REPUBLIC OF GHANA

MINISTRY OF SANITATION AND WATER RESOURCES

GREATER ACCRA SANITATION AND WATER PROJECT (GAMA S&WP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

FOR

CONSTRUCTION OF DRAINS TO ALLEVIATE FLOOD RISKS AT BANKUMAN, NAVAL BASE AREA, TEMA COMMUNITY 6, AND ADJEI KOJO/KANEWU COMMUNITIES

IN

TEMA METROPOLITAN ASSEMBLY (TMA)

JANUARY 2018

List of acronyms and their definitions

AIDS	Acquired Immune Deficiency Syndrome
AP	Affected Person
ARAP	Abbreviated Resettlement Action Plan
CBO	Community Based Organizations
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
EMSP	Environmental and Social Management Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
FGD	Focused Group Discussions
GEF	Global Environment Facility
GIS	Geographic Information Systems
GRC	Grievance Redress Committee
GRM	Grievance Re-dress Mechanism
HIV	Human Immunodeficiency Virus
ESMP	Health Safety and Environment
M&E	Monitoring and Evaluation
NGO	Non-governmental Organization
OP/BP	Operational Procedures/Bank Procedures
PAP	Project Affected Person
PC	Pollution Control
PMU	Project Management/Monitoring Unit
PPE	Personal Protective Equipment
STI	Sexually Transmitted Infection
TBD	To Be Determined
TOR	Terms of Reference
WB	World Bank
MSWR	Ministry of Sanitation and Water Resources

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EXECUTIVE SUMMMARY

Project Background

The Government of Ghana has received financing from the World Bank towards the cost of implementation of the Greater Accra Metropolitan Area (GAMA) Water and Sanitation Project (GAMAW&S Project). The project of the GAMAS&W Project is to increase access to improved sanitation and improved water supply in the GAMA with emphasis on low income communities and to strengthen management of environmental sanitation in the GAMA.

The GAMA S&W Project supports eleven Municipal and Metropolitan Assemblies spread across the Greater Accra Region. They are Accra Metropolitan Assembly (AMA), Tema Metropolitan Assembly (TMA) Ashaiman Municipal Assembly (AshMA), Tema Municipal Assembly (TMA), Ga East Municipal Assembly (GEMA), Ga West Municipal Assembly (GWMA), Ga Central Municipal Assembly (GCMA), Ga South Municipal Assembly (GSMA), La Dadekotopon (LadMA) and Ledzokuku Krowor Municipal Assembly (LekMA).

The Project has four components:

i. **Component 1**-Provision of water and environmental sanitation services to priority low income areas of GAMA

ii. **Component 2-** Improvement and expansion of the water distribution network in the GAMA

iii. **Component-3** Improvement and expansion of waste water and faecal sludge collection, transportation and treatment in GAMA, and

iv. **Component 4-** Institutional Strengthening.

The Ministry of Sanitation and Water Resources (MSWR) intends to apply part of the GAMA S&W Project funds for undertaking drainage interventions to address flood risks posed to some communities in the Tema Metropolitan Assembly through construction, reconstruction and lining of drains and to improve environmental sanitation in the Metropolis.

Flooding have posed threat to lives, property and environmental protection and sanitation in communities of Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu all in the Tema Metropolitan Assembly anytime there is heavy rainfall due to the low level or the lack of drainage interventions to contain the increasing runoff being experienced over the years due to increasing development in the affected areas.

In the low-lying communities of Bankuman Metropolis, where there are no drainage channels exist, the continuous flow of rainfall runoff through the communities over the years have created natural drainage paths. These drainage paths (which are not lined, nor properly sized) do not only promote inundation of the residents and businesses when it rains, but also led to induced soil and land erosion problems in the communities. In the Naval Base area, though road side drains currently exist to channel flood waters away from the community, however, the channels have become woefully undersized to be able to effectively carry the increasing

volumes of flood water during rainfall. In Tema Community 6, large sections of the main drain carrying storm waters through the community have not been lined but remain earth drains, leading to continuous washing away (land erosion) of the base of the earthern embankment and also the base of a major road crossing culvert. These pose danger to road users and property owners along that corridor of the drain. In the communities of Adjei Kojo/Kanewu, the existing streets are the main drainage paths for the storm water runoff through the community to its natural outfall, however, street do not have drains along the shoulders to direct flow of runoff. During rainfall, runoff stagnates on the street corridors and within the communities, causing flooding of homes and properties including shops, school compounds along the corridors of the community streets and destruction of the properties and economic activities. In addition, the streets become impassable, affecting motorists and pedestrians movement and successful conduct of business in the communities.

To address the flood risks in the communities, the Tema Metropolitan Assembly has proposed to undertake provision of drainage interventions in Bankuman, Tema Community 6, Tema Naval Base areas, and Adjei Kojo/Kanewu with the aim to minimize flooding impacts and safeguard lives, property and environment.

The construction works will include site clearance, demolition and excavation of existing drains, excavation of drain channels, construction and reconstruction of drains, and lining of drains. Other activities will include collection and disposal of construction wastes and backfilling of trenches.

The works have the potential to generate safeguards concerns including: soil erosion, loss of vegetation, waste generation, dust generation, noise and vibration, occupational health and safety concerns, among others.

The GAMA Project and World Bank Safeguard Policies and Ghana's environmental Policy Requirements:

The GAMA Sanitation and Water Project has triggered the World Bank Safeguards Policies on Environmental Assessment (OP4.01) and Involuntary Resettlement Policy (OP4.12). These require that, prior to the commencement of the proposed projects, the potential environmental and social impacts should be are identified and mitigation measures proposed for managing the adverse impacts at the construction stage. The Ghana national laws and regulations on environmental assessment LI 1652 1999 also requires that environmental and social impacts of newly proposed undertakings should be mitigated.

In seeking to comply with and abide by the relevant World Bank Safeguards policies and the Ghanaian environmental laws, this ESMP is prepared.

Methodology for developing the ESMP

The approach and methodology applied for the preparation of the ESMP included site visits, literature review/desk top studies and community stakeholder consultations.

Review of the relevant laws, regulation and administrative policies related to the project:

The relevant national and World Bank policies related to the implementation of the project were reviewed.

Identification of Environmental and social impacts

The potential environmental and social impacts of the project were identified**.**
The positive environmental and social impacts include:

i. The proposed project will provide short term employment opportunities for the local community during the project activities.
ii. The presence of the project will create increased economic activities within the project community in short term.
iii. It will result in improved drainage in the project community and will lead to reduction of incidents of mosquito bites, malaria and other health risks associated with poor drainage in the area
iv. The integrity of the flooded areas of the community will be enhanced.
v. Quality of life of the residents in the immediate environs of the drains will be enhanced through abatement of perennial floods and associated health impacts.

The adverse environmental and social impacts include:

i. Loss of vegetation**,**
ii. Impact on air quality;
iii. Noise and Vibration;
iv. Soil Erosion,
v. impacts on drainage,
vi. surface and ground water pollution,
vii. generation and disposal of construction waste;
viii. public and occupational health and hazard;

However, all the impacts can be managed with proper construction approach and compliance with this ESMP.

Environmental and Social Mitigation Plan and Environmental and Social Monitoring Plan

An Environmental and Social Management Plan (ESMP) comprising Environmental and Social Mitigation Plan and Environmental and Social Monitoring Plan have been proposed to guide the preconstruction, construction, decommissioning, and operational phases of the proposed sub-project, based on the ESMP studies. The tables are presented below

ENVIRONMENTAL AND SOCIAL IMPACTS MITIGATION PLAN

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
1	Surveying & pegging the proposed drain channel course	Occupational health and safety/Public safety issues	Provide personnel with protective clothing	TMA Urban Roads Engineer (URE), TMA GAMA Project Coordinator	2,000.00
2	Loss of properties and economic livelihoods in the communities dur to the proposed projects	Involuntary Resettlement at proposed project site	ARAP has been prepared which identifies the PAPs for compensation payment prior to commencement of works.	TMA	To the ARAP
3	Low community awareness in project communities	Negative community attitudes and perception towards the proposed project	Consult stakeholders and create awareness among local residents on the objectives of the proposed project and arrangements for compensating project affected persons	TMA URE, TMA GAMA Project Coordinator, Department of Waste Management of TMA	1,300.00
4	Lack of local community's involvement in project planning band implementation	Risk of social conflict	Consultation with and involvement of the project communities in the planning and implementation of the project	TMA URE, TMA GAMA Project Coordinator	2,000.00

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
5	Interference of drain reconstruction design	Disruption of Utility service lines	• Identify all utility service supply lines within the project catchment • As much as possible design should avoid encroachment on the supply lines; • Consult the utility owners to plan for relocation of the service lines where possible	TMA URE, TMA GAMA GAMA Project Coordinator, Utility Companies	1,800.00
6	Anxiety about improper identification of contractor for the drain construction	Inability to construct the drains to excellent standard and quality of work that will permanently solve the flood risks in the project communities	• Select a qualified contractor through competitive bidding • Design must ensure that all the existing inlet drains on are connected/integrated into newly proposed drains	TMA URE, TMA GAMA Project Coordinator, Procurement Officer.	2,500.00
Sub-Total					**9,600.00**
Construction phase					
	Site clearance, excavation of drain construction course	**Loss of vegetation**	• Replant areas at areas where vegetation is destroyed during construction to prevent soil erosion during runoff • Plant vegetation on the	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			slopes and embankments of the newly constructed drains in order to stabilize the soil and prevent soil erosion • Ensure that vegetation clearance is limited to only the areas demarcated/pegged for the drain works. • Plant vegetation at all areas disturbed by the contractor during construction works		
	Excavation to desilt the existing drain; site clearance; release of emissions from movement of and operation of excavators, concrete mixers	**Air quality impacts**	• Spray construction site regularly with water to suppress dust pollution on dusty and excavated areas • Cover construction sand and chippings stockpiled at construction sites in order to suppress dust generation into the air from these sources.	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			• Reduce speed limit of vehicles carrying sand and chippings, and excavators and concrete mixers at dusty areas within the project community to 30km/hr. • Switch off all idling excavators, concrete mixers and construction vehicles when they are not in use. • Use only well-maintained excavators, vehicles and concrete mixers during construction. • Avoid open burning of wastes at construction site • Construction workers should wear nose masks/face masks		
	Movement of excavators and concrete mixers to	**Noise and vibration**	• Contractor should ensure to use only well-maintained excavators, concrete mixers	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	construction sites; use of excavators close to the foundation of buildings and structure; use of excavators and concrete mixers during construction; movement of construction vehicles and trucks in construction community.		during construction so as to minimize noise impacts on residents and road users. • At sections where the drain course to be excavated is close to the foundation of buildings/ structures, ensure that only manual means are used to excavate the drains and do NOT use construction machinery like excavators and backhoe. • Reduce the speed of construction vehicles to 30km/hr within the project sites • Schedule the use of excavators and concrete mixers near homes to day time between 8:00hrs to 17:00hrs only • Concrete mixers should be placed as far as possible		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			from homes • Ensure that noise levels from the excavators and concrete mixers do not exceed 55 decibels near homes during construction and also not more than 75 decibels in the construction communities • Provide ear plugs for construction workers		
	Site clearance; excavation of earth drain channel; movement of excavators and construction trucks at construction site.	**Soil Erosion**	• Immediately backfill and cover all trenches along the newly constructed drains and areas where the soil is disturbed at the construction sites in order to avoid runoff during rainfall • Re-plant all exposed and disturbed areas at the construction site with rapidly growing vegetation in order to stabilize the soil and to prevent runoff during rain fall. • Plant grass along the	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			slopes/embankments of the newly constructed drains • Avoid engaging in construction activities during stormy weather conditions. • During construction, limit land clearing only to areas pegged to be involved in the drains construction works		
	Unearthed excavated materials; spent construction materials i.e. pieces of wood, iron rods, concrete, etc.; domestic refuse generated by construction workers	**Waste generation & disposal**	• Collect and dispose all unearthed wastes i.e. excavated earthen materials, demolished drain concrete, spent concrete wastes, etc. to TMA approved waste disposal sites on daily basis. Wastes must not be disposed or kept at construction sites. • Re-use excavated waste debris where appropriate (for backfilling of trenches along the drains, etc.)	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			• Provide dust bins to collect refuse generated by construction workers and dispose the wastes at TMA approved waste disposal site on daily basis • Provide mobile toilet on site for the construction workers to avoid open defaecation in open spaces, nearby bush and in drains within the project communities		
	Site clearing, excavation activities, disposal of construction waste on site, servicing, fuelling and maintenance of construction excavators, concrete mixers and construction trucks at project site.	**Water pollution**	• No garbage or refuse or oily wastes should be discharged into drains in the communities. • Collect and dispose all constructional wastes immediately to TMA approved waste dump sites to avoid contamination of water sources of the communities. • Maintenance, cleaning and	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			fuelling of excavators, concrete mixers, construction vehicles and trucks should take place at the Fuel Service Stations of recognized oil marketing companies located offsite the constructions areas. • Use only well- maintained excavators, concrete mixers and vehicles during the construction works to avoid discharge of or leakage of oils and lubricants in the construction sites. Provide mobile toilets at the construction sites for use by the construction workers. Construction workers should avoid indiscriminate defecation on the project sites and nearby bush, and in drains.		
	Drain excavation works, dumping and blocking of existing inlet drains connecting into the existing earth	**Flooding of project sites during construction.**	• Do not deposit excavated materials and other construction waste materials in the runoff directions and slope of	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	drain to be constructed; dumping and blocking the path of runoff around the construction site and project community		drains at the project sites. These will impede storm water flow and could result in flooding of the sites. • Do not dump excavated wastes into drain channels. Immediately dispose excavated materials to TMA approved waste disposal sites. • During construction, do not seal any existing drainage inlets channels that are channelling storm from the community water into the existing drainage channels • Avoid construction activities during stormy weather conditions		
	Excavation of construction site, excavation of drain,	**Relocation/damage to utility service supply lines at construction site**	• Identify and re-instate all utility service supply lines that fall on the right of way of the demarcated drain	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			channel • If possible, redesign the drain channel to avoid the utility supply lines • Involve the utility service providers in re-instatement of all affected utility lines.		
	All construction activities (falling of construction objects, accidents, etc.)	**Workers Occupational health & safety**	• Provide personal protective gear (gloves, hard hats, reflector jackets, safety boots, etc) to construction workers and ensure all workers wear the gears at all times during construction • Provide and stock first aid box on site to provide first aid during incidents before transferring the injured to hospital. Educate workers on the use of the first aid box • Provide safety induction to	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			workers on site on daily basis • Provide signages at the construction area to warn workforce personnel and public of dangers on site. The signages must be very visible and made of reflective materials • Provide toilets on site for construction workers. Ensure construction workers do not engage in open defaecation within the project community • Provide workers with HIV/AIDS education. Provide workers with condoms		
	All construction stages, blocking and cutting of the culvert street. Transportation of construction	**Public health & safety& traffic management**	• Do not place construction wastes and construction materials on walkways in the project communities and also along the street	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	materials; stagnation of water in constructions pits which can become a pool of water and drown children		corridors • Provide barriers between pedestrian's walkways and oncoming traffic to prevent vehicles knocking down pedestrians at the project sites. • Provide alternative access routes to motorists and pedestrians where road/streets will be temporarily closed temporarily to traffic. Provide a traffic man to direct motorists and pedestrians at such road diversions • Reduce speed limit of construction vehicles to 30km/hr within the construction communities in order to avoid vehicles knocking down community people and motorists		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			• As much as possible, cover immediately all trenches created to avoid stagnant water breeding mosquitoes • Where there is water standing in a construction pit, immediately pump the water out and backfill. • Fence off all construction pits to avoid unauthorised persons from accessing the pit areas. • Provide appropriate signage to warn community people and unauthorised personnel to stay away from construction pits and active construction areas • Provide barriers to cordon off the excavated drain channels from unauthorized persons at construction sites to avoid people falling in		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			them (channels) • Provide signages to warn public and drivers of dangers zones of the construction activities • Avoid use of child labour during the construction activities • Ensure a dedicated work staff to conduct children, the elderly and the vulnerable across the alternative footpaths provided within the community during construction activities. • As much as possible, cover immediately all trenches created to avoid stagnant water breeding mosquitoes • Contractor to provide code of conduct for construction workers.		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			• Prepare a health & safety Plan for the construction works. Educate the workers on the health and safety plan.		
	Lack of awareness and local people's engagement in the planning and implementation of the project	**Risk of social conflict**	• Conduct awareness raising among the project communities and construction workers about the project and the worker code of conduct and ethical behaviours. • Ensure continuous consultation on the project's update/progress with the project communities during the project implementation • Ensure timely implementation of Grievance Redress Mechanism	Contractor; TMA	Construction cost
	Tolerance for illegal behaviour of	**Increased risk of communicable diseases**	• Provide HIV/AIDs and STD transmission education and campaigns to workers	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	construction workers		and the local project community people • Provide workers with condoms		
	Engaging children and minors in the project activities	**Child labor and school drop-out**	• Ensure that children and minors are not employed directly or indirectly to undertake any of the project activities • Contractor should provide Code of conduct for his/ her labor force • Train the work force on the Code of conduct	Contractor	Construction cost
	Sexual harassment, child abuse and exploitation during project implementation	**Gender Based Violence (GBV)**	• Include zero tolerance for sexual harassment, child abuse and exploitation in workers Code of conduct • Provide workers with regular training on the code of conduct • Ensure all contractor's labor	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			force sign the code of conduct as a condition for employment		
	Employment of labour	**Socio-economic development and capacity building**	• Arrange to employ local people as part of the labour force in the construction works	Contractor	Construction cost
Sub- total					**0.00**
Decommissioning phase impacts					
	Removal and relocation of construction equipment to contractor's head office	**Public and occupational health & safety** **Waste generation and disposal** Soil erosion	• Dismantle and remove all construction equipment including concrete mixers, excavators, etc. from construction site before handover of works to TMA authorities. • Collect and dispose all spent construction wastes out of the construction communities and sites • The wastes should be disposed to TMA approved waste disposal sites.		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			• Plant vegetation at all areas disturbed during construction to avoid soil erosion		
Operational phase					
	Waste disposal into drains resulting in blocking of drains and flooding; lack of maintenance of the drains by TMA	Clogging of drains and flooding of communities Public health and safety of residents and sustainability of the newly constructed drains	• TMA will develop and implement a Drain Management and Monitoring Programme to cover the project communities. The Programme will to mitigate waste clogging the drains and flooding of the communities. The Department of Urban Roads of TMA has routine drain management in place to desilt drains and conduct repairs on broken down drains within the Metropolis. There exist Metro Waste Management Department and Public Health Department whose role is to undertake facilitation of provision of waste collection bins, facilitating waste collection service providers in communities to collect and dispose wastes to approved waste dumps,	Department of Urban Roads of TMA -Department of Public Health of TMA -Metropolitan Waste Department of TMA	70,000.00/per year TMA Sanitation and Waste Management Budget

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			raising awareness and conducting public education on sanitation, and enforcement of bye-laws on sanitation. These existing programmes will be extended to the newly drains drain to be constructed under this project to include: • Provision of public sensitization and education campaign on environmental sanitation and drain sustainability in the project community • Facilitating provision of waste collection bins and receptacle at vantage points in the Bankuman, Naval base area, Tema Community 6 drain area and Adjei Kojo/Kanewu communities especially among residents close to the newly constructed drain channels		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			• Facilitating linkage between the project communities residents and waste collection service providers to ensure regular collection and disposal of wastes form households • Routine desilting of the newly constructed drains of debris, refuse wastes, and weeds on 3 -monthly basis. • Routine repairs of the newly constructed drains on 3-monthly basis • Enforcement of the Metropolitan Byelaws on Waste Management in the project communities.		
Sub-total					**70,000.00**
Grand total					**77.600.00**

ENVIRONMENTAL AND SOCIAL IMPACTS MONITORING PLAN

POTENTIAL IMPACTS	MONITORING PARAMETERS	MONITORING SITE	FREQUENCY OF MONITORING	RESPONSIBILITY	ESTIMATED COST (GHC)
Pre-construction phase impacts					
Occupational health and safety/Public safety issues	-Survey personnel wearing PPEs	Drains construction sites in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu	Daily	TMA Urban Roads Engineer (URE) TMA GAMA Project Coordinator	3,000.00
Involuntary Resettlement at proposed project site	-ARAP document prepared for the proposed TMA drainage intervention subprojects -Compensation paid to PAPs prior to relocation/demolition of affected properties Number of people	Drains construction communities in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu	Daily	TMA	Refer to ARAP

	compensated				
Negative community attitudes and perception towards the proposed project	-Record of community consultation to create awareness on the proposed project -Complaints from community members about lack of information on the proposed project	Drains construction communities in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu	Daily	TMA URE, GAMA Project Coordinator in TMA, Metropolitan Health Department of TMA	1,800.00
Risk of social conflict	-record of project communities' consultation on the project - evidence of record of communities input and responsibilities contained in the implementation arrangements	TMA offices, project communities	Weekly	URE of TMA, GAMA Project Coordinator for TMA	1,000.00
Disruption of Utility service lines	-record of utility services lines identified to be on the right of way of the project construction - record of consultation with utility service facility owners -evidence of reinstatement of utility service	Urban Roads Department of TMA, Offices of the affected Utility companies in TMA	Weekly	TMA URE, GAMA Project Coordinator in TMA	2,000.00

Inability to construct the drains to excellent standard and quality of work that will permanently solve the flood risks in the project communities	-a qualified contractor engaged for the works through competitive procurement process -inlet connecting drains are incorporated into the drainage design	-TMA Urban Roads Department - TMA Procurement Department - Subprojects construction sites	Weekly	GAMA Project Coordinator in TMA, TMA URE, TMA Procurement Officer.	1,900.00
Sub-total					
Construction phase					
Loss of vegetation	-observable demarcation of areas that are to be used for the drainage channel at the construction communities -vegetation clearing is done only at areas demarcated for the drainage channel construction -visible evidence of planted vegetation at areas where vegetation was removed during construction activities -slopes of newly constructed drains planted with vegetation	Drains construction communities in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu construction site - embankments	Weekly	Contractor	Construction cost

	- observable number of trees replanted to replace trees felled during construction.				
Air quality impacts	- record/ observable evidence of spraying of water on exposed surface at construction site -Observable dust in air in surrounding environment of the construction site - excavators, construction vehicles and concrete mixers switched off when they are not in use - observable exhaust fumes in air in surrounding environment - evidence of routine maintenance programme or plan for the construction equipment (trucks, excavators, cement mixers) - record of construction equipment (i.e. excavators, construction vehicles and concrete mixers) maintenance programme implementation	-project construction site and community	Daily	contractor	Construction cost

	record -absence of open burning by construction workers at construction site. -construction workers provided with nose masks -observable evidence of sand, stone chippings and cement stockpiled under tarpaulin. - construction vehicles observe 30km/hr speed limit within the project community -complaints from project community about air pollution or nuisance				
Noise and vibration	-evidence of routine maintenance programme or plan for the construction equipment (trucks, excavators, cement mixers) - record of construction equipment (i.e. excavators, construction vehicles and concrete mixers) maintenance	-construction sites	Daily	Contractor	Construction cost

	programme implementation record -absence of excavation and use of concrete mixers during night hours. Construction activities are limited to 8:00hrs to 17:00hrs only -observable use of well-maintained excavators and cement mixers during construction - observable evidence of engines of excavators, construction vehicles and concrete mixers switched off when are not in use. -record of implementation of noise limits near homes (less than 50 decibels) and along the streets of the construction communities(less than 75 decibels) - Complaints of noise nuisance by project communities				

