source: Federal Highway Authority, 2006

**Plate 5: Residential Plots close to proposed pump station WBPS 2**

**Assessment**

The noise impact at the pre-construction, construction, and decommissioning stages is of moderate, highly probably, short-term negative impact within the beneficiary villages. The impact may not be reversible but can be minimised or avoided. This will affect the local area depending on the wind direction.

At the operation stage the noise impact will be insignificant at the surroundings of the location of WBPS 1 and WBPS 3 as they are located at the outskirts of the town and village respectively. There will therefore be no disturbance to people.

There will be significant disturbance to the residents staying around WBPS 2 as it is within a built-up environment. This would require mitigation measures to minimise the noise impact.

**Impact Mitigation**

1. The machinery and vehicles for the sub-project should be well serviced and equipped with silencers to minimize noise.
2. Project operations should strictly be undertaken during the daytime.
3. Initial construction activities will be a nuisance to the workers who should be provided with noise protection gear as stipulated in the code of construction ethics.
4. Well maintained equipment tends to reduce the magnitude of noise generated and should be encouraged.
5. The building for the pump station at WBPS 2 should be made sound-proof to attenuate noise from the pumps to the barest minimum.
6. A quieter pump to achieve the minimum noise threshold at the receiving environment should be installed.

**Significance of Residual Impact after Mitigation:** Low

**Impact 8: Vibrations Due to Blasting and Excavation Works**

**Phase: Construction**

Blasting and excavation by use of JCBs may be necessary for some of the trenches as rock outcrops were observed at some areas along the pipeline route. Blasting will cause short intense noise and may involve fly rock which can be dangerous to nearby homes and bystanders.

**Assessment**

This impact is negative and of a high severity if damages occur to structures. The impact may not be reversible but can be minimised or avoided. This will affect the local area depending on the Peak Particle Velocity due to the magnitude of vibrations. The duration of the impact is immediate. The impact is highly probable within the beneficiary villages. It is assessed as moderate negative environmental significance as blasting will be temporary and restricted to areas with hard rock.

**Impact Mitigation**

1. A pre- and post-blasting survey should be made of all buildings, fences, and services in the area to be blasted. Colour photographic documentation should be used in order to assess any subsequent compensation claims for blasting related damage. The photos should be signed by the owners or their representatives.
2. Blasting should be designed such that the Peak Particle Velocity (PPV) is kept to the minimum using the current best practice.
3. Blasting design should be approved by the Department of Mines, and blasting should be done with the consent of service providers who have services around the location to be blasted.
4. All blasts should be monitored using Vibrometers or similar instruments.
5. All workers involved in the blasting exercise should put on protective clothing.

**Significance of Residual Impact after Mitigation:** Low

**Impact 9: Land Pollution**

**Phase: Construction, Operation and Maintenance and Decommissioning**

It is anticipated that waste in the form of litter, cleared vegetation and excess spoil will be generated during the construction of the pipeline. In addition, land contamination may be caused by the following:

- Oil leaks resulting from the operation of machinery.
- Inappropriate handling and/or disposal of waste including plastics, bottles, and cans by the construction workers.
- Pipes that will be broken.
- Blasted rock materials ad boulders.
- Decommissioned materials such as old tanks, pipes, metal poles.

The expected waste stream and their disposal methods has been presented in *Table 13*. 
Assessment
This impact is negative and of a high severity. The impact is short-term and is reversible. The spatial scale of the impact is at the local level. The impact is highly probable within the beneficiary villages. It is assessed as moderate negative environmental significance.

Impact Mitigation
1. Avail waste bags or containers to move with the construction team along the pipeline.
2. All blasted rock materials or boulders should be used for construction purposes whereas excess spoil should be used for erosional liable areas or availed for construction. If there is no use for them, they should be buried in an old unrehabilitated borrow pit following the obtaining of permission from the division of Environmental Health of the respective council to do so.
3. All non-hazardous solid waste generated must be disposed of appropriately at the nearest landfill or refuse dump.
4. If there is no further use for old pipes in the project, these should be stockpiled for future use and made available to the general public to collect and reuse.
5. Materials from the decommissioned tanks at Gojwane can either be reused or recycled.
6. Where spoil is contaminated, this should be treated and disposed of by a licensed and registered company that deals with hazardous waste collection and disposal.
7. All waste materials should be sorted out first such as contaminated rubble, metal, wood and other waste materials so that they are disposed of appropriately.
8. The Central District Council should inspect the site works to ensure that safe working environment is achieved.

Significance of Residual Impact after Mitigation: Low

Impact 10: Pooling of Water in Trenches

Phase: Construction
During the rainy season, water may pool in open trenches creating conditions for the outbreak of water-borne diseases. Mosquitoes breed in such environments. Children also like playing in such conditions further exposing them to hazards. Open trenches also pose risks to both livestock and humans, as they can fall into them.

Assessment
This impact is negative and of a low severity. The impact is immediate and is reversible. The spatial scale of the impact is at the site only. The impact is highly probable when it rains during when excavations have been made within the beneficiary villages.

Impact Mitigation
1. As much as possible all trenches should be opened and covered on the same day.
2. Open trenches along the pipeline routes and around the pump stations and reservoir tank sites should be fortified by a fence where possible to restrict access by children.
3. Special meetings with children should be conducted at Kgotla meetings and in schools to educate against playing in or near trenches. Parents/guardians should also be aware of the potential for harm and injury to children and assist in making necessary adjustments to ensure child safety.

Significance of Residual Impact after Mitigation: Low
**Impact 11: Fire Risk**

**Phase: Pre-Construction, Construction and Operation and Maintenance**
The use of ignitable materials such as petrol and other chemicals could cause fire at any stage of the project implementation. Machinery could auto ignite and cause fire; there could be electrical problems which could also cause fire. Smoking at places where ignitable materials could be can also cause fire.

**Assessment**
This impact is negative and of a high severity of immediate duration and is irreversible. The spatial scale of the impact is at the site. The occurrence of the impact is possible particularly at the contractor’s office and storage areas of vehicles and inflammable substances.

**Impact Mitigation**
1. All sources of ignition including matches, cigarettes, radios etc. should be kept away from all flammable liquids.
2. All flammable liquids and chemicals should be stored within a paved bunded area and protected from direct sunlight.
3. Fire extinguishers are to be provided at strategic places within the construction camp site especially at the workshop and fuel tank site and the engineers’ office. The extinguishers should conform to BOS ISO 5923:2006.
4. All project vehicles, trucks and machinery (e.g. JCB) used by the Contractor as well as the engineers should be equipped with fire extinguishers.
5. A 10 m firebreak/guard from the perimeter of the construction camp site should be maintained.
6. All fire hazard areas should be clearly defined, and appropriate signage erected (e.g. prohibition of the use of smoking materials, cellular phones, or other potential spark generating equipment) (IFC, 2007).
7. All firefighting equipment including fire hydrants, hoses, fire detectors, alarm systems, fire extinguishers, fire beaters, fire hydrant and sand buckets are available on site. These should be tested for effectiveness at least once a year for the duration of the construction works.
8. When spillages or leakages do occur, they should be dealt with quickly in the way as recommended by the supplier.
9. Workers should be sensitized on safe work procedures related to the use, handling, storage, cleaning up and disposal of flammable liquids. To this effect they should be educated on the hazards arising from the use of flammable liquids and the need to eliminate ignition and heat sources from work area. Training on proper handling and storage of flammable liquids should be provided. The training should also include emergency procedures for dealing with incident. Periodic refresher training should be arranged.
10. Workers handling fuels and other chemicals should be provided with adequate and proper protective clothing including safety boots, overalls, and head caps.
11. Workers should not be permitted to smoke within, around and along the project site.

**Significance of Residual Impact after Mitigation:** Low
**Impact 12: Change in Direction of Surface Run Off/ Altering of Drainage Patterns**

**Phase: Pre-Construction, Construction and Operation and Maintenance**
With the disturbance of the earth surface through excavation and movement of heavy-duty trucks, the direction of surface runoff may change and find its own level. This may flow into people’s home or properties and flood them.

**Assessment**
This impact is negative and of a moderate severity, immediate duration and is irreversible. The spatial scale of the impact is at the site. The impact is possible particularly at the contractor’s office and storage areas of vehicles and inflammable substances.

**Impact Mitigation**
1. Regular inspection of excavated site to check direction of flow of surface run off.
2. Redirect surface flow to original direction or channel of flow.
3. Compensate owner for any property damaged.
4. Insure for third party/ public and private properties that are damaged.

**Impact 13: Water Quality from the Water Treatment Plant**

**Phase: Operation and Maintenance**
The increased throughput from the water treatment plant and considering its age there could be issues of compromised water quality supplied thereby posing health risk to project beneficiaries.

**Assessment**
This impact is negative, moderate and reversible. The affected will be locals getting water from the treatment plant including the town of Selebi-Phikwe.

**Impact Mitigation**
1. Continue with routine monitoring of water quality – raw water supply and treated water.
2. Implement and adhere to Care and Maintenance Plan to ensure the water treatment plant and associated infrastructure is performing optimally.
3. As per the engineering design have further treatment (chlorine dosing) at pump stations and supply tanks to compensate for loss of residual chlorine due to distance from the water treatment plant.

**Impact 14: Increased Water Abstraction from the Dam and the Treatment Plant.**

**Phase: Operation and Maintenance**
With addition of population of the six villages the raw water abstraction from the dam will increase with potential conflict with other competing users. The significant other user is the southern part of the country via the NSCWP.

**Assessment**
This impact is negative, of a moderate severity and will happen for the life of the project. It is of national concern in that even populations outside the project area could be affected. The closure of the mine has availed extra water and capacity at the dam and treatment plant albeit that as part of the master plan the villages were included under master planning for the region.
**Impact Mitigation**

1. Planning and management of dam as a source in context of national approach guided by demands by different users.
2. Public education and awareness on water conservation measures to the whole nation so to preserve the limited water available in Botswana.
3. The wellfields in the region will recharge and act as back-up source in cases of need.

**7.4.4 NEGATIVE SOCIAL IMPACTS**

**Impact 1: Land Acquisition/Expropriation**

**Phase: Pre-Construction**

Land will be required for the pump stations in Selebi-Phikwe and Serule. Likewise, land will be required for the reservoirs and pipe laying. In all three new plots are required for the reservoirs and pump stations. These are at Selebi-Phikwe Town, Serule and Gojwane Settlements.

For the pipeline route, a total of two plots will partially be affected. These comprise of a commercial and private plot in Mmadinare village and a private plot belonging to the VDC in Topisi village. Portions of the Plots must be expropriated, and compensation paid as per the Abbreviated Resettlement Action Plan which has been prepared.

The owners of all these properties affected have been consulted and have consented. They are currently awaiting the payment of compensation.

**Assessment**

This impact is negative and of a minor severity and is of permanent duration and is irreversible. The spatial scale of the impact is at the site. The occurrence of the impact is definite as land is required for the laying of the pipeline and location of a new water tank and reservoir.

**Impact Mitigation**

1. Applications for the acquisition of land will need to be lodged by the Client-Water Utilities Corporation with relevant institutions such as the Selebi-Phikwe Town Council for land within the Selebi-Phikwe planning area
2. Compensation must be paid to all affected before construction commences as per OP 4.12
3. Throughout the design process, the aim should be to minimize the number of properties to be affected, by changing the design, rerouting the pipeline where possible.
4. The properties to be affected should be listed and the owners identified.
5. Respective Land Boards where the project is being implemented should spearhead the process of evaluation of properties for compensation.
6. The cost of compensating affected parties should be included in the overall project costs.

**Significance of Residual Impact after Mitigation:** Low
Impact 2: Cracking of Structures (Houses)

Phase: Construction
Due to the proximity of some households to the routes to be constructed, there is the likelihood that these properties may be affected by construction activities such as excavating by use of machinery and blasting of rocks. Usually, due to the intensity of work undertaken by these machines, there occur instances of houses cracking under the impact of these machines.

Assessment
This impact is negative and of a moderate severity and is of a short-term duration and is reversible by repairing the cracks. The spatial scale of the impact is at the site. The occurrence of the impact is possible as it will depend on the strength of the structures and the intensity of vibrations.

Impact Mitigation
1. Photographic records of properties likely to be affected should be taken prior and after construction to determine whether the damage/cracking was due to construction activities. This should discount any prospects of false claims arising from property owners.
2. Properties affected should be repaired or owners adequately compensated.
3. The Contractor should prepare a Vibration Plan as part of its Contractor’s Environmental and Social Management Plan (C-ESMP)

Significance of Residual Impact after Mitigation: Low

Impact 3: Damage to Public Utility Services

Phase: Construction
A number of public utility services may be affected or even damaged during the construction of the project. The pipeline will crossroads, railway, paths, affect bridges and culverts. Some of these public utility properties may be damaged in the process. Services or infrastructure such existing BPC lines or cables, optical fibre and water pipelines may be damaged and cause disruption of services to communities even beyond the project site.

Assessment
This impact is negative and of a moderate severity. It is of a short-term duration and is reversible by repairing the damages. The spatial scale of the impact may be at the local spatial scale depending on the type of utility. For example, there may be distribution disruptions downstream when a utility is damaged. The occurrence of the impact is highly possible.

Impact Mitigation
1. Prior to excavation works, all services underground and above ground should be mapped with the assistance of the service providers to avoid damage.
2. Operators of machinery should be assisted with a ground man when excavating.
3. Outlined procedures should be followed in the crossing of roads, bridges, and culverts.
4. Any damage should immediately be reported to the respective authorities or service provider for repairs.

Significance of Residual Impact after Mitigation: Low-Moderate depending on extent of repair
Impact 4: Blockage of Access to Properties

Phase: Construction
In residential areas, access to properties will be a major challenge as the trenches will cut across accesses into homes and other properties. Some paths will also be blocked due to the excavation of trenches.

Assessment
This impact is negative and of a moderate severity, of an immediate duration, and is reversible through the mitigation measures provided. The spatial scale of the impact is at the site only. The occurrence of the impact is possible as trenching will also occur in the built environment of the beneficiary villages.

Impact Mitigation
1. During the digging of trenches, access to properties including culverts should be spared to allow residents continued access to houses.
2. Digging trenches across accesses to homes should only be attempted when it is clear works can be completed on the same day, so as not to frustrate residents especially those who own vehicles.
3. Where possible alternative access to properties should be provided should it become evident that works cannot be completed on the same day.
4. Any gaping holes leading to accesses should be quickly closed, otherwise clear markings for their presence should be provided.
5. Works across busy paths should be worked expeditiously to be completed in a day.
6. Crossing facilities over trenches should be provided.

Significance of Residual Impact after Mitigation: Low

Impact 5: Traffic Disruption

Phase: Construction
The proposed pipeline route will have a total of 20 road crossings. Although the bulk of these crossings are on dirt and gravel roads, at some points the road crosses the A1 Road as well as the Serule-Phikwe Road (Plate 6). Traffic will be delayed and disrupted at the sections where the pipeline is being constructed. This will cause frustrations among the motorists.

Plate 6: Road to be Crossed at Mmadinare Junction, as well as at Serule Junction
Assessment
This impact is negative and of a moderate severity of an immediate duration and is reversible through the mitigation measures provided. The spatial scale of the impact is at the site only. The occurrence of the impact is highly possible as the project will generate traffic and cut along the main A1 Road.

Impact Mitigation
1. The contractor must develop and implement a site-specific Traffic Management Plan.
2. To reduce delays, detours should be provided and signs indicating their presence should be very clear.
3. Adequate warning signs should be placed on the road warning motorists on the presence of roadworks.
4. Flagmen should be deployed at the detours to ensure safe movement of motorists.

Significance of Residual Impact after Mitigation: Low

Impact 6: Traffic Accidents

Phase: Construction and Decommissioning
There is potential for accidents including construction vehicles and motorists, as well as construction vehicles and pedestrians. This may be because construction vehicles are generally slow moving and may not use designated/conventional access routes and some drivers who are keen to deliver may be impatient and may not obey traffic signs.

Assessment
This impact is negative and of a moderate severity. It is of an immediate duration and is reversible through the mitigation measures provided. The spatial scale of the impact is at the site only. The occurrence of the impact is rated as low.

