

APPENDIX 7: TERMS OF REFERENCE FOR PROJECT MANAGEMENT CONSULTANT

I. INTRODUCTION

1. A consulting firm will be recruited to act as the Project Management Consultants (PMC) for the proposed Water Supply and Sanitation Sector Improvement Project (the Project) in Lao People's Democratic Republic (Lao PDR), to be financed by the Asian Development Bank (ADB). The Project will be managed by the Project Coordination Unit (PCU) under the Department of Water Supply (DWS) of the Ministry of Public Works and Transport (MPWT) and is expected to commence in September 2024.

A. Project Overview

2. The Project will focus on increasing access to safe water supply and sanitation facilities, to promote improved livability, and long term sustainable and economic growth in the participating towns. It is aligned with the following impact: safe, reliable, affordable and climate-resilient water supply and sanitation services increased.

3. The Project will have the following three outputs:

- (i) **Output 1: Regulatory environment improved.** The project will support the strengthening of the operating environment of the water supply and sanitation sector through:
 - a. The development of a water supply and sanitation framework to improve asset planning, management and operations of water supply and sanitation infrastructure. The framework will provide guidance specifically to: (i) ensure that climate change is factored in the design of water supply and sanitation infrastructure; (ii) promote best-practice in asset planning and asset management; (iii) link infrastructure planning and design with operational aspects such as climate change and environmental sustainability, integrated catchment planning, water source management, drought management, and demand and leakage management; and (iv) promote the development of a more commercial water supply and sanitation sector through the adoption of proactive financial and performance management practices that focuses on budget planning, tariff setting and levels of service; and
 - b. Development of technical standards that will guide the design of resilient sanitation services in urban areas. The standards will include key planning considerations and concepts for designing, constructing, and managing sanitation infrastructure and systems, including the use of nature-based solutions for wastewater treatment.
- (ii) **Output 2: Water supply and sanitation services improved.** The delivery of water supply and sanitation services in each participating province will be supported by: (i) the development of a water supply and sanitation investment plan for each participating PNP, where the projected demands and expected quality, level of service, proposed staging of delivery of the capital works and an overview of the resources that will be required to provide and maintain a resilient water supply and sanitation service in the short, medium, and long term will be documented; and (ii) the delivery of the capital works required to service the immediate demands of the population in the subproject towns. This would include the rehabilitation and upgrading of existing water supply schemes, improving non-

revenue water (NRW) reduction through the establishment of district metered areas, construction of new climate-resilient water supply schemes, providing new gender-sensitive sanitation facilities in priority public places and implementing digital technologies and systems to improve operational efficiencies, that may include automated control systems, water meters, asset management systems, early warning systems and geographical information systems. The project will continue with the free connection policy initiated under the earlier ADB-funded projects for households with a sanitation facility in place. For poor and low-income households that lack a sanitation facility, the project will cover the cost of providing an improved sanitation facility (pour-flush latrines) to enable them to access the free water supply connection.

- (iii) **Output 3: Institutional effectiveness and governance improved.** The technical capacity, institutional and governance arrangements of the DWS and PNPs will be strengthened through the delivery of training and capacity development programs. The project will support the PNPs as they develop corporate business plans in line with the government's regulations, and training will be provided to help improve corporate plan reporting and financial accountability, focusing on financial management, reporting and tariff reviews. Technical skills training through on the job training of both male and female PNP employees will also be included to: (i) improve their understanding how water supply and sanitation assets operate and how climate change can impact the O&M of these services; and (ii) promote asset management, NRW management, and proactive O&M planning. An information, education and communication awareness and outreach program will be developed to build the community's awareness and understanding of the new water supply and sanitation services. Support will also be provided to the DWS as they build their capacity as a technical and oversight body through the promotion of peer-to-peer knowledge exchange program with development partners, technical experts, other water utilities, and by developing processes that supports its ability to monitor and assess the effectiveness of corporate business plan implementation of each PNP to ensure operational sustainability of the sector.

II. SCOPE OF CONSULTING SERVICE

4. The role of the PMC is to assist the PCU and the Project Implementation Units (PIUs) throughout project implementation by ensuring the effective implementation and timely completion of the Project for works relating to Outputs 2 and 3.

5. The PCU will be led by a project director and supported by deputy project directors, who will be responsible for the day-to-day project management, supervision, and administration of the project. This will include:

- (i) Overall project administration and management duties, including reviewing project budget, overseeing financial management and accounting, and progress and performance of consultants;
- (ii) Coordinating with ADB on project progress and project issues;
- (iii) Reviewing and approving feasibility studies, detailed engineering designs, and safeguard due diligence and plans that have been prepared by consultants; and

- (iv) Procurement and financial management oversight, including managing all procurement and consultant recruitment activities, reviewing bidding documents and bid evaluation reports, conducting contract negotiations and contract awards, assessing contract variations and submitting recommendations to the EA for approval.

6. The PMC will be expected to work closely with the PCU and support the delivery of the following services:

- (i) development of the long term water supply and sanitation infrastructure plans for each participating province;
- (ii) technical support, including conducting project screening, carrying out field surveys and site investigations, preparing preliminary concepts, feasibility study reports, detailed engineering designs, technical specifications and bidding documents;
- (iii) due diligence support, including: (a) conducting community consultations, focus group discussions, (b) carrying out screening of potential social, resettlement and environmental impacts; (c) conducting social surveys, which includes detailed measurement surveys, socio-economic surveys and replacement cost surveys (RCS), (d) preparing social impact assessments; and (e) preparing environmental, involuntary resettlement and indigenous peoples safeguard due diligence documents that comply with the requirements of the government and ADB's Safeguard Policy Statement (SPS);
- (iv) detailed stakeholder engagement, which includes liaison with key government stakeholders to obtain information, approvals/clearances, consultations with development partners, and other consultants who may also be engaged to support the delivery of the project, to share information and promote knowledge sharing and consistency of approaches within the water supply and sanitation sector;
- (v) construction supervision and contract administration of all civil works packages;
- (vi) institutional development through the design, roll out and implementation of capacity development programs;
- (vii) information, education and community awareness campaigns, to build knowledge and understanding of the project;
- (viii) monitoring and reporting of progress throughout all stages of project implementation, including project implementation plan, resource plan, financial management, contract awards and disbursements, environmental, involuntary resettlement and indigenous peoples safeguards, and social and gender dimensions; and
- (ix) monitoring and reporting on compliance against financial management action plans, time bound action plans, or other plans that may be developed over the course of the project, and loan covenants.

7. In addition to the role of the PMC, the PCU will be engaging the following consultants to assist in the delivery of the project, and as such, the PMC will be required to coordinate and

collaborate with these consultants throughout the project implementation. The objective is to ensure all deliverables under this project are aligned and delivered in a cohesive manner.

- (i) Technical Assistance (TA) Consultant, who will support the delivery of Output 1, including providing training and capacity development initiatives in relation to the deliverables under Output 1;
- (ii) Capacity Development (CD) Consultant, who will support the delivery of water and sanitation technical and on-the-job training for the DWS and PNPs, as part of Output 3; and
- (iii) Independent valuation specialist, who will assist in conducting due diligence associated with land market assessments, land titling and registration, and valuations for each subproject with land acquisition and resettlement impacts. This valuation specialist will support the contractor in valuation of affected structures (if any) on corridor of impact (COI) during construction.

8. Additional consultants may be appointed from time to time and the PMC will be expected to engage with the incoming consultants throughout project implementation.

9. To facilitate the coordination, the PMC will be tasked as the key focal point for the whole project, and will be required to liaise with the other consultants on a regular basis, sharing project information as needed.

10. A detailed breakdown of the scope of services under each output is described in the following sections.

A. Output 1: Regulatory Environment Improved

11. The key deliverables under this output will be delivered by the TA Consultant, however, the PMC will be expected to provide the following services:

- (i) Liaise with, and support, the TA Consultants who have been engaged to prepare the water supply and sanitation framework and technical design standards for sanitation services, by providing any background information, outputs from field surveys, and other technical reports, that may assist in the development of the water supply and sanitation framework and technical design standards.
- (ii) Provide technical inputs and commentary to the TA Consultants, to ensure the water supply and sanitation framework and technical design standards are comprehensive and applicable, taking into consideration the country context, institutional and governance capacity of the DWS and the PNPs.
- (iii) Participate in any technical working group discussions throughout the development of the water supply and sanitation framework and technical design standards.
- (iv) Adopt the principles outlined in the water supply and sanitation framework when designing the water supply and sanitation infrastructure plans and the detailed designs of the civil works components, under Output 2.

B. Output 2: Water Supply and Sanitation Services Improved

12. This output involves: (i) the development of a long term water supply and sanitation infrastructure plan for each participating province that identifies the projected demands, the infrastructure requirements to service the short, medium and long term, the anticipated capital and operational costs, capacity development and resource requirements, (ii) the delivery of the capital works (infrastructure), which may include construction of new, or expansion and rehabilitation of existing, water supply facilities and distribution networks; and (iii) provision of sanitation facilities, in the form of pour/flush latrines for identified poor households and gender-sensitive public sanitation blocks in nominated locations in each participating town.

13. The government has identified the following 9 towns across 5 provinces as potential subproject locations for consideration.¹ Under this output, the PMC will be expected to support subproject preparation, which includes design development, contract management and administration, and construction supervision.

No	Province	Subproject Towns
1	Xaixomboun	Anouvong
2		Longxan
3		Hom
4	Xiengkouang	Pek
5		Phaxay
6		Mock
7	Salavan	Kongxedone
8	Huaphan	Hiem
9	Bokeo	Thonpueng

14. The PMC will be expected to assist the PCU, PIUs and PNPs throughout all stages of the subproject preparation, from the initial subproject screening, through to the development of feasibility studies to detailed engineering design, bidding and procurement and construction supervision, contract administration and operations and maintenance. It is expected that the PMC will deliver the following works:

1. Project Management and Administration

Project coordination and management

- (i) Assist the PCU in organizing and facilitating project orientation meetings to inform project principles and support needs from local authorities. Assist the PCU in coordinating all project activities by taking an advisory role and direct action/intervention as needed.
- (ii) Assist the PCU in liaising with the ADB and prepare project-related information material from time to time, as requested.
- (iii) Support PCU and PIUs in liaising with all relevant line ministries, provincial departments and sector stakeholders.
- (iv) Collect and compile all necessary information and prepare all necessary documents for ADB's loan administration missions.
- (v) Assist PCU and PIUs in preparing financial statements and reporting in accordance with relevant project financial covenants and make necessary

¹ The total number of subprojects to be completed under this output will be dependent on the estimated construction costs of all subprojects and the total project budget available for capital works.

arrangements with auditing units to supervise the financial management of PCU and PIUs.