	-- observable use of manual means in excavating drain channels that are very close to foundations of buildings and fence walls instead of using excavators -construction workers provided with ear plugs -workers using ear plugs during noise making construction activities -number of grievances recorded at the project communities				
Soil erosion	- trenches created at the project construction sites backfilled/covered -observable presence of vegetation planted at areas disturbed at the construction site and also along the slope of the newly constructed drains -No visible construction	Bankuman, Naval Base area, Tema Community 6, Adjei Kojo construction sites	Weekly	Contractor	Construction cost

	activities by the contractor during stormy conditions				
Waste generation & disposal	-No visible construction wastes at the project construction sites, community walkways and inside drains in the community - record of waste collection and disposal to TMA approved waste disposal sites. - Record of final waste disposal sites -availability of waste collection bins at construction site -availability of mobile toilet on site for the construction workers	-construction site - TMA Metropolis	Daily	Contractor	Construction cost
Water pollution	-observable change in turbidity of water in the drain channels in the project communities - No visible maintenance, cleaning, servicing and	- Construction sites - inside drains and water bodies	-weekly	Contractor	Construction

	fuelling of excavators, concrete mixers, vehicles and trucks construction ongoing at the construction sites -Visibility of oil and grease film in drains and water bodies - Record of maintenance, cleaning, fuelling and servicing of construction machinery (excavators, concrete mixers, construction vehicles) off site at Fuel Service Stations of recognized oil marketing companies in TMA -observable use of well serviced excavators and concrete mixers for the construction activities -availability of mobile toilets for construction workers				
Flooding of project sites during construction activities	-observable absence of excavated materials heaped across runoff directions in the project areas - record of waste collection	-construction sites Construction communities	Weekly	Contractor	Construction cost

	and disposal to TMA approved waste disposal sites. - absence of excavated materials deposited in drain channels and embankments -absence of construction activities during stormy conditions -observable inlets channels connecting into the newly constructed drain channels -record of number of flood occurrences at construction site during construction period . - complaints of flooding from project community residents				
Relocation/damage to utility service supply lines at construction site	-record of utility service lines affected by the project activities re-instated -record of	Construction sites -Construction community	Weekly	Contractor	Construction cost

	consultation/engagement with property owners during re-instatement - complaints by affected utility service providers.				
Workers Occupational health & safety	-availability of contractor's health and safety plan for the construction works -Construction workers provided with PPES (hand gloves, hard hats, reflector jackets. Construction boots, etc) -workers wearing PPEs at all times during construction activities - availability of signages warning construction workers of dangers on site - availability of first aid box at the construction site stocked with necessary drugs -Record of daily safety induction of workers -absence of unauthorised	Construction sites	Daily	Contractor	Construction cost

	persons on active construction site -record of incidents involving workers and public on construction site -availability of toilet on site for construction workers - record of HIV/AIDS awareness and education for workers				
Public health & safety& traffic management .	-presence of signages warning people of dangers at construction site -availability of barriers separating pedestrian's walkways and oncoming traffic along the streets of the construction activities -trenches created by the construction activities condoned off -absence of stagnant water in pits created by the construction activities	Construction communities	Weekly	contractor	Construction cost

	- availability of alternative access routes for motorist and pedestrians at the community streets involved in the project activities - availability of construction staff directing motorists and pedestrian's road blocks and diversions during peak hours in the morning and evening -absence of construction wastes and equipment parked on community walkways in the project communities -observation of vehicle speed limit of 30km/hr by construction drivers at the construction community -record of HIV/AIDS education organized for the project communities -active construction areas and trenches cordoned off separating unauthorized persons from excavated drain channels -absence of unauthorised				

	personnel found at active construction site -Record of accidents involving the public as a result of the project works				
Risk of social conflict	-record of awareness raising meetings for the project communities and workers about the project and the workers code of conduct -record of project update engagement/consultation meetings with the communities -number of grievances addressed on the project	-construction communities	Weekly	contractor	Construction cost
Increased risk of communicable diseases	- record of HIV/AIDs and STD transmission education held for the local project community people and workers - availability of condoms at the construction sites for the workers	-construction sites	Monthly	Contractor	Construction cost
Child labor and school	-Absence of children and minors involved directly or	-construction site	Weekly	Contractor	Construction

drop-out	indirectly in the project activities -availability of Contractor's Code of conduct for workers -report on training provided for workers on the Code of conduct	-construction community			cost
Gender Based Violence (GBV)	-absence of complaints of sexual harassment, child abuse and exploitation at the construction sites and communities -record of contractor employees signing to the code of conduct as a condition for employment	Construction sites -construction community	Weekly	Contractor	Construction cost
Socio-economic development and capacity building	-Number of local community people engaged in the construction activities -complaints by community residents	Project communities	Weekly	Contractor	Construction cost
Sub-total					
Decommissioning phase impacts					
Public and occupational	-absence of all construction equipment including concrete	-Construction sites in the project	Weekly	Contractor	Construction

health & safety Waste generation and disposal **Soil erosion**	mixers, excavators, etc. from construction site -absence of all spent construction waste from the construction site and community -absence of all road block, signages at the construction site and community on completion of the works - observable reinstated areas along the street and slope of drain (i.e. replanting of trees and grass, and pavements resurfacing, etc.)	communities -project communities			cost
Operation phase impacts					
Clogging of drains and flooding of communities Public health and safety of residents and sustainability of the newly constructed drains	- availability of approved Programme for Drains Management and Drainage Monitoring for the newly constructed drains in TMA -- Record of implementation of Management and Monitoring Programme of the newly constructed drains. - record of public sensitization	-TMA Urban Roads Department -TMA Waste Management Department	Quarterly basis	TMA	TMA Sanitation and Waste Management Annual Budget 100,000.00

	and education campaign on proper drain management in TMA communities --availability of solid waste collection receptacles at vantage points in drain communities in Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu. -record of desilting of the newly constructed drains by TMA in the drain communities -number of residents prosecuted and sanction in accordance with the TMA Metropolitan Bye- laws on Waste Management				
Sub-total					100,000.00
Grand Total					108,700.00

Grievance Redress Mechanism

As part of the ESMP, a grievance redress procedure has been designed aimed at addressing and resolving grievances or complaints from persons who may have grievances as a result of the sub-projects implementation, promptly, fairly and in a manner to extent possible, acceptable to all parties during the project implementation. The process provides for:

- Steps for submitting grievances and complains
- Registration of complain by an aggrieved person
- Determining and implementing the grievance action.
- Verifying the redress action
- Monitoring and Evaluation.
- Further Steps for Grievance Resolution and Court of law

The membership and functions of the Grievance Redress Committee are also proposed as part of the grievance redress process,

ESMP Capacity Building Plan for stakeholders

A capacity building Plan for the key stakeholders who will be engaged in the successful implementation of the ESMP has been prepared and presented in this report. The GAMA PCU will organize capacity building and training workshop for the contractor and his/her workforce as well as the other key stakeholders who will be engaged in the implementation of the ESMP on the ground. The capacity building will help create understanding on the ESMP and provide the necessary skills for the stakeholders to be able to implement the ESMP successfully.

Format for ESMP Monitoring Reporting

The ESMP mitigation measures monitoring reporting format has been presented in the Report.

Institutional responsibilities for the ESMP implementation

The roles and responsibilities for the different actors under ESMP implementation are also stated.

Code of Conduct

To ensure responsible conduct by the contractor, his/her employees and subcontractors during the entire construction activities in order to avoid illegal activities and misconduct i.e. gender based-violence, sexual harassment, and child labour etc., Code of Conduct has been presented in this ESMP to guide the conduct of the contractor and his/her workers and sub-contractors. All workers and subcontractors should sign the Code of Conduct as part of their employment conditions. This Code of Conduct is enforceable. Prior to the commencement of the construction activities, training will be provided for the relevant stakeholders, in particular, the contractor and employees, on the Code of Conduct.

Estimated Cost of ESMP Implementation

The estimated cost for the ESMP implementation is GHC211,100.00. This involves

i. Implementation of environmental and social management mitigation measures: GHC 77,600.00
ii. Monitoring of the environmental and social impacts: GHC108,700.00
iii. Grievance Redress Committees work: GHC5,800.00
iv. Capacity building of key stakeholders in the ESMP implementation: GHC19,000.00

A 10% contingency on the estimated cost of GHC21,110.00 to cater for unseen issues is proposed.

1.0 INTRODUCTION

1.1 Background

The Government of Ghana has received financing from the World Bank towards the cost of implementation of the Greater Accra Metropolitan Area (GAMA) Water and Sanitation Project. (GAMA W&S Project). The GAMAS&W Project is to increase access to improved sanitation and improved water supply in the GAMA with emphasis on low income communities and to strengthen management of environmental sanitation in the GAMA.

The GAMA project supports eleven Municipal and Metropolitan Assemblies spread across the Greater Accra Region. The Project has four components.
Component 1 - Provision of water and environmental sanitation services to priority low income areas of GAMA.
Component 2 -Improvement and expansion of the water distribution network in the GAMA.
Component 3- Improvement and expansion of waste water and fecal sludge collection, transportation and treatment in GAMA, and
Component 4- Institutional Strengthening.

The Ministry of Sanitation and Water Resources, through the Tema Metropolitan Assembly (TMA) intends to apply part of the GAMA Project funds to construct drainage interventions to alleviate flood risks in some communities in the TMA namely Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu where floods have posed risk to lives, property and economic activities due to the lack of drainage infrastructure to effectively channel storm water runoff to their natural outfalls.

The Need for the Proposed Project

The increasing development taking place in the communities of the Tema Metropolis has brought in its wake, flood risks in some communities because of the unavailability or low level of drainage interventions in the areas to effectively contain and channel the increasing storm water runoff being experienced anytime it rains.

Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu are communities in the Tema Metropolis where floods have posed threat to loss of property, lives and safety, economic losses, and soil erosion whenever there is heavy downpour due the low level of or non-availability of drains channel storm runoff away from the communities to their natural outfall.

In the low-lying Bankuman community, storm water flows through the community into the sea nearby which is the natural outfall. Over the years, the continuous flow of storm water runoff through the community have created a main natural drainage path through which runoff flows. This drainage path is not lined, nor aligned nor properly sized so that it can effectively collect and discharge the ever-increasing storm waters that flows through it during heavy rainfall. As a result, the community have become prone to flooding of residents and businesses during rainfall. Furthermore, the situation is accompanied by induced soil and land erosion problems along the runoff flow direction in the community, with attendant washing away of soil under the foundation of some buildings.

At the Naval Base area, though road side drains currently exist to channel flood waters away from the community, however, the channels have become woefully undersized to be able to effectively carry the increasing volumes of flood water during rainfall due to the increased storm water runoff due the expanding development in the area. During rainfall, homes and businesses along the road experience floods with loss of property and income of the residents.

In Tema Community 6, where a main drain carrying storm water through upstream Tema Community 8&9 passes through, large sections of the main drain have not been lined within the Tema Community 6 but rather remain an earth drain. During heavy downpour, the residents around the unlined portions flooding of their homes and property. Also, the continuous washing away (land erosion) of the base of the earthen embankment of the drain and also the base of a major road crossing culvert pose danger to the road users and property owners along that corridor of the drain.

In the communities of Adjei Kojo/Kanewu, the existing streets course are the lowest area in terms of topography and provide the main drainage paths for the storm water runoff through the community to its natural outfall, however, the streets do not have drains channels constructed along the street shoulders to carry storm ware runoff out of the streets and community. During rainfall, storm water stagnates on the streets corridors and within the communities, resulting in flooding of homes and properties including shops, school compounds, and destruction of the properties and economic activities. In addition, the streets become impassable during rainfall, affecting the movement of motorists and pedestrians and successful conduct of livelihood activities within the communities.

In other to address the flood risk situation in Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu, the subprojects are proposed to construct drainage structures at the flood prone areas in these communities to mitigate the flood risks and the threat to lives, property, economic livelihoods, and the environment in the project communities.

At Bankuman, the existing earth drain channel course will be properly aligned, properly sized and constructed into slapped reinforced concrete storm drain that will serve as the outfall drain for all the receptor drains in the community to properly channel runoff into the sea.

At the Naval Base area, the existing undersized drains will be demolished and replaced with bigger sized reinforced concrete storm drain channels along the road to effectively channel the increasing storm water from the community.

At Tema Community 6, the proposed project is to line the unlined sections (earth drain) of the main storm drain where there is continuous washing away of the base of the earth embankment and cross culvert along the Nana Prempeh Street, which sections have become a source of worry to road users and property owners along that corridor anytime there is heavy rainfall. The proposed project will prevent a looming disaster which can claim lives and property if left unattended to.

At the Adjei Kojo/Kanewu proposed project areas, a combination of different sizes of reinforced concrete drains and double cell pipe culverts will be constructed along the flood prone community streets for channelling storm water to their outfall.

The specific scope of works to be carried out at the proposed project communities are presented below.

The Proposed subprojects and activities:

The Tema Metropolitan Assembly has proposed construction of:

i. Bankuman community: Alignment, sizing and construction of the existing earth drain into 1.2mx1.2mx400m reinforced concrete storm drain and covered with slab.

ii. Naval Base area: Demolishing of existing undersized drains and reconstruction through combination of 1.2m x 1.2m reinforced concrete storm drain; 0.6m U-drain and 0.9m U-drains of length 223m

iii. Tema Community 6: Continue lining of the earthern (unlined) portion of the Tema Community 6 drain into 14mx3.5mx200m.

iv. Adjei Kojo/Kanewu: Construction covering 875m of a combination of 0.6m U-drain; 0.9mx U-drain;1.2mx1.2m reinforced storm drain; 1.5m diameter double cell pipe culvert and de-silting drain 500m

The construction works will include site clearance, excavation of drain channels, demolition and excavation of existing drains, construction and reconstruction of drains, and lining of drains. Other activities will include collection and disposal of construction wastes and backfilling of trenches.

These works have the potential to generate safeguards concerns including: soil erosion, loss of vegetation, waste generation, dust generation, noise and vibration, occupational health and safety concerns, among others.

1.2 Objectives of the assignment

The Environmental Protection Agency Act 490, of 1994, and the Ghana's Environmental Assessment Regulation, 1999 (LI 1652) requires that for any project which has the potential to impact negatively on the environment and people, the undertaking should be assessed for its environmental and social impacts and the appropriate mitigation measures identified prior to the undertaking. The GAMA project also triggers two of the World Bank Safeguard Policies, namely the Environmental Assessment Policy OP 4.01 and the Involuntary Resettlement Policy OP 4.12 requiring that any potential environmental and social issues arising from any proposed project should be identified and a management plan prepared to mitigate the impact. The purpose of the national environmental laws and the World Bank Policies are to ensure that the environmental and social impacts associated with any undertaking under the project are avoided where possible or effectively mitigated.

In seeking to comply with the GAMA project Environmental and Social Management Framework (ESMF) and other relevant national laws, this ESMP is prepared.

1.3 Objectives of the ESMP

The overarching objective of the ESMP is to ensure that the environmental and social impacts likely to arise from the proposed construction of the underground drains are addressed and appropriate mitigation measures integrated into project implementation and operation in order to protect human and environmental health.

The specific objectives of the ESMP are to:

- Identify potential positive and negative environmental and social impacts that may arise from the implementation and operation of the project;
- Proffer management actions that need to be implemented in order to mitigate the negative environmental and social impacts and enhance the positive impacts of the project;
- Propose environmental and social monitoring programs that will ensure that mitigation measures are implemented and effective during project execution and timely corrective actions are taken where required
- Propose institutional arrangements, incorporating roles and responsibilities of stakeholders involved in management actions and monitoring;
- Describe capacity building and training requirements for effective implementation of the ESMP;
- Outline the implementation schedule and reporting procedures for the ESMP;
- Communicate environmental and social expectations and requirements throughout the project life cycle;
- Ensure the allocation of sufficient resources for effective implementation of the ESMP.
- Comply with applicable National Environmental Assessment Regulation Act 490 1999 LI1652 as well as the World Bank's environmental and social safeguard policy on Environmental Assessment OP 4.01

1.4 Scope of work for the assignment

The scope of work for the assignment for the ESMP preparation include the following**:**

- Description of location of each project activity.
- Description of each project activity and subcomponents.
- Description of each project site: description of baseline environmental and social conditions of each project site- covering but not limited to: land cover (vegetation, trees, agriculture crops), soil characteristics, topography and elevation and drainage pattern that make the project area prone to flood. Description of land use of the project area: existing road/street, park/recreation, agriculture, developed/partly developed residential site, physical structures, agriculture and economic/livelihood activities. Provide diagrams/maps of each site and also pictures of the sites including vegetation, agriculture crops, economic and livelihood activities. Give a preliminary estimate of people that may be impacted by the project, as well as property, livelihoods, temporary displacements.
- Review policy, legal and institutional framework related to environmental management of the project.
- Identification of environmental and social impacts related to each project activities during construction, decommissioning and operational phases-including but not limited to dust generation, noise and vibration, air quality, changes in drainage pattern which could result in erosion effects, trees, waste generation, flood, occupational health and safety, human and vehicular traffic, land use activities, displacement of property and livelihoods, displacement of utility services (electricity and telephone poles and water

supply lines and bill boards), etc. Describe the project components that will generate the environmental and social impacts.

- Propose and describe adequate mitigation measures for addressing each of the negative environmental and social impacts identified. Include technical measures that will need to be incorporated in the works designs that prevent possible occurrence of flood and erosion in the communities due to changes in flow of water because of the works, and safeguard property. Provide description of the institutions and persons who will be responsible for proper implementation of the mitigation measures and their respective roles and mandates.

- Proposed Environmental and Social Management Plan (ESMP) which summarizes the (A) mitigation measures for all the impacts identified, including (i) an environmental, health and safety (EHS) plan, (ii) waste management plan, (iii) workers' camp management plan, (iv) direct community's engagement measures, etc.(B) appropriate indicators for monitoring and frequency of monitoring; (C) persons and institutions responsible for the proper implementation of the mitigation measures; and (D) the mitigation measures implementation costs.
- Consultation of stakeholders- including the project communities and community opinion leaders, community based organizations, owners of houses and shops along the frontlines of the proposed works whose existing access slabs will be temporarily affected, crop owners, local transport unions, Electricity Company of Ghana (ECG), the Ghana Water Limited (GWCL), Telecommunication Service Companies, the Environmental Protection agency (EPA), Churches whose access routes will be temporarily impacted. Photographs should be taken on the consultation meetings and presented in the ESMP reports.
- Annexes: Include technical design drawings of the undertakings from the Engineer; photographs showing the areas and immediate catchment of the drainage construction activities, record of people and institutions consulted (include photos and minutes), issues discussed and responses given by the stakeholders should be incorporated into the ESMP.

1.5 Methodology for developing the ESMP

1.5.1 Introduction

Stakeholder consultation and participation process was adopted in the preparation of this ESMP which ensured that stakeholders concerns and perception are gathered and incorporated into the overall design of the ESMP and to ensure smooth implementation of the proposed subprojects. Emphasis was placed on consultation among the Bankuman,, Adjei Kojo Kanewu, Naval Base area and Tema Community 6 communities. Also of key focus during the consultation were TMA Management, the Metropolitan Waste Management Department, the Metropolitan Urban Roads Engineers, Utility Service provides in the Tema Region including the Ghana water Company Limited and the Electricity Company of Ghana.. Consultation visits were conducted to the project sites and project communities to identify thekey environmental and social impacts; literature review/desk top studies were carried out; and stakeholder consultation meetings were organised The environmental and social impacts were identified with subsequent mitigation measures.

1.5.2 Site Visits

Visits were made to the proposed project sites located in Bankuman; Adjei Kojo Kanewu, Naval Base area and Tema Community 6 communities under the jurisdiction of the Tema Metropolitan Assembly (TMA) by the Consultant. At the inception of the ESMP preparation, the Consultant was accompanied to the proposed project sites by the Urban Roads Engineers, the Waste Management and Public Health Engineer, and the GAMA PCU Environmental Safeguards Specialist where he was introduced to some members of the project communities The aim of the visits was also introduce the consultant to the scope and boundaries of the project and preliminary identification of the environmental and social issues that could arise from the proposed works. The potential project affected persons interacted with, with the purpose to identify their concerns and also suggestion which could be integrated into the mitigation of the potential negative impacts. Follow-up visits were further conducted to assess the existing drain lines that will be constructed and assessment of land use activities in the areas to be affected by the proposed project. The existing baseline study covering the environmental and social characteristics, elevation, physical development, economic development were also gathered. Focus was also placed on potential occurrence of displacement of economic/ livelihood activities and on private assets and structures, waste management practices at the project area,

Other planned field visits were also conducted to the proposed project sites in company with staff of the Ghana water Company Limited, and Electricity Company of Ghana to determine the potential impacts of the subprojects on the GWCL supply line and Electricity supply lines at each of the proposed project sites. The field visits covered all the proposed project sites- Bankuman, Naval Base Area, Tema Community 6, and Adjei Kodjo/Kanewu. t each site, the GWCL and ECG personnel assessed the scope of the works and identified the impacts of the project on their utility lines. This was followed by a discussion of how the impacts would be mitigated.

1.5.3 Review of available literature/project documents

The purpose of the literature review was to acquire the relevant information about the project, the safeguard policies triggered by the project, the project scope, the project stakeholders and other requirements of the project. The documents reviewed by the consultant included:

- GAMA Project Appraisal Document (PAD);
- GAMA Environmental and Social Management Framework (ESMF);
- GAMA Resettlement Policy Framework (RPF); and
- World Bank Safeguards Policies,
- Baseline information relating to the physical, biological and socio-cultural environment of the project sites;
- Ghana Environmental Assessment and Regulation LI 1652 1999 and other relevant policies, laws and guideless relevant to the project.
- The drain construction design
- Tema Assembly Profile 2016; and
- Baseline report on solid waste management component.

1.5.4 Stakeholder consultations

Key stakeholder involved in the consultations in the ESMP preparation are the

i. Ministry of Sanitation and Water Resources
   - Environmental Safeguards Specialist and Social Safeguards Specialist at GAMA PCU

ii. Tema Municipal Assembly(TMA) which is the proponent of this project.
   - The Metropolitan Coordination Director of TMA
   - The Metropolitan Planning Officer of TMA
   - the TMA Urban Roads Engineers,
   - TMA GAMA Project Coordinator

iii. Project beneficiary community
   - Local people around the Bankuman Adjei Kojo Kanewu, Tema Naval Base area and Tema Community 6 proposed project areas

iv Utility providers

   - GWCL
   - Electricity
   -

1.5.5 Identification of Potential Environmental and Social Impacts i

The following procedures were used in the impact identification.

(1) From the interaction with the people related to the project and experts,
(2) From site visits and observations
(3) From professional judgements
(4) From interaction of the proposed project activities with the environmental baseline conditions

1.5.6 Reporting

The information gathered report was compiled into this ESMP report.

2.0 PROPOSED PROJECT DESCRIPTION

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2.1 The subprojects locations

The proposed subprojects are located at four (4) communities in the Tema Metropolitan Assembly, namely Bankuman, naval base area, Tema Community 6, and Adjei Kojo/Kanewu.

The communities of Bankuman and Naval Base are located within the Tema Newtown, lying at the eastern part of Tema.

The Bankuman community is mainly a residential area and a sea front community (Atlantic Ocean). It is a fast-growing low-income community where the inhabitants engage in economic activities including fishing and fish mongering, dressmaking shops, hair dressing saloons, motor repairs, carpentry among others. The community is low-lying where storm water from within the community and upstream areas flows through the community into the sea nearby which provides the natural outfall. No constructed drains exist in the community. Over the years, the continuous flow of storm water runoff through the community have created a what has become a main natural drainage path through which runoff flows into the sea. This drainage path is not lined, nor aligned nor properly sized so that it can effectively collect and discharge the ever-increasing storm waters that flows through it during heavy rainfall. As a result, the community have become prone to flooding of residents and businesses during rainfall. Furthermore, the situation is accompanied by induced soil and land erosion problems along the runoff flow direction in the community, with attendant washing away of soil under the foundation of some buildings.

The Naval Base area is located near the Tema Naval Base and shares boundary with the Bankuman community. Just like the Bankuman community, the residents engage in economic activities including fishing, fish mongering, dressmaking shops, hair dressing saloons,motor repairs, carpentary roasting of maize and yam, among others. Although road side drains currently exist to channel flood waters away from the community to the sea nearby, however, the channels have become woefully undersized to be able to effectively carry the increasing volumes of flood water during rainfall due to the increased storm water runoff due the expanding development in the area. During rainfall, homes and businesses along the road experience floods with loss of property and income of the residents.

Tema Community 6 is located in central Tema township and close to Nana Prempeh Street. The area is residential with other commercial activities such as schools, clinics and shops. The main drain carrying storm water through upstream Tema Community 8&9 passes through Tema Community 6 before arriving at the Sakumono lagoon which os its natural outfall. Large sections of the main drain have not been lined within the Tema Community 6 but remain an earth drain. During heavy downpour, the residents around the unlined portions experience flooding of their homes and property. Also, the continuous washing away (land erosion) of the

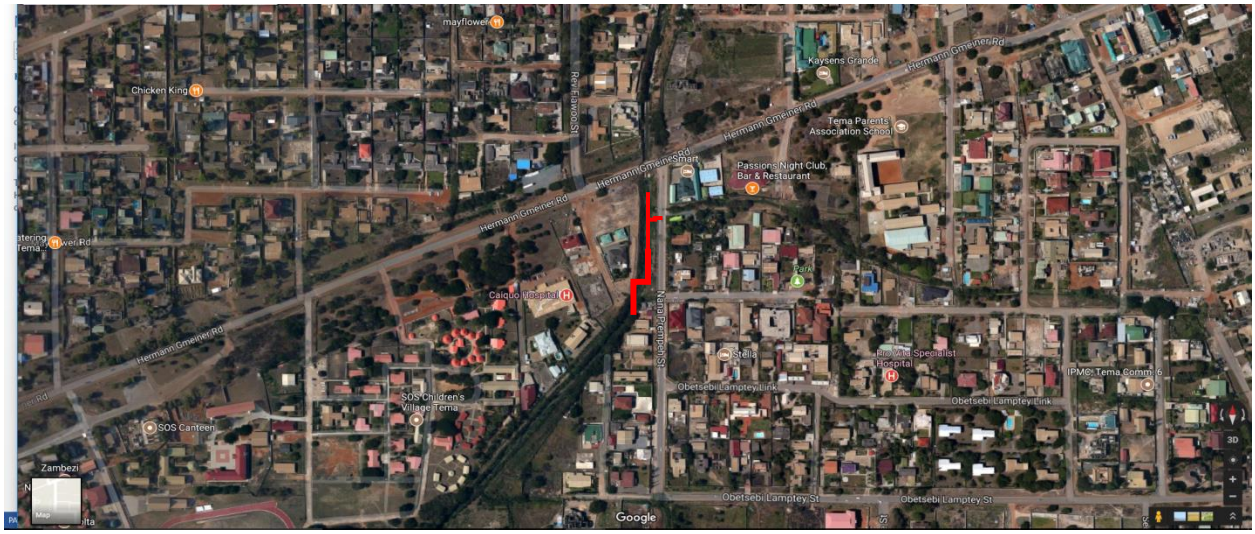
base of the earthen embankment of the drain and also the base of a major road crossing culvert pose danger to the road users and property owners along that corridor of the drain.