Impact Mitigation
1. Signs warning motorists and pedestrians about the presence of construction work and construction vehicles should be erected near project works.
2. The local community should be informed in advance of project commencement including safety measures which will need to be upheld.
3. Contractor staff should be educated to uphold the Road Traffic Act.
4. Construction vehicles should have a yellow flashing light on top to warn other motorists.
5. Adequate warning signs should be placed on the road warning motorists on the presence of works.
6. The contractor should have a road safety officer on site during construction to control traffic when roads are being crossed.

Significance of Residual Impact after Mitigation: Low

Impact 7: Damage to Land and Personal Property

Phase: Construction
Like impact 3, it is likely that a number of private properties including land may be disturbed during the construction of the project. The disturbance would be in the form of removal and replacement of fences, sign boards, the train monument in Selebi-Phikwe and access to land uses such as bus stops, places of sale (firewood, food vendors, etc.).
In order to create adequate space for construction in the built area of Gojwane Settlement, after the general dealer’s plot, it is likely that fences of plots along the access road to the tank may be removed and re-instated after construction.

**Assessment**

This impact is negative and of a moderate severity. It is of an immediate duration and is quickly reversible through the mitigation measures provided. The spatial scale of the impact is at the site only. The occurrence of the impact is ranked definite.

The impact is of moderate environmental significance. The disturbances caused by the pipeline project are, however, reversible.

**Impact Mitigation**

1. Prior to works owners of properties likely to be disturbed should be informed at least a week prior to implementation of works either through door to door visits by the CLO or through letters indicating activities to be undertaking and when and duration.
2. Compensation to be paid by the constructor. For example; where fences have been damaged, they should be replaced within a week of disturbance. All fences removed should be properly reinstated.

**Significance of Residual Impact after Mitigation:** Low

**Impact 8: Exposure of Workers and Water to Radiation**

**Phase: Construction and Operation**

Radiation exposure can lead to potential discomfort, injury or serious illness to workers. According to A-Cap Resources, the company intending to mine Uranium in the project area, the resource is widespread all over Gojwane, Serule and at Damuchojennaa Settlements. They indicate that Uranium is found at a metre deep. This implies the construction workers working within these areas will be exposed to radiation through dust and will need to be protected. Those working at the soil laboratory to be established for the project are also potentially equally exposed to radiation because of the machines they use. They however reported that the total doses from atmospheric sources (dust) are well below the threshold limits.

**Assessment**

The potential impact of radiation exposure to workers and the community during the construction phase is negative, it could be high severity with immediate to permanent duration and effect. It is irreversible when it occurs. The spatial scale of the impact is limited to the area around Gojwane, Serule and the occurrence of the impact is ranked highly possible.

**Impact Mitigation**

Prevention and control strategies should be established in places of work involving occupational and/or natural exposure to ionizing radiation.

In mitigating the potential impact of occupational radiation of workers, documents on radiation safety from the International Atomic Energy Agency (IAEA) as well as studies undertaken by A-Cap Resources on the Uranium have been considered. Consultations have also been held with the Radiation Protection Inspectorate of Botswana. The mitigation measures suggested below are therefore commensurate with the potential exposure levels to workers and communities associated with this sub-project and internationally recognized safety standards and guidelines (including dose limits):
1. Educate workers on hazards of Uranium and radiation in general by inviting qualified personnel from the Department of Radiation Protection Inspectorate to the potential affected sites.

2. Provide the appropriate PPE for the prevention of radiological exposure, including but not limited to safety boots, overalls, face masks, gloves and hard hat.

3. Undertake mandatory medical surveillance (pre-medical and post medical examination) of workers of workers working in high risk areas.

4. Monitor exposure of radiation on workers daily by using TLD monitoring badges. The threshold for exposure as contained in The WBG EHS General Guidelines\(^{30}\) and specifically the guidelines on Occupational Health and Safety, section 2.6 Radiological Hazards, Table 2.6.1\(^{31}\)(also presented in Annex W)

5. Use water to suppress dust at the work place.

6. Monitor water quality to Gojwane regularly during operation for any possible cross contamination through the pipework.

**Significance of Residual Impact after Mitigation:** Low–Moderate

**Impact 9: Trench Collapse (Cave-ins)**

**Phase: Construction**

Trench collapse or cave-ins is one of the most injurious and fatal activities in construction associated with excavations or trenching. The sub-project entails trenching of 130.4 km of pipeline at a depth of 1.5 m. The pipes will be laid about 2 to 2.5 m from the edge of road reserves. Excavations will be done by machines (excavators) and the pipes will be laid in the trenches by workers and backfilled and compacted using machines. Any trench with a depth of 1.22 m or deeper is risky and needs all attention to protect workers and the walls of the trench depending on the soil type being worked, as well as the surrounding conditions such as weather and vehicle movement. Excavation and trenching are among the most hazardous construction operations.

**Assessment**

This impact is negative and of a moderate severity. It is of an immediate duration and is reversible through the mitigation measures provided. The spatial scale of the impact is at the site only. The occurrence of the impact is ranked probable as the soils at some sections are collapsible.

**Significance of Impact**

The significance of this impact is of a moderate, negative and non-reversible in nature.

**Impact Mitigation/Intervention**

1. Employ a competent person to inspect trenching daily.
2. Keep heavy equipment away from trench edges.
3. Trenches should be inspected following a rainstorm.
4. Provide safe access and ingress to all excavations with the use of amongst ladders and step ramps. These should be provided at intervals of 8 m along the trenched pipeline route.

\(^{30}\)https://www.ifc.org/wps/wcm/connect/377bfe12-a3c0-433f-a5e3-c51dbebe38d4/SectorSpecificEHSGuidelines_Applicability.pdf?MOD=AJPERES&CVID=lakafE1

\(^{31}\)https://www.ifc.org/wps/wcm/connect/1d19c1ab-3ef8-42d4-bd6b-cb79648af3fe/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES&CVID=ls62x8l&useDefaultText=0&useDefaultDesc=0
5. Stockpiles of excavated materials should be put at minimal a safe distance of 1 m from the edge of the trench.
6. Protect workers and trenches by use of shoring or shielding.

**Significance of Residual Impact after Mitigation:** Low

**Impact 10: Increase in HIV/AIDS, STDs and Other Communicable Diseases especially resulting from labor influx**

**Phase: Construction and Decommissioning**
The presence of construction workers in the project area may result in the development of sexual relationships amongst themselves or with the community which may result in the transmission of STDs including HIV/AIDS and other communicable diseases. Considering the ongoing HIV/AIDS pandemic, there is high potential for workers to contribute negatively to the population of the project area. School girls and young unemployed women are especially vulnerable, who may seek financial benefits from relationships with workers.

Selebi-Phikwe and the Central Bobonong areas which includes, Mmadinare, Damuchojena, and Serule areas have one of the highest HIV/AIDs prevalence rates in Botswana as indicated in Table 36. The most affected males between the ages of 30-34 are affected the most in Selebi-Phikwe. In all the cases both ages and sex, the prevalence of HIV are higher in the beneficiary communities than the national rate.

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<tbody>
<tr>
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<td>10.1</td>
<td>42.2</td>
<td>29.9</td>
<td>6.7</td>
<td>12.4</td>
<td>20.2</td>
<td>54.2</td>
<td>33.4</td>
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<tr>
<td>Selebi-Phikwe</td>
<td>9.2</td>
<td>12.6</td>
<td>30.8</td>
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<td>20.2</td>
<td>51.3</td>
<td>38</td>
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<tr>
<td>Central Bobonong</td>
<td>9.6</td>
<td>39.4</td>
<td>29.2</td>
<td>4.8</td>
<td>13</td>
<td>21.1</td>
<td>43.9</td>
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<tr>
<td>National</td>
<td>7.9</td>
<td>34.4</td>
<td>24.3</td>
<td>4.1</td>
<td>9.5</td>
<td>16.3</td>
<td>40.6</td>
<td>23.9</td>
</tr>
</tbody>
</table>

Source: NACA (2014)

This is of moderate to high significance and could be life threatening and may be either reversible or irreversible depending on the type of disease. The impact is of an indirect nature as the workers employed may be exposed to communicable diseases (such as diarrhoea, flu, and coughing) when the leave the site or return. The impact may re-occur and spread further if it is not properly treated given the nature of infectious diseases. Some are transmitted through bites from insects while others are caused by ingesting contaminated food or water.

**Assessment**
This impact is negative and of a high severity. Its effect is of permanent duration and is irreversible. The spatial scale of the impact could be at the national and local levels. The occurrence of the impact is highly probable. It is assessed as high negative social significance. The mitigation measures presented below should, therefore, be implemented given the direct impact on human well-being.

**Impact Mitigation**
1. The Contractor should conduct an awareness session periodically (monthly) on communicable diseases, their prevention and treatment.
2. Workers should be encouraged to keep good personal hygiene.
3. The contract will be existing local HIV/AIDS institutions and focal points (including the HIV/AIDS coordinating office) in the beneficiary villages for service provision and HIV/AIDS education with project workers and communities. And this measure will be included in the C-ESMP.
4. Sensitize workers on HIV/AIDS and afford them time to attend health sessions.
5. Consult with the relevant health institution to ensure alignment of health and safety programs with national HIV/AIDS Policy and District HIV/AIDS programs.
6. Condom dispensers should be placed at the Contractor’s office, toilets’ and change rooms and replenished daily.
7. Ensure women have an equal opportunity to be hired as this could help address the problem of younger women getting into relationships for financial support.
8. Enforce the Codes of Conduct and socialize them with workers and communities.

**Significance of Residual Impact after Mitigation:** Low

**Impact 11: Increased Pressure on Existing Social and Health Facilities**

**Phase: Construction and Decommissioning**
The influx of workers, estimated to be around 120 people (approximately 180 will be from the local communities) will result in increased pressure on the existing social and health infrastructure like health institutions, waste facilities, roads, veldt products, and water. This could lead to social conflicts.

The significance of this impact is of a moderate, negative and irreversible nature. It is also of a direct nature as the workforce and staff will need these social services to survive. There is however enough capacity to absorb the demands of the workers and staff.

**Assessment**
This impact is negative, of a moderate severity, with short term duration and is reversible. The spatial scale of the impact could be at the local level. The occurrence of the impact is definite.

**Impact Mitigation**
1. The Contractor shall assist with waste collection and disposal.
2. The workers and staff will be prohibited to harvest natural resources so as to avoid competing with community members for livelihoods. This will also be monitored by the contractor. However, they are permitted to purchase such products from local suppliers.
3. The workers shall receive monthly awareness training on the norms and cultural values of the local communities.
4. WUC will hold a stakeholder engagement session for local service providers, including health and emergency services to discuss the temporary influx of workers in the project area and to prepare for potential increase in demand due to the project.

**Significance of Residual Impact after Mitigation:** Low

**Impact 12: Accidents, Ill Health and Injuries of Workers (Occupational Health)**

**Phase: Pre- Construction, Construction and Decommissioning**
There is a potential risk of incidents and accidents involving workers as well as members of the public who may gain unauthorized access or inadvertently venture on to the site during construction.
Open trenches may pose a threat to the animals (domestic and wild) as they move from one place to the other. The trenches also pose a threat to the community members especially the school children and livestock as the pipes that will be laid along the road reserve pass within residential plots.

The project will also require installation of elevated water tank; this is likely to cause potential accidents and injuries to workers, as they would be working at heights averagely 6m high.

Project activities like sawing, building of chamber valves and the rest could result in accidents and injuries of workers.

**Assessment**
This impact is negative and of a moderate severity. Its effect could be of a permanent duration and is irreversible. The spatial scale of the impact could be at the site only. The occurrence of the impact is highly probable. It is assessed as high negative social significance. The mitigation measures presented below should, therefore, be implemented given the impact on human and animal well-being and safety.

**Impact Mitigation**
1. All open trenches should be adequately barricaded using danger tapes strung around profiles.
2. All possible entry points into the site should be closed immediately.
3. The local community should be informed in advance of project commencement including safety measures that would be upheld throughout the construction period
4. A Community Liaison Officer (CLO) should be engaged to handle and record for reference purposes any complaints that might be raised by members of the community.
5. Ensure the scaffolding at the 15 m high tank is inspected by a competent person before use.
6. Appropriate PPE such as harnesses, safety nets and helmets should be provided and the use of these should be enforced.
7. The Contractor and its subs and all workers must be sensitized on the Codes of Conduct and Action Plan for Implementing ESHS and OHS Standards throughout the implementation of the project, with monitoring to ensure compliance.

**Significance of Residual Impact after Mitigation**: Low

**Impact 13**: Accidents Involving Humans and Livestock of Beneficiary villages (Community Health)

**Phase: Construction and Decommissioning**
Open trenches may pose a threat to the animals (domestic and wild) as they move from one place to the other. The trenches also pose a threat to the community members especially the school children and livestock as the pipes that will be laid along the road reserve pass within residential plots.

**Assessment**
This impact is negative and of a high severity. Its effect could permanent and is irreversible. The spatial scale of the impact could be only at the site. The occurrence of the impact is highly probable. It is assessed as high negative social significance. The mitigation measures presented below are highly recommended.

**Impact Mitigation**
1. “Workers Ahead” signs should be placed close to working areas especially when they are near roads or working on roads.
2. All open trenches should be adequately barricaded using danger tapes strung around profiles.
3. No unauthorized entry signs should be placed at the entrance to the site which should be manned at all times.
4. The local community should be informed in advance of project commencement including safety measures that would be upheld throughout the construction period.
5. A community liaison officer should be engaged to handle and record for reference purposes any complaints that might be raised by members of the community.
6. The contractor should also insure the public or third party as part of its insurance policy.

**Significance of Residual Impact after Mitigation:** Low

**Impact 14: Potential Disturbance of Burial Sites**

**Phase:** Construction

Although no archaeological sites or artefacts were found at the surface of the ground during the Archaeological Impact Assessment Study (see AIA Report: Volume 3 of 3) there may be a potential to unearth graves or artefacts during excavation. It is important to be ready to deal with such situations should they occur.

**Assessment**

This impact is negative and of a high sensitive, culturally, socially and spiritually significant to the community and individual members. Its effect is of a short to permanent duration depending on the level of disturbance. It is irreversible. The spatial scale of the impact could be at the site only. The occurrence of the impact is highly probable between Serule to Gojwane settlements.

**Impact Mitigation**

1. Educate workers on archaeological finds.
2. Follow the procedures of Chance Finds in Annex U. This includes stopping work and informing the Project Monitoring Team. They will in turn inform the Department of National Monuments and Museum for further action.

**Significance of Residual Impact after Mitigation:** Low

**Impact 15: Potential for Gender Based Violence (GBV) and Sexual Harassment Exploitation Abuse (SHEA) and Violence against Children (VAC)**

**Phase:** Pre-Construction, Construction and Decommissioning

GBV is an umbrella term for any harmful act that is perpetrated against a person’s will and that is based on socially ascribed (i.e. gender) differences between males and females. It includes acts that inflict physical, sexual or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private. The term GBV is used to underscore systemic inequality between males and females (which exists in every society in the world) and acts as a unifying and foundational characteristic of most forms of violence perpetrated against women and girls. (Annex S)

Given the high situational context for GBV risk in the country (approximately 67 percent), the presence of influx of workers may increase this risk for GBV/SHEA.

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The key findings of the GBV Indicators Research Project in Botswana undertaken by Gender Links and the Women’s Affairs Department (WAD) indicate relevant for impact assessment:

1. Over two thirds of women in Botswana (67 percent) have experienced some form of gender violence in their lifetime including partner and non-partner violence. A smaller, but still high, proportion of men (44%) admit to perpetrating violence against women.
2. Nearly one third of women (29%) experienced Intimate Partner Violence (IPV) in the 12 months to the prevalence survey that formed the flagship research tool in this study. In contrast, only 1.2% of Batswana women reported cases of GBV to the police in the same period. Thus the prevalence of GBV reported in the survey is 24 times higher than that reported to the police. This suggests that levels of GBV are far higher than those recorded in official statistics and that women have lost faith in the very systems that should protect them as well as offer redress.
3. Patriarchal attitudes are a significant underlying factor driving the incidence of GBV in Botswana. While women and men affirm gender equality in the public domain this has not translated in their private lives particularly in their intimate relationships.
4. During the consultations for the social assessment in Damuchojenaa and Gojwane settlements, the community highlighted their concern over the rise of teenage pregnancies in their communities, often leading to single parenthood and deepening poverty and other impacts on the development of single parents such as dropping out of school, further entrenching poverty and hardship. The community reflected on previous (non-World Bank projects) in their community that gave rise to such outcomes. They asked for the project to address this risk in the project. To that end, the project will socialize expected behaviours with project workers as agreed to with the signed Code of Conduct, including reinforcing the understanding that any sexual relations with anyone under the age of 18 is prohibited and failure to comply will result in immediate dismal and subject to legal sanctions. As such, monthly training on the Codes of Conduct will be conducted by the contractor to reinforce worker’s and community understanding of expected behaviours.