Project performance and progress reporting

- (vi) Assist the PCU in the preparation of all project progress reports reporting on all status of the project (feasibility studies, detailed engineering design, safeguard due diligence, procurement and construction activities), including brief monthly management reports; quarterly progress reports including status of gender action plan (GAP), risk assessment and risk management action plan (RARMP), and financial management action plan (FMAP); semi-annual safeguards monitoring reports (separately for social and environment) to the ADB and government.
- (vii) Set up the project performance management system (PPMS) based on the design monitoring framework (DMF), GAP and other relevant loan documents in accordance with ADB's policy requirements, including establishing baseline and operation mechanism for data collection (sex disaggregated), analysis and reporting, and any other systems required to ensure efficient and effective information sharing and collection, and monitoring and reporting of the project against the DMF, GAP, RARMP, FMAP and loan covenants.
- (viii) Carry out consultations and surveys relating to take-up of connections, consumer satisfaction, effect on household gender relations, and report on status of project implementation.
- (ix) Prepare the project completion report (PCR).

Social and gender dimensions

- (x) Identify project beneficiaries of each subproject using data disaggregated by sex, age, disability, ethnic group, and other social factor, relevant to a person's vulnerability.
- (xi) Develop community surveys to track if and how the infrastructure responds to the needs of the project beneficiaries, ensuring participation from women and vulnerable groups.
- (xii) Assist the PCU and PIUs in the implementation of the GAP and ensure necessary workshops and focus group discussions are conducted that is gender-sensitive and socially inclusive.
- (xiii) Monitor social and gender issues, activities and performance indicators, including updating the GAP monitoring table and ensure data provided in the progress of GAP implementation consistence with data in M&E recorded.
- (xiv) Support capacity development and training on social development and gender aspects (gender mainstreaming, GAP implementation).

2. Infrastructure Planning

- (i) Conduct socio-economic profiling of the participating provinces, identifying key drivers for development, current and anticipated population growth, infrastructure requirements;
- (ii) Prepare a water supply and sanitation infrastructure plan for the province, that identifies the population and demand projections, the infrastructure gaps, and the proposed staging plan (with indicative layout of the proposed location of treatment

- facilities including distribution networks) to deliver the infrastructure over the short (5-10 years), medium (10-20 years) and long term (20+ years).
- (iii) Develop an outline of the indicative capital and operational and maintenance expenditure to deliver the infrastructure, and the resource requirements to operation and maintain the water supply and sanitation service in the future.

3. Subproject screening and preparation

Subproject screening

- (i) Conduct initial subproject screening in accordance with the established screening criteria set forth in the project administration manual (PAM). The PMC will be expected to liaise closely with the PCU throughout this process to ensure the screening is carried out efficiently and documented. As described in the PAM, all subprojects shall be economically justified and subject to detailed financial analyses to ensure it does not have any adverse impact on the overall PNPs operations.
- (ii) Prepare supporting documentation and/or appraisal reports in accordance with the screening criteria, including any action plans, which will be submitted to the PCU and ADB for review and confirmation.
- (iii) Check and ensure that each hold point, as indicated in the screening criteria, is addressed, and any prerequisite activities are completed before proceeding to the next stage of design works, and to discuss with the PCU and ADB if there are any issues with the eligibility of a subproject against the screening criteria.

Subproject design

- (iv) Conduct field investigations and surveys, including any field tests, community surveys, focus group discussions, etc. to inform the development of the feasibility study reports.
- (v) Liaise with the PCU and PIAs to confirm the number of poor and vulnerable households in need of sanitation facilities, as well as the location of public sanitation facilities.
- (vi) Prepare detailed feasibility studies (FS) for each subproject to deliver the infrastructure to meet the short-medium duration. The FS shall be based on collection of socio-economic data and cover technical, economic, financial, safeguards, institutional and social development assessment of the subprojects. As a minimum, the FS and concept designs should consider:
 - a. an assessment of the raw water source (including identification of alternatives);
 - b. viability of the raw water source and implications on the catchment;
 - c. establishment of zones for flow monitoring/implementation of district meter areas to improve non-revenue water (NRW) reduction;²
 - d. climate resilient design features where possible, including the incorporation of digital tools, such as SCADA, GIS, asset management systems, early warning systems, and these costs are to be itemized separately;

² The PMC is expected to liaise closely with the CD Consultants in the development of the NRW reduction strategy as this module will be covered as part of the capacity development training program. There should be clear alignment between what has/will be delivered as part of Output 2 and the overall sectoral training program.

- e. a financing and economic assessment of the subproject, to determine its financial and economic viability;
- f. an assessment of the financial status of the PNP to identify any financial risks and/or constraints, and develop a time bound action plan to address these issues; and
- g. resource capacity and constraints.

A template on the FS reports will be developed and agreed between the PMC and the PCU at the commencement of the project, and this will be documented in the inception report.

- (vii) Conduct consultations with key stakeholders and prepare supporting documents, as required and in accordance with national regulations, to obtain all necessary domestic clearances, permits and assurances, in relation to the works.
- (viii) Prepare detailed engineering designs (DEDs) and design reports. This will include preparation of all construction drawings and specifications in accordance with Lao PDR national design guidelines and standards. A template on the DED reports will be developed and agreed between the PMC and the PCU at the commencement of the project, and this will be documented in the inception report.
- (ix) Prepare the engineer's cost estimates for civil works.

Safeguard compliance and reporting

- (x) Provide training on the project's safeguards policies, grievance redress mechanisms (GRM) and gender mainstreaming to participating PCU and PIU staff on commencement of the project, and on commencement of each subproject.
- (xi) Preparing methodology, tools, templates for environmental and social safeguards impact assessments based on ADB's SPS and the government's laws and regulations and presenting to the PCU and ADB for review and approval;
- (xii) Conducting data collection surveys to support environmental, land acquisition and compensation and indigenous peoples planning activities, including facilitating public consultations, interviews etc.³
- (xiii) Assist the PCU and resettlement committees to conduct replacement cost survey.
- (xiv) Assist the PCU in preparing, revising, and updating all necessary safeguards due diligence documents and plans for environment, involuntary resettlement (IR) and indigenous peoples (IP) for subprojects, including conducting screening for subproject categorization. All safeguard activities are to be undertaken in accordance with ADB's SPS, government rules and regulations, and the approved environmental assessment and review framework (EARF), land acquisition and compensation framework (LACF), and ethnic groups development framework (EGDF).
- (xv) Assist the PCU and PIUs in monitoring compliance against safeguard requirements, including implementation of the land acquisition and compensation plans (LACP), ethnic group development plan (EGDP), environmental management plans (EMP), and corresponding construction environmental management plans (CEMPs), occupational health and safety (OHS) plans,⁴ and GRM, and any corrective action plans.

³ Note that UXO pathfinding activities is excluded from the PMC contract; this will be carried out by the PCU. The PMC will be required to coordinate with the PCU to ensure the necessary UXO clearances are incorporated into relevant safeguard documents and prior to the commencement of any works on site.

⁴ Referred to as Site Specific Environmental Management Plan and Site Specific Health and Safety Management Plan.

- (xvi) Assist the PCU and PIUs by providing inputs to the project progress reports, and in the preparation and review of the semi-annual safeguards monitoring reports and compensation completion reports.

Procurement support

- (xvii) Assist in the preparation and compilation of bidding documents based on ADB's standard bidding documents, and qualification and evaluation criteria, ensuring relevant safeguard due diligence reports and other supporting documentations are included as part of the bid package/contract documents.
- (xviii) Assist PCU and bid evaluation committee through the procurement process, reviewing procurement documents (e.g., technical specifications, bill of quantities, evaluation criteria), technical reviews, evaluation and documentation and contract negotiations.
- (xix) As part of the bid preparation, prepare the contract management plan (CMP) template and submit to ADB for review, with the CMP to be included as part of the bid documents.
- (xx) On contract award, complete the CMP in consultation with the PIU, with the relevant project data to enable monitoring of the works or service.

Construction supervision and contract administration

- (xxi) Provide training to the contractors on health and safety requirements of the project, including delivery of information, communication and outreach campaigns to raise awareness of gender-based violence, sexual exploitation, abuse and harassment (GBV-SEAH).
- (xxii) Provide training to contractors in accordance with the social safeguards plans and due diligence reports on temporary impacts on structures during construction and requirement of land for temporary land use such as worker camps and access to the works site (if any), consultations and GRM. The training will also explain the role of independent valuation specialist in valuation of affected structures due to temporary impacts.
- (xxiii) Coordinate works between contractors and various stakeholders and monitor construction schedule and interactions with other works, if applicable.
- (xxiv) Engage with the contractor to develop a comprehensive CEMP, which includes site-specific EMP (SSEMP) and site-specific health and safety management plan (SSHSMMP) and support the PCU and Employer to review and approve the CEMP.
- (xxv) Monitor the implementation of the CEMP including providing progress updates in the respective safeguards monitoring reports and carry out health and safety audits on site.
- (xxvi) Monitor progress of construction activities, including compliance with approved safeguard documents, restoration of affected structures due to temporary impacts, and compensation payment by contractors.
- (xxvii) Provide expert inputs and justifications for contract variations and prepare necessary documents (e.g., due diligence report) in accordance with government and ADB requirements.
- (xxviii) Review and certify contractor's claims for payments.
- (xxix) Prepare progress reports for the PCU that outlines, as a minimum, health and safety status, environmental status, status of construction activities, temporary construction related impacts on structures on ROW, progress of works and identification of any delays, summary of trainings/surveys/outreach programs

conducted, summary of payments, expenditure and variation orders/variation order requests, risks and problems encountered, grievances, and any potential changes in designs. Construction photos are to be included in the progress reports.

4. Operations and Maintenance

- (i) Develop the capacity of the PNPs to operate and maintain the new water supply and sanitation infrastructure through field and hands on learning, working in coordination with the contractors.
- (ii) Facilitate development of preventative maintenance schedule (including costs) for the new water supply and sanitation infrastructure for each subproject.
- (iii) Developing processes to enable PNPs to conduct regular monitoring/checks to ensure operational performance and service quality is maintained.

C. Output 3: Institutional Effectiveness and Governance Improved

15. The objective of this output is to strengthen the participating PNPs in corporate governance, O&M, and service delivery, building on the lessons learnt from the earlier ADB-funded projects, and ensuring the PNPs understand the new infrastructure and have the skills, capacity and expertise to operate and maintain the service efficiently.

16. The PMC will also be required to assist DWS to monitor ongoing developments in the water sector, including legal, regulatory, and institutional issues throughout the implementation of the Project, and will be expected to work alongside the appointed TA Consultants and the CD Consultants, who will also be engaged to develop capacity of the DWS and PNPs, and institutional strengthening. The PMC will undertake the following tasks:

1. Corporate planning and institutional support

Corporate business planning

- (i) Conduct a review of the existing corporate business plans, including assessment of the financial statements, cash flows, existing liabilities and existing tariff structures.
- (ii) Conduct an assessment of the service area, consumer profile and demographics.
- (iii) Assess the resource capacity and key constraints.
- (iv) Identify key performance and financial indicators and targets for inclusion in the corporate business plans.
- (v) Develop a revised financial model that considers an appropriate tariff structure which gives due consideration to the recovery of costs for operations and maintenance and depreciation and achieving a prescribed debt service coverage ratio.
- (vi) Develop a revised corporate business plan for presentation to the PNP and DWS which includes key corporate plan initiatives and activities. The corporate business plans should be aligned with the relevant national guidelines, as well as with the proposed water supply and sanitation sector framework, that will be developed as part of Output 1.