Adjei Kojo/Kanewu community lies at the western part of Tema and shares common boundary with the Ashaiman Municipal Assembly. It is a fast-growing area for residential purposes and commercial activities such as basic schools, selling of motor spare parts, cement, provisions, food selling, cement block making facilities, gardening among others. In the communities of Adjei Kojo/Kanewu, the existing streets courses are the lowest area in terms of topography and provide the main drainage paths through which storm water runoff through the community is able to leave the community to its natural outfall into the Sakumono lagoon downstream, however, the streets do not have drains channels constructed along the street shoulders to carry storm ware runoff out of the streets and community effectively. During rainfall, storm water stagnates on the streets corridors and within the communities, resulting in flooding of homes and properties including shops, school compounds, and destruction of the properties and economic activities. In addition, the streets become impassable during rainfall, affecting the movement of motorists and pedestrians and successful conduct of livelihood activities within the communities.

Maps and photographs of the ground situations at the proposed sites where the drains interventions will be undertaken were gathered and shown below:

Red line showing the routes of the proposed drains construction in the Bankuman community in Tema Newtown

Red line showing the route where drains will be reconstructed at Naval Base area in Tema New Town



Red colour showing where lining of drains will be done at Tema Community 6

Red routes showing where drains will be constructed at Adjai Kojo/Kanewu community

Drain channel at Tema Community 6 that will be lined by the project

Tema Community 6 drain showing a section to the right where the drain will be lined

Tema Community 6 drain showing a section to the right where the drain will be lined

Adjei Kojo/Kanewu - An existing street corridor providing runoff direction where drains will be constructed to channel storm water away from the community

Adjei Kojo/Kanewu - An existing street corridor providing runoff direction where drains will be constructed to channel storm water to leave the community

Adjei Kojo/Kanewu - An existing street corridor providing runoff direction where drains will be constructed to channel storm water to leave the community

Adjei Kojo/Kanewu - A route where drains will be constructed to channel storm water to leave the community

Adjei Kojo/Kanewu- A route where drains will be constructed under the project

Adjei Kojo/Kanewu- A street corridor where drains will be constructed under the project

Adjei Kojo/Kanewu-a street corridor where drains will be constructed under the project

Adjei Kojo/Kanewu- A proposed drainage course under the project

The earth drainage course where drains will be constructed and slapped in Bankuman

Earth drain course in Bankuman which will be constructed into a drain covered with slap.

Earth drain course in Bankuman where drains will be constructed and slapped

Earth drain route where drain will be constructed and slapped in Bankuman community

Section of undersized drains at Naval Base area which will be demolished and reconstructed

Section of undersized drain in Naval base area which will be reconstructed under the project

Section of Naval Base area proposed drain site where a GWCL chamber currently exists

Section of Naval base site for the proposed drains construction

2.2 Proposed subproject activities

The Tema Metropolitan Assembly is the proponent of the subproject, which are as follows:

v. Bankuman community: Alignment, sizing and construction of the existing earth drain into 1.2mx1.2mx400m reinforced concrete storm drain and covered with slab.

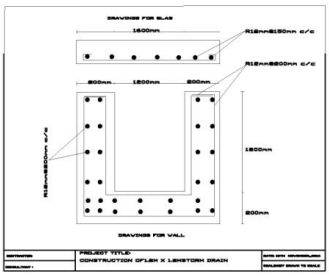
vi. Naval Base area: Demolishing of existing undersized drains and reconstruction through combination of 1.2m x 1.2m reinforced concrete storm drain; 0.6m U-drain and 0.9m U-drains of length 223m

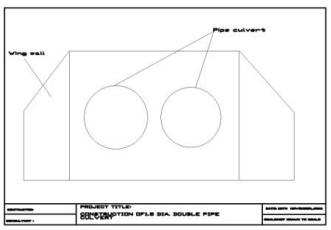
vii. Tema Community 6: Continue lining of the earthern (unlined) portion of the Tema Community 6 drain into 14mx3.5mx200m.

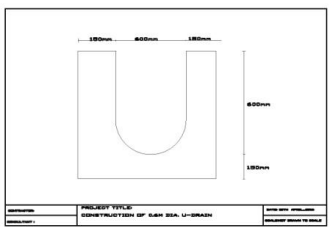
viii. Adjei Kojo/Kanewu: Construction covering 875m of a combination of 0.6m U-drain; 0.9mx U-drain;1.2mx1.2m reinforced storm drain; 1.5m diameter double cell pipe culvert and de-silting drain 500m

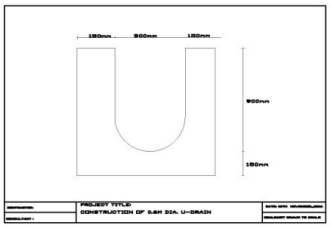
The construction works will include site clearance, excavation of drain channels, demolition and excavation of existing drains, construction and reconstruction of drains, and lining of drains. Other activities will include collection and disposal of construction wastes and backfilling of trenches

2.3 Proposed project design drawings









Sectional drawing of the drains

2.4 Building materials for construction and construction equipment:

The main raw materials include cement, water , stone aggregates, sand, wood, iron rods, drain pipes, and nails . The construction equipment that will be used will include concrete mixers; excavators; backhoe; water storage tank; construction vehicles for transporting construction materials.

2.5 Decommissioning of construction site after project construction activities

After completion of construction activities, all spent construction materials including iron rods, pieces of wood, concrete waste, construction pipe wastes, cement papers, nails, chippings, sand, unused excavated soil, excavated stones, will have to be carried away from the construction sites in the communities. Likewise, all construction equipment (i.e. excavators, backhoe, concrete mixers, etc.) should be dismantled and carried away. Any disturbed areas will have to be restored to pre-project conditions.

2.6 Operation

The drains will require some maintenance by way of regular desilting and repair of broken drains sections to keep it to function properly once constructed. Drain management programmes should be put in place to achieve the maintenance of the drains post construction. It should be kept clean from dumping of refuse and wastes. Periodically, the entire drain should be de-silted through removal of wastes, sand and weeds.

2.7 Labor for construction

It is estimated that a work force of twenty will be engaged at each site for the execution of the subprojects. There shall be workshop for the contractor to keep his/her cement and other construction materials. However, workers will not be allowed to sleep at the work site. Majority of the unskilled labor will be recruited from the local communities and will have to go home after work each day. A security man will be maintained at the site to ensure safety and security of the construction materials.

To ensure responsible conduct by the contractor and his/her workforce during the entire construction activities and avoid among other things, gender based-violence, sexual harassment, and child labor etc., a Code of Conduct has been developed in this ESMP to guide the conduct of the contractor and his/her workers and subcontractors. All workers and subcontractors should sign the Code of Conduct as part of their employment conditions. This Code of Conduct is enforceable.

Prior to the commencement of the construction activities, training will be provided for the relevant stakeholders, in particular, the contractor and employees, on the ESMP and the Code of Conduct.

2.8 Displacement of persons. property and economic activities:

The construction of the proposed drainage activities will affect some properties including wooden kioks, metal kiosks, foundations of some building, compounds, fish mongering sites, table top food vendors, and operation of shops within the right of way of the constructions works. Consequently, and in accordance with World Bank Safeguards Policy 4.12 and the RPF of the GAMA Project, a separate Abbreviated Resettlement Action Plan (ARAP) document has been prepared for the project. The ARAP identified all project affected persons and provide compensation package for them.

3.0 ENVIRONMENTAL BASELINE AND SOCIO-ECONOMIC CHARACTERISTICS OF THE TEMA MUNICIPAL ASSEMBLY

3.1 Background

The Tema Metropolis was created from the erstwhile Tema Municipality in 2007 with the promulgation of Legislative Instrument (LI) 1929. In 2012, the Kpone-Katamanso Sub-Metropolitan Council was carved out of the Tema Metropolis to establish the Kpone-Katamanso District. The Tema Metropolis has three Sub-Metropolitan Councils namely; Tema West, Tema East and Tema Central**.**

3.2 Physical Features

3.2.1 Location and size

Tema Metropolis is a coastal district situated about 30 kilometers East of Accra, the Capital City of Ghana. It shares boundaries in the northeast with the Dangme West District, south-west by Ledzokuku Krowor Municipal, north-west by Adentan Municipal and Ga East Municipal, north by the Akuapim South District and south by the Gulf of Guinea. The Ashaiman Municipal is an in-lock enclave within the Tema Metropolis. The Metropolis covers an area of about 87.8 km2 with Tema as its capital. The metropolis lies in the coastal savannah zone.

The Greenwich Meridian (i.e. Longitude 0º) passes through the Metropolis, which meets the equator or latitude 0° in the Ghanaian waters of the Gulf of Guinea. The Metropolis proximity to the sea with its low lying terrain which projects into the sea makes it a natural endowment for a harbour. This evidently informed the decision of the construction of the Tema Harbour in 1957, making the Metropolis “the Eastern Gateway of Ghana”.

3.2.2 Topography

The topography of the Tema Metropolis is generally flat and forms part of the coastal plains. The terrain of the district barely rises up to 35m above sea level. The almost flat nature of land has made it flood prone but this also makes it a good agricultural/developmental terrain. However, the only major constraint to this strength is the erratic rain fail pattern in the region.

3.2.3 Climate

The Metropolis lies in the coastal savannah zone and therefore enjoys a dry equatorial climate. The rainy season is usually from April to July (major rainy season) and from September to November (minor rainy season). The highest amount of rain is experienced in May, June and early July. Temperatures are high all year round with significant daily and seasonal variations.
Tema being an industrial hub, some areas have been demarcated to serve as greenbelts as a result of the absence of forest reserves (zones) to control the micro climate of Tema (climatic condition in relatively small area). However, the number of industries and waste generated have been increasing in the Metropolis without a corresponding increase in afforestation to absorb excess carbon mono-oxide generated by the factories. Also, areas reserved as green belts are being encroached upon. This has led to changes in weather condition with its associated effects, such as, loss of biodiversity and erratic rainfall pattern.

3.2.4 Vegetation and soils

The vegetation zone in the Metropolis comprises of the following; shrub land, grassland and few patches of semi-deciduous forests. Soils in Tema Metropolis are composed of sand, clay, humus, gravel and stone. The sandy and humus nature of the soil support the cultivation of vegetables whiles the clayey nature, though support the production of brick, could also have adverse effects on general construction activities.

The Metropolis is underlain by the Precambrian rocks of the Dahomeyan formation: metamorphic rocks mainly consisting of granite, gneiss and schist have been probably derived from sedimentary layers. These rocky formations are weathered or decomposed at the surface with a thickness not exceeding 12m in the area.

At the proposed project sites, Bankuman and Naval base areas have no vegetation. However, there exist some vegetation of short trees on the slopes of the Tema Community 6 sites, while the vegetation at the Adjei Kojo/Kanewu sites are on grass vegetation.

3.2.5 Drainage pattern

The streams in the Metropolis are seasonal. Most of the streams flow through depressions into the sea during the rainy season. Notable among them is the Gynakorgyor (flows into the Gao Lagoon between Manhean and Kpone). Industrial liquid waste and water from the eastern part of Manhean Township converge into a major drain ending up in the Chemu Lagoon between the harbour area and Tema Manhean. Pollutants especially from the industrial liquid waste could be responsible for the destruction of the aquatic life of the lagoon.

Storm water runoff pose flooding challenge to some parts of Tema where drainage structures do not exist or are inadequate, resulting in flooding incidents leading to loss of lives and property and soil erosion. Some of the communities are Bankuman, Adjei Kojo/Kanewu, Naval Base area, Tema Community 6

3.2.6 Land management

The Tema Metropolis comprises of two district planning areas – the Tema “Acquisition Area” which is administered by Tema Development Corporation (TDC) and the “Non-Acquisition Area” which, though owned by the various traditional authorities, is managed by the Town and Country Planning Department of the Tema Metropolitan Assembly (TMA). The Land Use Plan of this area was prepared in 1960 based on the concept of self-sufficiency per community and the neighbourhood concept of town planning.

Before the establishment of TMA (by Act 462), the Tema Development Co-operation (TDC), established by L.I 1468 ensured the appropriate development of the Acquisition Area. Currently this area also falls under the jurisdiction of TMA. This situation has resulted in the overlapping of planning functions which continues to breed a lot of conflict on issues between the two planning authorities. For instance, most residents report that development permits acquired from TDC are normally annulled by TMA and vice-versa.

3.3 Political Administration

3.3.1 Political Structure of the Assembly (local government structure)

Ghana's current program of decentralization was initiated prior to the national democratic transition in the early 1990s. In 1988, the PNDC government introduced a major legislative reform, the Local Government Law (PNDC Law 207). This created 110 designated districts within Ghana's ten regions, with non-partisan District Assembly (DA) elections held initially in 1988/89 and subsequently every four years (1994, 1998, and 2002). In addition to the two-thirds of DA members elected on an individual, non-party basis, one-third was appointed by central government, along with a chief executive for each district. The Local Government Act 462 1993 and Local Government Legislative Instrument LI 1929, established the Tema Metropolitan Assembly on the first day of November 2007 under the decentralization system to take control of the day-to-day running of the city. TMA was empowered by the law with deliberative, executive and legislative responsibilities. The Assembly was tasked to make laws, including the rules and bye-laws which give legal effect to decisions and also mobilize resources to undertake developmental programs and activities.

The General Assembly is the main body of the Assembly responsible for formulating laws and policies in the district. The membership of the General Assembly stands at fifty (50). The members are include the Metropolitan Chief Executive, the forty six (46) Assembly Members of which thirty- two (32) are elected and fourteen (14) appointed by the President of Ghana in consultation with the traditional authorities and other opinion leaders and the three Members of Parliament from the Tema West, Tema East and Tema Central constituencies which fall under the jurisdiction of TMA. However, the three Members of Parliament do not have voting right at Assembly meetings. The General Assembly is expected to meet at least four times in a year.

The Assembly members elect one representative among them to serve as the Presiding Member who presides over the General Assembly meetings. The Presiding Member is elected once every two years and is eligible for re-election.

3.3.2 Administrative structure of the assembly

Administratively, the Chief Executive is responsible for the day-to-day performance of the executive functions of the Assembly, supervises the various departments in the Assembly and is the chief representative of the Central Government in the Metropolis.
The Executive Committee co-ordinates plans and programs of the sub-Committees and submits them as comprehensive plans of action to the Assembly. The committee is in charge of implementing resolutions of the Assembly and oversees the administration of the Assembly in collaboration with the office of the Chief Executive, among others.
The Executive Committee has the following Sub-Committees: Development Planning Sub-Committee, Social Services Sub-Committee, Works Sub-Committee, Education Sub-Committee, Finance & Administration Sub-Committee, Environmental Management Sub-Committee and the Revenue Mobilization Sub-Committee.

3.4 Social and Cultural Structure

3.4.1 Traditional set up

The culture of the people of Tema is seen in their way of life. These include inherited ideas, beliefs, values and knowledge. Since culture is dynamic, some practices of the people have undergone changes over the years. Tema was created out of a cluster of small fishing villages. History has it that "Torman", as it was originally called was founded by a migrating people called the 'Kpeshie's' who were Gas. They brought along seeds of the gourd plant, which they planted at their new-found site. The seeds thrived very well producing lots of gourds and the area was referred to as "Torman", meaning a town of gourds, which stood at where the defunct Meridian Hotel is located. The traditional people were later relocated to their present location at Tema Manhean in 1961 when the Tema Habour was constructed.

3.4.2 Festivals

The traditional festivals celebrated by the people are Kpledzoo and Homowo. "Kpledzoo" celebrated between March and April whiles "Homowo", which literally means hooting at hunger is celebrated from August to September every year. During these festivals people from all walks of life in the traditional area are brought together for the celebration.
The indigenous occupation of the people is fishing and is forbidden for fishermen to go to sea on Tuesdays. This deprives fishmongers and others engaged in fishing activities of their income for the day, and as such some form of revenue is lost to the Assembly.

3.4.3 Ethnic diversity

The original settlers of Tema are the Ga-Dangmes. However, because it is a popular destination of migrants, several ethnic groups can be found here. The dominant ethnic groups are the Akan, Ga-Dangme and Ewe. Other fairly well represented groups are the Mole-Dagbani and the Guans. The diverse nature of the inhabitants fosters interethnic tolerance and social solidarity that has promoted peace and harmony in the district. This has also reduced ethnocentrism. The religious composition of the Metropolis population is diverse since the inhabitants are of varied background. The prominent amongst them are Christians, Moslems and Traditionalists.

3.4.4 Health

Tema have both public and private health facilities that are spread across the entire Metropolis and their classification by type of facility is based on their functions and the range of services they provide. The total number of health facilities in the public sector is 46 (54.2 %), is higher than that of private health facilities 16 (38.9%). This means that in terms of accessibility to health facilities in the Metropolis, the public sector has a wider coverage in the provision of healthcare. However, due to rapid increase in the population of the Metropolis, expansion of health facilities both public and private has become necessary to meet the needs of the population.

The Tema Metropolitan Mutual Health Insurance Scheme was established in March 2004 as an intervention in the health sector. The purpose of the scheme is to provide a pool of resources to reduce the monetary stress on health acquisition. The scheme provides out-patient, in-patient, oral health, eye care, maternity care and emergency services.

3.4.5 Education

The Ghana Education Service (GES) implements approved policies made by the Ministry of Education (MoE). In the Tema Metropolis, educational concerns are addressed by the Metropolitan Education Directorate. The Metropolitan Education Directorate exists to facilitate and provide relevant quality pre-tertiary education, teaching and guidance with emphasis on science and ICT in the school environment through collaboration with stakeholders in education, industry and commerce to ensure that children develop to their full potential.
The Metropolis has many public and private tertiary and pre-tertiary educational institutions. Out of the 338 schools in the Metropolis, 185 are private and 153 are public schools. Also the Metropolis has one full fledge private university, the Datalink University, and satellite campuses for three other universities, namely, Presbyterian University, GIMPA and KNUST. In spite of the advancements of education in the Metropolis, the budget allocation for the education sector by the Metropolitan Assembly is always inadequate to meet the demands of the Education Unit to carry out infrastructural development of schools.

3.4.6 Water and sanitation

The Tema Metropolis has its main source of water supply from the Kpong water works. Occasional breakdown of activities at the water works, however, causes a nightmare in terms of water supply to the people in the Metropolis.

In the early 1960's, the government of Ghana in the development of the Tema Township built a large water carriage system referred to as the Tema Central Sewerage System. The system is composed of a network of pipes of various sizes that convey sewerage into three (3) pumping stations and two ejector stations. These pumping/ejector stations pump sewerage through a detention basin into the sea.

In 1988, the Tema (District Council) Metropolitan Assembly jointly with Tema Development Corporation commissioned a study into the effectiveness of continuous use of the Tema Sewerage System. Based on the recommendations of the study, funds were secured from IDA for the rehabilitation of the System. These include the rehabilitation of pumping mains, the rehabilitation of three pumping stations, provision of sewerage treatment plant, the replacement of some over-aged sewers, and the repair of the marine outfall.

In December 1990, the Assembly introduced private sector participation in the collection, transportation and disposal of solid waste. The Assembly has built on this initiative by expanding the coverage of solid waste collection in the Metropolis. Currently, the Assembly has privatized the collection and disposal of solid waste (except Tema NewTown) and this development has reduced the financial burden of solid waste collection on the Assembly. Under this new arrangement, contractors (service providers) are required to collect solid waste and associated approved fees directly from households.

3.5 Economy

3.5.1 Tema Harbour

The Tema Harbour was officially opened in February 1962 and is the hallmark of economic activities in the Metropolis. Located on the Greenwich Meridian and 28.5 km east of Accra, it provides the appropriate facilities to handle efficiently the expected growth in trade and industry

in the country. The Metropolitan Area serves as the industrial hub of Ghana with over 500 industries that produce chemicals, clothing, consumer electronics, electrical equipment, furniture, machinery, refined petroleum products, steel and tools. The country's biggest port and harbour facilities are located in Tema. These contribute substantially to the revenue of the state but not much to Tema Metropolitan Assembly. In order to reverse this trend, the Assembly is collaborating with businesses in the shipping industry to mobilize enough revenue from the Port. There is also a canoe beach where smaller boats/canoes dock. It is equipped with a fish market to make it easy for sales.

3.5.2 Free zone enclave

The Government of Ghana acquired a large tract of land designated as a "Free Zones Area" near the port for the production of goods, 70 percent of which are for export and 30 percent for local consumption. The imports of a free zone developer, sub-contractor or enterprise into a free zone's single-factory zone are exempted from direct and indirect taxes and duties. These factories and its shareholders are exempted from the payment of income tax on profits for the first ten years from the date of commencement of operation.
The free zone enterprises create employment directly in terms of the number of people employed in the factories. Indirectly, these enterprises create employment for artisans in the construction/building industry, packaging, as well as utility providers. In this respect, the success of the program will enhance the poverty reduction efforts in the Metropolis and the country in the long run.

3.5.3 Markets

Almost all the major communities within the Tema Metropolis have market facilities, and this is due to the fact that the city was planned using the Neighbourhood Concept of Town Planning. However, due to population growth and the growing commercial activities, the current facilities are inadequate. The situation continues to manifest itself in the proliferation of unauthorized commercial shops and stores in the form of wooden structures and shipping containers within the city. The creation of semi-commercial centers has therefore become imperative.

3.5.4 Electricity

The main source of electricity to the Tema Metropolis is from the Akosombo Hydro-electric Dam. Almost every part of the metropolis is served with electricity and this situation has contributed immensely to the success of operations of businesses and industrial activities in the area. Occasionally, however, the power fluctuations that hit the country greatly affect economic activities in the Metropolis.

3.5.5 Transportation and roads network

The total length of roads within the Metropolitan area is 1,237 km (including Kpone-Katamanso which has been carved out since 2012), made up of 38 km asphaltic concrete, 301 km surface dressed and 898 km gravel and earth roads. Many of these roads have no drains, bicycle or pedestrian facilities and those that exist are generally in deplorable conditions. This situation causes a lot of difficulties for travelers when commuting from one place to the other and impact negatively on travel time, rate of accidents and productivity within the Metropolis.
The main mode of transporting goods and services in the Metropolis is by road. Currently the rail system in the Metropolis is functioning and would help to relief the pressure on road

transport especially, if expanded from the Metropolis to other major cities. This has become imperative since goods like cocoa that serves as raw materials for some of the food production companies are transported not by rail but by road from the hinterlands. This situation sometimes results in congestion on the major roads in the Metropolis.

Due to the location of the harbour, a lot of shipping companies operates in the Metropolis that facilitates the export and imports of goods from other countries. There are private and commercial transport systems operating in the Metropolis, including, a web of taxi services which are available 24-hours. Heavy-duty trucks and Lorries come from all over the country carting goods to and from the harbour and the industries in Tema.

Basically, there are four types of commercial transport systems in the Metropolis; these are bus, commercial vehicles (trotro), shared and hired taxi services. All transport activities both within and intercity, originates and terminates at the various vehicle terminals and station at Community One which is also the central business district (CBD) of the Metropolis. Addressing transportation related problems in the CBD can therefore go a long way to improve activities in the transportation sector.
Currently, the Metro Mass Transit Services is in operation. Its services have impacted positively in the Metropolis since they started operation in late 2004. These buses commute from Tema to areas like Accra, Ashaiman, Teshie-Nungua, Manhean and other areas. This transport service is the cheapest in the Metropolis, hence it is greatly patronized by many people in the Metropolis.

3.5.6 Tourism and hospitality industry

Tourism and hospitality sectors play an important role in the economy of the Metropolis. The Tema Metropolis has a number of tourist attractions, such as, the Meridian Stone, Greenwich Meridian and the Sakumono beach. Tourism has the potential of diversifying the Metropolitan economy if the sector is given the needed attention, as well as, generating employment and revenue for TMA. Furthermore, there are 350 hotels and guest houses in the Metropolis. The Sakumono beach is one of the investment areas which have not been tapped into, and TMA, foreign and local investors need to channel resources to this sector for development.

