
State Institution "Development of Drinking Water Supply and Wastewater Disposal" under the Water Resources Service under the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic under the Cabinet of Ministers of the Kyrgyz Republic

Project Implementation Unit

Water Supply and Sanitation Universal Access Program, Phase 1 (WASUAP or Project)

AIIB-DED-QCBS-2025-1

TERMS OF REFERENCE (ToR)

For consulting services on the development of design and estimate documentation (DED), ensuring author's supervision for the construction of water supply systems in the subprojects of Chui and Issyk-Kul oblast

I. INTRODUCTION

I. Introduction

Background

The Government of the Kyrgyz Republic is implementing the Water Supply and Sanitation Universal Access Program Phase I (WASUAP or the Project) with financing from the World Bank, the Asia Infrastructure Investment Bank (AIIB), the Organization of Oil Producing Countries (OPEC) Fund and the Swiss Agency for Development Cooperation (SDC). The Project aims at increasing access to WSS services and improves the service delivery capacity in selected areas of the Kyrgyz Republic. The State Institution Drinking Water Supply and Wastewater Disposal (SIDWSWD), under the Water Resources Service, within the Ministry of Agriculture, Water Resources and Processing Industries has the overall responsibility for implementation of the Project through its Project Implementation Unit. The project consists of four components, namely: (i) Water Supply Investments, (ii) Sanitation Development, (iii) Performance-based Service Improvement Program, and (iii) Program Structuring and Management, and Institutional Development Support.

Under Component 1 the Project will finance the construction and upgrade of water supply systems in 126 rural villages and small towns in Chui, Issyk-Kul, and Osh regions (See Annex 1), benefiting around 450,000 people. The Project will prioritize the use of gravity systems, energy-efficient pumping equipment, and solar energy for the new water supply schemes to minimize greenhouse gas emissions. Water source development will target groundwater exploitation to provide a more drought-resilient supply, and network construction will utilize climate-resilient infrastructure design including materials resistant to high-temperature variations and that withstand ground movements in landslide-prone areas. All water intakes shall include source protection and reforestation interventions to prevent contamination and enable water conservation and aquifer recharge. The scheme

design shall adopt the World Bank Resilient Water Infrastructure Design Brief¹ to minimize the risk of water supply disruption due to landslides and other climate-related events. The design shall also follow a participatory approach, with consultations involving vulnerable groups, women and disabled people, building on local knowledge and historical data. The present ToRs cover the design and construction supervision for 29 villages in Chui Oblast. The proposed investments will prioritize interventions with demonstrated impacts on service reliability, financial viability, and climate resilience.

General information about subprojects

1. Target areas

The Chui oblast is located in Kyrgyzstan's northwestern region and surrounds the capital city Bishkek. It shares borders with Kazakhstan to the north and west. The region contains a wide range of ecosystems, from semi-deserts to the nival belt. The region consists of eight districts, 331 villages and a total population of 1 070 000. The project areas are located in Sokuluk and Panfilov Districts.

1.1. Sokuluk district

General characteristics of the district

Sokuluk district is located in the central part of the Chui valley and is bounded: from the north by the territory of the Republic of Kazakhstan; from the west by the territory of Moskovskiy district; from the south by the crest of the Kyrgyz range; from the east by the territory of Alamudunskiy district. The district was established in 1953. The area of the district is 2550 km², 1 city, 19 Ayil Aimak, 43.2% of the district area belongs to the mountainous and 56.8% to flat terrain. The climate is continental with dry hot summer and moderately cold winters. The average temperature in July is 25°C. Autumn is dry, warm with subsequent sharp transition to winter. Snow cover is inconstant. The number of days per year with snow cover is 71, the average snow cover height is 21 cm in the valley part of the district. In the valley part there is a widespread ravine and gully network with permanent and temporary watercourses of rain and groundwater supply.