**Assessment**

This impact is negative and of a high severity. Its effect could be of a permanent duration and is irreversible. The spatial scale of the impact could be at the local or project area. The occurrence of the impact is highly probable. It is assessed as high negative social significance. The mitigation measures presented below are essential to mitigate GBV incidences in this project.

**Impact Mitigation**

1. Contractor to engage an expert (as a staff or consultant) on GBV to conduct a monthly awareness and education discussion on GBV, Sexual Harassment Exploitation and Abuse (SHEA) and Violence Against Children (VAC). This should include their prevention and to provide services to GBV survivors and perpetrators. The Department of Gender should also be engaged and actively involved in such training given their expertise on this issue.

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2. Train project-related staff and beneficiary communities on behaviour obligations. To make this effective, all workers, including Contractors must sign a code of conduct, and enforced for compliance. A social officer should be hired to ensure enforcement and monitoring of the codes of conduct.

3. Give women equal opportunity when hiring labor between male and female employees as this could help address the problem of younger women getting into relationships for financial support and being abused in that process.

4. A Gender-Based Violence (GBV), Sexual Harassment Exploitation and Abuse (SHEA) and Violence Against Children (VAC) Compliance Team to be formed as per World Bank’s guidelines as presented in Annex S.

5. The Contractor and their sub-Contractors and all workers are to be sensitized on the Codes of Conduct and Action Plan for preventing Gender Based Violence (GBV) and Violence Against Children (VAC) throughout the implementation of the project and compliance should be monitored by safeguards specialists or a dedicated GBV compliance officer.

**Significance of Residual Impact after Mitigation:** Low

**Impact 16: Despondency on Loss of Employment**

**Phase: Decommissioning**

After construction, most workers will be laid off, and some may probably be unemployed for a long time. It is important that the workers are psychologically prepared to look for other employment avenues to meet their daily social and economic demands.

**Assessment**

This impact is negative and of a moderate severity. Its effect could be of a short term. The spatial scale of the impact could be at the national level. The occurrence of the impact is definite after the construction works, where labor will be laid off.

**Impact Mitigation**

1. The contractor should hire workers who were engaged in the construction from nearby localities when undertaking major maintenance work.

2. The contractor should invite relevant Government officials to site occasionally to educate workers about various Government poverty alleviation programmes including loans and grants which could enable them to start income generating programmes and not rely on sporadic engagements.

**Significance of Residual Impact after Mitigation:** Low

**7.5 IMPACTS ON VULNERABLE COMMUNITIES (BASARWA)**

In addition to the impacts identified and assessed above, which pertains to all the beneficiary villages, an assessment of impacts on Vulnerable Communities (the Basarwa) in Gojwane and Damuchojenaa settlements who meet the criteria of World Bank policy OP 4.10 is presented below.

**7.5.1 Impacts on Access to Land**

There is no loss of land that belongs to any Indigenous person in any the two settlements, apart from an area of about 937.8 m² of tribal land that will be used for the construction of a
new tank in Gojwane Settlement (See Maps 4 and 5. The site for the new tank has been allocated to WUC by the Tonota Sub-Land Board. The pipeline route is to be laid along road reserves belonging to either the Roads Department of both the local or Central Government and Botswana Railways.

In Damuchojenaa Settlement the pipeline has avoided the community grazing land. The pipeline route in Damuchojenaa is outside the residential areas of the settlement. The closest plot is about 30 m away. The Basarwa have communities in both settlements.

In Gojwane the pipeline route would pass between residential plots along the road reserve. The closest residential plot from the route is about 5 m. No physical or economic displacement is anticipated as a result of project interventions.

Map 4: Land Use Map of Damuchojenaa Showing Pipeline Route

Map 5: Land Use Map of Gojwane Showing Pipeline Route and Tank
7.5.2 Impacts on Livelihoods and Employment

No livelihoods of Basarwa will be disrupted or curtailed due to the sub-project. They will continue with the herding of cattle and harvesting of natural resources such as thatch, wild fruits and mopane worms and the Ipelegeng poverty eradication programme. Rather temporary employment for both skilled and unskilled labor will be created during construction of the pipeline. Livelihood opportunities may be created such as selling items such as food, and natural resources during construction, small scale/backyard gardening may also occur.

The creation of the employment will be short term during construction as there will be a need for local labor. Employment created for the local community and the influx of workers will also boost local businesses such as food stuffs and sale of livestock. The contractor will be encouraged to source some of the materials and services locally to boost the local economy and to improve livelihoods.

7.5.3 Impacts on Culture, including Language

In terms of culture, the pipeline route does not disturb any place of worship or cultural significance. All known burial areas have been avoided, should any be found the Chance Finds Procedure will be followed and the community will be involved in the process. Again, the sub-project within the Vulnerable Communities will take less than two months to complete so the any impact on culture, including language loss, is likely to be very weak.

The Basarwa are multilingual. They speak Setswana and English (and some speak their traditional language, Sesarwa) and can therefore communicate adequately with the project implementers.

Given the history of relocation from their traditional lands and forced severance, the Basarwa no longer practice their traditional livelihoods, although many expressed a desire to be able to reconnect with their cultural and ancestral traditions.

7.5.4 Impacts on Community Relations and Social Issues

The influx of workers may exacerbate the spread of HIV/AIDS and other diseases in the beneficiary communities. They may also put pressure on the existing social facilities such as health posts.

Alcohol abuse, teenage pregnancy and affray were found to be serious social problems in the beneficiary villages. Consultations in the two villages where vulnerable communities were present also highlighted these concerns and wanted measures in place to prevent exacerbating these issues as a result of the project. These will be addressed ESMP (Chapter 8, Table 38). As it is anticipated these challenges may be exacerbated as a result of labor influx and employed community members in the project, WUC hire a GBV/SHEA/VAC consultant or specialist to assist with implementation mitigation efforts and community engagement.

With the increase in income and in view of the high poverty levels, there may likely to be sexual exploitation, harassment and SHEA abuse (SHEA) of women by those employed particularly at the shebeens or bars, as well as an increased risk for transactional sexual relationships.

Given the poverty levels in the communities, children are normally involved in the herding of livestock, harvesting of veldt products and sales along the main roads. It is therefore likely that they may be encouraged by their parents or guardians to seek employment from the sub-project. It will be ensured that no child below the age of 14 is employed on the sub-project in line with national law and the International Labor Organization (ILO) and in this case only if it does not interfere with their education, social development and well-being and if it is light work.
The probability of some of these risks occurring is high and the severity may have enduring impacts on the community and individuals. The significance is therefore very high. Mitigation measures are included in the ESMP (Chapter 8). These include conducting regular awareness outreach and education on the Codes of Conduct on GBV/SHEA/VAC of both communities and all workers related to the subproject. In addition, monitoring behaviours of workers, Contractors, and the community and enforcing the Codes of Conduct. This will help mitigate against these social problems that may stem from the sub-project. Moreover, engaging the local police service, social workers, and the GBV unit in the Gender Department (as well as NGOs) to assist with delivering awareness sessions will also be part of the mitigation measures to enhance implementation. In addition, there will be regular outreach by the PLO and GBV consultant and awareness raising in communities on the existence and use of the GRM and the related processes in the GRM to report instances of GBV/SHEA/VAC. The Codes of Conduct (GBV/SHEA/VAC) will be included in the CESMPC-ESMP as well as related requirements for the contractor to ensure compliance and oversight of its workers as well as requirements for conducting sensitization sessions with the community and their workers on the Codes of Conduct and behavioural expectations.

### 7.5.5 Institutions

The sub-project will not destabilise any of the local institutions and current customs of the Basarwa. Current established institutions will be used in the management of the sub-project. The only new process/body to be formed in the vulnerable settlement will be the Grievance Redress Committee where two members of the community is expected to be part of the committee, and where Basarwa are present, at least one of those members must be from that community.
8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

This chapter together with Annex S (which includes in full the World Bank’s Codes of Conduct) represents the operationalization and the administration of the implementation of mitigation measures including monitoring and the conduct of the Contractor.

These set out measures and actions required for the project to achieve compliance with the ESMP considering the findings of the environmental and social assessment, the WB’s due diligence, the laws and regulations of Botswana and the results of the engagement with stakeholders, interested and affected parties.

This ESMP has been prepared following agreed and adopted final designs with the project engineering team.

8.2 Mitigation Plan

The mitigation plan presents a programme for the management of mitigation measures. It answers the questions on what impact is to be mitigated, the mitigation measure to be implemented, and resources required for implementing the measures and assigning responsibility on who undertakes the mitigation measures. This is represented in Table 38.

8.3 The Monitoring Plan

A monitoring plan for any project is designed to among other things, checking the compliance of the activities of the sub-project against set standards and regulations. According to the EIA Act 2011, the minimum content of the monitoring programme is shown in Table 39.

8.4 Environmental and Social Inspection and Reporting

The Contractor shall appoint an environmental officer registered with Botswana Environmental Assessment Practitioners Association (BEAPA) and a social specialist to foresee the proper implementation of all mitigation and enhancement measures recommended in the report.

The contractor’s Environmental Officer would prepare a Contractor’s ESMP (C-ESMP) and compile monthly reports showing environmental and social performance for the month. It would include past performance, audit reports and monitoring data, planned action for mitigating forthcoming risks, and how recommendations made by the Project Environmental Officer are being implemented. The codes of conduct and related safeguards will also be included in all procurement documents.

8.5 Roles and Responsibilities

a) WUC

The overall responsibility for implementing the ESMP lies with the Water Utilities Corporation (WUC). WUC will need to monitor the implementation of the mitigation measures and has appointed Environmental Consultant (Project Liaison Officers - PLOs) to assist with this responsibility.
b) Environmental and Social Consultants

Earthtec Consultancy (Pty) Ltd. has been appointed as the Environmental and Social Consultant (ESC) which will be referred to as the Project Liaison Officers (PLO) tasked to monitor the project. The PLO will carry out daily site inspections and to verify compliance with ESMP requirements. Feedback to the client would be in the form of bi-weekly progress reports and feedback. Urgent or pressing issues will be brought to the WUC immediately. The PLO will oversee the implementation of project activities in accordance with the mitigation implementation programme, ensure that the Code of Conduct is adhered to, sign off to indicate the satisfactory implementation of mitigation measures, and impose the necessary sanctions, if activities are not carried out in accordance with the ESMP. The PLO will ensure that the contractor follows through the specified mitigation measures and implement them to the proponent’s satisfaction in the specified timeframe.

The key responsibilities of the PLOs are to:

- Monitor the Contractor’s implementation of his the ESMP/C-ESMP via daily inspections of the Contractors camps and works sites.
- Organise periodic stakeholders meeting to ascertain effectiveness of mitigation measures.
- Prepare and submit Monthly Environmental and Social Reports summarizing the contractors activities (such as training programmes, community meetings, etc.) and compliance with the ESMP and C-ESMP to WUC and the DEA in compliance with Section 18 of the EA Act 2011.

If the PLOs identify any ESMP/C-ESMP non-compliance issues by the contractor, a non-compliance notice will be issued to the contractor if the engineer must take action. This will be included in the report to the WUC and on urgent issues, will be reported immediately. All documentation and communications to the contractor will be kept and preserved in accordance with good record keeping practices as this will be essential in the event of disputes and for project completion reviews. The contractor will be required to prepare a corrective action plan to be implemented by a date agreed with the engineer. Non-compliance will be ranked according to the following criteria:

**Non-Compliance Level I**: A situation that is not consistent with requirements of the ESMP/C-ESMP, but not believed to present an immediate or severe social or environmental risk. Repeated Level I concerns may become Level II concerns if left unattended.

**Non-Compliance Level II**: A situation that has not yet resulted in clearly identified damage or irreversible impact, but which demonstrates potential significance. Level II requires expeditious corrective action and site-specific attention to prevent severe effects. Repeated Level II concerns may become Level III concerns if left unattended.

**Non-Compliance Level III**: A critical situation that will result in significant in social or environmental damage occurring or a reasonable expectation of very severe impending damage. International disregard of Non- Compliance Notices or specific prohibitions is also classified as a Level III concern.

c) The Contractor

The contractor will be responsible for the day to day implementation of the project activities. To effectively implement this, the contractor shall appoint an Environmental Officer (EO), a Health and Safety Officer (HSO) and a Community Liaison Officer (CLO). The contractor must ensure that the supervisors including the workers supervisor of the project are well informed of the contents of the ESMP so that these are cascaded to the rest of the workforce on the project. The contractor will report any difficulties in implementing the mitigation measures to
the PLO and ensure that all instructions which are given by the client in pursuance of the same are carried out.

The contractor shall prepare and submit to the Engineer for acceptance the “Contractor’s Environmental and Social Management Plan” (C-ESMP) which provides a detailed explanation of how the contractor shall comply with the project’s safeguard documents such as the Project Environmental and Social Management Plan (ESMP) that were provided as part of the bid documents and/or have been publicly disclosed. No civil works shall commence until the C-ESMP has been cleared by the Engineer. In addition, the contractor shall:

- Attend public meetings as requested by the Engineer to discuss the C-ESMP or any other aspects of the project’s environmental and social compliance of interest to the public.
- Submit monthly reports on the C-ESMP implementation progress to the Engineer in an agreed format.
- Update the C-ESMP as necessary—in particular when there are design changes, (e.g. changes in the alignment, lay down areas, working hours or practices, etc.) that impact on the project area of influence or the public—or upon instruction by the Engineer for re-approval and re-disclosure.

The C-ESMP should include specific mitigation and enhancement measures based on the ESMP, the final design and the site selected for the contractor’s office. The plan should have Management Strategy and Implementation Plans (MSIPs) for the following and guidelines for details required are presented in Annex T:

- Work Activities Plan
- Traffic Management Plan
- Occupational Health and Safety Plan
- Community Health and Safety Management Plan
- Environmental and Social Management Plan at the contractor’s office
- Labour Influx Management Plan
- Hiring of Labour Plan
- Vibration Plan
- Codes of Conduct Implementation Plan to address GBV/VAC including training and awareness plans on community relations and norms for its workers as well as codes of conduct, handling of grievances, reporting and handling of GBV/VAC cases
- Training/awareness plan for workers of community relations/norms and how grievances are handled for the project, so all workers understand how it works.

For C-ESMP or ESMP infringements, the contractor shall be given a Notice by the Engineer to initiate actions to remedy the issue. If remediation and restoration has been satisfactorily initiated but could not be completed during the specified period, the Engineer shall determine a reasonable extended period to complete the remediation in consultation with the contractor and the Employer.

d) The Supervising Engineer

WUC has engaged Bothakga Burrow (Pty) Ltd as the supervising engineers. Their role in the implementation of the ESMP is to:

- Integrate the pre-construction, construction and decommissioning phases of the mitigation measures in the bidding documents prior to advertising for a contractor.
• Approve the C-ESMP from the contractor in liaison with WUC and World Bank.
• Convey the contents of the ESMP to the contractor and construction workers for intergration in the construction process
• Liaise with the PLO to determine whether the ESMP is being implemented to warrant payment.

e) The World Bank

The World Bank provides supervision to ensure compliance with the provisions of the Environmental and Social Management Plan (ESMP) and World Bank Safeguards Policies including applicable WBG EHS Guidelines. (General and sector specific Water and Sanitation Guidelines).

f) Other Supporting National and Local Institutions

In addition to WUC, the Environmental and Social Consultant, and the contractor, further checks and balances should be provided by the relevant institutional framework through which the project is implemented. These are shown in Table 37. All these institutions which have an oversight role to ensure environmental and social safeguards are complied with in the implementation of the ESMP are listed in the Monitoring Plan. They are to be formally introduced to the project by WUC before and during implementation. They will be invited and attend monthly site progress meetings and shall be trained to increase their capacity for oversight monitoring.