3.5.7 Communication and commerce

There are over 20 financial institutions, such as, Ecobank, Zenith Bank, Ghana commercial Bank, Barclays Bank among others with branches spread throughout the Metropolis. The Metropolis has access to more than ten (10) major free-on-air television stations including, TV3, GTV, Metro TV, NET 2, Viasat 1, Crystal TV, ETV, UTV and TV Africa. All the six (6) main mobile telecommunication companies (i.e. Expresso, MTN, Tigo, Airtel, Glo and Vodafone) operate in the Metropolis.

3.6 Population Size and Distribution

The most fundamental demographic parameter is the number of individuals within a population (Lebreton*et al*., 1992). The 2010 PHC indicate the total population of the Tema Metropolitan as 292,773 with 47.8 percent been males and 52.2 percent females. The metropolis is entirely urban.

The age group 25-29 years has the highest population among the population (11.4%), followed by the 20-24 years age group (11.1%), 15-19 years age group (9.6%) and 10.14 years age group

(9.3%). The least proportions are the 90-94 years and 95-99 years age groups (0.1% each). The proportion of children (0-14 years of age) in the population of the metropolis is 29.4 percent, adults (15-64 years age group) are 66.7 percent and the elderly (65+ years and older) is 3.9 percent. Among the female population, the proportion of children (28.7%) is lower than the proportion among males (30.1%) but the proportions of adults and the elderly among the female population (67.2% and 4.1%, respectively) are higher than the proportions among the male population (66.1% and 3.8%, respectively).

Generally, there are more females (52.2%) than males (47.8%) in the population of the metropolis. The sex ratio is 92, that is, for every 100 females in the Metropolis, there are 92 males

3.7 Population size, structure and composition

The population of Tema Metropolis, according to the 2010 Population and Housing Census, is 292,773 representing 7.3 percent of the region's total population. Males constitute 47.8 percent and females represent 52.2 percent. Also, 100 percent of the population live in urban localities. The Metropolis has a sex ratio of 91.6. The population of the Metropolis under 15 years 34.5 percent depicting a broad base population pyramid which tapers off with a small number of elderly persons 60 years and above (6.0%). The total age dependency ratio for the Metropolis is 50.0, the dependency ratio the males is higher (51.3) than that of the dependency ratio females (48.7)

3.8 Fertility, mortality and migration

The Metropolis has a Total Fertility Rate of 2.3. The General Fertility Rate is 68.3 births per 1000 women aged 15-49 years which is the sixth highest for the region. The Crude Birth Rate (CBR) is 21.0 per 1000 population. The crude death rate for the Metropolis is 4.4 per 1000. The death rate for males is highest for age 70 and above representing 51.0 deaths per 1000 population while for the females, the highest death rate of 27.2 deaths per 1000 population is also for age 70 and above. Accident/violence/homicide/suicide accounts for 13.8 percent of deaths, while 86.2 percent is by other causes. The Metropolis has a migrant population of 166,506. Majority of migrants (75.3%) living in the Metropolis were born in elsewhere in another Region, while 20.5 percent were born elsewhere in the Greater Accra region. For migrants born in another region, those born in Eastern region constitute 23.1 percent followed by Volta region, 22.6 percent and Central, 22.4 percent.

3.9 Household size, composition and structure

The Metropolis has a household population of 285,139 with a total number of 70,797 households. The average household size in the Metropolis is 4.1 persons per household. Children constitute the largest proportion of the household composition accounting for 34.1 percent. Spouses form about 10.6 percent while other relatives constitute 11.2 percent. Nuclear (head, spouse(s), children) constitute 22.4 percent of the total number of households in the Metropolis and this is followed by Extended households (head, spouse(s), children and head's relative) (19.4%).

3.10 Marital status

About 37.8 percent of the populations aged 12 years and older are married and 47.8 percent have never married. By age 25-29 years, about 35.7 of females are married compared to 16.8 percent of males. At age 65 and above, widowed females account for as high as 50.8 percent while widowed males account for only 11.4 percent. . Among the married, 10.6 percent have no

education while about 4.2 percent of the never married have never been to school. About 78.7 percent of the married population are employed, 4.5 percent are unemployed, and 16.8 percent are economically not active. Almost half of those who have never married (48.2%) are economically not active with 6.5 percent unemployed.

3.11 Nationality

The proportion of Ghanaians by birth in the Metropolis is 94.5 percent. Those who have naturalized constitute 0.7 percent and the non-Ghanaian population in the Metropolis is 2.5 percent.

3.12 Literacy and education

Of the population 11 years and above, 91.1 percent are literate, and 8.9 percent are non-literate. The proportion of literate males is higher (94.8 %) than that of females (87.8%). About five out of ten people (48.8%) indicated they could speak and write both English and Ghanaian languages. Of the population aged 3 years and above (272,880) in the Metropolis, 8.5 percent has never attended school, 33.8 percent are currently attending, and 57.7 percent have attended in the past.

3.13 Economic activity status

About 72.0 percent of the populations aged 15 years and older are economically active while 28.0 per cent are economically not active. Of the economically active population, 90.4 percent are employed while 9.6 percent are unemployed. For those who are economically not active, a larger percentage of them are students (50.2%) and 20.2 percent perform household duties. Again, about 53.5 percent of the unemployed are seeking work for the first and available for work.

3.14 Occupation

Of the employed population, about 31.5 percent are engaged as service and sales workers, 20.2 percent in craft and related trade and 10.4 percent in Elementary occupations. About 22.5 percent are engaged as managers, professionals, and technicians.

3.15 Employment status and sector

Of the employed population 15 years and older 42.4 percent are employees, while 40.8 percent are self-employed without employees. About 7.0 percent are self-employed with employees and 3.2 percent are apprentices. The private informal sector is the largest employer in the Metropolis, employing 65.4 percent of the population followed by the private formal with 23.6 percent.

3.16 Information Communication Technology

Of the population 12 years and above, 76.5 percent have mobile phones. Men who own mobile phones constitute 80.0 percent as compared to 73.4 percent of females. About 26.1 percent of the population 12 years and older use internet facilities in the Metropolis. Also, about 26.5 percent of households in the Metropolis have desktop/laptop computers.

3.17 Disability

About 2.5 percent of the Metropolis's total population has one form of disability or the other. The proportion of the female population with disability is slightly higher (2.5%) than that of

males (2.4%). The types of disability in the Metropolis include sight, physical, hearing, speech, intellect, and emotion. Persons with sight disability recorded the highest of 39.1 percent followed by physical (26.3%), and emotional disability (20.8%). Of the population disabled, 51.6 percent are employed and 43.1 percent economically not active. About 16.3 percent of the population with disability have never attended school.

3.18 Agriculture

In the Metropolis, 3.6 percent of households are engage in agriculture. Most agricultural households in the Metropolis (74.7%) are involved in crop farming with chicken (47.5%) as the dominant animal reared in the Metropolis.

3.19 Housing

The housing stock of Tema Metropolis is 40,956 representing 8.6 percent of the total number of houses in the Greater Accra Region. The average number of persons per house is 7.1.

3.19.1 Type, tenancy arrangement and ownership of dwelling units

Almost a third (31.2%) of all dwelling units in the Metropolis are compound houses; 20.2 percent are separate houses and 25.4 percent are semi-detached houses. About 48.2 percent of the dwelling units in the Metropolis are owned by members of the household; 33.6 percent are owned by private individuals; 8.1 percent are owned by a relative who is not a member of the household and only 5.2 percent are owned by public or government. About 1.3 percent of the dwelling units is owned through mortgage schemes.

3.19.2 Material for construction of outer wall, floor and roof

The main construction material for outer walls of dwelling units in the Metropolis is cement blocks/concrete accounting for 76.3 percent with wood constituting 19.8 percent of outer walls of dwelling units in the Metropolis. Cement/concrete (73.2%) and Ceramic/porcelain/marble tiles (8.2%) are the two main materials used in the construction of floors of dwelling units in the Metropolis. Metal sheets are the main roofing material (59.9%) for dwelling units in the Metropolis, while 28.2 percent of dwelling used slate/asbestos to roof their dwellings.

3.19.3 Room occupancy

Single room constitutes the highest percentage (53.8%) of sleeping rooms occupied by households in housing units in the Metropolis. About 11.5 percent of households with 10 or more members occupy single rooms.

3.20 Utilities and household facilities

The three main sources of lighting in dwelling units in the Metropolis are electricity (86.7%), kerosene lamp (5.3%) and flashlight/torch (4.4%). The main source of fuel for cooking for most households in the Metropolis is gas (51.7%). The four main sources of water in the Metropolis are pipe borne water, public standpipe and Tanker supply. About 49.4 percent of households drink water from pipe-borne inside dwelling.

Most households (53.1%) in the Metropolis use the W.C as places for convenient. Also, about 30.8 percent of households use public toilet (WC, KVIP, Pit, pan). About two fifth of households (40.5%) in the Metropolis have bathrooms for exclusive use of members while another 25.6 percent use shared separate bathroom in the same house.

3.21 Waste disposal

Most households (56.2%) have their solid waste collected. Another 21.8 percent dump solid waste dump in public container. For liquid waste disposal, throwing waste through the sewerage system (39.5%) and into the gutter (26.6%) are the two most common methods used by households in the Metropolis.

4.0 POLICIES, LEGAL AND ADMINITRATIVE FRAMEWORKS

The Environmental Policies and Environmental Assessment regulations, and of the World Bank, which are relevant to the Project are outlined below.

4.1 Policy Framework

The relevant Ghanaian policies to guide the implementation of the proposed culverts construction include the following:

- The national environmental policy (2013);
- The national environmental sanitation policy dated April 2010;
- National health policy, (2007)
- National Urban Policy framework and Action Plan, 2012; and

4.1.1 The GoG Environment Policy (2013)

The GoG Environmental policy was formulated in 1995 and revised in 2013. The ultimate aim of the National Environmental Policy of Ghana is to improve the surroundings, living conditions and the quality of life of the entire citizenry, both present and future. It seeks to promote sustainable development through ensuring a balance between economic development and natural resource conservation. The policy thus makes a high quality environment a key element supporting the country's economic and social development.

4.1.2 The National Environmental Sanitation Policy dated April 2010

The revised environmental sanitation policy seeks to refocus the priorities of the sector, it is forward looking and effectively embrace the challenges of changing life-style associated with modernization and improving wealth status. The policy lays the basis for developing a system and systematic approach and framework for identifying and harnessing resources for value-for-money (economy, effectiveness and efficiency) services to all.

4.1.3 National Health Policy (2007)

The National Health document which aims at creating wealth through health, among other things places emphasis on improvements in personal hygiene, immunisation of mothers and children. The National Health Policy also argues that a healthy population could be achieved if there were improvements in environmental hygiene and sanitation, proper housing and town planning, provision of safe water, food and nutrition and encouragement of regular physical exercise.

4.1.4 Riparian Buffer Zone Policy.2011

The riparian buffer zone policy identifies encroachment of watercourses and wetlands as a major cause of flooding in Ghana. To remedy the situation, the policy set out "to preserve or establish green spaces as riparian buffers along waterways in areas that are practically difficult for regeneration and reforestation of riparian vegetation as more efficient ways of preventing drinking water contamination and flooding ". Measures outlined in the policy to support flood abatement are provision of minimum development zones around water bodies and removal of unauthorised structures in reservations around water bodies.

The policy seeks to harmonise policies and laws from other sectors in respect to buffer zones but some of its proposal actually conflict with existing planning standards and legislations. For example, the 60-metre buffer along major rivers stipulated in the Riparian Buffer Zone Policy conflicts with the 30-meter standard set in the National Building Regulation (LI. 1630, 1996)

4.1.5 National Urban Policy Framework and Action Plan, 2012

The goal of the National Urban Policy (NUP) is "to promote a sustainable, spatially integrated and orderly development of urban settlements with adequate housing, infrastructure and services, efficient institutions, and a sound living and working environment for all people to support the rapid socioeconomic development of Ghana. The policy identifies chocked drains and frequent flooding as part of the key sources of environmental deterioration. The initiatives to achieve objective 4:"improving environmental quality of urban life", includes to "Develop and implement a system and systematic programme of flood control measures in urban communities (Initiative 4:6)". The key activities proposed in the action plan for initiative 4:6 are as follows:

- 4.6.1 Review existing flood control and management situation and develop, as necessary, drainage/flood control management plans for cities and towns
- 4.6.2 Monitor, evaluate and revise plans on a regular basis
- 4.6.3 Prepare a technical manual on urban drainage channels schemes to guide MMDAs
- 4.6.4 Institute regular inspection and maintenance of drains; and enforce strict land use controls to prevent building encroachments on drainage channels and nature reserves
- 4.6.5 Strengthen the technical capacities of MMDAs for drainage planning, development and management; and flood disaster prevention, preparedness and management.

4.1.6 National Water Policy

The National Water Policy was formulated in 2007 within the context of Growth and Poverty Reduction Strategy (GPRS II), New Partnership for Africa's Development (NEPAD) and the Millennium Development Goals (MDGs). The policy objective is to "promote an efficient and effective management system and environmentally sound development of all water resources in Ghana."(Government of Ghana, 2007:12). The highlight of the document is the recognition that water resource have competitive and conflicting uses and is organised around three themes namely water resources management, urban water supply and community water and sanitation.

The water policy resources management theme discusses issues relating to flood abatement under focal area 1 and 6 that cover integrated water resource management and climate change/variability respectively. In both focal areas, there is an acknowledgment that water resources are finite and vulnerable given its multiple uses. The plan recognises the need to integrate water resources planning with land use planning activities and river basins as units. Finally, water resources were to be protected from human activities and river basin management was to be integrated with coastal zone and wetlands management. These sectors also make statements about the threat posed by extreme weather events, notable flooding.

4.2 National Legal and Regulatory Framework

The relevant national laws and legislation particularly to guide the preparation of the ESMP covering the proposed project include the following;

- The constitution of Ghana
- The state lands Act, 1962
- The lands(statutory wayleaves) Act, 1963

- Lands commission Act 2008, Act 767
- Environmental protection Agency Act 1994, Act 490
- Environmental Assessment Regulations 1999, LI 652
- Fees and charges (Amendment) Instrument 2015 (LI 2228)
- Water Resources Commission Act 1996, Act 522
- Local Government Act 1993 Act 462
- Lands (statutory wayleaves) Act, 1963w (Act 186)
- The state lands Act, 1963 (Act 125)
- Lands commission Act 2008 (Act 767)
- The Labour Act, 2003 (Act 651)
- Workmen's compensation law, 1987, PNDCL

4.2.1 Then Constitution of Ghana and the Protection of Individual Property

Displacement of people

The project has taken note of clause 3 of Article 20, which states that:"where a compulsory acquisition or possession of land effected by the state accordance with clause (1) of this article involves displacement of any inhabitants, the state shall resettle the displace inhabitants on suitable alternative land with due regard for their economic well-being and social and culture values."

Article 20 of the 1992 constitution of Ghana provides for the protection from deprivation of property unless such acquisition is made in the interest of defence, public safety, public order, public morality, town and country planning, or the development or utilisation of property to promote public interest.

Under the same Article 20 of the constitution of Ghana, such compulsory acquisition of property by the state should be made under a law which makes provision for prompt payment of fair and adequate compensation as well as a right of access to a High Court by any person who has interest in or right over the property for the determination of his interest or right and the amount of compensation to which he is entitled.

4.2.2 The state Lands Act, 1962

The state lands Act, 1992 (Act 125) vests in the president of the republic the authority to require land for the public interest via an executive instrument. In addition, the state lands Act, 1962, details different elements to be taken into consideration when calculating compensation and these include:

- "cost of disturbance" means the reasonable expenses incidental to any necessary change of residence or place of business by any person having a right or interest in the land;
- "Market value" means the sum of money which the land might have been expected to realise if sold in the open market by a willing seller or to a willing buyer,
- "Replacement value" means the value of the land where there is no demand or market for the land by reason of the situation or of the purpose for which the land was devoted at the time of the declaration made under section 1 of this Act, and shall be the amount required for reasonable re-instatement equivalent to the condition of the land at the date of the said declaration; and
- "Other damage" means damage sustained by any person having a right or interest in the land or I adjoining land, by severance from or injurious affection to any adjoining land.

4.2.3 The lands (Statutory Wayleaves) Act, 1963

The lands (statutory wayleaves) Act, 1963 (Act 186) details the process involved in occupation of land for the purpose of the construction**,** installation and maintenance of works of public utility, and for the creation of right of ways for such works. The key elements of this Act include the following:

- The owner/occupier of the land must be formally notified at least a week in advance of the intend to enter, and be given at least 24hours notice before actual entry;
- Any damage due to entry must be compensated in accord with the procedures established by the Minister unless the land is restored or replaced;
- In the case of highways, no compensation shall be paid, unless the land taken is more than one fifty of the total holdings of an affected person;
- Where a right of way must be established in the public interest, the President may declare the land to be subject to such statutory wayleave; and
- On publication of a wayleave instrument specifying the area required, and without further assurance, the land shall be deemed to be subject to wayleave. Compensation is then determined and paid, with the right of appeal to Tribunal established by the President, in parallel with the lands Act, 1962.

4.2.4 Lands Commission Act 2008, Act 767

Lands commission Act 2008 re-establishes the lands commission to integrate the operations of public service land institutions in order to secure efficient land Titles among others to:

- Promote the judicious use of land by the society and ensure that land use is in accordance with sustainable management principles and the maintenance of a sound eco-system; and
- Ensure that land development is effected in conformity with the nation's development goals.

4.2.5 Environmental Protection Agency Act 1994, Act 490

The environment protection agency Act 1994 (Act 490) gave mandate to the Agency to ensure compliance of all investments and undertakings with laid down Environmental Assessment (EA) procedures in the planning and execution of development projects, including compliance in respect of existing ones.

4.2.6 Environmental Assessment Regulations 1999, LI 1652

The Environmental Assessment Regulations 1999 (1652) enjoins any proponent or person to register an undertaking with the Agency and obtain an Environmental Permit prior to commencement of the project.

4.2.7 Fees and Charges (Amendment) Instrument 2015 (LI 2228)

The Fees and Charges (Amendment) Instrument 2015 (LI2228) replaces the Fees and Charges (Amendment) Instrument, 2014(LI 2216), and gives regulations to the fees and charges (Miscellaneous Provision) Act 2009, Act 793. The law provides comprehensive rates, fees and charges collectable by Ministries, Department and Agencies (MDAs) for goods and services delivered to the public.

4.2.8 Water Resources Commission Act 1996, Act 522

The Water Resources Commission Act 1996 (Act 522) establishes and mandates the Water Resources Commission as the sole agent responsible for the regulation and management and the utilisation of water resources and for the co-ordination of any policy in relation to them. Section 13 prohibits the use of water (divert, dam, store, abstract or use water resources or construct or maintain any works for the use of water resources) without authority. The Act states under section 24 that any person who pollutes or fouls a water resource beyond the level that the EPA may pre-scribe, commits an offence and is liable on conviction to a fine or a term of imprisonment or both.

4.2.9 Local Government Act, 1993

This Act establishes and regulates the local government system and gives authority to the Regional Coordinating Council (RCC) and the District Assembly to exercise political and administrative power in the Regions and District, provide guidance, give direction to, and supervise all other administrative authorities in the region and district respectively. The assembly is mandated to initiate programmes for the development of basic infrastructure and provide municipal works and services as well as being responsible for the development, improvement and management of human settlements and the environment in the district.

4.2.10 The Labour Act, 2003 (Act)

Section 118(1) of the labour Act 2003 (Act 651) stipulates that it is the duty of an employer to ensure that every worker employed works under satisfactory, safe and healthy conditions. Act 651 contains a number of specific provisions relating to an employer's duty to its workers. These include providing and maintaining "at the workplace, plant and system of work that are safe and without risk to health" and taking "steps to prevent contamination of the workplaces by, and protect the workers from, toxic gases, noxious substances, vapours, dust, fumes, mists and other substances or materials likely to cause risk to safety or health".

4.2.11 Workmen's Compensation Law, PNDCL 187

It is to provide for the payment of compensation to workmen for personal injuries caused by accidents arising out and in the course of their employment. The tenets of the law places a large share of the burden of supporting workers injured at the workplace on the shoulders of the employers.

4.3 Institutional Framework

The ministries with responsibilities for drainage are the Ministries of Water Resources, Works and Housing and the Ministry of Roads and Highways, via the National Environmental Sanitation Policy, which has devolved responsibilities for sanitation and hygiene to the local level, the Ministry of local Government and Rural Development is also involved.

The responsibility for primary drains lies with the Hydrological Services Department (HSD) under the MWRWH. The responsibility for the construction of secondary and certain tertiary drains lies with the Development of Urban Roads (DUR), a civil service organization under the Ministry of Road and highways. While DUR funds, procures and supervises the execution of works, these responsibilities are gradually developed to the MMDA.

4.3.1 Ministry of Local Government and Rural Development

The ministry of local government and rural development (MWS) exists to promote the establishment and development of a vibrant and well-resourced decentralized system of local government for the people of Ghana to ensure good governance and balance rural based development. The MWS is the main implementation agency for the GAMAS&W project, aimed at providing emergency priority drainage intervention to alleviate the situation in flood prone areas.

4.3.2 Environmental Protection Agency

The Environmental Protection Agency is the body responsible for regulating the environment and ensuring the implementation of government policies on the environment. The functions of the Agency include:

- Ensuring compliance with any laid down environmental impact assessment procedures in the planning and execution of development projects, including compliance in the respect of existing projects;
- Promoting effective planning in the management of the environment.
- Imposing and collecting environmental protection levels in accordance with the Environmental Protection Agency Act 1994, Act 490 or regulations made under the Act ; and
- Acting in liaison and co-operation with government agencies, District Assemblies and other bodies and institutions to control pollution and general protect the environment.

4.3.3 Department of Urban Roads (DUR)

The responsibility of the construction of secondary and certain tertiary drains lies with the Department of Urban Roads (DUR), a civil service organization under the Ministry of Roads and Highways. While DUR funds, procures and supervises the execution of works, these responsibilities are gradually devolved to the MMDA. Thus, for the maintenance for secondary and tertiary drains in the MMDA, the Urban Roads Department (URD) is the first responsible entity.

4.3.4 Tema Metropolitan Assembly

Metropolitan, Municipal and District Assemblies (MMDAs) are responsible for the provision of water and sanitation services with their respective areas of jurisdiction, including the planning and implementation of projects where necessary.

The proposed culverts construction falls within the jurisdiction of the Accra Metropolitan Assembly. The Tema Assembly is a key institution involved in flood adaptation in the city. The legislative instrument (L.I.1500, 1989) establishing the Assembly charges it to ensure public safety, including public protection from the adverse impacts of floods. Section 46 of the Local Government Act, 1993 (Act 462). The Assembly serves as the planning the authority responsible for the overall development of their areas of jurisdiction.

The URD of the Tema Assembly is expected to coordinate activities with the Works Department –in charge of the design and management of all building projects of the Assembly –

and the Waste Management Unit or Department (WMD) –responsible for ensuring a clean environment. In practice, the coordination between these departments is challenging.

The functions of the assembly include:

- The day-to-day administrations of its area
- Regular inspection of the area for the detection of nuisance or any condition likely to be offensive or injurious to health and to cause proper steps to be taken to secure the abatement of the nuisance or the removal of the condition.
- To build, install, maintain and control public latrines, lavatories and urinals.
- Waste management in its area.
- Sensitize the public on development projects with the Assembly
- Demolishing of unauthorized structures on public right of ways
- Demolishing buildings on water ways.

4.4 World Bank Safeguards Policies

The World Bank (WB) has 10 +1 environmental and social safeguard policies which are used to guide the safe development of projects it funds. For the GAMA project, Environmental Assessment Policy (OP 4.01) and Involuntary Resettlement Policy (OP4.12) are triggered. The summary of the policies are presented in the table below which shows the reason for the policies triggering or not.