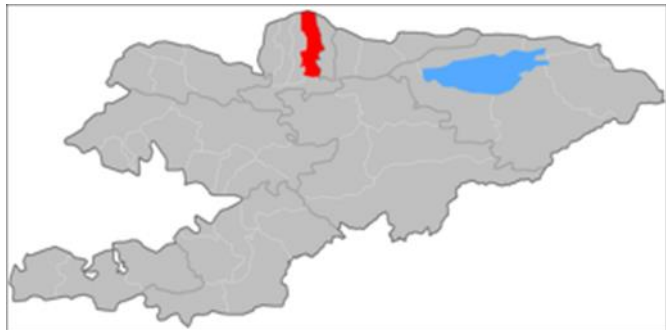


Figure 1. Location of the Sokuluk district

The district population, according to the National Statistical Committee of the Kyrgyz Republic, is estimated at 261,100 people (of which 96 percent rural) as of January 1, 2023. The average population density is 102.3 people per 1 km². The administrative center of the district is Sokuluk village with a permanent population of 15,100 people.

¹ Source: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/868981599035366969/resilient-water-infrastructure-design-brief>

1.2. Panfilov district

General characteristics of the district

The administrative center of the district is Kaiyndy town with a permanent population according to the National Statistical Committee of the Kyrgyz Republic as of January 1, 2023 is 10.1 thousand people. Panfilov district is the westernmost district of the oblast. Its territory is bounded by: from the north and west - by the state border with the Republic of Kazakhstan; from the south - by the territory of Talas oblast; from the east - by the territory of Zhaiyl district of Chui oblast. In addition, the district territory includes lands of common use of Suusamyr valley without settlements, used as pastures in spring-autumn period.

The climate of Panfilov district is characterized by the main climatic indicators for the western part of the Chui Valley. The climate is continental with dry hot summers with moderately cold winters. The average temperature in July is about 25°C. Autumn is dry, warm with a sharp transition to winter. Snow cover is inconstant. The number of days per year with snow cover in the valley part is 71 with a snow cover height of 21 cm up to altitudes of 800 m above sea level.

The hydrographic network of the district belongs to the Chu River basin and is represented by its numerous left tributaries. The largest of them: Chon- Kaiyndy River - 26.9 m³/s; Cholok-Kaiyndy River - 5.9 m³/s; Dzhardy-Kaiyndy River - 31.7 m³/s; Chorgoly River - 3.0 m³/s; Taldy-Bulak River - 5.3 m³/s; Kara-Bulak ravine - 3.0 m³/s; Chorgoly ravine - 1.0 m³/s. The rivers are fed by glaciers and snow, partly by rainfall. In the valley part there is a widespread gully and ravine network with permanent and temporary watercourses.

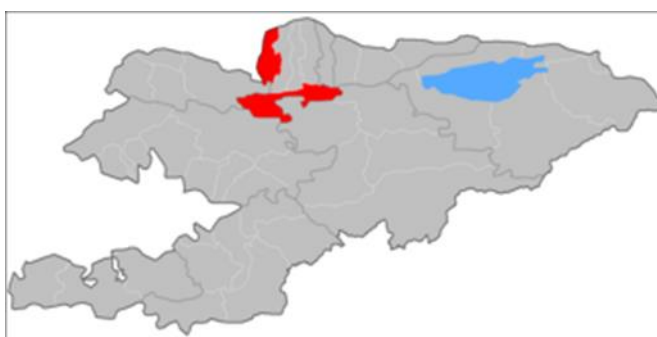


Figure 2. Location of the Panfilov district

1.3. Ak-Suu District

General description of the district

Ak-Suu district was established in 1973. The district is located in the eastern part of the Issyk-Kul basin. The district covers an area of 9,917 km² and borders with Tyup district in the north, Kazakhstan in the northeast, China in the southeast, and Zheti-Oguz district in the west. According to the National Statistical Committee of the Kyrgyz Republic, as of January 1, 2023, the total permanent population of the district is 74,000 people. The average population density in the district is 7.5 people per 1 km². About 93% of the Ak-Suu district is mountainous, and the remaining 7% is valley terrain. The climatic conditions of the district are characterized by the following data: the average air temperature in January is -8 °C in the valley and -26 °C in the mountains. In July, the average monthly temperature ranges from +14 °C in the valley to +9 °C in the mountains. The minimum air temperature is -40 °C. The average maximum air temperatures range from +30°C in the valley to +15°C in the mountains. Precipitation is 300-400 mm in the valley and 500-600

mm in the mountains, with up to 150 mm in the valley during the warm season and 250 mm in the mountains during the cold season.



