

Initial Environmental Examination

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NEP: Urban Water Supply and Sanitation (Sector)
Project – Tikapur Storm Water Drainage and Fecal
Sludge Management Project Tikapur, Kailali District

Package No: W-18

Prepared by the Ministry of Water Supply, Government of Nepal for the Asian Development Bank.

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Initial Environmental Examination

May 2020

**NEP: Urban Water Supply and Sanitation (Sector) Project
(UWSSP)**

Tikapur Storm Water Drainage and Faecal Sludge Management Project

Tikapur, Kailali District

Prepared by the
Ministry of Water Supply (MoWS)
for the
Asian Development Bank (ADB)

ABBREVIATIONS

ABR	Anaerobic Baffle Reactor
ADB	Asian Development Bank
AR	Anaerobic Reactor
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
DCC	District Coordination Committee
DSMC	Design, Supervision and Management Consultant
DWSSM	Department of Water Supply and Sewerage Management
EARF	Environmental Assessment and Review Framework
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
EPA	Environment Protection Act
EPR	Environment Protection Rules
EO	Environmental Officer
ES	Environmental Specialist
ESA	Environmental Safeguard Assistant
ESE	Environmental Safeguard Expert
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
IBAT	Integrated Biodiversity Assessment Tool
ICG	Implementation Core Group
IEE	Initial Environmental Examination
MoFE	Ministry of Forests and Environment
MoWS	Ministry of Water Supply
NDWQS	National Drinking Water Quality Standard
NPR	Nepalese Rupees
PMO	Project Management Office
PMQAC	Project Management and Quality Assurance Consultant
RPMO	Regional Project Management Office
REA	Rapid Environmental Assessment
SDG	Sustainable Development Goal
S-EMP	Site-Specific Environmental Management Plan
SPS	Safeguard Policy Statement
ToR	Terms of Reference
USD	United States Dollar
UWSSP	Urban Water Supply and Sanitation (Sector) Project
WTP	Water Treatment Plant
WHO	World Health Organization
WUSC	Water Users' and Sanitation Committee

WEIGHTS AND MEASURES

C	Celsius/centigrade
dBA	decibel audible
ha	hectare/s
km	kilometer/s
kph	kilometer/s per hour
m	meter/s
m ³	cubic meter/s
amsl	Above mean sea level
mg/l	milligram/s per liter
mm	millimeter/s

NOTES

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EXECUTIVE SUMMARY

The Urban Water Supply and Sanitation (Sector) Project (UWSSP) will support the Government of Nepal's 15-year Development Plan for Small Towns. The project will improve water supply and sanitation service delivery in small-scale urban and semi-urban centers across Nepal.

Tikapur Storm Water Drainage and Faecal Sludge Management Project is located in Tikapur Municipality of Kailali district in Sudurpashchim Province of Nepal. It lies between 28°27'30" N to 28°33'30" N latitude to 81°2'30" E to 81°10'5" E longitude. The project area is bounded by Karnali River and Bardiya Area-3 in the East, Bhajani Municipality in the West, Janaki Rural Municipality in the North-West, and Indian border in the South. The nearest national highway from Tikapur is the East West highway which is about 14 km north of Tikapur. It is located 14 km north of the Indian border and 95 km east of eastward of Dhangadhi. The nearest airports are Nepalgunj airport in Banke district, and Dhanghadi airport in Kailali district.

The Storm Water drainage will serve the core area of ward number 1 of Tikapur municipality. The Faecal sludge treatment plant will be located in ward number 1 and the onsite service will be available for whole of the municipality.

Flooding occurs due to over flooding in Karnali river during monsoon. The locals have problem of water logging and flooding annually. In each rainy period, the problem of inundation sometimes remains for as long as 2-3 days or more. Even though there is around 4 kms of surface drain in the core city, there is problem of choking due to sediments and waste being accumulated in the drains. Thus, city wide drainage with more efficient drainage system is very much a need of the proposed project area. Such a project will protect the locals from flooding and water logging problems, and will help in further development and economic opportunities in the project area. Likewise, there is no sewerage system in the project area. FSM is also a requirement for the urban core areas of the subproject area. Hence, the proposed project is highly relevant for the project area.

The most dominant ethnic groups are Tharu who occupy 41.14% followed by the Chhetri (26.76%), Brahman (9.55%), Kami (5.85%), Damai (3.25%), Magar (3.15%) and remaining other castes such as Thakuri, Lohar and others. Nearly 20.8% of the households have agriculture as main occupation. Service is another main occupation (17.9%) followed by business (16.3%). Significant portion, around 15% of the households have wage labour as their major occupation.

Subproject Selection. The selection of Tikapur Storm Water Drainage and Faecal Sludge Management Project complies with the subproject selection criteria discussed in the project administration manual (PAM) and environmental assessment and review framework (EARF) developed for the project. Consistent with the EARF, compliance of Tikapur Storm Water Drainage and Faecal Sludge Management Project with these criteria has been confirmed prior to the conduct of initial environmental examination.

Categorization: The Tikapur subproject is classified as Category B for Environment per ADB SPS, 2009 as no significant impacts is envisioned. This initial environmental examination (IEE) report has been prepared based on final detailed design and following requirements of ADB SPS and Government of Nepal laws, rules and regulations. In particular, the subproject is included in Schedule 1 of the Government of Nepal Environmental Protection Rules (EPR), 1997, and an

IEE is required. The IEE has been undertaken to assess the environmental impacts of the subproject, and provide mitigation and monitoring measures that will ensure no significant environmental impacts occur as a result of the subproject.

Subproject Scope: The subproject is formulated under UWSSP to urban sanitation infrastructure in Tikapur municipality, Kailali. Investments under this subproject include construction of Storm Water drainage and construction of a Faecal Sludge Treatment Plant, and the allied components.

Implementation Arrangements: The Ministry of Water Supply is the executing agency. The Department of Water Supply and Sewerage Management (DWSSM) is the implementing agency. Implementing activities will be overseen by a separate Project Management Office (PMO) which is established in DWSSM head office in Kathmandu and two Regional Project Management Offices (RPMOs) in the eastern and western region. A team of technical, administrative, and financial officials including safeguard specialists will be provided at the PMO to implement, manage and monitor project implementation activities. The RPMO will be staffed by qualified and experienced officers and will be responsible for the day-to-day activities of project implementation in the field, and will be under the direct administrative control of the PMO. Consultant teams are responsible for subproject planning and management and assuring technical quality of design and construction; designing the infrastructure and supervising construction; and safeguards preparation.

Description of the Environment: The subproject components are located in Tikapur Municipality. The subproject components will be located in public road right-of-way (RoW) for Storm Water drainage system, and a public land for FSTP. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject locations.

Environment Management Plan: Two separate environmental management plans (EMPs) are included as part of this IEE, which includes i) mitigation measures for environmental impacts during implementation, ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting, iii) public consultation and information disclosure, and iv) a grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The EMPs and the associated costs of implementation of the EMPs will be included in civil works bidding and contract documents. Indicative cost for EMP implementation for Storm Water Drainage package is NPR 1,625,000, and the indicative cost for EMP implementation for Faecal Sludge Management package is NPR 1,550,000.

Locations and siting of the proposed infrastructure were considered to further reduce impacts. The concepts considered in design of subproject are: i) demand for storm water drainage and FSM in the town; ii) maximum population coverage mostly in urban core of Tikapur town; iii) locating storm water drainage within RoWs to avoid acquisition of land; iv) controlled disposal of septage in accordance to national and international standards; and v) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

During the construction phase, impacts mainly arise from the need to disposal of moderate quantities of waste soil; and from the disturbance to residents, businesses, and traffic. These are common impacts of construction in urban areas, and there are well adopted practices for their

mitigation. These are common temporary impacts of construction and will be minimized by using best construction methods. Traffic management will be necessary during pipe laying on busy roads.

During operation, the possibility of blockage of storm water drains is a concern that can be mitigated with good operation and maintenance, prompt action on damages/clogging and quality monitoring of the system. Similarly, in case of FSTP, foul odour will be a prime concern. The operation and maintenance will be carried out timely during this phase.

The mitigation measures have been proposed for adverse environmental impacts. The IEE suggests mitigation of adverse impacts during construction phase and operation phases.

To ensure that the recommended mitigation and monitoring actions are duly implemented, monitored, assessed, evaluated and disseminated to the stakeholders for feedback and improvement, the Project's Environmental Management Office will be established and manned by the qualified environmental experts, whose sole responsibility will be to monitor the implementation of the environmental mitigation measures and direct project supervising engineers through project management office for needed action and coordination.

Consultation, Disclosure, and Grievance Redress Mechanism: Public consultations were carried out during the preparation of the subproject and IEE. On-going consultations will be carried throughout the subproject implementation period. A grievance redress mechanism is described to ensure any public grievances are addressed quickly.

Monitoring and Reporting: The PMO, RPMO and DSMC will be responsible for environmental monitoring. The RPMO with support from DSMC will submit monthly monitoring reports to PMO. The PMO will consolidate the monthly reports and will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports in its website.

Conclusions and Recommendations: Tikapur Storm Water Drainage and Faecal Sludge Management Project will bring a series of benefits to the local people. However, there are some risks in the commencement of the subproject on time and sustainability of the subproject which requires to be identified and measures taken to mitigate them. But the analysis shows that subproject benefits outweigh the risks and these potential risks can be overcome through proper planning, coordination and management. Therefore, the proposed subproject is unlikely to cause significant adverse impacts. Based on the findings of IEE, there are no significant adverse impacts and the classification of the subproject as Category B for environment is confirmed. No further special study or detailed Environmental Impact Assessment (EIA) needs to be undertaken.

I Introduction

A. Background

1. The Urban Water Supply and Sanitation (Sector) Project (UWSSP) will support the Government of Nepal (the government) in providing better access to water supply and sanitation (WSS) in selected municipalities (project municipalities)¹ in Nepal. The Asian Development Bank (ADB) has supported the government in providing improved WSS services through three earlier projects.² Drawing on experience and lessons, this project will fund physical investments in WSS infrastructure in project municipalities and non-physical investments strengthening institutional and community capacity, service delivery, and advanced preparation of future investments.³

2. The Ministry of Water Supply (MoWS) is responsible for planning, implementation, regulation, and monitoring of WSS. The Department of Water Supply and Sewerage Management (DWSSM) under the MoWS supports the provision of WSS facilities in municipalities where large utilities do not exist, and these are operated by municipalities or water users' associations (WUAs). The DWSSM assists municipalities and WUAs in preparation of investment plans, project design, and establishing sustainable service delivery. The Local Governance Operation Act (2017), established municipalities as autonomous government institution with responsibility for WSS services.⁴ However, shortage of investment funds, skilled personnel, and inadequate operation and maintenance (O&M) budgets, hinder municipalities from providing adequate, cost-effective services. While municipalities' capacity is being built, the government and residents have been receptive to an established decentralized, participatory, and cost-sharing service provision model through Water Users' Steering Committees (WUSCs).⁵ Development support for municipal WSS is mainly being channeled through budget allocation as grants to DWSSM and loans through to the Town Development Fund (TDF)⁶ with contributions from municipalities and beneficiaries. The TDF is also supporting WUSCs in institutional and financial management including the introduction of tariffs.

3. UWSSP is being implemented over a five-year period (2018 to 2023) and supported through ADB financing using a sector lending approach. In continuation of ongoing third small towns WSS sector project,⁷ MoWS is the executing agency and Department of Water Supply and Sewerage Management (DWSSM) as the implementing agency. The project management office (PMO) established under ongoing ADB Loan 3157-NEP: Third Small Towns Water Supply and Sanitation Sector Project is also responsible for the overall management, implementation and

¹ Interventions will be in preselected urban areas of municipalities, previous to Nepal's federalization referred to as small towns, defined as (i) population of 5,000 to 40,000; (ii) located on a road linked to the strategic road network; (iii) has perennial road access, grid power, telecommunication, and potential for growth; (iv) has an average population density of 10 persons per hectare; and (v) has jurisdiction of one administrative boundary.

² ADB. 2000. *Report and Recommendation of the President to the Board of Directors: Small Towns Water Supply and Sanitation Sector Project*. Manila; ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Second Small Towns Water Supply and Sanitation Sector Project*. Manila; and ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Third Small Towns Water Supply and Sanitation Sector Project*. Manila.

³ Project preparation was supported by loan consultants under the ongoing *Third Small Towns Water Supply and Sanitation Sector Project*.

⁴ Government of Nepal, 2017. *Local Governance Operation Act*. Kathmandu.

⁵ The WUSCs, formed under the Nepal Water Resource Act (1992), are the elected executive bodies of the WUAs. WUSCs are required to have women (at least 33%) and marginalized ethnic groups representatives, and for a woman to occupy at least one of the key posts (Chair, Vice Chair, Secretary, or Treasurer).

⁶ The TDF is a government-owned entity established under the Town Development Fund Act, 1997. Loans from the government to municipalities or WUSCs are generally on lend through the TDF.

⁷ ADB Loan 3157-NEP: Third Small Towns Water Supply and Sanitation Sector Project.

monitoring of UWSSP. There are Regional PMOs (RPMO) to manage day-to-day project implementation at the subproject/municipality levels. After construction including a one-year O&M period by the contractor, subprojects will be operated by the municipality itself or a user association such as the Water Users Associations (WUAs).⁸

4. Overall, UWSSP will have the following impact: quality of life for urban population, including the poor and marginalized, through provision of improved sustainable water supply and sanitation services.⁹ UWSSP will have the following outcome: inclusive and sustainable access to water supply and sanitation services in project municipalities improved.¹⁰ UWSSP will have two outputs:

- (i) Water supply and sanitation infrastructure in project municipalities improved; and
- (ii) Institutional and community capacities strengthened.

5. There is no proper drainage system for storm water as well as for the domestic sewage in Tikapur Municipality. These drains are not used frequently and get choked every rainy season due to lack of maintenance. There is no defined outlet for storm water, so during the rainy season many low lying areas of the Municipality are inundated. Since the project area is situated at flat terrain with gentle slope, water logging in the wet season is an issue despite there being ample space and sufficient outlet points to drain off storm water naturally. Flooding occurs due to overflowing of the nearby Karnali River.

B. Subproject Selection Based on Environmental Assessment and Review Framework

6. An EARF has been developed to provide guidance on subproject selection, screening and categorization, information disclosure and consultation, assessment, planning, institutional arrangement, and processes to be followed in the formulation and implementation of subprojects during project implementation. The subproject has been screened to ensure that it complied with all the subproject selection criteria provided in the EARF. No subproject will be funded by ADB unless it complies with all these selection criteria. Table I-1 below shows the status of compliance with the selection criteria.

Table I-1: Status of Compliance with the Subproject Selection Criteria in the EARF

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable)	Remarks (Provide basis of compliance)
General Criteria			
1.	Not located in ecologically sensitive areas. ¹¹	Complied.	Section V para. 74 (Page 26); IBAT in Annex 4; REA Checklist in Annex 1; No Mitigation Measures Scenario Checklist in Annex 1
2.	Does not directly affect environmentally protected areas, core zones of biosphere reserves, highly valued cultural property.	Complied.	Section V para. 74 (Page 26); IBAT in Annex 4; REA Checklist in Annex 1; No Mitigation Measures

⁸ WUAs are registered entities with the district water resources committee as users' associations under the Water Resources Act (1992). Water Users and Sanitation Committees (WUSCs) are the elected executive bodies of the WUAs.

⁹ Government of Nepal. 2009. *Urban Water Supply and Sanitation Policy*. Kathmandu

¹⁰ The design and monitoring framework is in Appendix 1.

¹¹ Wildlife/bird sanctuaries, national parks, tiger reserves, elephant reserves, conservation reserves, core zone of biosphere reserves, centrally protected monuments or critical habitat (as defined in ADB Safeguard Policy Statement or SPS)

Subproject Selection Criteria in EARF		Status of Compliance (Complied / Not Complied / Not Applicable)	Remarks (Provide basis of compliance)
			Scenario Checklist in Annex 1
3.	Does not cause damage/destruction, removal, alteration or defacement of adjacent or nearby structures/monuments and sites of international, national and local significance. ¹²	Complied	Table II-2 mentions no PCR will be affected.
4.	Does not include and/or involve any activities listed in ADB's Prohibited Investment Activities List (Appendix 5 of ADB SPS).	Complied	Screening has been carried out
5.	Provides replacement ratio of 1:10 for any tree cutting. (Complying with GoN's EPA, 2019)	Complied	This has been mentioned in EMP

C. Basis and Extent of IEE Study

7. The Government of Nepal has prepared a 15-year development plan to implement the water supply and sanitation programs in emerging towns or small towns in order to improve the health and the quality of life of the people living in the project towns by constructing and extending water supply system, drainage and sanitation facilities and providing health and hygiene education programs in the towns. The project follows the community managed demand responsive approach where the community will be involved from the very planning phase to the implementation phase for the operation and maintenance of the subprojects soon after it is completed. The project, 'Urban Water Supply and Sanitation Sector Project, STWSSSP' is the outcome of that effort. The "Asian Development Bank" (ADB) has been providing financial assistance to implement the project in the previous phases of small towns project. The "Department of Water Supply and Sewerage Management" (DWSSM) is the implementing agency whereas the "Ministry of Water Supply" (MoWS) is the executing agency.

8. Both the Nepali law and ADB policy require that the environmental implications of individual developments are taken into account in the planning and decision making process and that action is taken to reduce the impacts to acceptable levels. This is done through the environmental assessment process, which has become an integral part of lending operations and project development and implementation worldwide. This IEE report is prepared meeting GoN and ADB requirements, the IEE template of EPR 1997 of GoN is followed to prepare the document. The IEE report primarily: (i) provides information on the subproject and its environmental requirements; (ii) provides the necessary baseline conditions of the physical, ecological, physical cultural and socio-economic environments and/or resources in and surrounding the Subproject's area of influence; (ii) identifies and assesses potential impacts arising from the implementation of the Subproject on these environments and/or resources; (iii) recommends measures to avoid, mitigate, and compensate for the adverse impacts; (iv) presents information on stakeholder consultations and participation during Subproject preparation (v) recommends a mechanism to address grievances on the environmental performance of the subproject; and (vi) provides an environmental management plan.

¹² Subprojects with component activities near (within 50 m from) such sites shall have prior coordination with the Department of Archaeology

D. Objectives and Scope of the Environmental Study

9. The main objective of the IEE is to fulfill the requirements of both ADB Safeguard Policy Statement (SPS), 2009 and Government of Nepal Environmental Protection Rules, 1997 (and its amendments). It aims to help decision makers to make informed decision about project. The specific objectives of the IEE study are as follows:

- (i) To identify, predict and evaluate the potential beneficial and adverse impacts of the subproject on the physical, biological and socio-economical resources in the subproject area;
- (ii) To suggest enhancement measures to augment the benefits of the subproject, & to propose mitigation measures to avoid, minimize/compensate adverse impacts of the project;
- (iii) To prepare appropriate Environmental Management Plan (EMP); and
- (iv) To inform public about the proposed subproject and its impact on their livelihood.

10. Scope of the IEE focuses on the adverse environmental impacts and its mitigation measures relating to the location, design, construction and operation of all the subproject activities. This IEE report is based on the final detailed engineering design report of the subproject.

E. Relevancy of the Study

11. The proposed drainage subproject needs to be studied from the environmental point of view as per Section 3 of Environment Protection Act 2019, and Clause I of Schedule 1 of the Environment Protection Rules, 1997 (including amendments). The proposed drainage component of the subproject is intended to serve ward number 1 of Tikapur Municipality and the FSM component of the subproject is intended to serve the whole of Tikapur Municipality.

12. As the proposed subproject falls within the definitions provided in the EPR 1997 (and amendments) Clause I (1-E) of Schedule - 1 of EPR 1997 (GoN), for the project that includes operation of sewerage and drainage schemes of cost more than NRs 50,00,000 an IEE study has to be carried out.

II Policy, Legal and Administrative Framework

A. Nepal's Environmental Policy Framework

13. Most of the national policies and laws of the Government of Nepal (GoN) are in favor of environmentally sound economic development and growth. Following table summarizes the relevant policies, acts and regulations and guidelines that have been an integral part of the project and have been reviewed during the preparation of the IEE report.

1. The Constitution of Nepal (2072)

14. The Constitution defines that each person shall have the right to live in a healthy and clean environment (Clause 1 of Article 30). The victim of environmental pollution and degradation shall have the right to be compensated by the pollutant as provided for by law (Clause 2 of Article 30). It prescribes for the State to give priority to the protection of the environment and prevention of its further damage due to physical development activities. Proceeding from, and conformable to, the Constitution, the Government of Nepal has passed a series of environmental laws, policies and implementing regulations and standards. Among these, the basic legislation that provides the framework within which environmental assessment is carried out in Nepal.

2. Fifteenth Plan (2076/77-2080/81) Approach Paper, 2076 BS (2019 AD)

15. Fifteen Plan Approach Paper 2076 BS has forced its objective to extend road network keeping the net transportation cost at minimal level, and continue upgrading as well as maintenance work to ensure regular road connectivity. This policy has established multiple working area based on five major strategies. It has planned to ensure balanced development in considering provincial level balanced infrastructures based on master plan. Furthermore, it has also planned to promote modern infrastructure construction through adoption of modern technology as well as providing surplus input on activities like Bio-engineering.

3. National Environmental Policy, 2076 BS (2019 AD)

16. The policy has versioned for the management of pollution, waste maintenance of greenery to ensure people's right to live in hygienic and healthy environment. Similarly, the policy has objective of mainstreaming the environmental concerns in developmental activities. It has emphasized to promote reuse and recycle of the waste. To prevent, control and minimize the pollution has proposed following policies and strategies:

- Efficient structure will be formed to prevent, control and minimize the pollution
- Promotion of environment friendly vehicles.
- Waste segregation as well as promotion of reuse and recycle technique similarly, proper disposal of the remaining solid waste has to be ensured.
- To maintain the hygienic aquatic environment direct release of polluted water, sewage and solid waste to the water body will be prevented.

While managing the solid and liquid waste, appropriate mitigation measures will be imposed to the source and minimize the potential adverse impacts on downstream area.

4. National Policy on Rural Drinking Water Supply and Sanitation, 2004

17. The policy provides guidance on water and sanitation service provision in rural areas using community led participatory approaches. While partially relevant to the urban context, particularly around the integration of inputs and local capacity building, it generally fails to address the complex operational challenges to be faced by municipal authorities in implementing and managing urban services.

5. National Urban Policy (2007) Policy

18. The policy gives importance to environment conservation while carrying out urban development works and natural resource use; thus, supporting the required environmental conservation and protection in donor-assisted development projects.

6. National Urban Water Supply and Sanitation Sector Policy, 2009

19. The policy is formulated to provide the overall policy support and guidance towards achieving equity in service delivery by ensuring that the financially marginalized households within the system areas are mainstreamed as valid customers of service through design and implementation of financial incentives where so required. It aims to ensure that the roles and responsibilities of central and local government bodies, external development partners, private sector including NGOs and user groups are clearly defined in scheme implementation and regulation and performance management in accordance with national decentralization policy.

A. Government of Nepal Environmental Legal Framework

20. Environment Protection Act, 2076 BS (2019 AD) and Environment Protection Rules (EPA), 2054 B.S. (1997 A.D), requires a proponent to undertake IEE or EIA of the proposed subproject and have the IEE or EIA report approved by the concerned sector agency or ministry of environment, respectively, prior to implementation. The EPA: (i) sets out the review and approval process of IEE and EIA reports, that involve informing and consulting stakeholders; (ii) stipulates that no one is to create pollution that would cause significant adverse impacts on the environment or harm to public life and health, or to generate pollution beyond the prescribed standards; (iii) specifies for the ministry in charge of environment to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA report; (iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and (v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.

21. Environment Protection Rules (EPR), 1997, and its amendments, define the implementing rule and regulations of the IEE/EIA process, elaborating the provisions in the EPA. Schedules 1 and 2 of the EPR list down the projects of activities that require IEE and EIA, respectively.

22. **Status of securing MoWS-approved IEE.** PMO is currently in the process of obtaining MoWS-approved IEE in compliance with the EPR. PMO will ensure that approval from MoWS will be obtained prior to the award of any contract under the subproject. A copy of the approval document from MoWS will be attached in the first semi-annual environmental monitoring report to ADB.

23. All other statutory clearances such as no objection certificates, forest clearances, site location clearances, permits to construct, permits to operate, and/or road cutting permits as required will be obtained by the PMO and/or RPMO. No civil works will commence until and unless required statutory clearances are obtained.

24. Other environmental acts, rules, plans, policies, guidelines that are relevant to the sub-project are presented in Table II-1:

Table II-1: Other Relevant Environmental Act, Rules, Plan, Policies & Guidelines of Nepal

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Environment Protection Act	2076 BS (2019)	The act emphasis on new aspects like provisions of Preliminary Environmental Study, IEE and EIA under the jurisdiction of local authority, provincial government, and central government. Need of Strategic Environmental Assessment for policies/plans/programs, and considerations of climate change for projects are among the newly enforced aspects of this act.	
Labour Act Labour Rules	2017 2018	The Act emphasizes OHS Policy; Safety & Health Committee; OHS arrangements including child care center; workplace safety; environment of work place; and specific Labour Audit Additional rest period for certain female employees, Specific provisions relating to the safety of the works having health hazards are also there in the Act	The bidding document (Section 6) includes condition that the contractor shall adopt all safety measures for the safety of its workers and other personnel and shall also adhere to environmental and aesthetic issues identified during the construction works
Water Resources Act	2049 B.S. (1992 A.D.)	A comprehensive law on the development, use and conservation of water resources in Nepal, it aims to minimize damage to water bodies by requiring the conduct of EIA & preparation of EIA Report before granting license to use water resources for any purpose.	Per amendment to the EPR, the subproject requires an IEE (instead of EIA) as its nature and extent fall within Schedule 1 of the EPR. Schedule 1 enumerates all types of subprojects that would require IEE only. The permission to use water resource for this subproject has been obtained.
		Proponents shall make sure that the beneficial use of water resources does not cause damage to other water uses/users (Article 4).	
		Article 17 requires proponents to apply for any necessary land acquisition accordingly;	
		Article 18 requires the compliance to quality standards in making use of water resources. Article 19 prohibits the pollution of water resources. Under the Act are two regulations for drinking water purposes: (i) Water Resources Regulation, 1993, setting out the implementation procedures for the Act; and (ii) the Drinking Water Regulation, 1998, which specifies compliance with the drinking water quality standards and control of water pollution (or sanitation) as it affects drinking water.	

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Forest Act	2076 B.S.	It stipulates that the GoN can develop a land use plan of a forest in order to maintain the balance of environment and development. It also provisions that the government can develop a specific forest conservation plan for a particular section of a national forest. It also states that the forest area can be used with approval for national priority projects.	Based on preliminary assessment and site visits, no forest trees covered by the Forest Act will be cut. For any unanticipated cutting of trees covered under the Act, a forest clearance will be obtained by PMO/RPMO. As per IEE study, tree cutting is not required EMP stipulates no illegal quarrying of natural aggregate materials.
National Environmental Policy and Action Plan (NEPAP)	2049 B.S. (1993 A.D.)	Of its five objectives, most relevant to the Project are to: (i) mitigate adverse environmental impacts; and (ii) safeguard national & cultural heritage & preserve biodiversity, within & outside protected areas.	Project will not have significant impacts on physical cultural heritage & biodiversity. EMP provides measures to mitigate some of the possible impacts.
National EIA Guidelines	2050 B.S. (1993 A.D.)	Chapter 3 of this guideline described an Initial Environmental Examination report must be prepared for those projects which may cause significant impact on environment, whose impact may be known easily and for which mitigation measures may be revealed easily, as mentioned in Schedule-1.	EMP prescribes environmental impact and mitigation measures and their performance monitoring.
Local Government Operations Act	2017	The Local Government Operation Act, 2017 empowers the local authority for the conservation of local natural resources and implementation of environmental conservation activities along with prime responsibility of conducting development projects which includes water supply, sanitation and awareness activities. Provides basis for Local Government to monitor the environmental performance of the projects. EMP provides the responsibilities of LGs in EMP implementation.	
Child Labor Prohibition and Regulation Act	2056 B.S. (2001 A.D.)	The section 3 of the act prohibits a child from engaging in work, sub clause 1 of the clause 3 states "Nobody shall engage in work a child who has not completed fourteen years of age as a labor and sub clause 2 states "Nobody shall engage a child in a risk full occupation or work set forth in the Schedule". The section 4 states "Child not to be engaged in work against his will by temptation or fear or pressure or by any other means"	The bidding document (Section 6) provides condition that contractors shall comply with applicable labor laws and core labor standards of Nepal on prohibition of child labor
Implementation Directives for the National Drinking	2063 B.S. (2005 A.D.)	It sets out the water sampling, testing, analysis, monitoring and surveillance procedures to certify that the quality of supplied drinking water conforms to the National drinking Water Quality Standards.	Operate and maintain any WTP in accordance with national requirements and internationally

Act/ Rule Policy/Law/Guideline	Year	Relevant Provisions	Remarks
Water Quality Standards			accepted standards to meet national water quality standards or, in their absence, World Health Organization (WHO) Guidelines for Drinking Water Quality. Monitoring of the quality of supplied water is prescribed in the EMP following the NDWQS Directives.
Updated 15-Yr Development Plan for Small Towns Water Supply and Sanitation Sector	2067 B.S. (2009 A.D.)	The Plan defines the population threshold of “small towns” to be in the range of 5,000 to 40,000. Reference to Schedules 1 and 2 of the EPR, as amended in 2007, places water supply projects in small towns under Schedule 1 or within the threshold of water supply projects requiring only an IEE. The Plan emphasizes monitoring and evaluation as an important component of a project to determine the overall impact of a project.	EMP prescribes environmental effects and performance monitoring.
Solid Waste Management Act	2068 B.S. (2011 A.D.)	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act. Article 5 provides that individuals and entities have the duty to reduce the amount of solid waste generated while carrying out work or business.	EMP prescribes environment friendly management of solid and hazardous wastes.
National Forest Policy	2075 BS	The policy focuses on coordination and partnership between all the three levels of government in Nepal - the federal government, the provincial government and the local government for sustainable and participatory management of the forests, protected areas, watersheds and biodiversity. Conservation of the forest area and its multiple utility has been taken as one of the eleven objectives of the policy. Active role of the local government in forest management and compensatory plantation works have also been pronounced in this policy.	
Consumer Protection Act	2075 BS	Article 3 of the act states that every consumer shall have the rights to quality goods and services. Article 7 talks about compensation to the customer if any kind of damage is caused due to the manufacture of goods and service. Article 12 provisions that the service provider should provide services without any discrimination.	
Guidelines for removal of trees from government land	2071	This procedure simplifies the procedure of getting approval from the local authority/government for tree removal	

B. International Environmental Agreements

25. Table II-2 below lists the relevant international environmental agreements that Nepal is party to, and their relevance to various subprojects under UWSSP.

Table II-2: International Environmental Agreements Relevant to the Subproject

International Environmental Agreement	Year*	Relevant Provisions	Remarks
World Heritage Convention	1978	Parties to ensure the protection and conservation of the cultural and natural heritage situated on territory of, and primarily belonging to, the State	The subproject will help the Government of Nepal comply with this agreement. The subproject has been selected ensuring that it will not negatively impact cultural and natural heritage at the subproject sites.
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)	1987	Parties to conserve and wisely use wetlands (i.e., maintaining their ecological character) as a contribution towards achieving sustainable development locally and throughout the world	The subproject will help the Government of Nepal comply with this agreement. The subproject components are not located in wetlands and other protected areas of the country.
Convention on Biodiversity	1992	Parties to require the environmental assessment of projects that are likely to have significant adverse effects on biological diversity with a view of avoiding or minimizing such effects	The subproject will help the Government of Nepal comply with this agreement. The subproject will not impact biodiversity in the country.
UN Framework Convention on Climate Change	1992	Parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.	The subproject will help the Government of Nepal comply with this agreement. The subproject will ensure implementation of its EMP as measure to minimize the causes of climate change.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1996	Parties to, among others, minimize the amount and toxicity of hazardous waste generated, manage the hazardous and other wastes they generate in an environmentally sound manner and as close as possible to the source of generation.	The subproject will help the Government of Nepal comply with this agreement. The subproject will ensure implementation of its EMP as measure to avoid or minimize the generation and disposal of hazardous wastes.

* (Year) - Year last amended.

26. The subproject will continuously support Nepal's commitment to these international agreements. Eventually, the subproject will help the country fulfill its commitment to the 6th goal of

United Nation's Sustainable Development Goals, which is to ensure access of all to clean water and sanitation.

C. Environmental Assessment Requirements

27. The subproject is subject to the environmental safeguard requirements of both the ADB and Government of Nepal.

D. Environmental Assessment Requirements of the ADB

28. All projects funded by the ADB must comply with the Safeguard Policy Statement (SPS) 2009 to ensure that projects funded under ADB loan are environmentally sound, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards. With respect to the environment, the SPS 2009 is underpinned by the ADB Operations Manual, Bank Policy (OM Section F1/OP, 2010). The policy promotes international good practice as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines.¹³

29. Table II-3 summarizes the environmental safeguard requirements applicable to the subproject per ADB SPS;

Table II-3: SPS 2009 Safeguard Requirements

SPS 2009 - Safeguard Requirements	Remarks
Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment (EA) so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	REA has been undertaken, indicating that the Subproject is NOT : (i) environmentally critical; and (ii) adjacent to or within environmentally sensitive/critical area. The extent of adverse impacts is expected to be local, site-specific, confined within main and secondary influence areas. Significant adverse impacts during construction will be temporary & local. Hence can be mitigated without difficulty. Hence, IEE is sufficient.
Conduct EA to identify potential direct, indirect, cumulative, & induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary global impacts, including climate change.	IEE has been undertaken to meet this requirement. (Impacts are discussed in Section VI). No transboundary & global impacts, including climate change.
Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Analysis of alternatives is presented in Section VII.
Avoid, and where avoidance is not possible, minimize, mitigate, &/or offset adverse impacts and enhance positive impacts by means of environmental planning & management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or	An EMP has been prepared to address this requirement. Section VIII

¹³ New Version of the "World Bank Group Environmental, Health, and Safety Guidelines", April 30, 2007, Washington, USA. <http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines>

SPS 2009 - Safeguard Requirements	Remarks
organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.	
Carry out meaningful consultation with affected people & facilitate their informed participation. Ensure women's participation. Involve stakeholders, including affected people & concerned NGOs, early in the project preparation process & ensure that their views & concerns are made known to & understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to EA. Establish a GRM to receive & facilitate resolution of affected people's concerns & grievances on project's environmental performance.	Key informant and random interviews have been conducted. A grievance redress mechanism for the resolution of valid subproject-related social and environmental issues/concerns is presented in Section IX.
Disclose a draft EA (including the EMP) in a timely manner, before project appraisal, in an accessible place & in a form & language(s) understandable to affected people & other stakeholders. Disclose the final EA, & its updates if any, to affected people & other stakeholders.	The IEE will be disclosed on ADB's website. GoN approved IEE Report will be made available at the offices of the PMO, ICG and WUSC.
Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	EMP implementation, reporting and disclosure of monitoring reports are included in this IEE report.
Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	The sub-project does not encroach into areas of critical habitats. The major project structures and drainage alignment are proposed on public land and existing public road RoWs as far as possible. Therefore, no settlements are expected to be adversely affected.
Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	This requirement is also applicable to the sub-project in the aspect of pollution management, and waste management, e.g., effluent from FSTP unit. The sub-project will ensure that the contractor's measures and practices are in line with internationally accepted standards
Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and	EMP provides measures to mitigate health and safety hazards during construction and operation phases.

SPS 2009 - Safeguard Requirements	Remarks
response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	
Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	The Subproject will not affect any physical cultural resource. The EMP recommends the measures to mitigate any such adverse impacts, and also in case of chance find.

30. During the design, construction, and operation of the subproject the PMO and concerned RPMO shall apply pollution prevention and control technologies and practices consistent with international good practices, as reflected in internationally recognized standards. When the Government of Nepal regulations differ from these levels and measures, PMO shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, PMO will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

E. IEE Approval Process of Nepal

31. The Environment Protection Rules (EPR, 1997 with amendments) defines for the preparation, review, and approval of the IEE report. The process applicable to the subproject is summarized in Table II-4 below. The key environmental quality standards applied in the GoN IEE (as well as in the ADB IEE) are listed in Table II-4 and their details featured as Annex 2-A.

Table II-4: The GoN IEE Report Preparation, Review, Approval and Implementation Process

Steps in the Process	Remarks
Proponent refers to EPR Schedules 1 & 2 for the required environmental assessment (IEE or EIA) to carry out.	Subproject requires an IEE.
If proposed project requires an IEE, Proponent prepares an IEE schedule of work/ToR using the format prescribed in Schedule 3 of the EPR and submit this to the CSA for approval.	Subproject has secured an approved ToR.
Proponent carries out IEE according to the approved work schedule/ToR and prepares an IEE Report following the format prescribed in EPR Schedule 5 and incorporating stakeholders' feedback applying the consultation procedure specified in the EPR.	Subproject carried out the IEE and prepared the IEE Report accordingly.
Proponent submits 15 copies of the IEE Report along with the project proposal and recommendation of the concerned Rural Municipality or Municipality to the CSA.	Subproject submitted documents accordingly for review and approval.
CSA conducts review and grants approval of IEE Report.	Subproject's IEE Report has been approved, without having
➤ If review reveals project implementation to have no substantial adverse impact on the environment, CSA grants approval within 21 days from receipt of report.	To undertake EIA.
➤ If review reveals the necessity to carry out an EIA, Proponent conducts an EIA following the prescribed EIA	

Steps in the Process	Remarks
process.	
Proponent implements approved IEE Report and any terms and conditions given with the approval.	Subproject has not started implementation.
CSA monitors and evaluates impact of project implementation. When necessary, issue directives to the Proponent to institute environmental protection measures.	Subproject has not started implementation.
MoWS conducts environmental audit after two years of project commissioning/operation.	Subproject has not started implementation.

CSA Concerned Sector Agency
EPR Environment Protection Rules, 2054 (1997) (and amendments)
MoWS Ministry of Water Supply

F. Relevant Environmental Quality Standards

Table II-5: Relevant Environmental Quality Standards

Particular	National Standard	International Standard
Ambient air quality	National Ambient Air Quality Standards, for Nepal, 2003	WHO Air Quality Guidelines, Global Update, 2005
Emission standard for diesel generator discharge to ambient Air	Emission standard for diesel generator	EPR-15, 1997
Noise	National Noise Standard Guidelines, 2012	WHO Guideline Values on Noise Level
Drinking water quality	National Drinking Water Quality Standards, 2006	WHO Guidelines for Drinking-water Quality, Fourth Edition, 2011
Effluent standards (to be used for FSTP)	Tolerance limits for wastewater to be discharged into inland surface waters from combined wastewater treatment plant (generic standards)	

* For surface and ground water quality monitoring, the National Drinking Water Quality Standard (2062) of Nepal shall be applied since these resources are used for drinking.

32. The project will operate and maintain the drainage system and FSM treatment unit in accordance with national requirements and internationally accepted standards, in their absence for any parameter of concern, will comply with World Health Organization (WHO) Guidelines.

III APPROACH AND METHODOLOGIES

33. In order to meet the objectives of the IEE study a systematic and integrated methodology was followed in accordance with the legal requirements of GoN. The IEE study was conducted as per provisions of the Environment Protection Rules (1997) following the provision of Rules 5, 7, 10 & 11 in compliance with the schedule 1, 3 & 5.

34. The basic methodology as per EPR includes review of literature for preparation of IEE, ToR and approval from the concerned ministry, followed by a 15-days public notification & collection of suggestions from the project baseline information related to physical, biological socio-economic & cultural environment (Rule 5 of EPR) was conducted using various applicable survey tools. The study has followed the procedures outlined in the approved ToR and has covered the issues delineated therein. Key elements of the methodology include collection of primary data based on field studies, consultation with local people and officials. The principal steps undertaken in the IEE methodology to accomplish the assignment are briefly discussed below;

A. Literature review:

35. Available primary and secondary literature in the form of reports and maps; topographic maps, land use maps, aerial photographs, cadastral survey maps etc were collected and reviewed. Feasibility studies of the subproject conducted at various times were the key documents collected and reviewed to determine the nature and scope of activities of the subproject that influences the environmental conditions of the proposal area. Similarly published and unpublished reports pertaining to environmental standards, Acts, Regulations etc were collected and reviewed. Published and unpublished literatures of the subproject area pertaining to biological, social, chemical, physical, and cultural environments in the form of maps, and reports etc. were collected from various sources and reviewed to get information on the coverage of the studies and fulfill the data gaps.

36. *Impact Area Delineation:* The desk study also involved the preparation of questionnaire/checklists/matrices for detailed field study to collect the primary data within the Zone of Influence (ZoI). In order to specify the area that would be covered by the assessment, the geographical boundary of the influence area was delineated on the topographical map. Depending upon the nature and extent of the expected impact area, the Zone of Influence (ZoI) was categorized into Direct Impact Zone (DIZ) and Indirect Impact Zone (IIZ).

37. *Direct Impact Zone (DIZ):* The project areas directly affected by the project activities are demarcated as Direct Impact Zone. Subproject component sites of ward number 1 come under the Direct Impact Zone (DIZ).

38. *Indirect Impact Zone (IIZ):* The area 200 m around the DIZ that could be indirectly affected due to project construction and implementation activities such as mobility of people, equipment, vehicles, noise, dust are demarcated as the Indirect Impact Zone.

B. Field Study:

39. Field studies were conducted in subproject site areas in an extensive manner by a multidisciplinary team, which comprised of an environmentalist, biologist, socio-economist, and civil engineer. During the visits, baseline information on physical and cultural, chemical, biological, and social conditions of the subproject direct and indirect impact areas were collected by using checklists (Annex 7). The sub-sections below present briefly the various approaches and methodological tools used during the field exploration.