- (vii) Support the PNP in the implementation of the corporate business plan, including providing focussed trainings to review and report on progress of the corporate business plan implementation.

Service agreements

- (viii) Facilitate the development of a service agreement between the PNP and the provincial government that sets out the responsibilities and the operating conditions for the water supply and sanitation service.
- (ix) Facilitate the development of a district sanitation regulation for endorsement by the district government.

Training and capacity development

- (x) Provide training to the PNPs to support the development of (i) corporate business plans, including data collection, monitoring and reporting on progress of implementation; (ii) tariff reviews and adjustments, and impacts on cash flows and financial status; and (iii) financial reporting, budgeting, and accounting.
- (xi) Liaise with, and provide technical guidance and contributions from field experience to the development of a capacity development program, that will be developed by the TA Consultants, to strengthen capacity in: (i) environmental and health and safety management; (ii) catchment management; (iii) asset management; (iv) project planning and service delivery; (v) leakage management and water loss reduction, and (vi) disaster risk management and contingency planning; and (vii) financial and performance management.
- (xii) Liaise and coordinate with the CD consultants, who have been engaged to provide operations and maintenance and asset management skills training to the DWS and PNPs, to ensure the training program is versatile, comprehensive, and well suited for the DWS and PNP, taking into consideration country context, and capacity.
- (xiii) Prepare a genders-sensitive and socially inclusive information, education and communication awareness program focusing on key sustainability themes, including water usage and sanitation and gender mainstreaming activities, for use during public consultation meetings and information dissemination by participating PNPs, that promotes the benefits of potable water and encourages and increases women's participation in the sector.

III. IMPLEMENTATION ARRANGEMENTS

17. Consulting services for the project will be provided over a period of six (6) years, from 2024 to 2030. An indicative timeframe of the project implementation arrangements is included as Appendix 2.

18. The PMC will be based in the PCU's office in Vientiane and will mobilize construction supervisors for each subproject during the construction stage, as required.

19. Participating provincial and district agencies will provide suitable office accommodation for the PMC as and when required. PCU, provincial agencies and each PIU will make available

to the PMC all relevant data, maps, and reports, and ensure access to all equipment purchased under the Project at no cost to PMC, including vehicles, and communication equipment.⁵

20. PCU and provincial and district authorities in participating province will provide counterpart and support staff to work with PMC and will arrange necessary introductions to concerned government organizations, ministries, and departments.

21. To ensure that all project outputs are properly integrated and coordinated, the PMC is to be led by a single Team Leader reporting to the PCU. This arrangement is necessary to ensure that the consulting services are efficient, effective, and properly coordinated especially since several activities will run concurrently in the same project provinces throughout the project period. The Team Leader will also assist to coordinate between the components of the Project and between the various levels of Government administration at national, provincial, district and village levels.

22. The Team Leader will manage all activities and all inputs of team members to ensure the PMC fully meets its terms of reference. During the Team Leader's absence from the Project, the Deputy Team leader will assume the role of Team Leader (designate).

IV. EXPERTISE REQUIRED

23. The consulting services will be provided by an association of an international consulting firm and a national consulting firm, who will be engaged in accordance with ADB's Procurement Regulations for ADB's Borrowers (October 2017, as amended from time to time),⁶ using quality and cost-based selection criteria with a quality cost ratio of 90:10, through a full technical proposal.

24. All international consultants should have experience in developing countries. Experience in the Southeast Asia region, preferably Lao PDR, will be considered. All national consultants should be fluent in English as well as the national language.

25. Separate consulting and service contracts for specialized services, including but not limited to: (i) topographical and geotechnical field surveys; (ii) water quality testing; (iii) socio-economic surveys;; (iv) project accounting; and (v) project and PNP financial reporting and auditing, may be required. Terms of reference for these contracts will be prepared as part of the PMC scope and provision for these subcontracts will be included in the main consulting contract as provisional cost items and may be subject to competitive bidding during project implementation.

26. Proposing firms have some flexibility to determine the number and nature of the experts they will require to achieve the objectives of the contract, in accordance with their proposed approach and methodology and to ensure the output deliverables are prepared to an agreeable standard. However, ADB requires minimum expertise in specific areas, with the minimum international and national person-months as listed in **Table 1**. CVs of these mandatory experts must be submitted.

Table 1 List of Experts and Qualifications

⁵ Including fuel consumption, vehicle maintenance, office rental and office operations and maintenance costs.

⁶ Available at <https://www.adb.org/sites/default/files/adb-procurement-policy.pdf> and <https://www.adb.org/sites/default/files/procurement-regulations-ADB-borrowers.pdf>

No.	Position Title	Total person months	Qualification and Experience
A - International Key Specialists			
A1	Team Leader – Water Supply and Sanitation Specialist	30	<p>Bachelor's degree in civil/municipal engineering or similar and be a chartered/professional engineer with broad experience in the implementation of water sector projects, including sector reform and infrastructure, as well as water sector planning and management.</p> <p>S/he will have a minimum of 20 years of experience in water supply development and with sound experience of managing a culturally diverse team.</p> <p>Previous experience on infrastructure projects financed by ADB or other multilateral development agencies in Lao PDR or Southeast Asia is preferred.</p>
A2	Regulatory and Institutional Specialist	6	<p>Bachelor's degree in civil/municipal engineering or similar and have a broad experience in corporate governance, institutional development, and reform. Experience in the formulation and implementation of corporate business plans, and supporting improvements to governance principles and processes, especially with water supply utilities, will be essential.</p> <p>S/he will have a minimum of 20 years of experience in the water supply sector, and preferably with experience in Lao PDR, or Southeast Asia.</p> <p>Previous experience on infrastructure projects financed by ADB or other multilateral development agencies is preferred.</p>
A3	Water Supply Specialist	6	<p>Bachelor's degree or equivalent in civil/environmental engineering with at least 10 years of experience on water supply engineering projects in Lao PDR or Southeast Asia.</p> <p>S/he will also be experienced in non-revenue water management, developing water balances, establishing/designing district metering areas and leak detection programs.</p> <p>Previous experience on infrastructure projects financed by ADB or other multilateral development agencies is preferred.</p>
A4	Financial and Economic Specialist (Water Sector)	8	<p>Bachelor's degree in business management/financial or accounting/finance and economics postgraduate qualification with a minimum of 15 years of experience in the water supply industry.</p> <p>S/he should have experience working with water utilities in business planning, tariff setting, and designing cost recovery systems and billing mechanisms. and preparing economic and financial analysis in accordance with ADB's Guidelines.</p>

No.	Position Title	Total person months	Qualification and Experience
			Previous experience working in Lao PDR, or in Southeast Asia, and on infrastructure projects financed by ADB or other multilateral development agencies is preferred.
A5	Safeguard Specialist - Environment	8	Bachelor's degree in environmental management, environmental engineering, biological sciences or related discipline. At least 15 years' experience in environmental management of urban infrastructure projects (water, wastewater/sanitation) including preparation of environmental impact assessment and works supervision is essential. Experience in occupational health and safety and experience with ADB or other multilateral development agencies in environmental safeguards is preferred. Country experience, or experience working in Southeast Asia is preferred.
A6	Safeguard Specialist - Involuntary Resettlement and Indigenous Peoples	8	Bachelor's degree in social sciences or related discipline, with at least 15 years' experience in land acquisition and resettlement, and indigenous peoples planning activities associated with infrastructure projects. Previous experience working in Lao PDR, and on infrastructure projects financed by ADB or other multilateral development agencies is preferred.
A7	Specialist –Social and Gender	6	Bachelor's degree in social sciences or related discipline with at least 10 years' experience in social development, gender action planning, community consultations, behavior change and awareness raising for infrastructure projects and water supply, sanitation and hygiene is desirable. Previous experience on infrastructure projects financed by ADB or other multilateral development agencies is preferred. Country experience, or experience working in Southeast Asia is preferred.
B – International Non-Key Specialists			
B1	Water Resource Specialist	5	Bachelor's degree in engineering, environmental science, or similar, with at least 10 years' experience in water supply, water conservation, hydrological and hydraulic modelling.
B2	Climate Change Specialist (Water Sector)	5	Bachelor's degree in engineering or environmental science, with 10 years' experience in the design and construction of water supply projects and specialist knowledge in climate change, climate resilience, hydrology and water resource management.
C - National Key Specialists			
C1	Deputy Team Leader – Water Supply and Sanitation Specialist	56	Bachelor's degree or equivalent in civil/environmental engineering with at least 15 years of experience on water and wastewater engineering projects.
C2	Project Performance Monitoring Specialist	14	Bachelor's degree in social science or related field, with at least 10 years' experience in international development projects, and 5 years' experience in establishing reporting systems and conducting project monitoring and progress reporting.

No.	Position Title	Total person months	Qualification and Experience
C3	Financial Management Specialist	16	Bachelors' degree or equivalent, with at least 10 years of experience in accounting, auditing, financial management, economic and financial analysis. He/she must be a chartered accountant/certified public accountant with the Lao Institute of Accountants, or any member/affiliate with the International Federation of Accountants. Experience in accounting, financial reporting, auditing, cost recovery, billing mechanisms, and tariff reform is preferred.
C4	Water Supply Design Engineer - 1	16	Bachelors' degree or equivalent in civil/environmental engineering with at least 10 years of experience on water supply and wastewater related projects. Experience in coordinating field studies, developing feasibility studies, detailed designs and estimating bill of quantities on water related projects involving treatment and distribution would be essential. Experience in construction of water supply and wastewater projects would be preferable.
C5	Water Supply Design Engineer - 2	16	
C6	Safeguard Specialist – Environment	30	Bachelor's' degree in environmental management, environmental engineering, or biological sciences with at least 10 years of experience working on infrastructure projects with a focus on conducting environmental impact assessments and experience of health and safety.
C7	Safeguard Specialist – Involuntary Resettlement and Indigenous Peoples	30	Bachelor's' degree in social sciences or equivalent, with at least 10 years of experience in land acquisition and resettlement activities associated with infrastructure projects including conducting surveys and consultations.
C8	Specialist – Social and Gender	24	Bachelor's degree in social sciences (or related discipline), with at least 10 years of experience in social and gender issues associated with infrastructure projects including conducting socioeconomic surveys, gathering data for socioeconomic profile, gender mainstreaming, behavior change, community awareness.
C9	Procurement and Contract Specialist	16	Bachelor's degree and at least 10 years' experience in procurement in accordance with the country's regulations and requirements, and with at least 5 years' experience working on projects financed by ADB or other multilateral development agencies. S/he should have experience preparing bidding documents, assisting in bid evaluations, preparing bid evaluation reports and contract management of civil works packages.
C10	Contract Engineer	12	Bachelor's degree and at least 10 years of experience in contract management and administration in accordance with the country's regulations and requirements. S/he will be expected to have experience in inspecting progress of works on sites to verify contractor payments and requests for payments. Experience in ADB-funded projects is preferred.
D – National Non-Key Specialist			
D1	Asset Management Specialist	9	Bachelor's degree in civil/municipal engineering or similar and have a broad experience in the