Figure 3. Location of Ak-Suu district

II. MAIN OBJECTIVES OF THE CONTRACT

The objective of this assignment is to develop the engineering design and estimate documentation (DED), and tender documents, including the environmental and social documents for subprojects in Chui and Issyk-Kul oblasts. Specifically, the consultant will:

- 1) Development of detailed engineering design for water supply systems construction and rehabilitation,
- 2) Preparation of environmental and social safeguards documents relevant to the project component (ESIA, ESMP и RAP)
- 3) Preparation of tender documents for works contracts.
- 4) Assistance during the tender process
- 5) Author supervision

The DED should reflect the most effective solutions to enable universal access to water supply in the target villages and promote safely managed sanitation solutions. Further, the engineering solutions should be designed to improve water quality, reliability and efficiency of water supply services, and enable the climate adaptation and mitigation for the beneficiary communities. The consultant is expected to actively engage and work closely with the local organizations, Local Self-Governments, and beneficiary households to ensure a participatory process in accordance with local needs and technical requirements.

III. DETAILED SCOPE OF CONSULTING SERVICES

The Consultant shall conduct all necessary studies, assessments and surveys (including on geological, hydrogeological, geodetic and socio-economic data, environmental and social surveys, as well as the identification of natural hazards and climate risks) required to prepare a complete set of detailed design documents in accordance with the Kyrgyz Republic legislation, local standards and the best international practice, including necessary engineering and topographic surveys for rehabilitation and/or construction of all the water supply works and networks, and auxiliary facilities. If the available data are insufficient for design, the Consultant shall carry out additional surveys required for the preparation of the detailed design, subject to the approval of the Contract authorized representative of the State Institution for the Development of Drinking Water Supply and

Wastewater Disposal (SIDWSWD), and Water Resources Service (WRS) under the Ministry of Water Resources, Agriculture and Processing Industry (MWRAPI) of the Kyrgyz Republic (hereinafter referred to as the Client) and the World Bank.

- The topographic survey and mapping should be done with sufficient level of detail to ensure accuracy of technical design and for construction purposes with regulatory permissible tolerances (description of the terrain, elevations and scope of work on the drawings). Referencing to the state geodetic elevations networks (Reference pegs of the state leveling networks), to buildings and installations shall be reflected in the topographic survey.
- The hydrogeological and hydrological assessment shall include the measurement of groundwater levels (seasonal dynamics for both surface and groundwater). Including collection of soil and water samples for laboratory analysis of samples;
- The geological surveys shall use methods and methodology pre-approved by the Client (in accordance with “SNiP Surveys for Construction Needs”), covering a detailed study of the engineering and geological conditions of the area (sites, sections, water supply routes), including relief, geomorphological, seismic, hydrogeological conditions, geological structure, granulometric composition, categories of soils, condition and properties of soils (whether there are risks of subsidence or waterlogging), possible geological processes and phenomena (including natural disasters), as well as data for forecasting changes during construction and operation of the water supply system;
- The geotechnical studies shall also cover social facilities (schools, kindergartens, FAPs, hospitals, etc.) located in the project villages for potential WASH improvement activities.

The design must rely on proven technology and established design and construction methods. The Consultant shall advise any alternative design that may offer the best technical and economic solutions.

The Consultant shall ensure coordination and consultation with key stakeholders, including government agencies. The PIU should assist in obtaining approvals from the authorities if necessary.

The Consultant shall be responsible for the correction of any drawings or documents found to be incorrect due to insufficient field investigation, errors or omissions made during the design phase. In this case, all technical modifications and revisions of the design during the construction period shall be at the Consultant's cost.