40. *Physical Environment:* An extensive Physical Environment survey was carried out by delineating the subproject impact area to collect the baseline information on physical environment. Topographic and geomorphic features were observed and documented. Physical features such as

topography, climate & meteorology, air quality, erosion and land stability & Land use pattern were observed and recorded. Similarly, data on rainfall and other meteorological conditions were collected. Consultations with the local communities were done at Users Group Office.

41. *Biological Environment:* The vegetation survey was carried out by walkover survey throughout the subproject direct impact areas. Type of vegetation and forest were identified based on the species composition. Biodiversity values of the indirect impact area were estimated as low, moderate, and high applying standard tools. Ethno-botanical information was obtained. The protected vegetation (rare, endangered, indigenous etc.) of the influence area as per IUCN Red Book, CITES Appendices, and GoN list species were enumerated based on consultation with the local people in the indirect impact areas of the subproject. Wildlife biodiversity in the indirect impact areas was studied in the field interacting with local people (for habitat continuity) methods to identify linkages between wildlife habitats and proposal activities. The indicator wildlife and threatened or endangered species (as per IUCN Red Book, CITES Appendices, and GoN list) in the area via consultation with the local communities.

42. *Socio-economic and Cultural Environment:* Household survey was carried. Information on socio-economic and cultural aspects like demography, ethnicity, education, health, and sanitation, drinking water condition of the subproject area, irrigation facility, local traditions, religion, land holding pattern, income and expenditure and to acquire their perception towards proposed subproject, etc were collected from different secondary sources.

43. Stakeholder consultations were held at at Tikapur Water Users Group Office to interact with local people and stakeholders in order to collect information on migratory pattern of local people, history of the river, impact of river on settlement, agriculture, information on subproject affected families (if any), land transaction and to obtain suggestions and comments from all relevant stakeholders through. Direct observation (walk-through survey) was done to collect information on the cultural sites, and public institutions such as temples, cremation grounds, and festival sites, historical and archaeological sites, school, and health post within the direct project affected areas. Consultation with village elites and through focus group discussions was made to assess the current situation of these facilities and the general sanitation status of the subproject area community.

C. Public/Stakeholder Consultations:

44. Stakeholder consultations were conducted regarding demarcation of project service area and the beneficiaries. The land availability of project components and location of these components were also discussed in the semi-formal, formal and informal meetings. The major concerns raised during public consultations were need of coordination with local authority and residents so as not to damage water supply pipelines, and need of waste/spoil disposal. Section VI discusses the details of the impacts.

D. Data Processing and Impact Identification, Prediction & Evaluation Methods

45. The environmental impact both beneficial and adverse were elaborately identified, predicted and evaluated to the extent possible, for both construction and operational stages. Each impact identified, predicted and evaluated by using standard methods and techniques on physical, biological, socio-economic and cultural aspects. The impacts were studied in terms of their nature, magnitude, extent and duration. National EIA Guidelines 1993 was used for the reference for the impact identification, prediction and evaluation. Simple matrix method was used. Magnitude of the impact were classified into High (H), Medium (M) and Low (L), extent will be classified in terms of Site Specific (SS), Local (L), and Regional (R). Similarly, the duration of impact is further classified into Short Term, Medium term and Long term.

Scoring of Impacts

46. The impacts are identified as Direct Impact (D) or Indirect Impact (IN) based upon the nature of the impacts. The scoring is based on magnitude of the impact, extent of its occurrence and duration of the impacts as follows;

Magnitude: H = High (60); M = Medium/Moderate (20) ; and L = Low (10);

Extent: R = Regional (60), L = Local (20); and S = Site-specific (10);

Duration: LT = Long-term (20), MT = Medium-term (10); and ST = Short-term (5).

47. The points/scoring are taken from the National EIA Guidelines, 1993. Significance of Impact rated if total score: More than 75: Very Significant, 45-75: Significant, Less than 45: Insignificant.

E. Preparation of IEE report

48. Upon meeting the GoN and ADB requirements for conducting IEE, an IEE report is prepared in a format prescribed in Environment Protection Rules 1997. The format for EPR 1997 is followed but the requirements of ADB are compiled while preparing the report in GoN format.

F. Team Members for IEE Study

49. The following experts were mobilized to complete the IEE study of Tikapur Storm Water Drainage and Faecal Sludge Management Project (Table III-1).

Table III-1: Study Team for IEE Study of the Subproject

SN	Name of Expert	Designation	Expertise field
1	Dr. DhundiRaj Dahal	Team Leader, DSMC	Engineering/Design-Supervision
2	Yogesh Shakya	Environmental Specialist Team Leader, IEE	Environmental Management (IEE Focal Person)
3	Keshav Dhungana	Social Safeguards Specialist	Socio-economist
4	Sanjay Khadka Dr. BhagwanRatna Kansakar	Design Engineer Design Engineer	Drainage Design FSM Design
5	Elena Pudasainee	Support Staff	

IV DESCRIPTION OF THE PROJECT

A. Type, Category and Need of the Subproject

50. The proposed "Tikapur Storm Water Drainage and Faecal Sludge Management Project" is urban infrastructure subproject with tow components; (i) Storm Water Drainage, and (ii) Faecal Sludge Management system. The service area of the subproject covers ward 1 under drainage component, and all wards of Tikapur Municipality under FSM component.

51. This subproject fall under new construction project and falls under Category B for environment as per ADB's Safegurads Policy Statement (SPS 2009).

52. The project area of the proposed subproject has a flat terrain. On the other hand, the rainfall intensity is high. The recorded maximum 24 hour rainfall ranges from 88.7 mm/day to 290.9 mm/day as per the data of 1987 to 2016 (Department of Hydrology and Meteorology, GoN). Flooding occurs due to over flooding in Karnali river during monsoon. The locals have problem of water logging and flooding annually. In each rainy period, the problem of inundation sometimes remains for as long as 2-3 days or more. Even though there is around 4 kms of surface drain in the core city, there is problem of choking due to sediments and waste being accumulated in the drains. Thus, city wide drainage with more efficient drainage system is very much a need of the proposed project area. Such a project will protect the locals from flooding and water logging problems, and will help in further development and economic opportunities in the project area. Likewise, there is no sewerage system in the project area. FSM is also a requirement for the urban core areas of the subproject area. Hence, the proposed project is highly relevant for the project area.

B. The Subproject

53. The design period of this project is 20 years. The total length of RCC storm water drain proposed for Tikapur Municipality is 49011 m. Among the total length of RCC storm water drain 39915.5 m is proposed for Tikapur Bazaar Area and remaining 9096 m is proposed for Shaktinagar Area. The FSTP has been designed for 15 years with 2021 as base year.

1. Salient Features

54. The salient features of the project are given in table below;

Table IV-1: Salient Features of the Project

SN	Items	Description
1	Name of the Project	Tikapur Storm Water Drainage and Faecal Sludge Management Project, Kailali Urban Water Supply and Sanitation (Sector) Project
2	Type	Urban Drainage and Sanitation
3	Study Level	Detailed Engineering Design Report
4	Location Area	
	Province	Sudurpaschim Province
	District	Kailali
	Municipality/Wards	Project Municipality: Tikapur Drainage coverage: Ward 1 FSM Coverage: All wards (1 to 9)
5	Available Facilities	
	Road	Lamki-Tikapur feeder road linked to East-West Highway
	Nearest Airports	Dhangadhi Airport, and Nepalgunj Airport
	Existing Sanitation Systems/Services	Drainage No proper drainage system Only around 4 km of drain (slab cover/open) in Ward 1

SN	Items	Description
		<u>Sewerage</u> No sewerage system Most of the houses have septic tanks
6	Project Components	
6.1	Storm Water Drainage System	
	Storm Water Discharge	0.52 cumec to 3.391 cumecs
	Type of Drainage	RCC Storm Water drain
	Length of Drainage	49.011 km In Phase I: 29.6165 km
	Width of Drainage	0.5 m to 1.5 m
	Depth of Drainage	0.652 m to 2.459 m
6.2	Faecal Sludge Treatment Plant	
	Type	Municipal Faecal Sludge
	Designed daily sludge flow	9 m ³ /day for design year 2036
	Faecal Sludge Treatment Units	Anaerobic Digester (AD), Sludge Drying Bed (SDB), Anaerobic Baffle Reactor (ABR), Anaerobic Filter (AF), Horizontal Flow Constructed Wetlands (HFCW), Polishing Pond (PP), Compost Yard (CY)
	Faecal Sludge Treatment Plant	5,587 sq. m.
7	Social Status	
	Population (2018)	Total: 98,651
	Household Numbers	Total: 18,620 (FSM coverage for total municipality)
8	Total Cost of the Project (NRs.)	NRs 1.537 billion
	Storm Water Drain	NRs 1.4725 billion with 15% contingencies & 13%VAT
	Phase I	NRs 915.013 million with 15% contingencies & 13%VAT
	Phase II	NRs 497.382 million with 15% contingencies & 13%VAT
	Faecal Sludge Treatment Plant	NRs 64.481 million with 13%VAT

55. Drain works and FSTP works under Phase I will go into immediate construction while the remaining works under Phase II will be constructed later as per need of the municipality.

2. Components of the Subproject

56. Tikapur Storm Water Drainage and Faecal Sludge Management Project has been designed as an urban sanitation improvement project. The subproject is expected to improve the sanitation infrastructure of the municipality. The details of the storm water drainage component, and fecal sludge management component are provided in the sub-sections below;

2.1 Storm Water Drainage Component

57. This component is designed to provide the target urban cores of ward 1 of Tikapur municipality with a well-designed storm water drainage system. This covers Tikapur core area and Shaktinagar area of the municipality. A Google Image of Tikapur Municipality was used as base map for detail design of drain around Tikapur Bazaar area and Shaktinagar area. The image was taken from Google earth, which is shown in Figure IV-1 and Figure IV-2 respectively.

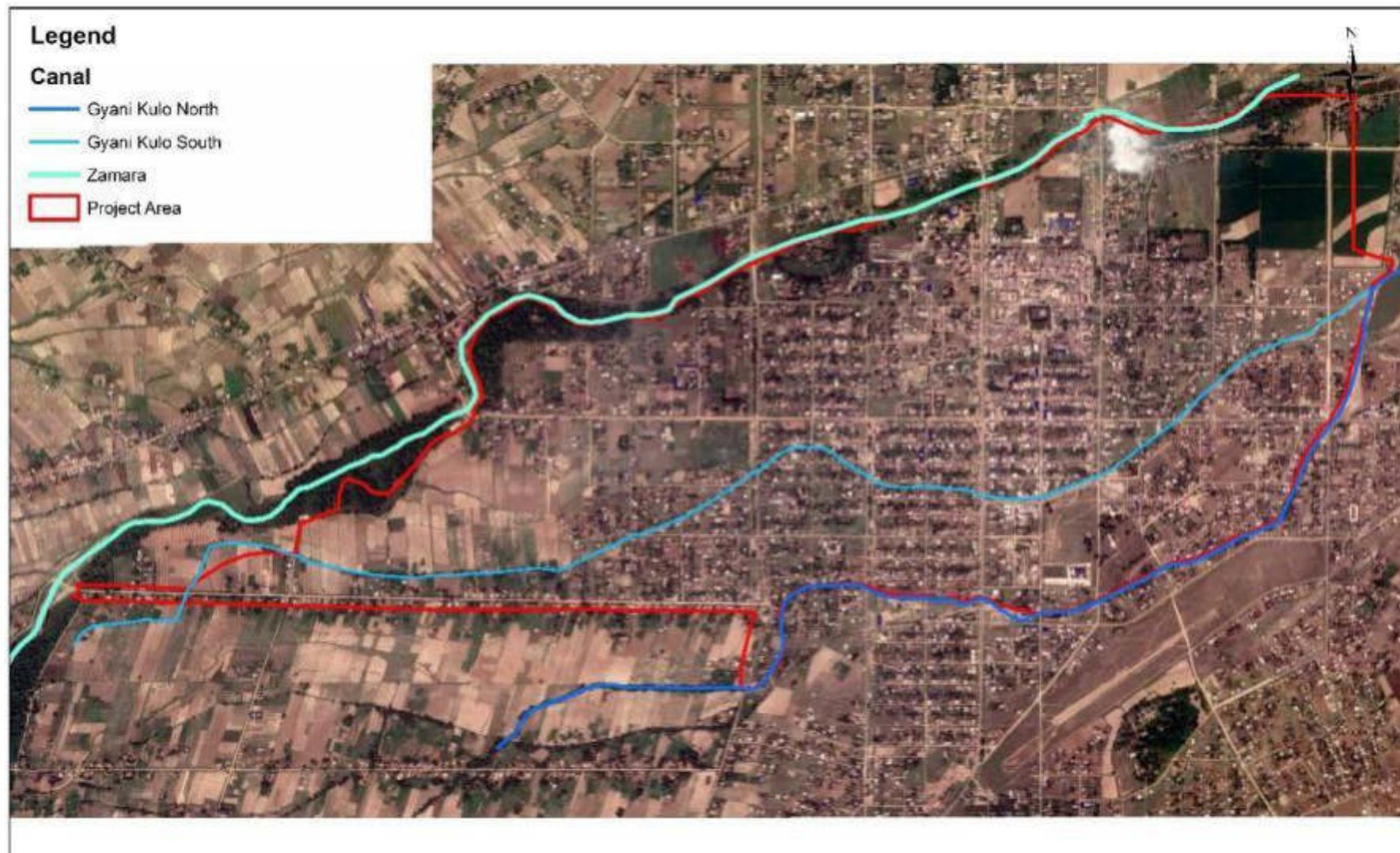


Figure IV-1: Storm Water Drainage Area of Tikapur core area

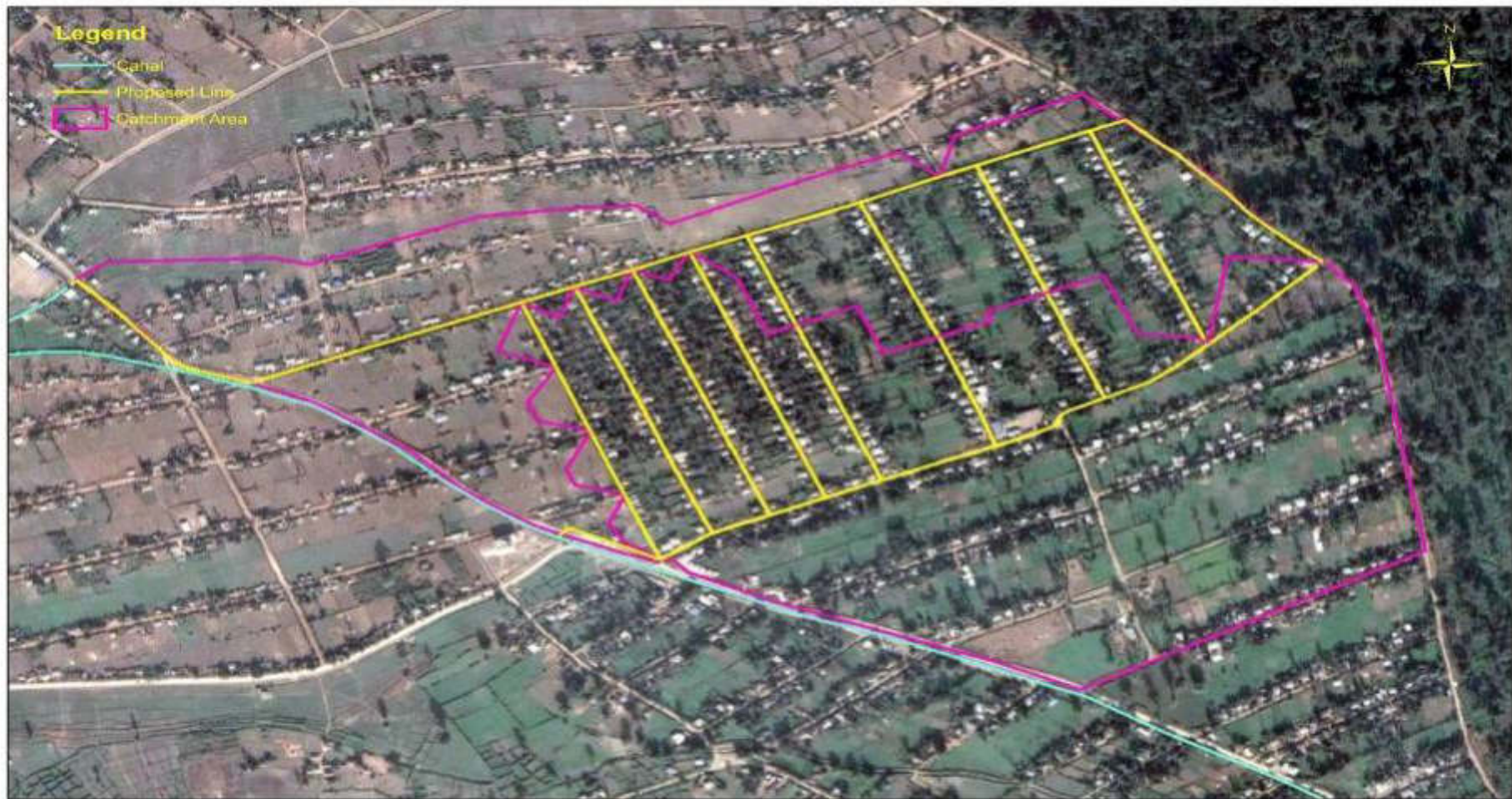


Figure IV-2: Storm Water Drainage Area of Shaktinagar area

58. The total length of RCC storm water drain proposed for Tikapur Municipality is 49011 m. Among the total length of RCC storm water drain 39915.5 m is proposed for Tikapur Bazaar Area and remaining 9096 m is proposed for Shaktinagar Area. For the drains that are proposed on Tikapur Bazaar area, each drain is named like “T1L1 Section 1”. T in the name stands for Tikapur Bazaar, 1 refers to the outfall, L refers to the left section and is according to the flow direction of drain. If the drain has got more than one section, the notation “section 1 or 2” is provided. Similarly for the drains that are proposed on Shaktinagar area, each drain is named like “SL”. S in the name stands for Shaktinagar, L refers to the Line. The following table summarizes the details of the drainage lines of the service area;

Table IV-2: Summary of Drainage Lines

SN	Catchment Area/Drainage No.	Catchment Area (ha.)	Length (m)	Outfalls
A	Tikapur Service Area			
1.	Line T1	24.771 ha.	2128.0	Jamara Canal
2.	Line T2	41.627 ha.	5484.5	Jamara Canal
3.	Line T3	53.826 ha.	9219.0	Jamara Canal
4.	Line T4	5.74 ha.	479.0	Gyani Canal North
5.	Line T5	12.029 ha.	2015.0	Gyani Canal North
6.	Line T6	17.063 ha.	4071.0	Gyani Canal North
7.	Line T13	5.343 ha.	609.0	Gyani Canal South
8.	Line T14	5.108 ha.	470.0	Gyani Canal North
9.	Line T15	5.996 ha.	1632.0	Gyani Canal South
10.	Line T16	11.095 ha.	1074.0	Gyani Canal South
11.	Line T17	8.662 ha.	1369.0	Gyani Canal South
12.	Line T18	5.711 ha.	674.0	Gyani Canal South
13.	Line T20	5.118 ha.	1397.0	Gyani Canal South
14.	Line T21	6.556 ha.	1293.0	Gyani Canal South
15.	Line T22	15.731 ha.	3797.0	Gyani Canal South
16.	Line T23	23.685 ha.	4204.0	Jamara Canal
B.	Shaktinagar Service Area			
1.	Line SL	54.608 ha.	9096.0	2 outfalls in Gyani Kulo
	Total (A+B)	302.669 ha.	49011.5	



Photo 1: Outfall Location at North Gyani kulo, ward number 1



Photo 2: Outfall Location at South Gyani kulo, ward number 1



Photo 3: Division Section of North Gyanikulo and South Gyanikulo in the end point of Jamara Canal



Photo 4: Outfall Location at South Gyani kulo, Shanktinagar area



Photo 5: Main outfall of Banagaun area to Jamara Canal



Photo 6: Outfall of Block 8



Photo 7: Outfall of Block 12



Photo 8: Outfall of Block 18



Photo 9: Outfall of Block 19



Photo 10: Outfall of Block 21

59. The proposed storm water drainage system is expected to drain out Storm Water from an area of about 302.669 hectares. The rainfall data available from year 1987 to 2016 is used for estimation of storm water volume (*Department of Hydrology and Meteorology*) and designing of the storm water drains. In Phase I of Storm Water Drainage Component, only 29.6165 km of the drain will be constructed. The drains will be of two types, viz; (i) Open channel drain, and (ii) Box drain (culvert type). Drain that are laid on the sides of the road and convey storm water to the near outfall from surrounding area of open channel type RCC drain while the drain which are laid either in the middle of road or in road crossing are Box culvert type RCC drain. These drains are designed to bear heavy traffic load.

Table IV-3: Length of the various types of proposed drain with the height distribution

Width (m)	Depth of excavation/Drain height				Total (length)
	0-1 m	1-1.5 m	1.5-2 m	2-2.5 m	
0.50	13469.00	4761.00	349.00	28.00	18607.00
0.60	4074.00	4037.00	390.00	0.00	8501.00
0.80	3566.00	4788.00	477.00	0.00	8831.00
1.00	849.00	2959.00	881.00	29.00	4718.00
1.20	62.00	3369.50	2243.00	518.00	6192.50
1.50	0.00	672.50	973.50	516.00	2162.00
Total (Depth)	22020.00	20587.00	5313.50	1091.00	49011.50

60. Out of the 49011.5 m of the total proposed drain, 22020 m of drain has height less than 1 meter, 20587 m of drain has height between 1 to 1.5 m, 5313.5 m of drain has height between 1.5 to 2 m and 1091 m of drain has height above 2 m.



Photo 11: Narrowest road of Block 14



Photo 12: Widest road of Banagaun area



*Photo 13: Widest road of Block A;
main road of Tikapur*



*Photo 14: Widest road of Block B;
near Birendra School*

61. The minimum width of proposed drain is 50 cm while the maximum is 150 cm. The drains are proposed within the RoWs of the public roads for which there is no problem as the minimum set-back even in narrow roads is 1.5 meters while the drains in narrow roads are of only 0.5 meter width. Drains of width 1.0 m, 1.2 m and 1.5 m are proposed for roads with width of 10 m to 15 meters. These roads and the RoWs are under jurisdiction of municipality, and they are all wide open. Hence there will be no problem of land in these wide sections as well.

2.2 Faecal Sludge Management System and the Faecal Sludge Treatment Plant

62. Faecal sludge management component is aimed for providing service to the whole municipality. This Faecal Sludge Management System and Faecal Sludge Treatment Plant is based on the final detailed engineering design done for the project entitled 'Final Detailed Engineering Design Report of Faecal Sludge Management in Tikapur Municipality, Kailali', Urban Water Supply and Sanitation Project, dated May 2020. The faecal sludge will be collected from on-site sanitation points of 18,620 households as per need on regular frequencies. However, much of the demand is based on core settlements of ward number 1. The collection will be carried out using suction tankers. The mechanical emptying of the septic tanks from on-site sanitation facilities will be carried out using tankers of 3 m³ capacity. These are vacuum tanks fitted with suction pipes. It is estimated that there will be around 6 trips of faecal sludge to be collected every week from the service areas. The collection task in each vehicle will be operated by a driver and an operator. The specific collection activities include opening the system to facilitate the process; collecting/pumping the FS; and close & secure the system once the FS removal has been completed.

63. The collected faecal sludge will be transported through the collection tankers itself. There will be no transfer station and the collected faecal sludge will be directly transported to the Faecal Sludge Treatment Plant (FSTP) site.

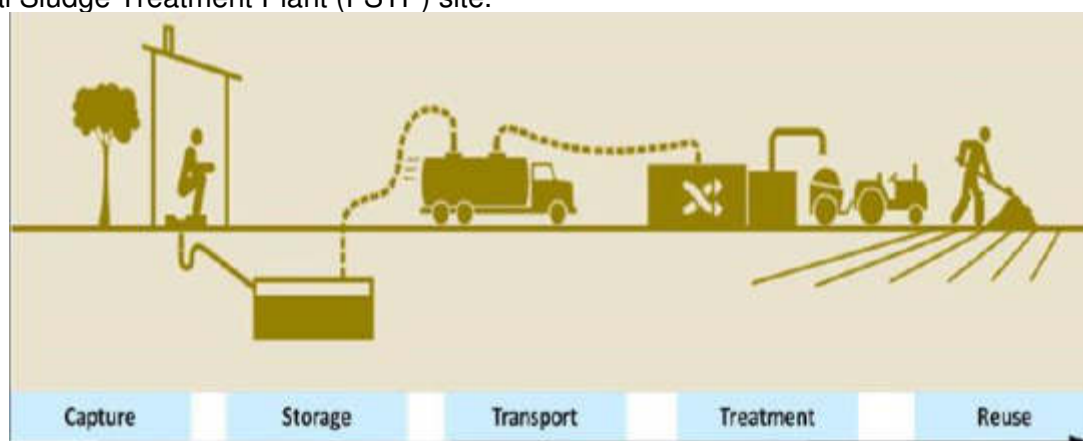


Figure IV-3: Proposed FSM system in Tikapur Municipality

64. The FST Plant will be established at an open land of Banagaun of ward number 1 of the municipality. The land proposed for FSTP is a public land which is not in any particular use. There are sparse vegetation in the proposed land. The land is adjacent to Jamara canal, and the land is around 150 meters from a nearest settlement towards east from the site. A google map is given in Annex 3.

65. The faecal sludge treatment plant will consist of primary, secondary and tertiary treatment units, and it is proposed to be carried out in two phases. The design is based on the qualitative analysis of the faecal sludge samples from the project area (Annex 6). The treatment system will consist of Anaerobic Digester (AD), Sludge Drying Bed (SDB), Anaerobic Baffle Reactor (ABR), Anaerobic Filter (AF), Horizontal Flow Constructed Wetlands (HFCW), Polishing Pond (PP), and Compost Yard (CY).

Primary treatment units

66. Primary treatment units are the components that remove larger floating and suspended solids from the incoming FS. These are also referred as Physical Unit Operations. The unit operation used in the current design is Screen Chamber for removing floating papers, rags, clothes, plastics, wrappers, labels, etc. Primary treatment units can reduce BOD by 20 to 30 percent and suspended solids by up to 60 percent. The primary treatment phase in the current arrangement retains all settleable solids larger than 20mm and allow only fine or dissolved solids to discharge to next treatment phase.

Secondary treatment units

67. Secondary treatment uses biological processes to separate the dissolved organic matter passing through the primary treatment. Microbes are allowed to consume the dissolved organic matter as food, converting it to carbon dioxide, methane, water, energy and cell tissue, before settling at the bottom. While secondary treatment technologies vary, from the conventional treatment units to constructed wetland systems, the final phase of each involves an additional settling process to remove the remaining suspended solids further. The primary objective of the Secondary Treatment Units is to convert the dissolved and colloidal organic matter present in sewage to biological cell tissues and to end products.

68. Secondary treatment can be achieved by applying aerobic, anaerobic, anoxic and facultative processes. FSTP's normally use anaerobic process in the Secondary Treatment Units as this process does not require energy input. Anaerobic Baffle Reactors, Anaerobic Filters, Trickling Filters and Contact Beds are the examples of the Secondary Treatment Units. In the treatment plant designed for Tikapur Municipality, Anaerobic Digesters (AD), Sludge Drying Bed (SDB), Anaerobic Baffle Reactors (ABR) and Anaerobic Filter (AF) are used in succession as secondary treatment modules. Secondary treatments can remove up to 85 percent of BOD and Total Suspended Solids (TSS).

Table IV-4: FSTP Components; Key Functions and Footprints

SN	Components	Key Function	Area (m ²)
1	Screen Chamber	Physical retention of large particles	0.00 ¹⁴
2	Anaerobic Digester (AD)	Biological degradation of organic matters	201.60
3	Sludge Drying Bed (SDB)	Sludge Dewatering and Drying	902.81
4	Anaerobic Baffle Reactor (ABR)	Biological degradation of organic matters	29.95
5	Anaerobic Filter (AF)	Filtration, biomass absorption	
6	Horizontal Flow Constructed Wetlands (HFCW)	Biological degradation and nutrient removal	124.11
7	Polishing Pond (PP)	Tertiary treatment - Oxidation Disinfection	11.94
8	Compost Yard (CY)	Further drying of FS from SDB	103.24
Total			1,373.65

69. The proposed FSTP has a structural footprint of 1,373.65 square meters. After provision of roads, necessary facilities and clearance spaces, the gross land area required is 5,680.35 square meters.

Effluent Assessment

70. Effluent Standard as provisioned under *Tolerance limits for wastewater to be discharged into inland surface waters from combined wastewater treatment plant (generic standards)*¹⁵ by GoN is taken as reference for the effluent standard to be met for this FSTP. As per this standard, the permissible limits are 50 mg/L of BOD, 250 mg/L of COD and 50 mg/L of TSS in the effluents. The FSTP design uses the BOD₅, COD and TSS value as the basis for FS treatment efficiency. The outlet FS effluent is targeted to reduce BOD, COD and TSS to less than 50 mg/L BOD, 250 mg/L COD and 50 mg/L of TSS respectively, which complies with the national effluent standards.

71. The water leaving the Polishing Pond is the final effluent of the treatment plant. The effluent will be discharged under gravity flow, and will be safely through an RCC outfall structure to Jamara canal.

¹⁴ Screen chamber placed above AD

¹⁵ This is only effluent standard available in Nepal for wastewater.

Tertiary treatment units

72. Tertiary treatment processes are necessary to remove pollutants such as nitrogen, phosphorus, additional suspended solids, refractory organics, and heavy metals and dissolved solids. The main purpose of the tertiary treatment is to ensure that the treated water which is to be released on to the environment is biologically accepted by all other fresh water organisms such as weeds and algae. Normally, Constructed Wetlands and Polishing Ponds are used as tertiary treatment units in FSTP. In the design of Tikapur Municipality, a Horizontal Flow Constructed Wetlands (HFCW) followed by a Polishing Pond (PP) is provisioned as Tertiary Treatment Unit.

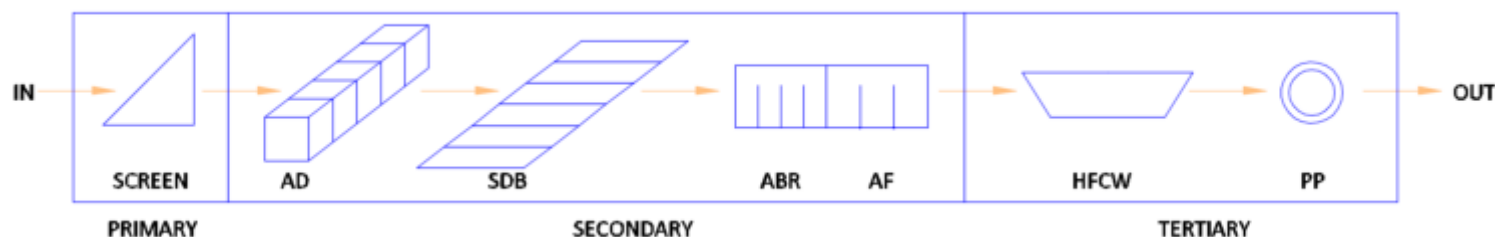


Figure IV-4: Flow Chart of Proposed FSTP in Tikapur Municipality

73. In the constructed wetland, the liquid flows in the horizontal direction through the pores of the gravel media preventing the undesirable odour to spread into the ambient environment. The vegetation to be planted in constructed wetland is chosen to be of local dominating macrophyte species. It can be Tall reed (*Phragmites Karka*), Cattail (*Typha latifolia*) or Canna (*Canna indica*). The species shall create deep root penetration, strong rhizomes, and massive fibrous root after couple of months of plantation. The density of plant in the wetland shall not exceed 2 plants per square meter.

3. Proposed Schedule for Implementation

74. Therefore the base year for the project has been assumed as the year 2019 and considering design period as 20 year the design year has been taken as the year 2039. The project has been designed with the principle of active community participation from the design stage itself. The implementation strategy of the project is based on the community management approach, which includes encouraging the financial responsibility towards the improved facility. Therefore, user participation at the outset of the planning and design exercise is an essential requirement. The project's construction phase will be of 18 months and its O&M Phase will be of 1 year after completion of the construction works.

V DESCRIPTION OF THE ENVIRONMENT

A: Physical Environment

1. Location:

75. The proposed Tikapur Storm Water Drainage and Faecal Sludge Management Project is located in Tikapur Municipality, which is situated in Kailali district of Sudurpaschim Province of Nepal. It lies between 28°27'30" N to 28°33'30" N latitude to 81°2'30" E to 81°10'5" E longitude. The project area is bounded by Karnali River and Bardiya Area-3 in the East, Bhajani Municipality in the West, Janaki Rural Municipality in the North-West, and Indian border in the South. The nearest national highway from Tikapur is the East West highway which is about 14 km north of Tikapur. It is located 14 km north of the Indian border and 95 km east of eastward of Dhangadhi. The nearest airports are Nepalgunj airport in Banke district, and Dhanghadi airport in Kailali district.

2. Topography and Geology:

76. Tikapur is a flat land. The project area has average elevation ranging from 145 m to 161 m above the mean sea level. Tikapur is mostly dominated by clayey soil along with boulders. Based on field observations during the sub-project feasibility study, the project area has flat alluvial land consisting of 1.0 to 1.5 m thick top soil underlain by gravels, cobbles and boulders of about 25.0 to 30.0 m thick in the center and slightly thinning outward to the foothills. In some areas, due to deposits of the Karnali River, recent alluvial plain mainly consisting of LRMP 2C mapping type, extremely fertile soil is also found.

3. Climate and Hydrology:

77. The climate of the project area is sub-tropical. Temperature of this area varies from 3-4°C in winter to 30°C in summer. In comparison to eastern Nepal, here the monsoon rain arrives late between July to September. The mean annual rainfall is 1703mm. Pathraiya River is located to the West and Karnali River to the East of the Municipality.

4. Air, Noise and Water Quality

78. There are no major industries in Tikapur town. The few and small cottage industry doesn't contribute significantly to create air pollution. Air pollution is caused by fugitive dust from vehicle movements particularly over unpaved roads and other unpaved grounds, construction activities, street sweeping and wind action on unpaved exposed surfaces. Gas emissions come from household cooking, open burning and vehicles. Emissions from these sources are scattered/spread apart both in terms of locations and timing. From field observation, the ambient air quality of the area is considered to be within the National Air Quality Standard of Nepal. Vehicle noise and local construction activities are among the sources of noise in the project area.

79. No major concern of water quality pollution is observed in the project area. Discharge from small cottage industries, and waste disposal are among the sources of water pollution.

B: Biological Environment

1. Flora in the Project Area:

80. The project area is a mix of settlements, agricultural land and nearby forest areas. There is only scattered tree cover and grassland within the project area. Sal (*Shorea robusta*) forest is predominant in the project area. Khayar (*Senegalia catechu*), Sisso (*Dalbergia sisso*) are the common vegetation found in the project area. Mango (*Magnifera Indica*), Banana trees (*Musa Velutina*), Guava (*Psidium guajava*), jackfruit (*Artocarpus integra*) are among the common fruit species found in the project area.

2. Fauna of in the Project Areas:

81. The project area is an urban setting. Project municipality has many species of mammals and birds. Both large and small mammals are present. Sambeer deer (*Carvus unicolor*), Spotted deer (*Axis axis*), Wild Boar (*Sus scrofa*), Langoor Monkeys (*Trachypithecus francoisi*), Squirrel (*Sciuridae*), Hispid hare (*Caprolagus hispidus*), Rabbit (*Lepus nigricollis*), Nil gai (*Baselaphus tragocamelu*) etc are found in and around the project area. Birds such as Mayur (*Pavo cristatus*), Crow (*Corvus splendens*), Hutityau (*Tringa hypoleucos*), Sparrow (*Passer domesticus*), Pigeon (*Columba livia*), Parrot (*Cacatuasp.*), Eagle (*Haliaeetus leucocephalus*), Oriental Pied Hornbill (*Anthraceroceros albirostris*), Pied Kingfisher (*Ceryle rudis*), Sano bakulla (*Egretta garzetta*) are among the bird species found in the area.

82. IBAT information has been assessed (Annex 4). Since the project is of small scale and its Indirect Impact Zone (IIZ) is only 200m, only the species suggested under 1 km periphery of the core project coordinate have been considered. There are no protected areas within the project area and 1 km of its periphery. The boundary of Buffer Zone of Bardiya National Park is around 5 km from the project area.

C: Socioeconomic and Cultural Environment

1. Demography:

83. Service area of the project has been established to cover ward 1 of Tikapur Municipality for drainage component, and FSTP unit also lies in ward number 1 but it is designed to serve the whole municipality as needed. The project municipality has average household size of 4.33 and male to female ratio of 0.84. The ward-wise households and population is given in table V-1 below;

Table V-1: Households in wards

SN	Features	Ward No.									Total
		1	2	3	4	5	6	7	8	9	
1	Household	9823	1651	983	995	1049	1067	1315	994	743	18,620
2	Population	39778	7,408	4615	4509	4845	5001	5995	4849	3690	80,690

Source: Municipality profile of Tikapur Municipality, 2075 BS

The population density of the municipality is 643/sq km.

2. Caste / Ethnicity:

84. There are six major ethnic and caste groups in the subproject area. The most dominant ethnic groups are Tharu who occupy 41.14% followed by the Chhetri (26.76%), Brahman (9.55%), Kami (5.85%), Damai (3.25%), Magar (3.15%) and remaining other castes such as Thakuri, Lohar and others total around 10.3% of the population.

3. Occupation:

85. Although, the economy of the area is gradually shifting from rural agricultural economy to trade/ business and service based, majority of the households are still dependent on agriculture. As the socio-economic data shows, nearly 20.8% of the households have agriculture as main occupation. Service is another main occupation (17.9%) followed by business (16.3%). The ward-wise households by occupation are presented in table below;

Table V-2: Main Occupation of Household

SN	Occupation	Percent	Remarks
1	Agriculture	20.8	
2	Services	17.9	
3	Business	16.3	
4	Wage labour	15.1	
5	Foreign Employment	9.3	
6	Others	20.6	
	Total	100.0	

Source: Municipality profile of Tikapur Municipality, 2075 BS

4. Existing water supply condition:

86. Tikapur Third Small Town Water Supply and Sanitation Project under Third Small Towns Water Supply and Sanitation Sector Project has currently connected over 6500 household taps in the municipality. This has largely improved the water accessibility status of the core municipality areas. However, in the peri-urban areas, there are still households using tubewells and public taps.

5. Existing Sanitation Condition

5.1 Sanitary Facilities

87. The overall sanitary condition of the Municipality is found to be reasonably satisfactory. In the core area, almost all HHs have their private water seal toilets whereas in isolated/semi-urban areas some people still practice open defecation. The socio-economic survey (2014) reported that 1.6% HHs still practice open defecation in project area and majority of HHs i.e. 78.5% have water-borne private toilets outside house. Data shows that 98.4% have one or other type of toilets. Reportedly ward nos. 1, 4, 5, 6 & 7 have been declared Open Defecation Free (ODF) although some people still do not have toilets. The Municipality is in the process of being declared ODF in this fiscal year.

88. The same survey shows that majority of houses (72.43%) have pour flush/water seal type toilets. Similarly, 17.88% HHs have pit latrine, 9% have ventilated pit latrine and only 0.35% have cistern flush. The existing latrines in the houses as well as in the schools are not maintained properly. The community has very limited knowledge on the use of sanitary latrines and personal hygiene especially in the city periphery. There are four public toilets within the project area. One is at National Park in ward-3 and remaining 3 areas at Bus Park, Kancchi Bazaar Chowk and Hospital Chowk (ward-9), respectively. These toilets have been operated by various organizations but the condition of most of them is not satisfactory.

5.2 Drainage Facilities

89. There is no proper drainage system for storm water as well as for the domestic sewage in Tikapur Municipality. The core area of the city has about 4 km of open surface drains in ward 9. These drains are of rectangular channels with cover slabs and also open drain. These drains are not used frequently and get choked every rainy season due to lack of maintenance. There is no defined outlet for storm water, so during the rainy season many low lying areas of the Municipality are inundated. Since the project area is situated at flat terrain with gentle slope, water logging in the wet season is an issue despite there being ample space and sufficient outlet points to drain off storm water naturally. Flooding occurs due to overflowing of the

nearby Karnali River. The core area of project (Bazaar) lies in north-south direction along the main feeder road and does need surface drains. In order to address these drainage issues, Tikapur Municipality prepared report on "Detailed Engineering Design of Sewer and Storm Water Drainage Network (Periphery Area)" in June 2011. It proposed construction of 31 km of storm water drains with 3 outlets with an estimated cost of NPR 251 million. However, due to limited financial resources the proposed works have not been implemented yet.

6. Health status

90. There is one hospital and 36 various health facility centers such as ayurvedic hospital, dental clinics, service centers and private clinics in the project town which provide health services, the details have been presented below;

Table V-3: Status of health facilities

SN	Health Facilities	No.	Bed	Remarks
1	Tikapur Hospital	1	25	
2	Private Clinics	16	-	
3	Eye Treatment Centers	1	15	
4	Dental Clinics	3	-	
5	Ayurvedic Hospitals	1	-	
6	Pharmacies	37	-	
Total		59	40	

Source: Planning Handbook of Tikapur Municipality, 2013

91. The Tikapur Town Development Committee allocated 12 bigha of land where Tikapur Hospital is now operated with 3 blocks and 25 beds. It started providing health services from 2034 BS as a Health Post. It is considered one of the major hospitals in the far- western region of the Nepal.