Table 4-1: Summary of safeguards policies triggered by the project

Operational Policy	Yes	No	Reasons
Environmental Assessment(OP.4.01);	**X**		Safeguards policy OP 4.01 is triggered, and the potential civil work activities include rehabilitation of the drains, culverts (incl. removing vegetation to expose concrete surface, making access) immediate repairs and restoration of culverts, dredging of drains, lining of drains etc..
Natural Habitat (OP/BP 4.04)		**X**	This policy is not triggered because the project activities may not take place near to critical natural habitats (forests, wetlands, mangroves, etc.) or environmentally sensitive areas and some mitigation measures may be necessary to minimize any negative environmental and social impacts. The project is being implemented in built up area within Accra with no critical natural habitats, nor does it involve the significant conversion or degradation of natural habitats.
Forests (OP 4.36)		**X**	The project will not finance the development of forests. The area in which this project would be implemented will not have impacts on the health and quality of forests or the rights and welfare of people and their level of dependence upon or interaction with forests.
Pest Management OP 4.09		**X**	The project will not raise potential pest management issues or finance the development of the procurement of pesticides, pesticide application equipment or the use of pest management practices.
Physical Cultural Resources (OP 4.11)	**X**		Some activities may include civil works that could expose chance finds. These chance find sites may include sacred shrines and burial sites.
Indigenous Peoples (OP 4.10)		**X**	There are no indigenous peoples in the project area.
Involuntary Resettlement (OP/BP 4.12)	**X**		This policy is trigged because most of the sub-projects could involve minimal or moderate or restriction of access to usual means of livelihood as most of the sub-projects will largely be rehabilitation of existing infrastructure. However, some of the projects may involve significant displacement of affected people. As part of the safeguards due diligence, the client will prepare a Resettlement Policy Framework RPF which will be reviewed and cleared by the Bank. Also, site specific Resettlement Action Plans (RAPs) or Abbreviated Resettlement Action Plans (ARAPs) will address the needs of persons who will be affected by loss of economic activities, land acquisition and/or relocation. The preparation of these safeguards documents

			will be inclusive and participatory, promoting community ownership and social accountability. The RPF and/or RAPs will be reviewed and cleared by both the project safeguards team and the Regional Safeguards Advisor. The RPF will have to be sent to the bank for review and clearance before it is disclosed publicly in country and on the Bank's info shop prior to project appraisal.
Safety of Dams (OP/BP 4.37)		**X**	The GAMA will not be involved in the construction of dams.
Projects on International Waters (OP/BP 7.50)		**X**	The project is not on International Waters.
Projects in Disputed Areas (OP/BP 7.60)		**X**	The area in which this project would be implemented is not a conflict or disputed area.
Disclosure Policy (OP/BP 17.50)	**X**		All projects must disclose key information in-country and through the Bank's external website

4.5 Ghana EIA Guidelines and World Bank EA Guidelines

The Ghana Environmental Impact Assessment Act 490(1994) requires that development projects be screened for their potential environmental and social impact. Based on the screening, a full or Preliminary Environmental Assessment, or no EIA may be required. Guidelines issued in 1994 direct the screening process. According to these guidelines the Ghana EIA Categories include: (See Table 5 below).

Table 4-2: Ghana EIA Guidelines and World Bank EA Guidelines

GHANA EPA REGULATIONS					
Category	**I**		**II**	**III**	
	Projects will require a full Environmental Impact Assessment (EIA) for projects under this category EIA is mandatory according to EPA Act 490. 1994 Projects includes large-scale activities such as agriculture (500 hectares or more), airport (2500m or longer airstrip), land reclamation (50 hectares or more), fisheries (land based aquaculture of 50 hectares or more), forestry (50 hectares or more conversion, etc.		Projects may require only a Preliminary Environmental Report which will focus on mitigation and Environmental planning measures, unless the project is located near an environmentally sensitive area--in which case a full EIA is required	Projects are considered to have no significant impact hence the proponent "essentially beneficial impacts" on the environment, for which the proponent will only fill Form EA1	
World Bank					
Category	**A**	**B**	**C**	**F1**	

	Projects are those whose impacts are sensitive, diverse, and unprecedented, felt beyond the immediate project environment and are potentially irreversible over the long term. Such projects require full EA.	Projects involve site specific and immediate project environment interactions, do not significantly affect human populations, do not significantly alter natural systems and resources, do not consume much natural resources (e.g., ground water) and have negative impacts that are not sensitive, diverse, unprecedented and are mostly reversible. Category B projects will require partial EA, and environmental and social action plans.	Projects are mostly benign and are likely to have minimal or no negative environmental impacts. Beyond screening, no further EA action is required for a Category C project, although some may require environmental and social action plans.	A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in sub-projects that may result in negative environmental and social impacts.

This World Bank categorization (A, B, & C) corresponds in principle with the Ghana EIA requirements of Category (I, II and III), which in actual practice is done with regard to the level of impacts associated with a given project.

Thus for this ESMP, the Ghana's EIA requirements and World Bank safeguard policies were harmonized as far as possible.

This is made responsive with regard to the following:

- Early consideration of environmental and social issues (starting at the screening stage);
- Identification and early consultation with stakeholders;
- Prevention of negative environmental and social impacts through the consideration of feasible alternatives; and
- Incorporation of mitigation measures into planning and (engineering) design.

4.6 Adequacy of Legal Instruments for Environmental & Social Issues

Generally with regard to environmental and social management issues, legislation is in a continuing process of development in Ghana. Amongst the existing pieces of legislations highlighted above, there are a number of national and international environmental guidelines applicable to the sub-projects under the proposed GAMA.

5.0 STAKEHOLDER CONSULTATION AND PARTICIPATION

5.1 Introduction

This section discusses the participatory processes used to develop the ESMP. The overall aim of the consultation is to ensure that stakeholders interest is identified and incorporated into the mitigation measures d during the preparation of the ESMP, and in particular, those who are affected by the project are taken into account in the project planning stage.

5.2 The specific objectives of the stakeholder's consultation and participation

The specific objectives of the stakeholders consultation and participation are:

- To exchange information regarding the development of the ESMP,
- To discuss the project's perceived and real potential impacts,
- To receive feedback and to provide opportunity for participation in ESMP planning and decisions in a meaningful, timely, accessible and culturally appropriate manner.

Thus, public consultation and participation help to develop and maintain avenues of communication between the project, stakeholders and project beneficiaries in order to ensure that their views and concerns are well incorporated into project preparation and implementation with the objectives of reducing negative impacts, unnecessary disputes between beneficiaries and project proponent and enhancing benefits from the project.

In this context, public consultations helped to serve the following purposes:

- Provide timely information to project beneficiaries and implementers about ESMP process and related activities
- Obtain the cooperation and participation of project beneficiaries and other stakeholders in ESMP planning and implementation
- Provide avenues for the stakeholders to air their views and concerns regarding the proposed project
- Creates understanding about the needs and priorities of PAPs regarding the project impact on their health and safety and other activities to be undertaken
- Obtaining the reactions from project beneficiaries and other stakeholders on regular basis especially on the effectiveness of policies and implementation process
- Enable the project to design the proposed activities in a manner to fit the needs and priorities of project-affected-persons.

5.3 Stakeholder Identification

The stakeholder identification was based on the project scope of works, the project regulators, the project proponent, the traditional setting of the project as well as project area of influence. The main considerations in the stakeholder group selection process were:

- the project proponent
- project host community
- Project affected groups/communities/people;
- Relevant local government authorities;
- Relevant regulatory institutions;

- Utility companies
- Government agencies which may be involved or have direct interest

5.4 Key stakeholder involved in the consultations

The consultative meetings were held with the stakeholders during spanning July to December 2017.. The approach adopted for the consultation was in the form of visits to the project areas, small group meetings, face to face discussions, telephone calls and e-mail communications. Pictures were taken of the consultation and field activities and are presented in this chapter.

The key stakeholder involved in the consultations are:

a) Environmental Safeguards Specialist and Social Safeguards Specialist at GAMA PCU of the Ministry of Sanitation and Water Resources;
b) The Metropolitan Coordinating Director of TMA
c) The TMA Urban Roads Engineers
d) The Metropolitan Planning Officer of TMA
e) TMA GAMA Project Coordinator
f) The Project Affected Persons at the proposed project site of Adjei Kojo/Kanewu
g) The Project community residents and project affected persons at Bankuman
h) The Project community residents and project affected persons at Naval Base area
i) The Project community residents and project affected persons at Tema Community 6
j) Ghana Water Company of Ghana-Tema Region
k) Ghana Water Company of Ghana-Ashaiman District
l) Electricity Company of Ghana-Tema Region
   Vodafone-Tema

The consultation was used to share the project scope and other information including the need for environmental and social management plan study of the proposed project interventions. The consultation dwelt among others, gathering the concerns and sharing information bothering on the environmental and social concerns around the proposed projects, the flood situation in the areas, identification of the proposed project impacts on utility service lines and how to effectively mitigate the potential environmental and social impacts before, during and operation of the project interventions, .

Field visits were conducted in company with the GWCL, ECG,the PCU Safeguards Specialist and the TMA Officials to the proposed project sites to determine the potential impacts of the proposed projects on the GWCL and Electricity supply lines. The field visit was paid to each of the proposed project sites of Bankuman, Naval Base Area, Tema Community 6, and Adjei Kojo/Kanewu. At each site, the GWCL and ECG personnel and the TMA Team assessed the scope of the works and identified the potential impacts on the utility lines. This was followed by a discussion of how the impacts would be mitigated. The field visits revealed that there is the potential for some utility service lines at Bankuman, Naval Base area and Adjei Kojo/Kanewu sites to be affected during the project construction. The potential impacts include low tension electric poles and cables, at Bankuman and Adjei Kojo and Kanewu; underground cables at Naval Base area; underground main GWCL water supply lines at Naval Base area and Adjei Kojo/Kanewu community. It was agreed that during the project implementation, the affected properties be reinstated should they be impacted. These discussion is summarised in the table below.

5.5 The lists of stakeholders consulted/engaged and the outcome of stakeholder consultations

Table 5-1 List of Stakeholders Project Proponents and Official engaged during the consultations activities

Name	Designation	Contacts
Mr. Samuel Donkor	Municipal Coordinating Director	02434441828
Ali Amadu	Metropolitan Planning Officer	0244270344
Mrs. Betha Essel.	TMA GAMA Project Coordinator/ Metropolitan Waste Management Engineer	0264063280
Richard Amankwah	Urban Roads Engineer	0543401110
Mr Kingsley Amankwa	Urban Roads Engineer of TMA	02089522457
Mr. George B.K. Awudi	GAMA Environmental Officer	0206152780
Sarah Antwi Bosiako	GAMA Social Safeguard Officer	0204352807

Table 5-2 List of Bankuman Project community people consulted

Name of Persons Consulted	Occupation	Contacts
John Kaweku Tandoh	Fisherman	0543939482
Redeemer Mensah	Fisherman	To be contacted through 0543939482
David Martey	Fisherman	To be contacted through 0543939482
Wisdom Ayivor	Fisherman	To be contacted through 0543939482
OkoeAdjei	Fisherman	To be contacted through 0543939482
KojoTete	Fisherman	0243038965
John KwekuTandoh	Fisherman	To be contacted through 0543939482
Rebecca Martey	Trader	To be contacted through 0543939482

Grace Akwettey	Fishmonger	0543236535
Chester Abro	Fisherman	To be contacted through 0543939482
Gbeko Kofi Clement	Fisherman	0246347932
Agnes Aku Soku	Fishmonger	0248175798
Dora Aformanyah	Hairdresser	02498752132
Noble Nyonyo	Security Officer	0240322078
Jennifer Davor	Trader	0240196984
Nina Ashimade	Trader	0554712241
Ganyo Sofanshi	Trader	0554712241
The community		

Table 5-3 List of AdjeiKojo/Kanewu community consulted

Name of PAP	**Occupation**	**Contacts**
Enoch Adu	Mechanic	
Francis Odu	Mechanic	0246886609
MaltildaKaba	Trader	0243053418
Isaac Korlety	Teacher, Nazareth Presby School	0243804377
Yvonne Kankan Boadu	Trader	02755828253
AdamaAlhassan	Chop bar owner	0546903296
SulleySalifu	Spare parts dealer	0247450260
Kofi	Mechanics	
AbdullaiDawud	Vulcaniser	0271900660
Nana Sarpong	Spare parts	0240125814
Bobby Jaber		0557454864
Nazareth PresbySch/Isaac Korletey	School /teacher	0243804377

Table 5-4 List of Naval Base area people consulted

Name of PAP	Occupation	Contacts
Aisha Doku	Trader	0245754822
George Andrews	Lotto Agent	
Essumang Kweku	Lotto operator	0246755454
Patience Dede Kotogbo	Trader	0271141883
Vero Pumpulampu	Trader	0246883683
Terrida Mumuni	Petty Trader	0260743099
Erika Otto	Caterer and Trader (sells cloth, pure water)	0243947447
C-Jay	Photo studio operator	0275938649/ 0247714573
Abeka	Drinking Spot	
Mawuli Adzogble	Lotto Operator	0243931802
Wisdom Ajettey	Mobile money operator	0571056532

Table 5-5 Utility Service Providers engaged in the consultation

Name	Institution	Designation	Tel Contact
W. Ahenkorah	ECG Tema North	Supervisor	0208176472
Tetteh Epan	ECG Tema	Engineer	0244829363
J.K. Lomotey	GWCL Tema	Engineer	0244290658
	GWCL Ashaiman	Foreman	0244608291

Table 5-6 Summary of the nature of impacts on the utility supply lines and the mitigation measures and responsibilities of the stakeholders agreed.

Utility Company	Utility service to be impacted	Nature of impact	Mitigation measure	Nature of compensation	Responsibility
At Bankuman site					
ECG	A stay cable on a Low Tension electricity pole	Stay cable is on the ROW of the drain course	Relocation	Re-instatement cost.	Project will provide replacement cost. ECG will undertake the relocation by itself.
At Naval base Area					
ECG	High Voltage underground cable in front of Naval base	Cable is on the ROW of proposed drain course	Relocation required if the depth of the drain will interfere with the cable	Reinstatement cost	The Project to buy the replacement cable. ECG will do the reinstatement.
GWCL	GWCL underground main pipeline in front of Naval Base	Pipeline on the ROW of the drain course	Relocation required if the depth of the drain will interfere with the cable	Reinstatement cost	The Project to buy the replacement cable. GWCL will do the reinstatement.

VODAFONE	Vodafone underground main pipeline in front of Naval Base	Pipeline on the ROW of the drain course	Relocation required if the depth of the drain will interfere with the cable	Reinstatement cost	The Project to buy the replacement cable. Vodafone will do the reinstatement
At AdjeiKojo/ Kanewu					
ECG	4No. Low tension pole network to be removed and realign	The poles are on the ROW of the proposed drain course	Relocation	Reinstatement cost	The Project to buy the replacement cable. ECG will do the reinstatement.
	A stay supporting a High Voltage poles	The stay is on the ROW of drainage course	Relocation	Reinstatement cost	Project to buy 2 new electricity poles to replace the stay
GWCL	Main water pipelines 4inches and 6 inches PVC pipes to be replaced covering 550m long.	Pipelines are on the ROW of proposed drain works	Relocation	Reinstatement cost	Project to provide replacement cost
	4No. Valve Chambers	Chambers on the ROW of proposed	Relocation	Reinstatement cost	Project to reconstruct the valves

		drain course			

Table 5-6 Summary of input from the Utility Service Companies regarding how the mitigation measures should be approached by the Contractor

Name of Utility Company Representative	**Contact**	**Summary discussion on mitigation of impacts on utility supply lines**
Tetteh Apan (ECG Tema Engineer) Mr. W. Ahenkorah (ECG Tema)	0244829363 0208176472	Where a service supply line will be negatively impacted due to the proposed drains construction works, that service line will have to be re-instated or relocated. The TMA and the contractor should seek the involvement of the ECG Tema North in this regard. Where a service line will have to be shifted/relocated/re-aligned, the ECG will assess the full replacement cost of the materials (cables, etc.) and present same to the Project to fund. ECG will want to do the relocation of the service line themselves and not the drains contractor. The ECG will bear the cost of labour for the relocation/realignment. All relocation/realignment of the ECG utility lines should be effected before commencement of the drain works.
J.K. Lomotey (GWCL Tema) (GWCL Foreman Ashaiman District)	0244290658 0244608291	Where a service supply line will be negatively impacted due to the proposed drains construction works, that service line will have to be re-instated or relocated. The TMA and the contractor should seek the involvement of the GWCL Tema in this regard. Where GWCL service line will have to be shifted/relocated/re-aligned, the GWCL will assess the full replacement cost of the materials (cables, etc.) and present same to the Project to fund. The GWCL will want to do the relocation of the service line themselves and not the drains contractor. The GWCL Team demands further engagements with the TMA to work out the cost of labour for re-alignment/relocation of supply lines. Where valve chambers will have to be relocated, the GWCL will present the design drawings to the drain contractor to reconstruct. All

		relocation/realignment of the GWCL utility lines should be effected before commencement of the drain works.
Bafour Wade Vodafone	0202006542	Where a service supply line will be negatively impacted due to the proposed drains construction works, that service line will have to be re-instated or relocated. The TMA and the contractor should seek the involvement of the Vodafone in this regard

Table 5-7 Summary of consultation with TMA (the proponent for the culverts works), GAMA PCU

Name of Officer	Designation	Telephone contact	Key issues that they were engaged in during the consultation
Mr. Samuel Donkor	Metropolitan Coordinating Director of TMA	02434441828	He reiterated that the Utility Service providers are key stakeholders in the environmental and social impacts identification and that they should be involved at all cost.
Ali Amadu	Metropolitan Planning Officer of TMA	0244270344	He contributed to explanation of the need for proposed in the selected communities. He clarified that the TMA will include the newly constructed drains in the programme of regular drains maintenance activities of the Assembly.
Richard Amankwah	Urban Roads Engineers of TMA	0543401110	• They provided information on flood inpacts in the communities in TMA. • The Engineers provided information on the project scope and how it is intended to alleviate flood risks in the Bankuman , Adjei Kojo Kanewu, Naval Base area and Tema Community 6communities. They provided information on the justification for the proposed projects.
Mr. Kingsley Amankwah	Urban Roads Engineer, TMA	0208149245	

			• They provided the design drawings of the proposed drains. He clarified the areas that the project construction activities would affect properties and small businesses within the projects catchments.They described the design drawings and functions of the various components of the designs. • They provided information on the institutional arrangements for managing the drains in the Metropolis which will be extended to the newly constructed drains by the TAM. The drains management arrangements in place includes regular desilting of the drains; regular minor repairs on the broken portions of the drains and drain linings •
Betha Essel	GAMA Project Coordinator & Metropolitan Public Health Engineer of TMA	0264063280	• She conducted the consultants and Safeguards Specialists to the proposed construction sites and provided information on those the stakeholder consultation should be covered at the various sites. • She supported in providing information on the institutional arrangements for managing waste in the TMA. • . • She was engaged in the identification of environmental

			and social issues of the proposed construction works.She was engaged in the discussion of mitigation measures to deal with waste management activities during the operation phase to manage the drains and culverts. She outlined the ongoing waste management programme activities in the Metropolis which will be extended to the newly constricted drains to ensure that solid wastes and properly collected and disposed away from the communities in a way that they do not find their way into the drains and cause floods during rainfall.
Mr. George B.K. Awudi	Environmental Safeguards Specialist	0206152780	• He provided background information on the safeguards requirements for the GAMA S&W Project. He provided relevant safeguards documents which include the GAMA S&W Project Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF). • He together with the TMA officials conduct the consultant to the project sites and catchments. • Supported in the stakeholder identification
			• She provided background information on the safeguards requirements for the GAMA S&W Project. He provided relevant safeguards documents which include the GAMA S&W Project Environmental and

			Social Management Framework (ESMF), Resettlement Policy Framework (RPF). • She together with the TMA officials conduct the consultant to the project sites and catchments. • Supported in the stakeholder identification and identification of PAPs.

5.4 Summary of key issues of concern to the community residents during the consultation

- During rainfall, the streets and community walkways get flooded and people cannot move out from their homes to their places of work and school.

- Due to the heavy nature of the storm waters during floods, it is advisable that the construction works are not carried out during rainfall season. If the construction activities are carried out during the rainy season, the construction activities will lead to more flooding of homes and the streets. So, it is better for the construction activities to be carried out when there is no rainfall.
- Some residents are worried that excavated wastes will be left on the frontage of their homes during construction. This will block access to their houses and foot paths. They recommended that the contractor should remove all excavated wastes from the community on daily basis.
- The project promptly should compensate those whose properties will be lost. Also, people's fence walls and frontline cement floors that will be destroyed should be reinstated.
- Some buildings are located close to the routes where the drain channel will pass. Care should be taken that excavation works do not undermine the integrity of the buildings

People were concerned about the quality of reinstatement works to be carried out by the contractor and expects proper supervision to ensure quality work is done.

5.5 Public disclosure of the final ESMP document

Disclosure of ESMP document at Local and National Levels:

When completed and approved, the final ESMP document will be publicly disclosed at the local, national and global level prior to actual commencement of the works. This is a requirement by the World Bank that all safeguards instruments of its funded projects be publicly disclosed.

On finalisation and approval of the ESMP by the World Bank, the GAMA PCU in collaboration with TMA will cause publication of the ESMP to be advertised in the national daily newspapers of Ghana. Copies of the ESMP will also be distributed physically to the key stakeholders including the MSWR, Ministry of Finance and Economic Planning, the Zonal Council Offices of TMA, the opinion leaders of Bankuman Adjei Kojo/Kanewu, and Naval Base and Community 6 community members. Public notices will also be posted at the website of the TMA as well as Public Libraries in the Municipalities.

Disclosure of the ESMP at the World Bank External Website

Following the in-country disclosure of the ESMP document, the PCU will submit the document to the World Bank office in Washington for its disclosure at the Bank's external website for global attention.

Stakeholder participation and engagement Plan during construction and operation of the constructed drains:

Stakeholder consultation, participation and engagement will continue throughout the ESMP study and during the implementation of the ESMP. The effective stakeholder consultation and participation will help the project communities to relieve their worries and give them the opportunity to participate in what will affect their lives. They will draw attention to their concerns and raise queries when things are going wrong, and this will ultimately ensure that the project proponent and the contractor are kept on track to the benefit of the project' successful implementation.

The TMA should forge and always ensure the maintenance of the drains through regular removal of weed and silt and ensuring proper waste management in the community that will allow for the proper functioning of the drains during post construction (operation operational phase).

5.5 Pictures on consultation activities in the project communities

At Adjei Kojo/Kanewu community

At Adjei Kojo/Kanewu

At Adjei Kojo/Kanewu site

At Adjei Kojo/Kanewu site

At Tema Community 6 site

At Naval Base site

At Naval Base site

At Bankuman community site

At Bankuman Community Site

At Bankuman community Site

At Adjei Kojo/Kanewu site

At Naval Base site

6.0 DESCRIPTION OF ENVIRONMENTAL AND SOCIAL IMPACTS

6.1 Introduction

The potential environmental and social impacts of the proposed project that have been identified are presented in this chapter. The potential beneficial and adverse impacts are based on the interactions between the project activities, the results of public consultation and the environmental setting of the various ecological components of the project, namely the physical, biological, social, and health components. The potential negative environmental and social impacts identified with the proposed projects would occur under four main phases of the project. These are preparatory phase; construction phase; decommissioning phases and operations phase. Suitable mitigation measures are discussed in the next chapter (Chapter Seven). These are then costed and the responsibilities for their implementation assigned as appropriate within the Environmental and Social Management Plan (ESMP).

6.2 Potential beneficial environmental and social impacts

They include the following:

- It will result in improved drainage in the project community and will lead to elimination or reduction in the risk floods, damage to property and economic activities and threat to human safety currently associated with the existing poor drainage in the areas
- Quality of life of the residents in the immediate environs of the drains will be enhanced through abatement of perennial floods and the flood risks. Economic activities by the community members will be secured.
- Project will provide short term employment opportunities for the local community during the project activities.
- Challenges of movement of residents along community streets during rainfall will be eliminated
- The integrity of the flooded areas of the community will be enhanced and infrastructure development can be extended.

6.3 Potential adverse environmental and social impacts

6.3.1 Preparatory Phase adverse environmental and social impacts

6.3.1.1 Occupational health and safety of people engaged in surveying to demarcate, peg at the sites:

During the subproject preparatory phase, the main activities envisaged are surveying activities to demarcate and peg the drainage course and awareness raising on the proposed project.

Occupational health and safety impacts during demarcation and pegging of the site may pose some risk of accident and injury to the personnel involved. The preparation activities will also involve field visits and inspections to the proposed drain areas by the EPA as part of environmental registration activities to grant EPA Environmental Permit for the works in accordance with Ghana Environmental Assessment Regulation LI 1652. (1999).

However, the survey and pegging activities are minor as their duration will be short. Provision and wearing of protective gears by the personnel during the survey activities will mitigate the potential negative impacts.

6.3.1.2 Displacement of properties and Involuntary Resettlement arising from the proposed project

Some properties are found on the right of way of the proposed drainage construction courses at Bankuman, Naval Base area and Adjei Kojo/Kanewu communities. These will have to be demolished and reinstated, or shifted for the works to proceed. The properties include, wooden and metal kiosks, table top food vendors, fish mongering, bath houses, wooden shades and removal of pavement in frontage of homes and kiosks. In order to properly mitigate the losses and disturbances to these properties and persons, an Abbreviated Resettlement Plan (ARAP) has been prepared separately for the proposed subprojects which identified the project affected persons and provided the appropriate compensation and assistance to cover them. The ARAP will be implemented prior to the commencement of the construction works in compliance with the GAMA Project Resettlement Policy Framework and the World Bank Policy on Involuntary Resettlement (OP 4.12)

6.3.1.3 Negative community attitude and perception about the project:

Despite the fact that a lot of consultation and awareness were carried out during the ESMP preparation, a good number of the community members will still need consultation about the project aims and objectives, the scope of the construction works and how the project affected persons will be catered for as part of the proposed project. This way there would be increased understanding of the subprojects so that negative perceptions about the projects among the residents will be avoided during the projects construction and operation

6.3.1.4 Concern about excellent construction of the drains by the constructor

Use of inexperienced contractor for the works can lead to production of shoddy works and could lead to ineffective drainage intervention by the project. Procurement of a competent contractor for the works is a precondition for providing a drainage that can alleviate the risk of flooding in the area. It is expected that the Metropolitan Assembly has experience in ensuring proper methods for selecting contractors for the works implementation.