3.1 Preliminary Design

Specific activities to be undertaken under this task shall include, but not necessarily limited to the following:

- **Preliminary Assessment and compilation of existing documentation and assessments.** Obtain, review and analyze all relevant documents, including previous plans and reports. The collected data shall include the extent of the existing water supply systems and solutions, GIS maps at appropriate scales, hydrological, hydrogeological, geotechnical, topographical, land use and other data relevant to the completion of characterization of the water supply infrastructure plans etc. This analysis should involve a collection and analysis of satellite imagery and aerial photographs amongst other data sources and will involve ground truthing and field verification. Conduct preliminary site investigations (including geotechnical investigations) of the target villages, including the expansion areas.
- **Growth and demand forecast.** Review demographic, land use, socioeconomic profile of the target villages (including demographic trends and expected population growth for 20 years, housing types and densities, population growth patterns and spatial trends) to determine the demand projections for water supply services. Identify key industries and institutions significant to the economic and social development of the villages and locate them on the maps with consideration to special requirements for the provision of water supply services.
- **Performance of the existing schemes/systems.** Conduct an analysis of the existing water supply system with regard to the capacity to meet the required levels of service, performance and condition of the existing network and water sources, including seasonal variation. This includes an inventory of the sources, intakes, flow meters, water treatment, reservoirs, wells, electricity, and distribution networks. The assessment should cover the condition and performance of the existing water supply scheme, including hydraulic characteristics and capacity, structural and physical condition, efficiency of pumping stations, coverage, water quality and key network bottlenecks leading to poor performance. Prepare a GIS map detailing the key elements of the existing system, and solutions adopted for households for water supply and associated services such as sanitation and drainage. The Consultant shall also provide details on the number of connections, difficulties and constraints associated with water supply in each project village.
- **Identification of water sources.** The consultant shall assess the potential water sources for the targeted villages, including surface and groundwater sources and recommend the preferred location(s) and source, based on the technical, financial and environmental feasibility of the proposed source. In doing so, the consultant shall analyze the available groundwater atlases, topography, geology, geotechnical characteristics, hydrology, hydrogeological conditions, climatic features geodetic information necessary to identify potential wellfields for borehole drilling and development of system designs. The source analysis should include quantity

assessment to cover the demand projections and quality of existing and proposed water supply sources. Laboratory tests of **physico-chemical and microbiological parameters and tests for radioactive safety** in accordance with the Law of the Kyrgyz Republic No. 34 of May 30, 2011 “Technical Regulations “On the Safety of Drinking Water.” The consultant shall also assess the potential for optimizing or aggregating the source for neighboring villages, and where needed propose new water sources.

- **Preparation of GIS based water supply schemes database.** Prepare and develop an up-to-date GIS based water supply database for both existing and new networks, that indicates pipe sizes, key objects in the network, pipe length, connections and associated drawings
- **Beneficiary assessment.** The consultant will, in coordination with the baseline consultant, conduct a rapid survey of the proposed villages and expansion areas – to understand existing water management practices; ascertain demand and willingness to pay for water tariff and connections to the proposed water supply network.
- **Options analysis.** The consultant shall develop a framework and a methodology for prioritization of interventions, based on multiple factors (universal access to water supply, climate adaptation and mitigation, affordability, among others – to be discussed and agreed with the local government and the SIDWSSD); and using this framework, identify priority investments in adequate detail, in terms of scope of work and feasibility; estimate the cost of the identified projects; and conduct economic and financial analysis of the identified priority interventions. Recommend the most feasible set of interventions and alternatives to enable universal access in the target villages. The feasibility assessments shall cover technical, environmental and social and economic feasibility. Develop an implementation plan for the investments in the Rayons by stages and provide costs corresponding to each element and stage. The selected technical solution options shall be consulted upon and submitted for review and agreed upon with the Client and key stakeholders.
- **Presentation of the options.** Consolidate the analysis into a feasibility and preliminary design report, including the design options and recommended solutions, environmental and social requirements, implementation risks and proposed mitigation measures.
- **Service delivery model and institutional development plan.** The consultant shall assess the existing operation and management model, including technical, financial and operational efficiency, analyze the service projections and associated operating costs; and propose the required capacity enhancement to enable efficient and sustainable system operation and service management considering the new/upgraded scheme, and the aggregation model at the district level.