7. Education

92. Tikapur is termed as an "educational city" as there are several educational institutes like schools and colleges in the Municipality. The socio economic survey, commissioned by the PPTA in 2014 shows that the overall literacy rate is 78.3%. About 21.7% are still illiterate and only 12.2% have graduated or above graduate level. The Planning Handbook published by the Office of Tikapur Municipality in 2013 provides the information that some 82 educational institutions exist in the municipality, the details have been presented below:

Table V-4: Existing Educational institutions

SN	Educational Institution	Primary School	Lower Secondary School	Secondary School	Higher Secondary School	Campus	Training Centre	Child Development Centre	Total
1	Private	11	2	3	5	4	1	-	26
2	Community	11	5	5	-	-	-	10	31
3	Government	5	5	7	5	3	-	-	5
Total		27	12	15	10	7	1	10	82

Source: Planning Handbook, Tikapur Municipality, 2013

93. There are 42 educational institutions in the project area. Most of these educational institutions i.e. 72% are located in ward 1, the core urban center of the municipality

8. Urban Infrastructure and facilities

8.1 Road and transport

94. Tikapur municipality is situated 14 km south from East West highway. This municipality is well linked with road network but most of the road are earthen type. Only about 29 km road is black topped while about 135km road is graveled. There are two bus terminals and main means of transportation within the city and out of city are Auto-Rikshaw, Bus, Tempo etc

8.2 Wastewater Management Practices

95. There is no sewerage system in the project area. Waste water from individuals is managed inside the house except for a few HHs that discharge excess water to the adjacent road side drains. In the wet season, waste water overflows in these roads and drains to the Rani Canal (Rani-Jamar Kulo) that passes through the Municipality. Most of households do have septic tanks but the outlets are connected to the road side storm water drains.

96. The socio economic survey conducted the PPTA team in 2014 shows that 98.4% HHs have their own toilet. Some of them have constructed septic tanks and some have directly connected with surface drains. There is no wastewater treatment plant in the Municipality to treat domestic sewage. The septage is either dumped into nearby water courses or discharged into surface drains. However, the survey shows that only 51.7% of the sampled HHs showed an interest in improving the septage management system and are interested to pay for it.

8.3 Solid Waste

97. The major sources of waste generation in Tikapur Municipality are households, hotels, hospitals, vegetable and fruits market, meat stores, groceries, clothing/ fancy stores/tailors etc. The average per capita household waste generation rate in Tikapur Municipality was 0.19 kg/person/day according to the report "Strategic Plan and Action Plan for Solid Waste Management in Tikapur Municipality, 2013". It is estimated that the waste generation is about 11.0 tons per day. The municipal waste from household level comprised of organic waste 39.0%, plastic waste 17 %, paper waste 12 %, Glass 7 %, Metal 3%, Inert 4%, Medical 2%, Sand/ Dust 10%, Wood 1 % and others 5 %.

98. Tikapur municipality office itself is the only service provider in waste collection within the municipality. It collects waste from city core area, ward 9, every day. This ward is the only area to benefit from the collection service of the municipality. Other areas are partially serviced or not served at all with collection of solid waste. The house owners take out waste from the houses and municipal collectors empty into the tractor. These collectors sweep the city streets and the waste is collected in rickshaws using shovels and unloaded into the tractor to bring to the dumping site. It is estimated that the waste collection is about 0.75 Ton/day.

99. The municipality doesn't have any land for solid waste disposal and they are trying to find an appropriate disposal site. Currently, it is dumped in an open low lying area of Block 5 near Khadga's School and block 29 near Mentha of the Municipality. From time to time mud is spread over the waste materials as instructed by the municipality personnel. The Municipality has assigned 8 personnel (1 supervisor, 1 driver and 6 sweepers) for solid waste management activities. It has a tractor and 3 rickshaws (0.6 m³ capacity) to collect and transport all municipal waste to dumping site.

D. Major Environmental Concerns of Project Areas

100. Some of the major environmental problems prevalent to project area are as follows:

1. Air Quality:

101. There are no major industries in the project area. There are small factories and cottage industries. Air pollution is caused by emissions from these along with the fugitive dust from vehicle movements particularly over unpaved roads, and by local small scale constructions activities. Emissions from these sources are scattered/spread apart both in terms of locations and timing. These emission may couple with the low scale emissions from any new construction activities.

2. Acoustic Environment:

102. The sources of noise in the project area are the local small scale construction activities and vehicle movements. The anthropogenic noise is confined in few clustered settlements and in market places and only in the daytime. From field observation, noise level in the project area is within the national and international permissible standards at daytime and nighttime.

3. Water Quality:

103. The surface water sources do not have significant source of threat. However, disposal of waste onto water bodies is seen as a concern at some places. No major case of ground water contamination is noticed.

4. Sanitation

Storm water is a major concern in the project area. Water logging and urban flash flood are of major concern. This has even posed challenge in long term sanitation management aspects and water supply system of the project area.

5. Greenery and biodiversity

Towards the north-east of the project area there is a forest area. There is buffer zone of Bardiya National Park around 5 km from the boundary of the project area. However, this doesn't fall within the zone of influence of the project.

VI ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

104. The potential impacts of the proposed Tikapur Storm Water Drainage and Faecal Sludge Management Project are *Physical, Biological, and Socio-economic & Cultural* in nature. These impacts may occur at various phases of the project such as design, preconstruction, construction and operation and maintenance phases. The magnitude of these project related impacts can be small, moderate, or high depending upon its severity, and can be temporary or long term, reversible or irreversible, local or wide. The impacts need not necessary be limited to negative ones but can be positive as well. The objective of Environment Management is to attempt to augment positive impacts and to minimize negative impacts through sustainable mitigation measures.

A: Beneficial Impacts and Augmentation Measures

A-1: Construction Phase

i. Employment Generation and Increase in Income

105. An important direct beneficial impact of a construction project is the generation of employment opportunity to the local communities and its nearby places. The socio-economic study shows that substantial percentage, i.e. around 15.1% of the household have daily wage-based works as main occupation of the household. The locals who are interested can get opportunities in semi-skilled, unskilled as well as skilled works. This opportunity remains open to all, but the priority will be given to the locals. The income amount will directly enhance various economic activities and enterprise development with multiplier effect in the project area. In order to augment the impact, the local people particularly poor, dalits, ethnic minority and women will be given priority for employment.

ii. Skill Enhancement

106. The local people will be given on-the-job trainings. The onset of project construction phase is likely to enhance their skills in plumbing, fittings and other construction works. Working skills acquired from this project will be useful for the locals to secure employment opportunities in similar projects in coming days. If required, the locals will be given trainings on various construction activities so that the interested and potential ones can adopt it as a profession. Since Tikapur is itself a growing town, the skilled ones will easily get better employment opportunities in the nearby places. In order to augment the impact, the locals will be given on-the-job trainings.

iii. Enterprise Development and Business Promotion

107. During the construction period, different types of commercial activities will come into operation in order to cater the demand and requirement of workers. As money flow begins, they will regularly demand different food items, beverages and other daily needs. To meet these demands, small shops and restaurants around the vicinity of the construction sites are likely to open. Various farm based enterprises including wide range of agricultural and livestock products will also gain momentum as a result of increased demand by labors. At present almost 16.3% of the households are involved in business. This shows that the locals will be more motivated and promoted to expanding their business and in opening new potential business related to sanitation facilities or sanitation services.

A-2: Operation and Maintenance Phase

i. Improvement in health

108. After the proposed project is complete, the people living within the project area will benefit from the improved sanitary conditions. There will be saving in health care expenses as vector borne diseases are expected to reduce significantly after the service of the project begins.

109. The impact will be augmented through regular maintenance of the drainage system by the user committee. City Sanitation Plan (CSP) will be implemented under an active CSP sub-committee. Implementation of CSP can be an effective means to ensure functionality of the system and hence leading to its sustainability.

ii. Increased Markets and Higher Market Values

110. The proper management of proper storm water drainage and faecal sludge management system in the project area will accelerate the rate of development of Tikapur. At present, there are locals who are earning by selling agricultural products like food crops and fruits. Oilseeds, pulses, vegetables are sold to neighbouring major townships like Nepalgunj. Commercial farming of off-seasonal vegetables is also seen in the project area. After further attraction of settlements and further investments in the town, these products will have increased market value, better market-chain and increased opportunities of sales.

iii. Income from FSTP byproduct

111. The dried sludge from the FSTP can be converted to briquettes that can be used as cooking fuels and or powder of dried sludge can be used as organic fertilizer or soil conditioner. Revenue can be collected by selling these reeds as well as dried sludge.

iv. Appreciation of Land Value

112. One of the benefits of the project is that land price will increase due to the availability of reliable sanitation system. Tikapur has a plain land, and it also has fertile land with irrigation facilities. Upon completion of the present project, migration from nearby places is expected to increase. In order to promote land development in the area, the local people will be made aware that high value lands are acceptable to the banks and microfinance institutions to provide loans for them to start their own economic/social ventures.

v. Quality of Life Values

113. The project will provide improved sanitation facilities. It is likely to bring improvement in personal, household and community sanitation practices. This will result in good public health. These improvements in lives of the locals will bring about overall improvement in quality of life of the locals in the long-run.

B: Adverse Impacts and Mitigation Measures

B-1: Pre-construction Phase

114. The pre-construction works involves field survey and investigation, development of design & detailed drawings, carrying out cost estimate etc. This also includes discussion with WUSC and revision of design if necessary. As there will be no construction activities involved; there will be no construction related adverse impacts.

115. The Rapid Environmental Assessment (REA) Checklist for drainage and FSM/sewerage were separately used to identify potential impacts/issues/concerns of the sub-project as per design (Annex 1). "No mitigation measures scenario" checklist developed for UWSSP was also used and this is also provided in Annex 1. This helped identify the issues and concerns that should be considered during design, impacts that should be mitigated during construction and impacts that should be mitigated or enhanced during operation. The considerations made during design are listed in Table VI-2:

Table VI-1: REA-identified Impacts/Issues/Concerns and Mitigation Measures Taken during Project Preparation Phase

REA identified Impacts/Issues/Concerns	Measures taken during FS/DED to mitigate impacts/issues/concerns
Siltation of drainage	• Incorporate measures and sites for handling excessive spoil materials • Provide silt traps in all drainage inlets.
Hazards (accidents of falling into open drainage canals) to residents, passersby and animals.	• Provide cover to all drainage constructed.
Discharge of sewage/septic wastes and grey water from households will cause pollution	• The inlet design to ensure that only storm or rainwater flows into the drainage system. • Prevent households from connecting outlets of septic tanks and grey water to the drainage lines.
Accumulation of wastes and silt at the outfall sections resulting to pollution or degradation of the quality of surface water.	• Provide siltation or sedimentation chambers at the outfalls of the drainage system to prevent solid wastes or silts from flowing directly to the receiving body of water. • Position the outfall enough to have space for the provision of siltation or sedimentation ponds including accessibility during maintenance phase.
Damage to Gyani kulo and Jamara kulo due to discharge at the outfalls	• Velocity control parameter has been incorporated in the design of drains at the point before discharge to outfall • At every outfall point of Gyani kulo and Jamara kulo, there is provision of concrete lining 5 feet either side so that the pressure of discharge doesn't damage the canal (Consent has been taken from the canal management committee - Annex 5)
Health and safety of community and workers	• Prepare training manuals in Nepali with sketches on community health and safety and potential occupational health and safety during construction, and community health and safety during the operation phase.
Disruption of vendors' business	• Provide compensation to the affected people • Baseline Photographs of the construction areas • As much as possible, place drainage alignments away from utilities during design. • Provide budget for restoration/replacement of damaged utilities • Avoid placing drainage alignment near heritage buildings • Photograph all sites within heritage areas to enable before and after comparison (note: all roads are to be reinstated to original character especially in heritage areas)
False claims from people; water quality changes due to construction.	
Interference with other utilities during construction	
Disturbance and hazards to pedestrians and road users.	Obtaining letter of approvals and agreements from Department of Roads and Municipality for temporary acquisition of land as well as dismantling of the road. Preparation of Traffic Management Plan (Sample template in Annex 2-C)
Traffic congestion	
Selection of appropriate land for FSTP site	Selection of land so as to meet technical requirements, minimize distance, and so as to minimize social concerns (Availability and consent for use of land is given in Annex 5)
Possibility of odour pollution and water pollution during operation of FSTP	Establishing green belt around the FSTP site; design considerations to reduce order; and siting of the project not close to the core urban settlement/s or market areas

116. The design of the Storm Water drainage system will ensure that only storm water or rainwater will be flowing to the drainage canals once they become operational. The final detailed design will ensure that the following:

- (i) Inlets to the drainage system be positioned away from outlets of septic tanks and grey-water lines of households or commercial establishments. This will avoid the situation where the drainage system will be used as discharge point of septic and household wastes that could pollute the receiving bodies of water; and
- (ii) Silt traps are integrated in the design to avoid heavy siltation in the drainage system during monsoon season that could eventually affect the receiving bodies of water at the outfalls of the drainage system.
- (iii) The design of the outfalls will ensure that siltation or sedimentation chambers (or similar structures) be constructed at the outfalls with sizes depending on the peak volume flow. This will avoid heavy siltation and pollution of the receiving body of water;
- (iv) Position the outfalls at locations enough to provide space for the construction of siltation or sedimentation chambers (or similar structures); and
- (v) Position the outfalls and siltation or sedimentation chambers (or similar structures) at locations that will be accessible for maintenance and cleaning during the operation phase.

117. The design of the FSTP will ensure the following:

- (i) Provision of co-composting unit in the FSTP so that the dried faecal sludge will be sanitized through aerobic thermophilic composting; and
- (ii) Provision of buffer/green belt around the FSTP site so that the odour nuisance is reduced.

B-2: Impacts and Mitigations during Construction Phase of Storm Water Drain Component

a: Physical Environment

i. Land surface disturbance and degradation

118. Excavation and digging works during construction may lead to silt runoff, and unsettling of land and street surfaces. Haphazard disposal of the excavated earth can disturb the road surface. The activity as such will be a nuisance and discomfort to the road users and inhabitants. Accordingly water stagnation in the construction area especially during the rainy season may occur. The drains will be constructed with RoWs of public roads, and hence there will be no impacts on private land.

119. Precautionary measures will be taken, proper backfilling of excavated trenches will be done and the excavated soil will be stacked properly. Construction activities will be, as far as possible, avoided during the rainy season. Topsoil will be conserved and resurfaced with compaction.

ii. Damage to the Existing Facilities

120. During the construction period, while excavating the earth, existing water supply distribution pipe lines, side-drains and compound walls may get damaged in few places particularly in the major settlement and market areas. Drainage-laying works are proposed through existing public road and RoWs. Hence, disturbance is minimal. However, some disturbances and damages to public or private properties can take place at core area of Tikapur, the Park Road, and also in Shaktinagar area. There may be some concerns of damages to compound walls of private houses in some areas of Block 12 and Block 14 that have some narrow roads.

121. Timely and proper reinstatement of any damage to public or private property will be carried out. A proper inventory of any damages to existing facilities will be kept. Any grievance regarding such damage will be dealt with priority and will be addressed timely.

iii. Air and Noise pollution

122. The construction activities like excavation and construction of drainages, along with plying of construction related vehicles will produce some extent of air pollution and noise for a certain period of time. There will be some activities such as transportation, loading/unloading of construction materials, stockpiling of construction materials, disposal of spoil, and earthworks. These will cause effect into air quality due to dust generation and vehicular emissions. Dust from excavation, unloading of construction materials and loading/hauling of spoil is likely to cause air pollution. Use of power horns and movement of heavy vehicles can cause serious disturbance to the community, educational institutes, hospitals/health posts and residences.

123. The air pollution concerns related to the project will be addressed by using the vehicles and equipments with low emissions. Regular water sprinkling will be carried out at places where dust pollution is caused due to plying of construction related vehicles. The vehicles carrying construction materials will be covered, and drop height of the hauling vehicles will be minimized. Regular wetting of stock piles of sand and gravel will be carried out. Burning of waste in the campsites or at construction sites will be restricted.

124. The noise nuisance will be controlled by use of soft horns in vehicles used in construction. The construction activities near core settlements and/or healthcare facilities will be restricted after 7 pm and before 6 am. Construction schedules will be discussed with locals so as to minimize any disturbance in major community functions or activities.

iv. Disturbance to traffic and local public activities

125. The excavation works to be carried out during the construction phase will cause disturbances to local traffic. There will be some nuisance to local public due to excavation of drains. This nuisance will be at short and particular stretches only while the work is under progress.

126. To minimize the traffic concerns, the excavated materials will be removed as soon as possible, and the movement of project vehicles, e.g. hauling of spoil, will be scheduled to avoid peak traffic hours of the project area. Signboards on traffic concerns and safety matters will be placed in local language. A traffic management plan will be to be developed by the contractor, and it will be approved by the Consultant. The project will immediately reinstate any damaged public structure. There will be provision of sign boards to inform the locals about the active construction works and sites. The number of workforce will be increased in sensitive sites like schools and public offices so as to complete the works as soon as possible.

v. Impact on water bodies and water canals

127. There will be some impacts on water bodies and canals located within the project area during the construction phase. Gyani Canal, Jamara Canal, Kauriala river and Girwa river are likely to face risks of pollution during construction phase. Possible activities, which may influence the water quality, are listed below.

- Haphazard disposal of solid waste on canals
- Sediment and excavated materials may be transported to water bodies during rain
- Leakage and disposal of oil and grease from construction equipment

128. The excavation works will cause turbidity in water up to a certain extent. However the quantity is limited, and the impact will be there for short period of time.

129. Mitigation measures are avoiding disposal of spoil or waste onto canals and water bodies, and restriction of washing and fishing by workers in local surface water bodies. Regular monitoring of the canals, river or stream water quality will also be carried out.

vi. Waste Disposal

130. Waste like excess grease, lubricants, paints, etc may pollute soil and water resources. Solid wastes from construction campsites are also likely to be a visible source of pollution. However, waste segregation, containment and safe disposal are expected to be conducted as per standard practices. Proper waste management and disposal system will be done during the construction period. Proper toilets for the workers will be installed before starting the work. Waste like excess grease, lubricants will be collected in plastic containers and will be sold to scrap

dealer. Solid waste and other construction waste will be deposited near by the labour camp and will be cleared after the completion of the construction works.

131. Spoil disposal will be one of the concerns during construction phase. Spoil generated specially during the construction of wide drains will cause pollution on land and surface water bodies if not handled properly. Piling of spoil, hauling of spoil materials and its disposal may cause dust pollution while its disposal is also a source of traffic nuisance as well as noise pollution. Haphazardly disposed spoil may also degrade the land surface.



*Photo 15: Proposed Site 1 for spoil disposal
(Ward 1, near Kanya School)*



*Photo 16: Proposed Site 2 for spoil disposal
(Ward 1, - Block 21)*

132. The project will minimize the generation of spoil where possible. The generated spoil, if not used for backfilling, will be immediately hauled in a vehicle with cover. No spoil will be disposed over water bodies. The reuse of spoil for filling of land will be carried out. The potential sites identified during the field study and consultations for spoil disposal are (1) an open land near Kanya Primary School - ward number 1, and (2) an open land area of Block 21. These both sites are public open land parcels within the project's service area. They are not in any use and can be used as and when needed. These sites have easy road access for large vehicles (Map in Annex 3). It has been assessed that these sites will be leveled and upgraded after disposal of spoil in these areas. The contractor will take permission from municipality before use of any land for spoil disposal.

b: Biological Environment

i. Impact on flora and fauna

133. The potential environmental impacts of the project on local flora and fauna during construction will be low, and thus the project's overall impact on natural eco-system will not be significant.

134. Since there is Buffer Zone of Bardiya National Park within around 5 km from the project area, the workforce will be given following instructions;

- a. Strictly prohibition from fodder collection in forest area,
- b. Restriction in conducting any activities in streams,
- c. Ban of hunting and poaching activities or any activities related to that

135. Code of conduct will be provided to all the technicians and workers regarding the activities that may disturb any migratory or local species of amphibians, birds and other fauna. Bardiya National Park office and its team will be coordination on regular basis to be aware if there is any ecological condition which needs to be notified to the locals and workforce during construction period so that any possible disturbance can be avoided. The sensitivity in term of conservation areas and biodiversity has been analyzed also based on IBAT information as attached in Annex 4 of this report.

iii. Impact on aquatic life

136. The construction activities will physically disturb the water quality for a certain period of time and may cause adverse impact on aquatic life. But these effects will be temporary in nature.

137. Disposal of waste or spoil onto water bodies will be strictly prohibited, and fishing by the workforce will be restricted.

c: Socio-economic Environment

i. Disturbance to community activities

138. Construction activities, particularly construction of storm water drainage networks on roads will cause disturbances to the community activities, festivals and social events. The free movement of vehicular traffic and pedestrians will be affected. Noise produced due to the operation of machines may disturb the neighbourhood in construction areas. The impacts to human settlement including markets areas, and agricultural lands will be very low.

139. The construction schedules will be shared with the locals and notice of any major works that might hinder public activities will be provided well in advance.

ii. Social Dispute and Dissatisfaction

140. There is a possibility of influx of outside workforce. There are chances of disharmony of the influx population with the local community. Social dispute may arise if there are any irresponsible behaviour of the workers such as gambling and excess drinking. Disposal of waste, improper sanitation practices, etc by the workforce may also bring dissatisfaction in the local communities. On the other hand, the local who are willing to get employment in the project may not get employment benefits from the project causing dissatisfaction and conflicts.

iii. Occupational health and safety (OHS)

141. Health and safety of workers particularly of those involved in concreting, trench cutting, formwork and rebar fixing in the overhead tank is of prime concern. Injuries, falling sick and chances of communicable diseases are also possible cases for the workforce. These risks may arise at different work fronts. However, provision and use of safety equipments, first aid services and medical instances will keep these risks to possible minimum level. The records of PPE equipment provided will be kept and the use of PPEs will also be documented. Awareness activities will be conducted at all the work-fronts.

142. Under the context of recent spread of the SARS-CoV-2 pandemic, there workers will be instructed to work through compulsory use of masks along with other PPEs, and they will be provided with adequate provisions for washing hand with soap-water, and also for hand sanitization provisions. Water for drinking and water for washing will be provisioned adequately without any break or gap.

iv. Community health and safety

143. Since some of the construction works take place near the settlements, and the construction works of storm water drainage will be through the settlements, there are chances that the local people may face small accidental cases. This is critical primarily for children and old-aged people. Chances of communicable diseases are also a concern. Stock-piles sites, spoil disposal sites and movement of vehicles for construction activities are some of the aspects of construction works which may pose threat to health and safety of the community. Under the context of recent spread of the SARS-CoV-2 pandemic, the workforce will be instructed to have minimal contact with the community people.

v. Resettlement, relocation and compensation issue

144. Resettlement or relocation is not required. Compensation to loss of private property like compound walls and aprons of the compounds of private property will be required as per the site conditions. This is included in the BoQ of the contractor's contract. The project will reinstate any damaged public or private property to the state of its original utility or state.

B-3: Impacts and Mitigations during Operation & Maintenance Phase of Storm Water Drain Component

i. Nuisance due to blockage of drains

145. Drains may be clogged due to disposal of waste onto the drainage system due to some carelessness. This may result into accumulation of debris and organic loads - thus causing odour nuisance. This may also attract vectors of communicable diseases such as pests and rodents in the drainage system that could affect public health.

146. Mitigations include proper waste management in public areas so that the litter doesn't enter the drainage system. This will also be ensured through public awareness activities as well. In addition to this, there will be need of regular monitoring and cleaning of the silt traps, drains, and siltation or sedimentation chambers or similar structures at the outfalls, to prevent entry or accumulation of silt and solid wastes inside these drains and siltation chambers. Any damaged drain covers will be replaced as quick as possible. Cleaning of siltation units at the outfalls of the drainage system will be carried out on regular basis to prevent solid wastes or silts from flowing directly to the receiving body of water. This concern seems to be more important in the outfalls of Block 19 of Tikapur area and in outfall of Shaktinagar area.

ii. Disposal of solids/residuals from storm water drains

147. Silt, mud, plastic and debris are the main residues that will come into the storm water drainage system - and may cause disturbance in the normal flow. Hence, these will be cleaned on regular basis. A section of spoil disposal sites (as discussed in sub-section B-2-a-vi, paragraph 132) will be used for disposal of the solids and residuals. Dried sludge, along with separated plastic, textile and rubber residues will be segregated to be disposed into the municipal solid waste collection stream. Local communities will be coordinated, especially for cleaning of roads and open spaces, to avoid entry to plastic and other residues into the drainage system.

iii. Community Health and Safety

148. The locals may be exposed to risks of accidents if the covers of the drainages are damaged and left unmaintained or uncovered. This impact will be higher specially for the children and in the market areas. The exposed drainage will pose risk to animals and vehicles as well. Community health will also be considered.

149. To mitigate this risk, regular inspection of the drainage alignments is required to ensure that all drainage covers are intact. In case of damage or loss of drainage cover, there shall be immediate provision of replacement of drain cover/s.

iv. Occupational Health and Safety (OHS)

150. Provision of proper Personal Protective Equipment (PPEs) and monitoring for regular use of the provided PPEs to the worker will be carried out. Standard set of PPEs containing masks, gloves, boots, safety goggles and working suit will be provided for the workers. Under the context of possibility of spread of the viral infections, the workers will be instructed to work through compulsory use of masks along with other PPEs. Adequate supply of water for drinking and water for washing will be provisioned for the operations and its operators. Screening of health conditions of the workforce should be carried out on weekly basis.

B-4: Impacts and Mitigations during Construction Phase of FSM Component

a: Physical Environment

i. Land surface disturbance and degradation

151. Excavation and digging works during construction may lead to silt runoff, and unsettling of the land. Haphazard disposal of the excavated earth can disturb the nearby earthen road to Banagaun area. The construction site is a public land and is an unused land parcel.

152. Public land will be used for construction of faecal sludge treatment plant. Nearly 5666.38 sq.m land will be used for the FSTP construction.

ii. Air and Noise pollution

153. The construction activities like excavation and construction of FSTP units, along with plying of construction related vehicles will produce some extent of air pollution and noise for a short period of time. There will be some activities such as transportation, loading/unloading of construction materials, stockpiling of construction materials, disposal of spoil, and earthworks. These will cause effect into air quality due to dust generation and vehicular emissions. Use of power horns and movement of heavy vehicles can cause some disturbance to the community on the road that leads to the FSTP construction site.

iii. Impact on water bodies and water canals

154. There will be some impacts on Jamara Canal during construction phase. Possible activities, which may influence the water quality, are listed below.

- Haphazard disposal of solid waste onto the canal
- Sediment and excavated materials may be transported to Jamara canal during rain
- Leakage and disposal of oil and grease from construction equipment

155. The excavation works will cause turbidity in water up to a certain extent. However the quantity is limited, and the impact will be there for short period of time.

156. Along with the general measures, some specific measures will be taken to avoid any pollution to Jamara canal during construction period. Protection wall will be built as per need along the stretch of the canal (around 50 meters) where the excavation works will be carried out close to the line of the canal. Weekly monitoring of the canal will also be carried out.

iv. Waste Disposal

157. Waste like excess grease, lubricants, paints, etc may pollute the vegetated land and water systems. Solid wastes from construction campsites are also likely to be a visible source of pollution. However, waste segregation, containment and safe disposal are expected to be conducted as per standard practices. Proper waste management and disposal system will be done during the construction period. Proper toilets for the workers will be installed before starting the work. Waste like excess grease, lubricants will be collected in plastic containers and will be sold to scrap dealer. Solid waste and other construction waste will be deposited near by the labour camp and will be cleared after the completion of the construction works.

158. Spoil disposal will be one of the concerns during construction phase. Spoil generated during the construction of FSTP units will cause pollution on land and surface water bodies if not handled properly. Piling of excavated materials, hauling of spoil materials and its disposal may cause dust pollution while its disposal is also a source of traffic nuisance as well as noise pollution. Haphazardly disposed spoil may also degrade the land surface.

159. The project will minimize the generation of spoil where possible. The generated spoil, if not used for backfilling, will be immediately hauled in a vehicle with cover. No spoil will be disposed over water bodies. The reuse of spoil for filling of land will be carried out. The potential site identified during the field study and consultations for spoil disposal is an open land area of Block 21. The site is not in any use and can be used as and when needed. The site has easy road access for large vehicles (Site location map in Annex 3). It has been assessed that the site will be leveled and upgraded after disposal of spoil in these areas. The contractor will take permission from municipality before use of any land for spoil disposal.

b: Biological Environment

i. Loss of vegetation

160. There will be loss of around 20 to 25 trees in the proposed Faecal Sludge Treatment Plant site at Banagaun UttarPuruwa of ward number 1 of Tikapur municipality. The site is a public land. However, there are some trees, and it lies near a local forest area. Around 12 trees of Sissau (*Dalbergia sissoo*), and other few trees like Bayar (*Ziziphus mauritiana*), Simal (*Bombax ceiba*) and Bamboo (*Bambus spp*) are the tree species that might need to be felled. Compensatory plantation will be carried out at the ratio 1:10 for every tree felled. However, the project will avoid tree felling as far as possible.

ii. Impact of flora and fauna

161. Since there is no dense forest area, the direct impacts on flora and fauna will be low. As the project requires a single permanent site for FSTP, and the project's overall impact on natural eco-system will not be significant.

162. The Buffer Zone of Bardiya National Park within around 7 km from the FSTP construction site, so there is no major concern of impacts of the activities under this component.

c: Socio-economic Environment

i. Disturbance to community activities

163. Since this site is around 1.5 kilometers from core settlements of Tikapur, the disturbances to core communities will be less. However, there are sparse settlements near the FSTP site. Thus, the construction activities may cause disturbances to the community activities, festivals and social events of the nearby sparse settlements. The free movement of pedestrians will be affected to some extent, but for short period of time only. Noise produced due to the operation of machines may disturb the neighbourhood in and near Banagaun area.

164. The construction schedules will be shared with the locals and notice of any major works that might hinder public activities will be provided well in advance.

ii. Social Dispute and Dissatisfaction

165. There is a possibility of influx of outside workforce. The locals near the FSTP site may want to work in the project activities, and if this is not addressed well, the locals may show dissatisfaction. There are chances of disharmony of the influx population with the local community. Social dispute may arise if there are any irresponsible behaviour of the workers such as gambling and excess drinking. Disposal of waste, improper sanitation practices, etc by the workforce may also bring dissatisfaction in the local communities.

iii. Occupational health and safety (OHS)

166. Health and safety of workers particularly of those involved in concreting, trench cutting, formwork and rebar fixing in the overhead tank is of prime concern. Injuries, falling sick and chances of communicable diseases are also possible cases for the workforce. These risks may arise at different work fronts. However, provision and use of safety equipments, first aid services and medical instances will keep these risks to possible minimum level. The records of PPE equipment provided will be kept and the use of PPEs will also be documented. Awareness activities will be conducted at all the work-fronts.

167. Under the context of recent spread of the SARS-CoV-2 pandemic, there workers will be instructed to work through compulsory use of masks along with other PPEs, and they will be provided with adequate provisions for washing hand with soap-water, and also for hand sanitization provisions. Water for drinking and water for washing will be provisioned adequately without any break or gap.

iv. Community health and safety

168. Since some of the construction works take place near the settlements, and the construction works of storm water drainage will be through the settlements, there are chances that the local people may face small accidental cases. This is critical primarily for children and old-aged people. Chances of communicable diseases are also a concern. Stock-piles sites, spoil disposal sites and movement of vehicles for construction activities are some of the aspects of construction works which may pose threat to health and safety of the community. Under the context of recent spread of the SARS-CoV-2 pandemic, the workforce will be instructed to have minimal contact with the community people.

v. Resettlement, relocation and compensation issue

169. Resettlement or relocation is not required as the FSTP site lies in the public land.

B-5: Impacts and Mitigations: Operation & Maintenance Phase of FSM Component

i. Water pollution

170. If the effluent from the FSTP is not well treated, then there will be risk of pollution of local water bodies due to the discharge of effluent. However, likeliness of occurrence of this case is very low. Proper operations of the treatment plant at all times will be ensured so as to avoid any such risk of pollution.

171. The treatment plant will be cleaned on regular basis. Quality of the effluent will be regularly monitored to ensure that the effluent meets the GoN tolerance limits of discharge of wastewater from combined wastewater treatment plan (Annex 2-A.4). The operation and maintenance of the FSTP will be carried out on timely and regular basis as per its O&M Plan (Annex 2-G)

ii. Pollution and nuisance due to sludge removal and its disposal

172. Periodic desludging will be required. Screen chamber needs to be desludged weekly. This needs removal of sand and silt only. ABR needs to be desludged every 6 to 12 months. Desludging may cause environmental pollution if disposed haphazardly. It will also cause health risks to the workers if not handled properly. Odour nuisance will be there during the transferring of the sludge to sludge drying bed. This odour will last for a day or so, and it can be felt up to around 100 m periphery of the drying bed. This is only for a short period and its occurrence is only once in a month or so.

173. Sludge will be handled only by designated trained team authorized by the municipality. Covered containers will be used for collecting screenings that are raked from the bar screen. Sludge will be disposed to the sludge drying bed. Only the residue will be disposed to the final disposal site of the municipality under coordination and permission of the municipality.

174. Some of the specific concerns that could lead to low efficiency of the FSTP and thus cause the pollution in local environment are listed below along with the activities to be carried out to ensure that the FSTP functions in an efficient manner;

Table VI-2: Measures to be taken during FSTP Operations

SN	Units / (Concerns)	Activities to be carried out to avoid environmental nuisance due to inefficient functioning of the plant	Remarks
1	Screening Chamber (Foul smell)	Check the blockage at Screen; clean the blockage/solid waste by Scraper; remove the Screen and scrap/clean sludge deposition at the bottom of the Screen chamber; dispose the removed silt/sand to the SDB for drying and solid waste to the closed container for final disposal to the solid waste collection facility.	This will also reduce odour in the inlet of the FSTP component
2	Anaerobic digester	Remove the blockage in the inlet with a rod; remove any blockages in the outlet using scrapers if exist; remove any blockages and replace the damaged or broken pipes immediately in the digester unit.	
3	Sludge drying bed (Overflow and foul smell)	Remove the blockage in the inlet and outlet pipes with scrapers; use a dry stick to check the level of sludge, and conduct timely removal of dried sludge from consecutive beds	This will also reduce odour in the SDB unit
4	Anaerobic Baffle Reactor	The inlet and outlet manholes should be checked and cleaned regularly; check the level of sludge on regular basis and desludge it as per schedule; replace the fallen down or broken baffle pipes and repair damaged wall immediately	
5	Anaerobic filters	Clean and remove the blockages in inlet and outlet pipes with scrapers; check for turbidity. Unusual turbidity may indicate problems in preceding component.	
6	Horizontal Flow Constructed Wetlands (Foul smell)	Remove dead/fallen leaf, weeds and unwanted plants manually using an appropriate tool; check for the ponding over the surface of filter media and clean the clogged area	Reduces odour, improves aesthetic value
7	Polishing pond	Remove the blockages in inlet and outlet pipes with scrapers	

iii. Odour nuisance

175. Foul odour will be generated during the operations of the faecal sludge treatment plant. This will cause nuisance to nearby people. However, since the site is more than 100 m from any settlement, this concern will be of low significance.

176. Lime spraying in sludge will be carried out to suppress the foul odour. Plantation of aromatic plants (e.g. *Murraya paniculata*, *Magnolia champaca*) around the FSTP as green belt will also be done to reduce the odour nuisance.

iv. Occupational Health and Safety (OHS)

177. Provision of proper Personal Protective Equipment (PPEs) and monitoring for regular use of the provided PPEs to the worker will be carried out. Standard set of PPEs containing masks, face shield/visor, water proof gloves, boots, safety goggles and working suit will be provided for the workers. Provision of adequate welfare facilities including clean water, soap, nailbrushes, disposable paper towels and washing facilities. First Aid Kits should be provided. Provisions should include clean water or sterile wipes for cleansing wounds, and a supply of sterile, waterproof, adhesive dressings.

178. During cleaning of FSTP units, utmost precautions should be taken for the safety of workers conducting such works. O&M workers will be required to ensure that employees and line management understand the risks through proper instruction, training and supervision.

179. Under the context of possibility of spread of the viral infections, the workers will be instructed to work through compulsory use of masks along with other PPEs. Adequate supply of water for drinking and water for washing will be provisioned for the operations and its operators. Screening of health conditions of the workers should be carried out on weekly basis.

v. Community Health and Safety

180. Community health and safety will also be considered. There will be restriction on unauthorized entry of local people inside the treatment plant area. Under the context of possible spread of the viral infections, the workers will be instructed to have minimal contact with the community people. Awareness in community level will be conducted to ensure the safe behaviors to avoid any transmissions of viral infection to and from the workers during emptying of the sanitation facilities.

vi. Concerns of faecal sludge collection from municipal sources

181. There is chance of littering and contamination during the collection of faecal sludge from households or other municipal sources like hotels and offices. Leakages in collection pipes may also cause nuisance and pollute the local environment. The vehicular collection and transfer of faecal sludge may pose traffic concerns especially in the narrow roads of the service area. On the other hand, delivering the collected sludge to the treatment plant will also pose some concerns.

182. In addition to the measures for OHS aspects and community health & safety aspects discussed above, there are some specific health and safety concerns associated with collection, transport and discharge of faecal sludge. Workers are at a high risk of exposure to physical, chemical and biological hazards. Physical hazards include slips, trips and falls during faecal sludge collection. Exposure to sharp objects contained in the sludge - e.g. glass pieces, metal sharps, etc. Biological hazards include direct and indirect oral, nasal and dermal exposure to multiple types of pathogens in FS (e.g. bacteria, viruses, protozoa, and helminthes).

183. Following measures will be taken to avoid these concerns;

1. The workers involved in collection works will be provided specific orientations so as to reduce any littering and contamination
2. There will be operation guidelines for collection services. Specific PPEs will be provided for collection workers. PPEs will at least include masks, gloves, boots, and hard-hats of proper specifications. Face and eye protection equipments are also to be provided to the workers. The workers will be restricted from smoking during the entire process of collection and transfer.
3. Things to be considered during collection are;

- ✓ Using caution when entering homes with hoses and other equipment, and protecting floors, walls and furniture from damage;
 - ✓ After collecting faecal sludge from any point, the workers will clean up the site after the process is completed;
 - ✓ Avoid any leakage, and if any, clean up any spillage using proper sorbent materials
 - ✓ Provide with disinfectants, barriers, sorbents and bags for cleaning up and collecting spilled material.
4. Considerations needed for vehicle use in faecal sludge collection;
 - ✓ Each collection vehicle will be provided with disinfection/cleaning materials
 - ✓ Park the truck as close to the system as possible.
 - ✓ wheel chocks to prevent the vehicle from moving when parked;
 5. Considerations needed during discharge of collected faecal sludge to treatment plant;
 - ✓ Use of water for washing/flushing the solid/non-biodegradable solids
 - ✓ Clean up any spillage in the area around the inlet after completing the discharge of FS
 - ✓ Hygiene practices (e.g. hand washing) after completion of the works

C: Evaluation of the Impacts

184. The impacts are evaluated based on their impact levels, coverage of area and duration of the impacts. The evaluation will be used to emphasize the need to address the concerns. Magnitude, geographical extent and duration of impacts are defined below;

185. Magnitude: This can be low-L (minor), medium-M (moderate), and high-H (major), depending on the scale or severity of change.

186. Geographical extent: If the action is confined to the sub-project area, it is referred as site specific (Ss), if it occurs outside area but close to sub-project area, the extent of impact is local (Lc), if it occurs far away from the sub-project, it is referred as regional (R).

187. Duration: It can be short term (St - i.e. less than 3 years), medium term (Mt - i.e. 3-20 years), and long term (Lt - i.e. more than 20 years).

188. For the Impact evaluation the matrix method with numerical ranking is used for the quantitative ranking of the predicted impacts. The numerical scale mentioned in the National EIA Guidelines 1993 has been adopted for this sub-project. The numerical scale is as:

Magnitude		Extent		Duration	
High	60	Regional	60	Long Term	20
Moderate	20	Local	20	Medium Term	10
Minor	10	Site Specific	10	Short Term	05

189. The combined less than 45 is termed as insignificant impact; 45-75 is termed as Significant and beyond 75 is termed as very significant impact. Following table summarizes the evaluations of the impacts;

Table VI-3: Evaluation of the Environmental Impacts

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Beneficial Impacts					
Construction stage					
Employment Opportunity and Increase of Income	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Skill Enhancement	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Enterprise Development and Business Promotion	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
Operation Stage					
Improvement in health	Direct	M (20)	Lc (20)	Lt (20)	Significant (60)
Increased markets and Higher Market values	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Income from FSTP byproduct	Indirect	Mi (10)	Lc (20)	Lt (20)	Significant (50)
Appreciation of land value	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Quality of Life Values	Indirect	M (20)	Lc (20)	Lt (20)	Significant (60)
Adverse Impacts - Storm Water Drainage Component					
Construction stage - Storm Water Drainage Component					
<i>Physical Environment</i>					
Land surface disturbance and degradation	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Damage to existing facilities	Direct	L (10)	Ss (10)	St (5)	Insignificant (25)
Air and Noise Pollution	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Disturbance to traffic and local public activities	Direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)
Impacts of water bodies and water canals	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Waste disposal	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
<i>Biological Environment</i>					
Impacts on flora and fauna	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Impacts on aquatic life	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
<i>Socio-economic Environment</i>					
Disturbance to community activities	Direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Social dispute and dissatisfaction	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Resettlement, relocation and compensation issues	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Operation & Maintenance Stage - Storm Water Drainage Component					
Nuisance due to blockage of drains	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Concerns regarding disposal of solids/residuals from storm water	Direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
drains					
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)

Table VI-4: Evaluation of the Environmental Impacts (Faecal Sludge Management Component)

Impacts	Nature	Magnitude	Extent	Duration	Total score and significance
Adverse Impacts - Faecal Sludge Management Component					
Construction stage - Faecal Sludge Management Component					
<i>Physical Environment</i>					
Land surface disturbance and degradation	Direct	M (20)	Ss (10)	Lt (20)	Significant (50)
Air and Noise Pollution	Direct	L (10)	Lc (20)	St (5)	Insignificant (35)
Impacts of water bodies and water canals	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
Waste disposal	Direct	M (20)	Lc (20)	Mt (10)	Significant (50)
<i>Biological Environment</i>					
Loss of vegetation	Direct	M (20)	Ss (10)	Mt (10)	Insignificant (40)
Impacts on flora and fauna	Direct	L (10)	Lc (20)	Mt (10)	Insignificant (40)
<i>Socio-economic Environment</i>					
Disturbance to community activities	Direct	M (20)	Ss (10)	St (5)	Insignificant (35)
Social dispute and dissatisfaction	Indirect	M (20)	Ss (10)	St (5)	Insignificant (35)
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Operation & Maintenance Stage - Faecal Sludge Management Component					
Water Pollution	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Pollution and nuisance due to sludge removal and its disposal	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Odour nuisance	Direct	M (20)	Lc (20)	St (5)	Significant (45)
Occupational health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Community health and safety	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)
Concerns of faecal sludge collection from municipal sources	Direct	H (60)	Ss (10)	Mt (10)	Significant (80)

VII: Analysis of Alternatives

A. With- and Without-Subproject Alternative

190. The project area is a major junction and booming marketplace. The town is facing increased problems of sanitation. The core town faces problems of flash flood and inundation every year during monsoon period. On the other hand, there is increasing need and demand for faecal sludge services as well.