6.3.2 Key construction phase activities

The key construction phase activities will include the following:

- Site preparation
- Excavation of drainage courses in the community
- Demolition and excavation of existing drains at Naval Base area
- Concrete works to construct drains and culverts
- Lining of drains
- Transportation of materials and equipment for construction
- Backfilling of trenches
- Collection and disposal of construction wastes
- Reinstatement of damaged fence walls that will be temporarily affected by the project

Potential negative impacts during construction phase

6.3.2.2 Impact on vegetation:
Not much vegetation is exists at the proposed construction sites, consequently, the impact on vegetation will minor. Where vegetation is found, they are grass and weeds along the drainage flow course. During the construction, it should be ensured that vegetation is re-planted where grasses will be removed in order to restore the lost vegetation. Also, all exposed surfaces on the slopes of the constructed drains should be re-planted with grass.

6.3.2.3 Impact on air quality
Impact Source:
Mobilization of equipment such as excavators and concrete mixers, exhaust emissions from the excavators and concrete mixers during construction works, transportation of construction materials and sand; and demolishing of existing drains are the potential sources of air pollution during the works. Use of maintained excavators and concrete mixers and transportation vehicle carrying sand and stone may lead to exhaust emissions
However, air quality impacts are expected to be of short term and will occur during the construction period only. Also, the impacts can easily be managed through implementation of appropriate and standard mitigation measures which include the following measures. Spraying of the construction site regularly with water to suppress dust pollution on dusty and excavated areas; ensuring all sand, stone chippings and cement being transported by truck to the construction site are covered with tarpaulin; ensuring that sand, stone chippings and cement that are stockpiled on construction site are covered with tarpaulin to avoid dust generation from these sources; switching off all idling excavators and concrete mixers when they are not in use; using only well maintained excavators, construction vehicles and concrete mixers during construction and ensuring to regularly service these construction machinery at approved service centres off the construction area; wearing of nose masks/face masks by construction workers; avoiding open burning of wastes at construction site; and limiting the speed of vehicles carrying sand and chippings, and excavators and concrete mixers at dusty areas within the project areas to 30km/hr.

6.3.2.4 Impact on Noise and Vibration

Impact Source
The mobilization and movement and use of excavators; operation of concrete mixers; excavation of existing drains have the potential for noise and vibration effects during construction of the drains.

It is expected that during the periods of excavation of drain courses by the excavator will generate some of noise in the areas in proximity of the activities. At the Naval Base area and Tema Community 6 where the construction activities will take place along moderately busy streets, the noise from the construction excavators and concrete mixers can combine with the already existing noise background from the vehicular traffic to increase the overall noise levels during the construction. However, the use of excavators and concrete mixers will be of short duration. Overall, the construction works are not expected to result in any significant noise nuisance and vibration effects during the project construction activities in the communities. At Bankuman in particular where the drainage course to be constructed are very close to the foundations of buildings and fence walls, it is important that neither backhoe nor excavators be used to dig the drain channels, instead manual means should be employed

by the contractor in order to avoid destruction of these buildings. Only excavators and concrete mixers that are well maintained should be used in order to reduce their noise generation during use. Noise making activities should be scheduled 8:00am to 17:00hrs near homes. Concrete mixers should be placed as far as possible from homes; and construction workers will have to wear ear muffs Noise level should not exceed 55 decibels near homes during construction and also not more than 75 decibels at the Naval Base area and Tema Community 6 sites.

6.3.2.5 Soil Erosion

Impact Source

Sources of impact for soil erosion are mainly drainage course excavation, vegetation clearance and movement of excavators along the path of the drain construction and related earthwork activities such as site preparation.

Excavators to create the drain channels will lead to loosening of soil along the active construction areas and expose the soil erosion during rainfall. This can lead to creation of gullies and increase degradation of land in the communities. Though the construction activities are limited in scope and the duration of the works is of short term, there is the need to put in place appropriate mitigation measures to check soil erosion due to the project construction activities. Mitigation measures should include covering of trenches created on construction sites, backfilling of all disturbed areas and trenches along the newly constructed drains. Areas where soils are loosened or exposed should be planted with rapidly growing vegetation to stabilize the soil. Also, construction activities should be scheduled to avoid rainy periods in order to avoid soil erosion at the construction sites.

6.3.2.6 Waste generation and disposal during construction

Impact Sources

Waste from excavated earth drain channel including mud, sand, domestic refuse, debris and broken concrete rocks; constructional waste including cement paper, pieces of iron rods and wood, spent concrete and refuses by construction workers are potential sources waste generation.

The construction of the proposed project will generate wastes including excavated soil from existing earth drains, dredging materials, spent concrete, pieces of wood, cement papers, excavated debris, workers sanitary effluent and domestic wastes/refuse, waste plastic pipes, pieces of iron rods and wood, among others. If not well managed, this could lead environmental pollution, health and safety issues on the residents, obstruction of walkways and movement of people and motorists in the construction communities which will cause public health and safety concerns. littering of the community, clogging and chocking of drains and resulting in flooding in the community, contamination of soils and water sources of the people in the communities. Therefore, the wastes should be managed to avoid adverse impacts on the environment and people. Mitigation measures should include:

avoid sitting temporary solid waste storage sites at the construction sites; collection and disposal of all of excavated materials and other constructional wastes to disposal at TMA approved waste disposal sites; provision of waste collecting bins at the project site to store wastes and refuse generated by workers and their disposal to TMA approved waste disposal

sites on daily basis; reuse of excavated debris where appropriate to backfill trenches disturbed areas to check soil erosion. Mobile toilets should be provided on site for the construction workers to avoid open defecation by the workers which could lead to contamination of soils and water sources within the project communities.

6.3.2.7 Impacts on drainage, water resources

Impact Source
Maintenance and cleaning and fueling of excavators, concrete mixers and vehicles at construction site can release oily matter into the environment and can contaminate soils and also water course during rainfall. Lack of provision of toilet for the workers can lead to open defecation and the project communities which can contaminate water sources in the communities during rainfall.

Improper construction activities such as storage of excavated wastes and cement and sand on runoff direction at the project sites and community spaces and also dumping of excavated wastes into drains can lead to flooding incidents in the project communities as a result of the project construction activities. This is because, dumping of construction materials on the runoff directions in the project sites/project communities will impede storm runoff away from the communities during heavy rainfall.
Fueling, cleaning and maintenance of excavators, concrete mixers and construction vehicles at the project sites will lead to soil contamination with oils and release of oily materials around the project areas which can be transported by surface runoff into the drains during rainfall. Indiscriminate defecation of workers in the community can contaminate soils and pollute water sources which can lead to cholera and other water borne diseases in the project communities.
The potential for flooding of the construction sites and communities as well as contamination of soils and water sources as a result of improper handling of wastes materials and oils in the project activities should be of checked during construction activities through application of measures which include the following: avoid storage of construction wastes and excavated materials along waterways at the project sites; collection and disposal of all construction wastes immediately to TMA approved waste dump sites; avoidance of discharge of ill-maintained excavators and construction vehicles for the construction activities; avoidance of fueling and servicing of excavators and construction vehicles and concrete mixers at the construction sites; carrying out maintenance, cleaning and fueling of excavators, concrete mixers, construction vehicles and trucks at Fuel Service Stations Station of recognized oil marketing companies which are located offsite the project sites; provision of construction workers with on-sit toilet facilities to avoid indiscriminate defecation in nearby bush or drain channels by the workers.

6.3.2.8 Public and Occupational Health and Safety

The location of the construction activities are all located within the project communities and which and which if proper safety practices are not observed, could result in health and safety impacts in the communities. Indiscriminate and haphazard dumping of construction wastes, construction sand and stone chippings, construction iron rods and wood, and excavators and concrete mixers within the project sites and community walkways can pose threat of accidents and injury to the community people and the public. Dangerous driving and over-speeding of excavators, and construction trucks and vehicles by the drivers to and from the

project site and within the project communities can lead to accidents and deaths and may also pose traffic congestion along the routes leading to the project communities.
Broken down construction vehicles left unattended to in the project communities and by the road can also create safety hazard to the general public.

Contractor's workers who are not properly protected with appropriate clothing can be at risk of injury and accidents which can result in temporary or permanent injury and loss of lives.
Where the contractor workforce indulge in gender based violence, illegal behavior such as use of child labour and sexual harassment can lead to health and safety impacts. They can lead to unsolicited sex which can lead to spread of sexually transmitted diseases like HIV/AIDS in the construction community and beyond.
These impacts can be mitigated through: collection and disposal of all wastes from the construction sites to TMA approved waste disposal sites on daily basis; avoidance of storage of construction wastes and construction materials and equipment on community walkways; provision of barriers and signages at the construction area that will warn workforce personnel and public of dangers on site and also to prevent unauthorized personnel from the active construction sites. The signages must be very visible and made of reflective materials. Provision of personal protective clothing like hard hats, boots, reflector jackets, gloves, nose masks and ear plugs for the construction workers and the construction workers must wear the protective clothing during the construction activities; the construction workers and the drainage construction beneficiary community members should be provided with health education about sexually transmitted diseases (STDs); provision of first aid at construction site for the construction workers for treating incidents before transferring the injured to hospital where the need be. Education of workers on the use of the first aid box, provision of health and safety induction to workers on site on daily basis, Speed limits of movement of construction trucks and vehicles with the construction communities should be controlled to 30km/hr to avoid over speeding by the drivers and accidents. Where excavation of drain drain channels have to be carried out close to foundation of buildings and structures, only manual means should be used instead of excavators and backhoe in order to avoid collapse of the building /structures on people which could result in deaths and injuries to both the residents and the workers.

6.3.2.9 Employment Opportunity

Short term jobs employment opportunities will be created during the construction activities including labor hand, security men and equipment operators. Local community persons may not be employed which could lead to lack of cooperation with the contractor when the need arises. Excluding the local community people in the construction labour force can lead to negative perceptions within the community and may fuel opposition and potential conflict with the contractor.

6.4 Decommissioning Phase Activities

On completion of construction activities, the constructor has to restore the construction site by removing unused construction materials, construction waste materials, construction equipment, and re-grassing of the disturbed areas. The decommissioning of the project would potentially have environmental and safety concerns.

6.4.1 Decommissioning Phase Impacts

i. Occupational/public safety and traffic

The relocation of all construction equipment and remaining materials including the concrete mixer, trucks, poly tanks to the contractor's office or yard for future works could result in accident and injury to workers. The removal and transportation of excavators and concrete mixers pose traffic risks and public safety concerns within the vicinity of the drain. It could also lead to noise and air pollution to the project community. Speed limits of 30km/hr should be observed by vehicles transporting construction materials and equipment away from the sites after constructional works.

ii. Waste generation and disposal

The dismantling and removal of work camp facilities, equipment and materials at the site during decommissioning can generate waste such as scraps metal, wood, concrete debris and garbage (pieces of plastic bags, food wrappers, etc). at the construction site and community. All left- over wastes should be collected immediately to disposal at TMA approved waste disposal site on daily basis.

6.5. Operational Phase Impacts

6.5.1 Public health and safety;

Accumulation of silt and debris in the newly constructed drains, waste disposal into the newly constructed drains and clogging of the drains can inhibit proper functioning of reconstructed drains to effectively channel storm waters away from the communities and could lead to flooding of homes and property, loss of property and livelihoods, loss of lives, soil erosion and land degradation on the slopes of the drains and communities to aggravate the already existing flood risks n the project communities. Therefore, reduction of the flood risks, during the operation of the drains, will depend effective and regular drainage maintenance and comprehensive environmental sanitation management strategy in the project communities in particular, and in TMA in general.

Proper and effective functioning of the drains will demand that following activities among other interventions:

(i) regular desilting of the drains to remove siltation, weeds and solid wastes from the drain channels to prevent accumulation of sand and weed debris in drain channel and to ensure that the storm waters can flow freely during rainfall,
(ii) carrying out regular repairs at the broken portion of the drain channels
(iii) maintenance of vegetation cover on the slopes of the drain to avoid erosion along the slopes,
(iv) drain management education by TMA among the project communities
(v) public environmental sanitation education and advocacy in the communities of TMA
(vi) TMA facilitating acquisition of waste bins by residents especially those along the drains to ensure proper household waste gathering for disposal
(vii) TMA facilitating waste collection from households to disposal through Waste Collection Service providers
(viii) Enforcement of TMA bye-laws on waste management in the drain communities
(ix) Facilitating the formation of resident associations with a focus on providing watchdog over compliance with bye-laws on waste management in the communities.

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Introduction

This Chapter contains a table of mitigation measures for the potential adverse environmental and social impacts under four main phases of the project execution which phases have been covered in Chapter 6 above. The phases are project preparatory phase; construction phase; decommissioning phase and operations phase. The measures are then costed and responsibilities for their implementation assigned as appropriate within the Environmental and Social Management Plan (ESMP).

The ESMP includes measures for mitigating soil erosion, waste management during construction, workers and public health and safety management during the project implementation, among others. The ESMP is to be available to inform the bidding process for recruiting contractor(s) in order to ensure that the mitigation measures are planned for and costed. The contractor is expected to prepare work plans for environmental and social management in line with the ESMP.

The estimated budget for the mitigation measures implementation is GHC77,600.00.

TABLE 7-1: ENVIRONMENTAL AND SOCIAL IMPACTS MITIGATION PLAN

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
1	Surveying & pegging the proposed drain channel course	Occupational health and safety/Public safety issues	Provide personnel with protective clothing	TMA Urban Roads Engineer (URE), TMA GAMA Project Coordinator	2,000.00
2	Loss of properties and economic livelihoods in the communities dur to the proposed projects	Involuntary Resettlement at proposed project site	ARAP has been prepared which identifies the PAPs for compensation payment prior to commencement of works.	TMA	To the ARAP
3	Low community awareness in project communities	Negative community attitudes and perception towards the proposed project	Consult stakeholders and create awareness among local residents on the objectives of the proposed project and arrangements for compensating project affected persons	TMA URE, TMA GAMA Project Coordinator, Department of Waste Management of TMA	1,300.00
4	Lack of local community's involvement in project	Risk of social conflict	Consultation with and involvement of the project communities in the planning and implementation of the	TMA URE, TMA GAMA Project Coordinator	2,000.00

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	planning band implementation		project		
5	Interference of drain reconstruction design	Disruption of Utility service lines	• Identify all utility service supply lines within the project catchment • As much as possible design should avoid encroachment on the supply lines; • Consult the utility owners to plan for relocation of the service lines where possible	TMA URE, TMA GAMA GAMA Project Coordinator, Utility Companies	1,800.00
6	Anxiety about improper identification of contractor for the drain construction	Inability to construct the drains to excellent standard and quality of work that will permanently solve the flood risks in the project communities	• Select a qualified contractor through competitive bidding • Design must ensure that all the existing inlet drains on are connected/integrated into newly proposed drains	TMA URE, TMA GAMA Project Coordinator, Procurement Officer.	2,500.00
Sub-Total					**9,600.00**
Construction phase					
	Site clearance, excavation of drain	**Loss of vegetation**	• Replant areas at areas where vegetation is destroyed during	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	construction course		construction to prevent soil erosion during runoff • Plant vegetation on the slopes and embankments of the newly constructed drains in order to stabilize the soil and prevent soil erosion • Ensure that vegetation clearance is limited to only the areas demarcated/pegged for the drain works. • Plant vegetation at all areas disturbed by the contractor during construction works		
	Excavation to desilt the existing drain; site clearance; release of emissions from movement of and operation of excavators, concrete	**Air quality impacts**	• Spray construction site regularly with water to suppress dust pollution on dusty and excavated areas • Cover construction sand and chippings stockpiled at	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	mixers		construction sites in order to suppress dust generation into the air from these sources. • Reduce speed limit of vehicles carrying sand and chippings, and excavators and concrete mixers at dusty areas within the project community to 30km/hr. • Switch off all idling excavators, concrete mixers and construction vehicles when they are not in use. • Use only well-maintained excavators, vehicles and concrete mixers during construction. • Avoid open burning of wastes at construction site • Construction workers		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			should wear nose masks/face masks		
	Movement of excavators and concrete mixers to construction sites; use of excavators close to the foundation of buildings and structure; use of excavators and concrete mixers during construction; movement of construction vehicles and trucks in construction community.	**Noise and vibration**	• Contractor should ensure to use only well-maintained excavators, concrete mixers during construction so as to minimize noise impacts on residents and road users. • At sections where the drain course to be excavated is close to the foundation of buildings/ structures, ensure that only manual means are used to excavate the drains and do NOT use construction machinery like excavators and backhoe. • Reduce the speed of construction vehicles to 30km/hr within the project sites • Schedule the use of excavators and concrete	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			mixers near homes to day time between 8:00hrs to 17:00hrs only • Concrete mixers should be placed as far as possible from homes • Ensure that noise levels from the excavators and concrete mixers do not exceed 55 decibels near homes during construction and also not more than 75 decibels in the construction communities • Provide ear plugs for construction workers		
	Site clearance; excavation of earth drain channel; movement of excavators and construction trucks at construction site.	**Soil Erosion**	• Immediately backfill and cover all trenches along the newly constructed drains and areas where the soil is disturbed at the construction sites in order to avoid runoff during rainfall • Re-plant all exposed and	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			disturbed areas at the construction site with rapidly growing vegetation in order to stabilize the soil and to prevent runoff during rain fall. • Plant grass along the slopes/embankments of the newly constructed drains • Avoid engaging in construction activities during stormy weather conditions. • During construction, limit land clearing only to areas pegged to be involved in the drains construction works		
	Unearthed excavated materials; spent construction materials i.e. pieces of wood, iron rods, concrete, etc.; domestic refuse generated by	**Waste generation & disposal**	• Collect and dispose all unearthed wastes i.e. excavated earthen materials, demolished drain concrete, spent concrete wastes, etc. to TMA approved waste disposal sites on daily basis. Wastes must not be	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	construction workers		disposed or kept at construction sites. • Re-use excavated waste debris where appropriate (for backfilling of trenches along the drains, etc.) • Provide dust bins to collect refuse generated by construction workers and dispose the wastes at TMA approved waste disposal site on daily basis • Provide mobile toilet on site for the construction workers to avoid open defaecation in open spaces, nearby bush and in drains within the project communities		
	Site clearing, excavation activities, disposal of construction waste on site, servicing,	**Water pollution**	• No garbage or refuse or oily wastes should be discharged into drains in the communities.	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	fuelling and maintenance of construction excavators, concrete mixers and construction trucks at project site.		• Collect and dispose all constructional wastes immediately to TMA approved waste dump sites to avoid contamination of water sources of the communities. • Maintenance, cleaning and fuelling of excavators, concrete mixers, construction vehicles and trucks should take place at the Fuel Service Stations of recognized oil marketing companies located offsite the constructions areas. • Use only well- maintained excavators, concrete mixers and vehicles during the construction works to avoid discharge of or leakage of oils and lubricants in the construction sites. Provide mobile toilets at the construction sites for use by the construction workers.		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			Construction workers should avoid indiscriminate defecation on the project sites and nearby bush, and in drains.		
	Drain excavation works, dumping and blocking of existing inlet drains connecting into the existing earth drain to be constructed; dumping and blocking the path of runoff around the construction site and project community	**Flooding of project sites during construction.**	• Do not deposit excavated materials and other construction waste materials in the runoff directions and slope of drains at the project sites. These will impede storm water flow and could result in flooding of the sites. • Do not dump excavated wastes into drain channels. Immediately dispose excavated materials to TMA approved waste disposal sites. • During construction, do not seal any existing drainage inlets channels that are channelling storm from the	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			community water into the existing drainage channels • Avoid construction activities during stormy weather conditions		
	Excavation of construction site, excavation of drain,	**Relocation/damage to utility service supply lines at construction site**	• Identify and re-instate all utility service supply lines that fall on the right of way of the demarcated drain channel • If possible, redesign the drain channel to avoid the utility supply lines • Involve the utility service providers in re-instatement of all affected utility lines.	Contractor	Construction cost
	All construction activities (falling of construction objects, accidents, etc.)	**Workers Occupational health & safety**	• Provide personal protective gear (gloves, hard hats, reflector jackets, safety boots, etc) to construction workers and ensure all workers wear the gears at	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			all times during construction • Provide and stock first aid box on site to provide first aid during incidents before transferring the injured to hospital. Educate workers on the use of the first aid box • Provide safety induction to workers on site on daily basis • Provide signages at the construction area to warn workforce personnel and public of dangers on site. The signages must be very visible and made of reflective materials • Provide toilets on site for construction workers. Ensure construction workers do not engage in		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			open defaecation within the project community • Provide workers with HIV/AIDS education. Provide workers with condoms		
	All construction stages, blocking and cutting of the culvert street. Transportation of construction materials; stagnation of water in constructions pits which can become a pool of water and drown childre	**Public health & safety& traffic management**	• Do not place construction wastes and construction materials on walkways in the project communities and also along the street corridors • Provide barriers between pedestrian's walkways and oncoming traffic to prevent vehicles knocking down pedestrians at the project sites. • Provide alternative access routes to motorists and pedestrians where road/streets will be temporarily closed	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			temporarily to traffic. Provide a traffic man to direct motorists and pedestrians at such road diversions • Reduce speed limit of construction vehicles to 30km/hr within the construction communities in order to avoid vehicles knocking down community people and motorists • As much as possible, cover immediately all trenches created to avoid stagnant water breeding mosquitoes • Where there is water standing in a construction pit, immediately pump the water out and backfill. • Fence off all construction pits to avoid unauthorised persons from accessing the		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			pit areas. • Provide appropriate signage to warn community people and unauthorised personnel to stay away from construction pits and active construction areas • Provide barriers to cordon off the excavated drain channels from unauthorized persons at construction sites to avoid people falling in them (channels) • Provide signages to warn public and drivers of dangers zones of the construction activities • Avoid use of child labour during the construction activities • Ensure a dedicated work staff to conduct children,		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			the elderly and the vulnerable across the alternative footpaths provided within the community during construction activities. • As much as possible, cover immediately all trenches created to avoid stagnant water breeding mosquitoes • Contractor to provide code of conduct for construction workers. • Prepare a health & safety Plan for the construction works. Educate the workers on the health and safety plan.		
	Lack of awareness and local people's engagement in the planning and implementation of the	**Risk of social conflict**	• Conduct awareness raising among the project communities and construction workers about the project and the worker	Contractor; TMA	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	project		code of conduct and ethical behaviours. • Ensure continuous consultation on the project's update/progress with the project communities during the project implementation • Ensure timely implementation of Grievance Redress Mechanism		
	Tolerance for illegal behaviour of construction workers	**Increased risk of communicable diseases**	• Provide HIV/AIDs and STD transmission education and campaigns to workers and the local project community people • Provide workers with condoms	Contractor	Construction cost
	Engaging children and minors in the project activities	**Child labor and school drop-out**	• Ensure that children and minors are not employed directly or indirectly to undertake any of the project	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			activities • Contractor should provide Code of conduct for his/ her labor force • Train the work force on the Code of conduct		
	Sexual harassment, child abuse and exploitation during project implementation	**Gender Based Violence (GBV)**	• Include zero tolerance for sexual harassment, child abuse and exploitation in workers Code of conduct • Provide workers with regular training on the code of conduct • Ensure all contractor's labor force sign the code of conduct as a condition for employment	Contractor	Construction cost
	Employment of labour	**Socio-economic development and capacity building**	• Arrange to employ local people as part of the labour force in the construction works	Contractor	Construction cost

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
Sub- total					**0.00**
Decommissioning phase impacts					
	Removal and relocation of construction equipment to contractor's head office	**Public and occupational health & safety** **Waste generation and disposal** Soil erosion	• Dismantle and remove all construction equipment including concrete mixers, excavators, etc. from construction site before handover of works to TMA authorities. • Collect and dispose all spent construction wastes out of the construction communities and sites • The wastes should be disposed to TMA approved waste disposal sites. • Plant vegetation at all areas disturbed during construction to avoid soil erosion		
Operational phase					

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
	Waste disposal into drains resulting in blocking of drains and flooding; lack of maintenance of the drains by TMA	Clogging of drains and flooding of communities Public health and safety of residents and sustainability of the newly constructed drains	• TMA will develop and implement a Drain Management and Monitoring Programme to cover the project communities. The Programme will to mitigate waste clogging the drains and flooding of the communities. The Department of Urban Roads of TMA has routine drain management in place to desilt drains and conduct repairs on broken down drains within the Metropolis. There exist Metro Waste Management Department and Public Health Department whose role is to undertake facilitation of provision of waste collection bins, facilitating waste collection service providers in communities to collect and dispose wastes to approved waste dumps, raising awareness and conducting public education on sanitation, and enforcement of bye-laws on sanitation. These existing programmes will be extended to the	Department of Urban Roads of TMA -Department of Public Health of TMA -Metropolitan Waste Department of TMA	70,000.00/per year TMA Sanitation and Waste Management Budget

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			newly drains drain to be constructed under this project to include: • Provision of public sensitization and education campaign on environmental sanitation and drain sustainability in the project community • Facilitating provision of waste collection bins and receptacle at vantage points in the Bankuman, Naval base area, Tema Community 6 drain area and Adjei Kojo/Kanewu communities especially among residents close to the newly constructed drain channels • Facilitating linkage between the project communities residents and waste collection service providers		

	IMPACT SOURCE/PROJECT ACTIVITY	POTENTIAL IMPACTS	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	ESTIMATED COSTS (GHC)
			to ensure regular collection and disposal of wastes form households • Routine desilting of the newly constructed drains of debris, refuse wastes, and weeds on 3 -monthly basis. • Routine repairs of the newly constructed drains on 3-monthly basis • Enforcement of the Metropolitan Byelaws on Waste Management in the project communities.		
Sub-total					**70,000.00**
Grand total					**77.600.00**

8.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

8.1 Introduction

This Chapter contains a table of environmental and social monitoring plan for the proposed mitigation. The overall aim of the environmental and social monitoring is to ensure that the mitigation measures are implemented and they are effective. A monitoring plan has been developed to determine whether the mitigation measures for the impacts on the physical, biological and socio-economic/cultural environments within the project's area of influence are adequate or additional mitigation measures are necessary.