No.	Position Title	Total person months	Qualification and Experience
			development and utilization of asset management geographic information systems, especially with water supply utilities. S/he will have a minimum of 10 years of experience in GIS-based asset management, and preferably with experience in Southeast Asia.
D2	GIS Specialist	8	Bachelor's degree in civil engineering (or related discipline), with at least 10 years' experience that includes 5 years as an asset management expert with in-depth knowledge of GIS systems, GIS mapping and development of asset databases and registers.
D3	Geotechnical Engineer	8	Bachelor's degree in geotechnical engineering (or related discipline) with at least 10 years' experience including conducting field surveys and ground investigations, developing design criteria, concepts and methodologies.
D4	Structural Engineer	8	Bachelor's degree or equivalent in civil engineering or structural engineering, with at least 10 years' experience in design concepts and methodologies, preparation of structural designs, technical specifications, performance specifications, detailed cost estimates and quantities for water infrastructure projects.
D5	Mechanical Engineer	8	Bachelor's degree or equivalent in civil/mechanical engineering or related discipline, with at least 10 years of experience in developing appropriate electrical/mechanical design criteria, design concepts and methodologies, instrumentation drawings, specifications, cost estimates and quantities for water infrastructure projects.
D6	Electrical Engineer	8	Bachelor's degree in civil/electrical engineering, or related discipline with at least 10 years of experience in developing detailed engineering designs, technical specifications, performance specifications, detailed cost estimates, quantities, process and instrumentation drawings and remote control and monitoring systems, for water infrastructure projects.
D7	Community Engagement Specialist	10	Bachelor's degree in social science or related field, with at least 10 years' experience in community engagement, developing information, education and awareness campaigns, facilitating community consultations and focus group discussions. Experience in water supply projects would be preferable.
D8	Ecologist/Biodiversity Specialist	5	Bachelor's degree in ecology, biology or related discipline, with at least 5 years working as an ecologist, biologist or biodiversity specialist in Lao PDR. The specialist must be able to communicate (written and verbal) in English language.
D9	Autocad Operator – 1	18	At least 5 years of AutoCAD experience in preparing detailed engineering design drawings for subproject works, including mechanical and structural design drawings, detailed transmission and distribution network pipeline drawings, and preparation of bill of quantities and cost estimates.
D10	Autocad Operator – 2	18	
D11	Autocad Operator – 3	18	

No.	Position Title	Total person months	Qualification and Experience
D12	Resident Engineer – 1	48	Bachelor's degree or equivalent in engineering or technicians in a related field with at least 5 years construction supervision experience on major construction projects, preferably in water supply.
D13	Resident Engineer – 2	48	
D14	Resident Engineer – 3	48	
D15	Construction Supervisor – 1	48	Bachelor's degree with at least 10 years' experience in civil engineering, and 5 years' experience in contracts management, procurement and construction supervision. Experience in water supply is essential.
D16	Construction Supervisor – 2	48	
D17	Construction Supervisor – 3	48	
	Total – International Inputs	82	
	Total – National Inputs	636	
	Total Inputs	718	

The indicative duties of all the expert is provided in Appendix 1.

V. OTHER NON-KEY EXPERTS

27. In addition to the mandatory key and non-key experts, other non-key experts may be required to ensure all aspects of the work can be undertaken and all deliverables and reports prepared. Other non-key experts refer to experts that provide additional expertise in areas that are relevant to this assignment, related to the civil works or to any other aspects of the terms of reference, as deemed appropriate by the proposing firm.

28. The PMC is free to propose the nature and number of other non-key experts and person months for each non-key expert, as required, in line with the proposed work plan and schedule.

VI. REPORTING REQUIREMENTS AND DELIVERABLES

29. The PMC shall submit to ADB and the PCU the following deliverables. Deliverables will be prepared in the English language.

Deliverable	Expected Submission Date
Inception report	3 months of mobilization
Screening/appraisal reports ^a	
Water supply and sanitation infrastructure plans for each participating province	
Feasibility reports, including investigation reports ^b	
Detailed engineering design reports, including technical specifications and bid documents for all subprojects ^c	
Monthly management reports/progress briefs	Within two weeks at the end of each month
Quarterly progress reports incorporating CMPs and updates to DMF, GAP, RARMP, FMAP and other requirements as per loan covenants	Within two weeks of the end of each quarter
Semi-annual safeguards monitoring reports (separate environment and social safeguards monitoring report for reporting period)	Within one month of the end of the reporting period
Project completion report	Within three months of physical completion of the Project

CMP = Contract Management Plan, DMF = design and monitoring framework, FMA = financial management action plan, GAP = gender action plan, RARMP = risk assessment and risk management plan.

^a One screening/appraisal reports will be prepared for each province covering all subprojects within the province. Submission will be dependent on the project implementation plan, which will be agreed during project inception. However, these are to be submitted in accordance with the hold points as indicated in the screening criteria.

- ^b Feasibility reports will be prepared for each subproject and should include cost estimates as well as draft safeguards planning documents. An indicative template of the feasibility study will be developed and agreed between the Project Coordinating Unit and Project Management Consultant during the project inception.
- ^c Submission of the detailed engineering design reports, and bidding documents will be based on the project implementation plan, which will be agreed during project inception.

30. All infrastructure plans, feasibility studies, subproject screening/appraisal reports, feasibility studies, detailed engineering designs, bidding and contract documents will be subject to ADB review. Subproject appraisal reports should be a short summary of the feasibility report confirming that it meets the screening criteria for each subproject.

31. Information on social development and safeguards shall be included in feasibility studies and approved by ADB.

32. All reports and designs shall be carried out in full consultation with the PCU, PIUs, PNPs and other relevant parties and stakeholders, as deemed necessary.

Appendix 1: Indicative Terms of Reference of Specialists

The following provides an indicative list of duties and responsibilities of each specialist required under the PMC contract. The list of duties and responsibilities are not exhaustive and additional activities, tasks, and/or duties that are not listed may be required in order to deliver the key project objectives of the PMC. The PMC has the flexibility to add tasks as they deem appropriate to ensure quality outputs are achieved. At all times, all specialists that form part of the PMC will be expected to work collaboratively and coordinate with other members of the PMC, and other consultants who may be appointed by the executing agency (EA), PCU and PIUs.

A – International Key Specialists

A1 Team Leader – Water Supply and Sanitation Specialist

The role of the team leader is to oversee the project deliverables of the project management consulting firm and provide general project management support to the government, the EA, PCU and PIUs. The team leader will be involved in technical and capacity development initiatives, sector coordination, and providing advice and support to the government, ADB, and other stakeholders as required, on issues relating to the water supply and sanitation sector. The team leader will be expected to carry out the following duties, as a minimum:

- a. Manage, coordinate and supervise the performance of the project team including project deliverables to ensure that (a) inputs and activities of both the international and national consultants are of high quality and effective; and (b) all consulting components and project components are fully integrated and properly coordinated.
- b. Liaise and coordinate with other project consultants/consultancy firms appointed by the EA/DWS as part of the Project. This includes sharing progress updates, project information/project briefs, and participating in workshops and meetings, as required.
- c. Monitor developments in the water sector and keep DWS, ADB and other development partners informed.
 - a. Participate in sector workshops and subsector working group meetings, as required, including conducting regional workshops for the teams and senior PNP personnel to share experiences and lessons learned, as well as to provide a forum for networking.
 - d. Assist and guide the PCU and PIUs on administrative procedures, project accounts, procurement, report preparation, project performance monitoring and evaluation, and ADB procedures.
 - e. Assist PCU and PIUs to prepare operational budgets, disbursement projections, and withdrawal applications, and provide ongoing support for project accounting and reporting systems.
 - f. Assist PCU to conduct initial project orientation and information meetings with key stakeholders at central, provincial, district and village levels, and ensure clear understanding by the stakeholders of the objectives, scope, organization and work plan of the Project, and their roles and responsibilities.

- g. Assist PCU to prepare Subsidiary Loan Agreements, Service Agreement and Amortization Schedules, and conduct workshops and meetings with participating provincial government agencies.
- h. Assist PCU and PIUs to manage all aspects of project implementation, including:
 - i. Developing the long term water supply and sanitation infrastructure plans;
 - ii. Identifying, prioritizing and evaluating subprojects according to the subproject selection criteria, including assessment of the readiness and capacities of the PIUs to implement the subproject(s);
 - iii. preparing, monitoring and updating overall project planning and implementation schedules, and monitoring individual subproject project implementation schedules, including reporting of delays and providing recommendations to address any progress issues;
 - iv. preparing feasibility studies for confirmed priority subprojects including conducting field surveys, socio-economic surveys and stakeholder consultations as required to inform the development of the feasibility studies including the safeguard due diligence reports;
 - v. preparing detailed engineering design and all supporting documentation;
 - vi. supporting the EA to carry out bidding, evaluation and contract award;
 - vii. contract management and construction supervision, including preparation and monitoring of Contract Management Plan (CMP) and Site-Specific Health and Safety Management Plan (SSHSMP), and assisting the PCU and PIUs to administer the construction and procurement contracts and reviewing and validating any proposed variations, contractor progress reports and contractor payment claims;
 - viii. Conducting monitoring of the quality of the construction works and the installation of equipment to ensure compliance with contract drawings and specifications, issuing any corrective actions, carrying out project commissioning and evaluation of the performance of completed facilities and new equipment; and make recommendations to PCU on the issuance of the certificates of completion;
 - ix. monitoring environmental, indigenous people and involuntary resettlement safeguard compliance throughout the whole of project implementation, including preparing the necessary safeguards monitoring reports, and preparing corrective actions, or providing suggestions to improve practices, where required;
 - x. conducting monthly, quarterly and annual project progress reporting, and other progress reporting as required, including assessment of progress against the design and monitoring framework (DMF) and the gender action plan (GAP);
 - xi. preparing and conducting surveys as required to support the preparation of the project progress reports, including conducting consultations with PIU, PNPs, and other project stakeholders;

- xii. monitoring project compliance against loan covenants and other project conditions, and preparing corrective actions, or suggestions to improve, where required;
 - xiii. facilitating the development and adoption of the sanitation regulations, and free connections policy for each subproject;
 - xiv. supporting capacity development initiatives and activities; and
 - xv. preparing project completion report.
- i. Participate in loan reviews, mid term reviews and other project reviews as required.
 - j. Providing technical support to the EA and PCU throughout the delivery of this project that may be required from time to time.