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- **Preliminary design.** Based on the results from the options analysis, in accordance with Kyrgyz State Standards, SNiP for water supply systems, Supplement to SNiP (where applicable based on the population size, as well as “Drinking water GOST” and international best practices), the consultant shall:
 - a. Establish a set of design criteria for the water supply scheme design, to ensure universal access in the target villages, climate resilience, financial and operational sustainability of the scheme.
 - b. Calculate water availability and develop a design solution for water intake, treatment, transmission and distribution to meet the demand projections. For groundwater abstraction, the consultant shall collect and analyze the available hydrogeological data, including the profile and performance of the neighboring wells, inspect the technical condition of the existing, prepare the drilling design, profile, requirements and instructions; and assess and obtain the required approvals for the sanitary protection zones.
 - c. Optimize the system design, including clustering settlements with nearby water supply systems of cities and/or into one system which have single water source, where feasible.
 - d. Consider household connections with minimum number of manholes for connecting points to street networks. Prepare options for household water meters with remote reading for the Client’s consideration and approval.
 - e. Develop the hydraulic model including a continuous pressure monitoring system as well as an extended simulation period (24 hours).
 - f. Propose the system materials that would enable the scheme resilience to key climate relate risks affecting the project areas.
 - g. Propose the technological processes and equipment for drinking water treatment, as well as development of technical and economic justification for the selected options.
 - h. Calculate the need for power supply for all project facilities, including back-up options. Analyze and propose to the client energy saving alternatives, and renewable energy solutions such as solar power, to enhance climate change adaptation.
 - i. Prepare a preliminary design report per village or cluster of villages in accordance with the scheme optimization solution, including calculations of structures, electrical, mechanical equipment, and accompanied by drawings, BoQs and cost estimates for the client review and consultation. This should include water intake and production (including treatment and disinfection where necessary), water mains (water conduit) and distribution networks. The location of the proposed house connections should be visualized in drawings and in the form of a presentation;

3.2 Detailed design report and tender documents

After approval of the preliminary design reports by the beneficiaries, the Client in consultation with the Donors, and the local governments, the Consultant shall proceed with the preparation of the detailed designs. The Consultant shall be guided by local construction codes and design standards (SNiP) approved by Gosstroy (the state authorized body regulating construction codes and regulations in Kyrgyzstan), as well as by regulations of the Cabinet of Ministers of the Kyrgyz Republic in the field of construction and other international regulatory documents. The standards determine the content and design of the drawings. The total design period shall not exceed 12 months from the date of contract award.

To perform work on behalf of the Client, the Consultant must:

- Obtain all initial permit documentation in accordance with the norms and rules of urban planning and government decisions for the development of the Detailed Design. For this purpose, the consultant shall obtain the relevant permits (license, KR certificate) or conclude a partnership agreement with a local company that has the relevant documents;
- At its own expense, obtain expert opinions and permits from the state expert review bodies, including environmental and all other government and municipal bodies, for the project design documentation to be developed.

Detailed design. The consultant shall prepare the detailed engineering design for each element of the project, as required. These detailed designs should be based on well-structured and calibrated (for system upgrades) hydraulic models, and include the works packaging options based on the implementation efficiency, cost optimization and a construction market study carried out by the consultant on the current situation in the Kyrgyz Republic water sector with analysis of national and regional contractors' capacity and all other required details to carry out "procurement" and subsequent design execution. All relevant design calculations, route maps, aerial and satellite imagery, schedules, diagrams, and drawings shall be provided to the Client in paper and electronic form as required. The detailed design scope, includes:

- Prepare the architectural and structural design for all the system components, including pipe works, structures and mechanical equipment, and other complementary elements (electricity, appliances, heating/cooling, roads, landscaping, fencing, etc.). Particular attention should be paid to the pipeline materials in case of aggressive soils. water sources/intakes design should to meet drought and flood resilience requirements and take into account climatic conditions and changes, including the impact of winter frosts and seasonal changes in water flow rate/volume at the source, as well as global climate change; water treatment facilities should take into account the quality of the source water (especially for new sources), construction, restoration/expansion of the network and associated facilities;
- Develop standardized solutions for household connections to be installed up to the boundary of the yard. Connection points and schemes for multi-storey

buildings should be defined and included in the design, if they are envisaged in the subproject;

- Develop the design of locally adapted automation systems, remote control, dispatching and SCADA.
- Prepare a detailed design report package containing the general design data, the simulation data, layout and outputs of the hydraulic model in a format accessible for and editable by the Client, drawings (plans, profiles and elements) of the water supply systems and structures including household connections, engineering cost estimate and bill of quantities; and specifications for all designed elements, including equipment and buildings.
- **Drawings.** Prepare the construction drawings covering all the designed elements, sufficiently detailed (including plans, sketches, and cross sections) for bidding purposes and to graphically convey to bidders and construction managers the exact scope of work to be performed or the requirements to be met. All information that can best be shown with reference to the drawings and accompanying benchmarks and dimensions shall be presented in drawings. The design drawings shall be presented in hard (scale 1:500) and electronic (AutoCAD) form, with plotting of all elevation marks, coordinates, location of structures (houses, plots, outbuildings, schools, etc.), which shall be submitted to the Client (Acceptance Certificate). All horizontal profiles shall be presented at a scale of 1:500, vertical profiles - 1:100. A vector-based version of the topographic plan in WGS84 coordinate system shall also be provided.
- **Bill of Quantities.** Prepare a Detailed Bill of Quantities (BoQ) for the design. In agreement with the Client, the BoQ shall be split into the proposed tender packages. The BoQ shall contain sufficient information on the quantities of materials to be procured and works to enable (i) bidders to submit accurate quotations and (ii) the Client and Contractors to make periodic assessments of the quantities of works to be carried out. The BoQ shall include a list of environmental mitigation measures related to temporary impacts during the works;
- **Cost Estimates.**
 - Prepare the overall cost estimates for the works packages. The estimates shall be based on current prices for the goods and works required and are expected to be within 15% accuracy (engineering estimates for construction start-up costs), including contingencies.
 - Prepare the detailed cost estimate (confidential) for items presented in BoQ divided into supplies of materials and construction work and import supply component. Estimated costs shall include those related to the implementation of the environmental and social management plan.
- **Technical Specifications.** The specifications shall describe the work to be carried out and/or the materials to be procured, supplementing the drawings and plans. They shall set out details of the work to be executed, including schedules and requirements for insurance, permits, licenses and other special procedures or requirements. The specifications should cover the both the General Specifications (relating to working

conditions, procedures, access to the site, any special scheduling requirements and other details that would be applicable to the work/contract) and Special Technical Specifications (requirements relating to material standards, manufacturing standards and procedures, details of production/factory tests or other required tests, details of commissioning works, and temporary environmental impacts and related mitigation measures).

- **Approvals.** Obtain the necessary initial approval documents and approvals from the local self-government bodies, as well as all favorable opinions of the technical and environmental state expert review panels, as well as all necessary permits for construction and installation works (district services, local power distribution authority, Road maintenance department, Ministry of Transport, sanitary and epidemiological service, fire department under the Ministry of Emergency Situations, Department for Monitoring of emergency situations, etc.). All costs associated with obtaining expertise and technical reviews and approvals as required by national procedures shall be covered by the Consultant.

Final Submission. The consultant shall prepare 5 (five) hard copies of the DED and one electronic copy in PDF and AutoCAD formats and hand them over to the Client based on a delivery and acceptance certificate.