The results of the monitoring are expected to indicate whether the predictions of potential environmental impacts are accurate and also whether the mitigation measures proposed for the management of the impacts are appropriate and adequate. The plan will also serve as an early warning system by revealing unforeseen impacts and allowing additional corrective measures to be implemented to- arrest the situation and ensure that irreversible damage is not caused.

The contractor shall employ an officer to be responsible for the implementation of the environmental and social requirements. The Officer will maintain regular contact with the Safeguards Specialist and the TMA. The contractor should ensure that the proposed mitigation measures are properly implemented during the construction phase.

The plan is also expected to provide useful guidance for the successful planning and implementation of future storm water management programs that will be undertaken by the GAMA.

The estimated cost of monitoring the ESMP is GHC 108,700.00.

TABLE 8-1 ENVIRONMENTAL AND SOCIAL IMPACTS MONITORING PLAN

POTENTIAL IMPACTS	MONITORING PARAMETERS	MONITORING SITE	FREQUENCY OF MONITORING	RESPONSIBILITY	ESTIMATED COST (GHC)
Pre-construction phase impacts					
Occupational health and safety/Public safety issues	-Survey personnel wearing PPEs	Drains construction sites in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu	Daily	TMA Urban Roads Engineer (URE) TMA GAMA Project Coordinator	3,000.00
Involuntary Resettlement at proposed project site	-ARAP document prepared for the proposed TMA drainage intervention subprojects -Compensation paid to PAPs prior to relocation/demolition of affected properties Number of people compensated	Drains construction communities in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu	Daily	TMA	Refer to ARAP
Negative community attitudes and perception towards the proposed	-Record of community consultation to create awareness on the proposed	Drains construction communities in	Daily	TMA URE, GAMA Project Coordinator in TMA,	1,800.00

project	project -Complaints from community members about lack of information on the proposed project	Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu		Metropolitan Health Department of TMA	
Risk of social conflict	-record of project communities' consultation on the project - evidence of record of communities input and responsibilities contained in the implementation arrangements	TMA offices, project communities	Weekly	URE of TMA, GAMA Project Coordinator for TMA	1,000.00
Disruption of Utility service lines	-record of utility services lines identified to be on the right of way of the project construction - record of consultation with utility service facility owners -evidence of reinstatement of utility service	Urban Roads Department of TMA, Offices of the affected Utility companies in TMA	Weekly	TMA URE, GAMA Project Coordinator in TMA	2,000.00
Inability to construct the drains to excellent standard and quality of work that will permanently solve the flood risks in the project	-a qualified contractor engaged for the works through competitive procurement process	-TMA Urban Roads Department - TMA	Weekly	GAMA Project Coordinator in TMA, TMA URE, TMA Procurement Officer.	1,900.00

communities	-inlet connecting drains are incorporated into the drainage design	Procurement Department - Subprojects construction sites			
Sub-total					
Construction phase					
Loss of vegetation	-observable demarcation of areas that are to be used for the drainage channel at the construction communities -vegetation clearing is done only at areas demarcated for the drainage channel construction -visible evidence of planted vegetation at areas where vegetation was removed during construction activities -slopes of newly constructed drains planted with vegetation - observable number of trees replanted to replace trees felled during construction.	Drains construction communities in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu construction site - embankments	Weekly	Contractor	Construction cost
Air quality impacts	- record/ observable evidence of spraying of water on	-project construction site	Daily	contractor	Construction

	exposed surface at construction site -Observable dust in air in surrounding environment of the construction site - excavators, construction vehicles and concrete mixers switched off when they are not in use - observable exhaust fumes in air in surrounding environment - evidence of routine maintenance programme or plan for the construction equipment (trucks, excavators, cement mixers) - record of construction equipment (i.e. excavators, construction vehicles and concrete mixers) maintenance programme implementation record -absence of open burning by construction workers at construction site. -construction workers	and community			cost

	provided with nose masks -observable evidence of sand, stone chippings and cement stockpiled under tarpaulin. - construction vehicles observe 30km/hr speed limit within the project community -complaints from project community about air pollution or nuisance				
Noise and vibration	-evidence of routine maintenance programme or plan for the construction equipment (trucks, excavators, cement mixers) - record of construction equipment (i.e. excavators, construction vehicles and concrete mixers) maintenance programme implementation record -absence of excavation and use of concrete mixers during night hours. Construction activities are limited to	-construction sites	Daily	Contractor	Construction cost

	8:00hrs to 17:00hrs only -observable use of well-maintained excavators and cement mixers during construction - observable evidence of engines of excavators, construction vehicles and concrete mixers switched off when are not in use. -record of implementation of noise limits near homes (less than 50 decibels) and along the streets of the construction communities(less than 75 decibels) - Complaints of noise nuisance by project communities -- observable use of manual means in excavating drain channels that are very close to foundations of buildings and fence walls instead of using excavators				

	-construction workers provided with ear plugs -workers using ear plugs during noise making construction activities -number of grievances recorded at the project communities				
Soil erosion	- trenches created at the project construction sites backfilled/covered -observable presence of vegetation planted at areas disturbed at the construction site and also along the slope of the newly constructed drains -No visible construction activities by the contractor during stormy conditions	Bankuman, Naval Base area, Tema Community 6, Adjei Kojo construction sites	Weekly	Contractor	Construction cost
Waste generation & disposal	-No visible construction wastes at the project construction sites, community walkways and inside drains in	-construction site - TMA Metropolis	Daily	Contractor	Construction cost

	the community - record of waste collection and disposal to TMA approved waste disposal sites. - Record of final waste disposal sites -availability of waste collection bins at construction site -availability of mobile toilet on site for the construction workers				
Water pollution	-observable change in turbidity of water in the drain channels in the project communities - No visible maintenance, cleaning, servicing and fuelling of excavators, concrete mixers, vehicles and trucks construction ongoing at the construction sites -Visibility of oil and grease film in drains and water bodies	- Construction sites - inside drains and water bodies	-weekly	Contractor	Construction

	- Record of maintenance, cleaning, fuelling and servicing of construction machinery (excavators, concrete mixers, construction vehicles) off site at Fuel Service Stations of recognized oil marketing companies in TMA -observable use of well serviced excavators and concrete mixers for the construction activities -availability of mobile toilets for construction workers				
Flooding of project sites during construction activities	-observable absence of excavated materials heaped across runoff directions in the project areas - record of waste collection and disposal to TMA approved waste disposal sites. - absence of excavated materials deposited in drain channels and embankments	-construction sites Construction communities	Weekly	Contractor	Construction cost

	-absence of construction activities during stormy conditions -observable inlets channels connecting into the newly constructed drain channels -record of number of flood occurrences at construction site during construction period . - complaints of flooding from project community residents				
Relocation/damage to utility service supply lines at construction site	-record of utility service lines affected by the project activities re-instated -record of consultation/engagement with property owners during re-instatement - complaints by affected utility service providers.	Construction sites -Construction community	Weekly	Contractor	Construction cost
Workers Occupational	-availability of contractor's	Construction sites	Daily	Contractor	Construction

health & safety	health and safety plan for the construction works -Construction workers provided with PPES (hand gloves, hard hats, reflector jackets. Construction boots, etc) -workers wearing PPEs at all times during construction activities - availability of signages warning construction workers of dangers on site - availability of first aid box at the construction site stocked with necessary drugs -Record of daily safety induction of workers -absence of unauthorised persons on active construction site -record of incidents involving workers and public on construction site -availability of toilet on site				cost

	for construction workers - record of HIV/AIDS awareness and education for workers				
Public health & safety& traffic management .	-presence of signages warning people of dangers at construction site -availability of barriers separating pedestrian's walkways and oncoming traffic along the streets of the construction activities -trenches created by the construction activities condoned off -absence of stagnant water in pits created by the construction activities - availability of alternative access routes for motorist and pedestrians at the community streets involved in the project activities - availability of construction	Construction communities	Weekly	contractor	Construction cost

	staff directing motorists and pedestrian's road blocks and diversions during peak hours in the morning and evening -absence of construction wastes and equipment parked on community walkways in the project communities -observation of vehicle speed limit of 30km/hr by construction drivers at the construction community -record of HIV/AIDS education organized for the project communities -active construction areas and trenches cordoned off separating unauthorized persons from excavated drain channels -absence of unauthorised personnel found at active construction site -Record of accidents involving the public as a result of the project works				

Risk of social conflict	-record of awareness raising meetings for the project communities and workers about the project and the workers code of conduct -record of project update engagement/consultation meetings with the communities -number of grievances addressed on the project	-construction communities	Weekly	contractor	Construction cost
Increased risk of communicable diseases	- record of HIV/AIDs and STD transmission education held for the local project community people and workers - availability of condoms at the construction sites for the workers	-construction sites	Monthly	Contractor	Construction cost
Child labor and school drop-out	-Absence of children and minors involved directly or indirectly in the project activities -availability of Contractor's Code of conduct for workers -report on training provided	-construction site -construction community	Weekly	Contractor	Construction cost

	for workers on the Code of conduct				
Gender Based Violence (GBV)	-absence of complaints of sexual harassment, child abuse and exploitation at the construction sites and communities -record of contractor employees signing to the code of conduct as a condition for employment	Construction sites -construction community	Weekly	Contractor	Construction cost
Socio-economic development and capacity building	-Number of local community people engaged in the construction activities -complaints by community residents	Project communities	Weekly	Contractor	Construction cost
Sub-total					
Decommissioning phase impacts					
Public and occupational health & safety	-absence of all construction equipment including concrete mixers, excavators, etc. from construction site -absence of all spent construction waste from the construction site and	-Construction sites in the project communities -project communities	Weekly	Contractor	Construction cost

Waste generation and disposal **Soil erosion**	community -absence of all road block, signages at the construction site and community on completion of the works - observable reinstated areas along the street and slope of drain (i.e. replanting of trees and grass, and pavements resurfacing, etc.)				
Operation phase impacts					
Clogging of drains and flooding of communities Public health and safety of residents and sustainability of the newly constructed drains	- availability of approved Programme for Drains Management and Drainage Monitoring for the newly constructed drains in TMA -- Record of implementation of Management and Monitoring Programme of the newly constructed drains. - record of public sensitization and education campaign on proper drain management in TMA communities --availability of solid waste collection receptacles at	-TMA Urban Roads Department -TMA Waste Management Department	Quarterly basis	TMA	TMA Sanitation and Waste Management Annual Budget 100,000.00

	vantage points in drain communities in Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu. -record of desilting of the newly constructed drains by TMA in the drain communities -number of residents prosecuted and sanction in accordance with the TMA Metropolitan Bye- laws on Waste Management				
Sub-total					100,000.00
Grand Total					108,700.00

9.0 SUPERVISION, MONITORING AND REPORTING OF THE SAFEGUARDS ISSUES

Monitoring and reporting of safeguards issues will be an integral part of the implementation of the proposed project. A monitoring plan (Table 8-1) has been developed to facilitate determination of tracking of the project mitigation measures described for the potential environmental and social impacts of the project on the physical, biological and socio-economic/cultural environments within the project's area of influence.

The Contractor, the Urban Rods Engineers of the TMA, the PCU Safeguards Specialists will be involved in the supervision and monitoring of the compliance with the ESMP requirements during pre-construction, construction, decommissioning stages of the works. The Contractor will directly supervise the implementation of the ESMP through his/her Safeguards Officer. The Contractor will be supervised by the Engineers of the Urban Roads Department of TMA and the PCU Safeguards Specialists. This will be done through ensuring that the Contractors. Workforce are carrying out all their activities in accordance with the ESMP. The Supervision and monitoring by the TMA Engineers and the PCU Specialists will also ensure that the Contractor provides the necessary PPEs, desirable construction equipment (excavators, concrete mixers, etc.) to ensure protection of the environment and health of the workers and the public. The supervision and monitoring of the Contractors activities will be carried out through regular visits (daily, weekly, etc.) to the project sites and construction communities during project implementation (in accordance with the Environmental and Social Monitoring Plan Table 8-1) in order to collect/provide information regarding compliance with the environmental and social impacts mitigation plan of the project, the effectiveness of mitigating measures and the contractor's environmental and social performance. The results of the monitoring are expected to indicate whether the predicted mitigation measures for the potential environmental and social impacts are accurate and also appropriate and adequate.

The Contractor and Urban Roads Department (URD) Team of the TMA will produce and submit their environmental and social monitoring reports to the PCU on bi-weekly basis (a reporting Format (Annex 1) is developed in the ESMP Report) . The PCU Safeguards Team will also conduct monitoring field visits to the construction sites to verify the reports presented by the Contractor and Assembly Teams and to provide guidance for any remedial actions that could be needed to be taken to prevent non-compliance and recurrence of inaction on the part of any stakeholder. The PCU Safeguards Team will compile the safeguards Monitoring report to be contained in the Quarterly Implementation reports of the PCU to the World Bank.

The results of the environmental and social monitoring plan would be continuously evaluated by GAMA in order to evaluate the success of the mitigation as part of project supervision, and to allow corrective actions to be taken when needed.

The Reports to be produced will involve physical, biological and Health and safety activities of the ESMP implementation as well socio-economic issues.

Thus, the outcome of the monitoring report will also serve as an early warning system by revealing unforeseen impacts and allowing additional corrective measures to be implemented to- arrest the situation and ensure that irreversible damage is not caused. The plan is also expected to provide useful guidance for the successful planning and implementation of future projects to be undertaken by the GAMA Project and the Ministry of Sanitation and water resources.

Other relevant Institutional arrangements for the implementation of the ESMP is presented in Section13.0 of this Report.

10.0 PREPARATION OF A HEALTH AND SAFETY PLAN

When the contractor is selected, he or she would be requested to submit his Health and Safety Plan prior to his or her engagement by the Assembly.

The contractor's health and safety plan will provide information on the contractor's procedures relating to occupational health and safety of his workers and public health and safety during the implementation of the proposed project. The Assembly, through the Urban Roads Engineer must ensure that this is complied with.

The Plan shall be guided by the World Bank's Health and Safety Guidelines as well as the Ghana Factories, Offices and Shops Act 328 (1970) and Fire Precaution Regulations, L.I. 1724. The following provides an outline of the Plan:

- Provision of signages warning people of dangers at construction site
- Provision of adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc.at appropriate points
- Traffic diversion and alternative access route for motorists and pedestrians the public during construction period
- provision of personal protective equipment for workforce to protect them from injury and accidents
- implementation of vehicle speed limit of 30km/hr for movement of construction equipment at the construction community and project environs
  HIV/AIDS education for the project communities and workers. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of AIDS.
- Measures for protection of construction site from unauthorised personnel
- Plan for health and safety induction for construction workers
- Immediate remedial measures to contain accidents and dangerous occurrences on site
- Record keeping of accidents involving the public as a result of the project works.
- The posting of "no smoking" signs at fire sensitive areas. (e.g. fuel storage areas etc.)
- Provision of appropriate and adequate number of fire extinguishers.
- Proper storage of hazardous and flammable materials.
- Handling of flammable materials by competent persons only.
- Provision of emergency smoke and fire alarm systems.
- Fire prevention knowledge for employees and key stakeholders who will be paying monitoring visits
- Record keeping of the implementation of the Plan

The GAMA PCU Safeguards Specialists and the TMA Urban Roads Engineer will monitor implementation of the Plan as part of the ESMP implementation and ensure that the Contractor implements the required Plan and report on it. The Assembly will also ensure that budgetary provision is made in the contractor's contract.

11.0.0 GRIEVANCE REDRESS MECHANISM

11.1 Introduction

In spite of the fact that the ESMP preparation processes and methodology weighed heavily on consultation and participation of project stakeholders, however, grievances are sometimes raised by project-affected persons during the project implementation. In the light of this, grievance resolution procedures for projects are necessary to resolve disputes that may arise from an aggrieved person,

11.2 The objectives of the grievance process:

- To address and resolve grievances or complaints from affected persons promptly, fairly and in a manner, that to extent possible acceptable to all parties;
- Provide affected people with avenues for making a complaint or resolving any dispute that may arise during the course of the implementation to ensure that disputes do not hold back the implementation of the project.
- Avoid the need to resort to judicial proceedings.

11.3 Steps for submitting grievances and complains

Registration of complain by an aggrieved person

An aggrieved person can lodge his or her complain verbally through phone calls, or through email to the Municipal Engineer of Urban Roads Department at TMA. The Engineer of Urban Roads Department will be the secretary to the Grievance Redress Community. The grievance will be captured on a complain form and submitted to the Grievance Redress Committee.

11.4 Determining and implementing the grievance action

The Redress community will inform the complainant about the status of the grievance in 2 days. The GRC will resolve the grievance and determine the possible corrective action within 5 days and inform the complainant if possible the complainant should be part of the determination of the corrective actions. If a resolution is seen to require commitment of the TMA management, the members shall coordinate and consult with the TMA Metropolitan Coordinating Director who will constitute a panel to resolve the matter. In such cases the time frame for the determination of the corrective action shall be additional three days. After the case is evaluated in detail and possible corrective action determined, the proposed solution or corrective/preventive actions shall be discussed with the complainant within 24 hours.

The corrective steps, time frame they are to be completed and the party responsible for implementing them shall be recorded in a grievance close out form. Once an agreement has been reached between the applicant and the responsible action, the applicant will be asked to sign off the grievance close out form on the acceptance of resolution. If the applicant remains dissatisfied with the outcome, an additional corrective would be agreed on and carry out by the responsible party.

11.5 Verifying the redress action

The GRC will visit the affected property site or get in touch with the complainant to confer that the redress action is carried out. Verification will be completed within 7 days of the execution of the redress action.

11.6 Monitoring and Evaluation

The monitoring and evaluation team from the PCU will monitor the GRC to ensure that all complaints and grievances brought to the committee by PAPs are properly resolved.

11.7 Further Steps for Grievance Resolution and Court of law

If the complainant remains dissatisfied with the mediation and redress actions of the TMA, he or she can bring the matter to the attention of the Chief Director of MSWR for the resolution of the unresolved matter, and the matter should be resolved within 5 days on receipt by the Chief Director. The complaint then has an option to seek appropriate redress at High Court of competent jurisdiction if the resolution at the Ministry failed.

11.8 Proposed Membership and functions of the GRC.

- The GAMA Project Coordinator in TMA–Chairperson
- The Metropolitan Engineer of Urban Roads Department of TMA who shall also serve as the secretary to the GRC
- Assemblyman/woman of the Bankuman, Naval Base area, Tema Community 6, and Adjei Kojo/Kanewu communities
- A representative of the PAPs in each of the subproject communities

11.9 Estimated Budget for the GRC

An estimated sum of GHC 5,800.00 is the budget for the GRC work. This money will support transportation and lunch for the committee members to attend meetings and verification visits.

12.0 TRAINING AND CAPACITY BUILDING OF STAKEHOLDERS

12.1 Introduction:

To ensure the effective implementation of the ESMP of the proposed project, there is the need to train them and key people to be trained and the training issues are presented in the table below. It is estimated that GHC12,000.00 will be required to undertake the training.

Table 12-1: ESMP Training/capacity building activity Plan

Training Issues	**Targeted participants**	**Training timing**	**Training cost (GHC)**
Training on ESMP • Overview of ESMP • Management of Occupational Health and hazards • Management of public health and safety • Traffic management • Waste management • Decommissioning of project • ESMP monitoring and reporting • Grievance redress mechanism • Code of Conduct	Contractor, contractors' staff (clerk of works, works engineer, supervising foreman, safeguards officer) Five TMA Officials (Urban roads engineer, GAMA Coordinator, Procurement Officer, Metropolitan Environmental Health Officer); GAMA Project Coordinator for TMA Five PCU staff (Sanitary Engineer, Other relevant staff)	1 -day	
TOTAL			GHC19,000.00

13.0 INSTITUTIONAL RESPONSIBILITIES IN THE PROJECT IMPLEMENTATION

The following institutional arrangement have key responsibilities for the project implementation

i. The Ministry of Sanitation and Water Resources is the GOG institution responsible for the oversight responsibility for successful implementation of the project in accordance with the GAMA Project Financing Agreement

ii. The Environmental and Social Safeguards Specialists at the PCU will be responsible for the overall coordination of the safeguards implementation of the project

iii. The Environmental Protection Agency (EPA) is responsible for compliance with the providing environmental permit for the works. It will monitor to ensure compliance with the permit schedules for the works.

iv. The TMA is vested with the overall responsibility of coordinating, planning, and implantation of this project, including leading on the grievance redress. The Department of the Urban Roads of TMA is responsible for the design and of the standard construction of the drains.

v. The contractor will be responsible for the actual construction work. He shall together with his/her company's Safeguards Officer lead to ensure and supervise that the ESMP conditions are complied with and reported bi-weekly to the Safeguards Specialist at the PCU, who will compile these reports to the Ministry and the World Bank.

vi. The Project communities shall ensure that the enabling environment including access to the project site for the relevant institutions to carry out their monitoring and surveillance during the implementation of the proposed project.

14.0 ESTIMATED COST OF ESMP IMPLEMENTATION

The estimated cost for the ESMP implementation is GHC211,100.00. This involves

i. Implementation of Environmental and social management mitigation measures: GHC 77,600.00

ii. Monitoring of the environmental and social impacts: GHC108, 700.00

iii. Grievance Redress Committees work: GHC5,800.00

iv. Capacity building of key stakeholders in the ESMP implementation: GHC19,000.00.

15.0 CONCLUSION AND RECOMMENDATIONS

The potential impacts of the project on the existing environment of the project area were identified and it was based on the interactions between the project activities and the environmental status and sensitivities of the various ecological components of the project, namely the physical, biological, social, and health components.

The ESMP would ensure not only that procedures for managing the potential adverse impacts and associated impacts of the proposed project on the environment are put in place but that they are also enforced throughout the life of the project. Also, a monitoring plan for the project has been integrated to the ESMP in order to ensure that all impact indicators for all the environmental components in every phase of the project are within limits throughout the life of the project.