A2 Regulatory and Institutional Specialist

The Regulatory and Institutional Specialist will be responsible for providing advice and guidance on policy, sector and capacity development initiatives and making recommendations to introduce reforms to strengthen the operation of the sector, particularly in the areas of corporate planning, water sector planning and management. The role of the specialist includes, but is not limited to the following:

- a. Assess and provide an update on the current state of the water supply and sanitation sector in terms of policy, regulatory/laws, guideline, development initiatives, particularly the progress of reform under existing projects, such as conditions of the subsidiary loan agreements, service agreements, free connection policy, sanitation regulations, and corporate business planning, tariff reviews and reforms, and identification of gaps and recommendations for additional reforms;
- b. Identify and coordinate the efforts of twinning arrangements with other team members, that may include development partners, private stakeholders, etc. who have been engaged on sector reform and development activities;
- c. Review and develop the corporate planning guidelines and design training modules to improve the corporate planning process and strengthen corporate governance;
- d. Develop and deliver a corporate planning training program for all the PNPs in the country using the training modules as the basic curriculum, including tariff analysis;
- e. Provide specific support to DWS and PNP under the Project in the development of their respective corporate plans;
- f. Review the existing monitoring program for service agreements and corporate business plans, and initiate a monitoring program to assess progress and opportunities for improvements;
- g. Facilitate discussions with DWS and PCU, other development partners and stakeholders as necessary, on issues relating to policy, sector development and legislation through workshops, sector coordination/working group meetings, and forums, to identify the activities and/or initiatives required to strengthen the sector.

A3 Water Supply Specialist

The role of the Water Supply Specialist is to provide technical inputs and design, construction and operations and maintenance advice on the proposed water supply infrastructure. The specialist is expected to facilitate the development of initiatives to maintain a low non-revenue water target, implement proactive operations and maintenance strategies and the development of a maintenance schedule for the water supply assets. The responsibility of the water supply specialist includes, but is not limited to the following:

- b. Review available water supply technologies and recommend appropriate options for rehabilitation and new constructions, taking into consideration recommendations from the climate risk and vulnerability assessments and climate change assessment
- c. Review the designs of previously built water supply systems and recommend the most cost-effective and appropriate technology;
- d. Review design options and alternatives with safeguard specialists to avoid and minimize impacts and demarcating corridors of impact.
- e. Confirm or develop appropriate design criteria, design concepts and methodologies;
- f. Lead the development of the water supply and sanitation infrastructure plans for each province identifying the short, medium and long-term infrastructure requirements to service the projected demands of the province;
- g. Lead and oversee the conduct of topographic surveys, geotechnical investigations and other field surveys as required to carry out raw water assessments, assess physical and environmental conditions including topography, natural drainage flows to inform the development of the feasibility studies and detailed engineering designs;
- h. Assess the service levels, and operation and maintenance status, of existing water supply infrastructure;
- i. Confirm service areas, design population, design criteria and standards for design of water supply systems in each subproject town;
- j. Coordinate with the technical design team (i.e. water supply design engineers, asset management engineer, GIS specialists and other technical specialists as may be required) on the establishment of district metering areas (DMAs), and the installation of valves and meters and the replacement of pipes, meters and valves;
- k. Coordinate with the technical design team and safeguard specialists and prepare design reports for all subprojects;
- l. Conduct quality assurance for all preliminary design and detailed design submissions, including checks on bill of quantities, life cycle cost analyses, technical specifications and performance specifications for all subprojects;
- m. Undertake periodic inspections during construction to ensure that the constructed works comply with the design intent and provide guidance/instructions to the site supervisor to carry out any corrective actions, or design variations, as may be necessary;
- n. Contribute to all necessary reporting under the Project, including participating in review missions and field visits, as may be required;

- o. Coordinate with other consultants etc. who may be engaged by the EA to support the delivery of this Project, to share project information and to promote and ensure consistency of approach in the design, operation and maintenance of water supply and sanitation infrastructure;
- p. Support capacity development initiatives to promote understanding of the water supply and sanitation sector, the operation and maintenance of water supply and sanitation infrastructure, and participate in technical workshops/forums, as required;
- q. Provide on-the-job training/field training on nonrevenue management and leak detection and repair to key PNP personnel and supervise the implementation of the leak detection programs of selected rehabilitation and improvements of the existing water supply systems, including water meter testing and identification of illegal connections; and
- r. Assist the PNP to develop a scope of services, work plan and targets for the leak detection teams, other PNP managerial, technical and commercial staff.

A4 Financial and Economic Specialist (Water Sector)

The Financial and Economic Specialist will assist the DWS and PNPs in developing the corporate business plans, carrying out the detailed financial assessment of the PNPs, preparing financial management action plans and critical activities to promote financial sustainability, including proposing tariff structures to promote cost recovery, and conducting financial and economic analysis in accordance with ADB's guidelines. As a minimum, the Financial and Economic Specialist will be expected to contribute to the following:

- a. Prepare the economic analyses for the subprojects in a format agreeable to ADB, covering demand forecast, least economic cost analysis, economic cost and benefit analysis, economic internal rates of return, average incremental economic costs, sensitivity analysis, benefit distributional analysis, poverty impact ratio and subsidies;
- b. Prepare the financial analyses for the subprojects in a format agreeable to ADB, covering financial cost and benefit analysis, financial internal rates of return, weighted average cost of capital, average incremental financial costs, incremental recurrent cost analysis, sensitivity analysis with respect to major project design and implementation risks, water tariff recommendations, willingness to pay assessment, affordability analysis, performance and indicators of the PNPs, and financial projections of the PNPs;
- c. Assess the financial performance of the PNPs and formulate recommendations including actions plans for their financial sustainability;
- d. Analyse the cost of all technically feasible alternatives and assess whether the subproject proposals are the least cost options or establish other (non-cost) factors that favor choosing another alternative;
- e. Review current accounting and administrative capacities within each PNP, the internal control system employed and internal and external auditing procedures; recommend any changes as appropriate;
- f. Provide support to the PCU on financial matters relating to the corporate governance of PNPs;

- g. Provide support on the development of corporate business plans and facilitate the development of training modules to improve the capacity of the participating PNP's;
- h. Develop a debt aging analysis model, and support the introduction of such model into the corporate management and planning processes;
- i. Mentor and assist participating PNP's in the development of their respective policies and procedures on general accounting, customer billing and collection, financial planning and budgeting, inventory accounting, fixed assets accounting, financial information reporting and monitoring, and overall internal control;
- j. Provide close support to DWS and PCU on the preparation/facilitation of all workshops and meetings for water supply and sanitation; and
- k. Provide detailed and close support in the preparation of all progress and other reports, as well as support to ADB loan review missions.

A5 Safeguard Specialist – Environment

The role of the Safeguard Specialist – Environment is to support the PCU, PIU and PNP's in conducting environmental assessments and preparing environmental safeguard due diligence reports for the subprojects, assisting in capacity development, and facilitating environmental monitoring throughout project implementation and construction. The specialist will also ensure that in conducting their duties, that compliance with applicable environmental laws and regulations of the Lao PDR are upheld. Specific tasks of the specialist includes, but is not limited to the following:

- a. Lead the initial orientation and briefing to PCU and PIU staff on the process of environmental assessment and management and health and safety that covers purpose, methods of assessment, reporting requirements, EARF principles, IEE, EMP preparation, review and updates, application of EMP in works contracts, grievance redress mechanism (GRM) and compliance monitoring requirements during project implementation;
- b. Assist PCU and PIUs to prepare ADB's rapid environmental assessment (REA) checklists for each subproject, which will be included as part of each subproject feasibility study;
- c. Assist PCU and PIUs to undertake consultations with local communities on environmental issues to ensure that their needs and concerns are incorporated in subproject design and implementation;
- d. Provide inputs, as required, to the feasibility studies to ensure the subprojects address environmental sustainability and complies with the relevant rules and regulations;
- e. Guide the preparation and update of IEEs and EMPs for each subproject at feasibility and detailed engineering design stages, working closely with the technical design team, the PMC ecologist, PCU and PIU, and oversee site investigations etc. that is required to complete the preparation of the IEE and EMPs;
- f. Assist the PCU in securing relevant environmental licences and certificates prior to contract awards and to ensure fulfilment of national requirements on monitoring and reporting, including obtaining any necessary validity extensions.

- g. Conducting quality assurance of IEE and EMP, and ensuring key requirements and documents are captured in the contract documents for civil works;
- h. Review and monitor reporting on project specific grievance redress mechanism (GRM) in line with the EMP;
- i. Assist the PCU and PIUs in working with the civil works contractors to prepare site-specific CEMP in accordance with IEE/EMP and environment safeguard requirements;
- j. Assist the PCU and PIUs in reviewing and clearing CEMPs of the civil works contractors before commencement of works on site and ensure ADB is informed of the CEMP clearance before works start;
- k. Assist PCU and PIUs to design and implement environmental monitoring programs that include regular on site monitoring visits and preparation of corrective action plans where required;
- l. Assist PCU and PIU to prepare environmental monitoring reports which will include corrective action plans issued and resolutions;
- m. Visit subproject towns during construction and provide guidance relating to supervision and compliance monitoring, advising PIUs and construction supervisors of any actions required to ensure compliance with the EMP/CEMP, or of any activities/issues that may pose a risk to the project.
- n. Provide inputs to the project progress reports, safeguards monitoring reports and project completion reports;
- o. Develop and lead any further environmental safeguards training and capacity development measures as deemed necessary and as capacity gaps are identified.