Table 37: Supporting National and Local Institutions in ESMP Implementation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Mandated Role</th>
<th>Role/Activities to Play in ESMP Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Land Management,</td>
<td>Policy and funding for land, water and</td>
<td>Funding and Policy Direction</td>
</tr>
<tr>
<td>Water and Sanitation Services</td>
<td>sanitation</td>
<td></td>
</tr>
<tr>
<td>Department of Roads</td>
<td>Development and maintenance of roads in the</td>
<td>Permit use of road reserve for pipeline route, attending to site progress meeting</td>
</tr>
<tr>
<td></td>
<td>country</td>
<td></td>
</tr>
<tr>
<td>Botswana Railways</td>
<td>Development and maintenance of railways in the</td>
<td>Permit use of railway reserve for pipeline route, attending to site progress meeting</td>
</tr>
<tr>
<td></td>
<td>country</td>
<td></td>
</tr>
<tr>
<td>Department of Lands</td>
<td>Management of land and State lands</td>
<td>Oversite monitoring of safeguard measures</td>
</tr>
<tr>
<td>Palapye Sub Land Board</td>
<td>Management of Tribal land</td>
<td>Assess and evaluate land expropriation in Topisi village by use of approved methods in the ARAP</td>
</tr>
<tr>
<td>Mmadinare Sub Land Board</td>
<td>Management of Tribal land</td>
<td>Assess and evaluate land expropriation in Mmadinare Settlement by use of approved methods in the ARAP</td>
</tr>
<tr>
<td>Tonota Sub Land Board</td>
<td>Management of Tribal land</td>
<td>Permit/ give surface rights for pipeline route from Serule Pump Station (P2) to the railway reserve in Serule village.</td>
</tr>
<tr>
<td>Ministry of Youth Empowerment Sports</td>
<td>Development of the youth and sports and</td>
<td>Educate Vulnerable Community members in financial management and entrepreneurship and sports development.</td>
</tr>
<tr>
<td>and Culture Development</td>
<td>culture</td>
<td></td>
</tr>
<tr>
<td>Ministry of Nationality, Immigration</td>
<td>Policy and responsible for gender affairs,</td>
<td>Will be represented on the GRM for gender affairs.</td>
</tr>
<tr>
<td>and Gender Affairs</td>
<td>and labor</td>
<td></td>
</tr>
<tr>
<td>Institution</td>
<td>Mandated Role</td>
<td>Role/Activities to Play in ESMP Implementation</td>
</tr>
<tr>
<td>-------------</td>
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<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Department of Environmental Affairs</td>
<td>Responsible for environmental and social impact assessment</td>
<td>Will receive monthly reports and audit the project.</td>
</tr>
<tr>
<td>Town and District Councils - Selebi-Phikwe Town Council - Bobirwa Sub District Council - Palapye/Serowe Administrative Authority - Tonota Sub District Council</td>
<td>Seeks development of various districts</td>
<td>- Provide oversite monitoring of environmental and social safe guards measures. - Monuments site at Selebi-Phikwe - Beneficiaries including the vulnerable people are employed</td>
</tr>
<tr>
<td>Department of Occupational Health and Safety</td>
<td>Ensures the safety and welfare of workers at the factories</td>
<td>Inspect site for safety of workers and compliance with the Factories Act</td>
</tr>
<tr>
<td>Department of Waste Management and Pollution Control</td>
<td>Policy making and in charge of waste management in the country</td>
<td>Inspect site for waste management (land pollution, soil contamination etc.)</td>
</tr>
<tr>
<td>Department of National Museum and Monuments</td>
<td>Responsible for archaeology in the country (Cultural and historically sites and artefacts)</td>
<td>Will respond to 'Chance Finds' and give guidance.</td>
</tr>
<tr>
<td>Botswana Police Services</td>
<td>Protection and prevention of Crime and Civil cases</td>
<td>Maintain peace at the work sites and advice on crime prevention and affrays</td>
</tr>
<tr>
<td>Department of Labor and Home Affairs</td>
<td>Labor Issues</td>
<td>- Provide safety awareness/education materials for workers. - Inspect site periodically.</td>
</tr>
<tr>
<td>Department of Road Transport and Safety</td>
<td>Promotes road and machinery use in a safety manner</td>
<td>- Ensure that the machinery to be used by the contractor is safe to use.</td>
</tr>
<tr>
<td>Department of Radiation Protection and Inspectorate.</td>
<td>Permits use of radiation equipment and monitors the exposure</td>
<td>- Permit use of laboratory equipment at site be provide services for - Monitoring of exposure levels of workers to radiation especially when working along the Serule-Gojwane section.</td>
</tr>
<tr>
<td>Central District Medical Health Teams (Medical Facilities)</td>
<td>Provide health education and medical services</td>
<td>- Provide health awareness/education materials and provide medical services to ill/sick workers.</td>
</tr>
<tr>
<td>Settlement Development Committee and Tribal Administration</td>
<td>Settlement Development and Local/Community Governance</td>
<td>- Elect/ choose representatives for GRM - Monitor implementation of safeguard measures</td>
</tr>
<tr>
<td>NGOs (i.e. GIDA, Khwedom Council)</td>
<td>Seeks/advocates for the rights/education/awareness of the Vulnerable Community (including the Basarwa) and other vulnerable groups such as women in National/Community/Individual Development</td>
<td>- Educate and create awareness on social issues such as GBV and resuscitation on some San cultures/traditions such as speaking the Sesarwa language - Be part of the GRM Committee for Damuchojenaa and Gojwane settlements Settlements.</td>
</tr>
<tr>
<td>Impact Phase</td>
<td>Project Phase</td>
<td>Activity</td>
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</tbody>
</table>
| Site establishment | Pre-Construction | Identification of a site for Contractor’s office (workshop and site offices) as well as the engineers’ offices | To have an office for project management | - No construction camp and engineers offices should be cited within 500 m of the Serule River and Bonwatlou River.  
- Apply for surface rights from the Tonota Sub Land Board as the camp is to be established in Serule village.  
- Complete and submit a Project Brief Form to the DEA to recommend which kind of assessment to be undertaking for the site.  
- Undertake assessment (if required) as recommended by the DEA and obtain approval.  
- As much as possible, the contractor should accommodate staff in rented accommodation within the beneficiary villages.  
- In addition, the consent of the community through the local leadership (Kgosi) and via a Kgotla should be sought. | Personnel | P150,000.00 (US $13,575.00) | Contractor |
| Acquisition of equipment/instrument for environmental monitoring | | To enable measurement of environmental parameters such as noise and air quality | Purchase measuring equipment/instruments | Sound level meter  
Air Sampler  
Vibrometers | | P70,000.00 (US $6,335.00) | Contractor |
| Setting up of the Contractor’s office (workshop and site offices) as well as the engineers’ offices | | To minimize extent of vegetation clearance during campsite and office site establishment | - Limit clearing strictly to required camp and office site.  
- Areas outside the project site which are disturbed due to pre-construction activities should be rehabilitated following completion of work.  
- Cleared vegetation should be heaped away from the road where they cannot interfere with traffic.  
- The movement of construction vehicles should be restricted to designated access routes.  
- Cleared vegetation should be stockpiled at an agreed location with the ECO to allow the communities to harvest or collect them in a safe environment. | Personnel, poles, danger tapes | See Induction Costs | Contractor |
| Setting up of the Contractor’s office (workshop and site offices) as well as the engineers’ offices | | To ensure that waste generated during camp site and office establishment is properly managed and disposed of. | - A well-constructed temporary waste holding facility comprising of a roof, gate and side protection using nets should be provided within the confines of the construction camp site to store all solid wastes such as cement bags and plastic wrappings that would be generated not only during preconstruction phase but throughout project implementation. The waste collection area should be clearly marked. | Waste bins  
Water borne toilets, conservancy tank, waste holding facility | P40,000.00 (US $3,620.00) | (WUC) |
- A soil hospital consisting of two partitions should be constructed to store and treat contaminated soil. The bunded area floor should be paved and the facility roofed. The soil hospital wall should be at least 1 m high and should be covered at the top. This facility should be approved by Department of Waste Management and Pollution Control.

- Purchase of mobile toilets for workers. The ratio of toilets to workers should be 1:25 in compliance with the Factories Act Regulation on Sanitation.

- Purchase of waste bags and colour coded bins or waste receptacles for use within and around the construction camp site and offices.

- The waste bins should be conveniently placed so as to be easily accessible to all the residents of the camp.

- The contractor and engineer’s office should be provided with a waterborne toilet connected to a conservancy tank. The capacity of the conservancy tank should be adequate enough to cater for the two facilities. These should be emptied periodically depending on how long it takes to fill.

- A vehicle should be dedicated to collecting and disposing of solid waste to the nearest dumping site or landfill.

<table>
<thead>
<tr>
<th>Setting up of the Contractor’s office (workshop and site offices) as well as the engineers’ offices</th>
<th>To reduce the risk of fire outbreak</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Purchase and installation of fire extinguishers at workshop, fuel filling points and offices.</td>
<td>- Open fire cooking should be discouraged.</td>
</tr>
<tr>
<td>- The perimeter of the construction office should be graded to provide a firebreak of at least 5 m between the camp site and the surrounding area.</td>
<td>- Workers should be educated on good housekeeping rules to prevent fire outbreaks.</td>
</tr>
<tr>
<td>- A Jojo tank permanently filled with water should be placed within the construction camp and connected to hoespipe to deal with any fire emergency within the camp and site perimeter.</td>
<td>- Workers should be educated on good housekeeping rules to prevent fire outbreaks.</td>
</tr>
<tr>
<td>- A Jojo tank permanently filled with water should be placed within the construction camp and connected to hoespipe to deal with any fire emergency within the camp and site perimeter.</td>
<td>- Workers should be educated on good housekeeping rules to prevent fire outbreaks.</td>
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<thead>
<tr>
<th>Loss of vegetation</th>
<th>Pre-construction, construction</th>
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</thead>
<tbody>
<tr>
<td>To reduce vegetation loss during construction</td>
<td>Limit site clearing along the pipeline route to a 5 m corridor on either side along the pipeline routes.</td>
</tr>
<tr>
<td>- At the tank and pump station sites, vegetation clearance should be limited to the sites only and 5 m from the perimeters of the facilities.</td>
<td>All cleared vegetation along the pipeline route and from the pump station and tank sites should be heaped away from access routes/roads where they can interfere with traffic.</td>
</tr>
<tr>
<td>- Cleared vegetation should be stockpiled at an agreed location with the ECO to allow the communities to harvest or collect them in a safe environment.</td>
<td>Personnel, P10,000.00 (US $905.00) Contractor</td>
</tr>
<tr>
<td>Riverine bank erosion and siltation</td>
<td>Construction</td>
</tr>
<tr>
<td>Disturbance of soil stability</td>
<td>All phases</td>
</tr>
<tr>
<td>Landscape degradation and visual intrusion</td>
<td>Pre-construction and construction</td>
</tr>
<tr>
<td>Potential soil and water contamination</td>
<td>All phases</td>
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<thead>
<tr>
<th>Scarring of the environment</th>
<th>Pre-construction, construction</th>
<th>Excavation for construction material</th>
<th>To prevent degradation of the environment through sourcing of construction material</th>
</tr>
</thead>
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<tr>
<td></td>
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<td>- All construction material should be obtained from licensed sources.</td>
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<td>- Any new sites from which earth material is to be borrowed from should be subjected to EIA.</td>
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<td></td>
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<td></td>
<td>Consultancy fees for EIA for new borrow pits P200,000.00 (US $18,100.00) Contractor (WUC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Noise pollution</th>
<th>Pre-Construction, Construction, decommissioning and Operation</th>
<th>Backfilling of trenches/excavations, movement of construction vehicles/trucks, Cribbing, thrust boring, pipe jacking, decommissioning of pump stations, pipes and water tanks</th>
<th>To minimise impact of noise generated from pre-construction and construction activities on workers and residents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- All project machinery and vehicles should be properly serviced with earplugs to minimize noise generation.</td>
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<td>- Project operations should strictly be undertaken during the daytime.</td>
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<td>- Workers should be provided with noise protection gear including ear plugs.</td>
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<td>- The building for Pump Station 2 (WBPS 2) should be made sound-proof.</td>
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<td>- A quieter pump should be installed</td>
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<tr>
<td></td>
<td></td>
<td>Project costs to service machinery Earplugs, Sound level meter P40,000.00 (US $3,620.00) Contractor (WUC)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dust and gaseous emissions</th>
<th>Pre-construction, construction and decommissioning</th>
<th>Excavations, Cribbing and Thrust boring.</th>
<th>To reduce dust emission levels and health-related risks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- The workers on site should be provided with nose masks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nose masks P70,000.00 (US $6,335.00) Contractor (WUC)</td>
<td></td>
</tr>
</tbody>
</table>

| Personnel, environmental mats, spill kits, waste bags, mobile toilets, shovel, buckets | P480,000.00 (US $43,440.00) Contractor |
movement of construction vehicles/trucks, decommissioning of pump stations, pipes and water tanks

- Working areas close to residential areas should be sprayed with water before and during works to suppress dust generation.
- All construction vehicles should be tuned and maintained regularly to ensure the emission levels are kept within permissible levels. Ensure that exhaust fumes from vehicles conform to BOBS Vehicle Emission Standards.
- Construction machinery and equipment should be switched off when not in use to avoid unnecessary idling of the engines.
- All haul trucks for transporting earth materials and spoils should be covered as per directive from Department of Waste Management and Pollution Control to prevent the emission of dust during transportation of materials. Covering of material in transportation by tapourlene is highly recommended.

Improper Waste Management

- Provide colour coded waste receptacles at the camp site and site offices.
- Avail waste bags or containers to move with the construction team along the pipeline.
- All blasted rock materials or boulders should be used for construction purposes whereas excess spoil should be used to repair for erosion prone areas or availed for construction. If there is no use for them, they should be buried in an old unrehabilitated borrow pit after seeking permission from the division of Environmental Health of the responsible Council.
- All non-hazardous solid waste generated must be disposed of appropriately at the nearest landfill or refuse dump site.
- Where spoil is contaminated, this should be collected for remediation at the soil hospital within the Contractor’s office.
- Following successful remediation, this should be collected and disposed of by a licensed and registered company that deals with hazardous waste collection and disposal.
- All waste materials should be sorted out first such as contaminated rubble, metal, wood and other waste materials so that they are disposed of appropriately.
- The Central District Council should inspect the site works to ensure that safe working environment is maintained.

Vibrations due to blasting and excavation works

- A pre-blasting survey should be made of all buildings, fences, and services in the area to be blasted. Where possible colour photo documentation should be used in order to assess any subsequent compensation claims for blasting related damage.
- Blasting should be designed such that the Peak Particle Velocity (PPV) is kept to the minimum using the current best practice.
- Blasting design should be approved by the Department of Mines, BPC and the WUC or other organizations with services close to the blasting site.
- All blasts should be monitored using vibrometer or similar instrument.
- All workers involved in the blasting exercise should have and wear full protective clothing.