191. Doing nothing about these challenges would be allowing the subproject municipality to further develop as “under-serviced” area, put the health of its residents and the general public at more risks, and worsen its living environment. This would impede: (i) further social and economic development project municipality and (ii) Nepal’s delivery of its commitment to SDG 6th to increase the proportion of population with sustainable access to basic sanitation. Hence, do-nothing or without-project alternative is not chosen.

B. With subproject’s location alternative:

192. The project area is a very needy area in terms of storm water drain and FSM infrastructure. Strategically, the investment in urban sanitation in this belt will help to push the improvement in the overall socio-economic aspects of the Province.

193. The project components are selected at technically safe site where there is no social dispute as well. Minimization of loss of vegetation cover is also considered. Minimizing tree clearance and damage to cultivated land has also been considered in site selection.

C. Alternatives Related to technology, materials and implementation procedure

194. In case of storm water drainage system, the alternatives have been analyzed for different types of drain types. RCC pipe drains, plastered brick drains, tick drains, open channel drains and box drains were primarily taken as options, and after considering the field conditions (topography) and the financial implications, RCC rectangular drains were selected as the primary type of drain. However, at the core market area where there is busy market activities at both sides of the road, box drain (of culvert type) has been proposed at limited length.

195. In case of faecal sludge treatment options, different options like centralized sewerage system, decentralized system, and onsite treatment option of FSM model were considered. After consideration of field conditions and the current need to the municipality, Faecal Sludge Management (FSM) system with onsite treatment approach with a FSTP was chosen. The design of FSTP considered various options like inclusion or exclusion of biogas component in it. Since the financial viability was not positive, the design used combination of Anaerobic digester, Anaerobic baffle reactor (ABR) and Anaerobic filter for the stabilization of sludge.

196. The work involved is labor intensive and minimum use of mechanical equipment is involved. Most of the construction work will be done manually, avoiding heavy equipment which will produce minimum environmental impacts. Trained human resources will be employed.

197. The working procedures proposed are participatory one and the beneficiaries will be actively participating in all the phases of the project. Except for some mechanical equipment, most of the raw materials used will be local in nature. Similarly, as far as possible, local people will be employed for the project so that the chances of conflict are minimal.

VIII ENVIRONMENTAL MANAGEMENT PLAN

198. The purpose of the Environmental Management Plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assignment conducted for the subproject; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensuring that safety recommendations are complied with.

199. A copy of the EMP will be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

A. Institutional Arrangement

200. The Ministry of Water Supply (MoWS) will be the Executing Agency, working through the Department Water Supply and Sewerage Management (DWSSM), which will establish a Project Management Office (PMO) for the project¹⁶ headed by a Project Director. The DWSSM will also establish Regional PMO (RPMO) in Nepalgunj.

201. The PMO will be responsible for overall project planning, management, implementation, monitoring and reporting for the project. The PMO will also be responsible for screening the proposed subprojects in accordance with the subproject selection criteria for the project, assisting the municipalities in conducting feasibility studies, reporting to and being point of liaison with ADB on the project; quality control of detailed design and construction supervision; procurement of civil works contractors; support for capacity building; and overseeing safeguard compliance. The PMO will liaise with WUSCs or municipalities to sign the management agreement prior to the award of contract for each subproject. The PMO will also engage all consultants under the project.

202. The RPMO will report to the PMO and be supported and monitored by PMO to implement the projects in the field and manage contractors and consultants. The RPMO will manage the detailed design and construction supervision with support from DSMC that PMO would engage. The DSMC will be based at the respective RPMO. For each subproject, a dedicated implementation core group will be established in the field, at each WUA's office,¹⁷ headed by a qualified engineer from the RPMO to conduct day-to-day project management, planning and construction supervision. The TDF will coordinate with RPMO, WUSC and municipalities at least on monthly basis.

203. The WUSC, on behalf of the WUA¹⁸ or the municipality¹⁹ will be responsible for operation and maintenance (O&M) of the water supply and sanitation facilities constructed, operating under a management agreement with DWSSM. WUSC consist of nine executive members,²⁰ at least three of whom are women. The subproject will fund the WUA's minimum prescribed staffing and

¹⁶ DWSSM will continue the existing PMO established and operational for the Third Small Towns Water Supply and Sanitation Sector project.

¹⁷ The implementation core group, as a minimum, comprises of (i) an Engineer, a Social mobilizer, and an EMP monitor, RPMO; (ii) an Administration Staff, a Finance Staff, and an Engineer or Junior Engineer, WUSC.

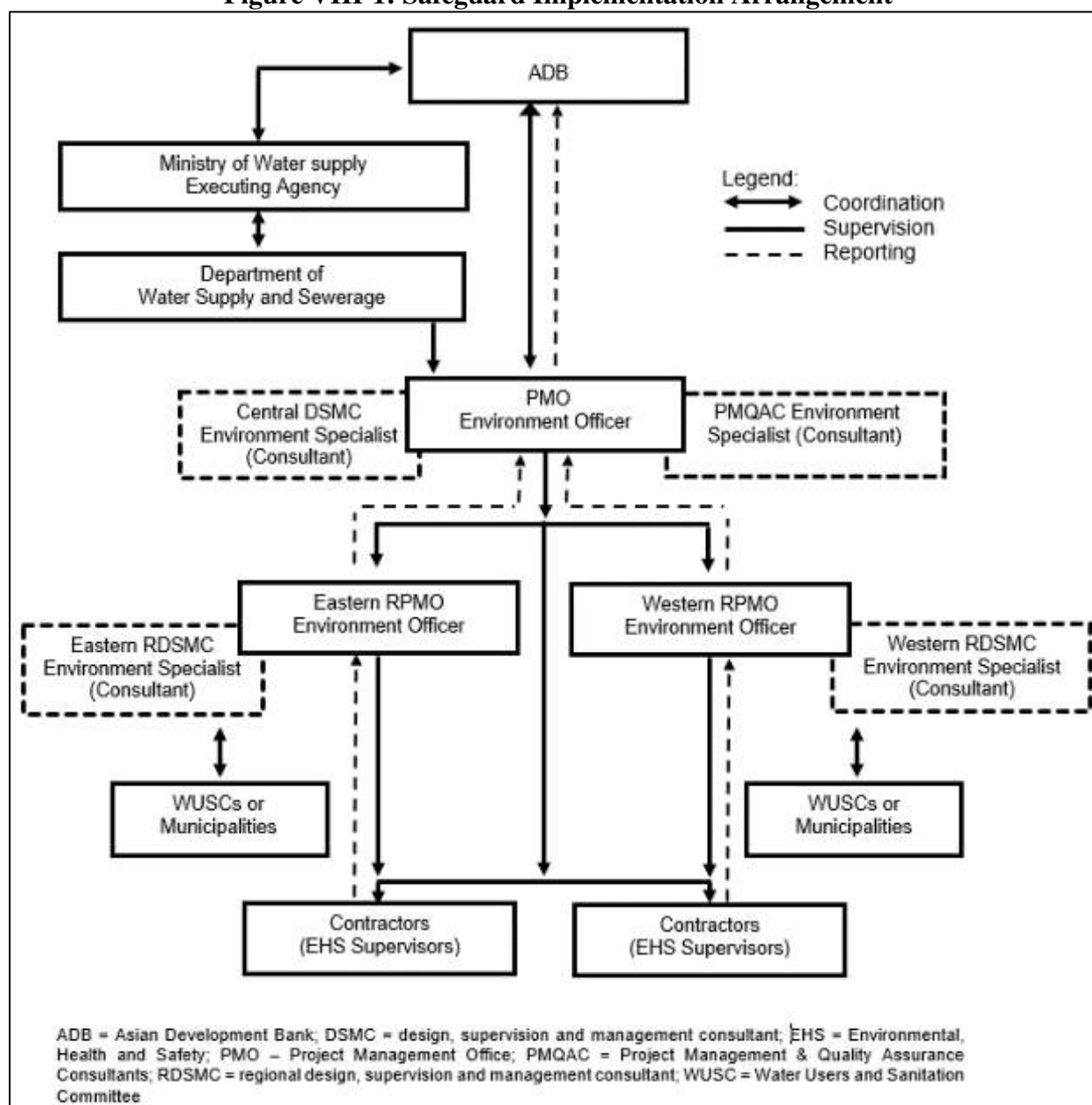
¹⁸ WUAs are registered with the district water resources committee as a user association under the Water Resources Act (1992).

¹⁹ As the project is a demand based open access project, the WUAs or the municipalities can apply for funding a proposed subproject that meets the subproject selection criteria.

²⁰ WUSCs will be formulated by ensuring proportional representation of gender, caste and ethnic groups. It shall include at least 33% representation of women.

other resource requirement, as outlined in the management agreement with DWSSM for sustainable operations of the system during the project period. For the subprojects yet to be selected and where WUA does not exist initially, or when the municipality doesn't have the capacity and chooses to delegate the operation to user's representatives, an interim user committee (IUC) will be first established in the feasibility stage by representing potential consumers. The IUC will work with the RPMO and DSMC in undertaking a feasibility study, confirm the technical proposals and the boundaries of the service areas. WUAs will be developed from IUC at the detailed design stage.

Figure VIII-1: Safeguard Implementation Arrangement



204. Project Management Office. A project officer (Environment) will be engaged in PMO to ensure implementation of environmental safeguards. He/she will be provided with necessary consultant support, and capacity development and training. The responsibilities of the Environment Officer are:

- (i) review and confirm existing IEE and EMP are updated based on detailed designs, that new IEE/EMP prepared by DSMC comply to exclusion criteria and project selection guidelines as stipulated in the EARF and government rules; and recommend for approval to PMO;

- (ii) approve subproject environmental category;
- (iii) ensure that EMP is included in bidding documents and civil works contracts;
- (iv) provide oversight on environmental management aspects of subproject and ensure EMP is implemented by RPMO and contractor;
- (v) establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the EMP;
- (vi) facilitate and confirm overall compliance with all Government rules and regulations regarding site and environmental clearances as well as any other environmental requirements as relevant;
- (vii) supervise and provide guidance to the RPMO to properly carry out the environmental monitoring and assessments as per the EARF;
- (viii) review, monitor and evaluate effectiveness with which the EMPs are implemented, and recommend necessary corrective actions to be taken;
- (ix) consolidate monthly environmental monitoring reports from RPMO and submit semi-annual monitoring reports to ADB;
- (x) ensure timely disclosure of final IEE/EMP in project locations and in a form accessible to the public;
- (xi) assist with ongoing meaningful consultation and assist in setting up of GRM in respect of environment concerns;
- (xii) address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner as per the IEE;
- (xiii) undertake regular review of safeguards-related loan covenants, and the compliance during program implementation; and
- (xiv) organize periodic capacity building and training programs on safeguards for project stakeholders, PMO, RPMO, and WUA.

205. **Regional Project Management Office.** The environmental officer assigned by DWSSM to the RPMO will receive support from (i) the PMO environmental officer, (ii) environmental specialist from PMQAC; and (iii) the environmental specialist and EMP monitor of the regional DSMC to carry out the following:

- (i) prepare new IEE and EMP in accordance with the EARF and government rules;
- (ii) include EMP in bidding documents and civil works contracts;
- (iii) comply with all government rules and regulations;
- (iv) take necessary action for obtaining rights of way;
- (v) oversee implementation of EMP including environmental monitoring by contractors;
- (vi) take corrective actions when necessary to ensure no environmental impacts;
- (vii) submit monthly environmental monitoring reports to PMO;
- (viii) assist with ongoing meaningful consultation and assist in setting up of GRM in respect of environment concerns; and
- (ix) address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEE.

206. **Project Management and Quality Assurance Consultant.** The Project Management and Quality Assurance Consultants (PMQAC) will provide support to the PMO in the following areas. The detailed TORs are in the PAM:

- (i) ensure that the quality of the designs and construction of all water supply and sanitation components implemented under the project are to the required standards; and
- (ii) assist the PMO with the overall planning, implementation and monitoring of the project during all stages of implementation including adherence to all environmental and social safeguards' requirements.

207. **Regional Design, Supervision and Management Consultant.** The RDSMC will provide support to the RPMO in the following areas. The detailed TOR is given in the PAM:

- (i) prepare quality feasibility studies, detailed engineering designs, safeguards documents and bid documents

- (ii) provide effective construction supervision and contract management of all water supply and sanitation components implemented under the project in its region
- (iii) assist the RPMO with the overall planning, implementation and monitoring of each subproject during all stages of implementation including adherence to all environmental and social safeguards requirements
- (iv) work closely with the Water User and Sanitation Committee (WUSC), respective project municipalities and communities to ensure that the citizens are aware of project benefits and their responsibilities
- (v) ensure that poor and vulnerable groups will benefit equally from the project.

208. **Civil Works Contract and Contractor.** The contractor will be required to designate an Environment, Health and Safety (EHS) supervisor to ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring measures outlined in their contract. The contractor will be required to submit to RPMO, for review and approval, a Site-specific environmental management plan (S-EMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; (iii) monitoring program as per S-EMP; and (iv) budget for S-EMP implementation. No works can commence prior to approval of S-EMP. The contractor will be required to undertake day to day monitoring and report to the respective RPMO and DSMC. The contractor will need to depute an Environment, Health and Safety (EHS) focal person in its site as a member of regular field team.

209. A copy of the EMP or approved S-EMP will be kept on site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or S-EMP constitutes a failure in compliance and will require corrective actions. The EARF and IEE specify responsibilities in EMP implementation during design, construction and O&M phases.

210. The PMO and RPMO will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the subproject sites.

211. **Capacity Building.** The design review and technical audit consultant (DRTAC) safeguards experts (environmental and social) will be responsible for training the; (i) PMO's safeguards officers (environmental and social); (ii) RPMO's engineer and social development officer. Training modules will need to cover safeguards awareness and management following both ADB and government requirements as specified below:

- (i) Introduction to environment and environmental consideration in water supply and wastewater projects;
- (ii) Review of IEE and integration into the detailed project design;
- (iii) Improved coordination within nodal departments; and
- (iv) Monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers before deployment to work sites.

212. **Water Users' and Sanitation Committee.** WUSC is the eventual operators of the completed projects. The key tasks and responsibilities of WUSC are, but not limited to:

Before Construction

- (i) Facilitate public consultation and participation, information dissemination and social preparation.
- (ii) Provide available data to DSMC-ESS during IEE
- (iii) Assist in securing tree-cutting permits and/or registration of water source.

- (iv) Participate in training programs.

During Construction

- (i) Assist in the observance of the grievance redress mechanism.
- (ii) Actively participate in the monitoring of Contractor's compliance with the IEE and its EMP and the conditions set out with Government's approval of the IEE Reports.
- (iii) Facilitate public consultations, as necessary.

During Operation

- (i) Implement the Environmental Management Plan and Water Safety Plan.
- (ii) If applicable, actively work with the engaged licensed and accredited laboratory in water quality monitoring.
- (iii) Prepare the environmental monitoring report as per IEE.
- (iv) Ensure observance of the grievance redresses mechanism.

213. **Licensed and Accredited Laboratory.** It is recommended that a licensed and accredited laboratory be engaged to conduct water quality monitoring in the first few years of operation and to train WUSC. The laboratory will ensure that while carrying out the water quality monitoring as prescribed in the National Drinking Water Quality Standard and its Directives, 'hands-on' training is provided to WUSC.

B. Environmental Management Plan

214. Separate Environmental Management Plans (EMPs) have been developed – one for each; Storm Water Drainage Component, and Faecal Sludge Management Component. The EMP is prepared to provide mitigation measures to reduce all negative impacts to acceptable levels.

215. The EMPs will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between PMO, RPMO, PIU, consultant and contractor. The EMPs will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (i) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detail specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensure that safety recommendations are complied with. The EMPs include a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries.

216. The contractor of each component will be required to (i) carry out all of the mitigation and monitoring measures set forth in the approved EMP; and (ii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE, EMP and site-specific EMP (S-EMP). The contractor shall allocate budget for compliance with these IEE, EMP and SEMP measures, requirements and actions. The contractor will be required to submit to PIU, for review and approval, a S-EMP including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) specific mitigation measures following the approved EMP; and (iii) monitoring program as per EMP. Contractor of each separate package will be required to develop its own S-EMP for its package. No works can commence prior to approval of the S-EMP.

Environmental Management Plan (EMP) for Storm Water Drainage Component

Table VIII-1: Environmental Management Plan Matrix for Storm Water Drainage Component

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
1. Prior to Construction Activities					
Consents, permits, clearances, no objection certificate (NOC), etc.	Failure to obtain necessary consents, permits, NOCs, etc can result to design revisions and /or delay/stoppage of works	- Obtain all of the necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. - Acknowledge in writing and provide report on compliance (all obtained consents, permits, clearance, NOCs, etc.)	PMO, RPMO, & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Existing utilities	Disruption of services	- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction - Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. - Require contractors to prepare spoils management plan (see Annex 2-D for outline).	DSMC, RPMO	List of affected utilities and operators; Bid document to include requirement for a contingency plan for service interruptions (for example provision of water if disruption is more than 24 hours),	During detailed design phase
Storm Water drainage	Chances of siltation of drainage Chances of clogging of the drains Chances of damages to outflow receiving points at the outfall points of the canals	- Provision of units for siltation and sedimentation - Provision of cover slabs in the drains - Special considerations in the inlet and outlet design and positioning of drainage so as to avoid unnecessary depositions, and also to allow space for cleaning - Design for speed control at outlet, and provision of protective works at the outfall receiving points/sections of the receiving canals	DSMC, PMO, RPMO	Incorporated in final design and communicated to contractors	Prior to award of contract
Construction camps, stockpile areas, storage areas, and disposal areas	Occupational Safety aspects Disturbance to local community activities	- Adequate provisions for the workers in the campsites - Determine locations prior to starting construction activities - Determine the standards and requirements of campsites in BoQ	DSMC, RPMO	Incorporation of campsite standards and requirements in the BoQ List of selected sites for construction work camps, stockpile areas, storage areas, and disposal areas. Written consent of landowner/s (not lessee/s) for reuse of	During detailed design phase

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
				excess spoils to agricultural land	
EMP Implementation Training	If no training is done, there is a possibility of the EMP not implemented efficiently and accurately, leading to unfavorable impacts to environment, workers and community.	- Project manager and contractors to undergo training on EMP implementation, including standard operating procedures (SOP) and occupational health and safety (OHS) for construction works. - Timely implementation of the EMP. - Development and execution of measures for any unanticipated environmental impacts.	PMO, RPMO and DSMC. Contractor's Environmental Supervisor	Record of completion (Safeguards Compliance Orientation or Training)	During detailed design phase prior to mobilization of workers to site.
2. During Construction Activities					
A. Physical Characteristics					
Land surface disturbance and degradation	Surface cutting and excavation works causing changes in local land surfaces	- Precautionary measures such as: (i) reuse of excavated soil, (ii) immediate and proper backfilling of the trenches, (iii) the excavated soil temporarily stored properly, and (iv) spoil to be used for land reclamation in the town	Contractor	Records of stock piles; Sites of drainage alignment	Daily (or as often as necessary especially during monsoon or rains) by contractor. Monthly visual inspection by RPMO and DSMC-ESE.
Existing facilities	Damage to existing facilities (like drains, compound walls and pavements)	- Existing infrastructure (such as water distribution pipes, electricity poles, etc.) shall be relocated before construction starts at the subproject sites. - Prior permission shall be obtained from respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users. - If construction work is expected to disrupt, users of community shall be served 7 days in advance and again 1 day prior to start of construction. - Ensure any damage to properties and utilities will be restored or compensated to pre work conditions.	Contractor	List of any public or private infrastructure disturbed by the project works Minutes of meetings with the locals or affected persons	As per need, or field-inspection if any such case is foreseen
Ambient air	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of pollutants in ambient air which will affect people who live and	- Water sprinkling at dry exposed surfaces and stockpiles of aggregates at least twice daily, or as necessary. - If re-surfacing of excavated portion of roads cannot be done immediately, spread of crushed gravel over backfilled surfaces - Require trucks delivering aggregates and cement to have (tarpaulin) cover	Contractor	Location of stockpiles; Number of complaints from sensitive receptors; Heavy equipment and machinery with air pollution control devices;	Daily monitoring (when there are ongoing works) by contractor. Monthly visual inspection by RPMO & DSMC-ESS. Air quality monitoring, if

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	work near the sites.	- Limit speed of construction vehicles in access roads to maximum of 30kph. - Ensure use of equipment and fuel complying with applicable emission standards		Certification that vehicles are compliant with air quality standards.	practical and reasonable.
Acoustic environment	Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment materials, and people.	- Involve the local authority and the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. - Restrict high-noise activities at daytime. - Minimize drop heights when loading and unloading coarse aggregates. - Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; - Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufactures' specifications at all times. - All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent type generators (if required) - If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Identify any building at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.	Contractor	Results of monitoring noise levels (Maintain maximum sound levels not exceeding 80 decibels when measured at a distance of 10m or more from the vehicle/s) Number of complaints from sensitive receptors	Daily monitoring (when there are ongoing works) by contractor. Monthly inspection by RPMO & DSMC-ESS. Noise level measurement, on as needed basis and/or if practical and reasonable.
Traffic and local public activities	Excavations, piling, and vehicular movements related to project may disturb traffic movement and day-to-day and specific activities of the local people	- Excavated materials will be removed as soon as possible, and excavations will not be left un-addressed for long/unnecessary time period - Movement of project vehicles, e.g. hauling of spoil, will be scheduled to avoid peak traffic hours of the project area - Signboards on traffic concerns and safety matters will be placed in local language. - Number of workforce will be increased in sensitive sites like schools and public offices so as to complete the works as	Contractor	Records of movement of project vehicles Records of start of excavations and their end so as to instruct if the excavations are left un-addressed for long/unnecessary time period Complaints from the locals (Grievance records)	Visual inspection by RPMO and DSMC-ESS on weekly basis Weekly field monitoring

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		soon as possible. - A traffic management plant will be to be developed by the contractor, and it will be approved by the Consultant.			
Impact on water bodies and water canals	Pollution of water bodies, contamination of water sources due to waste disposal, transport of sediments from worksites and/or construction camps (if any)	- Earthworks generating higher amount of spoil will be conducted during dry season to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. - Location for stock yards for construction materials shall be identified at least 300m away from water courses. Place for storage of fuels and lubricants will be away from any drainage leading to water bodies - Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sediment basins along the drainage leading to the water bodies. - While working across or close to any water body/canal, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse/canal - Proper and timely implementation of design measures to avoid impact of water discharge force at the outfall points of the canals	Contractor	Areas for stockpiles and sites of storage of fuels and lubricants and waste materials; Number of physical measures (like silt traps installed). Visual inspection. Water quality sampling, if practical and reasonable.	Visual inspection by RPMO and DSMC-ESS on weekly basis Weekly field monitoring Water quality monitoring, if practical and reasonable.
Waste disposal	Pollution of water and land resources, and cases of vector borne diseases due to haphazard waste disposal	- Waste minimization and waste segregation will be prioritized - Practices of composting will be promoted - Containment of hazardous waste will be carried out - Proper collection, hauling and disposal of spoil as per spoil management plan	Contractor	On-site situation in campsites (if any), active work sites and their vicinities	Monthly monitoring by RPMO & DSMC-ESS
B. Biological Characteristics					
Flora and fauna	Disturbances to local and migratory birds, reptiles and mammals (The service area is core urban area, so this impact will be minimal)	- No heavy vehicles will be made available to run on the road that may disturb the wildlife of the area - Horn prohibited sign will be placed in nearby wildlife inhabited area - Prohibit workforce from any wood logging, hunting	Contractor	Vehicles running nearby wildlife inhabited area will be monitored Number of complaints from areas near to sensitive receptors on	Monthly visual inspection by RPMO & DSMC-ESS

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		- Providing alternative fuel to workers for cooking.		disturbance of poaching, fishing, etc.	
Aquatic system	Disposal of waste on or nearby water bodies, sediment transport and leakage/disposal of hazardous waste may harm the aquatic lives in/near the rivers/streams of subproject area	- Washing of vehicles on rivers will be restricted - Disposal of waste of any kind on water bodies will be strictly prohibited - Fishing in rivers by the workforce will be strictly prohibited	Contractor	Local streams and rivers (<i>Kauriala khola</i> , <i>Girwa khola</i>) will be monitored (These rivers are not within close proximity of the service area) Any grievances from locals regarding disposal of waste onto water bodies will be referred	Monthly visual inspection by RPMO & DSMC-ESS
C. Socioeconomic Characteristics					
Community activities	The construction related activities that generate dust, noise and impede access will disturb the local residents	- To minimize the disturbances, construction work will be conducted as quickly as possible. - The local residents will be consulted and informed about the work schedule and possible disturbances in advance. - Temporary diversions and signboards will be provided for the pedestrians.	Construction contractor	Time schedule of construction work; Information related to construction activity to local residents Number of temporary diversions sign, signboards etc.	Daily (or whenever there are construction activities) by contractor Monthly visual inspection by RPMO & DSMC-ESS
Social harmony	Poor sanitation practices by workforce may cause pollution of surrounding environment. Social problems may arise due to bad behavior of the workforce such as gambling, alcoholism and disrespect to local people and culture	- Include in workers training adherence to proper housekeeping practices at worksites. - Local people should be given priority to work (recommended that more than 60% local workers whenever available) in the subproject which helps to minimize the chances of cultural discrepancy and conflict due to increased labor from outside.	Construction contractor	Daily entry-sheet of the workforce in the campsites Number of local people versus outside workers in the subproject area will be regularly monitored	Monthly inspection at campsites (if any) by RPMO & DSMC-ESS.
Occupational Health & Safety	During the construction work, the laborers involved in the construction activities may be exposed to different level of health risks and are prone to accidents	- Mandatory use of safety measures (PPEs) such as mask, helmet, hand gloves and rubber boots, etc. - The laborers will be insured for their health and safety. - Provide safe drinking water for labours - First aid box will be kept at a proper and easily accessible place. - Prohibit child labour in all construction activities.	Construction contractor	Availability of personal protective equipment, First-aid facilities, Medical insurance coverage for workers, Housekeeping and condition of sleeping and sanitation facilities at campsite (if any), Roster of workers	Daily (or when there is a construction activity) by contractor. Monthly visual and document inspection by RPMO and DSMC-ESS

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
Community Health & Safety Hazards	Overall, communities will be exposed to cross-cutting threats from construction's impacts on air and water quality, ambient noise level; Chances of accidents, Communicable and transmittable diseases may potentially be brought into the community by construction workers	- Contractor's will maintain adequate space and adequate lighting, temporary fence, barriers and signage at worksites; Hard barricades will be used around deep excavated areas or trenches; - Provide sign boards for pedestrians to inform nature and duration of construction works, safety warnings, and contact numbers for concerns/complaints. - Use metal plates and handrails across trenches or excavated sections in areas needing access to commercial and residential establishments. - Children will be prohibited from active construction sites - Proper fencing of stockpile areas - Awareness programs on communicable diseases and hygiene practices will be carried out - Disseminate the GRM to communities and affected stakeholders during consultations - Sensitive localities in terms of risk of this impact are Bijayanagar, Banagau, locality of Kanya Primary School, park road and other market and core areas	Construction contractor	Number of permanent signs, barricades and flagmen on worksites as per Traffic Management Plan (Annex 2-D); Number of complaints from sensitive receptors; Number of walkways, signs, and metal sheets placed at subproject location	Daily by contractor. Monthly visual inspection by RPMO & DSMC-ESS
Reinstatement and compensation issues	Damage to road, and other public/private facilities	- Reinstatement of damaged facilities to its original state - Any compensation required will be paid through WSUC's coordination	Contractor/WUSC	Records of any grievance from the locals regarding any disturbance or damage on the public properties	Quarterly monitoring by RPMO & DSMC-ESS
3. During Operation and Maintenance Phase					
Blockage of drains	Accumulation of debris and foul odour	- The drainages to be monitored and cleaned regularly - Proper waste management in the open spaces of the town so as to ensure that no littered waste goes into the Storm Water drainage system	Contractor during DLP; WUSC or municipality after DLP	Visual inspection	Daily (or as needed) by the operator. Weekly in small drainages
Disposal of solids/residuals from storm water drains	Haphazard disposal of sludge may pollute the local environment	- Regular cleaning of the drains - Drying and disposal of the sludge in a designated section of the spoil disposal site approved by the municipality - Segregation of plastic, rubber and textile solids from the sludge and dispose them	Contractor during DLP; WUSC or municipality after DLP	Visual inspection	Weekly

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		into municipals waste collection stream			
Community Health and Safety	There could be accidents like falling into open/damaged drains with open surface This also poses risks to animals and vehicles	- Prompt maintenance of the cover slabs, and provision of cover of drains at all the times - Installation of warning sign boards in local languages during maintenance periods and heavy rain periods	Contractor during DLP; WUSC or municipality after DLP	Visual inspection Records of incidents if any, and Grievances from locals	Regular basis; Monthly review of any such cases
Occupational Health and Safety	Health risks for the workers involved in maintenance and cleaning of storm water drains	- Provision of adequate PPEs for the workers - Provision of washing and sanitization facilities for the workers	Contractor during DLP; WUSC or municipality after DLP	Visual inspection Records of incidents if any, and Grievances from locals	Regular basis; Monthly review of any such cases

Environmental Management Plan (EMP) for Faecal Sludge Management Component

Table VIII-2: Environmental Management Plan Matrix for FSM Component

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
1. Prior to Construction Activities					
Consents, permits, clearances, no objection certificate (NOC), etc.	Failure to obtain necessary consents, permits, NOCs, etc can result to design revisions and /or delay/stoppage of works	- Obtain all of the necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. - Acknowledge in writing and provide report on compliance (all obtained consents, permits, clearance, NOCs, etc.)	PMO, RPMO, & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Existing utilities	Disruption of services	- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction - Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. - Require contractors to prepare spoils management plan (see Annex 2-D for outline).	DSMC, RPMO	List of affected utilities and operators; Bid document to include requirement for a contingency plan for service interruptions	During detailed design phase
Faecal sludge treatment plant	Pollution and odour concerns of FSTP	- Ensure design includes (i) appropriate lining to avoid seepage of wastewater; (ii) appropriate number of treatment chambers; and - Establishing of effluent quality - Adequate facilities for washing for the workers during operation phase	PMO, RPMO, & DSMC	Incorporated in final design and communicated to contractors	Prior to award of contract
Construction camps, stockpile areas, storage areas, and disposal areas	Occupational Safety aspects Disturbance to local community activities	- Adequate provisions for the workers in the campsites - Determine locations prior to award of construction contracts	DSMC, RPMO	Incorporation of campsite requirements in the BoQ List of selected sites for construction work camps, stockpile areas, storage areas, and disposal areas. Written consent of landowner/s (not lessee/s) for reuse of excess spoils to agricultural land	During detailed design phase
EMP Implementation Training	If no training is done, there is a possibility of the EMP not	- Project manager and contractors to undergo training on EMP implementation, including standard operating procedures	PMO, RPMO and DSMC. Contractor's	Record of completion (Safeguards Compliance	During detailed design phase prior to mobilization of workers to site.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	implemented efficiently and accurately, leading to unfavorable impacts to environment, workers and community.	(SOP) and occupational health and safety (OHS) for construction works. - Timely implementation of the EMP. - Development and execution of measures for any unanticipated environmental impacts.	Environmental Supervisor	Orientation or Training)	
2. During Construction Activities					
A. Physical Characteristics					
Topography and landforms	Surface cutting and excavation works causing changes in local land surfaces	- Precautionary measures such as: (i) reuse of excavated soil, (ii) immediate and proper backfilling of the trenches, (iii) the excavated soil temporarily stored properly, and (iv) spoil to be used for land reclamation in the town	Contractor	Records of stock piles; Site of FSTP	Daily (or as often as necessary especially during monsoon or rains) by contractor. Monthly visual inspection by RPMO and DSMC-ESE.
Ambient air	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of pollutants in ambient air which will affect people who live and work near the sites.	- Water sprinkling at dry exposed surfaces and stockpiles of aggregates as necessary. - Require trucks delivering aggregates and cement to have tarpaulin cover - Limit speed of construction vehicles in access roads to maximum of 30kph. - Maintenance of vehicles on regular basis - Ensure use of equipment and fuel complying with applicable emission standards	Contractor	Location of stockpiles; Number of complaints from sensitive receptors; Heavy equipment and machinery with air pollution control devices; Certification that vehicles are compliant with air quality standards.	Daily monitoring (when there are ongoing works) by contractor. Monthly visual inspection by RPMO & DSMC-ESS. Air quality monitoring, if practical and reasonable.
Acoustic environment	Temporary increase in noise level and vibrations may be caused by excavation equipment, and the transportation of equipment materials, and people.	- Involve the local authority and the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. - Restrict noisy activities at daytime. - Minimize drop heights when loading and unloading coarse aggregates. - Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; - Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensure that these are maintained to manufactures' specifications at all times. - All vehicles and equipment used in	Contractor	Results of monitoring noise levels (Maintain maximum sound levels not exceeding 80 decibels when measured at a distance of 10m or more from the vehicle/s) Number of complaints from sensitive receptors	Daily monitoring (when there are ongoing works) by contractor. Monthly inspection by RPMO & DSMC-ESS. Noise level measurement, on as needed basis and/or if practical and reasonable.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		construction shall be fitted with exhaust silencers. Use silent type generators (if required) - If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Identify any building at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.			
Impact on water bodies and water canals	Pollution of water bodies, contamination of water sources due to waste disposal, transport of sediments from worksites and/or construction camps (if any)	- Earthworks generating higher amount of spoil will be conducted during dry season to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. - Location for stock yards for construction materials shall be identified at least 300m away from water courses. Place for storage of fuels and lubricants will be away from any drainage leading to water bodies - Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sediment basins - While working across or close to any water body/canal, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, are disposed in a manner that may block the flow of water of any watercourse/canal - Proper and timely implementation of design measures to avoid impact of water discharge force at the outfall points of the canals	Contractor	Areas for stockpiles and sites of storage of fuels and lubricants and waste materials; Number of physical measures (like silt traps installed). Visual inspection in the Banagaun area along Jamara Canal Water quality sampling, if practical and reasonable.	Visual inspection by RPMO and DSMC-ESS on weekly basis Weekly field monitoring Water quality monitoring, if practical and reasonable.
Waste disposal	Pollution of water and land resources, and cases of vector borne diseases due to haphazard waste disposal	- Waste minimization and waste segregation will be prioritized - Practices of composting will be promoted - Containment of hazardous waste will be carried out	Contractor	On-site situation in campsites (if any), work sites and their vicinities	Monthly monitoring by RPMO & DSMC-ESS
B. Biological Characteristics					
Vegetation	Loss of vegetation cover during construction works and laying of the	- Greenery promotion around the construction sites and road alignments where possible	Contractor	Area of greenery that has been cleared Number of trees cut	Monthly monitoring by RPMO & DSMC-ESS

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	pipelines (Around 20 to 25 trees are expected to be felled)	- Tree felling will be avoided, and if any such cases occur, prior approval from the local bodies will be received and compensatory plantation @ 1:10 will be carried out - Trees of local economic value and aesthetic significance will be planted under compensatory plantation - Locally demanded species (with non-timber values) will be promoted during compensatory plantation		(only if unavoidable) Complaints or grievances by the locals	
Impacts on flora and fauna	Disturbances to local and migratory birds, reptiles and mammals	- No heavy vehicles will be made available to run on the road that may disturb the wildlife of the area - Horn prohibited sign will be placed in nearby wildlife inhabited area - Prohibit workforce from any wood logging, hunting - Designating stockpiling areas - Providing alternative fuel to workers for cooking.	Contractor	Vehicles running nearby wildlife inhabited area will be monitored Number of complaints from sensitive receptors on disturbance of poaching fishing, etc.	Monthly visual inspection by RPMO & DSMC-ESS
Aquatic system	Disposal of waste on or nearby water bodies, sediment transport and leakage/disposal of hazardous waste may harm the aquatic lives in the rivers/streams of subproject area	- Washing of vehicles on rivers will be restricted - Disposal of waste of any kind on water bodies will be strictly prohibited - Fishing in rivers will be prohibited for workforce	Contractor	Local rivers will be monitored; Any grievances from locals regarding disposal of waste onto water bodies will be referred	Monthly visual inspection by RPMO & DSMC-ESS
C. Socioeconomic Characteristics					
Community activities	The construction related activities that generate dust, noise and impede access will disturb the local residents	- To minimize the disturbances, construction work will be conducted as quickly as possible. - The local residents will be consulted and informed about the work schedule and possible disturbances in advance. - Temporary diversions and signboards will be provided for the pedestrians.	Construction contractor	Time schedule of construction work; Information related to construction activity to local residents Number of temporary diversions sign, signboards etc.	Daily (or whenever there are construction activities) by contractor Monthly visual inspection by RPMO & DSMC-ESS
Social harmony	Poor sanitation practices by workforce may cause pollution of surrounding environment. Social problems may arise due to bad behavior of the workforce such as gambling, alcoholism	- Include in workers training adherence to proper housekeeping practices at worksites. - Local people should be given priority to work (recommended that more than 60% local workers whenever available) in the subproject which helps to minimize the chances of cultural discrepancy and	Construction contractor	Daily entry-sheet of the workforce in the campsites Number of local people versus outside workers in the subproject area will be regularly monitored	Monthly inspection at campsites (if any) by RPMO & DSMC-ESS.

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
	and disrespect to local people and culture	conflict due to increased labor from outside.			
Occupational Health & Safety	During the construction work, the laborers involved in the construction activities may be exposed to different level of health risks and are prone to accidents	- Mandatory use of safety measures (PPEs) such as mask, helmet, hand gloves and rubber boots, etc. - The laborers will be insured for their health and safety. - Provide safe drinking water for labours - First aid box will be kept at a proper and easily accessible place. - Prohibit child labour in all construction activities.	Construction contractor	Availability of personal protective equipment, First-aid facilities, Medical insurance coverage for workers, Housekeeping and condition of sleeping and sanitation facilities at campsite (if any), Roster of workers	Daily (or when there is a construction activity) by contractor. Monthly visual and document inspection by RPMO and DSMC-ESS
Community Health & Safety Hazards	Overall, communities will be exposed to cross-cutting threats from construction's impacts on air and water quality, ambient noise level; Chances of accidents, Communicable and transmittable diseases may potentially be brought into the community by construction workers	- Contractor's will maintain adequate space and adequate lighting, temporary fence, barriers and signage at worksites; - Children will be prohibited from active construction sites - Proper fencing of stockpile areas - Awareness programs on communicable diseases and hygiene practices will be carried out - Disseminate the GRM to communities and affected stakeholders during consultations - Sensitive localities in terms of risk of this impact is Banagaun locality	Construction contractor	Number of permanent signs, barricades and flagmen on worksites as per Traffic Management Plan (Annex 2-D); Number of complaints from sensitive receptors; Number of walkways, signs, and metal sheets placed at subproject location	Daily by contractor. Monthly visual inspection by RPMO & DSMC-ESS
3. During Operation and Maintenance Phase					
Effluent discharge	Water Pollution if the plant doesn't function properly (this is only a possible risk, not a regular case)	- Regular cleaning and maintenance of different components of the treatment plant - Effluent quality will be regularly monitored - Development of Standard Operations Procedures/and Operation of the FSTP as per the O&M Manual	Contractor during DLP; WUSC or municipality after DLP	Visual inspection Water Quality reports FSTP records in the logbook	Daily visual inspection Weekly effluent sampling and quality monitoring
Sludge removal and its disposal	Pollution of the nearby water sources and land pollution; odour nuisance	- Periodic desludging to be carried out - Sludge will be handled only by designated trained team - Covered containers will be used for collecting sludge	Contractor during DLP; WUSC or municipality after DLP	Visual inspections Inspection of records/logbook of FSTP operations unit	

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		- Sludge will be disposed to the sludge drying bed. - Dried sludge from the FSTP can be converted to briquettes that can be used as cooking fuels and or powder of dried sludge can be used as organic fertilizer or soil conditioner. For this Tikapur Municipality office will coordinate with District Agriculture Development Office, Kailali. If these options are not possible, the sludge will be disposed in the final solid waste disposal site of the municipality. This will be carried out as per government's laws and policies. - Lime spraying in sludge will be carried out to suppress the foul odour.			
Odour nuisance from FSTP	Foul odour causing public nuisance	- Operate as per standard operations procedures; and use of lime in the sludge drying bed - Maintaining green belt around the FSTP site so as to reduce the odour - Plantation of aromatic plants (e.g. <i>Murraya paniculata</i>, <i>Magnolia champaca</i>) around the FSTP as green belt will also be done to reduce the odour nuisance	Contractor during DLP; WUSC or municipality after DLP	Frequency of spray of lime. Status of green belt around the FSTP. Complaints from locals.	Weekly by DSMC team during the 1 st year Weekly by WUSC/Municipality during the later phase of operations
Occupational Health and Safety	Risk of physical and biological hazards for the workers in FSTP	- Provision of standard set of PPEs containing masks, face shield/visor, water proof gloves, boots, safety goggles and working suit - Provision of adequate welfare facilities including clean water, soap, nailbrushes, disposable paper towels and washing facilities. - Provision of First Aid Kits. Provisions should include clean water or sterile wipes for cleansing wounds, and a supply of sterile, waterproof, adhesive dressings. - Regular supervision and monitoring of provision and use of PPEs - Under the context of possibility of spread of the viral infections, the workers will be instructed for (a) compulsory use of masks along with other PPEs, (b) adequate supply of water for drinking & washing, (c) screening of health conditions of the			

Field	Impacts	Mitigations Measures	Responsible for Implementation	Monitoring Indicator	Frequency of Monitoring
		workers			
Risk of community hazards	There could be accidents like falling into open/damaged drains with open surface. This also poses risks to animals and vehicles.	- Restriction of unauthorized entry of people in the treatment plant area - Installation of warning sign boards in visible locations, and in local languages during maintenance periods and heavy rain periods - Under the context of possible spread of the viral infections, the workers will be instructed to have minimal contact with the community people.	Contractor during DLP; WUSC or municipality after DLP	Visual inspection Records of any accidents, and grievance records	For first year, DSMC After that WSUC daily inspection or as needed.
Faecal sludge collection from municipal sources	Pollution due to littering/leakage; health risks to workers and service community	- Operation Guidelines for workers involved in collection, hauling and disposal of faecal sludge - Orientation to the workers on the standard operation procedures - PPEs including masks, gloves, boots, and hard-hats, face and eye protection equipments of proper specifications - workers will be restricted from smoking during the entire process of collection, transfer and disposal - Provide with disinfectants, barriers, sorbents and bags for cleaning up and collecting spilled material. - Use of water for washing/flushing the solid/non-biodegradable solids - Clean up any spillage in the area around the inlet after completing the discharge of FS - Hygiene practices (e.g. hand washing) after completion of the works	Contractor during DLP; WUSC or municipality after DLP	Visual inspection Records of any spillage/leakage, and grievance records from service receivers	For first year, DSMC After that WSUC daily inspection or as needed.