3.3 Preparation of environmental and social safeguards documents related to the Project

The Consultant shall develop the required environmental and social safeguards instruments as per the World Bank Environmental and Social Framework (ESF), including:

- The environmental and social impact assessment and environmental and social management plan (ESIA / ESMP), covering all the sub-projects, including screening and site-specific plans for each subproject, an assessment of impacts and proposed mitigation through the project development phases, construction and operation.
- The resettlement (or simplified) action plan (RAP), if the sub-project may cause involuntary resettlement; and Gender Action Plan in accordance with the Project's Environmental and Social Framework (ESMF) and resettlement policy framework (RPF) and national regulatory requirements.
- Provide technical, advisory and legal support up to the completion of the procedures for the approval of the environmental and social instruments, including land acquisition, consultations and government approvals; including:
 - Site visits, direct participation in negotiations with state authorities and in public consultations and hearings, as required.
 - Approval and licenses from the State Environmental Expertise for draft ESIA/ESMP, etc.
 - Documentation and drawings required for land acquisition in accordance with national regulations.

3.4 Other important requirements in the design development process

Permits/licenses

The Consultant shall obtain all necessary permits, technical specifications, architectural and urban-planning permission as well as engineering and technical specifications and shall ensure that all documentation is duly registered with State institutions and agencies. In particular, the Consultant **shall obtain** a favorable opinion of the technical and environmental state expert review of the design; if the detailed design does not comply with the environmental and technical requirements of the State Expert Review or other requirements (Fire Safety, Monitoring and Forecasting of Emergencies under the Ministry of Emergency Situations, etc.) that prevent the obtaining of a favorable opinion, the Consultant shall finalize the DED in accordance with the norms and requirements of the legislation of the Kyrgyz Republic until a favorable opinion is received.

Drawings

Technical drawings, diagrams shall include:

- Site Master Plan(s);
- Basic layout drawings;
- Detailed drawings, with longitudinal and transverse profiles.

The drawings shall be shop drawings containing sufficient information to enable the Client to invite Contractors to submit bids for the construction of the Facilities, and to enable the Client to hand them over to the successful Contractor for construction, without further revision of the drawings. If errors in the DED are discovered during construction and installation work, the Consultant shall be required to eliminate such errors and revise the DED at its own expense. The scale of the drawings shall comply with the required norms and standards.

Longitudinal sections shall be prepared for all rehabilitation networks, including household networks (except for connections to multi-storey buildings). Drawings shall be made at a scale of 1:500 for horizontal projections and 1:100 for vertical profiles.

Drawings of pumping stations, if any, shall include all required cross-sections and a description of materials and structures, as well as equipment installation methods.

Drawings shall cover all mechanical and electromechanical equipment, internal systems and valves, as well as electrical components, electrical circuits and wiring diagrams.

External power supply diagrams (transformer substations, transmission lines) shall be developed if required.

Drawings shall be prepared in A3 format, A2, A1 if necessary, and submitted to the Client on memory cards, with 5 (five) hard copies for each individual project. Individual drawings (color general plan, site plan, etc.) shall be submitted in A1 format at the Client's request.

Specifications

The specification shall be customized for each subproject. For polyethylene (PE) pipes, a nominal pressure of 10 bar shall be taken as the minimum required. All technical specifications shall be adapted to the scope of each subproject.

The specifications shall specify the types of work, materials and equipment, supplementing the information provided in the drawings and plans. The specifications shall also set out

the details of the works to be performed, including necessary time schedules and requirements for insurance, permits, licenses and other special procedures or requirements. These "Specifications" shall be included as a separate book in the design. It shall not be permitted to use references to brands, catalog numbers or other information that limits any materials or products to a specific manufacturer. When referring to standard specifications or construction codes, it shall be indicated that other international standards that ensure equivalence are acceptable.

Estimates and Bills of Quantities (BOQs)

BoQs shall be prepared based on the "RIK" Software package adopted by the Gosstroy of the Kyrgyz Republic, as well as according to international standards in unit market prices. The consultant shall take into account all comments and prepare final drawings, diagrams and documents.

Preparation of the "Environmental Protection" section

The consultant shall develop an environmental impact assessment of the proposed activity. The findings of the impact assessment must be presented in the form of the "Environmental Protection" section of the design (detailed design) and a favorable opinion of the State environmental expert review panel shall be obtained.