<table>
<thead>
<tr>
<th>Pooling of water in trenches</th>
<th>Pre-construction, construction and decommissioning</th>
<th>Excavations, construction of pump stations, chambers, To prevent /minimise the potential for water pooling in trenches</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>• As much as possible all trenches should be opened and covered on the same day.</td>
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<td>• If not, the area should be secured with fencing for community safety.</td>
</tr>
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<td></td>
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<td>• Open trenches along the pipeline routes should be fortified using danger tapes strung around poles erected into the ground to prevent access by children and livestock.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Children should be educated at Kgolga meetings as well as at schools and ensure they understand the dangers of playing in trenches. Families, guardians and the community need to also be aware of this danger and make appropriate accommodations to protect children.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fire risk</th>
<th>Pre-construction and construction</th>
<th>Construction of water pipeline, pump stations, welding, To prevent fire outbreak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>• All sources of ignition including matches, cigarettes, radios etc should be kept away from the all flammable liquids.</td>
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<td>• All flammable liquids and chemicals should be stored within a paved bunded area and protected from direct sunlight.</td>
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<td>• Fire are to be provided at strategic places within the construction camp site especially at the workshop and fuel tank site and the engineers’ office.</td>
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<td></td>
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<td>• The extinguishers should conform to BOS ISO 5923:2006.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• All project vehicles, trucks and machinery (e.g JCB ) used by the Contractor as well as the engineers should be equipped with fire extinguishers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• A 10 m firebreak/guard from the perimeter of the construction camp site should be maintained.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• All fire hazard areas should be clearly defined and labelled (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment) (IFC, 2007).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• All fire fighting equipment including fire hydrants, hoses, fire detectors, alarm systems, fire extinguishers, fire hydrant and sand buckets are available on site. These should be tested for effectiveness at least once a year for the duration of the construction works.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protective clothing</th>
<th>Logbook for recording readings from blasting activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poles, danger tapes, personnel</td>
<td>P50,000.00 (US $4,525.00)</td>
</tr>
<tr>
<td>Contractor</td>
<td>P80,000.00 (US $7,240.00)</td>
</tr>
<tr>
<td>Contractor</td>
<td>P80,000.00 (US $7,240.00)</td>
</tr>
</tbody>
</table>
When spillages or leakages do occur they should be dealt with quickly in the way as recommended by the supplier.
- Workers should be sensitized on safe work procedures related to the use, handling, storage, cleaning up and disposal of flammable liquids.
- Workers handling fuels and other chemicals should be provided with adequate and proper protective clothing including safety boots, overalls, and head caps.
- Workers should be prohibited from smoking within, around and along the project site.
- A firebreak/guard which is at least 2 m from the perimeter of the pumps stations and tanks should be maintained.
- No smoking, naked flames, use of cellular/mobile phones, radio equipment or handheld computing devices should be allowed during at the pump stations and tanks sites.
- All maintenance staff should be inducted on fire fighting and prevention.

| Change in direction of surface runoff/ Altering Drainage Patterns | Construction Site establishment, Construction of water pipeline, pump stations welding, decommissioning of pump stations, pipes and water tanks | To prevent damage to property due to change in surface runoff | - Regular inspection of excavated site to check direction of flow of surface run off.  
- Redirect surface flow to original direction or channel of flow.  
- Compensate all owners of any property damaged.  
- Insure for third party/ public and private properties that are damaged. | Finance P200,000.00 (US $18,100) | Contractor

| Potential cracking of structures (houses) | Pre-construction, construction and decommissioning Movement of construction machinery/trenching, blasting of rocks | To minimise the damage on structures (houses) during project implementation, the reduce the number of houses affected by the project | - Photographic records of properties likely to be affected should be taken prior to and after completion of works along the pipeline route, pump stations and concrete reservoir sites.  
- Those whose properties are affected should be fully and timeously compensated. | Camera Funds for compensation P200,000.00 (US $18,100) | Contractor

| Blockage of access into properties | All phases Trenching/excavations, | To prevent blockage of access into properties along the project route | - Owners of properties to be affected should be notified in writing by the Community Liaison Officer (CLO) at least a week prior to commencement of trenching works.  
- During trenching, access to properties including culverts should be spared to allow residents continued access to houses.  
- Trenching across access to houses should only be done when it is clear that works will be completed on the same day, so as not to frustrate residents especially those who own vehicles. | Project equipment to clear and grade alternative access routes, crossing facilities Part of project cost | Contractor (WUC)
| Damage to public utility services | Pre-construction, construction and decommissioning | Movement of construction machinery/trenching, blasting | To prevent damage to utility services along the pipeline routes and around the pump stations and concrete reservoir sites | - Prior to excavation works, all services under and above ground should be mapped with the assistance of the service providers to avoid damage.  
- Operators of machinery should be assisted by a ground man when excavating.  
- Outlined procedures in the Standard Specifications for Road and Bridges for Botswana should be followed when crossing roads, bridges, and culverts.  
- Any damage to utility infrastructure and services should be immediately report to the affected service provider.  
- Due reparation/restoration/payment for damage as maybe required. | Funds for reparation/restoration/payment for damages | Evaluation to be carried out after reported damage | Contractor (WUC) |

| Traffic disruption | Pre-construction, construction and decommissioning | Movement of construction machinery/trenching, blasting | To minimize traffic disruption during construction | - To reduce delays, detours should be provided and should preferably be paved and signs indicating their presence should be very clear.  
- Adequate warning signs should be placed on the road warning motorists on the presence of road works.  
- Detours should be should be constructed at the sections under construction to facilitate movement of traffic in those areas.  
- Flag men should be deployed at the detours to ensure safe movement of motorists. | Funds for the erection of detours Road signs Personnel to be deployed as flagmen | Part of project costs P50,000.00 (US $4,525.00) | Contractor (WUC) |

| Traffic accidents | Pre-construction, construction and decommissioning | Movement of machinery, trucks, trenching, blasting | To prevent traffic accidents from occurring | - Display clear information/warning signs setting out the traffic control arrangements into and out of the construction camp site, concrete reservoir site and along the pipeline route. These signs should be placed at intervals of at least 20m from either ends of the gravel access road.  
- Residents of beneficiary communities should be informed a week in advance through the respective Kgotla of project commencement including safety measures which will need to be adhered to.  
- Contractor’s staff should be sensitised weekly by the SHE Officer about the requirements of the Road Traffic Act and its regulations.  
- All necessary traffic safety signs  
- Yellow flashing lights for construction vehicles | Included under Traffic disruption costs. | | Contractor (WUC) Botswana Police |
All construction vehicles should have a yellow flashing light attached to the top of the car to alert other motorists and road users of their movements.

- Warning signs should be placed at least 100 m on either approaches of access roads abutting the pipeline routes to alert road users of ongoing works.
- Flagmen/women should be deployed along access roads to manage traffic.

<table>
<thead>
<tr>
<th>Increase in HIV/AIDS, STD and other Infectious diseases due to influx of workers</th>
<th>Pre-construction, construction and decommissioning site establishment, construction of the water pipeline, concrete reservoir, pumps station, decommissioning of pumphits and water tanks</th>
<th>To prevent an increase in STDS and HIV transmission among workers and between workers and resident population</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Harness all the existing HIV/AIDS programmes and integrate them into the HIV/AIDS programme for the construction of the project. It will be important that the Contractor liaise with the local AIDS Co-ordinating Office to set up an effective HIV/AIDS prevention programme for the workers.</td>
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<tr>
<td>- Sensitize workers on a monthly basis on the risks associated with contracting HIV/AIDS and understanding community dynamics and prevention of GBV, VAC and sexual exploitation.</td>
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<tr>
<td>- Consult with District (local) stakeholders e.g. Clinics, HIV/AIDS Coordinators in the District or Sub-district and ensure alignment with national HIV/AIDS Policy and District or Sub-district HIV/AIDS programmes.</td>
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<tr>
<td>- Recruit labor work force from within beneficiary communities so that the majority of the workforce is not separated from their families during the construction period.</td>
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<tr>
<td>- Give women equal opportunity to be hired as this could help address the problem of younger women getting into relationships for financial support.</td>
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<tr>
<td>- Ensure all bidding documents contain references to the codes of conduct and in Contractors ESMP</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>HIV resource personnel</th>
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</thead>
<tbody>
<tr>
<td>Condoms</td>
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<tr>
<td>ARVS</td>
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<tr>
<td>Educational pamphlets on HIV/AIDS, STIs and STDs awareness</td>
</tr>
</tbody>
</table>

P200,000.00 (US $18,100)

Central District HIV Coordinating Committee Contractor
Potential Gender Based Violence (GBV), Sexual Harassment Exploitation and Abuse (SHEA) and Violence Against Children

| Construction of the water pipeline, concrete reservoir, pumps station, | To reduce the incidence of GBV during construction within the beneficiary villages | - Contractor to engage a GBV Service Provider to conduct an awareness talk periodically (monthly) on GBV, and their prevention and to provide services to GBV survivors and perpetrators.  
- Train project-related staff and beneficiary villages on behaviour obligations. To make this effective, all workers will sign Individual Code of Conduct as presented in the Codes of Conduct in Annex S.  
- Ensure women have equal opportunity to be hired as this could help address the problem of younger women getting into relationships for financial support and being abused in that process.  
- A Gender Based Violence (GBV) and Violence Against Children (VAC) Compliance Team to be formed as per World Bank's guidelines as presented in Annex W.  
- The concrator and its subs and all workers are to be sensitized of Codes of Conduct and Action Plan for preventing Gender Based Violence (GBV) and Violence Against Children (VAC) throughout the implementation of the project.  
- Inform and sensitize the community about the GRM and specific procedures for reporting instances of GBV and VAC.  
- Engage police in sensitization and awareness on GBV/VAC to ensure they are aware of procedures in place and need for survivor-centered procedures and to participate in community and worker training. Engage Ministry of Youth Empowerment Sports and Cultural Development and the Department of Gender Affairs for feedback on procedures and to participate in community and worker training and awareness programs. |

| Increase pressure on existing public services due to influx of workers | Pre-construction, construction | To minimise the demand on existing public services | - The Contractor should assist, with waste collection and disposal  
- The workers and staff are to be educated to share the natural resource or services wisely and with due respect to the residents of the settlement bearing in mind the sustainability of the services or resources.  
- The workers should be educated monthly on the norms and cultural values of the people within which settlement they are working in.  
- Workers and staff will be prohibited to harvest natural resources so as to avoid competing with community members for livelihoods. This will also be monitored by the contractor. However, they are permitted to purchase such products from local suppliers. |

| Funds, Personnel Education materials | P250,000.00 (US $40,000.00) | Contractor |
| Accidents, ill health and injuries to workers | All phases | Excavations, backfilling of trenches, compacting, site clearing, site establishment, decommissioning of pump stations and water tanks | To minimise the occurrence of accidents, ill health and injuries to workers | - Workers Ahead signs should be placed at least 100m on either approach along roads running parallel to the pipeline routes.  
- Ensure all scaffolding is inspected by competent person(s) before use.  
- Appropriate PPE including safety harnesses, safety nets and helmets should be provided and the use of these should be enforced.  
- Workers should be inducted on the proper use of machinery and equipment.  
- Health and safety education should be provided to all workers on the project at least on a monthly basis for the duration of the construction phase.  
- The awareness campaign or education should include behaviour change communication, encouraging voluntary counselling and STI testing.  
- A First Aid Box stocked to the specifications as prescribed in the (Factories Regulations) should be readily available on site daily.  
- Implement good housekeeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from footpaths. |
| Damage to land and private properties | Pre-construction, construction and decommissioning | Construction of the water pipeline, concrete reservoir, pumps station, decommissioning of pump stations and water tanks | To minimise disturbance to private and public properties | - Prior to works, owners of properties likely to be disturbed should be informed at least a week prior to implementation of works either through door to door visits by the CLO or through letters indicating activities to be undertaking and when and duration, and include reference about the GRM process and contact persons in all communications.  
- Compensation to be paid by the constructor. For example, where fences have been damaged, they should be replaced within a week of disturbance. All fences removed should be properly reinstated.  
Conduct awareness community meetings on the existence of and use of GRM in the event resolution is not timely or appropriate |
| Exposure of workers and water to radiation | Construction and Operation | Construction of the water pipeline, concrete reservoir, pumps station, | To prevent workers from exposure to radiation | Educate workers on hazards of uranium and radiation in general by inviting qualified personnel from the Department of Radiation Protection Inspectorate  
Provide nose mask to prevent inhaling dust.  
Have a medical surveillance a (pre- and post-medical examination) of workers.  
PPE - Induction material/including health safety awareness material  
- Transport for Department of Occupational Health and Safety personnel (Scaffold inspector)  
- First aid box/kit |

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| PPE | Contractor (WUC) | P150,000.00 (US $13,575.00) |
| Fence mesh, poles, stays, laborers | Contractor (WUC) | P50,000.00 (US $4,525.00) |
| TLD monitoring badges. Nose mask, PPEs, | Contractor (WUC) | P50,000.00 (US $4,525.00) |
Use water to suppress dust at the work place. Monitor water quality to Gojwane regularly during operation.

<table>
<thead>
<tr>
<th>Potential disturbance of burial sites</th>
<th>Pre-construction and construction</th>
<th>Site establishment, excavation/trenching</th>
<th>To prevent disturbance to burial sites</th>
<th>Educate workers on archaeological finds. Stop work and inform the Project Monitoring Team. They will in turn inform the Department of National Monuments and Museum for further action. Please refer to Annex U.</th>
<th>Personnel (Archaeologist)</th>
<th>P150,000.00 (US $13,575.00)</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accidents involving humans and livestock</td>
<td>All phases</td>
<td>Construction of the water pipeline, concrete reservoir, pumps station,</td>
<td>To prevent human and livestock accidents</td>
<td>Workers Ahead signs should be placed close to working areas especially when they are near roads or working on roads. All open trenches should be adequately barricaded using danger tapes strung around profiles. No unauthorized entry signs should be placed at the entrance to the site which should be manned at all times. All possible entry points into the site should be closed immediately. The local community should be informed in advance of project commencement including safety measures that would be upheld throughout the construction period. A community liaison officer should be engaged to handle and record for reference purposes any complaints that might be raised by members of the community. Ensure the scaffolding at the 15 m high tank is inspected by competent person before use. Appropriate PPE such as harnesses, safety nets and helmets should be provided and the use of these should be enforced.</td>
<td>Signage (safety, no unauthorized entry signs, danger tapes, profiles, record book, PPEs) Community liaison officer</td>
<td>P50,000.00 (US $4,525.00)</td>
<td>Part of Contractor’s payroll</td>
</tr>
</tbody>
</table>
### Land pollution

**All phases**

- **Construction of the water pipeline, concrete reservoir, pumps station,** To ensure proper management of waste generated
  - Avail waste bags or containers to move with the construction team along the pipeline.
  - Any rock boulders derived from blasting should be advertised for construction purposes whereas excess spoil should be used erosion liable areas or availed for construction.
  - All non-hazardous solid waste generated must be appropriately disposed of at the nearest landfill or refuse dump.
  - If there is no further use for old pipes, these should be stockpiled for future safe disposal. Botswana currently does not have a safe disposal method for these materials.
  - Materials from the decommissioned tanks at Gojwane can either be reused or recycled.
  - Where spoil is contaminated, this should be treated and disposed off by a licensed and registered company that deals with hazardous waste collection and disposal.
  - All waste materials should be sorted out first such as contaminated rubble, metal, wood and other waste materials so that they are disposed of appropriately.