C. Environmental Monitoring Program

217. Environmental monitoring will be done during construction at three levels:
- (i) Monitoring development of project performance indicators by the PMO-ESS;
 - (ii) Monitoring implementation of mitigation measures by the Contractor; and
 - (iii) Overall regulatory monitoring of environmental issues by the PMO.

218. In addition to regular monitoring onsite (at town level) by the ICG and DSMC-ESS on the EMP implementation of the mitigation measures, monitoring of key environmental parameters is proposed. The environmental monitoring plan will be similar for both the components. Table VIII-3 presents the indicative environmental monitoring plan for the subproject which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsible agencies.

Table VIII-3: Environmental Pollution Monitoring Program

SN	Field	Stage	Parameters	Location (as relevant)	Frequency	Standards	Responsibility
1.	Air quality	- Prior to construction to establish baseline - Construction phase	TSP and PM ₁₀ /PM _{2.5} SO ₂ (only if potential source is due to subproject) NO _x (only if potential source is due to subproject)	- Work site locations - Along storm water drainage alignment at major urban centers - FSTP construction site - Construction campsite locations	24-hour monitoring once in a season (except monsoons) for the construction period	National Ambient Air Quality Standards, 2003	Contractor
2.	Noise and vibration levels	- Prior to construction to establish baseline - Construction phase	Equivalent day and nighttime noise levels	- PTWs location - Along storm water drainage alignment at major urban centers - FSTP construction site - Construction campsite locations	Once in a season (except monsoons) for the construction period	National Noise Standard Guidelines, 2012	Contractor
3.	Water quality (for storm water drainage component)	- Prior to construction to establish baseline - Construction phase	Drinking water parameters; TSS in effluent	- Adjacent to construction sites - Outfalls of the storm water drains	- Twice a year - During post construction phase	- National Drinking Water Quality Standards, 2005 - Effluent criteria (GoN)	Contractor
4	Water quality (for faecal sludge management component)	- Prior to construction to establish baseline - Construction phase	TSS, pH, BOD, <i>faecal coliform</i> , DO	- Adjacent to construction sites - Effluent outlets of FSTP	- Twice a year - During post construction phase	- National Drinking Water Quality Standards, 2005 - Effluent criteria (GoN)	Contractor

D. Institutional Capacity Development Program

219. Considering the limited capability of the project's key players in environmental management, technical assistance from environmental specialists and capacity development during loan implementation will be needed. Capacity development will consist of hands-on training in implementing the responsibilities in EMP (as well as in EARF) implementation, complemented with a short-term series of lectures/seminars on relevant topics.

220. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work site. The proposed training project along with the frequency of sessions is presented in Table VIII-4. The Environmental Safeguard specialist & EMP Field Monitoring Staffs are responsible for organizing different training program for Environmental Management in both the components.

Table VIII-4: Training Program for Environmental Management

Items	Pre-construction/prior to construction	Construction	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staff	Experiences and best practices sharing
Purpose	To make the participants aware of the environmental safeguard requirements of ADB and GON and how the project will meet these requirements	To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GON	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	Module 1: Orientation • ADB Safeguards Policy Statement • Government of Nepal Environmental Laws and Regulations Module 2: Environmental Assessment Process • ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements • Review of environmental assessment report to comply with ADB requirements • Incorporation of EMP into the project design and contracts	• Roles and responsibilities of officials/contractors/consultants towards protection of the environment • Environmental issues during construction • Implementation of EMP • Monitoring of EMP implementation • Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by PMO, ICGs, and (provide if DRTAC or DSMC)
Participants	Executing and implementing agencies, PMO, and PMO staff (technical and environmental) involved in the project implementation	PMO ICGs Contractors	PMO ICGs Contractors

221. The following table provides the cost of capacity building for this project;

Table VIII-5: Indicative Cost of Capacity Building

Table VIII-3: Indicative Cost of Capacity Building							
	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Cost covered by
A	Capacity Building						
	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguards Policy Statement, GoN environmental laws and regulations, and environmental assessment process; (ii) induction course contractors, preparing them on EMP implementation and environmental monitoring requirements (iii) lessons learned information sharing	Module 1 – immediately upon engagement of the (provide if DRTAC or DSMC) environmental specialists Module 2 – prior to award of civil works contracts (twice a year for 4 years) Module 3 - Upon completion of the project	lump sum	1 8 1	Module 1 – 300000.00 Module 2 – 100000.00 Module 3 – 200000.00	300,000.00 800,000.00 200,000.00	Covered under DRTAC or DSMC contract
TOTAL						1,300,000.00	

E. Staffing Requirement and Budget

222. Costs required for implementing the EMP will cover the following activities:

- (i) Updating IEE, preparing and submitting reports and public consultation and disclosure;
- (ii) Application for environmental clearances; and
- (iii) Implementation of EMP, environmental monitoring program and long-term surveys.

223. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PMO-ESS assisted by the PMO environmental safeguard officer. Therefore, no separate budget is required for the PMO-ESS.

224. The cost of mitigation measures and surveys during construction stage will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors. The indicative costs of EMP implementation in both packages are shown in Table VIII-6 and Table VIII-7 (by source of funds).

Table VIII-6: Indicative Cost of EMP Implementation for Storm Water Drainage Component

S N	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Remarks
1	Protection/Reinstatement works	Construction phase				520,000.00	
2	Compensation costs	Construction phase				375,000.00	
3	Air quality monitoring	- Pre-construction - Construction	Per location	4	30,000.00	120,000.00	
4	Noise levels monitoring	- Pre-construction - Construction	Per location			50,000.00	
5	Water Quality Test	Pre-construction - Construction	Project area At outfalls	12 Lump sum	5000.00	60,000.00 50,000.00	
6	Public consultations, and information disclosure	Information disclosure and consultations including public awareness campaign through media	As per requirement	Lump sum		75,000	
7	Awareness and sensitization on environmental aspects, environmental sanitation, health & safety aspects along with material support	Community awareness and awareness of the workforce		Lump sum		150,000	
8	Water Sprinkling	During dry seasons, during heavy plying of construction vehicles, near sensitive areas		Lump sum		200,000	
9	GRM implementation	Meetings, consultations, communication, and information dissemination		Lump sum		25,000	
10	Any unanticipated impact due to project implementation	Mitigations approved by DSC team					As per civil works contract provisions
TOTAL						1,625,000.00	

Out of a total of NPR 1,625,000 will be required for implementation of environmental mitigation and monitoring works for the subproject.

Table VIII-7: Indicative Cost of EMP Implementation for Faecal Sludge Management Component

S N	Particulars	Stages	Unit	Total Number	Rate (NPR)	Cost (NPR)	Remarks
1	Protection/Reinstatement works	Construction phase				500,000.00	
2	Greenery management/Promotion	Construction phase				425,000.00	
3	Air quality monitoring	- Pre-construction - Construction	Per location	5	30,000.00	150,000.00	
4	Noise levels monitoring	- Pre-construction - Construction	Per location			50,000.00	
5	Water Quality Test	Pre-construction - Construction	Per Location	20	5000.00	100,000.00	
6	Public consultations and information disclosure	Information disclosure and consultations including public awareness campaign through media	As per requirement	Lump sum		50,000	
7	Awareness and sensitization on environmental aspects, health & safety aspects along with material support	Community awareness and awareness of the workforce				250,000	
8	GRM implementation	Meetings, consultations, communication, and reporting/information dissemination		Lump sum		25,000	
9	Any unanticipated impact due to project implementation	Mitigations approved by DSC team					As per civil works contract provisions
TOTAL						1,550,000.00	

A total of NPR 1,550,000 will be required for implementation of environmental mitigation and monitoring works for the subproject.

IX INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Information Disclosure, Consultations and Participations

225. Stakeholder consultation and participation was an essential process in project preparation and IEE study. The process in engaging stakeholders and affected people involved key informant interviews, on-site discussions with WUSC, and random field interviews of stakeholders. Table IX-1 lists the persons consulted during the IEE Study.

Table IX-1: Lists of People and Institutions Consulted

SN	Name	Organization/Address
1	Mr. Bhairab Sing Rawal	Chairperson, Tikapur WUSC
2	Mr. Gopiram Jaisi	Vice-chairperson, Tikapur WUSC
3	Mr. Naresh Kumar Khatri	Secretary, Tikapur WUSC
4	Mr. Bishram Tharu	Treasurer, Tikapur WUSC
5	Mr. Kriti Bahadur Rokaya	Member, Tikapur WUSC
6	Mr. Balbahadur Kami	Member, Tikapur WUSC
7	Ms. Sarita Rawal Thapa	Member, Tikapur WUSC
8	Ms. Shrijana Sharma Pandit	Member, Tikapur WUSC
9	Ms. Krishni Chaudhari	Member, Tikapur WUSC
10	Mr. Dambar Bi.Ka.	Account Officer, Tikapur WUSC
11	Mr. Jhapat Bahadur Sodari	Beneficiary, Tikapur
12	Mr. Rang Prasad Adhikari	Beneficiary, Tikapur
13	Ms. Laxmi Bista	Beneficiary, Tikapur
14	Mr. Nripraj Bhandari	Beneficiary, Tikapur
15	Mr. Hridayaraj Regmi	Beneficiary, Tikapur
16	Mr. Mohan Sing Rawal	Beneficiary, Tikapur
17	Ms. Sita Chaudhari	Beneficiary, Tikapur

226. During the IEE preparation, consultations were undertaken (Annex 5). The following table presents lists of public consultation with details and discussions;

Table IX-2: List of Public Consultations and their Summary

SN	Meeting	Date	Location	Outcomes
1	Preliminary consultation	18 th January 2020	WUSC office, Ward 1	The consensus was built on processing for the documentation of consent from local stakeholders as it was explained that no negative impacts would be there on socio-economic aspects of the project area.
2	Public Consultation	31 st January 2020	WUSC office, Ward 1	Details of potential environmental implications were discussed in relation to the project components and design. Mitigation measures were discussed in detail.

227. Stakeholder consultations will continue throughout the implementation of the subprojects and its operations. All stakeholders must be invited and encouraged to participate in community consultations. To facilitate the engagement of stakeholders, the PMO and ICG will maintain good communication and collaboration with WUSC and the Municipality. PMO, ICG, Contractors and/or WUSC will be open to the public to contact on matters concerning the progress of the subprojects, adverse impacts, mitigation measures and environmental monitoring and grievances. Future stakeholder consultations will be as follows:

- During the construction stage , if there would be a major change in design/alignment/location, the PMO and ICG will hold at least one public consultation meeting early on in the construction period to solicit perceived impacts, issues, concerns and recommendations from affected communities;
- Prior to construction, the PMO and ICG will conduct an intensive information, education and communication (IEC) campaign to ensure sufficient level of awareness/information among the affected communities regarding the upcoming construction, its anticipated impacts, the grievance redress mechanism, contact details and location of the PMO and ICG, and status of compliance with the Government's environmental safeguard requirements, among others, are attained/provided. Billboards about the subproject, implementation schedule and contact details of the executing agency, PMO-ES, ICG-ESA and Contractors will have been set up at strategic locations within the subprojects' main areas of influence. The grievance redress procedure and details will have been posted at the offices of the ICG, WUSC and Municipality;
- During construction, regular random interviews will be conducted by the ICG-ESA every month to monitor environmental concerns of subproject communities;
- During operation, periodic random interviews will be conducted by the ICG and WUSC to monitor the environmental concerns of subproject communities;
- The public consultations and information disclosure will be continuous throughout the project cycle. PMO and ICG will be responsible for designing and implementing such aspects on the ground. Consultation activities will be conducted by the DSMC team also to convey the final detailed design of the drainage component and FSTP component.

228. Consents for drainage component has been received from municipality and the *Rani Jamara Kulariya Irrigation Project*, and the local *Jamara Branch Canal Irrigation User Committee*. Likewise, consent for land for FSTP site has been received from the municipality office (Annex 5). The GoN-approved IEE Report (in English), will be available at the offices of the PMO, ICG and WUSC for the perusal of interested parties. Copies may be made available upon formal request. The approval of the IEE is in its process. The IEE and environmental monitoring reports will be disclosed on the ADB's and UWSSP website.

B. GRIEVANCE REDRESS MECHANISM

229. A project-specific GRM will be established to receive, evaluate and facilitate resolution of affected persons' concerns, complaints, and grievances related to social, environmental and other concerns on the project. The GRM will aim to provide a time-bound and transparent mechanism to resolve such concerns. Grievances may be channelled through letters, emails, text messages (SMS), verbal narration, grievance boxes and registers. Suggested template for grievance redress form is in Annex 2-B.

230. A common GRM will be in place for social, environmental or any other grievances related to the subproject. The GRM will provide an accessible forum for receiving and facilitating resolution of affected persons' grievances related to the project. Project will publish the sample grievance registration form on its website, and publish it in local language and/or indigenous people dialect, at the hoarding board of each of the participating WUA or municipalities' office. Every grievance shall be registered with careful documentation of process adopted for each of the grievance handled, as explained below. The environmental and social safeguards officer (ESO/SSO) at the PMO will have the overall responsibility for timely grievance redress on environmental and social safeguards issues. The Social Safeguards Officer at the RPMO will be the focal person for facilitating the grievance redress at the local level.

231. A municipal-level public awareness campaign will be conducted on a regular basis as per the communication strategy of the project to ensure awareness on the project and its GRM. The social and environmental safeguards experts of the project management and quality assurance consultant (PMQAC) and regional design, supervision and management consultants (RDSMCs) will support the WUA or municipalities in conducting municipality-wide awareness campaigns, which will ensure that all stakeholders including poor and vulnerable are aware of the GRM and project's entitlements.

232. A grievance redress committee (GRC) will be formed at the Municipality level, comprising the Mayor as Chairperson of GRC, and Regional Project Manager RPMO as Secretary. The GRC members will comprise of (1) WUSC Secretary; (2) RPMO Engineer; (3) RPMO social /environmental (as relevant) officer, (4) representative of affected persons, (5) RDSMC's safeguards specialist (social/environment as relevant), (6) a representative of reputable and relevant CBO/SHG/organization working in the subproject area as invitee,²¹ and (7) contractor's representative. The secretary of the GRC will be responsible for convening timely meetings and maintaining minutes of meetings. The concerned social safeguards expert of RDSMC will support the RPMO safeguard's officer and Project Manager of RPMO to ensure that grievances, including those of the poor and vulnerable are addressed. All GRCs shall have at least two women committee members. Along with representatives of the affected persons, civil society and eminent citizens can be invited as observers in GRC meetings. The formation of the GRCs in all three levels will be notified to the local stakeholders and community level.

233. The functions of the local GRC are as follows: (i) provide support to affected persons on problems arising from environmental or social disruption; asset acquisition (if necessary); and eligibility for entitlements, compensation and assistance; (ii) record grievances of affected persons, categorize and prioritize them and provide solutions within 15 days of receipt of complaint by WUA or local bodies; and (iii) ensure feedback to the aggrieved parties about developments regarding their grievances and decisions of the GRC. The GRM procedure is depicted in Figure 5, and is outlined below in detail, with each step having time-bound schedules and responsible persons to address grievances and indicating appropriate persons whose advice is to be sought at each stage, as required. If affected persons are not satisfied with the response they can elevate it to the next level:

- (i) **First Level of GRM (WUA level):** The first-level, which is also the most accessible and immediate venue for quick resolution of grievances will be the contractors, RDSMC field engineers and RPMO supervision personnel, who will immediately inform the WUA. Any person with a grievance related to the project works can contact UWSSSP to file a complaint. The municipal-level field office of the RPMO, in WUA's building, will document the complaint within 24 hours of receipt of complaint in the field, and WUA or local bodies will immediately address and resolve the issue at field-level with the contractor, supervision personnel of RPMO and RDSMC field engineers within 5 days of receipt of a complaint/grievance. The assigned RDSMC's Social Mobilizer will be responsible to fully document: (i) name of the person, (ii) date of complaint received, (iii) nature of complaint, (iv) location and (v) how the complaint was resolved as well as to provide feedback to the complainant. If the complaint remains unresolved at the local level within 5 days, the WUA will forward the complaint to the municipality level GRM.
- (ii) **Second Level of GRM (Municipality level):** The complainant will be notified by the WUA that the grievance is forwarded to the Municipality-level GRC. The Municipality-level GRC will be called for a meeting, called and chaired by the Mayor. The GRC will recommend corrective measures at the field level and assign clear responsibilities for implementing its decision within 10 days of receipt of complaint by WUA. If the grievance remains unresolved within 10 days of receipt

²¹ If the complaints are related with IP/Dalits/other vulnerable groups, specific NGO/CBO that actively involved in development of these communities shall be involved.

of complaint by WUA, the matter will be referred to the third level. The RPMO Engineer will be responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings, providing feedback to complainants and taking follow up actions so that formal orders are issued and decisions are carried out.

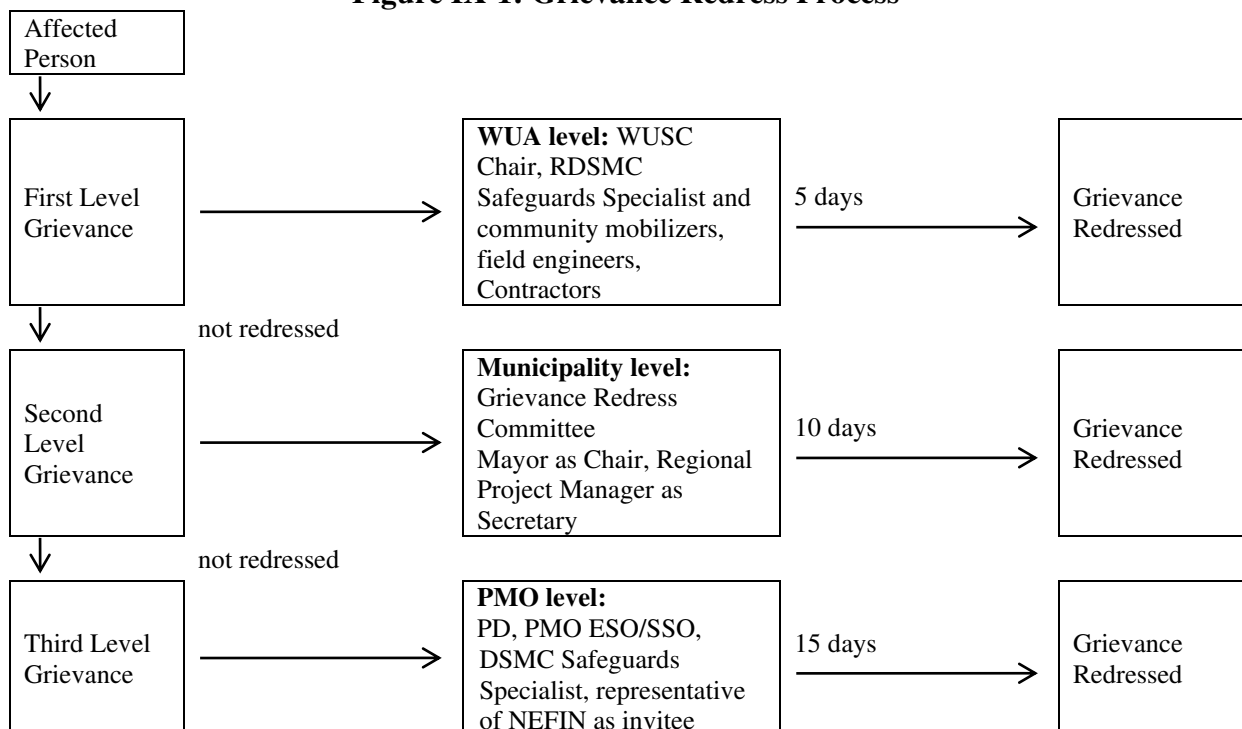
- (iii) **Third Level of GRM (PMO Level):** Any unresolved or major issues at Municipality level will be referred to the PMO for final solution. A representative of the Nepal Foundation for Indigenous Nationalities (NEFIN) will be invited to attend any meetings related to resolution of Indigenous Peoples grievances. Decision has to be made within 15 days of receipt of complaint from the Municipality-level GRC. The Project Director will sign off on all grievances received by the PMO. The concerned Deputy Project Director (DPD) and environmental and social safeguards officers (ESO and SSO) of PMO will be involved with support from the PMQAC's social/environment safeguards experts. The SSO will be responsible to convey the final decision to the complainant.

234. All paperwork (details of grievances) needs to be completed by the WUA member secretary assisted by RDSMC and circulated to the WUA Chairperson and members. At Municipality level, the RPMO Engineer will be responsible for circulation of grievances to the Regional Project Manager, DWSSM, Mayor and other GRC members, prior to the scheduled meetings. The RPMO's Engineer will be responsible for follow-through of all escalated grievances. All decisions taken by the GRC will be communicated to the affected persons by the RPMO's SSO.

235. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

236. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use ADB's Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Nepal Resident Mission. The complaint can be submitted in any of the official languages of ADB's developing member countries (DMCs). The ADB's Accountability Mechanism information will be included in UWSSSP Information Datasheet (PID), to be published in web and distributed to the affected communities, as part of the project GRM.

Figure IX-1: Grievance Redress Process



DSMC = design, supervision and management consultant; ESO=environmental safeguards officer; NEFIN = Nepal Federation of Indigenous Nationalities; PD = project director; PMO = project management office; RDSMC = regional design, supervision and management consultant; SSO = social safeguards officer; WUA = water users' association; WUSC = water users' and sanitation committee.

237. **Record Keeping and Disclosure.** Records at the municipal-level will be kept by the concerned WUA or local bodies member secretary, assisted by RDSMC, of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions and the date of the incident and final outcome. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PMO office, WUA, and on the web, as well as reported in the safeguards monitoring reports submitted to ADB on a semi-annual basis. For any grievance escalated to RPMO/ Municipality level, the RPMO's Engineer assigned as GRM focal person will be responsible for record-keeping, calling of GRC meetings and timely sharing of information with WUA or municipalities. For grievances escalated to PMO and above, the PMO's SSO will be responsible for maintenance of records, sending copies to RPMO and WUA for timely sharing of information with the person filing complaint.

238. **Periodic Review and Documentation of Lessons Learned.** The PMO's SSO will periodically review the functioning of the GRM at municipality or WUA level and field level and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances. Indicators pertaining to grievance redress (no. of grievances received, no. redressed/resolved to be reported by Member Secretary, WUA to RPMO SDO, and by RPMO to PMO SSO) in monthly and quarterly progress reports.

239. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) at local (field/ward/municipal) level will be borne by the concerned focal organizations at each level: WUA at local level, and municipality at municipal level; and PMO at central level. Cost estimates for grievance redress are included in resettlement cost estimates.

Table IX-3: Suggested Format for Record Keeping of Grievances

SN	Date of receipt of grievance	Name and contact details of complainant	Description of complaint	Nature of complaint	Decisions taken	Response given to complainant and date	Whether closed

X MONITORING AND REPORTING

240. RPMO will monitor and measure the progress of EMP implementation. The monitoring activities will relate to the subproject's impacts that are identified in IEE. PMO, ICGs will compare the works completed and deviations from the original scope. They will also undertake site inspections and review documents to verify that the project complies with the EMP.

241. RPMO will submit monthly monitoring and implementation reports to PMO, who will take follow-up actions, if necessary. PMO will submit semi-annual monitoring reports to ADB. Project budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue on an annual basis. Monitoring reports will be posted in a location accessible to the public.

242. The PMO will retain external experts to verify its monitoring information. PMO-ESS will document monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan, and for each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by the PMO-ESO, with support from PMO-ESS. The budget of NPR 500,000 should be allocated under the Civil Works contract for any third party monitoring through ministry level (MoWS or/and MoFE).

243. ADB will review the project performance against MOWS's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

- (i) conduct periodic visits to projects with adverse environmental or social impacts;
- (ii) conduct supervision and review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
- (iii) review the periodic monitoring reports submitted by EAS to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
- (iv) work with EAS to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance; and
- (v) prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

244. ADB's monitoring and supervision activities are carried out on an on-going basis until a Project Completion Report (PCR) is issued. ADB issues a PCR within 1-2 years after the project is physically completed and in operation.

245. The contractor will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The contractor needs to conduct regular monitoring of environmental status, compliance and standards in its working sites and campsites. This needs to be included in monthly reporting to the PMO Consultant in the format prescribed by the PMO Consultant. The Contractor shall facilitate for field visits in any and all monitoring activities planned by the PMO consultants, PMO / RPMO personnel and the ADB.

XI CONCLUSION AND RECOMMENDATIONS

246. Field study and analysis of the environmental aspects of the proposed project shows that the proposed project is not an environmentally critical intervention. The IEE shows that;

- The proposed Tikapur Storm Water Drainage and Faecal Sludge Management Project and its components are not within environmentally sensitive area. However, the project will follow the provisions and requirements not to disturb any environmentally sensitive receptors.
- There will be some adverse impacts of the project implementation. However, the extent of adverse impacts is expected to be local, confined within the projects' main areas of influence, and the routes to and from these sites. With the EMP in place, the potential adverse impacts will either be eliminated or minimized to insignificant levels through appropriate measures.
- The few adverse impacts of significance during construction will be temporary and short-termed (i.e. most likely to occur only during peak construction periods). These will not be sufficient to threaten or weaken the surrounding resources.
- During operation, the potential risks of odour nuisance can be mitigated through good operation and maintenance, prompt action on damages, and complying with the required quality monitoring.
- The proposed subproject will bring about the benefits of improved environmental sanitation and in overall it will enhance community health to support ensure improved quality of life as final outcome. Implementation of the subproject will help attract more urban sanitation investments in that belt of Sudurpashchim Province.

247. Based on the above findings, the classification of Tikapur Storm Water Drainage and Faecal Sludge Management Project as Category B is confirmed, and no further special study or detailed EIA needs to be undertaken.

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**ANNEX 1: REA Checklist
&
No Mitigation Scenario Checklists**

ANNEX 1: REA CHECKLISTS OF TIKAPUR STORM WATER DRAINAGE AND FAECAL SLUDGE MANAGEMENT PROJECT

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST Drainage Component

Instructions

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: Nepal/Urban Water Supply and Sanitation (Sector) Project/Tikapur Drainage Project

Subproject: Urban Development/Sanitation

Screening Questions	Yes	No	Remarks
A. PROJECT SITING IS THE PROJECT AREA...			
▪ DENSELY POPULATED?		√	The population density is 6.43 per hectare which is not densely populated condition. The core area is slightly denser.
▪ HEAVY WITH DEVELOPMENT ACTIVITIES?		√	There are only small scale development activities going on.
▪ ADJACENT TO OR WITHIN ANY ENVIRONMENTALLY SENSITIVE AREAS?		√	Buffer Zone of Bardiya National Park lies around 5 km from the project area
• CULTURAL HERITAGE SITE		√	
• PROTECTED AREA		√	
• WETLAND		√	
• MANGROVE		√	
• ESTUARINE		√	
• BUFFER ZONE OF PROTECTED AREA		√	
• SPECIAL AREA FOR PROTECTING BIODIVERSITY		√	
• BAY		√	
B. POTENTIAL ENVIRONMENTAL IMPACTS WILL THE PROJECT CAUSE...			
▪ impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		√	
▪ deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		√	
▪ degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		√	

Screening Questions	Yes	No	Remarks
▪ dislocation or involuntary resettlement of people?		√	
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?		√	
▪ degradation of cultural property, and loss of cultural heritage and tourism revenues?		√	
▪ occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?		√	
▪ water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters)?		√	
▪ air pollution due to urban emissions?	√		There will be some fugitive emissions construction works and due to plying of vehicles; however the impacts are short term and local
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during project construction and operation?	√		If the safety aspects are not considered well, the concern of OHS will be of concern
▪ road blocking and temporary flooding due to land excavation during rainy season?		√	
▪ noise and dust from construction activities?	√		There will be some dust during excavation works and due to plying of vehicles; however the impacts are short term and local
▪ traffic disturbances due to construction material transport and wastes?	√		There will be temporary traffic disturbance during excavation works, and added traffic due to plying of project vehicles
▪ temporary silt runoff due to construction?	√		This concern is of low scale
▪ hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		√	
▪ water depletion and/or degradation?		√	
▪ overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		√	
▪ contamination of surface and ground waters due to improper waste disposal?		√	
▪ pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		√	
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
▪ social conflicts if workers from other regions or countries are hired?	√		EMP has proposed that local employment will be prioritized
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?	√		EMP has proposed measures
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		√	

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ²²
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	1	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	1	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): 3 (Medium Risk)

Other Comments: _____

Prepared by:

Yogesh Shakya,
Environmental Expert,
WR-DSMC; BDA/PEA JV.

²² If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Rapid Environmental Assessment (REA) Checklist

Faecal Sludge Treatment Plant (FSTP) Component

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Nepal/Urban Water Supply and Sanitation (Sector) Project/Tikapur Drainage Project

Sector Division:

Urban Sanitation

Screening Questions	Yes	No	Remarks
B. PROJECT SITING IS THE PROJECT AREA...			
▪ DENSELY POPULATED?		√	The population density is 6.43 per hectare which is not densely populated condition. The core area is slightly denser.
▪ HEAVY WITH DEVELOPMENT ACTIVITIES?		√	There are only small scale development activities going on.
▪ ADJACENT TO OR WITHIN ANY ENVIRONMENTALLY SENSITIVE AREAS?		√	Buffer Zone of Bardiya National Park lies within 5 km from the project area
• CULTURAL HERITAGE SITE		√	
• PROTECTED AREA		√	
• WETLAND		√	
• MANGROVE		√	
• ESTUARINE		√	
• BUFFER ZONE OF PROTECTED AREA		√	
• SPECIAL AREA FOR PROTECTING BIODIVERSITY		√	
• BAY		√	
A. POTENTIAL ENVIRONMENTAL IMPACTS WILL THE PROJECT CAUSE...			
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?		√	
▪ interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?		√	
▪ dislocation or involuntary resettlement of people?		√	
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	
▪ impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?	√		This is a risk of chance case. If during operation phase, the system doesn't work, it might result into pollution of downstream water bodies
▪ overflows and flooding of neighboring properties with raw sewage?		√	
▪ environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?		√	

Screening Questions	Yes	No	Remarks
▪ noise and vibration due to blasting and other civil works?	√		No blasting works, but some nuisance of noise during construction phase. It is of site-specific nature
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?	√		If the safety aspects are not considered well, the concern of OHS will be of concern
▪ discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?		√	
▪ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?		√	This has been considered in the design
▪ road blocking and temporary flooding due to land excavation during the rainy season?		√	
▪ noise and dust from construction activities?	√		There will be some noise nuisance and dust during excavation works and due to plying of vehicles; however the impacts are short term and local
▪ traffic disturbances due to construction material transport and wastes?	√		There will be temporary traffic disturbance during excavation works, and added traffic due to plying of project vehicles
▪ temporary silt runoff due to construction?		√	
▪ hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?		√	
▪ deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?	√		This is a risk of chance case.
▪ contamination of surface and ground waters due to sludge disposal on land?	√		This is a risk of chance case.
▪ health and safety hazards to workers from toxic gases and hazardous materials which maybe contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unstabilized sludge?		√	
▪ large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?		√	
▪ social conflicts between construction workers from other areas and community workers?	√		EMP has proposed that local employment will be prioritized
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?	√		EMP has proposed measures
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		√	

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ²³
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): 0 (Not Likely)

Other Comments: _____

Prepared by:

Yogesh Shakya,
 Environmental Expert,
 WR-DSMC; BDA/PEA JV

²³ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

NO MITIGATION SCENARIO (SCOPING CHECKLIST) of Tikapur Storm Water Drainage and Faecal Sludge Management Project

Checklist 1: Scoping Checklist Part 1 - Questions on Project Characteristics

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	Very small changes in existing land cover status thus adding a small built-up unit at FSTP site in the existing open land	Not significant because the proposed land is currently unused, and the area is of very small scale
1.2	Clearance of existing land, vegetation and buildings?	No		
1.3	Creation of new land uses?	No		
1.4	Pre-construction investigations e.g. boreholes, soil testing?	No		
1.5	Construction works?	Yes	Surface water bodies and ambient air quality could be of concern	Not significant because scale of work is small
1.6	Demolition works?	No		
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Chance of disposal of waste from temporary campsite thus polluting the local surface water bodies.	Not significant because scale of work is small
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	Excavation works may cause disturbance to local socio-economic activities during construction phase	Not significant because scale of work is small
1.9	Underground works including mining or tunnelling?	No		
1.10	Reclamation works?	No		
1.11	Dredging?	No		
1.12	Coastal structures eg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	Yes	Stockpile site is needed. This may disturb community safety, especially for children	The site selected for stockpile is not a prime public space.
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	Yes	Small compost pits in campsites; and soak pit for sludge trap may be required. These may pollute the surface water bodies	Not significant as these are in-house units, not community scale units.
1.17	Facilities for long term housing of operational workers?	No	The project will be under care of existing WUSC of Tikapur Town WS&S Project	Not significant as the land required is small
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air,	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?			
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No		
1.21	New or diverted transmission lines or pipelines?	No		
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	Yes	Urban surface water flow in canals and surface drains will be altered	This is likely to be a significant effect.
1.23	Stream crossings?	No		
1.24	Abstraction or transfers of water from ground or surface waters?	No		
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	This project will improve the urban drainage and run-off	This is likely to be a significant positive impact
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Local construction materials need to be transported from within the project district	Not significant as the transportation needed is intermittent
1.27	Long term dismantling or decommissioning or restoration works?	No		
1.28	Ongoing activity during decommissioning which could have an impact on the environment?	No		
1.29	Influx of people to an area in either temporarily or permanently?	Yes	Temporary influx of workforce may cause disturbance to local social activities, harmony	Not significant as they will be coming for short time for specific works only
1.30	Introduction of alien species?	No		
1.31	Loss of native species or genetic diversity?	No		
1.32	Any other actions?	No		
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?	Yes	Undeveloped land will be used	Not significant as the unused small land parcels are selected
2.2	Water?	No		
2.3	Minerals?	No		
2.4	Aggregates?	Yes	These will be used from authorized local suppliers	

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
2.5	Forests and timber?	No		
2.6	Energy including electricity and fuels?	Yes	Electricity, Petrol, diesel, and LPG gas will be used. However these are not locally produced energy sources	Air pollution could be a concern if proper operation of vehicles and equipments not carried out
2.7	Any other resources?	No		
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	No		
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?	Yes	The surroundings of the worker's camp may be affected as they may not have access to safe supply of water and good sanitation practice. During operation phase, this will be a positive improved drainage will reduce disease vectors	Not significant as the campsites proposed are not within core settlements Potentially significant positive impact
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	Yes	Positive aspect of the welfare enhancement	Potentially significant
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	No		
3.5	Any other causes?	No		
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?	Yes, spoil generation	Degradation of surface land and pollution of surface water sources due to spoil disposal	Not significant as scale of works is small
4.2	Municipal waste (household and or commercial wastes)?	Yes	Waste from campsite will increase municipal waste	Not significant as it is short term and small scale
4.3	Hazardous or toxic wastes (including radioactive wastes)?	No		
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	Yes	Sludge from cleaning of drains, and sludge from FSTP unit/s	Significant
4.7	Construction or demolition wastes?	Yes	Small volume of construction waste during construction	Not significant as these are not

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
			phase, and some waste during decommissioning will be generated	hazardous
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	No		
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Ambient air pollution is a concern	Not significant as GoN standard vehicles and fuel are in use in general
5.2	Emissions from production processes?	No		
5.3	Emissions from materials handling including storage or transport?	Yes	During construction phase, dust generation by the unloading of materials like cement, aggregates, metal bars, etc.	Not significant as the scale of works is not large; and these are only site specific activities of short term nature
5.4	Emissions from construction activities including plant and equipment?	Yes	No separate plant is required. Dust generation due to earthworks and other construction activities.	Not significant as these are short term
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	During construction phase, air pollution due to dust generation during unloading of construction materials like aggregates, cements, metal bars, etc.	Not significant as the scale of works is not large; and these are only site specific activities of short term nature
5.6	Emissions from incineration of waste?	No		
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	No		
5.8	Emissions from any other sources?	No		
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines, ventilation plant, crushers?	Yes	Noise and vibration (limited) may cause community nuisance	Not significant as the scale of work is small, site specific and short term
6.2	From industrial or similar processes?	No		
6.3	From construction or demolition?	Yes	Noise may cause community nuisance	Not significant as the scale of work is small, site

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
				specific and short term
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic?	Yes	Construction traffic will cause disturbance to community activities	Not significant as local roads are wide, and the activities are short term
6.6	From lighting or cooling systems?	No		
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No		
6.8	From any other sources?	No		
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	No		
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	Yes	This is a risk of chance case. During operation, any failure in drainage or FSTP unit/s pose risk of pollution of land and surface water	Significant
7.3	By deposition of pollutants emitted to air, onto the land or into water?	No	The land nearby the workers camp may be polluted by the daily activities of the workers residing there temporarily.	Not significant
7.4	From any other sources?	No		
7.5	Is there a risk of long term build-up of pollutants in the environment from these sources?	No		
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	No		
8.2	From events beyond the limits of normal environmental protection e.g. failure of pollution control systems?	No		
8.3	From any other causes?	No		
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc?	No		
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	Yes	People from the neighbouring areas may migrate to this project town to achieve improved living standards and this may bring change in demography as the population of the project area may be increased.	This project is not expected to be the most significant factor for the said change
9.4	By placing increased demands on local facilities or services eg housing, education, health?	No		
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	Requirement of labour for the construction works prioritize the local people hence, providing employment opportunities to the local people. This is a positive case.	Yes, because the skills they learnt during their employment period can be utilized in the future in other similar kind of works.
9.6	Any other causes?	No		
Question - Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
9.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	Yes	Urban growth and investments will be in rise once the sanitation systems are functional. This is a positive aspect of development.	It is a cumulative aspect of development related to the city/urban development plan of the municipality.
9.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g. supporting infrastructure (roads, power supply, waste	No		

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
	or waste water treatment, etc) housing development extractive industries supply industries other?			
9.3	Will the project lead to after-use of the site which could have an impact on the environment?	No		
9.4	Will the project set a precedent for later developments?	Yes	This is a positive impact. Improvement in urban sanitation by this project may create opportunities for other development works	Yes, because it will be the important factor for the sustainable development of the town
9.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	No		

**Checklist 2: Scoping Checklist Part 2 - Characteristics of the Project Environment
(Environmental Sensitivity)**

Question - Are there features of the local environment on or around the Project location which could be affected by the Project? • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or sensitive for reasons of their ecology e.g. • Wetlands, • Watercourses or other water bodies, • the coastal zone, • mountains, • forests or woodlands • Areas used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project? • Inland, coastal, marine or underground waters? • Areas or features of high landscape or scenic value? • Routes or facilities used by the public for access to recreation or other facilities? • Transport routes which are susceptible to congestion or which cause environmental problems? • Areas or features of historic or cultural importance?	The buffer zone of Bardiya National Park is within 5 km from the service area. There is very little or no implications of this project in this regard. Yes, the part of project area lying along the main road may be susceptible to traffic congestion during excavation works for drainage that may provide discomfort to the passer-by and also may disrupt the access to the roadside shops and houses.
Question - Is the Project in a location where it is likely to be highly visible to many people?	Yes. The proposed site for project components is within service area
Question - Is the Project located in a previously undeveloped area where there will be loss of greenfield land?	No; there will be no loss of vegetation
Question - Are there existing land uses on or around the Project location which could be affected by the Project? For example: • Homes, gardens, other private property, • Industry, • Commerce, • Recreation, • public open space, • community facilities, • agriculture, • forestry, • tourism, • mining or quarrying	No
Question - Are there any plans for future land uses on or around the location which could be affected by the Project?	No
Question - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?	No
Question - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project? • hospitals,	No

• schools, • places of worship, • community facilities	
Question - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example: • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals.	No
Question - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?	No
Question - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	No
Question - Is the Project likely to affect the physical condition of any environmental media? • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g. quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g. quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions?	No
Question - Are releases from the Project likely to have effects on the <u>quality</u> of any environmental media? • Local air quality? • Global air quality including climate change and ozone depletion • Water quality – rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Nutrient status and eutrophication of waters? • Acidification of soils or waters? • Soils • Noise? • Temperature, light or electromagnetic radiation including electrical interference? • Productivity of natural or agricultural systems?	Yes The construction activities may shortly affect local ambient air quality especially during dry season. The grey water from campsite during construction phase; and slurry from drainage, and sludge from treatment plants if not well managed during operation phase may be pollution local surface water bodies Noise nuisance in close proximity to construction sites is potential It due to movement of vehicles for transporting materials
Question - Is the Project likely to affect the availability or scarcity of any resources either locally or globally? • Fossil fuels? • Water? • Minerals and aggregates?	No

• Timber? • Other non-renewable resources? • Infrastructure capacity in the locality - water, sewerage, power generation and transmission, telecommunications, waste disposal roads, rail?	
Question - Is the Project likely to affect human or community health or welfare? • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions?	Yes, Ambient air quality deterioration, noise levels and exposure to risks from stockpiles/trenches have potentiality to affect community health & safety aspects during the construction phase This project may also result in the occurrence of communicable diseases due to temporary settlement of workers

Checklist 3: Significance of Impacts

Questions to be Considered	
1. Will there be a large change in environmental conditions?	No
2. Will new features be out-of-scale with the existing environment?	No
3. Will the effect be unusual in the area or particularly complex?	No
4. Will the effect extend over a large area?	No
5. Will there be any potential for trans boundary impact?	No
6. Will many people be affected?	No
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?	No
8. Will valuable or scarce features or resources be affected?	No
9. Is there a risk that environmental standards will be breached?	No
10. Is there a risk that protected sites, areas, features will be affected?	No
11. Is there a high probability of the effect occurring?	No
12. Will the effect continue for a long time?	No
13. Will the effect be permanent rather than temporary?	No
14. Will the impact be continuous rather than intermittent?	No
15. If it is intermittent will it be frequent rather than rare?	No
16. Will the impact be irreversible?	No
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?	No

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Date:	16 th January 2020

ANNEX 2:
ENVIRONMENTAL STANDARDS, SAMPLE FORMS, FORMATS
AND
REPORTING TEMPLATE

ANNEX 2-A: RELEVANT ENVIRONMENTAL QUALITY STANDARDS

2-A.1 Ambient Air Quality Standards

Parameter	Averaging Period	Nepal's Ambient Air Quality Standard ($\mu\text{g}/\text{m}^3$) *	WHO Air Quality Guidelines ($\mu\text{g}/\text{m}^3$) **	
			Global Update 2005	Second Edition ^
TSP	Annual	-	-	-
	24-hour	230	-	-
PM ₁₀	Annual	-	20	-
	24-hour	120	50	-
PM _{2.5}	1-year	-	10	-
	24-hour	-	25	-
SO ₂	Annual	50	-	-
	24-hour	70	20	-
	10-minute	-	500	-
NO ₂	1-year	40	40	-
	24-hour	80	-	-
	1-hour	-	200	-
CO	8-hour	10,000	-	10,000
	15-minute	100,000	-	100,000
Pb	1-year	0.5	-	0.5
Benzene	1-year	20	-	-

* National Ambient Air Quality Standards for Nepal, 2003. Obtained from Environment Statistics of Nepal 2011, Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics, Kathmandu, Nepal.