A6 Safeguard Specialist – Involuntary Resettlement and Indigenous Peoples

The Safeguard Specialist – Involuntary Resettlement and Indigenous Peoples will assist the PCU to oversee all land acquisition, compensation and resettlement activities, management of project related impacts that may affect indigenous peoples and vulnerable groups, and develop capacity to manage involuntary resettlement and indigenous peoples related safeguards. The specialist will be required to:

- a. Oversee the development of methodology, tools and templates for conducting social safeguards impact assessment and documents;
- b. Lead data collection surveys, public consultations, information campaigns, and coordination with government officials and others, as required;
- c. Preparing draft LACPs, detailed measurement survey, inventory of losses and public information booklets;
- d. Providing guidance to the EA, PCU and PIUs on social safeguards aspects of the project with emphasis on land acquisition, compensation, livelihoods restoration, indigenous peoples safeguard requirements, compliance monitoring and reporting;

- e. Provide training to project staff and PNPs, PCU and PIUs and contractors on national legal and regulatory framework, ADB SPS and its application as well as Project safeguards requirements;
- f. Provide training to the contractors on documentation process (pre and post construction) and temporary impacts.
- g. Provide inputs, as required, to the feasibility studies on matters relating to social safeguards;
- h. Prepare and update due diligence reports, LACPs, ethnic group development plans (EGDP) as required for all subprojects in accordance with the feasibility study designs, detailed engineering designs, approved LACF, EGDF, ADB SPS and government's laws and regulations, and monitor the implementation of the activities;
- i. Lead the detailed measurement surveys (DMS), asset registration surveys to identify and confirm of affected assets, the number of permanent and temporary loss of land, assets and structures; Advise PIUs in conducting the surveys.
- j. Establish a register of all documents, ((inventory of losses (IoL), detailed measurement survey (DMS), Socio-Economic Survey of Affected Households (SESAH), compensation forms, grievances, etc.) ensuring that household IDs (unique identifier) are recorded both on the document and on e-files;
- k. Establish a system to prepare and record maps and photos with georeferences (e.g. Map Info, GIS, AutoCAD) of the surveyed households, affected villages and all acquired land using unique household identifiers to link household documents and surveys to land;
- l. Provide training to the PCU, PIU, local resettlement committees and other officers as required, to build capacity to manage the registers/databases of affected persons, recording records of compensation awards and grievance redress;
- m. Provide inputs to the preparation of the bidding documents and civil works contract packages to ensure all safeguard documents, and relevant safeguard provisions are included in the contract documents;
- n. Support the PCU and PIUs to (a) supervise and monitor land acquisition and resettlement, in accordance with the approved LACPs (b) implement the LACPs with a focus on community consultation, entitlement review, compensation assessment, and grievance procedures;
- o. Provide training to the grievance committee members of the Project Specific Grievance Redress Mechanism (GRM) to build capacity on roles and responsibilities of the GRC, record keeping, reporting etc.;
- p. Support the PCU and PIUs to implement grievances redress mechanisms and advising if necessary on any required improvements;
- q. Support PCU and PIU in monitoring of any corrective action plans.
- r. Conduct field visits to monitor progress of the subprojects and advise the PCU of any issues that may affect project progress;

- s. Provide inputs to the project progress reports, safeguards monitoring reports, and project completion reports;

A7 Specialist – Social and Gender

The role of the Social and Gender Specialist is to assist in the preparation of poverty and social analyses, implementation of the GAP, promoting gender mainstreaming into the Project, raising gender awareness and conducting training to improve understanding of gender issues. The specialist will be responsible for:

- a. Supporting the PCU and PIUs in the implementation of the GAP;
- b. Leading the baseline data collection surveys, including elements of gender and development, ethnic groups, and community development for the preparation of the socio-economic surveys as part of feasibility study preparation;
- c. Managing the socio-economic surveys in all subproject towns.
- d. Preparing survey methodology, engage surveyors and data processors, analyse, and report on survey results;
- e. Preparing a socioeconomic profile for each town included in the sector project, with data disaggregated by sex, ethnicity, and income where appropriate;
- f. Consulting with Lao Women's Union (LWU), beneficiaries and staff of PNPs to ensure women's needs are addressed in project activities, and in the design and monitoring of the Project
- g. Providing advice on implementing the gender plan including data collection and monitoring, coordinating gender within the sector, technical design issues, gender sensitive communication, equal access to training and capacity development, and mentoring opportunities. Develop and measure gender indicators to differentiate outcomes of male and female beneficiaries.
- h. Providing support to carry out surveys to identify take-up of connections, consumer satisfaction, effect on household gender relations, and report on status of project implementation;
- i. Preparing training courses relevant to the water sector and appropriate for all project implementing agencies. Deliver gender awareness training to project team members, PCU, PNPs/PIUs and other relevant agencies and individuals as required; and
- j. Providing inputs to the project progress reports, safeguard monitoring reports and project completion reports.

B – International Non Key Specialists

B1 Water Resource Specialist

The role of the Water Resource Specialist is to support the development of the feasibility studies and detailed engineering designs. The specialist will be expected to work closely with the technical design team and will be responsible for:

- a. Providing inputs to support the development of the water supply and sanitation framework and water supply and sanitation infrastructure plans, particularly on issues relating to climate and disaster management, integrated catchment and water resource management;
- b. Leading the field surveys and data collection of raw water, assessing water quality, water users, and projected water demands for each subproject;
- c. Assessing the upstream and downstream impacts of water abstraction at the identified location of the raw water intake;
- d. Performing hydrologic, hydraulic and water quality modelling;
- e. Establishing systems and leading the data capture of water resource data utilising appropriate GIS / asset management systems;
- f. Preparing documentation, mapping, drawings, etc. as required to support the preparation of the feasibility studies and detailed engineering designs and relevant reports;
- g. Identifying opportunities to promote water conservation and develop water strategies to ensure sustainable provision of water supply for each subproject;
- h. Providing technical inputs to the feasibility study reports and detailed engineering design reports; and
- i. Supporting the PCU and PNPs to develop capacity in water resource management and integrated catchment management and planning, and water demand management.

B2 Climate Change Specialist (Water Sector)

The role of the Climate Change Specialist is to provide technical inputs to the design of the water supply and sanitation systems, ensuring the proposed new systems consider vulnerability and risks associated with climate change. The key responsibilities of the Climate Change Specialist includes:

- a. Providing inputs to support the development of the water supply and sanitation framework and water supply and sanitation infrastructure plans, particularly on issues relating to climate and disaster management, integrated catchment and water resource management;
- b. Supporting the technical design team and providing inputs to the development of the long term water supply and sanitation infrastructure plans, feasibility studies and detailed engineering designs on matters relating to water resource development and climate change and vulnerability risk assessments, including ensuring the designs incorporate climate mitigation measures;
- c. Identifying opportunities for implementation of climate mitigation measures, which includes digital technologies, and early warning systems;
- d. Providing inputs towards cost estimates, financial and economic analyses for each subproject as required; and
- e. Supporting capacity development of the PCU, PIU and PNPs on climate risk management approaches and principles.

C – National Key Specialists

C1 Deputy Team Leader – Water Supply and Sanitation Specialist

The Deputy Team Leader's role will be to facilitate the delivery of the Project, working closely with the Team Leader by supporting general project management, and coordinating with specialists on their respective inputs. The responsibilities of the Deputy Team Leader include:

- a. Assisting the Team Leader in management, coordination and supervision of consulting services for the Project to ensure that: (a) inputs and activities of both the international and national consultants are of high quality and effective; and (b) all consulting components and project components are fully integrated and properly coordinated;
- b. Assisting the Team Leader, PCU and PIUs to manage all aspects of project implementation, including: (a) overall project planning, scheduling, management and coordination; (b) subproject selection; (c) feasibility studies; (d) detailed engineering design and documentation; (e) bidding, evaluation and contract award; (f) contract management and construction supervision; (g) project forecasting and monitoring; (e) safeguard compliance; and (f) progress reporting;
- c. Providing inputs to the development of the water supply and sanitation infrastructure plan for each province;
- d. Assisting in selection of appropriate water supply technologies and development options for rehabilitation and expansion of the existing water supply storage, treatment facilities and water supply distribution networks;
- e. Reviewing the designs of previously built water supply systems and recommending the most cost-effective and appropriate technology;
- f. Assisting to confirm or develop appropriate design criteria, design concepts and methodologies;
- g. Supervise all topographic surveys and geotechnical investigations;
- h. Conducting and supervising field surveys to assess service levels, physical and environmental conditions, and operation and maintenance of existing water supply infrastructure;
- i. Identifying requirements for topographic surveys, geotechnical investigations, water quality testing to obtain necessary information for subproject design and monitoring. Specify the necessary investigations, prepare the contract documents and call quotations. Evaluate and supervise the investigation and survey contracts, and assess and report on the data obtained;
- j. Coordinate with the PCU on UXO pathfinding, survey and clearance and provide inputs to the PCU on the key requirements for the required scope of investigations. (Preparation of the contract documents, call quotations, supervision of the investigation contracts, and review of report on the data obtained will be carried out by the PCU under a separate contract).

- k. Supervising all preliminary designs, costs, quantities and least cost analyses for water supply in all subproject towns for the feasibility studies;
- l. Supervising detailed engineering designs for all subproject works, technical specifications, performance specifications, detailed cost estimates and quantities;
- m. Ensuring coordination/collaboration between engineering and safeguards team during feasibility study and detailed engineering design, including timely demarcation of corridors of impacts, alternative designs to allow avoid or at least minimize impacts;
- n. Providing technical support to contract administration and construction supervision to ensure that the constructed works comply with the design intent;
- o. Providing inputs to the preparation of the final design report; and
- p. Contributing to all necessary reporting under the Project.

C2 Project Performance Monitoring Specialist

The Project Performance Monitoring Specialist's role is to assist the Team Leader and Deputy Team Leader in monitoring the progress of project implementation, including the delivery of outputs, outcomes and impacts under the project. The specialist will be expected to develop specific monitoring tools and templates to track project performance. The responsibilities of the Project Performance Monitoring Specialist includes:

- a. Assist the Team Leader and PCU to design a project performance monitoring and evaluation (PPME) framework, based on ADB guidelines for preparing a design and monitoring framework;
- b. Assist in the design of socio-economic and other surveys to ensure an adequate baseline can be established;
- c. Assist the PCU and PIUs to collect, record and analyse all necessary data, including baseline data;
- d. Provide training and guidance to PCU and PIUs on their duties and responsibilities under the project performance monitoring system (PPMS);
- e. Update the RARMP, status of compliance against loan covenants and prepare annual PPME reports for submission; and
- f. Assist in compiling the project progress reports and project completion report information.

C3 Financial Management Specialist

The financial management specialist will assist in the preparation of financial assessments for all subprojects and will be expected to work closely with the PCU and PNPs and facilitate preparation of the entity level financial statements and external audits. The specialist will also be expected to support the assessment of the financial sustainability of the PNPs, and assist in the preparation of financial management action plans to resolve identified risks and issues, tariff reviews and adjustments, and corporate business plans. As a minimum, the duties of the specialist includes:

- a. Support the development of subproject feasibility and appraisal reports;
- b. Support the development of corporate business plans and provide inputs and recommendations to improve the structure and content;
- c. Provide updates on the status of the FMAP implementation;
- d. Support the design and delivery of corporate training modules;
- e. Provide mentoring and assistance to participating PNPs in the development of their respective corporate plans including the review of existing systems, policies and procedures on general accounting, customer billing and collection, financial planning and budgeting, inventory accounting, fixed assets accounting, financial information reporting and monitoring, and overall internal control;
- f. Support the design and delivery of awareness and training programs in corporate business planning and corporate governance; and
- g. Support the PCU in the preparation and participation in all relevant workshops and meetings.

C4/C5 Water Supply Design Engineer (1 and 2)

The Water Supply Design Engineers will be responsible for developing the feasibility studies and detailed engineering designs for all subprojects. They will form an integral part of the technical design team, and will contribute towards the development of detailed technical studies. The duties of the Water Supply Design Engineers include:

- a. Assist to review available water supply technologies and recommend appropriate options;
- b. Assist to review the designs of previously built water supply systems and recommend the most cost-effective and appropriate technology;
- c. Assist to confirm or develop appropriate design criteria, design concepts and methodologies for rehabilitation and expansion of water supply systems;
- d. Conduct field surveys to assess service levels, physical and environmental conditions, determine expansion and rehabilitation needs of existing water supply infrastructure;
- e. Prepare preliminary and detailed engineering designs based on raw water assessments and analysis of topography, natural drainage flows, and the layout of water supply systems, including preparing the cost estimates, technical and performance specifications, and bill of quantities;
- f. Guide the development of all detailed design drawings, working closely with the AutoCAD operators,
- g. Conduct detailed reviews of all CAD drawings, and provide quality assurance to the final design outputs;
- h. Assist the PNPs to prepare and implement O&M plans for the new or improved water supply systems;

- i. Provide technical support to contract administration and construction supervision to ensure that the constructed works or design revisions comply with the design intent; and
- j. Provide inputs to the preparation of the final design report.