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### Creation of Temporary and Long – Term Employment

**Pre-Construction, Construction**

- **Construction of the water pipeline, concrete reservoir, pumps station, decommissioning of the pump stations and water tanks** To provide employment opportunities to residents of the beneficiary communities
  - Consideration of employment should be given to people from beneficiary villages especially women and vulnerable people (IPs) capable of undertaking some of the works onsite.
  - It is recommended that about 60 percent of those to be employed should come from the beneficiary communities, the recommendation in a form of a hiring plan to be in the C-ESMP with requisite budget.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Part of the project cost</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P20,000.00</strong> (US $65,160.00)</td>
<td><strong>P480,000.00</strong> (US $43,440.00)</td>
<td><strong>P375,000.00</strong> (US $33,937.00)</td>
</tr>
</tbody>
</table>

### Management of complaints and monitoring of adherence to ESMP

**Pre-construction, construction and decommissioning**

- **Construction of the water pipeline, concrete reservoir, pumps station, decommissioning of the pump stations and water tanks** To ensure smooth implementation of the ESMP
  - An independent consultant will be hired to oversee monitoring of ESMP as a precautionary measure, especially in vulnerable communities.
  - A GRM officer will be hired to manage complaints. Appropriate training and qualifications are necessary to execute this function.
  - A GRM officer will be appointed to ensure that all uptake stations are monitored (WUC project website, text messages, submission of written complaints in grievance boxes, including anonymous submissions). They will also notify complainants grievance has been received. For anonymous submissions, it will be acknowledged via community boards, WUC website and/or email response if submitted via email through WUC website.
  - The GRM officer will log all complaints into the logbook and notify the GRC immediately to ensure complaints are addressed within the time limits of the GRM process.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Safeguards consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P20,000.00</strong> (US $65,160.00)</td>
<td><strong>P480,000.00</strong> (US $43,440.00)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contractor (WUC)</th>
<th>Contractor</th>
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</thead>
<tbody>
<tr>
<td><strong>P20,000.00</strong> (US $65,160.00)</td>
<td><strong>P480,000.00</strong> (US $43,440.00)</td>
</tr>
<tr>
<td>Land expropriation</td>
<td>Pre-construction Site preparation</td>
</tr>
<tr>
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</tr>
<tr>
<td>Boost to Local Economy (Increased Job Opportunities)</td>
<td>Construction Operation</td>
</tr>
<tr>
<td>Sustainable supply of good quality water</td>
<td>Operation</td>
</tr>
<tr>
<td>Sustainable supply of good quality water</td>
<td>Operation</td>
</tr>
<tr>
<td>Sustainable supply of good quality water</td>
<td>Operation</td>
</tr>
<tr>
<td>Improved hygiene and health</td>
<td>Operation</td>
</tr>
<tr>
<td>Issue</td>
<td>Action</td>
</tr>
<tr>
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</tr>
<tr>
<td>Despondency on the loss of employment</td>
<td>The contractor should hire people from nearby localities when undertaking major maintenance work.</td>
</tr>
<tr>
<td>Construction and decommissioning</td>
<td></td>
</tr>
<tr>
<td>Completion of construction works</td>
<td></td>
</tr>
<tr>
<td>To minimise the effect of loss of employment on the community</td>
<td></td>
</tr>
</tbody>
</table>

| Sub-Total Cost of ESMP mitigation | P 3,260,000.00 | US$ 326,000.00 |
| Capacity Building of WUC Personnel | P 200,000.00 | US$ 20,000.00 |
| Capacity building of Stakeholders involved in Monitoring | P 300,000.00 | US$ 50,000.00 |
| Regular Monitoring of Project Sites and Activities | P 1,575,000.00 | US$ 157,500.00 |
| Cost of VCP implementation | P 1,290,000.00 | |
| Grievance Redress Mechanism Implementation Costs | P 953,000.00 | US$ 95,300.00 |
| Subtotal | P 7,478,000.00 | US$ 747,800.00 |
| Contingency at 15% | P 1,121,700.00 | US$ 112,700.00 |
| Total Estimated Budget for ESMP Implementation | P 8,599,700.00 | US$ 859,970.00 |
### Table 39: Monitoring Plan

#### (I) PRE-CONSTRUCTION PHASE

<table>
<thead>
<tr>
<th>Issue/Impact</th>
<th>The Parameter to be Monitored</th>
<th>Monitoring Objective</th>
<th>Location of Monitoring</th>
<th>Key Performance Indicator</th>
<th>Method of Monitoring</th>
<th>Responsible Agent for Monitoring</th>
<th>Frequency of Monitoring</th>
<th>Reporting Mechanism</th>
<th>Threshold or Existing Standard</th>
<th>Recommended Action when the Threshold is Exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permits or clearance from authorized agencies</td>
<td>Camp Site Offices</td>
<td>To monitor compliance and ensure that all relevant permits and clearances relating to the implementation of the water transfer scheme are obtained from relevant authorities.</td>
<td>Verification through clearance letters</td>
<td>WUC, Earthtec, PIU</td>
<td>Once before construction of the water transfer scheme</td>
<td>ESMP monthly monitoring Report</td>
<td>EIA Act, Monuments, and Relics Act, Mines and Mineral Act</td>
<td>The project should commence when all permits and licenses have been obtained</td>
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<td></td>
</tr>
<tr>
<td>Health of Workers</td>
<td>The site of working and Camp Site</td>
<td>To ensure and promote the wellbeing of workers and community To prevent or minimize the spread of HIV/AIDS and other sexually transmitted diseases</td>
<td>On the ground monitoring by two people and documentary evidence</td>
<td>Earthtec District Health Management Team Department of Occupational Health and Safety</td>
<td>Once a month since project commencement</td>
<td>ESMP monthly monitoring report, Contractor’s SHEQ Officer monthly report</td>
<td>Policy on HIV/AIDS, Public Health Act, Factories Act</td>
<td>Contractor instructed to order requisite PPE.</td>
<td></td>
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</tr>
<tr>
<td>Community awareness of project</td>
<td>Contractor’s Camp Site and Offices and Beneficiary villages</td>
<td>Formally consult tribal authorities, VDC and local Government authorities to inform them of impending works. Regular communication with communities.</td>
<td>Participation and verification with local authorities</td>
<td>WUC, Earthtec</td>
<td>Once prior to the commencement of works</td>
<td>ESMP monthly monitoring Report</td>
<td>EIA Act</td>
<td>All relevant consultations to be undertaken project commences</td>
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</table>

<table>
<thead>
<tr>
<th>Issue/Impact</th>
<th>The Parameter to be Monitored</th>
<th>Monitoring Objective</th>
<th>Location of Monitoring</th>
<th>Key Performance Indicator</th>
<th>Method of Monitoring</th>
<th>Responsible Agent for Monitoring</th>
<th>Frequency of Monitoring</th>
<th>Reporting Mechanism</th>
<th>Threshold or Existing Standard</th>
<th>Recommended Action when the Threshold is Exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>Camp site and offices</td>
<td>To ensure that all potential conflict in land use is cleared</td>
<td>Servitude required for the pipeline and necessary land acquisitions for Contractor’s</td>
<td>Earthtec</td>
<td>Once prior to the commencement of construction work</td>
<td>ESMP monthly monitoring Report</td>
<td>Tribal Land Act</td>
<td>Any inconsistency notified to respective</td>
<td></td>
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</tbody>
</table>

**GENERAL**

**SOCIAL**

**ENVIRONMENTAL**
<table>
<thead>
<tr>
<th>Issue/ Impact</th>
<th>The Parameter to be Monitored</th>
<th>Monitoring Objective</th>
<th>Location of Monitoring</th>
<th>Key Performance Indicator</th>
<th>Method of Monitoring</th>
<th>Responsible Agent for Monitoring</th>
<th>Frequency of Monitoring</th>
<th>Reporting Mechanism</th>
<th>Threshold or Existing Standard</th>
<th>Recommended Action when the Threshold is Exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improper Waste</td>
<td>Litter and human waste</td>
<td>To identify designated waste disposal locations situated along the pipeline route</td>
<td>Contractor's Camp Site and construction site</td>
<td>Avoid indiscriminate dumping of waste. Identify sites or areas where to dispose of waste safely and according to best practice.</td>
<td>Observation, Interviews</td>
<td>Earthtec</td>
<td>Once before construction</td>
<td>EIA monthly monitoring report, Waste Management Act, Public Health Act</td>
<td>Designated waste management disposal sites identified before the project commenced.</td>
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</tr>
<tr>
<td>Air pollution</td>
<td>Dust (PM&lt;sub&gt;10&lt;/sub&gt;)</td>
<td>To minimise the impact of air and noise pollution on residents and workers</td>
<td>Around site where Contractor's camp site and site offices are to be located</td>
<td>Ensure that all construction equipment and vehicles are in good condition. Measurements by use of noise level metre and air samplers. Documentary evidence of complaints.</td>
<td>Contractor's SHEQ Officer, Earthtec</td>
<td>Once prior to the commencement of construction work</td>
<td>ESMP monthly monitoring report, Contractor's SHEQ Officer report, Public Health Act BOBs Noise Standards and WB, EHS Standards Atmospheric Pollution Act</td>
<td>Contractor asked to remove equipment that does not meet requirements from the site.</td>
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<tr>
<td>Vegetation loss</td>
<td>Vegetation clearing</td>
<td>To verify the effectiveness of mitigation measure</td>
<td>All working areas along the pipeline route, at the pumps station sites as well as the water tanks which are to be cleared of vegetation. Limit of area (5 m) to be cleared demarcated on the ground. Trees to be spared are clearly marked (especially those with girth of more than 200 cm)</td>
<td>Observation, Document review</td>
<td>Earthtec, Contractor's SHEQ Officer</td>
<td>Prior and after clearing</td>
<td>ESMP monthly monitoring report, Contractor's SHEQ Officer report, Department of Forestry and Range Resources</td>
<td>Adhere to stipulated measures on tree conservation.</td>
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<tr>
<td>Issue</td>
<td>The parameter to be monitored</td>
<td>Monitoring objective</td>
<td>Location of monitoring</td>
<td>Key performance indicator</td>
<td>Method of monitoring</td>
<td>Responsible agent for monitoring</td>
<td>Frequency of monitoring</td>
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<tr>
<td><strong>BIOPHYSICAL ENVIRONMENT</strong></td>
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<tr>
<td>Noise Pollution</td>
<td>Noise</td>
<td>To reduce the impact of noise pollution on workers and households close to construction fronts</td>
<td>Near water tanks and within receiving residential/civic and community/commercial land uses.</td>
<td>All workers have adequate protective clothing and use them. (noise protection gear).</td>
<td>Auditory observation, List of complaints (document review)</td>
<td>Earthtec, Contractor's SHEQ Officer, Department of Occupational Health and Safety</td>
<td>During periods of undertaking noisy activities</td>
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<td>Measurement by use of Sound Level Metre, Review of noise reading logbook</td>
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<tr>
<td>Air Pollution</td>
<td>-Dust (PM_{10})</td>
<td>To reduce the impact of dust and emissions from vehicles and machinery on workers and surrounding land uses</td>
<td>In front of receiving residential/civic and community/commercial land uses.</td>
<td>All workers have adequate protective clothing and use them (dust protection gear), Number of days and times dust suppression measures are implemented, All construction vehicles are covered with tarpaulin, Dust levels recorded, Absence of complaints from people directly affected by construction noise.</td>
<td>Use of Air Sampler, List of complaints or grievances, Measurement by use of handheld air sampler, Review of air quality data</td>
<td>Earthtec, Contractor's SHEQ Officer, Department of Occupational Health and Safety</td>
<td>Daily during construction</td>
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<tr>
<td>Soil contamination</td>
<td>Presence of hydrocarbons in soils</td>
<td>To prevent soil contamination due to implementation of project works</td>
<td>All working areas along the pipeline routes, pump station, water tanks sites</td>
<td>Level of concentration of hydrocarbons in the contaminated soil</td>
<td>-Soil test for concentration of hydrocarbon, -Photography, -Observation</td>
<td>Earthtec, Contractor's SHEQ officer, Department of Waste Management and Pollution Control</td>
<td>Daily site inspection throughout construction period</td>
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<tr>
<td>Soil erosion</td>
<td>Erosional features (dongas and gullies)</td>
<td>To ensure that project works do not trigger erosion and siltation</td>
<td>All excavated areas /working areas along the pipeline route</td>
<td>Depth of eroded soil</td>
<td>Visual Observation, Photography, Sighting</td>
<td>Earthtec, Contractor's SHEQ</td>
<td>Daily during construction After storm event</td>
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<td>Aesthetics</td>
<td>Visual Intrusion</td>
<td>To preserve the natural beauty of the area</td>
<td>Along the pipeline route, water tank sites, pump station</td>
<td>No stock-piled sand or loose materials allowed to stand for long periods of time</td>
<td>Observation</td>
<td>Earthtec, Contractor's SHEQ Officer</td>
<td>Daily during construction</td>
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<td>Issue</td>
<td>The parameter to be monitored</td>
<td>Monitoring objective</td>
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<td>Key performance indicator</td>
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<td><strong>Improper Waste Management</strong></td>
<td>Provision of waste receptacles</td>
<td>To monitor compliance with existing standards/ regulations</td>
<td>Along pipeline route, pump stations, water tank sites and other active work fronts</td>
<td>No of waste receptacles available along working areas. Number of portable toilets provided along active work fronts Presence of temporary waste holding facility</td>
<td>Observation Document review (waste disposal manifest) Interviews with staff on site</td>
<td>Earthtec, Contractor’s SHEQ Officer Department of Environmental Health of respective District Council</td>
<td>Daily during construction</td>
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<td></td>
<td>Ratio of mobile toilets provided to number of workers on site</td>
<td>To verify effectiveness of mitigation measures</td>
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<td></td>
<td>Records kept of complaints Frequency of solid and liquid waste disposal</td>
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<td><strong>Riverine Pollution</strong></td>
<td>Lubricants, Waste (Litter, faeces, empty cans, oil spills etc.)</td>
<td>To avoid pollution within the river beds and small water courses To monitor the effectiveness of mitigation measures</td>
<td>Amount and type of contamination in river</td>
<td>Testing of river water for contaminant Observation</td>
<td>Earthtec Contractor’s SHEQ Officer Department of Water Affairs</td>
<td>Daily when working within and along river beds</td>
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<tr>
<td><strong>Social</strong></td>
<td><strong>Employment of Community Members</strong></td>
<td>Number of people employed from the beneficiary villages and those that are from vulnerable groups</td>
<td>To ensure mitigation measures are properly implemented and 60% of employees are from beneficiary communities</td>
<td>Number of people employed and their origins. Number of vulnerable people and women employed</td>
<td>Document review, records of those employed/ pay Roll</td>
<td>Earthtec District Labor Office Department of Gender Affairs Ministry of Youth Empowerment, Sport and Culture Development</td>
<td>Monthly</td>
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<td></td>
<td><strong>Occupational health</strong></td>
<td>Health wellbeing of workers Exposure to radiation</td>
<td>To ensure and promote the wellbeing of workers Record all accidents</td>
<td>All working areas on site Site Office</td>
<td>Periodic health educational sessions conducted for workers / laborers. Emphasis on generally good hygiene. First Aid Box provided on site and stocked with necessary drugs and condoms. Strict adherence to wearing of protective clothing and other safety devices while at work</td>
<td>Observation Document review Use of radiation Badges</td>
<td>Earthtec Contractor’s SHEQ Officer District Health Medical Team Radiation Protection Inspectorate</td>
<td>Monthly during construction</td>
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<td><strong>Cracking of structures (houses)</strong></td>
<td>Pre-and post-photographs. Vibrations</td>
<td>To ensure that complaints on cracking houses are addressed Structures where excavation works are being carried out and where blasting have occurred.</td>
<td>Evaluation reports on damaged properties Ensure community is aware of GRM and how to use it</td>
<td>Document review of pre and post photographic records Vibrometer readings</td>
<td>Earthtec Contractor’s SHEQ Officer</td>
<td>Once every month during construction</td>
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<tr>
<td>Issue</td>
<td>The parameter to be monitored</td>
<td>Monitoring objective</td>
<td>Location of monitoring</td>
<td>Key performance indicator</td>
<td>Method of monitoring</td>
<td>Responsible agent for monitoring</td>
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<td>Land acquisition/expropriation (Relocation and Displacement)</td>
<td>Economic and/or physical displacement</td>
<td>To ensure that any displacement/Compensation issues are promptly dealt with</td>
<td>Site Office WUC Head Office Site for damaged property</td>
<td>Complaints are addressed Homes damage beyond repair should be addressed in the ARAP. Measures for compensation and other assistance, and the standards of OP 4.12 can be used to assist in the definition of those measures.</td>
<td>Document review, Observation</td>
<td>Earthtec, Contractor's SHEQ Officer, BPC, BoFiNet, House owners</td>
<td>Once every month during construction</td>
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<tr>
<td>STD/HIV Transmission, GBV</td>
<td>STIs, STD and HIV/AIDS and GBV</td>
<td>To ensure that the project does not result in the accelerated transmission of STIs including HIV To prevent GBV from occurring</td>
<td>Clinics within beneficiary villages</td>
<td>HIV and GBV awareness information and training in place Record of HIV and GBV education and awareness meetings</td>
<td>Document review</td>
<td>District Health Management Team (Bobiriwa, Serowe, Palapye and Tonota Sub-District Councils and Selebi-Phikwe Town Council Earthtec Contractor's SHEQ Officer,</td>
<td>Once every month during construction</td>
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<tr>
<td>Exposure of workers to Uranium/radiation</td>
<td>Level of exposure</td>
<td>To prevent the exposure of workers to Uranium/radiation</td>
<td>Excavated areas around Serule, Gojwane and Damuchojena Settlements, Laboratories</td>
<td>Level of radiation Number of times of Dust Suppression Analysis of TLD Badges Records, Document Review</td>
<td>Analysis of TLD Badges Records, Document Review</td>
<td>Radiation Inspectorate (Hi) Earthtec Contractor's SHEQ Officer,</td>
<td>Once every month</td>
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<td>Traffic and safety</td>
<td>Records of the number of accidents Length of time of delay Strategic placement of relevant road safety signs</td>
<td>To ensure construction works are undertaken in a traffic safe environment.</td>
<td>Contractor's site camp and Engineers' Office at the site Roads parallel to the pipelines, roads within beneficiary villages, around the pump station and water tank sites</td>
<td>Road safety awareness to workers, community Road safety signs erected on roads around the construction area Zero/no incidence of road accidents/ collisions recorded/ reported on and off site Traffic warning signs provided along the construction site No traffic delays exceeding 10 minutes</td>
<td>Document review, Observation</td>
<td>Botswana Police Earthtec Contractor's SHEQ Officer,</td>
<td>Daily during construction and decommissioning</td>
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<tr>
<td>Archaeology</td>
<td>Archaeological resources</td>
<td>To ensure the preservation of archaeology resources</td>
<td>Areas of work near graveyards and monumental sites</td>
<td>Work stopped in the event of archaeology discoveries and archaeologist is informed</td>
<td>Observation Photography</td>
<td>Archaeologist, Earthtec Department of National Museum and Monuments Contractor's SHEQ Officer,</td>
<td>Daily earthworks</td>
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</tbody>
</table>
### III. OPERATION AND MAINTENANCE PHASE