** Environmental, Health and Safety General Guidelines, 2007. International Finance Corporation, World Bank Group.

^ Air Quality Guidelines for Europe, Second Edition, 2000. WHO Regional Office for Europe, Copenhagen.

Parameter that either has no national standard value for 24-hour observation or with WHO guideline value for 24-hour observation as more stringent than that specified in the national standards.

2-A.2 Noise Level Standards

Receptor / Source	National Noise Standard Guidelines, 2012 (dB)		WHO Guideline Values for Noise Levels Measured Out of Doors * (One Hour L _{Aeq} in dBA)	
	Day	Night	07:00 - 22:00	22:00 - 07:00
Industrial area	75	70	70	70
Commercial area	65	55		
Rural residential area	45	40	55	45
Urban residential area	55	50		
Mixed residential area	63	55		
Quiet area	50	40	-	-
Water pump	65		-	
Diesel generator	90		-	

* Guidelines for Community Noise, WHO, 1999.

Source: *Environmental, Health and Safety General Guidelines, 2007.*
International Finance Corporation, World Bank Group.

2-A.3 National Drinking Water Quality Standards, 2006

Group	National Drinking Water Quality Standards, 2006			WHO Guidelines for Drinking-water Quality, 4th Edition, 2011*
	Parameter	Unit	Max. Concentration Limits	
Physical	Turbidity	NTU	5 (10) **	-
	pH		6.5 - 8.5	none
	Color	TCU	5 (15)	none
	Taste & Odor		Would not be objectionable	-
	TDS	mg/l	1000	-
	Electrical Conductivity	µc/cm	1500	-
	Iron	mg/l	0.3 (3)	-
	Manganese	mg/l	0.2	-
	Arsenic	mg/l	0.05	0.01
	Cadmium	mg/l	0.003	0.003
	Chromium	mg/l	0.05	0.05
	Cyanide	mg/l	0.07	none
	Fluoride	mg/l	0.5 - 1.5 ^	1.5
	Lead	mg/l	0.01	0.01
	Ammonia	mg/l	1.5	none established
Chemical	Chloride	mg/l	250	none established
	Sulphate	mg/l	250	none
	Nitrate	mg/l	50	50
	Copper	mg/l	1	2
	Total Hardness	mg/l	500	-
	Calcium	mg/l	200	-
	Zinc	mg/l	3	none established
	Mercury	mg/l	0.001	0.006
	Aluminum	mg/l	0.2	none established
	Residual Chlorine	mg/l	0.1 - 0.2	5 ^^
	E-coli	MPN/100ml	0	must not be detectable in any 100 ml sample
	Total Coliform	MPN/100ml	0 in 95% of samples taken	

* Health-based guideline values

** Figures in parenthesis are upper range of the standards recommended.

^ These standards indicate the maximum and minimum limits.

^^ From WHO (2003) Chlorine in Drinking-water, which states that this value is conservative.

Parameter with WHO guideline value as more stringent than national standard value.

National Drinking Water Quality Standards was obtained from the Environment Statistics of Nepal 2011, Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics, Kathmandu, Nepal.

2-A.4 Tolerance limits for wastewater to be discharged into inland surface waters from combined wastewater treatment plant (generic standards)

Characteristics	Tolerance Limit
Total Suspended solids, mg/L, Max	50
Particle size of total suspended Particles	Shall pass 850-micron Sieve
pH	5.5 to 9.0
Temperature	Shall not exceed 40 degree C in any section of the stream within 15 meters down-stream from the effluent outlet
Biochemical oxygen demand (BOD) for 5 days at 20 degree C, mg/L, Max	50
Oils and grease, mg/L, Max	10
Phenolic compounds, mg/L, Max	1
Cyanides (as CN), mg/L, Max	0.2
Sulphides (as S), mg/L, Max	2
Radioactive materials:	
a. Alpha emitters, c/ml, Max	7 Oct
b. Beta emitters, c/ml, Max	8 Oct
Insecticides	Absent
Total residual chlorine, mg/L	1
Fluorides (as F), mg/L, Max	2
Arsenic (as As), mg/L, Max	0.2
Cadmium (as, Cd), mg/L, Max	2
Hexavalent chromium (as Cr), mg/L, Max	0.1
Copper (as Cu), mg/L, Max	3
Lead (as Pb), mg/L, Max	0.1
Mercury (as Hg), mg/L, Max	0.01
Nickel (as Ni), mg/L, Max	3
Selenium (as Se), mg/L, Max	0.05
Zinc (as Zn), mg/L, Max	5
Ammonical nitrogen, mg/L, Max	50
Chemical Oxygen Demand, mg/L, Max	250
Silver, mg/L, Max	0.1

Nepal Gazette, 23 June 2003

**ANNEX 2-B:
SAMPLE GRIEVANCE REDRESS FORM
(To be available in Nepalese and English)**

The _____ Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback. Should you choose to include your personal details but want that information remain confidential, please inform us by writing/typing* (CONFIDENTIAL)* above your name. Thank you.

Date		Place of registration	
Contact Information/personal details			
Name	Gender	*Male *Female	Age
Home Address			
Place			
Phone No.			
E-mail			
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If includes as attachment/note/letter, please tick here:			
How do you want us to reach you for feedback or update on your comment/grievance?			

FOR OFFICIAL USE ONLY

Registered by: (Names of official registering grievance)	
Mode of communication: Note/Letter E-mail Verbal/Telephonic	
Reviewed by: (Names/positions of official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	Yes No
Means of Disclosure:	

ANNEX 2-C: SAMPLE TRAFFIC MANAGEMENT PLAN

SAMPLE: TRAFFIC MANAGEMENT PLAN (TMP)

A. Principles

One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties
- Avoid hazards in addressing issues that may delay the project.

B. Operating Policies for TMP

The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

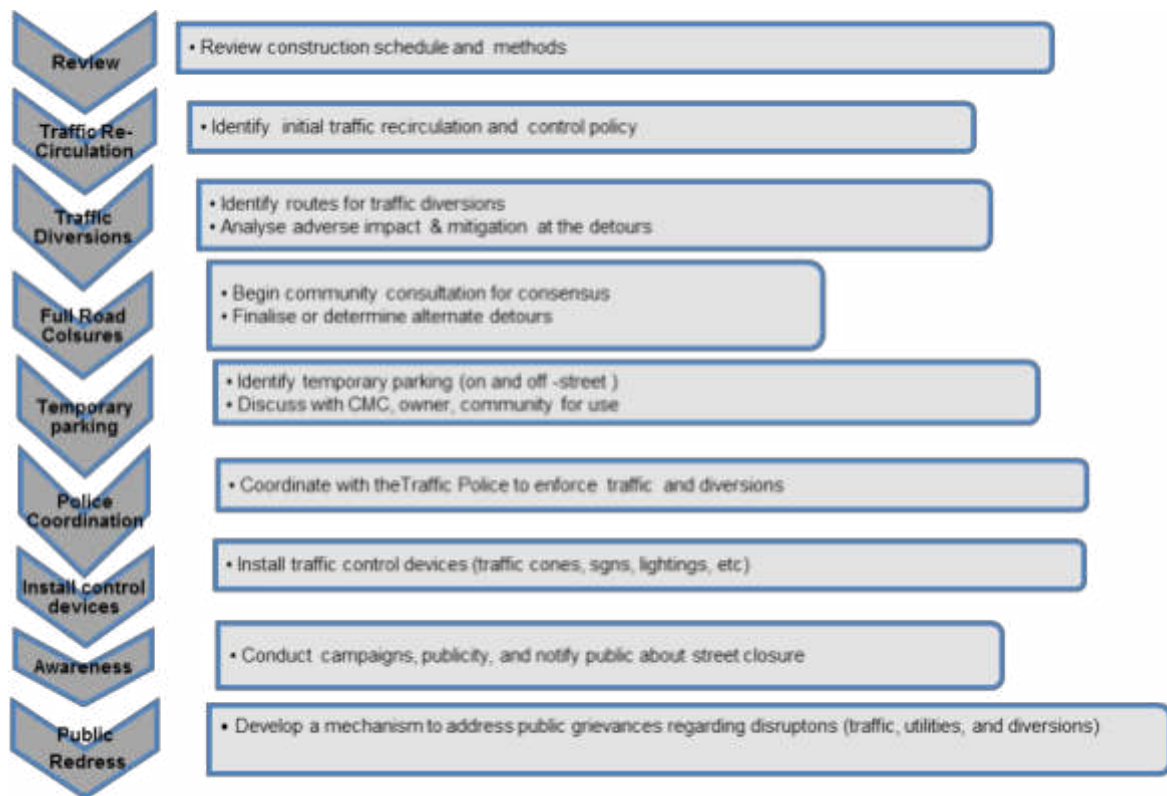
C. Analyze the impact due to street closure

Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the ICG, local administration to use the local streets as detours;
- consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;
- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the Detour Street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure A: Policy Steps for the TMP



D. Public awareness and notifications

As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

The ICG will also conduct an awareness campaign to educate the public about the following issues:

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
- defensive driving behavior along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will

also be available at the ICG, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- Explain why the brochure was prepared, along with a brief description of the project;
- Advise the public to expect the unexpected;
- Educate the public about the various traffic control devices and safety measures adopted at the work zones;
- Educate the public about the safe road user behavior to emulate at the work zones;
- Tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- Indicate the office hours of relevant offices.

E. Vehicle Maintenance and Safety

A vehicle maintenance and safety program shall be implemented by the construction contractor. The contractor should ensure that all the vehicles are in proper running condition and it comply with roadworthy and meet certification standards of GoN. All vehicles to be used at STWSSP shall be in perfect condition meeting pollution standards of GoN. The vehicle operator requires a pre state of shift checklist. Additional safety precautions will include the requirement for:

- Driver will follow the special code of conduct and road safety rules of Government of Nepal.
- Drivers to ensure that all loads are covered and secured drivers to ensure operation equipment can't leak materials hauled
- Vehicles will be cleaned and maintained in designed places.

F. Install traffic control devices at the work zones and traffic diversion routes

The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary "STOP" and "GO").

The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped

with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

The ICG and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

ANNEX 2-D: SPOIL MANAGEMENT PLAN

Spoil Management Plan (SMP)

Purpose and application: SMP is to describe how STWSSP will manage the spoil generated and reuse related to design and construction works. This is an integral part of EMP. The objective of SMP is to reuse of spoil from works in accordance with the spoil management hierarchy outlined in this document.

Objectives of SMP: The objectives of SMP are:

- To minimize spoil generation where possible
- Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- Manage onsite spoil handling to minimize environmental impacts on resident and other receivers
- Minimize any further site contamination of land, water, soil
- Manage the transportation of spoil with consideration of traffic impacts and transport related emissions

Structure of SMP:

Section 1: Introduction of SMP

Section 2: Legal and other requirements

Section 3: Roles and responsibilities

Section 4: Identification and assessment of spoil aspects and impacts

Section 5: Spoil volumes, characteristics and minimization

Section 6: Spoil reuses opportunities, identification and assessment

Section 7: On site spoil management approach

Section 8: Spoil transportation methodology

Section 9: Monitoring, Reporting, Review, and Improvements

Aspects and Potential Impacts

The key aspects of potential impacts in relation to SMP are listed in table below

Aspects	Potential Impacts
Air Quality	Potential for high winds generating airborne dust from the stock piles
Sedimentation	Potential for sediment laden site runoff from spoil stockpiles and potential for spillage of spoil from truck on roads
Surface and Groundwater	Contamination of water (surface and ground water)
Noise	Associated with spoil handling and haulage and storage
Traffic	Impacts associated with spoil haulage
Land Use	Potential for spoil to be transported to a receivable site that doesn't have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize spoil generation
Sustainability	Limited sites for storage, reuse opportunities

Spoil volumes, Characteristics and Minimization

Spoil volume calculations: Estimate the volumes of spoils produced from each of the construction sites.

Characterization of spoil: Based on the type of spoil; characterization is done (sand stone, MWSS mix materials, reusable materials)

Adopt Spoil Reduce, Reuse Opportunities

An overview of the assessment methodology to be used is mentioned below.

- Consideration of likely spoil characteristics
- Identification of possible reuse sites
- Screening of possible reuse opportunities

Identification of possible safe disposal sites for spoil: Those spoils which can't be reuse shall be properly disposed in designated areas, such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as spoil disposal area. The local administration must be consulted and if required permission should be obtained from them.

Storage and stock piling

Transportation and haulage route

Based on the above, the contractor will prepare a SMP as an integral part of EMP and submit it to the DSMC for their review and approval.

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

Appendixes

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection Report
- Others

ANNEX 2-E: SAMPLE SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

This template must be included as an appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

INTRODUCTION

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

N o.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be Reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual Report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
 - What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
 - Adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
 - Are their designated areas for concrete works, and refueling;
 - Are their spill kits on site and if there are site procedure for handling emergencies;
 - Is there any chemical stored on site and what is the storage condition?
 - Is there any dewatering activities if yes, where is the water being discharged;
 - How are the stockpiles being managed;
 - How is solid and liquid waste being handled on site;
 - Review of the complaint management system;
 - Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/EMP

No.	Sub-Project Name	EMP/CEMP Part of Contract Documents (Y/N)	CEMP/EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed & Additional Measures Required

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

Brief description on the approach and methodology used for environmental monitoring of each sub-project

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L)	TN (mg/L)	TP (mg/L)

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L)	TN (mg/L)	TP (mg/L)

Noise Quality Results

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Day Time	Night Time

**ANNEX 2-F:
SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT**

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER CONDITION:

INITIAL SITE CONDITION:

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:

Intervention Steps:

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition	Yes	No		
-------------------------------------	-----	----	--	--

Signature

Sign off

Name

Position

Name

Position

ANNEX 2-G: OPERATION AND MAINTENANCE PLAN FOR FSTP

FSTP requires continuous and appropriate operation and maintenance activities in order to ensure long term functionality. "Operation" refers to all the activities that are required to ensure that a FSTP delivers treatment services as designed, and "maintenance" refers to all the activities that ensure long-term operation of equipment and infrastructure.

Maintenance requirements

SN	Resources	Purpose	Number
1.	Spade/ Shovel	For removing accumulated materials in screen chamber bed, accumulated sludge in SDB and other similar works.	1
2.	Scraper	For scraping retained solid waste on screen bars.	1
3.	Sickle	For periodic cutting of grass in HFCW.	1
4.	Wheel Barrow	For collection and transport of screenings and dewatered sludge.	2
5.	Covered containers (20L)	For collecting screenings that are raked from the bar screen.	3
6.	Water and power supply	For Cleaning and other utility purpose	As per need
7.	Human resource	For properly operating and maintaining the plant	1
8.	Local sample collecting materials	For collecting wastewater samples to be transported to the nearest laboratory. (sampling bottles, beaker, volumetric flask, dropper)	1 each
9.	Local contracting firms	For assisting with periodic tasks that may be labour intensive or require special skill	As per need
10.	Personal Protective Equipment	For occupational safety/ occupational health (Gloves, Boots, Masks, Safety goggles and working uniform)	1 each
11.	Fire extinguisher	For fire safety	1
12.	Miscellaneous tools	Scraping rust, painting metal surface and repairing corroded concrete for corrosion control	As per need

Operation requirement

SN	Resources	Purpose	Number
1.	Engineering drawings and FSTP specification	For reference and clear knowledge on plant	1
2.	Plant operation manual	For providing clear instruction to the operator	1
3.	Activity time table	For performing regular activities as per the operation manual	1
4.	Register/ record file	For recording and monitoring important information	1

Methodology

Operation and maintenance must be considered as an integral component of the FSTP. With the passage of time, sludge accumulates at various components of the plant. These need to be desludged so that the treatment processes carry out efficiently. Similarly, the bar screens need to be cleaned and sludge removed from the SDB on a daily basis so that the plant is ready for the next load of FS. The detail methodology for each component of the FSTP is defined in the following section;

A. Screening chamber

Where & Why	What (Problem)	How (Activities)	When	Who
Bar Screen To prevent overflow of FS from the bar screen	Blockage	1. Check the blockage at Screen. 2. Clean the blockage/solid waste by Scraper. 3. Remove the Screen and scrap/clean sludge deposition at the bottom of the Screen chamber. 4. Dispose the removed silt/sand to the SDB for drying and solid waste to the closed container	Daily or immediately if there is blockage to flow	Operator

Screen chamber To remove the deposition of silt/ sand	Sludge deposition	for final disposal to the solid waste collection facility. 5. Reinstate the screening chamber.	Weekly	Operator
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B. Anaerobic Digester

Where & Why	What (Problem)	How (Activities)	When	Who
Inlet pipe To check blocking or clogging at inlet pipe	Blockage	1. Open the pipes for blockages. 2. Remove the blockage with a rod and dispose properly.	Daily or immediately at the time of blocking	Operator
Outlet pipe To check blocking or clogging at outlet pipe	Blockage	1. Check if the flow in the outlet pipes are normal 2. Remove any blockages using scrapers if exist.	Monthly	Operator
AD tank Structure damage may cause leakage creating nuisance in surrounding and ultimately may lead to failure of structure	Structural damage (Cracks or Breakage)	1. Open the manhole cover carefully 2. Check the position, blockages and condition of pipes 3. Remove any blockages and replace the damaged or broken pipes immediately.	Monthly	Operator

C. Sludge Drying Bed

Where & Why	What (Problem)	How (Activities)	When	Who
Inlet pipe To check blockage or clogging at inlet pipe	Clogging	1. Open the pipes for blockages 2. Remove the blockage with scrapers and dispose properly.	Daily and immediately at the time of blocking	Operator
Drying bed To make the drying bed ready for next batch of sludge Proper thickness ensures efficient dewatering	Removal of dried sludge Maintaining filter media depth	1. Remove the dried sludge of first bed. Make sure removal of sand is minimised. Proceed to next bed every day. 2. Check the position, blockages and condition of inlet pipes 3. Remove any blockages and replace the damaged or broken pipes immediately. 4. Dip a long stick to check the level of sludge accumulation. 5. Ensure whether it is time to desludge or not and proceed accordingly.	- Sequentially next bed every day - Media depth reduces by 100mm	Operator/ media supplier
Outlet Manhole To know the turbidity of effluent. The effluent with higher turbidity indicates the reduced performance of SDB.	Quality of effluent	1. Check if the flow in the outlet pipes are normal 2. Remove any blockages using scrapers if exist.	Monthly	Operator/ skilled person

D. Anaerobic Baffled Reactor

Where & Why	What (Problem)	How (Activities)	When	Who
Inlet manhole To check for clogging and blockage at inlet pipe	Clogging	1. Open the manhole cover carefully 2. Check the flow, sludge deposition and blockage. 3. Remove the blockage and sludge deposition with scrappers and dispose properly.	Monthly	operator
ABR Chamber To check the breakage or dislocation To know about desludging time To know performance of settler. if AD & SDB are working properly there should not be any scum formation To check for breakage or removal from the position To know the turbidity of effluent. the effluent with higher turbidity indicated the reduced performance of ABR and it may clog AF shortly	- Baffle pipes - Sludge deposition - Scum formation - outlet pipe of last chamber	1. Open the manhole cover carefully 2. Check the position and structural condition of baffle pipes/walls 3. Replace the fallen down or broken baffle pipes and repair damaged wall immediately 4. Dip a long stick to check the level of sludge accumulation. 5. Ensure whether it is time to desludge or not. Use of emptying truck to desludge is advisable.	•	Operator
Outlet manhole To know the turbidity of effluent. the effluent with higher turbidity indicated the reduced performance of ABR and it may clog AF shortly	Quality of effluent	1. Open the manhole cover carefully 2. Check the sludge deposition in the manhole 3. Remove the sludge deposition with scrappers and dispose properly.	Monthly	Operator/ skilled person

E. Anaerobic filter

Where & Why	What (Problem)	How (Activities)	When	Who
Inlet manhole To check for clogging and blockage at inlet pipe	Clogging	1. Open the manhole covers. 2. Check for turbidity. Unusual turbidity may indicates problems in preceding component. 3. Check for blockages. 4. Remove the blockage with scrapers and dispose properly.	Monthly	operator
Outlet manhole To know the turbidity of effluent. the effluent with higher turbidity or reduced flow indicates the reduced performance of AF and it may clog the inlet zone of wetland shortly	Clogging	1. Check if the flow in the outlet pipes are normal 2. Remove any blockages using scrapers if exist.	Monthly	operator

F. Horizontal Flow Constructed Wetlands

Where & Why	What (Problem)	How (Activities)	When	Who
Inlet and intermediate channels To check for clogging and blockage at inlet pipe	Clogging Uneven distribution	1. Open the manhole cover of inlet carefully. 2. Check the flow and compare with the normal flow. 3. Check the connection or leakage from the inlet. Repair leakage immediately and keep in place or replace in case of broken.	Monthly	operator
Inlet zone Clogging instigates flooding, resulting nuisance	Clogging and flooding	1. Open the cover of inlet & intermediate channel carefully 2. Check the flow at the inlet channel and ensure even distribution of flow across whole length of channel. 3. If the flow is not even, remove blockage or clean the distribution holes 4. Check for the ponding over the surface of filter media 5. Check for the treatment efficiency of previous unit or system 6. Replace the manhole cover properly 7. Check the sludge distribution in the distribution channel. 8. If the deposition is at the level of the distribution holes, clean the channel or remove the sludge deposition 9. Replace the cover and check for the treatment efficiency of previous unit or system	Monthly	Operator
Surface of HFCW Flooding causes nuisance Unwanted weeds/bushes may cause clogging To avoid rotting of dead leaf/plant, litter over HFCW To maintain the cleanliness and aesthetical looks Regular trimming of plant facilitates treatment efficiency Level the surface of filter media	Flooding of wastewater Unwanted weeds and bushes grow Trimming of plant Surface of filter media	1. Check for deposition of dead/fallen leaf, weeds inside the HFCW and unwanted plant. 2. Remove dead/fallen leaf, weeds and unwanted plants manually using an appropriate tool and dispose properly. 3. Check for ponding and clogging of filter media 4. Scrap few centimetres (5cm) from the affected area. 5. Take the scrapped filter media out of bed and wash it properly 6. Replace the cleaned filter media	Monthly	Operator
Outlet Lowering of retention level decreases treatment efficiency Higher retention level causes flooding and affects back flow at inlet.	Level of outlet structural damages of outlet pipe	1. Open the manhole cover of outlet carefully. 2. Check the position of outlet pipe and structural condition manhole 3. Keep in position the outlet pipe 4. Repair any damage and replace broken pipe 5. Replace the cover properly.	Monthly	Operator
Physical Structure It causes leakage	Cracks and other structural damages		Quarterly	Operator

G. Polishing pond

Where & Why	What (Problem)	How (Activities)	When	Who
Inlet pipe To check for clogging and blockage at inlet pipe	Clogging	1. Open the pipes for blockages 2. Remove the blockage with scrapers and dispose properly.	Monthly	operator
Outlet pipe To check for clogging and blockage at inlet pipe	Clogging		Monthly	operator

Machinery and equipment

Tikapur Fecal Sludge Treatment plant is primarily passive treatment plant. This implies that majority of the plant does not need active power supply to perform the treatment processes and works under gravity. However, to reduce the earthwork owing to maintaining the hydraulic gradient, a pump has been used between AF and HFCW. Hence, low level of external energy is required to operate the plant process. Some other basic machinery and equipment are required for utility purpose of the plant as well. All of the major equipments are listed below.

SN	Equipment	Nos.	Capacity	Remarks
1.	Submersible Sewage Pump	1	1 hp	
2.	Submersible Water Supply Pump	1	1 hp	For plant's utility requirement
3.	Emptying truck	1	3 cum	

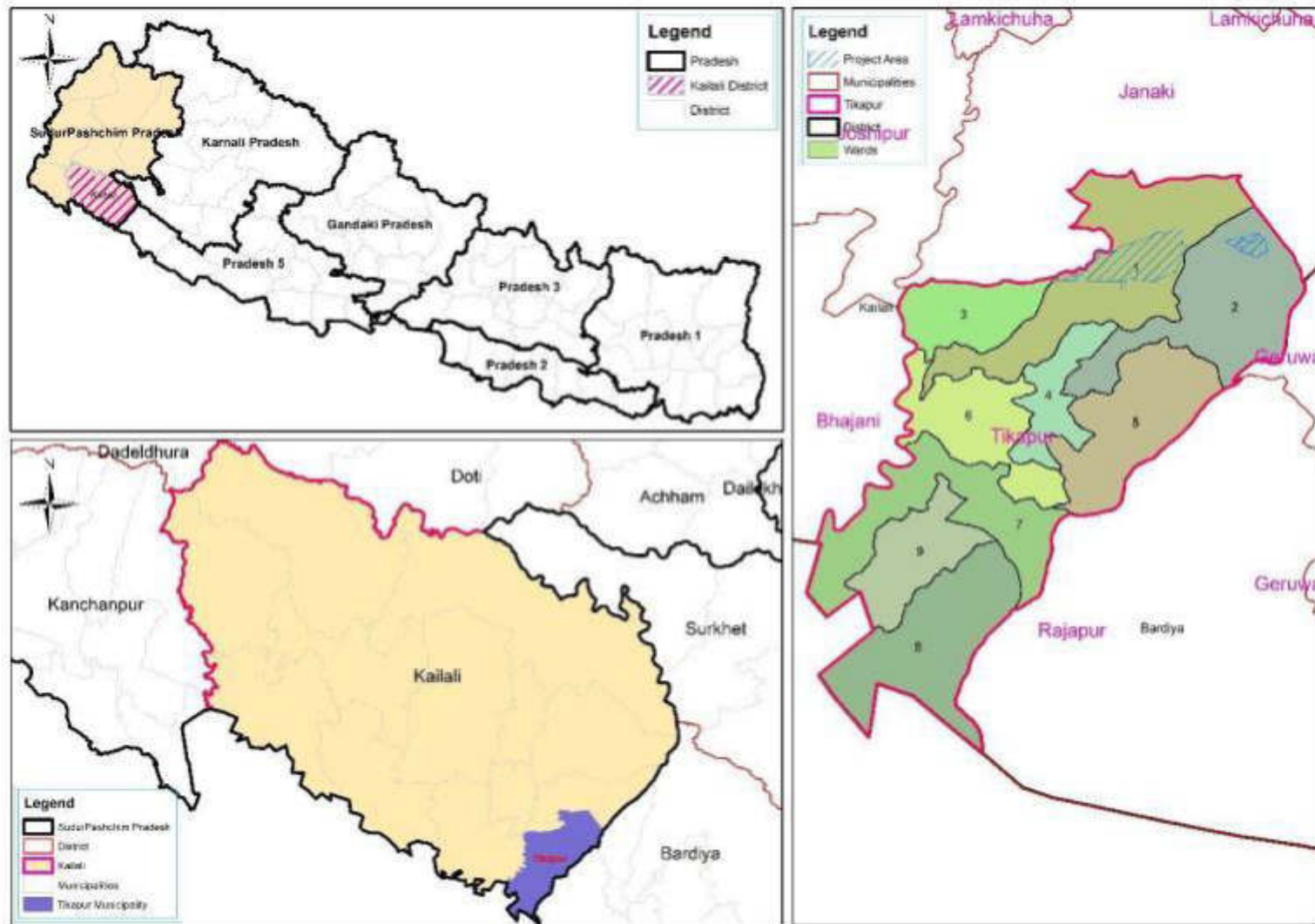
O & M Cost

The yearly operational and maintenance cost of the plant is summarised below.

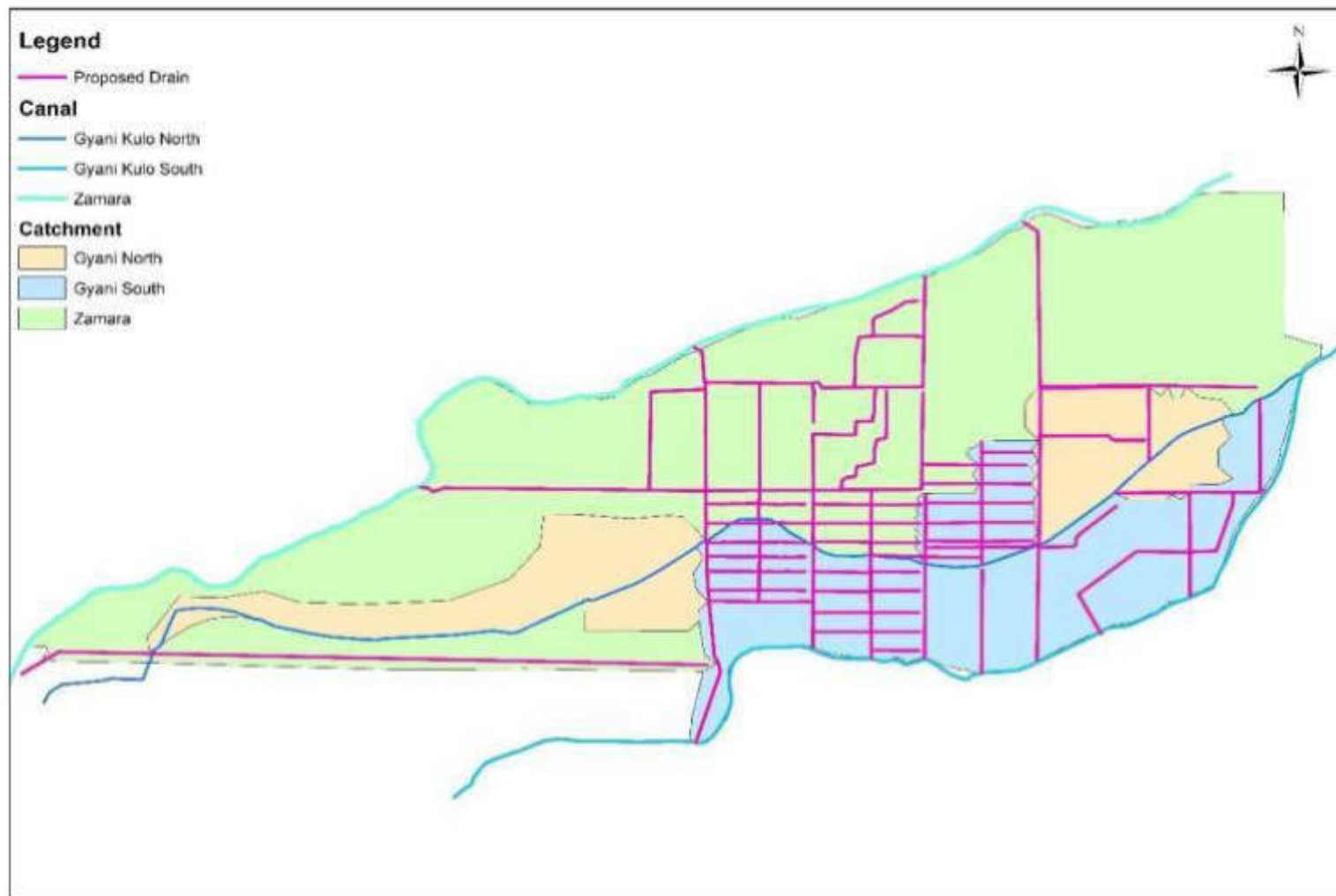
SN	Particulars	Unit	Qty	Rate	Amount (Rs.)
1	Operator salary and benefits	Month	12	30,114.00	361,368.00
2	Helper salary and benefits	Month	12	18,000.00	216,000.00
3	Yearly report production	Nos	1	15,000.00	15,000.00
4	Yearly filter media refilling	cum	78	3,250.00	253,500.00
5	Periodic desludging of ABR, AF and PP	Trip	0.33	5,000.00	1,666.67
6	Utility (Water and electricity)	Month	12	3,525.00	66,300.00
7	Lab tests	Month	12	20,000.00	240,000.00
8	Hygiene material (Soap, towels, etc)	Month	12	250.00	3,000.00
9	Stationery	Month	12	1,000.00	12,000.00
10	Miscellaneous (Paints, tools, etc)	Month	12	2,000.00	24,000.00
11	Contingencies	Month	12	1,000.00	12,000.00
	Operation & Maintenance cost per year				1,204,834.67

**ANNEX 3:
PROJECT LOCATION, SERVICE AREA
AND
Other Site Maps**

Project Location Map and Service Area



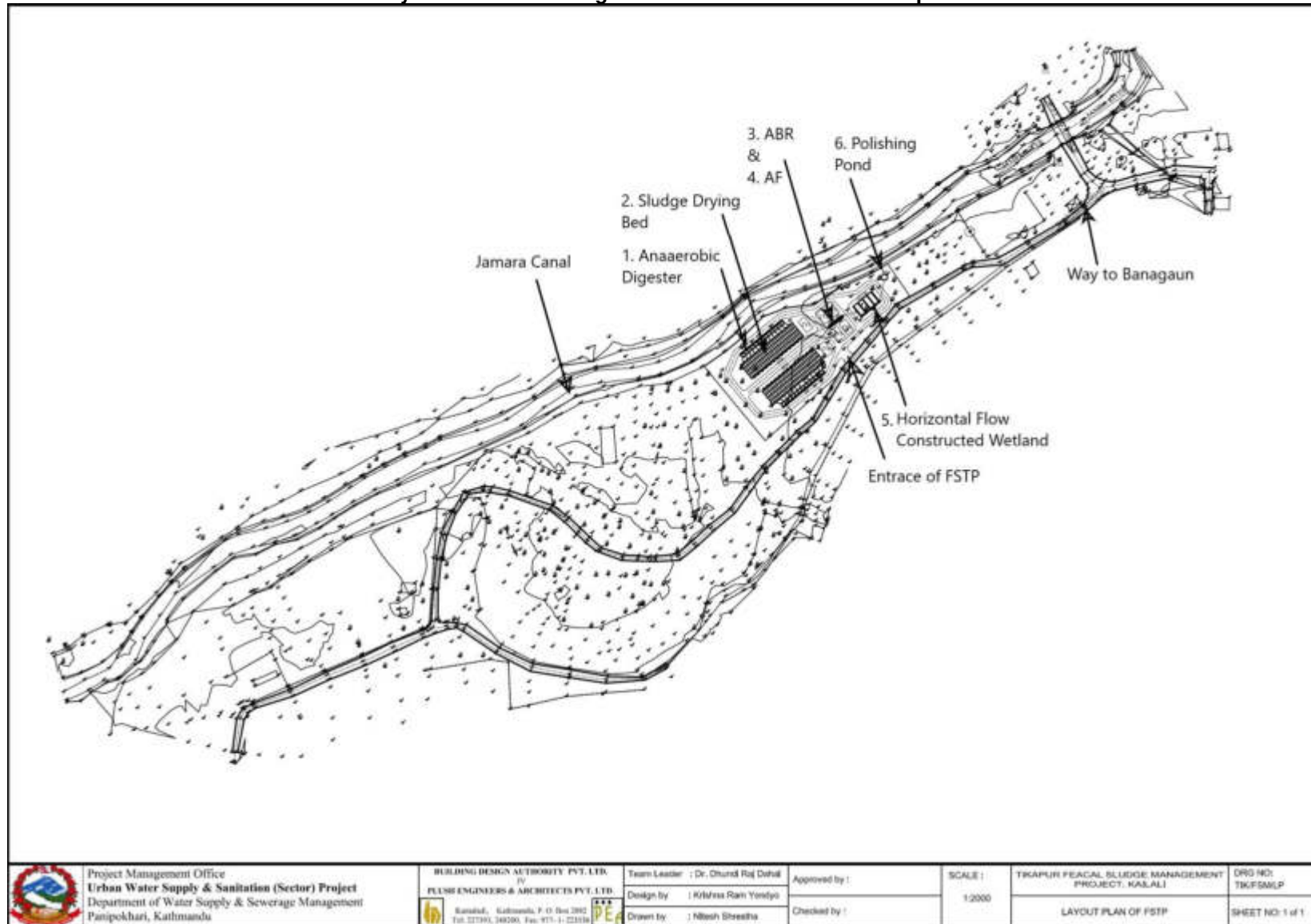
Overall Catchment area of proposed drain of Tikapur Bazaar area



Overall Catchment area of proposed drain of Shaktinagar Area



Site Layout of Faecal Sludge Treatment Plant with its components

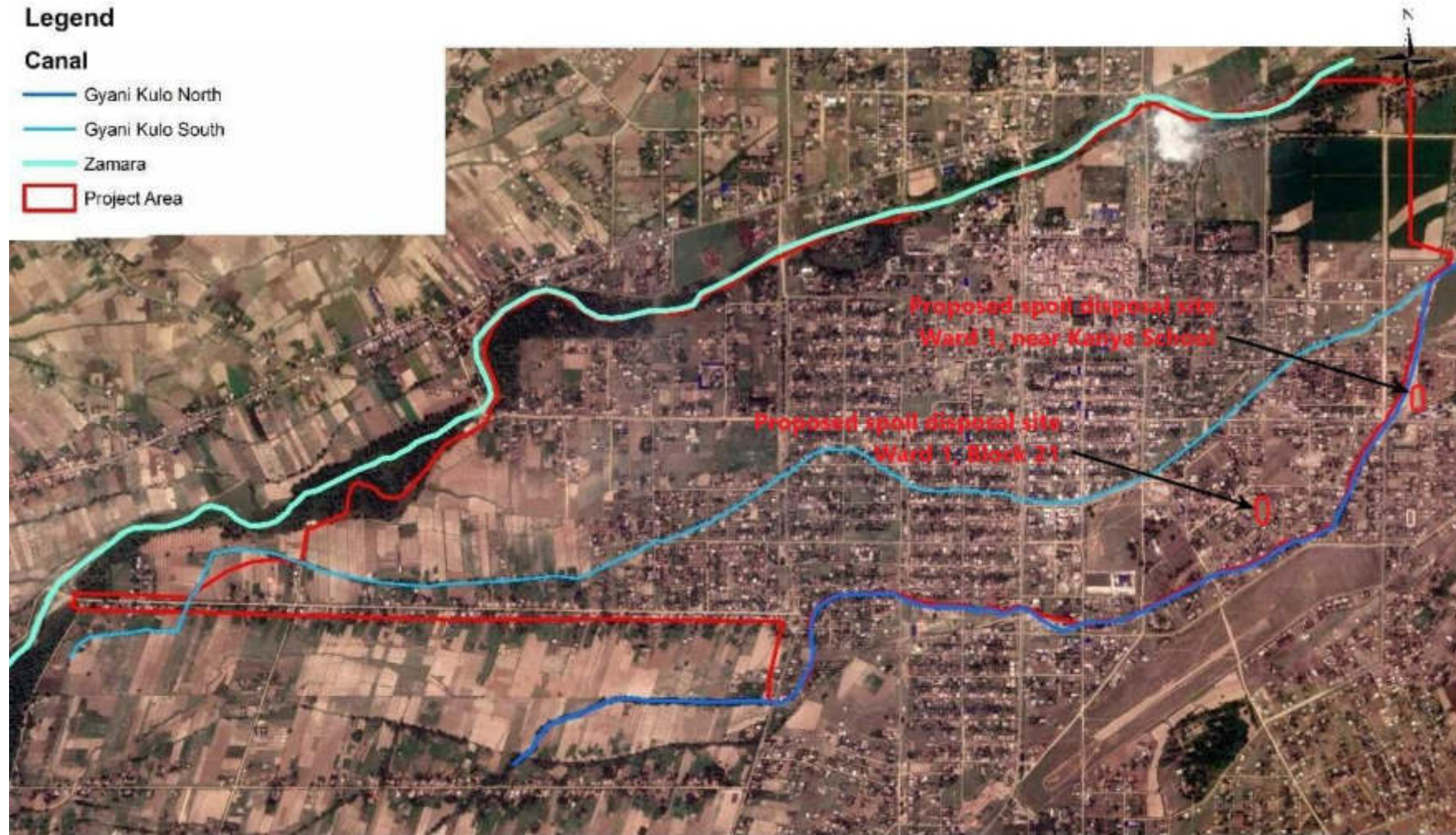


Proposed Spoil Disposal Sites - Ward 1 of Tikapur Municipality

Legend

Canal

- Gyani Kulo North
- Gyani Kulo South
- Zamara
- ▭ Project Area



Google Map of FSTP site - Tikapur



ANNEX 4:

IBAT INFORMATION ON BIODIVERSITY SENSITIVITY IN PROXIMITY OF PROJECT AREA

Protected Areas and Key Biodiversity Areas

The following sites are found within the selected buffer distances:

Features within 1 km

There are no features within 1 km.