ANNEXES

ANNEX 1: ESMP MONITORING REPORTING FORMAT/TEMPLATE

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
Pre-construction								
Occupational health and safety/Public safety issues during surveying and pegging of new drain course	Provide personnel with protective clothing	-Survey personnel wearing PPEs	Drains construction sites in Bankuman, Naval Base area, Tema Community 6, Adjei Kojo/Kanewu	Daily	TMA Urban Roads Engineer (URE) TMA GAMA Project Coordinator		On track Slight delays Major delays	
Involuntary Resettlement at proposed project site	ARAP has been prepared which identifies the PAPs for compensation payment prior to commencement of works	- relocation/demolition of affected properties	Project communities		TMA		On track Slight delays Major delays	
Negative community	Consult stakeholders and	-Record of community consultation to create	Project communities	weekly	TMA URE, GAMA		On track Slight delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
attitudes and perception about the proposed project	create awareness among local residents on the objectives of the proposed project and arrangements for compensating project affected persons.	awareness on the proposed project at Bankuman, Naval Base area, Tema Community 6, Adjei Kojo -Complaints from community members about lack of information on the proposed project	-Residents along the proposed drain catchment		Project Coordinator in TMA, TMA Department of Environmental Sanitation		On track Slight delays Major delays	
Risk of social conflict	Consultation with and involvement of the project communities in the planning and implementation of the project	record of project communities' consultation on the project - evidence of record of communities input and responsibilities contained in the implementation arrangements	TMA offices, project communities	Weekly	URE of TMA, GAMA Project Coordinator for TMA		On track Slight delays Major delays	
Disruption of Utility service lines	Identify all utility service supply lines and consult the owners	-record of utility services lines identified to be on the right of way of the project construction - record of consultation with utility service	-TMA Urban Roads department -Offices of the affected utility service providers	Weekly	TMA URE, GAMA Project coordinator in TMA		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
		facility owners -evidence of reinstatement of utility service						
Inability to construct the drains to excellent standard and quality of work that will permanently solve the flood risks in Nmai Dzorn community.	-Select contractor through competitive bidding -Design must ensure that all the existing inlet drains are connected/integrated into newly proposed drain	---inlet connecting drains are incorporated into the drainage design - a qualified contractor engaged for the works through competitive procurement process	TMA Urban Roads Department - TMA Procurement Department	Weekly	TMA GAMA Project Coordinator; TMA URE, TMA Procurement Officer.		On track Slight delays Major delays	
Construction phase								
Loss of vegetation	-Ensure that vegetation is cleared only at the areas demarcated for the drain works	-areas to be cleared for drains construction are demarcated -clearing of land and vegetation are limited to only areas demarcated	-construction site -construction community -drain embankments	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	-Avoid indiscriminate clearance of vegetation and land at the project site and project community -Avoid indiscriminate movement of construction equipment at the construction area -inform EPA before cutting trees -Replant areas where vegetation is destroyed during construction -Plant vegetation on the slopes and embankments of the newly constructed drains	for clearing -areas where vegetation was removed were replanted -slopes of newly constructed drains planted with vegetation -record of EPA obtained before cutting trees -Record of trees replanted						

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	-Plant vegetation at all disturbed areas.							
Air quality impacts	-Spray construction site regularly with water to suppress dust pollution on dusty excavated areas -Regular maintenance of construction equipment to minimize exhaust fume emissions -Construction workers should wear nose masks/face masks -Avoid open burning of wastes at construction site -Ensure construction	- Observable dust in air in surrounding environment - record/evidence of spraying of water on exposed surface at construction site - observation of exhaust fumes in air in surrounding environment - observation of well-serviced construction equipment employed during construction -record of servicing of construction equipment -construction workers provided with nose masks -stockpile of construction materials on construction site	project construction site and community	Daily	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	materials i.e. stockpile of sand and chippings are covered on site with tarpaulin Set speed limits for vehicles transporting construction materials and equipment	covered with tarpaulin -construction vehicles delivering sand and stone covered with tarpaulin - construction vehicles observe 30km/hr speed limit within the project community - complaints from project community about air pollution or nuisance -absence of open burning by construction workers at construction site.						
Noise and vibration	-Contractor should use only well-serviced construction equipment i.e. excavators, concrete mixers to minimize noise	-observation of use of noise making construction activities during night -observation of use of well serviced construction equipment by construction workers	-construction site -sections in the construction site where buildings exist very close to drain channel	-daily	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	impacts on residents and road users -Use good excavation practices close to homes and fence walls to avoid vibration effects breaking fence walls -At sections where the drain course to be excavated is close to the foundation of buildings/ structures, ensure that only manual means are used to excavate the drains and do NOT use construction machinery like excavators and	- absence of movement of construction materials and construction equipment during night hours -Complaints of noise nuisance by project communities - avoidance of use of backhoe/excavators to excavate drain channel close to foundations of buildings and fence walls; use manual of means in this case -construction workers provided with ear plugs -workers using ear plugs during noise making construction activities						

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	backhoe. -Schedule noise making activities and use of noise making equipment to daytime -Ensure noise making activities are not carried out during the night when people are sleeping. - Provide ear plugs for construction workers							
Soil erosion	-Avoid construction activities during stormy weather conditions -Backfill areas	-absence of construction works during stormy conditions - excavation activities limited to demarcated/pegged	- construction site -Construction community	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	around the constructed drains immediately during construction -Plant grass along the slopes of the drain and all areas disturbed during the construction -Limit land clearing to only at areas pegged to be involved in the construction works -Avoid indiscriminate land clearing methods, and indiscriminate movement of construction equipment on the drain slopes and project	areas at the construction site - observable reinstatement/backfill carried out at the slopes of the newly constructed drain channel -immediate backfilling of trenches created on construction site - vegetation planted along the slope of the newly constructed drain channel						

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	community							
Waste generation & disposal	-Avoid stockpiling construction waste at project construction sites -Collect and dispose all construction waste to TMA approved waste dump on daily basis. -Provide dust bins to collect refuse generated by construction workers and dispose the wastes at Municipal approved waste disposal site on daily basis -Reuse excavated	-absence of construction wastes stockpiled at project construction sites -record of evidence of construction waste deposited at TMA approved waste dump -availability of waste collection bins at construction site -absence of construction waste deposited in community open spaces, walkways and drains -availability of mobile toilet on site for the construction workers	construction site - TMA Municipality waste dump	Daily	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	debris materials where appropriate (in backfilling, etc.) -Ensure that construction waste materials are not deposited/disposed on walkways and streets in the project community -Provide mobile toilet on site for the construction workers -Ensure construction workers do not use toilet facilities inside residents' homes							
Water pollution	-Avoid discharging of	-observable change in turbidity of water in the	-Construction site	Weekly			On track Slight delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	construction waste, spent lubricants and oils into the drain channels -Avoid servicing of excavators, concrete mixers , vehicles at the project construction site - -Use only well serviced construction equipment during construction -Send all construction equipment to approved service centres for servicing	newly constructed drain channel -observable oil and the newly constructed drains - absence of servicing of construction equipment observed at construction site. -record of servicing of construction equipment at approved service provider					Major delays	
Impacts on drainage flooding on site during	-Avoid storage and dumping of excavated materials and	- absence of dumping of excavated materials and constructional waste materials onto runoff	Construction site -construction community	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
construction	constructional waste materials onto runoff directions at the project site -Avoid storage and dumping of excavated materials and constructional waste materials on the drain embankment -Do not seal any existing drainage inlets channels that are channelling storm into the drains -Avoid unnecessary and indiscriminate land clearance around the construction site	directions in the project communities - absence of excavated materials such as concrete rocks; desilted debris and earth materials scooped from the drain - -record of flood occurrence at construction site during construction period -absence of construction works during stormy conditions. - complaints from residents	-along the drain channel					
Relocation/dam	Prepare a health	-record of utility service	Construction site	Weekly	Contractor		On track	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
age to utility service supply lines at construction site	& safety Plan for workers and educate the workers on the plan Provide construction workers with personal protective gear (gloves, hard hats, reflector jackets, safety boots, etc.) Ensure construction workers wear protective gears during construction site Provide and stock First Aid Box on site to provide first aid during incidents before transferring the injured to hospital	lines affected by the project activities and re-instated -record of consultation/engagement with property owners during re-instatement - complaints by affected utility service providers	and community				Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	Provide safety induction to workers on daily basis Provide signage to warn personnel of danger areas. Provide toilets on site for construction workers. Ensure construction workers do not use toilet facilities meant for the school community							
Workers occupational health & safety		-availability of contractor's health and safety plan for the construction works -Construction workers provided with PPES (hand gloves, hard hats, reflector jackets. Construction boots, etc)	Construction site	Daily	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
		-workers wearing PPEs at all times during construction activities - availability of signages warning construction workers of dangers on site -- availability of first aid box at the construction site stocked with necessary drugs -Record of daily safety induction of workers -absence of unauthorised persons on active construction site -record of incidents involving workers and public on construction site -availability of toilet on site for construction workers - record of HIV/AIDS awareness and education for workers						

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
Public health & safety& traffic management	-Provide barriers between pedestrian's walkways and oncoming traffic to prevent vehicles knocking down pedestrians at active construction areas -Provide signages to warn public and drivers of dangers zones of the construction activities -Provide alternative access routes to motorists and pedestrians at project construction sites where existing streets will be temporarily	-presence of signages warning people of dangers at construction site -availability of barriers separating pedestrian's walkways and oncoming traffic along streets in the construction areas -cordon off trenches dug at the construction site and within the communities to avoid people falling inside. -availability of alternative access routes for motorist and pedestrians - availability of construction staff directing motorists and pedestrian's road blocks and diversions during peak hours in the	Construction site -project construction sites	Daily	Contractor			

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	closed during construction -Avoid use of child labour -Do not place construction materials on walkways in the project communities -Cordon off active construction sites to unauthorised persons.	morning and evening -absence of construction wastes and equipment parked on community walkways -observation of vehicle speed limit of 30km/hr by construction drivers at the construction community -record of HIV/AIDS education for the project communities -active construction areas and trenches cordoned off -absence of unauthorised personnel on construction site -Record of accidents involving the public as a result of the project works						
Risk of social conflict	-Conduct awareness raising among the project	-record of awareness raising meetings for the project communities	-construction communities	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	communities and construction workers about the project and the worker code of conduct and ethical behaviours. -Ensure continuous consultation on the project's update/progress with the project communities during the project implementation - Ensure timely implementation of Grievance Redress Mechanism	and workers about the project and the workers code of conduct -record of project update engagement/consultation meetings with the communities -number of grievances addressed on the project						
Increased risk of communicable	-Provide HIV/AIDs and STD transmission	- record of HIV/AIDs and STD transmission education held for the	Construction site	Monthly			On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
diseases	education and campaigns to workers and the local project community people - Provide workers with condoms	local project community people and workers - availability of condoms at the construction sites for the workers						
Child labor and school drop-out	-Ensure that children and minors are not employed directly or indirectly to undertake any of the project activities -Contractor should provide Code of conduct for his/ her labor force	-Absence of children and minors involved directly or indirectly in the project activities -availability of Contractor's Code of conduct for workers -report on training provided for workers on the Code of conduct	-construction site -construction community	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	-Train the work force on the Code of conduct							
Gender Based Violence (GBV)	-Include zero tolerance for sexual harassment, child abuse and exploitation in workers Code of conduct -Provide workers with regular training on the code of conduct -Ensure all contractor's labor force sign the code of conduct as a condition for employment	-absence of complaints of sexual harassment, child abuse and exploitation at the construction sites and communities -record of contractor employees signing to the code of conduct as a condition for employment	-construction community	-weekly	Contractor		On track Slight delays Major delays	
Socio-economic development and capacity building	Contractor to arrange for local people to be employed in the	-Number of local community people engaged in the construction by the	Bankuman, Naval Base area, Tema Community6, Adjei	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	construction works	contractor	Kojo/Kanewu					
Decommissioning phase impacts								
Public and occupational health & safety Waste generation and disposal	-Dismantle and remove all construction equipment including concrete mixers, excavators, etc. from construction site before handover of works to TMA -Collect and dispose all spent construction wastes out of the construction communities and streets. -Reinstate all areas disturbed	-absence of all construction equipment including concrete mixers, excavators, etc. from construction site -absence of all spent construction waste from the construction site and community -absence of all road block, signages at the construction sites and communities on completion of the works - observable reinstated areas along the street and slope of drain (i.e. replanting of trees and grass, and pavements resurfacing, etc.)	-Construction sites -construction communities	Weekly	Contractor		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	during construction by replanting of grass							
Operational phase								
Clogging of drains and flooding of community due to the construction works; Public health and safety of residents and sustainability of the newly constructed drains	Develop and implement a Drain/Waste Management and Drainage Monitoring Programme for the TMA newly constructed drains communities to mitigate waste clogging the drains and flooding of the communities. The Programme should include:	- availability of Waste Management and Drainage Monitoring Programme for TMA drain communities - record of public sensitization and education campaign on proper waste management in the drain TMA communities --availability of solid waste collection receptacles at vantage points in Bankuman, Naval Base area, Tema	- TMA Urban Roads Department - TMA Waste Management Department	Monthly	TMA		On track Slight delays Major delays	

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	-Provision of public sensitization and education campaign on environmental sanitation and the drain sustainability in the project communities -Facilitate provision and availability of waste collection receptacle at vantage points in Bankuman, Naval Base, Tema Community 6, Adjei Kojo/Kanewu drain communities	Community 6, Adjei Kojo/Kanewu. -record of drain desilting activities carried out by TMA new drain communities. -number of residents prosecuted and sanction in accordance with the TMA Metropolitan Bye- laws on Waste Management - Record of implementation of the drains Monitoring Programme.						

Potential Impacts	Proposed mitigation measures	Monitoring Parameters	Monitoring site	Frequency of monitoring	Responsibility	Evidence of completion (specify)	Status of completion (tick and provide reasons)	Measures taken to rectify major delays
	-Desilt the constructed drains of wastes and weeds regularly -Facilitate linkage between the residents and waste collection service providers to ensure regular collection and disposal of wastes form households -Enforce TMA Metropolitan Byelaws on Waste Management							

ANNEX 2: CODE OF CONDUCT FOR THE CONTRACTOR

A GAMA MODEL CODE OF ETHICS FOR CONTRACTORS, EMPLOYEES AND SUB-CONTRACTORS

This Code of Conduct applies to contractors, its employees and subcontractors is enforceable on them under the contract to ensure compliance with the ESMP requirements of the proposed works**.**

STANDARD OF CONDUCT

All workers (contractors and subcontractors) are expected to

- Act in accordance with honesty, integrity and fairness to foster a business climate that maintains such standards
- Adhere to all the measures provided in the Environmental and Social Management Plan (ESMP)
- Adhere to the code of conduct.

general environmental management conditions for construction contracts

COMPLIANCE WITH LAWS, RULES , REGULATIONS AND PERMIT CONDITIONS

Workers should comply with the laws, rules and regulations applicable to the construction works. These include the requirement of the provisions in the ESMP, the General Environmental Management Conditions for Construction Contracts of the GAMAProject (attached in Annex 3), the EPA Environmental Permit conditions for this works implementation, Factories Inspectorate Department of Ghana, International Labour Organization (ILO) Code of Practice for Safety and health in construction, as well as the code of practice on HIV/AIDS.

ACCURATE RECORD KEEPING AND REPORTING

Workers should accurately reflect transactions of material use i.e. cement, wood, water etc.in its records and reports. The contractor must maintain an adequate system of internal controls to promote compliance with applicable to workers. Falsification of records is prohibited. All reports, documents legally mandated for disclosure to the public should be accurate ad understandable.

EXPLOITATION

The Contractor aims to allocate sufficient resources to manage the business effectively and to meet daily demands. The organizational structure, normal duties and expected working hours for employees are defined. All local official public and site holidays are observed, and we comply with all laws governing minimum wages and minimum number of days of holidays.

Site supervisors and other Officers with authority may vary duties from time to time within reasonable limits. Working hours may also be adjusted, subject to compliance with Company guidelines, to suit project working schedules and to meet deadlines and such working hours

are monitored and controlled to ensure employees are treated fairly and efforts are recognized. At no time shall excessive or prolonged periods of overtime work be encouraged. Should employees consider their workload to be excessive or their position is being exploited they are encouraged to discuss the matter with their manager or follow the grievances procedure.

Employees are also allowed the freedom to join any union and the Company will not interfere in this regard.

GIFTS AND BENEFITS

A gift or benefit is anything that is offered to any worker in the course of their work, apart from the normal employment entitlements.

Gifts and benefits, including hospitality, should not be accepted if they are given with the intention of making them change how they do their work or if other people could reasonably believe they were intended for that purpose. Soliciting personal gifts and benefits is strictly prohibited in all circumstances.

DRUGS, ALCOHOL AND TOBACCO

While at work, workers must not be in possession of drugs, alcohol or any substance that is illegal to possess or distribute. Workers are not permitted to be in the work area if under the influence of alcohol or other drugs that are likely to adversely affect their ability to work effectively or may pose a risk to themselves, colleagues and the public.

"Under the influence" is defined as an obvious state of disturbance to one's physical and /or mental faculties and impairs performance or that may pose risk to workers or the general public

WORK, HEALTH AND SAFETY

While at work, workers must take care of their health and safety and health and safety of others within the working environment.

Workers at all levels have a responsibility to promote and maintain the health and safety of all persons in the workplace. All employees must comply with any reasonable direction from management and cooperate to ensure resolution of work, health and safety issues. Any real or perceived hazards must be reported to a manager.

HEALTH AND SAFETY OF LOCAL /HOST COMMUNITIES AND THE VULNERABLE

Workers must protect the health and safety of local communities hosting the project under contract, with particular concern for those who are disabled, elderly, or otherwise vulnerable. Workers must engage with and listen to affected persons and organizations and be responsive to their concerns, with special regard for disabled, , elderly people and the vulnerable.

ZERO TOLERANCE FOR ILLEGAL ACTIVITIES
Workers should be intolerant of sexual harassment, sexually provocative towards women and children, gender based violence and child defilement,

CO-OPERATION WITH RELEVANT AUTHORITIES AND LOCAL COMMUNITIES
Workers must work co-operatively, including with beneficiaries/end users of the works, relevant authorities, local communities and contractors. Workers must submit to relevant authorities with responsibility to monitor and enforce compliance with the ESMP, Laws, Rules, Regulations, Guidelines and Permit conditions pertaining to the contract.

BULLYING AND HARASSMENT
Ensure that the working environment promotes a healthy and safe work environment that is free from bullying and harassment. All workers have a right to be treated with courtesy and respect. It does not include reasonable management action carried out in a responsible manner

Bullying is repeated, and unreasonable behaviour directed towards a worker or a person that creates a risk to health and safety to those who experience it. Examples include offensive language or comments, unjustified criticism, deliberately excluding a worker from workplace activities.

Harassment is defined as any unwelcome behaviour that offends, humiliates or intimidates a person because of their age, race, disability etc.

DISCRIMINATION
Workers must ensure there is no discrimination on the grounds of their sex, gender identity, age, disability, political or religious beliefs.

REPORTING OF ILLEGAL OR UNETHICAL BEHAVIOUR
Workers should promote ethical behaviour and should encourage other workers to talk to supervisors or managers or appropriate personnel when in doubt about the best course of action in a particular situation.

The company may adopt a *Whistle-blower Policy* that provides comprehensive procedures to report any suspected criminal or unethical conduct among workers.

VIOLATION OF THE CODE
Workers have a duty to report violation of this code. There shall be no retaliation against workers who report violation of the Code, if that report is made in good faith.

DISCIPLINARY ACTIONS
Our company may have to take disciplinary action against employees who repeatedly or intentionally fail to follow our code of conduct. Disciplinary actions will vary depending on the violation.

Possible consequences include:

- Demotion.

- Reprimand.
- Suspension or termination for more serious offences.
- Detraction of benefits for a definite or indefinite time.

We may take legal action in cases of corruption, theft, embezzlement, illegal behaviours, drugs or other unlawful behaviour.

CONDITIONS OF EMPLOYMENT OF WORKERS AND SUBCONTRACTORS

All workers and subcontractors should sign the Code of Conduct as integral part of their employment conditions.

ANNEX 3: GAMA SANITATION AND WATER PROJECT GENERAL ENVIRONMENTAL MANAGEMENT CONDITIONS FOR CONSTRUCTION CONTRACTS

General

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

2. Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an EMP. In general, these measures shall include but not be limited to:

a. Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity dust producing activities.

b. Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g.
   excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.

c. Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out.

d. Prevent oils, lubricants and waste water used or produced during the execution of works from entering
   into rivers, streams, irrigation channels and other natural water bodies/reservoirs, and also ensure that stagnant water in uncovered borrow pits is treated in the best way to avoid creating possible breeding grounds for mosquitoes.

e. Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary
   construction camps and access roads on the biophysical environment including protected areas and arable

lands; local communities and their settlements. In as much as possible restore/rehabilitate all sites to
acceptable standards.

f. Upon discovery of ancient heritage, relics or anything that might or believed to be of archaeological or
historical importance during the execution of works, immediately report such findings to the SE so that the appropriate authorities may be expeditiously contacted for fulfilment of the measures aimed at protecting such historical or archaeological resources.

g. Discourage construction workers from engaging in the exploitation of natural resources such as hunting,
fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.

h. Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.

i. Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.
j. Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long-distance transportation.
k. Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents.

3. The Contractor shall indicate the period within which he/she shall maintain status on site after completion of civil works to ensure that significant adverse impacts arising from such works have been appropriately addressed.

4. The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.
5. Besides the regular inspection of the sites by the SE for adherence to the contract conditions and specifications, the Owner may appoint an Inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State environmental authorities may carry out similar inspection duties. In all cases, as directed by the SE, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

Worksite/Campsite Waste Management

6. All vessels (drums, containers, bags, etc.) containing oil/fuel/construction materials and other hazardous chemicals shall be bunded in order to contain spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed of at designated disposal sites in line with applicable government waste management regulations.

7. All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

8. Used oil from maintenance shall be collected and disposed of appropriately at designated sites or be re-used or sold for re-use locally.

9. Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

10. Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a daily basis.

11. If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the SE, of low land use value and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials should be placed in low-lying areas and should be compacted and planted with species indigenous to the locality.

Material Excavation and Deposit

12. The Contractor shall obtain appropriate licenses/permits from relevant authorities to operate quarries or borrow areas.
13. The location of quarries and borrow areas shall be subject to approval by relevant local and national authorities, including traditional authorities if the land on which the quarry or borrow areas fall in traditional land.

14. New extraction sites:

a. Shall not be located in the vicinity of settlement areas, cultural sites, wetlands or any other valued ecosystem component, or on high or steep ground or in areas of high scenic value, and shall not be located less than 1km from such areas.

b. Shall not be located adjacent to stream channels wherever possible to avoid siltation of river channels. Where they are located near water sources, borrow pits and perimeter drains shall surround quarry sites.

c. Shall not be located in archaeological areas. Excavations in the vicinity of such areas shall proceed with great care and shall be done in the presence of government authorities having a mandate for their protection.

d. Shall not be located in forest reserves. However, where there are no other alternatives, permission shall be obtained from the appropriate authorities and an environmental impact study shall be conducted.

e. Shall be easily rehabilitated. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred.

f. Shall have clearly demarcated and marked boundaries to minimize vegetation clearing.

15. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

16. Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits from workings.

17. The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable EMP, in areas approved by local authorities and/or the SE.

18. Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the SE and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

Rehabilitation and Soil Erosion Prevention

19. To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

20. Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

21. Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.

22. Re-vegetate stockpiles to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.

23. Locate stockpiles where they will not be disturbed by future construction activities.

24. To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.

25. Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.

26. Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

27. Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation.

28. Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.

29. Minimize erosion by wind and water both during and after the process of reinstatement.

30. Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

31. Revegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, forest department and the local people.

Water Resources Management

32. The Contractor shall at all costs avoid conflicting with water demands of local communities.

33. Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.

34. Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.

35. Temporary damming of streams and rivers shall be done in such a way avoids disrupting water supplies to communities downstream, and maintains the ecological balance of the river system.

36. No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.

37. Wash water from washing out of equipment shall not be discharged into water courses or road drains.

38. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

Traffic Management

39. Location of access roads/detours shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas.
40. Upon the completion of civil works, all access roads shall be ripped and rehabilitated.
41. Access roads shall be sprinkled with water at least five times a day in settled areas, and three times in unsettled areas, to suppress dust emissions.

Blasting

42. Blasting activities shall not take place less than 2km from settlement areas, cultural sites, or wetlands without the permission of the SE.

43. Blasting activities shall be done during working hours, and local communities shall be consulted on the proposed blasting times.

44. Noise levels reaching the communities from blasting activities shall not exceed 90 decibels.

Disposal of Unusable Elements

45. Unusable materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures will be disposed of in a manner approved by the SE. The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

46. As far as possible, abandoned pipelines shall remain in place. Where for any reason no alternative alignment for the new pipeline is possible, the old pipes shall be safely removed and stored at a safe place to be agreed upon with the SE and the local authorities concerned.

47. AC-pipes as well as broken parts thereof have to be treated as hazardous material and disposed of as specified above.

48. Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

Health and Safety

49. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of AIDS.
50. Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.
51. Construction vehicles shall not exceed maximum speed limit of 40km per hour.

Repair of Private Property

52. Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the

Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

53. In cases where compensation for inconveniences, damage of assets etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation.

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

54. Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works. The Contractor's EHS-MP will serve two main purposes:

- For the Contractor, for internal purposes, to ensure that all measures are in place for adequate HSE management, and as an operational manual for his staff.
- For the Client, supported where necessary by a SE, to ensure that the Contractor is fully prepared for the adequate management of the HSE aspects of the project, and as a basis for monitoring of the Contractor's HSE performance.

55. The Contractor's EHS-MP shall provide at least:

- a description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP;
- a description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
- a description of all planned monitoring activities (e.g. sediment discharges from borrow areas) and the reporting thereof; and
- the internal organizational, management and reporting mechanisms put in place for such.

56. The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

HSE Reporting

57. The Contractor shall prepare bi-weekly progress reports to the SE on compliance with these general conditions, the project EMP if any, and his own EHS-MP. An example format for a Contractor HSE report is given below. It is expected that the Contractor's reports will include information on:

- HSE management actions/measures taken, including approvals sought from local or national authorities;
- Problems encountered in relation to HSE aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Lack of compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects; and

- Observations, concerns raised and/or decisions taken with regard to HSE management during site meetings.

58. It is advisable that reporting of significant HSE incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendixes to the bi-weekly reports. Example formats for an incident notification and detailed report are given below. Details of HSE performance will be reported to the Client through the SE's reports to the Client.

Training of Contractor's Personnel

59. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHS-MP, and are able to fulfil their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP. General topics should be:

- HSE in general (working procedures);
- emergency procedures; and
- social and cultural aspects (awareness raising on social issues).