<table>
<thead>
<tr>
<th>Impact/Issue</th>
<th>Parameter to be monitored</th>
<th>Monitoring objective</th>
<th>Location of monitoring</th>
<th>Key performance indicator</th>
<th>Method of monitoring</th>
<th>Responsible agent for monitoring</th>
<th>Frequency of monitoring</th>
<th>Reporting mechanism</th>
<th>Threshold or existing standard</th>
<th>Recommended action when threshold is exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire</td>
<td>Fire outbreak</td>
<td>To reduce risk of fire outbreak and that if it does break out, it is quickly contained</td>
<td>All pump stations</td>
<td>- Number of firefighting equipment in place and in good working order</td>
<td>Observation, purchase and servicing records</td>
<td>WUC</td>
<td>Once every year during operation</td>
<td>WUC Project Monthly/quarterly report</td>
<td>Fire Service Act</td>
<td>Immediately install fire equipment</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Palisade fences, Reservoir, water tanks, Telemetry</td>
<td>To maintain the integrity of the infrastructure provided</td>
<td>All pump stations, water reservoir and tanks</td>
<td>No of faults or breakdown with the infrastructure</td>
<td>Visual inspections</td>
<td>WUC</td>
<td>Monthly</td>
<td>WUC Project Monthly/quarterly report</td>
<td>Drinking Water Quality Standard BOS 32:2000</td>
<td>Appropriate water treatment to ensure water quality is achieved</td>
</tr>
<tr>
<td>Water</td>
<td>Water quality/quantity</td>
<td>To ensure that residents receive adequate quality and quantity of water</td>
<td>Pump stations, Water tank Standpipes</td>
<td>Records of water testing Record of complaints and when addressed Record of water supply</td>
<td>Document review</td>
<td>WUC</td>
<td>Every three months after project completion</td>
<td>WUC Project Monthly/quarterly report</td>
<td>Drinking Water Quality Standard BOS 32:2000</td>
<td>Appropriate and timely maintenance of facilities</td>
</tr>
<tr>
<td>Water</td>
<td>Water Pressure and leaks</td>
<td>To ensure adequate water pressure and minimise or prevent leaks from pipelines, pump station and water tanks</td>
<td>Along the pipelines, chambers, water tank and pump station,</td>
<td>Records of pressure Number of complaints of low or no water pressure received and when addressed Record of number of leaks reported and when they were attended to</td>
<td>Observation Document review</td>
<td>WUC</td>
<td>Every three months after project completion</td>
<td>WUC Project Monthly/quarterly report</td>
<td>No reports of inadequate pressure received No records of leaks reported No rep</td>
<td>Appropriate and timely maintenance of facilities</td>
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9.0 GRIEVANCE REDRESS MECHANISM (GRM)

9.1 Introduction

A Grievance Redress Mechanism is necessary for addressing the concerns of Project Affected People and other stakeholders. It is anticipated that some of these concerns may include eligibility criteria, compensation entitlements for loss of livelihood and use of land.

The mechanism for grievance redress includes:

- Provision for the establishment of a Grievance Redress Committee (see GRC members below)
- Multiple grievance uptake locations and multiple channels for receiving grievances
- Fixed service standards for grievance resolution, include adjudication process and process of handling situations related to gender-based violence/sexual exploitation and abuse
- Prompt and clear processing guidelines (including reviewing procedures and monitoring system)
- A time frame for responding to grievances
- A reliable and effective reporting and recording system
- Procedure for assessing the grievance
- Grievance escalation process

The grievance redress mechanism is designed with the objective of solving disputes at the earliest possible time before they escalate. In addition, World Bank OP4.12 emphasizes that the PAPs should be heard and as such, they must have access to a fair, transparent and accessible means to address their concerns and views related to the project. Furthermore, the mechanism should be effective in addressing projects at project-level so that grievances are not referred through the court system for resolution, especially since the court system may not be financially accessible to all and may add cost and time burdens.

General Principles and Key Aspects of the GRM

The Project has put in place an extra-judicial mechanism for the management of grievances and disputes. The VCs will be able to trigger this mechanism, while still being able to resort to the judicial system.

Key aspects of the grievance redress mechanism are:

- The community including VCs need to be informed about the grievance redress mechanism and how they can make use of this process.
- Grievances will be recorded using a Grievance Form (in local language, also available in English). Grievance Forms will contain details regarding the grievance as well as the name and address of the applicant, application date, type of application and the name of the persons receiving the grievance. The forms will be logged in a register where they will be tracked through to a suitable resolution.
- Complainant will receive notification that their grievance has been received (if complainant is known) in writing.
- Grievance monitoring log (which includes actions taken, corrective measures, see Annex ZD).
- Closure sheet copy of which will be handed to the complainant after he/she has agreed to the resolution and signed off.
• The PIU will maintain a digital grievance database, containing the logs and records of all grievances received, with an indication of the respective status of a grievance (i.e. resolved, not resolved, pending, etc.), in addition to a hard copy.
• Resolution options will be developed through unilateral proposal, bilateral discussion and/or third-party mediation. If a complaint is not legitimate the case will be closed without agreement with the complainant. Any response will be communicated clearly either orally or in writing, and a grievance case will only be closed when an agreement with the complainant is reached.
• Community members including VCs will have access to third party legal advice, through referral to Botswana Legal Aid, at no cost. Information on access to legal advice will be communicated to the affected people.

9.2 Management Functions and Responsibilities

During the implementation phase of the sub-project, the mechanism for grievance redress shall include:
• Provision for the establishment of a grievance redresses committee with a sitting allowance budgeted for the Grievance Redress Committee (GRC) members.
• Multiple grievance uptake locations and multiple channels for receiving grievances (project hotline, project website, Facebook page, WhatsApp blasts, WUC PIU office, Kgosi and VDC, grievance box at the Kgotla).
• Fixed service standards for grievance resolution which include adjudication process.
• Prompt and clear processing guidelines: including reviewing procedures and monitoring system (see flow chart)
• A time frame for responding to grievances (see flow chart on GRM chapter)
• A reliable and effective reporting and recording system (grievance register, complaints logbook – hard copy)
• Procedure for assessing and responding to the grievance

9.3 Responsibilities for Implementing Stakeholder Engagement Activities

9.3.1 Roles and Responsibilities
The WUC PIU in consultation with the respective community will appoint Community Liaison Officers (CLOs) in project area villages/settlements where there are project works, to conduct stakeholder outreach during project implementation and respond to any grievances or complaints that may arise. The CLOs will act as key points of contact to bring project grievances from PAPs, stakeholders, construction workers, residents, and community members to the Grievance Redress Committee (GRC). They will liaise with the WUC Safeguards Team to inform them of all complaints and outcomes. The CLO will contact the PIU Safeguards Team in case a complaint is not resolved within two weeks after receiving the alert. The PIU safeguards team will go to the field in order to obtain further information and resubmit the case to the GRC. The complainant will be notified that further information is being collected and kept informed about the status.

a. Community Liaison Officers (CLOs)

The WUC PIU will in consultation with respective communities appoint Community Liaison Officers (PLO) in the specific sub-project areas. The Community CLOs will be situated in the project area villages/settlements where there are project works, will be designated to receive, review, record and address project related complaints. Every two weeks, CLO will consolidate complaints and submit to the GRC. Their contact information will be published and communicated via public announcements and information sharing about the project, (radio, television and newspapers, community meetings, etc.), to conduct stakeholder outreach during project implementation and respond to any grievances or complaints that may arise.
Key Functions:

- The Community CLO will create awareness on the existence of the project and Grievance Redress Mechanism.
- The CLO will act as the key point of contact to bring project grievances from project affected people, construction workers, local residents, and community members to the GRC.
- Register the grievance/complaints on the Grievance Logbook and acknowledge receipt within 5 days.
- Respond back to the beneficiary’s queries/complaints lodged, giving their status and/or their outcome if they had been resolved.
- Ensure that all queries/complaints from beneficiaries have been formally recorded following the existing procedures.
- Review and evaluate grievances/complaints and ensure that complainant is given feedback within 14 days.
- Conduct community consultations to provide inputs into the GRM.
- Facilitate communication which in the form of reports WUC PIU and Project Contractor and distribution of information, education and communication material to the community including VCs.
- Represent the project during Kgotla meetings.
- Represent the interests of vulnerable individuals and groups following consultations with them to better understand their concerns and issues, and keep notes and records of such meetings.
- The CLOs will be responsible for making sure the recommendations of the GRC are implemented and advising WUC PIU during ESMP and RAP implementation, as well as contractors to make any appropriate adjustments to their works.
- Work closely with the WUC Principal Sociologist and Environmental Officer and flag any issues of concern as well as report incidents as they occur.
- If a concern of a highly sensitive nature is raised such as gender based violence (GBA) or Sexual Harassment Exploitation and Abuse (SHEA), VACs, the CLO shall invoke the special procedures related to GBV/SHEA/VACs and will ensure the anonymity and confidentiality of the survivor. See Annex S for special procedures.

In addition to the CLO, the project will make available grievance forms in every settlement (at the Kgotla office) as an accessible venue for filing a grievance and a Grievance Submission Box. In collaboration with the communication and IT team for the project, the WUC telephone hotline and website will be also available to receive complaints anonymously or they can identify themselves. Every two weeks, the CLOs will collect forms filled out to submit them to the GRC and record them in the grievance logbook.

The WUC PIU Safeguards Team will work closely with the WUC communication and IT Team, who will oversee compiling complaints received on social media, website and WUC hotline. A meeting will be held at least once per week to review complaints and submit them to the GRC in order to provide timely and responsive feedback as per the commitments in this GRM. WUC’s IT and communication team will have dedicated staff who are trained on the GRM to ensure the principles and commitments under the GRM are adhered to. For illiterate persons, CLOs will assist them to write and submit complaints. To be sure that the adequate confidentiality well be kept, the Project will issue a code of conduct to be signed by the VDC.
and community liaison officers, as well as all project workers (including WUC staff) involved in the GRM.

b. The Grievances Redress Committee (GRC)

The GRC be responsible for receiving and resolving in a fair, objective, accountable, effectively, timely and accountable manner. All concerns or complaints raised by project affected persons (PAPs) in the communities during all phases of the project lifecycle.

c. Composition and Membership of the Grievance Resolution Committee (GRC)

The GRC will meet as and when required, preferably once per month.

When complaints arise, they will be submitted to the Project Grievance Redress Committee.

The committee will be created with clear terms of reference, and the guiding principles to be followed by the GRC during their conducting of business include among others: Confidentiality, Transparency and Accountability. In addition, specific Grievance Redress Mechanism for conflict prevention and resolution at the project level will be devised in consultation with the affected communities.

The GRC, shall maintain all records from complaint to final decisions made by the GRC for future reference, with an accurate and up to date grievance logbook (the PLO is to ensure the logbook is accurate and ensure they have a copy of updates to the logbook). The GRC shall also ensure that public participation and consultation is always a part of the process to promote understanding, transparency, trust in the project, accountability and mitigate against unnecessary complaints and disputes. The Chairmanship of the GRC will rotate amongst the Committee Members depending on the issues to be considered by the Committee.

The GRC Members include:

- Project Contractor
- Land Board Representative
- Water Utilities Corporation Representative
- Two Local Representatives (One man and one woman. In Vulnerable Communities, at least one representative of VC)
- Project Liaison Officer 1 (Safeguards Social Development Consultant)
- Environmental Officer 2 (Safeguards Social Development Consultant)
- Community Liaison Officer (Secretary)
- NGO representing Basarwa (e.g. Kwedom Council, San Youth Network)

The WUC PIU Safeguards Team Members will attend meetings when there is a matter that requires their urgent attention.

The broad responsibilities of the GRC include:

- Publicizing the grievance management procedures
- Receiving, reviewing, investigating and keeping track of grievances referred to them by the CLO
- Adjudicating grievances
- Monitoring and evaluating the fulfilment of agreements achieved through the grievance redress mechanism.
d. Project Liaison Officers (PLOs)

The Project Liaison Officers (PLOs) - the environmental and social safeguard monitoring consultants for the project will be tasked. Their contact information will be published and communicated via public announcements and information sharing about the project, (radio, television and newspapers, community meetings, etc.), to conduct stakeholder outreach during project implementation and respond to any grievances or complaints that may arise.

Key functions:

- Attend to households issues regarding the reconstruction works and facilitate the liaison between the beneficiary (households), local communities (community buildings) and the project team.
- Ensure prompt communication of concerns and issues about the project to the project team (not the Contractors).
- Assist the project communication team with all communication matters and to provide feedback on the effectiveness of the messages and means of communication used.
- Assist project team to arrange meetings and location of meeting for any consultation with the community.
- Monitor the implementation of the ESMP and report progress at Onsite Project Progress meetings.

e. The Contractor

During the implementation, Contractors shall work in line with the World Bank Standards on Environmental, Social, Health and Safety (ESHS) and Occupational Health and Safety (OHS) in the workplace and on their relationship with affected communities. The application of these Codes of Conduct will help ensure the project meets its ESHS and OHS objectives, as well as preventing and/or mitigating the risks of GBV and VAC on the project and in the local communities. Contractors should make sure these Codes of Conduct are adopted by those working on the project and are meant to:

- Create awareness of the ESHS and OHS expectations on the project
- Create common awareness about GBV and VAC and ensure a shared understanding that they have no place in the project
- Create a clear system for identifying, responding to, and sanctioning GBV and VAC incidents

Three codes of conduct must be adhered to in this project (full codes are in Annex S):

i. **Company Code of Conduct**: Commits the company to addressing GBV and VAC issues;

ii. **Manager’s Code of Conduct**: Commits managers to implementing the Company Code of Conduct, as well as those signed by individuals; and,

iii. **Individual Code of Conduct**: Code of Conduct for everyone working on the project, including managers.

These codes of conduct will be explained and displayed in the work sites, workers and affected communities will be sensitized prior to works start. The company liaison officer will work closely with WUC PIU safeguards team to bring to the GRC all complaints and special cases which affect the Codes of conduct.
For issues regarding GBV and VAC, the Response Protocol which is the mechanisms set in place to respond to cases of GBV and VAC will be implemented. By doing that, the Contractor will first establish a ‘GBV and VAC Compliance Team’ (GCCT).

The GCCT will include, as appropriate to the project, at least four representatives ('Focal Points') as follows:

1. A safeguards specialist from the WUC;
2. The occupational health and safety manager from the Contractor (or someone else tasked with the responsibility for addressing GBV and VAC on the Contractors side) with the time and seniority to devote to the position;
3. The Project Liaison Officer (also known as the supervision consultant or PLO); and,
4. A Social Worker with experience in Sexual Harassment, Exploitation and Abuse (SHEA), including Gender - Based Violence (GBV) and Violence Against Children (VACs) GBV and VAC (the ‘Service Provider’).