C6 Safeguard Specialist – Environment

The Safeguard Specialist – Environment, will assist in the preparation of the environmental assessments for the feasibility studies and detailed engineering designs for all subprojects, and assist in developing the capacity of the PCU and PIU to conduct environmental assessments and monitoring. The specialist will:

- a. Assist the international Safeguard Specialist - Environment, in designing and carrying out initial orientation to PCU and PIU staff in environmental assessment and management and health and safety, including the preparation of material and instruction in the Lao language;
- b. Visit each subproject town and carry out IEE/EMP report preparation, in accordance with the EARF for the Project;
- c. Participate in the design development of the civil works to ensure that adequate environmental consideration is incorporated into the designs including recommendations from the PMC ecologist;
- d. Coordinate with the social and resettlement specialists on stakeholder consultations related to environment aspects and/or address all of grievances through the GRM;
- e. Assist with preparation, update and review of IEEs/EMPs and prepare ADB rapid environmental assessment (REA) checklists for each subprojects, and co-ordinate with PIUs for any further investigations or reporting that may be necessary;
- f. Review, revised and update the EMPs for each subproject, as required;
- g. Provide inputs to feasibility studies, progress reports and project completion report;
- h. Provide inputs to bidding and construction supervision team, design engineer and procurement specialist to ensure that EMPs are integrated in contract and bidding documents;
- i. Visit subproject towns during construction and provide guidance on supervision and on-site compliance monitoring, advise PIUs and construction supervisors of any corrective actions required to ensure EMP/CEMP compliance;
- j. Visit subproject towns where construction has been completed and assist with establishing environmental monitoring procedures for the operation phase of the subprojects;
- k. Review safeguards monitoring reports and prepare submission to ADB semi-annually;
- l. Prepare summary of environmental safeguards and project GRM implementation progress for inclusion in the quarterly project progress monitoring reports, and identify any issues that may trigger a safeguards risk/issue and affect project progress; and
- m. Assist PMU and PIUs and other relevant agencies in local safeguards documentation translation and disclosure.

C7 Safeguard Specialist – Involuntary Resettlement and Indigenous Peoples

The Safeguard Specialist – Involuntary Resettlement and Indigenous Peoples will assist in the preparation, monitoring and supervision of all land acquisition, compensation and resettlement activities, and participate in social assessments and contribute to the safeguard of indigenous peoples and vulnerable groups. The specialist will be expected to:

- a. Provide orientation and capacity development on land acquisition and involuntary resettlement, project policies, grievance redress procedure, public consultation process and effective LACP implementation to staff of PCU, PIU and district agencies.
- b. Work closely with and provide guidance to the PCU and PIU on social safeguards aspects of the project with emphasis on land acquisition, compensation, livelihoods restoration, compliance monitoring and reporting;
- c. Assist in trainings of project staff, PCU and PIU on national safeguards policy and ADB safeguards policy and its applications;
- d. Plan and support data collection surveys for land acquisition and resettlement and ethnic group/indigenous peoples planning related activities;
- e. Carry out field works, including conducting DMS of affected assets and confirm the number of permanent and temporary loss of land and assets;
- f. Assist in the conduct of the information campaigns and public consultations;
- g. Prepare LACPs, detailed measurement survey, inventory of losses and public information booklets
- h. Provide inputs to feasibility studies and other documents as required;
- i. Based on approved technical design and bidding documents, carry out public consultations during updating of the social safeguards documents (plan and due diligence documents);
- j. Conduct asset registration survey to confirm all impacted assets, impacted households, and number of severely affected households due to the loss of productive agricultural land and residential structures;
- k. Assist in preparation of maps with geo references (e.g., MapInfo, GIS, AutoCAD) of the affected villages and all acquired land using unique household identifiers to link HH documents and surveys to land;
- l. Register and record photos of each surveyed household (preferably with all persons present) to be taken in front of their abode, with their household ID (unique identifier);
- m. Assist PCU and PIUs to (a) supervise and monitor land acquisition and resettlement, in accordance with the approved provincial resettlement plans and ADB's Policy on Involuntary Resettlement, and; (b) implement the resettlement plans with a focus on community consultation, entitlement review, compensation assessment, and grievance procedures;
- n. Assist PIUs in monitoring the contractor's work related to temporary impacts. Conduct monthly field visits during construction for every subproject.

- o. Assist PIUs, and local resettlement committees to establish their affected persons database, including records of compensation awards and grievances redress;
- p. Support PCU and PIU in monitoring of any corrective action plans.
- q. Ensure that grievances redress mechanisms are appropriate, and advise, if necessary, on actions and resolutions;
- r. Establish and implement procedures for ongoing internal monitoring and assist the PIU in preparing the internal monitoring reports; and
- s. Support in preparation of monitoring reports, progress reports, and compensation completion report.

C8 Specialist – Social and Gender

The role of the Social and Gender Specialist, will be to support the preparation of poverty and social analyses, implementation, and monitoring of the gender action plan, promoting gender mainstreaming, and conducting and supporting social assessments to facilitate the implementation of EGDs and other social safeguards as may be required. The duties of the Safeguard Specialist – Social and Gender includes:

- a. Assisting the PCU and PIUs in implementation of the GAP, in accordance with Government and ADB gender policies and objectives;
- b. Assisting in carrying out socio-economic surveys in all subproject towns to include gender and development, ethnic groups, and community development;
- c. Gathering data to support the development of a socioeconomic profile for each town, including information relating to connections, consumer satisfaction, effect on household gender relations, with data disaggregated by sex, ethnicity, and income where possible throughout project implementation phase;
- d. Consulting with LWU, beneficiaries and staff of PNPs to ensure women's needs are addressed in project activities, and in the design and monitoring of the Project;
- e. Acting as gender focal point and facilitator for gender mainstreaming in data collection and monitoring, coordination within the sector, technical design issues, communication, training and capacity development, and mentoring;
- f. Contributing to the preparation and delivery of training courses and stakeholder workshops to inform and raise awareness about gender in sector;
- g. Reviewing training materials, training manuals prepared under other projects or programs, and adapt these materials to local conditions to inform benefits of water conservation and use of clean water in consultation with PIU teams, health and education offices, Women's Union and mass organizations;
- h. Develop and produce project and relevant community awareness materials as needed, and assist PIUs and PNPs to raise awareness on benefits use of clean water; and
- i. Facilitating knowledge sharing of gender and social approaches in the sector, including through partner forums, web page and reports.

C9 Procurement and Contract Specialist

The role of the Procurement and Contract Specialist is to provide assistance on all aspects of procurement and contract management under the Project. The Specialist will assist with the following:

- a. Assist in the preparation and compilation of all bidding documents for consulting, civil works and goods packages, based on the latest requirements of ADB and the Government of Lao PDR;
- b. Assist in supporting PCU and PIUs to conduct all pre-bid meetings, bid openings, bid evaluations and contract negotiations;
- c. Assist the PCU and PIUs in preparing bid evaluation reports;
- d. Assist PCU in any procurement capacity development and training programs;
- e. Participate in workshops and discussions with the EA, PCU, PNPs, and provincial governments in the area of procurement; and
- f. Provide inputs to all progress reports, project performance monitoring and evaluation (PPME) reports and the final completion report.

C10 Contract Engineer

The role of the Contract Engineer will be to administer the contracts in accordance with the contract specifications. The Contract Engineer will be responsible for:

- a. Supporting the resident engineers and construction supervisors in the execution of all civil works contracts, including providing guidance and advice on matters relating to extensions of time and contract variations;
- b. Liaising with all other technical specialists as necessary on the progress and execution of the civil works contracts;
- c. Setting up a quality assurance system to monitor progress of works, including status of contractor's interim payment requests, working closely with the Procurement and Contract Specialist;
- d. Monitoring the budget, progress and schedule of all civil works contracts, and notifying the Team Leader of potential delays;
- e. Reviewing and checking contractors' interim payment requests; and
- f. Providing inputs to the project progress reports on progress and performance of the contractors.

D – National Non Key Specialist

D1 Asset Management Specialist

The role of the Asset Management Specialist is to provide guidance to the PCU, PIU and PNPs on the establishment of an asset management system that records asset details and allows

PNPs to conduct proactive planning and maintenance activities for the new water supply and sanitation assets. The duties of the Asset Management Specialist includes:

- a. Reviewing the current status of asset management and GIS systems utilized within the sector, including other PNPs, its suitability and appropriateness for the country context, and identify opportunities for improvement;
- b. Reviewing the current process for maintaining the asset registers, and provide suggestions / recommendations to refine the asset data procedures, coordinating closely with the TA and CD consultants, as required, who will also be involved in guideline development and training to promote sound asset management, operations and maintenance procedures;
- c. Support the PNPs to develop capacity in whole of life cycle asset management, including procedures to develop proactive maintenance, asset replacement and asset renewals programs;
- d. Support the PNPs in developing plans and programs to promote operations and maintenance;
- e. Set up templates to facilitate the recording of asset data ensuring appropriate references are captured to facilitate transfer of information to digital systems, such as MapInfo, GIS, AutoCAD etc.;
- f. Engage with the Regulatory and Institutional Specialist, Water Supply Specialist, Financial Management Specialist to ensure key asset management principles are incorporated into the corporate business plans;
- g. Collaborate with the GIS Specialist to ensure asset data is registered and logged in the GIS systems; and
- h. Provide inputs to the project progress reports and project completion report.

D2 GIS Specialist

The GIS Specialist will assist in setting up the GIS system for all subprojects, working closely with the technical design team, asset management specialist and regulatory and institutional specialist and safeguard specialists. The key duties of the GIS specialist will include:

- a. Reviewing the current status of asset management and GIS systems utilized within the sector, including other PNPs, its suitability and appropriateness for the country context, and identify opportunities for improvement;
- b. Establishing procedures and protocols for recording data, including setting up recording templates for asset registration, establishing identifiers to link documents with land details, utilizing georeferencing, accessing and maintaining asset and geospatial data, and transferring of files into GIS from CAD, working closely with the AutoCAD operators;
- c. Setting up templates and reporting tools to facilitate data collection and conduct field visits to subproject sites along with other specialists to support data collection and data capture;
- d. Carrying out data capture, data conversion, data entry as required, and create relevant files (shapefiles) and produce maps/databases based on the requirements of the technical design team;

- e. Resolving data accuracy issues as required;
- f. Support the technical design team to collect the necessary information on the civil works, or data/asset recording that may be required, including inputting data from as-built drawings and other information from CAD to the GIS database;
- g. Providing inputs to the technical specifications in the bidding documents on data requirements to facilitate transfer of information to GIS;
- h. Provide inputs to the asset management systems, working closely with the Asset Management Specialist;
- i. Generate digital and hardcopy maps, reports etc. as required;
- j. Support the capacity development of PNP, particularly PNP staff who will be administering the GIS by providing training and developing appropriate training materials to develop user capability; and
- k. Provide inputs to the project progress reports, project completion report, an other performance monitoring as required.