Features within 5 km

National-level protected areas		
IUCN Category V-VI	Bardia - Buffer Zone	55,751 ha
Priority Sites for Biodiversity		
Key Biodiversity Area	Bardia National Park CR/EN, VU, migratory birds/congregations, other	96,800 ha

Features within 10 km

There are no additional features within 10 km.

**ANNEX 5:
PUBLIC CONSULTATIONS
AND
CONSENT LETTERS**

PUBLIC NOTICE
Published in Arthik Abhiyan, a national daily, on 21st January 2020



**शहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजना
टीकापुर वर्षाते ढल आयोजना
टीकापुर नगरपालिका, कैलाली**

**प्रारम्भिक वातावरणीय परिक्षणको लागि राय सुभाष पेश गर्ने सम्बन्धी
सार्वजनिक सूचना**

प्रकाशित मिति: २०७६/१०/०७

नेपाल सरकार र एशियाली विकास बैंकको आर्थिक सहयोगमा सुदूरपश्चिम प्रदेशको कैलाली जिल्ला स्थित टीकापुर नगरपालिकामा टीकापुर वर्षाते ढल आयोजना अन्तर्गत वडा नं. १ मा वर्षाते ढल निर्माण कार्य गरिने तथा उक्त नगरपालिकामा संचालन हुन गइरहेको मानव मनमुथीय फोहोर व्यवस्थापन प्रणाली (FSM) को प्रशोधन केन्द्र (Treatment Plant) वडा नं. १ मा निर्माण गरिने कारण यस आयोजनाको प्रारम्भिक वातावरणीय परिक्षण (Initial Environmental Examination) प्रतिवेदन तयार गर्नु पर्ने भएकोले सो आयोजनाबाट टीकापुर नगरपालिका वडा नं. १ मा तथा आयोजनाको सेवा क्षेत्रमा भौतिक, जैविक, सामाजिक आर्थिक एवं सांस्कृतिक पक्ष तथा प्रणालीहरूमा के कस्ता असरहरू पर्नेछन् वा पर्ने सक्छन् सो बारे लिखित राय सुभाष १५ (पन्ध्र) दिनभित्र आईपुग्ने गरी निम्न ठेगानामा पठाई दिनु हुन वातावरण संरक्षण नियमबाली २०५४ को नियम ७ (२) अनुसार यो सूचना प्रकाशित गरिएको छ । साथै लिखित राय सुभाषको प्रतिविपी सम्बन्धित मन्त्रालय तथा विभागमा समेत दिन सकिनेछ ।

राय सुभाष पठाउने ठेगाना

शहरी खानेपानी तथा सरसफाई क्षेत्रगत आयोजना	टीकापुर खानेपानी तथा सरसफाई उपभोक्ता समिति कार्यालय,	वि.वि.ए.पि.ई.ए. जे.पी. कमलारी, काठमाडौं
आयोजना व्यवस्थापन कार्यालय	टीकापुर, टीकापुर नगरपालिका	पे.ब.नं. २८८२
पानीपोखरी, काठमाण्डौ	कैलाली जिल्ला	फोन नं. ०१-४२४८२००
फोन ०१-४४१२३४८	फोन ०११-२६१४४९	फ्याक्स ०१-४२२३४३६
फ्याक्स ०१-४४१२२८०	ईमेल: wusctkp@gmail.com	ईमेल: bdapn7td@gmail.com

DEED OF INQUIRY

टीकापुर साना शहरी खाबेपान उपभोक्ता तथा सरसफाई संस्था

प.सं. ०७६/७७

च.नं. १५

मिति २०७६/१०/०७

श्री जो अस संग सम्बन्ध राख्छ।

बिषय - सूचना टाँस गरिएको सम्बन्धमा ।

टीकापुर नगरपालिका वडा नं. १मा वर्षाते पानी व्यवस्थापन गर्न सतही ढल निर्माण हुने र यससंगै मानव मलमूत्रीय फोहर व्यवस्थापन प्रणाली (FSM) समेत निर्माण हुन लागेकोले सो प्रणाली निर्माण हुँदा पर्ने प्रभाव सम्बन्धी यस क्षेत्रका बासिन्दाको गुनासो वा भनाई भए सो को जानकारी गराउने उद्देश्यले मिति २०७६/१०/०७गते आर्थिक अभियान दैनिक पत्रिकामा सार्वजनिक भएको सूचना यस कार्यालयको सूचना पाटीमा तपसिल बमोजिमको मिति र समयमा टाँस गरिएको छ ।

तपसिल

टाँस गरिएको सूचनाको व्यहोरा



सूचना टाँस गरिएको स्थानहरु

१) उपभोक्ता तथा सरसफाई संस्थाको कार्यालय

टाँस गरेको मिति: २०७६.१०.६

रोहभर:

कार्यालयको छाप

हस्ताक्षर:

२) टीकापुर नगरपालिकाको कार्यालय

टाँस गरेको मिति: २०७६.१०.०९

रोहभर:

कार्यालयको छाप

हस्ताक्षर:

३) टीकापुर नगरपालिका वडा नं. १को कार्यालय

टाँस गरेको मिति: २०७६.१०.०७गते

रोहभर:

कार्यालयको छाप

हस्ताक्षर:

PUBLIC CONSULTATION

आज मिति २०७३ माघ १६ गतेका दिन यस टीकापुर स्थानीय शाही स्तानेपानी इपमोका तथा बस्तीमाई खोलाको मैठ, खोला का अन्धका श्री भैरव सिंह रावलको अध्यक्षतामा निम्न - इपमिति का बस्ती निम्नलिखित निर्णय हुन गरीयो ।

१. अध्यक्ष - श्री भैरव सिंह रावल
२. इपमिति - श्री गोपीराज श्रेष्ठ
३. सचिव - श्री नरेन्द्र कुमार खत्री
४. कोषाध्यक्ष - श्री विशाल थापा
५. सदस्य - श्री किर्ति बहादुर रोकाया
६. " " श्री बल बहादुर काशी
७. " " श्री. रत्निका रावल थापा
८. " " श्री - क्षुब्ध शर्मा पौडेल
९. " " श्री - कुशी चौधरी

आमलित

१. श्री. केदार दुवाल BDA-PEA
२. श्री. योगेश शर्मा " वातावरण विभाग
३. श्री. डम्बर वि.ड WUD नैना खोला
४. श्री. जयराज श्रेष्ठ इपमोका
५. श्री. रंग प्रकाश खत्री "
६. श्री. लक्ष्मी विष्ट "
७. श्री. नृपराज श्रेष्ठ "
८. श्री. हृदयराज श्रेष्ठ "
९. श्री. मोहन सिंह रावल "
१०. श्री. सीता चौधरी 'कार्यपालिका सदस्य' मे तथा

प्रस्तावः यस विषयमा तपसील विषय इलफलाका दुवास्तराई राहने निर्णय गरियो ।

१. आयोजनाको प्राथमिक वातावरणीय परिक्षण
 २. आयोजनाको सामाजिक विमर्श
- निर्णय - १ यस विषयमा आफ्नो इलफला गर्दा यस भैलाली आयोजनाको स्तरी इल निर्माण र मानव मलमुत्र आवस्थापनका लागि निर्माण हुने इल र विभिन्न संस्थाहरूको वातावरणीय असर तथा प्रभाव सम्बन्धि इलफला गरियो । यस इलफला प्रकाशित गर्दा प्रतिक्रिया

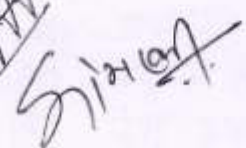
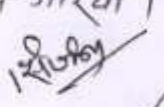
१५ दिन पाई पुन वृहत रूपमा इतफल गर्ने निर्णय गरियो साथै
आयोजनाको सामाजिक प्रभाव सम्बन्धमा इतफल गरियो । यो इतफल
मा कुनै पनि सामाजिक रूपमा बस्ती समुदायहरूलाई असर पर्ने देखि-
एको पाईमा ।

इत निर्माणको काम गर्दा स्थानिय वासीका, कृषा र खारी साधनको
जावत जखतलाई कमैक्रम अवरोध हुने गरी स्थानिय होल कसी
संग सम्बन्ध गरी काम गर्ने निर्णय गरियो ।

FSM-Treatment Plant को Site करिपर वृक्षारोपणको प्रावधान
राहुनु पर्ने विषयमा इतफल गरियो ।

वर्षात इत निर्माणका क्रममा उत्पन्न हुने मारो खिर्सजन र व्यावस्था-
पनका बारेमा इतफल गरियो ।

निर्माण व्यावस्थापीका लागि मापसक Composite र सौका व्यावस्थापन
का बारेमा इतफल गरियो ।

UNOFFICIAL TRANSLATION

Today on 31st January 2020, a consultation was held in the office of Tikapur Water Supply and Sanitation Project's user committee under the chairpersonship of the chairperson of this institution, and following decision were under presence of the stakeholders as per;

Presence

1. Mr. Bhairab Sing Rawal , Chairperson, Tikapur WUSC
2. Mr. Gopiram Jaisi, Vice-Chairperson, Tikapur WUSC
3. Mr. Naresh Kumar Khatri, Secretary, Tikapur WUSC
4. Mr. Bishram Tharu, Treasurer, Tikapur WUSC
5. Mr. Kriti Bahadur Rokaya, Member, Tikapur WUSC
6. Mr. Balbahadur Kami, Member, Tikapur WUSC
7. Ms. Sarita Rawal Thapa, Member, Tikapur WUSC
8. Ms. Shrijana Sharma Pandit, Member, Tikapur WUSC
9. Ms. Krishna Chaudhari, Member, Tikapur WUSC

(Signed by all the participants)

Invitees

10. Mr. Keshav Dhungana, BDA/PEA
11. Mr. Yogesh Shakya, BDA/PEA - Environmental Specialist
12. Mr. Dambar Bi.Ka., Account Officer, Tikapur WUSC
13. Mr. Jhapat Bahadur Sodari, Beneficiary, Tikapur
14. Mr. Rang Prasad Adhikari, Beneficiary, Tikapur
15. Ms. Laxmi Bista, Beneficiary, Tikapur
16. Mr. Nripraj Bhandari, Beneficiary, Tikapur
17. Mr. Hridayaraj Regmi, Beneficiary, Tikapur
18. Mr. Mohan Sing Rawal, Beneficiary, Tikapur
19. Ms. Sita Chaudhari, Member of Municipality Council, Tikapur Municipality

(Signed by all the participants)

Agenda: Following aspects were proposed for the agenda of the meeting

Agenda 1: About Initial Environment Examination (IEE)

Agenda 2: Social assessment of the project

Decision:

- Regarding the development of storm water drainage and faecal sludge management facilities under the proposed project, it was discussed about its structures and relevant environmental implications of the project. It was also reiterated that there will be an additional meeting entailing the public consultation for IEE after 15 days of the publication of public notice as per EPR of the Government of Nepal. In addition to this, the potential socio-economic impacts of the project were also discussed. It was agreed that the project will not need any relocation or rehabilitation of any settlement or community.

- The participants emphasized and discussed on the adequate/proper coordination with the locals during the time of construction of drainage so as to minimize the disturbance/damage to the local communities, markets and transportation.

- It was discussed that it is advisable to promote green belt around the Faecal Sludge Treatment Plant.

- The meeting also focused on the need of timely and proper management of spoil generated during the construction of storm water drainage.
- The meeting also discussed on the need and requirements for set up of the construction/labor camp/campsite for the project construction phase.

Meeting on design aspects

आज मिति २०६८ माघ ४ गतेको दिन यस टीकापुर स्थाना बाहरी
स्नानेपानी उपभोक्ता तथा सरसफाई संस्थाका अध्यक्ष श्री गौरव सिंह
रावल अध्यक्षको अध्यक्षतामा वसी निम्न उपस्थितिमा निम्न विधित
निर्वाच गरियो ।

उपस्थिति

१. अध्यक्ष :- श्री गौरव सिंह रावल
२. उपाध्यक्ष :- श्री गोपीराम गौरी
३. पदविध :- श्री गुरुराज कुमार खत्री
४. कोषाध्यक्ष :- श्री विष्णुमान थापा
५. सदस्य :- श्री नीति बहादुर रोकाया
६. सदस्य :- श्री सुवर्णा देवी चौधरी
७. सदस्य :- श्री वल बहादुर लाम्ही
८. सदस्य :- श्री सरिता रावल थापा
९. सदस्य :- श्री श्रुतमा शर्मा पाण्डे

[Signature]

[Signature]

[Signature]

[Signature]

आयोजन

- श्री विष्णुमान थापा RDA-PEA
श्री चरित रावल Sub-Eng. WARD

[Signature]

उद्देश्य

१. स्थानीय स्तरको विकास गर्न सक्ने।
२. आयोजनाको आर्थिक सामाजिक प्रभाव सम्बन्धमा।

विषय

उद्देश्य नं. १ माथी कलमाल गरी यस टीकापुर स्थाना बाहरी स्नानेपानी
तथा सरसफाई आयोजना अन्तर्गत यस क्षेत्रमा वसीको पानी बाह्रखण्ड
को लागि तथा गवनो डिजाइन इन्जिनियर RDA-PEA ज्व बाट प्राप्त
गयो र सो डिजाइन इन्जिनियर अनुसार निर्माण कार्य आगो बहादुरको
वसी आनन्दपुर पर्व स्तम्भ स्तम्भको गर्ने निर्वाह गरियो।

उद्देश्य नं. २ माथी कलमाल गरी यस आयोजना अन्तर्गत वसी
स्थानीय स्तरको आर्थिक सामाजिक यस आयोजना तथा आयोजना गरी
यस आयोजना कार्यक्रमको खिलखिलान, कुन पनि नकारात्मक
प्रभाव नपरे देखाएकोले सोही अनुसार कार्यक्रम प्रस्थापना
गडाउने निर्वाह गरियो ।

English Translation

Meeting has held on today dated 2076/10/04 in the chaired of Mr. Bhairab Rawal, Chair person of Tikapur water users and sanitation committee and discussion and decision has made as following;

Participants:

1. Mr. Bhairab Sing rawal, Chair Person
2. Mr. Gopiram Jaisi, Vice Chairperson
3. Mr. Naresh kumar khatri, Secretary
4. Mr. Bishram Tharu, Treasurer
5. Mr. Kirti bahadur Rokaya, Member
6. Mrs. Krishni devi Chaudhari, Member
7. Mr. Bal Bahadur Kami, Member
8. Mrs. Sarita rawal thapa, Member
9. Mrs. Srijana Sharma Pandit, Member

Other participants:

1. Mr. Keshav Dhungana, Social Safeguard Specialist
2. Mr. Charitra Rawal, Sub Engineer

Agenda:

1. Regarding the Design of Storm Water Drain
2. Regarding the Socio-economic Impact on Project

Decisions:

1. Detail design estimate about the storm water Drainage under Tikapur water supply and sanitation project has present by BDA/PEA JV and WUSC has decided that implement to construction of all component as per this design estimate.
2. Discussion has hold in meeting about the study and field monitoring of socioeconomic impact of the project in this project area. According to the monitoring and discussion, there are not seen any probability of negative impact in this project, so meeting has decided to implement the construction work as per this Design.

CONSENT LETTERS

नगर प्रमुख: ०९१-४६०३८०
प्रमुख प्रशासकीय अधिकारी: ०९१-४६०३९८
प्रशासकीय अधिकारी: ०९१-४६०८१६



टीकापुर नगरपालिका
नगरकार्यपालिकाको कार्यालय
टीकापुर, कैलाली
सुदूरपश्चिम प्रदेश, नेपाल

प.सं. : २०७६/७७
च.नं. : ३४४८

मिति : २०७६/०२/२२

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था,
टीकापुर, कैलाली ।

विषय : प्रशोधन केन्द्र स्थापनाको लागि आवश्यक जग्गा सम्बन्धमा ।

प्रस्तुत विषयमा तहसं संस्थाको प.सं.२०७६/७७, मिति २०७६।१।१४, च.नं.६८ को पत्र बमोजिम टीकापुर नगरपालिका क्षेत्रमा मानव मलमूत्रीय फोहोर व्यवस्थापनको लागि मानव मलमूत्रीय फोहोर व्यवस्थापन प्रणालीको प्रशोधन केन्द्र निर्माणको गर्नेको लागि ठाउँ छुट्टयाई दिन भनि अनुरोध भई आएकोमा उक्त प्रशोधन केन्द्र निर्माणको लागि टीकापुर नगरपालिका वडा नं.१ वनगाउँ उत्तरपुरुवा स्थित साविक टीकापुर ९(८) कि.नं.८ मध्येबाट एक (१) बिगाह (६७३२.६३ व.मी.) जग्गा छुट्टयाईएको व्यहोरा अनुरोध छ ।


तपेन्द्र बहादुर रावल
नगर प्रमुख

English Translation

Tikapur Municipality
Office of the Municipal Council
Tikapur, Kailali
Sudur Paschim Province, Nepal

Letter No. 2076/077
Letter Dispatch no. 3347
(2077/02/22)

Date: 4 June 2020

Subject: Regarding the land required for Treatment Plant

Tikapur Small Town Water Supply and Sanitation Committee,
Tikapur, Kailali.

With reference to the above subject matter, according to the received letter dated 16 February, 2020 (2076/11/14) of Tikapur Small Town Water Supply and Sanitation Committee with request to avail land for treatment plant for Faecal Sludge Treatment Plant, we inform that the municipality has allocated required land (6772.63 Sq.m) under plot number 8 - of Trace Map 9 (Ta). The land is located at Banagaun Uttar Puruwa, ward number 1 of Tikapur municipality.

Tapendra Bahadur Rawal
The Mayor
(Signed and Stamp)

नगर प्रमुख: ०९१-२६०६८०
प्रमुख प्रशासकीय अधिकृत: ०९१, २६०९१८
प्रशासकीय अधिकृत: ०९१, २६०८९६



टीकापुर नगरपालिका
नगरकार्यपालिकाको कार्यालय
टीकापुर, कैलाली
सुदूरपश्चिम प्रदेश नेपाल

प.सं.: २०७६/७७

च.नं.: १४५२

मिति: २०७६/१०/०६

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था,
टीकापुर, कैलाली।

विषय: सहमती प्रदान सम्बन्धमा।

प्रस्तुत विषयमा तहाँ संस्थाको मिति २०७६.१०.०६ गतेको पत्र बमोजिम नेपाल सरकार तथा
नगरपालिका मन्त्रालय, शहरी खानेपानी तथा सरसफाई (क्षेत्र) परियोजना (Urban Water and Sanitation
(Sector) Project) अन्तर्गत टीकापुर नगरपालिका वडा नं.१ भित्र पर्ने ब्लक नम्बरहरु ए, बी, सी, डी, १,
६, ७, ८, ११, १२, १३, १४, १७, १८, १९, २०, २१, २४, २५ तथा शक्तिनगर र बनगाउँ उत्तरपुरुवामा
वर्षातको पानी व्यवस्थापन प्रणाली (Tikapur Storm Water Drainage Management System)
निर्माणको लागि नगरपालिकाको तर्फबाट सहमति प्रदान गरिएको व्यहोरा अनुरोध छ।


केशरी बिष्ट रावल
का.बा. नगर प्रमुख

Unofficial Translation

Tikapur Municipality
Office of the Municipality
Tikapur, kailali
Sudur Paschim Province, Nepal

Letter No. 2076/077
Letter Dispatch no. 1492

Date: 2076/10/06

Subject: Letter of Consent

Tikapur small Town Water Users and Sanitation Committee
Tikapur, Kailali

With reference to the above subject matter, according to the received letter on dated 2076/10/06 of Tikapur small town water supply and sanitation committee, we inform that the Municipality is agree to construction of storm water drainage in the block no. A,B,C,D, 5,6,7,8,11,12,13,14,17,18,19,20,21,24,25, Bangaun Utarpuruwa and Shaktinagar area of Tikapur Municipality ward no. 1 to be implementing under the government of Nepal, Ministry of water supply and Urban water supply and sanitation (sector) project.

(Keshari Bista Rawal)
Deputy Mayor
(Signed and Stamp)

१ नं. वडा कार्यालय ०९१-५६०८१



पत्रसंख्या: २०७६/०७७
चलानी नम्बर: ४९०८

टीकापुर नगरपालिका
१ नं. वडा कार्यालय
टीकापुर कैलाली
सुदूरपश्चिम प्रदेश, नेपाल

मिति: २०७६/१०/०६

बिषय: सहमति सम्वन्धमा।

**श्री टीकापुर साना सहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था
टीकापुर, कैलाली।**

प्रस्तुत बिषयमा नेपाल सरकार खानेपानी तथा सरसफाई मन्त्रालय, श्री खानेपानी तथा सरसफाई (क्षेत्र परियोजना (Urban Water Supply and Sanitation (Sector) Project) अन्तर्गत टीकापुर नगरपालिका वडा नं. : का ब्लक नं. ए.वि.सी.डी, ५,६,७,८,११,१२,१३,१४,१७,१८,१९,२०,२१,२४,२५, बनगाउँ/उत्तरपुरुवा र शक्तिनगरमा बर्षातक पानी व्यवस्थापन प्रणाली (Tikapur Storm Water Dranaige Management System) निर्माण हुन लागेकोले सो को सहमति उपलब्ध गराई दिन हुन भनि त्यस संस्थाबाट मिति २०७६/१०/०६ गतेको प्राप्त पत्रबाट अनुरोध भि आएको हुँदा टीकापुर नगरपालिका १ नं. वडा कार्यालयको तर्फबाट आवश्यक सहयोग र समन्वय हुने प्रतिबद्धता सहित सहमति प्रदान गरिएको व्यहोरा जानकारीका लागि अनुरोध छ।


(सिता चौधरी)
का.वा.वडाअध्यक्ष
का.वा. वडा अध्यक्ष

Unofficial Translation

Tikapur Municipality
Office of the ward no. 1
Tikapur, kailali
Sudur Paschim Province, Nepal

Letter No. 2076/077
Letter Dispatch no. 4605

Date: 2076/10/06

Subject: Letter of Consent

Tikapur small Town Water Users and Sanitation Committee
Tikapur, Kailali

With reference to the above subject matter, according to the received letter on dated 2076/10/06 of Tikapur small town water supply and sanitation committee, we inform that the office of the ward no. 1 of Tikapur Municipality is agree with support and coordination to construction of storm water drainage in the block no. A, B, C, D, 5, 6, 7, 8, 11, 12, 13, 14, 17, 18, 19, 20, 21, 24, 25, Bangaun Utarpuruwa and Shaktinagar area of Tikapur Municipality ward no. 1 to be implementing under the government of Nepal, Ministry of water supply and Urban water supply and sanitation (sector) project.

(Sita Chaudhari)
Acting Chair Person
(Signed and Stamped)



उच्च जलस्रोत तथा सिंचाइ मन्त्रालय
जलस्रोत तथा सिंचाइ विभाग

फोन नं. ०११-४६१२६१/४६०४१०
फ्याक्स नं. ०११-४६१२३६

रानी जमरा कुलरिया सिंचाइ आयोजना टीकापुर, कैलाली

प.सं. २०७६/०७७

च.नं. २१०

मिति-२०७६/०६/०५

विषय सहमति सम्बन्धमा ।

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था
टीकापुर, कैलाली ।

उपरोक्त विषयमा तहां उपभोक्ता समितिको प.सं. २०७६/७७ च.नं. २४ मिति २०७६/०६/०५ गतेको प्राप्त पत्रानुसार वर्षातको समयमा आकासबाट परेको पानी (Rain Water) व्यवस्थापनको लागि लेखी आएकोले साविकमा किसानहरुद्वारा संचालनमा रहेका सिंचाइ प्रणालीहरु हाल यस आयोजनाबाट आधुनिकिकरण गर्ने प्रक्रियामा रहेको र साविक बमोजिमको पानी बहावमा (Discharge) फरक नपर्ने गरी साविक बमोजिमको स्थानहरुमा (Drain Inlet in Canal) नै व्यवस्थापन गर्न/गराउन यस आयोजनाको सहमति रहेको व्यहोरा जानकारीका लागि अनुरोध छ ।

(मधुकर राना)
आयोजना निर्देशक
आयोजना निर्देशक

Unofficial Translation

Government of Nepal
Ministry of Energy, Water Resource and Irrigation
Department of Water Resource and Irrigation

Rani Jamara Kulariya Irrigation Project
Tikapur Kailali

Letter no. 2076/077
Letter Dispatch no. 210

Date: 2076/06/05

Subject: Letter of Consent

Tikapur Small Town Water Users and Sanitation Committee,
Tikapur, Kailali.

With reference to the above subject matter, according to the received letter on dated 2076/10/05 of Tikapur small town water user committee, we would like to inform that, the office is agree to construction of drain inlet in existing canal without any impact on existing structure.

(Madhukar Rana)
Project Director
(Signed and Stamped)

CONSENT LETTER FOR LAND FOR FSTP

नगर प्रमुख: ०९१-४६०३८०
प्रमुख प्रशासकीय अधिकृत: ०९१, ४६०११८
प्रशासकीय अधिकृत: ०९१, ४६०८१६



टीकापुर नगरपालिका
नगरकार्यपालिकाको कार्यालय
टीकापुर, कैलाली
सुदूरपश्चिम प्रदेश, नेपाल

प.सं. : २०७९/७७
सं. १५२४

मिति : २०७६/११/२६

विषय : प्रशोधन केन्द्र स्थापनाको लागि आवश्यक जग्गा सम्बन्धमा ।

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था,
टीकापुर, कैलाली ।

प्रस्तुत विषयमा तहसँ संस्थाको प.सं. २०७६/७७, मिति २०७६/११/१४, च.नं. ६८ को पत्र बमोजिम टीकापुर नगरपालिका क्षेत्रमा मानव मलमूत्रीय फोहोर व्यवस्थापनको लागि मानव मलमूत्रीय फोहोर व्यवस्थापन प्रणालीको प्रशोधन केन्द्र निर्माण गर्नको लागि ठाउँ छुट्याई दिन भनि अनुरोध भई आएकोमा उक्त प्रशोधन केन्द्र निर्माणको लागि टीकापुर नगरपालिका वडा नं. १ वनगाउँ उत्तरपुरुवा स्थित साविक टीकापुर ९(ट) फि.नं. ८ मध्येबाट आवश्यक जग्गा छुट्याईएको व्यहोरा अनुरोध छ ।


तपेन्द्र बहादुर रावल
नगरप्रमुख
तपेन्द्र बहादुर रावल

Unofficial Translation

Tikapur Municipality
Office of the Municipality
Tikapur, kailali
Sudurpaschim Province, Nepal

Letter No. 2076/077
Letter Dispatch no. 1924

Date: 2076/11/26

Subject: Regarding the land required for Treatment Plant

Tikapur Small Town Water Users and Sanitation Committee,
Tikapur, Kailali.

With reference to the above subject matter, according to the received letter dated 2076/11/14 of Tikapur Small Town Water Supply and Sanitation Committee with request to avail land for treatment plant for Faecal Sludge Treatment Plant, we inform that the municipality has allocated required land under plot number 8 - of Trace Map 9(Ta). The land is located at Banagaun UttarPuruwa of ward number 1 of Tikapur municipality.

Tapendra Bahadur Rawal
The Mayor
(Signed and Stamp)

Minute of meeting on Faecal sludge treatment plant

આજ તારીખ ૨૦૧૬ સહ્યદ્ર અક્ષર ૬ ગતેકા દિન રીડાપુર સાનાવડી રાજાનેપાની તથા સરસગઈ સંસ્થાકો આયોજનમાં રીડાપુર નગરપાલીકાકો પ્રમુખ સમિતિએ ઉપસ્થિતિમાં લાનેપાની સંસ્થાકો અધ્યક્ષ નેરવ રાજાકો અધ્યક્ષતામાં નિમ્ન ઉપસ્થિતિમાં બેલા નક્કી નિમ્ન નિર્ણય કરાશે		
<u>ઉપસ્થિતિ</u>		
૧. શ્રી	નેરવ રાજુલ અધ્યક્ષ રીડાપુર સ.મી. (અ.પી.)	સહી
૨. શ્રી	ભુવેન્દ્ર વરદર રાજુલ પ્રમુખ, રીડાપુર ન.પા.	સહી
૩. શ્રી	કમ્બે રાજુલ નિર્વહી, પ્રમુખ " "	સહી
૪. શ્રી	ગંગાલાલ આચાર્ય, વજ્ર અધ્યક્ષ, મી.ન.પા. ૧	સહી
૫. શ્રી	ગોપીચંદ્ર કેશી, ઉપાધ્યક્ષ, સાનેપાની	સહી
૬. શ્રી	નરેશ કુમાર શક્તી લાલિય " "	સહી
૭. શ્રી	વિશ્વામ વાડુ, સોનાધામ " "	સહી
૮. શ્રી	શ્રીજા શાસ્ત્રી પાણિય, રાજુલ " "	સહી
૯. શ્રી	સારિયા વાળા " "	સહી
૧૦. શ્રી	કલ્કીદેવી ચૌધરી " "	સહી
૧૧. શ્રી	વલ વરદર શિવ " "	સહી
૧૨. શ્રી	શિવ વરદર રીડાપુર " "	સહી
૧૩. શ્રી	રવિશંકર શાહ નગર ઉદ્યોગ નેરવકાપાઠ	સહી
૧૪. શ્રી	દામરાજ ઉપાધ્યાય તથા " નેપાળીકોંગ્રેસ	સહી
૧૫. શ્રી	તરવંકા સુવેકી	સહી
૧૬. શ્રી	નરસિંહ રાજુલ	સહી
૧૭. શ્રી	સુપ્રસન્ન વરદર શિવ	સહી
૧૮. શ્રી	રવિશંકર શાસ્ત્રી તથા	સહી
૧૯. શ્રી	જિત વરદર ચૌધરી	સહી
૨૦. "	સુવલ્લ આપ	સહી
૨૧. "	ગોવિન્દ રાજુલ	સહી
૨૨. "	મહેન્દ્ર રાજુલ	સહી
૨૩. "	રમણ શિવ	સહી
૨૪. "	અનિલ રાજુલ	સહી
૨૫. "	દર્શના રામા	સહી
૨૬. "	ગોવિન્દ શિવ	સહી
૨૭. "	અચ્યુત રાજુલ	સહી
૨૮. "	તુલસીરામ ચૌધરી	સહી
૨૯. "	ગાંગાજી હિંમત	સહી
૩૦. "	સુપ્રસન્ન રાજુલ - સોનાધામ	સહી

29. श्री बीर बहादुर बडाला
30. श्री जनक बहादुर रावल
31. श्री निरंजना - चौधरी

निर्वाची
जनक रावल
निर्वाची

प्रस्ताव

9. F.S.M. प्रसोधन हेतु निर्वाचन समन्वयता

निर्वाचक

9. प्रस्ताव नं. 9 माधी कलकल जवळी बीकानेर नगरपालिका वडा नं. 9 मा निर्वाचन हुने F.S.M. उपसमूह मन्त्रालयका (सामान्य मन्त्रालय) हेतु प्रसोधन नैतिकता लायी बीकानेर नगरपालिका वडा नं. 9 वनाडो हेतु उत्तर, पश्चिम, पूर्व, र वायव्य पश्चिम मा रहेको विला नं. 1 माथेकाट रडु विला (5662.85 का.मी) जग्गा दिने निर्वाचन गरियो। यसका लागि बीकानेर नगरपालिका, उपसमूह सेवा (W.P.S.C.) र कृषि मन्त्रालय तर्फबाट र्हात बाप र्हात समूह र्हात प्रतिनिधिता एवम् बाडु गर्ने निर्वाचन गरियो।

1/10

श्री वीर बहादुर

निर्वाचक

श्री निरंजना

English Translation

A consultation meeting was held on 23rd June 2020, on the invitation of Tikapur Small Town Water Supply and Sanitation Committee, the meeting was held under the chairpersonship of the chairperson of WUSC with the participation Mayor of Tikapur Municipality and following discussion and decisions were made in the presence of listed stakeholders;

Presence

1. Mr. Bhairab Sing Rawal , Chairperson, Tikapur WUSC
2. Mr. Tapendra Bahadur Rawal. Mayor, Tikapur Municipality
3. Mrs. Keshari Rawal/Bista, Deputy Mayor, Tikapur Municipality
4. Mr. Gangaram Acharya, Chairperson, Tikapur Municipality ward no.-1
5. Mr. Gopiram Jaisi, Vice-Chairperson, Tikapur WUSC
6. Mr. Naresh Kumar Khatri, Secretary, Tikapur WUSC
7. Mr. Bishram Tharu, Tresuror, Tikapur WUSC
8. Mrs. Shrijana Sharma/ Pandit, Member, Tikapur WUSC
9. Mrs. Sarita Rawal, Member, Tikapur WUSC
10. Mrs. Krishni Devi Chaudhari, Member, Tikapur WUSC
11. Mr. Bal Bahadur B.K, Member, Tikapur WUSC
12. Mr. Kirti Bahadur Rokaya, Member, Tikapur WUSC
13. Mr. Khadak Shah, Nagar Chairperson, (Nepal Comunist Party)
14. Mr. Dhanaraj Upadhyaya, Nagar Chair person, (Nepali Congress)
15. Mrs. Narbada Subedi, consumer
16. Mr. Nara Prasad Khanal, consumer
17. Mr. Rupak Bahadur Bista, consumer
18. Mr. Khadga Ghartimagar, consumer
19. Mr. Jit Bahadur Chaudhari, consumer
20. Mr. Suraj Thapa, consumer
21. Mr. Saroj Khanal, consumer
22. Mr. Mahendra Rawal, consumer
23. Mr. Damber B.K, consumer
24. Mr. Charitra Rawal, consumer
25. Mrs. Darsana Sharma, consumer
26. Mr. Govinda Bista, consumer
27. Mr. Jayas saud, consumer
28. Mr. Tulsiram Chaudhari,consumer
29. Mr.Jagannath Dhungana,consumer
30. Mr. Suman kumar Neupane,consumer
31. Mr. Bir Bahadur Batala, consumer
32. Mr. Janak Bahadur Rawal, consumer
33. Mrs. Nirmala Chaudhari, consumer

(Signed by all the participants)

Agenda:

Agenda 1: Regarding the construction of Faecal Sludge Management

Decision: 1

Regarding the construction of treatment plant for the Faecal Sludge Management in Tikapur Municipality ward no. 1, the meeting has decided to provide the 6772.63 sq.m land of plot no.8 for construction of treatment plant at the location of the north-west side of Bangaun. And meeting has decided to the commitment for support and consent to this work by Tikapur Municipality, WUSC and Local Community.

Consent Letter from Jamara Branch Canal Irrigation User Committee

दस्तावेज नं. ०५५/०५६/४ जिल्ला जल श्रोत समिति कैलाली

 **जमरा कुलो शाखा सिंचाइँ प्रणाली जल उपभोक्ता संस्था**

पत्र संख्या: २०७६/०७७
चलानी: १०५८

 मिती: २०७७/०३/१७

श्री टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्था
टीकापुर, कैलाली ।

विषय :- सहमति सम्बन्धमा ।

उपरोक्त सम्बन्धमा टीकापुर साना शहरी खानेपानी उपभोक्ता तथा सरसफाई संस्थाको च.नं. ८५ मिति २०७७/०३/१४ को प्राप्त पत्रअनुसार टीकापुर नगरपालीका वडा नं. १ मा नेपाल सरकार खानेपानी मन्त्रालय, खानेपानी तथा ढल व्यवस्थापन विभाग र टीकापुर नगरपालीकाको लागत सहभागितामा वर्षाति पानी व्यवस्थापन प्रणाली (Storm Water Drainage Management system तथा Faecal Sludge Management (FSM) system निर्माण हुने कुराको जानकारी प्राप्त भयो । त्यस उपभोक्ता संस्थाबाट टीकापुर नगरपालीका वडा नं. १ ब्लक नं. ८ बाट दक्षिण पश्चिम तथा वनगाउँ उत्तरपुरुवाबाट उत्तर पश्चिममा निर्माण हुने Faecal Sludge Management (FSM) system बाट निश्काशन हुने प्रशोधित पानी जमरा कुलो शाखा सिंचाइँ प्रणालीमा व्यवस्थापन गर्न माग भै आएकोमा उक्त पानी धिया, रामपुर, कटानपुर बाँधको तल तिर जमरा कुलोमा निकास हुने गरी व्यवस्थापन गर्नको लागि सहमति दिइएको छ ।


लालबिर चौधरी
अध्यक्ष
जमरा कुलो शा.सि.उ.सं.न.

Jamara Branch Canal Irrigation User Committee

Date: 01 July 2020

Letter no. 2019/020

Ref. No. 1058

Tikapur Small Town Water Supply and Sanitation Committee

Tikapur, kailali

Subject: Regarding the consent

According to the letter received from Tikapur Small Town Water Supply and Sanitation committee with reference No. 85 dated on 28 June 2020, information was received about the construction of storm water drainage management and Faecal sludge management system in Tikapur Municipality ward No. 1 with the investment of Ministry of Water Supply, Department of Drinking Water and Sewerage management and Tikapur Municipality. As per the demand of Water Supply Committee, It has given a consent to manage the outlet at the bottom of Ghiya, Rampur and Katanpur dam of Jamara canal to manage the processed water from the Faecal sludge management system to be constructed at southwest of Tikapur Municipality ward no. 1 Block No. 8 and northwest of Bangaun Uttarpuwa.

Lalbir Chaudhari

Chairperson

Jamara Branch Canal Irrigation User Committee

Consultation meetings among stakeholders about SWD

A design presentation was held at Project Management Office Puz on 20th Dec. 2019 for Tikapur Stormwater Drainage project in the presence of PD, DMO officials, PM&AC, DRTAC, DSNC representatives and Tikapur Representatives.