9.4. Community Level Grievance Redress Mechanism

Local communities have existing traditional and cultural grievance redress mechanisms. It is expected that some disputes at the community level may be resolved using these mechanisms, without the involvement of the Project, Contractor(s), and or Government representatives at local and national level should. The extended family, settlement and/or Kgosi may be involved at this level. This may be more suitable for issues and concerns that are minor. For example, if the contractor needs to recruit housekeepers or other human resource needs, he or she can choose among the resumes collected by the community. The community and Contractor will be informed that the principle of non-discrimination and fairness as per the Botswanan Labor Law will apply in the selection. Also, if the company wants to compensate the community for using their sand, gravel or because of the impact of its activity (dust dispersion), those grievances can be solved at the community level, without the GRC, if the community so chooses.

9.5. Project Level Grievance Redress Mechanism

Many project related grievances during the works are minor and site-specific. Often, they revolve around nuisances generated during construction such as noise, dust, vibration, workers disputes, etc. They can be resolved easily on site. However, regarding disputes that include differences between households over land, or boundaries, even on issues triggered indirectly by the sub-project during its lifecycle, the GRM will have a body, the GRC to address disputes.

Other issues that are potential grievances may involve access to property arrangements, or sexual harassment, exploitation and abuse (SHEA), including Gender - Based Violence (GBV) and Violence Against Children (VACs) of workers Contractors and/or community members during construction phase. Most of these cannot be resolved immediately and on site and in the case of GBV, require specific interventions and processes to protect the safety, well-being and identity of survivors.

9.7 GRM Procedures

The community will be informed and sensitized about the use of an existence of the GRM (through radio notices, TV, community meetings, community signage, Kgotla, CLOs, PLOs) of the various uptake options where complaints can be submitted. The WUC PIU Safeguards Team will meet every two weeks with the communication and IT team to review all complaints from social media, websites and hotline and inform the complainants within three days that complaints have been received and the procedures they must follow.
The WUC PIU Safeguards Team will then organize a meeting for the GRC to meet at the soonest to ensure compliance with the timeline for responses to complainants.

If the identity of the person who submitted a grievance is known, the GRC must inform them within three days of the decision or when a decision is to be expected. The date of this outreach is to also be logged into the grievance log. The GRM will commit decisions to be finalized within two weeks of date of receipt and complainants will be notified and will record the complainant’s comments about decision. If the complainant is not satisfied, they will be notified about escalation procedures.

Notices and signage will be erected at all sites providing the public information on the Project and summarising the GRM process, including contact details of the relevant Community Liaison Officer. All complainants should be free to lodge a complaint in one or as many of the uptake stations noted above.

A Complaints Register (or Grievance Log) will be at the WUC PIU Safeguards Office and village/settlement Kgotala office with CLOs, but also with Contractors, who will log the: i) details and nature of the complaint (include categorization of sensitive/urgent, non-sensitive); ii) the complainant name and their contact details if known; iii) date the complaint was received; iv) corrective actions taken in response to the complaint; v) the date the response was made available to the community and the complainant; vi) the resolution; vii) the response of the complainant if response was acceptable to them or not; viii) the name of the person who received the complaint and location/method the complaint was lodged. This information will be included in WUC Safeguards Team progress reports to the World Bank. (See Annex ZD) for example of grievance log). The CLOs are responsible for ensuring that they collect all grievances so that they can update the PIU logbook and their logbook.

9.8 The Grievance Redress Structure

The structure or steps of the grievance mechanism includes:

- Multiple and accessible uptake stations to receive complaints (text, phone number, project website, mailing address, grievance box, others, communication to CLO, VDC, Kgosi) and account for vulnerable or disadvantaged individuals (persons with disabilities, elderly, illiterate, lack access to phone/computer, etc)
- Receive, register and acknowledge complaint in logbook
- Screen and establish the foundation of the grievance
- Implement and monitor decision
- Notify complainant of outcome and obtain feedback on acceptability
- If grievance is not escalated, conclusion to redress grievance and note in logbook
- Advise for a judicial proceedings as last resort if necessary
- Document the experience for future reference
- Notify the community (community boards, on project website, CLO, community meetings) about various complaints and outcomes without naming names

A step-by-step process, with duration of each stage from the reception of the complaint to the notification of the resolution, with suggested timeframe and responsibilities is indicated in Annexes E and F.

9.9 Grievance Redress Process

The steps of the grievance mechanism consist of:

- The Aggrieved Party (AP) will take his/her grievance to the CLO who will endeavour to resolve it immediately.
Where AP is not satisfied, the CLO will refer the grievance to the GRC.
- Receive, register and acknowledge complaint.
- Screen and establish the foundation of the grievance.
- Implement and monitor redress action.
- Notify the complainant of the result and obtain a response if the resolution is satisfactory. If not, inform the complainant of escalation process.
- Advise for judicial proceedings as last resort if necessary
- Document the experience for future reference.

Where the traditional and administrative procedures fail to resolve disputes, the aggrieved party has the right to take the matter to the courts in accordance with the Constitution of Botswana, other national laws, and the Lenders’ policies.

The process is highlighted in Table 40 with suggested timeframe and responsibilities.

**Table 40: GRIEVANCE REDRESS MECHANISM PROCESS**

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Description/Required Action</th>
<th>Completion Timeframe</th>
<th>Responsible Agency/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Receipt of Complaint</td>
<td>Document date of receipt, name of complainant, nature of complaint</td>
<td>1 day</td>
<td>CLO (Community Liaison Officer)</td>
</tr>
<tr>
<td>2.</td>
<td>Acknowledgement of Grievance</td>
<td>By letter, email, phone</td>
<td>1-5 days</td>
<td>CLO</td>
</tr>
<tr>
<td>3.</td>
<td>Screen and Establish the foundation / merit of the grievance</td>
<td>Visit the site; listen to the complainant/community; assess the merit</td>
<td>7-14 days</td>
<td>GRC members including the Community Liaison Officer, complainant and his/her representative</td>
</tr>
<tr>
<td>4.</td>
<td>Implement and Monitor a Redress Action</td>
<td>Where complaint is justified, identify and carry out the redress</td>
<td>21-30 days or at a time specified in writing to the complainant</td>
<td>Community Liaison Officers, WUC Social and Environmental Safeguard Specialists to coordinate the implementation of redress action</td>
</tr>
<tr>
<td>5.</td>
<td>Inform Complainant and Community (use of community boards, newspaper, radio, what's app group, Facebook page) to inform community of grievance outcome and solicit response</td>
<td>Where complainant is not satisfied, inform complainant of escalation process. If satisfied or not, ensure grievance logbook is updated.</td>
<td>1-2 days after making a decision on a grievance by the GRC</td>
<td>CLO</td>
</tr>
</tbody>
</table>
from complainant if claim has been fully addressed or not.

<table>
<thead>
<tr>
<th></th>
<th>Extra intervention for a dissatisfied scenario</th>
<th>Review the redress steps and conclusions, provide intervention solution</th>
<th>2-4 weeks of receiving status report</th>
<th>MLMWS, Social and Environmental Officers, and GRC to review and react</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Extra intervention for a dissatisfied scenario

Review the redress steps and conclusions, provide intervention solution

2-4 weeks of receiving status report

MLMWS, Social and Environmental Officers, and GRC to review and react

7. Judicial Adjudication

Complainant has the option to take complaint to court of law

No fixed time

Complainant

8. Funding of Grievance Process

WUC logistics and training, redress compensation, court process

No fixed time

WUC

9.10 Escalation of Grievances

If the complaint is not resolved to the satisfaction of the aggrieved party by the Grievance Redress Committee, it will then be referred by the WUC PIU Project Coordinator or to the Project Steering Committee (PSC).

The Project Steering Committee (PSC) will be composed of:

- Permanent Secretary - Ministry of Land Management, Water and Sanitation (MLMWS) - (Chairperson)
- Permanent Secretary - Ministry of Environment, Wildlife and Tourism – (MEWT)
- Permanent Secretary - Ministry of Finance and Economic Planning – (MFEP)
- Permanent Secretary - Ministry of Local Government and Rural Development – (MLGRD)
- Permanent Secretary - Mineral, Energy and Water Resources – (MEWR)
- All DPS under MLMWS
- CEO - Water Utilities Corporation
- Director General - National Strategy Office
- Director - Department of Water and Sanitation Services
- Director - Department of Environmental Affairs

The NSC will meet when required to address escalated grievances and will be required to address the concern within 30 days. Should measures taken by the National Steering Committee fail to satisfy the complainant, the aggrieved party is free to take his/her grievance to the Botswana judicial courts.

9.11 Judiciary Level Grievance Redress Mechanism

The project level GRM process will not impede affected persons access to the legal system. At any time, the complainant may take the matter to the appropriate legal or judicial authority as per the laws of Botswana. However, the quality and effectiveness of the judicial system should be assessed, as well as issues related to accessibility and affordability.

9.12 For sensitive issues regarding Gender Based Violence, Sexual Harassment or Violence Against Children

An exceptional or ad hoc meeting will be called the day after receiving this information. The Grievance Redress Committee, the National Steering Committee, the Contractor, and local authorities of the locality where this issue occurs will all meet as a plenary. At all times, the
approach for such issues will follow a survivor-centered approach and the anonymity of the survivor will remain intact. In addition, the survivor will have been informed of options such as receiving psycho-social support, medical assistance and other services as required.

For those issues, the mechanisms set in place to respond to cases of GBV and VAC will be implemented. By doing so, the Contractor will first establish a ‘GBV and VAC Compliance Team’ (GCCT). The GCCT will include, as appropriate to the project, at least four representatives (‘Focal Points’) as follows:

a. The Community Liaison Officer (CLO)
b. The Occupational health and safety manager from the Contractor, or someone else tasked with the responsibility for addressing GBV and VAC with the time and seniority to devote to the position
c. The Supervision Consultant (PLO)
d. The Social Worker
e. The Police Officer

The procedures for Addressing GBV, SHEA and VAC are in Annex S and will be refined once the GBV specialist/consultant for the project undertakes the mapping of services, review the GRM and create a Gender Action Plan.

9.13 Capacity of Local Institutions to Address Grievances and Disputes

- **Village Settlement Development Committee**: The settlement parliament has the responsibility to monitor developmental projects in their settlement. The interest of the community are their priority as per their mandate.
- **Kgosi**: The settlement tribal leader and is also an ex-officio member of the Settlement Development Committee and is a key figure in mediating among community members.
- **Project Resident Engineer**: As the head of the project, the engineer is responsible for ensuring that it is implemented smoothly.
- **Supervising Project Engineer**: Ensures that The Project Resident Engineer and ESIA Consultants are implementing the project as per their approved documents.
- **Project Liaison Officer (social and environmental safeguards monitor)**: Has a responsibility to ensure that all the ESIA/ESMP mitigation measures and plans are implemented accordingly.
- **Community Liaison Officer**: Liaises between the Project Officials/ Grievance Redress Committee and the Community. Reports all grievances to the GRC.
- **Grievance Redress Committee**: Has a responsibility to ensure that all grievances are addressed timely and properly recorded.
- **Water Utilities Corporation**: Has a responsibility to ensure that the objectives of the project are delivered as promised

9.14 Good Communication and Information Sharing

- Vulnerable and marginalized groups and individuals can report to the CLO who will be based at the settlement Kgotla.
- Can report by phone to Community Liaison Officer/Resident Engineer.
- Can send a text to the CLO/Resident Engineer
- There will an accessible grievance/complaints boxes in community areas which will be checked daily. For those who cannot write, the CLO will facilitate submission of a grievance and will be guided by a ethical code of conduct to respect the privacy of the complainant
- There will also be a project email and website to enable users to submit their grievances anonymously.
A WhatsApp group (or equivalent) will also be created for the community members who want to be informed on updates of the project.

All complaints must be acknowledged for receipt regardless if they are anonymous. Community boards and the project website will list complaints that were submitted (without names) and will include expected date of response. Once the response is determined, the response with the original complaint will also be posted on the community boards and on the project website.

There will be a specific person or persons who will be tasked to oversee the grievance process to ensure that all grievances are logged correctly and the GRC is notified.

There will be specific training for the GRC and the CLO to ensure quality control of the GRM process.

9.15 Monitoring

Annex ZD shows the grievance log that will be used to monitor and track the GRM and which will be reviewed regularly for accuracy and compliance to the GRM process. The logbook and at times, correspondence between the Contractor and PLOs in addressing grievances will also be reviewed by World Bank safeguards specialists undertaking project supervision.

9.16 ESTIMATED COST OF GRM IMPLEMENTATION

The detailed cost of implementing the GRM is presented below in Table 41. This cost has already been included in the overall costing of the ESMP as presented in Table 38.

### TABLE 41. COSTING OF GRM IMPLEMENTATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Time Frame</th>
<th>Budget (Pula)/USD</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>GRM Implementation and Monitoring</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Allowances for GRC Members</td>
<td>Throughout the Project</td>
<td>(P500.00 per sitting) x Members x twice a month x 15 months x 16 x 16 x 240,000.00 (USD24,000.00)</td>
<td>WUC</td>
</tr>
<tr>
<td>2</td>
<td>Monthly Stipends for Community Liaison Officers</td>
<td>Throughout the sub-project</td>
<td>(P600.00 per month) x 6 settlements x 30 months x 30 months x 16 x 108,000.00 (USD10,800.00)</td>
<td>WUC</td>
</tr>
<tr>
<td>3</td>
<td>GRM Publicity Material and Stationery</td>
<td>Throughout the sub-project</td>
<td>P200,000.00 (USD 20,000.00)</td>
<td>WUC</td>
</tr>
<tr>
<td>4</td>
<td>Capacity Building for All Stakeholders on GRM</td>
<td>Throughout the sub-project</td>
<td>P300,000.00 (USD 30,000.00)</td>
<td>Contractor</td>
</tr>
<tr>
<td>5</td>
<td>Funding for GBV mapping of services and inclusion of GBV/SHEA/VAC compliance and modification of GRM for GBV reporting</td>
<td>Throughout the project</td>
<td>GBV Mapping Services P150,000 (USD 15,000) GCCT P500 x 14 people x 15 months x 105,000.00 (USD 10,500.00)</td>
<td>Contractor &amp; WUC</td>
</tr>
<tr>
<td></td>
<td><strong>Sub-Total</strong></td>
<td></td>
<td>P 953,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>15 percent contingency</strong></td>
<td></td>
<td>P 142,950.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>P1,095,950.00 (US$109,595.00)</td>
<td></td>
</tr>
</tbody>
</table>
10.0 CONCLUSION

The study has determined that implementation of the sub-project will have various potential adverse impacts, such as those on land use, sensitive environs (such as rivers and streams), change in drainage patterns, potential incidents to host communities and workers and potential social problems (such as violence, sexual transmitted diseases). In the long-term, securing water and its concomitant benefits to project affected persons, will outweigh adverse impacts if properly mitigated. The sub-project takes the concerns and views of project affected persons seriously and is committed to implementing fair, transparent, accountable and effective mitigation measures to address them, according to the institutional requirements of the World Bank.

Some of the adverse environmental impacts are short-term, localized and small scale, and can be mitigated through this ESMP. These include potential effects on rivers and streams that are to be crossed, health and safety issues and waste management concerns.

Some social impacts will be mitigated through an Abbreviated Resettlement Action Plan (ARAP) and Vulnerable Communities Plan (VCP). It is expected that an acceptable ARAP, in consultation with the affected communities/persons, would meaningfully address community concerns. Likewise, the project seeks to ensure that no adverse impacts accrue to communities who meet the criteria of Vulnerable Communities under OP4.10 and that they can share equally in project benefits and consulted in a manner which meets the principles of free, prior and informed consultation leading to broad community support.

The ESMP, its mitigation and monitoring programs contained herewith will be included within the Bidding documents for project works for all components. The ESMP and all its requirements will then be added to the Contractor’s Contract thereby making the implementation of the ESMP a legal requirement.
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