D3 Geotechnical Engineer

The Geotechnical Engineer will conduct all geotechnical investigations to facilitate the development of geotechnical designs to support feasibility studies and detailed engineering designs for all subprojects. The Geotechnical Engineer will:

- a. Conduct field surveys as required to inform the preparation of the geotechnical designs, design concepts and methodologies;
- b. Prepare the geotechnical designs, including preparation of the bill of quantities with respect to geotechnical/groundworks;
- c. Provide inputs to the detailed engineering design reports for each subproject, including the bidding documents and technical and performance specifications;
- d. Guide the development of all detailed design drawings, working closely with the AutoCAD operators and carry out quality assurance on the final outputs; and
- e. Carry out periodic inspections during construction to ensure the geotechnical works comply with the design intent.

D4 Structural Engineer

The Structural Engineer will carry out all structural investigations and analysis require to inform the development of the feasibility studies and detailed engineering designs. The Structural Engineer will:

- a. Review the structural designs of existing water supply systems, and provide recommendations for rehabilitation/expansion, as required;
- b. Provide inputs to field surveys to ensure relevant data are captured and collected to enable the designs to be carried out;

- c. Develop the structural designs for all subprojects, including preparing the cost estimates;
- d. Provide inputs to the detailed engineering design reports for each subproject, including the bidding documents and technical and performance specifications;
- e. Guide the development of all detailed design drawings, working closely with the AutoCAD operators, and carry out quality assurance on the final outputs; and
- f. Carry out periodic inspections during construction to ensure the structural works comply with the design intent.

D5 Mechanical Engineer

The Mechanical Engineer will contribute towards the development of the mechanical designs of the water supply systems in all subprojects. The key responsibilities of the Mechanical Engineer will include:

- a. Developing the appropriate electrical and mechanical design criteria (in conjunction with the Electrical Engineer), design concepts and methodologies;
- b. Provide inputs to field surveys to ensure relevant data are captured and collected to enable the designs to be carried out;
- c. Developing the mechanical designs for the proposed water supply systems;
- d. Guide the development of all detailed design drawings, working closely with the AutoCAD operators, and carry out quality assurance on the final outputs;
- e. Develop the detailed cost estimates and quantities;
- f. Guide the development of all process and instrumentation diagrams, remote control and monitoring systems;
- g. Provide inputs to the detailed engineering design reports for each subproject, including the bidding documents and technical and performance specifications;
- h. Liaise with external utility service providers as required; and
- i. Undertake periodic inspections during construction to ensure the mechanical works comply with the design intent.

D6 Electrical Engineer

The Electrical Engineer will conduct the preparation of the electrical designs for the water supply systems, working closely with the mechanical engineer, technical design team and the AutoCAD operators. Where required, the Electrical Engineer will be expected to liaise closely with external utility providers to ensure the electrical designs addresses their requirements. The duties of the Electrical Engineer includes:

- a. Developing the appropriate electrical and mechanical design criteria, SCAD systems, design concepts and methodologies (in conjunction with the Mechanical Engineer);

- b. Conduct field surveys to assess condition of electrical components of existing water supply works, and to capture data required to inform the development of the electrical designs;
- c. Developing the electrical designs for the proposed water supply systems, including power supply;
- d. Guide the development of all detailed design drawings, working closely with the AutoCAD operators, and carry out quality assurance on the final outputs;
- e. Develop the detailed cost estimates and quantities;
- f. Guide the development of all process and instrumentation diagrams, remote control and monitoring systems;
- g. Provide inputs to the detailed engineering design reports for each subproject, including the bidding documents and technical and performance specifications;
- h. Liaise with external utility service providers as required; and
- i. Undertake periodic inspections during construction to ensure the mechanical works comply with the design intent.

D7 Community Engagement Specialist

The Community Engagement Specialist will be responsible for facilitating community engagement workshops, consultation sessions, focus group discussions, and other community campaigns, that may be required as part of the project. The specialist will be responsible for:

- a. Reviewing and updating the community stakeholder consultation plan and developing the appropriate community engagement materials for workshops, consultation sessions, focus group discussions, etc;
- b. Familiarizing themselves with the requirements of the GAP, PPME, DMF;
- c. Leading all stakeholder consultation events;
- d. Ensuring that the method of engagement is appropriate to the target audience, ensuring a broad and diverse group of stakeholders are engaged;
- e. Liaise with the technical design team, all safeguard specialists to ensure that the correct message is delivered during the community engagement sessions, and to also ensure that the appropriate level and quality of data is captured to facilitate project and performance reporting;
- f. Developing the community engagement and outreach materials for the various community engagement and focus group discussion events, and contribute to the development of information booklets;
- g. Supporting the technical design team and safeguard specialists as required throughout the project implementation;
- h. Providing inputs to the project progress reports, safeguard monitoring reports and project completion reports as required; and

- i. Participating in loan review missions and other meetings to inform the progress of stakeholder consultations.

D8 Ecologist/Biodiversity Specialist

The Ecologist/Biodiversity Specialist will lead a terrestrial and aquatic flora and fauna study for all subprojects. The specialist will work closely with the technical design team, environmental safeguard specialists and environmental focal points from the PCU and PIUs and deliver a report on each subproject (where required), which gives the PMC and PCU a clear understanding of the environment (flora and fauna) in the project area, the potential environmental impacts of the project and practical mitigation measures or design adaptations to limit the impacts to an acceptable level, in accordance with ADB's Safeguards Policy Statement (2009). The key responsibilities of the Ecologist/Biodiversity Specialist includes:

- a. Undertake desk-based literature studies and visits to all relevant project sites to identify baseline ecology conditions, habitats and terrestrial and aquatic flora and fauna species in the project area of influence covering the intakes, downstream of the intakes, the raw water pipelines, the transmission mains, the Water Treatment Plant sites, and potential access routes for construction.
- b. Map and categorise the habitats in the project area according to Lao national protected or special area categories and according to ADB's classifications (modified, natural or critical). Include any identified threats to the areas mapped, which may impact on the catchment and eventual water quality.
- c. Identify terrestrial and aquatic flora and fauna species in the project area, according to the IUCN Red List classification scheme and any relevant Lao classifications, focusing on likely presence of critically endangered (CR) and endangered (EN) species.
- d. Determine any constraints, regulations or requirements facing the project due to land or habitat classifications or species identified as above.
- e. Confirm the calculations of land area to be affected by the project according to the current (IEE) prepared during the project feasibility stage.
- f. Identify any social reliance on the terrestrial and aquatic flora and fauna in the project area including any downstream users of water which may be impacted by the project.
- g. Using the identified ecological baseline and social context, assess the project's potential impacts of the project on the identified ecology, habitats and flora and fauna species.
- h. Identify non-project related threats to species of conservation value that have been identified.
- i. Conduct consultations with local people, PAFO, DAFO, and PONRE officials and other stakeholders to confirm/verify findings.
- j. Confirm absence of significant impacts of the subproject on aquatic and terrestrial ecology; or, as needed, develop recommendations to limit the project impacts including:

- a. on site-specific ecological mitigation and compensation measures in relation to the identified impacts including compensatory measures to ensure no net loss of biodiversity where natural habitat is degraded, and to restore significant loss of ecosystem services.
 - b. mitigation through changes to the final project design which potentially can include changes to materials, locations, or methodologies.
- k. Identity monitoring requirements to ensure that any mitigation measures or impacts are checked throughout project implementation; and
 - l. Prepare a comprehensive report detailing all stages of the study and clearly stating the project impacts, and recommended mitigation measures. The report will include photographs and details of all meetings and consultations conducted. The report shall be developed and structured in such a way that it can be integrated into the IEE and EMP, to be updated to reflect DED.

D9-D11 Autocad Operators (1, 2, and 3)

The objective of the Autocad Operators is to support the technical design team in preparing the full design package. The responsibilities of the operators includes:

- a. Prepare detailed engineering design drawings for all subproject works, including mechanical and structural design drawings for the water treatment plants;
- b. Prepare detailed transmission and distribution network pipeline drawings; and
- c. Assist the Water Supply Engineers team to prepare the bills of quantities and cost estimates.

D12-D14 Resident Engineers (1, 2, and 3)

The Resident Engineers will be responsible for overseeing the construction and commissioning of the subprojects. The Resident Engineer will conduct field inspections to monitor on the progress of construction activities, check on the quality of the construction activities, monitor compliance against the CEMP, issue corrective actions, where necessary and providing updates to the Team Leader, PCU, and PIU. The key tasks of the Resident Engineers will include:

- a. Monitor, and update as necessary construction schedules with recommendations on construction supervision and management;
- b. Monitor and update construction cost schedules and contract expenditures, and providing regular updates to the Contract Engineer;
- c. Process and check the content of all interim payment claims by the contractors and informing key findings to the Contract Engineer;
- d. Supervise, inspect, measure, and control the quality of the construction works and the installation of equipment to ensure compliance with contract drawings and specifications, and make recommendations to the Contracts Engineer on the issuance of Contract Notices, and payment certificates;

- e. Assist the Contracts Engineer to (a) administer and supervise the construction and procurement contracts; (b) commission and evaluate the performance of completed facilities and new equipment; and (c) review and validate any proposed design modification; and
- f. Provide inputs to progress and project performance management system (PPMS) reports.

D15-D17 Construction Supervisors (1, 2 and 3)

The Construction Supervisors will be based on site at the subproject locations and will be responsible for supervising and reporting on general progress of the construction activities, guiding the construction contractors on the works ensuring quality is upheld, and issuing corrective actions where necessary. The key responsibilities of the Construction Supervisors includes:

- a. Monitor, observe, record and report on day-to-day construction activities;
- b. Supervise, inspect, measure, and control the quality of the construction works and the installation of equipment to ensure compliance with contract drawings and specifications, and make recommendations to the Construction Engineers on the issuance of contract notices, and payment certificates;
- c. Assist the Senior Contracts Manager and Construction Engineers to: (a) administer the construction and procurement contracts; and (b) commission and evaluate the performance of completed facilities and new equipment;
- d. Monitor compliance of implementation of and reporting on CEMPs;
- e. Coordinate with PIU on general implementation and liaise with local authorities on construction activities,
- f. Assist in solving any complaints raised by affected people - if any; and
- g. Assist the Resident Engineers with preparing progress reports and PPMS reports.