Attendees:

- Attendees:
1. Bidya Nath Bhattacharai, PD, PMO.
 2. Bikesh Wadhanchley, DPD, PMO.
 3. Dr. Rama Bahadur Raval, MP-Pradesh Indurgashim.
 4. Gaurino Shah CA Member
 5. Durgah Bahadur Thakulla - Tikapur-8 ward chairman
 6. Tapan Goro Raval - Mayor Tikapur Mun.
 7. Bhairab Singh Raval, chairman WUSC, Kp
 8. Chura Mani Pantli, CAO Tikapur mun.
 9. Navraj Joshi, Engineer, Tikapur mun.
 10. Navresh Kumar Khatri Secretary - WUSC Kp
 12. Hari Prasad Sharma - TL, BRTA -
 13. Nitish Swartha, BDA
 14. Manoj K. Sharma, CMS, BDA - PEA J/V
 15. Shyam P. Upadhyay DRE, PMRC
 16. Dr. Bhaynari Ratra Karsur, USE, BDA
 17. Sanjay Khadka BDA
 18. Dr. Dhundi Raj Dahal, TL / DSMC

Decisions: Presentation was done by BPA & discussed.
Budget allocated

Decisions: Presentation was done by BPA & discussed.
① As the Project Cost is beyond the budget allocated in Procurement Plan. Hence, the Project need to be eliminated in Phase - I & Phase II. The Tikaput representative agreed to put the following areas/phase in phase II: - S₂g-S₂g, T₂L₄L, T₂L₇R, T₃L₂L, T₃L₂R, T₃L₃L, T₃L₃R, T₃L₄L, T₃L₄R, T₃L₅L, T₃L₅R, T₃L₆L, T₃L₆R, T₃L₇L, T₃L₇R, T₃L₈L, T₃L₈R, T₃L₉L, T₃L₉R, T₃L₁₀L, T₃L₁₀R, T₃L₁₁L, T₃L₁₁R, T₃L₁₂L, T₃L₁₂R, T₃L₁₃L, T₃L₁₃R, T₃L₁₄L, T₃L₁₄R, T₃L₁₅L, T₃L₁₅R, T₃L₁₆L, T₃L₁₆R, T₃L₁₇L, T₃L₁₇R, T₃L₁₈L, T₃L₁₈R, T₃L₁₉L, T₃L₁₉R, T₃L₂₀L, T₃L₂₀R, T₃L₂₁L, T₃L₂₁R, T₃L₂₂L, T₃L₂₂R, T₃L₂₃L, T₃L₂₃R, T₃L₂₄L, T₃L₂₄R, T₃L₂₅L, T₃L₂₅R, T₃L₂₆L, T₃L₂₆R, T₃L₂₇L, T₃L₂₇R, T₃L₂₈L, T₃L₂₈R, T₃L₂₉L, T₃L₂₉R, T₃L₃₀L, T₃L₃₀R, T₃L₃₁L, T₃L₃₁R, T₃L₃₂L, T₃L₃₂R, T₃L₃₃L, T₃L₃₃R, T₃L₃₄L, T₃L₃₄R, T₃L₃₅L, T₃L₃₅R, T₃L₃₆L, T₃L₃₆R, T₃L₃₇L, T₃L₃₇R, T₃L₃₈L, T₃L₃₈R, T₃L₃₉L, T₃L₃₉R, T₃L₄₀L, T₃L₄₀R, T₃L₄₁L, T₃L₄₁R, T₃L₄₂L, T₃L₄₂R, T₃L₄₃L, T₃L₄₃R, T₃L₄₄L, T₃L₄₄R, T₃L₄₅L, T₃L₄₅R, T₃L₄₆L, T₃L₄₆R, T₃L₄₇L, T₃L₄₇R, T₃L₄₈L, T₃L₄₈R, T₃L₄₉L, T₃L₄₉R, T₃L₅₀L, T₃L₅₀R, T₃L₅₁L, T₃L₅₁R, T₃L₅₂L, T₃L₅₂R, T₃L₅₃L, T₃L₅₃R, T₃L₅₄L, T₃L₅₄R, T₃L₅₅L, T₃L₅₅R, T₃L₅₆L, T₃L₅₆R, T₃L₅₇L, T₃L₅₇R, T₃L₅₈L, T₃L₅₈R, T₃L₅₉L, T₃L₅₉R, T₃L₆₀L, T₃L₆₀R, T₃L₆₁L, T₃L₆₁R, T₃L₆₂L, T₃L₆₂R, T₃L₆₃L, T₃L₆₃R, T₃L₆₄L, T₃L₆₄R, T₃L₆₅L, T₃L₆₅R, T₃L₆₆L, T₃L₆₆R, T₃L₆₇L, T₃L₆₇R, T₃L₆₈L, T₃L₆₈R, T₃L₆₉L, T₃L₆₉R, T₃L₇₀L, T₃L₇₀R, T₃L₇₁L, T₃L₇₁R, T₃L₇₂L, T₃L₇₂R, T₃L₇₃L, T₃L₇₃R, T₃L₇₄L, T₃L₇₄R, T₃L₇₅L, T₃L₇₅R, T₃L₇₆L, T₃L₇₆R, T₃L₇₇L, T₃L₇₇R, T₃L₇₈L, T₃L₇₈R, T₃L₇₉L, T₃L₇₉R, T₃L₈₀L, T₃L₈₀R, T₃L₈₁L, T₃L₈₁R, T₃L₈₂L, T₃L₈₂R, T₃L₈₃L, T₃L₈₃R, T₃L₈₄L, T₃L₈₄R, T₃L₈₅L, T₃L₈₅R, T₃L₈₆L, T₃L₈₆R, T₃L₈₇L, T₃L₈₇R, T₃L₈₈L, T₃L₈₈R, T₃L₈₉L, T₃L₈₉R, T₃L₉₀L, T₃L₉₀R, T₃L₉₁L, T₃L₉₁R, T₃L₉₂L, T₃L₉₂R, T₃L₉₃L, T₃L₉₃R, T₃L₉₄L, T₃L₉₄R, T₃L₉₅L, T₃L₉₅R, T₃L₉₆L, T₃L₉₆R, T₃L₉₇L, T₃L₉₇R, T₃L₉₈L, T₃L₉₈R, T₃L₉₉L, T₃L₉₉R, T₃L₁₀₀L, T₃L₁₀₀R, T₃L₁₀₁L, T₃L₁₀₁R, T₃L₁₀₂L, T₃L₁₀₂R, T₃L₁₀₃L, T₃L₁₀₃R, T₃L₁₀₄L, T₃L₁₀₄R, T₃L₁₀₅L, T₃L₁₀₅R, T₃L₁₀₆L, T₃L₁₀₆R, T₃L₁₀₇L, T₃L₁₀₇R, T₃L₁₀₈L, T₃L₁₀₈R, T₃L₁₀₉L, T₃L₁₀₉R, T₃L₁₁₀L, T₃L₁₁₀R, T₃L₁₁₁L, T₃L₁₁₁R, T₃L₁₁₂L, T₃L₁₁₂R, T₃L₁₁₃L, T₃L₁₁₃R, T₃L₁₁₄L, T₃L₁₁₄R, T₃L₁₁₅L, T₃L₁₁₅R, T₃L₁₁₆L, T₃L₁₁₆R, T₃L₁₁₇L, T₃L₁₁₇R, T₃

by P.M.O.
Sikim

12

~~29 January~~
18 January




Meeting with stakeholders regarding SWD and FSTP

Date: 9 August 2019

A design presentation of Tikapur storm drainage and Tikapur Faecal Sludge Treatment Plan combinedly done at DWSSM hall, Kathmandu under the chairmanship of project Director Mr. Bidyanath Bhattarai along with enlisted officials, consultants and ~~the~~ Tikapur (project) inhabitants.

S.N.	Name	Designation	Signature
1.	Bidyanath Bhattarai	Project Director	
2.	Bikesh Wadhanthachya	Deputy Proj. Dir.	
3.	Purora Prasad Upadhyaya	Regional P.M.	
4.	Lantun Chachhary	wardchairman T.K.P. 9	
5.	Hari Prasad Sharma	TL, DRTAC	
6.	Tri Ratna Shokya	- Director, P.E.A	
7.	Sanjay Khedka	- Engineer, BDA	
8.	Nitesh Shrestha (BDA)	Sanitation Engg	
9.	Dhundi Raj Dahal	ATL BDA/DENJUBDSMC	
10.	Shyam Prasad Upadhyay	DRE, PMRAC	
11.	Bimal Chandra Jha	TL, PMRAC	
12.	Sayam Raj Pandey	Tikapur	
13.	Ganga Ran Achary	ward M.I. chairman	
14.	Tapendra Rawal	Mayor HKP Mun	
15.	Nama Raj Ghosh		
16.	Nav Raj Rawal	Tikapur	
17.	Bhairab Singh Rawal	Chairman, WUSC, Tikapur	
18.	Naresh Kumar Khatri	Secretary WUSC Tikapur	
19.	Nav Raj Jishi	Engineer, Tikapur Mun.	
20.	Krishna Ram Yendya	Eco Concern P.L. 12	
21.	Dil B. Thakara	Tikapur	
22.	Prakash Bahadur Budda	ward No. 2 chairman	
23.	Matsika Timilsena	Tikapur	

Meeting among stakeholders about FSTP

2008/2/12

27-JUN-2019

A presentation was conducted at Project Management Office under the chairmanship

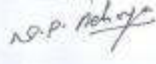
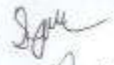
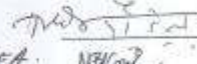
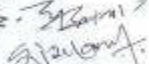
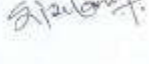
of Project Director Mr. Bidya Nath Bhattarai to discuss the design of Fecal Sludge Management Project in Titapur (Kailali) and Khakanga (Darchula) in presence of following government officials, DRTAC, WRDSMC.

SN	Name	Designation	Signature
1.	Bidya Nath Bhattarai	Project Director	
2.	Narayan Pd. Acharya	Deputy Project Director	
3.	Bikesh Wadhanthachhya	Deputy Project Director	
4.	Ram Kumar Shrestha	Deputy Project Director	
5.	Yagya Prasad Dhakal	Undersecretary (Accounts)	
6.	Ratindra Ray	Engineer, PMO	
7.	Aashutosh K. Thakur	Engineer, PMO	
8.	Hari Pd. Sharma	DRTAC - TL	
9.	Rajesh Maharjan	Water Treatment Expert	
10.	Sanjaya Adhikari	Water Governance & Sanitation Specialist ADB-TR	
11.	Mohan Bdr. Karkee	WRDSMC - TL	
12.	Manoj Kr. Sharma	WRDSMC - CMC	
13.	Dhundi Raj Dahal	WRDSMC	
14.	PURNA PRASAD UPADHYAY	RPMO - WEST CHIEF	
15.	Nitesh Shrestha	WRDSMC	

Meeting among stakeholders regarding SWD and FSTP

Dec 21, 2018

A consultation meeting is held on 21 December, 2018 in the chairmanship of Mr. Bidya Nath Bhattacharya to discuss on the issue of Tikapur Drainage Project, under Urban Water Supply and Sanitation (Sector) Project. The following government officials, DRAC and other special invitee is attended in the meeting.

S.No.	Name	Designation	Signature
1.	Mr. Bidya Nath Bhattacharya	Agent Director	
Special invitee	2. Mr. Ramakanta Duniadi	Deputy District General	
"	3. Mr. Ran Bdr Rawal	Hon. Provincial Parliament Member, Province 7	
4.	Mr. Tapendra Rawal	Mayor, Tikapur Municipality	
5.	Mr. Narayan Prad Acharya	DDP, PMO	
6.	Mr. Rajendra Sapkota	"	
7.	Mr. Hari Prd. Sharma	Coordinator, DRAC	
8.	Mr. Vijaya Rij Upadhyay	Technical auditor, DRAC	
9.	Mr. Sudeep Prudel	BDA	
10.	Mr. Mohan Bdr. Karki	TL, BDA-PEA	
11.	Mr. Manoj Kumar Sharma	CMS, BDA-PEA	
12.	Mr. Pankaj Naray Raj Rawal	WUSE Chairperson, Tikapur	
13.	Mr. Mushi Prd. Shrestha	BDA-PEA, P.P. Shrestha	
14.	Mr. Trixatna Shukla	BDA-PEA	
15.	Mr. Dhurba Rij Acharya	Tikapur Municipality	
16.	Mr. Nirodh Kumar Bhattarai	Tikapur WUSE	

- Agenda: 1. Scope of Tikapur drainage
2. Project & cost sharing mechanism.
3. AOB.

Decision:

1. The scope of Tikapur drainage is discussed so that the drainage design shall be done in phasing. The main drainage under phase 1 shall be included under UNSP and the secondary drain under phase 2 shall be constructed by the municipality itself by its own resources later.
2. In phase 1, it is also agreed to include FSM component.
3. The municipality has agreed to provide necessary land for SD & FSM component and shall contribute 15% of total project cost. also.

Noted.

**ANNEX 6:
LABORATORY TEST REPORTS**

Wastewater Quality



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ENVIRONMENT AND PUBLIC HEALTH ORGANIZATION ENPHO LABORATORY

(Cont. Reg. 1889/1996, STWC Reg. 3834/1998)

Managed and Marketed by : Eco Concern Pvt. Ltd.

Sample Analysis Report

Lab Sample ID: 2148[075-076]

ENPHO/QR/S.10.2.1/04/2075-076

Client: Building Design Authority (P) Ltd.
Client Address: Kamaladi, Kathmandu
Received On: Wednesday, March 13, 2019
Completed On: Thursday, April 11, 2019
Sample By: Lab Staff
Client's Sample Code: Mayor's House

Sample Category: Sludge
Sample Location: Block 5, Tikapur Municipality, Kailali
Point of Sample Collection: Outlet
Source of Sample: Septic tank
Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2148[075-076]	Test Methods
Ammonia	mg/L	1573.00	APHA, AWWA, WPCF (1985), 417 B
Biochemical Oxygen Demand (BOD)	mg/L	685	APHA, AWWA, WEF (2017), 5210 B
Chemical Oxygen Demand (COD)	mg/L	54240	APHA, AWWA, WEF (2017), 5210 B
Faecal Coliform (MPN)	MPN/100mL	>2400	APHA, AWWA, WEF (2017), 9221
Helminths	Present/Absent	Present (Ascaris eggs)	Pg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/L	50.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/L	52630.0	APHA, AWWA, WEF (2017), 5210 B
pH	-	7.42	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/L	401.25	APHA, AWWA, WEF (2017), 5111 B
Sludge Volume Index	mL/g	12	APHA, AWWA, WEF (2017), 2710D
Temperature	°C	21.87	APHA, AWWA, WEF (2017), 2590 B
Total Coliform (MPN)	MPN/100mL	>2400	APHA, AWWA, WEF (2017), 9221
Total Nitrogen	mg/L	2387.2	APHA, AWWA, WEF (2017), 4500-Norg B
Total Phosphorus	mg/L	1434.00	APHA, AWWA, WEF (2017), 4500 P E
Total Solids	mg/kg	84830.0	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/kg	84520.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/kg	51200.0	APHA, AWWA, WEF (2017), 2540 E
Volatile Suspended Solids	mg/kg	48440.0	APHA, AWWA, WEF (2017), 2540 E
Water content	%	92.2	APHA, AWWA, WEF (2017), 2540 B

ENPHO Laboratory Accredited by NEPAL BUREAU OF STANDARDS AND METROLOGY (NBSM).

References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

[] : Maximum Concentration Limit NO : Not Detected

Result with 'c' indicate that the concentration was below the detection limit. The limit is indicated by the number following 'c' sign.

[Signature]

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[Signature]

CHECKED BY

[Signature]

AUTHORIZED BY

Note:

- (1) The results refer only to the parameters tested of the sample provided/collected for analysis. Endorsement of products is neither inferred nor implied.
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(Cert. Reg. 1889471845, SPC Reg. 2839471845)

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Sample Analysis Report

Lab Sample ID: 2149[075-076]

ENPHO/QR/5.10.2.1/04/2075-076

Client: Building Design Authority (P) Ltd.
Client Address: Kamaladi, Kathmandu
Received On: Wednesday, March 13, 2019
Completed On: Tuesday, April 9, 2019
Sample By: Lab Staff
Client's Sample Code: Public Toilet

Sample Category: Sludge
Sample Location: Block 14, Tikapur Municipality, Kailali
Point of Sample Collection: Outlet
Source of Sample: Septic tank
Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2149[075-076]	Test Methods
Ammonia	mg/L	778.03	APHA, AWWA, WPCF (1985), 457 B
Biochemical Oxygen Demand (BOD)	mg/L	2230	APHA, AWWA, WEF (2017), 5210 B
Chemical Oxygen Demand (COD)	mg/L	25990	APHA, AWWA, WEF (2017), 5220 B
Faecal Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Helminths	Present/Absent	Present (Acicaris eggs)	Pg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/L	250.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/L	5530.0	APHA, AWWA, WEF (2017), 5310 B
pH	-	7.03	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/L	380.61	APHA, AWWA, WEF (2017), 3111 B
Sludge Volume Index	ml/g	12	APHA, AWWA, WEF (2017), 27100
Temperature	°C	21.48	APHA, AWWA, WEF (2017), 2550 B
Total Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Total Nitrogen	mg/L	1618.50	APHA, AWWA, WEF (2017), 4500-Norg B
Total Phosphorus	mg/L	477.00	APHA, AWWA, WEF (2017), 4500 P (
Total Solids	mg/L	81045.0	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/L	85100.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/L	5530.0	APHA, AWWA, WEF (2017), 2540 E
Volatile Suspended Solids	mg/L	43300.0	APHA, AWWA, WEF (2017), 2540 E
Water content	%	90.9	APHA, AWWA, WEF (2017), 2540 B

ENPHO Laboratory Accredited by NEPAL BUREAU OF STANDARDS AND METEOROLOGY (NBSM)

References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

[] : Maximum Concentration Limit ND : Not Detected

Result with "<" indicate that the concentration was below the detection limit. The limit is indicated by the number following "<" sign.

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Note:

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(Cert. Reg. 108947048, WPC Reg. 203947048)

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Sample Analysis Report

Lab Sample ID: 2150[075-076]

ENPHO/QR/S.10.3.1/04/2075-076

Client: Building Design Authority (P) Ltd.	Sample Category: Sludge
Client Address: Kamaladi, Kathmandu	Sample Location: Block D, Tikapur Municipality, Kailali
Received On: Wednesday, March 13, 2019	Point of Sample Collection: Outlet
Completed On: Tuesday, April 9, 2019	Source of Sample: Septic tank
Sample By: Lab Staff	
Client's Sample Code: Bhawana Hotel	Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2150[075-076]	Test Methods
Ammonia	mg/L	511.70	APHA, AWWA, WPCF (1985), 417 B
Biochemical Oxygen Demand (BOD)	mg/L	1370	APHA, AWWA, WEF (2017), 5210 B
Chemical Oxygen Demand (COD)	mg/L	11640	APHA, AWWA, WEF (2017), 5220 B
Faecal Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Helminths	Present/Absent	Present (Fasciola hepatica)	Fg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/L	56.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/L	24707.0	APHA, AWWA, WEF (2017), 5310 B
pH	-	7.11	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/L	213.79	APHA, AWWA, WEF (2017), 3111 B
Sludge Volume Index	ml/g	34	APHA, AWWA, WEF (2017), 27100
Temperature	°C	21.91	APHA, AWWA, WEF (2017), 2550 B
Total Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9221
Total Nitrogen	mg/L	2392.40	APHA, AWWA, WEF (2017), 4500-Norg B
Total Phosphorus	mg/L	376.00	APHA, AWWA, WEF (2017), 4500 P E
Total Solids	mg/L	30118.00	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/L	23640.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/L	24707.0	APHA, AWWA, WEF (2017), 2540 E
Volatile Suspended Solids	mg/L	20560.0	APHA, AWWA, WEF (2017), 2540 F
Water content	%	97.0	APHA, AWWA, WEF (2017), 2540 G

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References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

{ } : Maximum Concentration Limit ND : Not Detected

Result with "<" indicate that the concentration was below the detection limit. The limit is indicated by the number following "<" sign.

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Sample Analysis Report

Lab Sample ID: 2151[075-076]

ENPHO/QR/5.10.2.1/04/2075-076

Client: Building Design Authority (B) Ltd.
Client Address: Kamaladi, Kathmandu
Received On: Wednesday, March 13, 2019
Completed On: Tuesday, April 9, 2019
Sample By: Lab Staff
Client's Sample Code: Sirendra School

Sample Category: Sludge
Sample Location: Block B, Tikapur Municipality, Kailali
Point of Sample Collection: Outlet
Source of Sample: Septic tank
Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2151[075-076]	Test Methods
Ammonia	mg/l	1205.18	APHA, AWWA, WPCF (1985), 417 B
Biochemical Oxygen Demand (BOD)	mg/l	406	APHA, AWWA, WEF (2017), 5210 B
Chemical Oxygen Demand (COD)	mg/l	904	APHA, AWWA, WEF (2017), 5220 B
Faecal Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Helminths	Present/Absent	Absent	Pg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/l	28.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/l	1749.0	APHA, AWWA, WEF (2017), 5310 B
pH	-	8.50	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/l	427.02	APHA, AWWA, WEF (2017), 3111 B
Sludge Volume Index	ml/g	12	APHA, AWWA, WEF (2017), 2710D
Temperature	°C	22.17	APHA, AWWA, WEF (2017), 2550 B
Total Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9221
Total Nitrogen	mg/l	1226.90	APHA, AWWA, WEF (2017), 4500-Norg B
Total Phosphorus	mg/l	72.20	APHA, AWWA, WEF (2017), 4500 P E
Total Solids	mg/l	5566.0	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/l	2790.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/l	1749.0	APHA, AWWA, WEF (2017), 2540 E
Visible Suspended Solids	mg/l	1370.0	APHA, AWWA, WEF (2017), 2540 E
Water content	%	99.4	APHA, AWWA, WEF (2017), 2540 B

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References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

{ } : Maximum Concentration Limit ND : Not Detected

Result with "<" indicate that the concentration was below the detection limit. The limit is indicated by the number following "<" sign.

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Sample Analysis Report

Lab Sample ID: 2152[075-076]

ENPHO/QR/5.10.2.1/04/2075-076

Client: Building Design Authority (P) Ltd.	Sample Category: Sludge
Client Address: Kamaladi, Kathmandu	Sample Location: Block A, Tikapur Municipality, Kailali
Received On: Wednesday, March 13, 2019	Point of Sample Collection: Outlet
Completed On: Tuesday, April 9, 2019	Source of Sample: Septic tank
Sample By: Lab Staff	
Client's Sample Code: Near Char Chautari	Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2152[075-076]	Test Methods
Ammonia	mg/L	249.00	APHA, AWWA, WPCF (1985), 417 B
Biochemical Oxygen Demand (BOD)	mg/L	818	APHA, AWWA, WEF (2017), 5210 B
Chemical Oxygen Demand (COD)	mg/L	158.20	APHA, AWWA, WEF (2017), 5220 B
Faecal Coliform (MPN)	MPN/100mL	>2400	APHA, AWWA, WEF (2017), 9222
Helminths	Present/Absent	Present (Ascaris spp.)	Pg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/L	180.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/L	30733.0	APHA, AWWA, WEF (2017), 5310 B
pH	-	6.80	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/L	89.13	APHA, AWWA, WEF (2017), 3111 B
Sludge Volume Index	mL/g	55	APHA, AWWA, WEF (2017), 2710D
Temperature	°C	21.84	APHA, AWWA, WEF (2017), 2550 B
Total Coliform (MPN)	MPN/100mL	>2400	APHA, AWWA, WEF (2017), 9221
Total Nitrogen	mg/L	818.20	APHA, AWWA, WEF (2017), 4500-Nitro B
Total Phosphorus	mg/L	317.00	APHA, AWWA, WEF (2017), 4500 P E
Total Solids	mg/L	75928.0	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/L	64720.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/L	30733.0	APHA, AWWA, WEF (2017), 2540 E
Volatile Suspended Solids	mg/L	24220.0	APHA, AWWA, WEF (2017), 2540 E
Water content	%	93.4	APHA, AWWA, WEF (2017), 2540 B

ENPHO Laboratory Accredited by NEPAL BUREAU OF STANDARDS AND METEOROLOGY (NBSM).

References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

() : Maximum Concentration Limit ND : Not Detected

Result with 'c' indicate that the concentration was below the detection limit. The limit is indicated by the number following 'c' sign.

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Note:

- (1) The results refer only to the parameters tested of the sample provided/collected for analysis. Endorsement of products is neither inferred nor implied.
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Sample Analysis Report

Lab Sample ID: 2153(075-076)

ENPHO/QR/5.10.2.1/04/2075-076

Client: Building Design Authority (P) Ltd.
Client Address: Kamaladi, Kathmandu
Received On: Wednesday, March 11, 2015
Completed On: Tuesday, April 9, 2015
Sample By: Lab Staff
Client's Sample Code: Tikapur Hospital

Sample Category: Sludge
Sample Location: Block A, Tikapur Municipality, Kailali
Point of Sample Collection: Outlet
Source of Sample: Septic tank
Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2153(075-076)	Test Methods
Ammonia	mg/L	1601.25	APHA, AWWA, WPCF (1995), 417 B
Biochemical Oxygen Demand (BOD)	mg/L	275	APHA, AWWA, WEF (2017), 5220 B
Chemical Oxygen Demand (COD)	mg/L	1695	APHA, AWWA, WEF (2017), 5220 B
Faecal Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Helminths	Present/Absent	Absent	Pg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/L	290.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/L	1172.0	APHA, AWWA, WEF (2017), 5210 B
pH	-	7.32	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/L	342.27	APHA, AWWA, WEF (2017), 3113 B
Sludge Volume Index	ml/g	40	APHA, AWWA, WEF (2017), 2710D
Temperature	°C	22.18	APHA, AWWA, WEF (2017), 2550 B
Total Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Total Nitrogen	mg/L	1694.80	APHA, AWWA, WEF (2017), 4500-Norg B
Total Phosphorus	mg/L	68.80	APHA, AWWA, WEF (2017), 4500-P E
Total Solids	mg/L	1161.0	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/L	2620.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/L	2172.0	APHA, AWWA, WEF (2017), 2540 E
Volatile Suspended Solids	mg/L	2306.0	APHA, AWWA, WEF (2017), 2540 E
Water content	%	99.5	APHA, AWWA, WEF (2017), 2540 B

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References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

{ } : Maximum Concentration Limit NO : Not Detected

Result with "<" indicate that the concentration was below the detection limit. The limit is indicated by the number following "<" sign.

ANALYZED BY

CHECKED BY

AUTHORIZED BY

Note:

- (1) The results refer only to the parameters tested of the sample provided/collected for analysis. Endorsement of products is neither inferred nor implied.
- (2) In order to ensure the confidentiality, the report will be released to the person who produces the registration receipt.
- (3) All the samples are disposed off 7 days after the report date unless the laboratory has received special request.
- (4) Total liability of our organization is limited to the invoiced amount only.
- (5) The report should not be used in any advertising media without prior written permission from ENPHO Lab.



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ENVIRONMENT AND PUBLIC HEALTH ORGANIZATION ENPHO LABORATORY

(Govt. Reg. 1889471948, STC Reg. 2839471948)

Managed and Marketed by : Eco Concern Pvt. Ltd.

Sample Analysis Report

Lab Sample ID: 2154[075-076]

ENPHO/QR/5.10.2.1/04/2075-076

Client: Building Design Authority (P) Ltd.	Sample Category: Sludge
Client Address: Kamaladi, Kathmandu	Sample Location: Block D, Tikapur Municipality, Kailali
Received On: Wednesday, March 13, 2019	Point of Sample Collection: Outfall
Completed On: Tuesday, April 9, 2019	Source of Sample: Septic tank
Sample By: Lab Staff	
Client's Sample Code: Household II	Treated/Untreated: Untreated

PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS

Parameters	Unit	2154[075-076]	Test Methods
Ammonia	mg/L	1027.30	APHA, AWWA, WPCF (1985), 417 B
Biochemical Oxygen Demand (BOD)	mg/L	586	APHA, AWWA, WEF (2017), 5210 B
Chemical Oxygen Demand (COD)	mg/L	14890	APHA, AWWA, WEF (2017), 5220 B
Faecal Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9222
Helminths	Present/Absent	Present (Whipworms)	Pg 50, Centre for Science and Environment, New Delhi (2017)
Oil & Grease	mg/L	306.0	APHA, AWWA, WEF (2017), 5520 B
Organic Matter	mg/L	13274.0	APHA, AWWA, WEF (2017), 5310 B
pH	-	7.13	APHA, AWWA, WEF (2017), 4500-H B
Potassium	mg/L	304.33	APHA, AWWA, WEF (2017), 3111 B
Sludge Volume Index	ml/g	85	APHA, AWWA, WEF (2017), 2710D
Temperature	°C	22.52	APHA, AWWA, WEF (2017), 2550 B
Total Coliform (MPN)	MPN/100ml	>2400	APHA, AWWA, WEF (2017), 9221
Total Nitrogen	mg/L	1835.40	APHA, AWWA, WEF (2017), 4500-NO3 B
Total Phosphorus	mg/L	343.00	APHA, AWWA, WEF (2017), 4500 P E
Total Solids	mg/L	29159.0	APHA, AWWA, WEF (2017), 2540 B
Total Suspended Solids (TSS)	mg/L	26960.0	APHA, AWWA, WEF (2017), 2540 D
Volatile Solids	mg/L	19274.0	APHA, AWWA, WEF (2017), 2540 E
Volatile Suspended Solids	mg/L	16700.0	APHA, AWWA, WEF (2017), 2540 F
Water content	%	87.3	APHA, AWWA, WEF (2017), 2540 B

ENPHO Laboratory Accredited by NEPAL BUREAU OF STANDARDS AND METEOROLOGY (NBSM)

References: Standard Methods for the Examination of Water and Wastewater, 23rd Edition, APHA, AWWA, WEF (2017).

[] : Maximum Concentration Limit ND : Not Detected

Result with 'c' indicate that the concentration was below the detection limit. The limit is indicated by the number following 'c' sign.

ANALYZED BY

CHECKED BY

AUTHORIZED BY

Note:

- (1) The results refer only to the parameters tested of the sample provided/collected for analysis. Endorsement of products is neither inferred nor implied.
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**ANNEX 7:
CHECKLISTS**

Checklist for Physical Environment

A. Topography/Physiography

1. Study of Topographic maps/ other available maps and identify the ground topographic characteristics of land covered by the proposed project
2. Verify the topographic characteristics of the land in the field
3. Soil Type

B. Climate and Meteorology

1. Study of published data of regarding temperature, rainfall, humidity, wind speed and direction, solar radiation
2. If possible classify the climatic zone and its verification
3. Visit the meteorological office of the district and get latest information

C. Air Quality

1. Collect any data on air quality of the area from previous literature
2. Investigate on the air polluting activities of the area (traffic, biomass burning, industries, other anthropogenic activities)

D. Erosion and land Stability

1. Identification of erosion prone area along the road alignment
2. Investigate the erosion features and potentials of the local streams and gullies

E. Land Use

1. Investigate on the land use of the Project Blocks from the topo-maps, and other available land use maps
2. Investigate the land use affected by the project structures and subsidiary facilities
3. Investigate on the land use potentials of the area

CHECKLIST OF PLANT RESOURCES

Date:

[illegible]

Note:.....

CHECKLIST OF WILDLIFE ANIMALS

Date: _____

[illegible]

Note:.....

CHECKLIST OF (Birds)

Date:

S.No.	Birds	Remarks

Note:.....
.....
.....
.....

**ANNEX 8:
PHOTOGRAPHS**



Photo 1: Storm Water Drainage service area
(Park Road, Ward 1)



Photo 2: Public consultation in the WUSC office
(31st January 2020)



Photo 3: Division Section of North Gyani kulo and South Gyani kulo in the end point of Jamara Canal



Photo 4: Proposed public Road RoW for Drain construction at Shaktinagar area



Photo 5: Proposed site for Faecal Sludge Treatment Plant
(Ward number 1, Tikapur Municipality)



Photo 6: Access road near the proposed FSTP site
(Banagaun Ward 1, Tikapur Municipality)

SAUW IEE Review - Information Log

Instructions: Provide information based on IEE submitted by Project Management Office (PMO). This IEE log sheet will serve as record of the review findings, comments, and/or further actions required during implementation. A copy of the IEE log sheet should be (i) provided to PMO for their record and guidance on actions during implementation; (ii) attached in the cleared IEE to be disclosed; (iii) used as reference for review of updated/final IEE and (iv) inputted in the SARD Safeguards Compliance Tracking System.

Project:	Nepal: Urban Water Supply and Sanitation Project (UWSSP): Tikapur Drainage and Fecal Sludge Management Subproject																																				
Loan No.:	3711	Package No.:	W18																																		
Components:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Items</th> <th style="width: 50%;">Description</th> </tr> </thead> <tbody> <tr> <td colspan="2">Location Area</td> </tr> <tr> <td>Province</td> <td>Sudurpaschim Province</td> </tr> <tr> <td>District</td> <td>Kailali</td> </tr> <tr> <td>Municipality/Wards</td> <td>Ward 1, Tikapur Municipality</td> </tr> <tr> <td colspan="2">Project Components</td> </tr> <tr> <td colspan="2">Storm Water Drainage System</td> </tr> <tr> <td>Storm Water Discharge</td> <td>0.52 cumec to 3.391 cumecs</td> </tr> <tr> <td>Type of Drainage</td> <td>RCC Storm Water drain</td> </tr> <tr> <td>Length of Drainage</td> <td>49.011 km In Phase I: 29.6165 km</td> </tr> <tr> <td>Width of Drainage</td> <td>0.5 m to 1.5 m</td> </tr> <tr> <td>Depth of Drainage</td> <td>0.652 m to 2.459 m</td> </tr> <tr> <td colspan="2">Fecal Sludge Treatment Plant</td> </tr> <tr> <td>Type</td> <td>Municipal Fecal Sludge</td> </tr> <tr> <td>Designed daily sludge flow</td> <td>Phase I: 9 m³/day</td> </tr> <tr> <td>Fecal Sludge Treatment Units</td> <td>Anaerobic Digester (AD), Sludge Drying Bed (SDB), Anaerobic Baffle Reactor (ABR), Anaerobic Filter (AF), Horizontal Flow Constructed Wetlands (HFCW), Polishing Pond (PP), Compost Yard (CY)</td> </tr> <tr> <td>Fecal Sludge Treatment Plant</td> <td>5,587 sq. m.</td> </tr> </tbody> </table>			Items	Description	Location Area		Province	Sudurpaschim Province	District	Kailali	Municipality/Wards	Ward 1, Tikapur Municipality	Project Components		Storm Water Drainage System		Storm Water Discharge	0.52 cumec to 3.391 cumecs	Type of Drainage	RCC Storm Water drain	Length of Drainage	49.011 km In Phase I: 29.6165 km	Width of Drainage	0.5 m to 1.5 m	Depth of Drainage	0.652 m to 2.459 m	Fecal Sludge Treatment Plant		Type	Municipal Fecal Sludge	Designed daily sludge flow	Phase I: 9 m ³ /day	Fecal Sludge Treatment Units	Anaerobic Digester (AD), Sludge Drying Bed (SDB), Anaerobic Baffle Reactor (ABR), Anaerobic Filter (AF), Horizontal Flow Constructed Wetlands (HFCW), Polishing Pond (PP), Compost Yard (CY)	Fecal Sludge Treatment Plant	5,587 sq. m.
	Items	Description																																			
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	Fecal Sludge Treatment Plant	5,587 sq. m.																																			
Contract Type:	Civil Works																																				
Date of IEE:	February 2020																																				
Draft IEE?		Updated/Revised IEE?	Others																																		
?? The IEE report mentions that the components are based on final detailed design. However, the discussions suggest no final designs as yet (or no justification that the design is final). The information regarding the drainage and FSTP components as presented in the IEE report is not complete and not properly assessed.																																					

	Activity	Status		Detailed Comments and Further Actions Required
		Yes	No	
1.	Environmental assessment has been satisfactorily conducted based on ADB REA		X	The IEE report covers two distinct components, namely: storm water drainage and fecal sludge treatment plant (FSTP). The IEE needs additional important information on both components. And based on these

	Activity	Status		Detailed Comments and Further Actions Required
	Checklist and scoping checklist. ¹			information, the IEE needs additional assessment of the same on environmental point of view. The IEE has not provided discussions on the details of the FSTP, particularly on the anticipated impacts and mitigation measures during operations phase (the stage when FSTP has significant environmental impact). Simply putting a greenery around the FSTP is not a sufficient environmental safeguard measure, including measures with regard to community and occupational health and safety issues. Immediate Action Required: (i) <u>Storm Water Drainage.</u> - In addition to Table IV-2 and Table IV-3, provide tabulation of road carriage width and roadside ROW for each line. - Provide actual photos taken from the narrowest road/s and widest road/s. - Provide actual photos of each outfall mentioned in Table IV-2. - Consistent with the Spoil Management Plan, provide description of the spoil disposal area/s approved by the government, including location maps showing routes. - Provide photos of the location and vicinity of the spoil disposal area/s. (ii) <u>Fecal Sludge Management / Treatment</u> - Expand subsection B-2.2 of Section IV with appropriate comprehensive discussion on the fecal sludge management, including proposed collection and transport system of septage from households, number of households that will be served by the FSTP, etc. - Provide description of existing use and ownership of proposed FSTP location. - Use a location map showing the FSTP site, nearest residential area/s, and receiving bodies of

¹ ADB Rapid Environmental Assessment Checklist for screening and categorization. Scoping Checklist ("No Mitigation Scenario" Checklist) for scope of IEE, identification of impacts and development of environmental management plan.

	Activity	Status		Detailed Comments and Further Actions Required
				water. Use google earth map if possible. - Proposed layout of FSTP components by superimposing on drawn-to-scale site map. - Clarify on the phasing of the FSTP. Table IV-1 says the project will only cover phase 1 with 9 cubic meters per day capacity. Discuss the ultimate target capacity and assess if there is sufficient space for any expansion. - Provide more detailed assessment of effluent treatment. Provide more information on the area of wetlands, polishing ponds, plant species, desired effluent quality, effluent discharge methodology, ultimate discharge location, effluent standards to comply, etc. - Provide more detailed assessment of impacts of sludge treatment, transport and disposal. Provide information on sludge disposal site including approval by government.
2.	Environmental assessment based on latest project components and design	Yes	No	Based on the discussions, the engineering detailed design of the drainage system and FSTP is not complete.
		??		
3.	Statutory Requirements ²	Discussed	Forest Clearance	The IEE report explicitly states no trees will be cut. However, for any unanticipated cutting of trees during the implementation phase, ensure that PMO/RPMO obtain appropriate clearance (forest clearance or tree cutting clearance). No civil works will commence unless forest clearance or tree cutting clearance, if required, is obtained. PMO to report status in the SEMR.
		Discussed	No Objection Certificate	To be obtained by PMO/RPMO if needed. No civil works will commence unless NOC, if required, is obtained. PMO to report status in the SEMR.
		Discussed	Site Location Clearance	To be obtained by PMO/RPMO if needed. No civil works will commence unless site location clearance, if required, is obtained. PMO to report status in the SEMR.
		Discussed	Environmental Compliance Certificate	PMO is currently in the process of obtaining MOWS-approved IEE.

² If applicable, include date accomplished or obtained.

	Activity	Status			Detailed Comments and Further Actions Required		
					PMO to attach copy of approval document in the SEMR.		
		Discussed	Permit to Construct (or equivalent)		To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to construct (or equivalent), if required, is obtained. PMO to report status in the SEMR.		
		Discussed	Permit to Operate (or equivalent)		To be obtained by PMO/RPMO if needed. No civil works will commence unless permit to operate (or equivalent), if required, is obtained. PMO to report status in the SEMR.		
			Others				
5.	Policy, legal, and administrative framework	Adequate		Not Adequate	Section II discusses the policy, legal and administrative framework of the subproject.		
		X					
		Included discussions and requirements of the:					
		Yes	National regulation/law on EIA				
		Yes	Environmental agency				
		Yes	Relevant international environmental agreements				
		Yes	Environmental standards (IFC's EHS Guidelines)				
6.	Anticipated environmental impacts and mitigation measures	assessed impacts and risks:		mitigation measures included:			The IEE report mentions that there are no endangered or critically endangered species was found in the project area, particularly within the 1 km radius of the project site. The nearest sensitive area is 5 km away, and with the nature of the project, activities during all phases of implementation will not impact such area. The IEE report mentions that that project will ban hunting or poaching activities to ensure protection of fauna species in the community forests around the area. There is incomplete information to ascertain if related impacts and measures are addressed. Immediate Action Required: (i) After providing the important information on the two components (drainage and FSTP) as being required in line item #1 above, assess the potential environmental impacts and proposed mitigation measures for
				Yes	No	n/a	
			Biodiversity conservation	X			
			Pollution prevention and abatement	??			
			Health and safety	??			
			Physical cultural resources	??			

	Activity	Status					Detailed Comments and Further Actions Required
							each component. Separate discussions of each component. (ii) Segregate/Separate the EMP tables for drainage component and FSTP component.
			Cumulative impacts			X	
			Transboundary impacts			X	
7.	Impacts from Associated Facilities ³	Addressed	Not Addressed	Not applicable			
				X			
8.	Analysis of Alternatives	Yes	No				An analysis of alternatives is provided, but this is not required.
		X					
9.	EMP budget included	Yes	No				Section VIII provides indicative budget, but unclear on how much is for the drainage component and for the FSTP. Immediate Action Required: (i) Revised the EMP budget presentation by segregating EMP budget table for the drainage component and FSTP. (ii) In the budget table for FSTP, include budget of implementing the EMP during the operation phase.
		??					
10.	EMP implementation integrated in FAM/PAM and bid documents	Yes	No				(i) Included in PAM during loan processing. (ii) Section VIII includes discussion on the inclusion of the EMP in the bid and contract documents. PMO and the RPMO will have the responsibility to ensure compliance with this requirement.
		X					
11.	Consultation and Participation	Yes	No				(i) Section IX discusses the conduct of two consultations in January 2020. (ii) Annex H shows a minutes of consultative meeting, with translation in the English language. Next Step: Ensure to continue consultation activities to convey the final detailed design of the drainage component and FSTP component.
		X					
12.	Grievance Redress Mechanism	Yes	No				
		X					

³ ADB SPS (Appendix 1 para 6) defines associated facilities as not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project.

	Activity	Status		Detailed Comments and Further Actions Required
		Description of GRM.		Section IX discusses the GRM.
		GRC members identified.		Section IX discusses the GRC membership.
		GRM established and notified?		GRM is established. PMO to confirm in the first SEMR that (i) GRM is notified and GRC members have the capacity to address project-related grievances/complaints, and (ii) contractors are given instructions and orientation on GRM.
13.	Disclosure	To be complied	Endorsement to disclose on ADB website	To be complied after endorsement from PMO is received by ADB.
		To be complied	Disclosed on project website	To be complied by PMO once clearance of the IEE is received from ADB.
		To be complied	Relevant information available to stakeholders and affected people in language and form they understand.	To be complied by PMO once clearance of the IEE is received from ADB.
14.	Mobilized PMO Environment Specialist	Yes	No	This is confirmed in the SEMR for January – June 2019.
		X		
15.	Mobilized RPMO Environment Specialist	Yes	No	This is confirmed in the SEMR for January – June 2019.
		X		
16.	Mobilized PMQAC Environment Specialists	Yes	No	This is confirmed in the SEMR for January – June 2019.
		X		
17.	Mobilized DSMC/RDMSC Environment Specialists	Yes	No	This is confirmed in the SEMR for January – June 2019.
		X		
18.	Confirm bid and contract documents and/or EMP include requirement for the contractor to appoint EHS supervisor and/or nodal person for environment safeguards	Yes	No	Section VIII explains this role and responsibility of the contractor. Next Step: In the next SEMR, clarify/confirm if the subproject/package will be awarded to more than one contractor, and ensure that each contractor will prepare site-specific EMP (SEMP) that should be reviewed and approved by PMO.
		X		
19.	If contract awarded already, confirm contractor's appointment of EHS supervisor and/or nodal person for environmental safeguards	Yes	No	Section VIII explains contractor has the responsibility to appoint an environment supervisor.
		X		
20.	Awareness training on compliance to safeguard requirements	Yes	No	Section VIII discusses the institutional capacity development program, schedule, and topics for the subproject, which PMQAC will supervise.
		X		
21.	Monitoring and Reporting	Yes	No	

	Activity	Status		Detailed Comments and Further Actions Required
		X		Section X clarifies the monitoring and reporting roles of stakeholders.
22.	Others/Remarks	(i) Revise the cover page title to specify that this subproject covers both Tikapur Drainage and Fecal Sludge Management. (ii) Revise the IEE report to strengthen the environmental assessment based on actual environmental conditions and situations. Provide separate discussions for the drainage component and FSTP component.		
	Documents/References:	1. Draft IEE report of Tikapur Drainage and Fecal Sludge Management Subproject. 2. EARF of UWSSP.		