3.5 Assistance during the tender process

Bidding package. The consultant will provide technical support to PIU in the preparation of the bidding documents in accordance with the World Bank Procurement Regulations for IPF Borrowers, and optimized packaging, including:

- Invitation to bid;
- Standard Procurement Document
- Work requirements and specifications;
- Drawings;
- Bill of quantities;
- Construction Plan and work schedule;

Tender assistance. The consultant shall provide technical assistance to the Client and the Project Implementation Unit in conducting procurement procedures to ensure timely and efficient completion of the procurement processes. The consultant will work closely with the project staff and implementation offices. Assistance shall include:

- a) Assistance to the Client in procedures for preparing necessary clarifications arising during the bidding process.
- b) Assistance to the PIU in preliminary evaluation of the bids received (technical and financial parts).

Conclusion

3.6 Author's supervision

The consultant shall ensure author's supervision in the course of the project implementation in accordance with the work program prepared in agreement with the Client, including:

- Conduct site visits during construction works in accordance with the approved schedule and verify the compliance of the activities with the detailed design.
- Provide support to the PIU in the overall management of the project implementation, as well as supervise all stages of construction of the facilities.
- The Consultant shall ensure proper maintenance of the author's supervision log signed by the Consultant's responsible officer.
- On-site supervision specialists shall visit the construction site at the times specified in the work program agreed with the Client/PIU/, as well as upon request on mutually agreed terms.
- Prepare and submit design supervision reports (*each: 1 electronic copy to the PIU and Ayil Okmotu in Russian and English*). The reports shall include, but not be limited to, information on (technical and physical) deviations from the design and construction deficiencies identified during field supervision and actions taken. These documents will be approved after each mission during the project implementation.
- Attend the regular meetings among the Client, Contractor, Supervising Engineer and the beneficiary. Respond the Contractors queries regarding detail design in a timely manner, and when design alteration is needed and agreed by the Client and beneficiaries, revise design in a timely manner as requested by the client.

IV. REPORTING

Table 1 – Reporting and payment schedule for the development of design documentation

N o.	Payment/Report Title	Terms % of the contract amount	Expected date
1	Inception report	10%	upon expiry of the 2 nd week after the start of work
2	Interim design report (the entire detailed technical design and the most important calculations for the proposed activities, plans and schematic diagrams)	10%	3 months after submission of the I-report, end of the 3 th month from the date of signing the contract. Payment shall be made for each site/facility separately according to the table in Appendix B, upon full completion of the assignment for each stage

3	Interim design report (development of a conceptual design with consolidated cost estimates)	10%	3 months after submission of the II-report, end of the 6 th month from the date of signature. Payment shall be made for each site/facility separately according to the table in Appendix B, upon full completion of the assignment for each stage.
4	Interim design report (the DED development with obtaining all permits, including documents on environmental and social safeguards)	10%	3 months after submission of the III- report, end of the 9 th month after signing of the contract. Payment shall be made for each site/facility separately according to the table in Appendix B, upon full completion of the assignment for each stage.
5	Detailed Design Report (Final detailed design and bidding documents (all detailed documentation and the most important calculations for the proposed activities.	20%	3 months after submission of the IV-report, end of the 12 th month from the date of signing the contract. Payment shall be made for each site/facility separately according to the table in Appendix B, upon full completion of the assignment for each stage
6	Environmental and social documents 1. Environmental Protection Section with a positive conclusion of the State Environmental Expert Review. 2. ESMP according to the WB Social- Environmental requirements. 3.RAP developed in accordance with the WB requirements (if necessary).	15%	Along with detailed design report
7	Tender documents and assistance	15%	A month after the detailed design report.
8	Author supervision	10%	

	* Appendix B shows the % of payment for each village according to the stages of completion of the assignment
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Before submitting any report to the PIU, the Consultant shall thoroughly check the relevant document to ensure the required quality.

The Consultant shall be accountable to the Grand Coordinator and the PIU Engineer. The main point of contact is the PIU Infrastructure Engineer, to whom the Consultant shall submit progress reports. The Consultant will work in close cooperation with the PIU team and Ayil Okmotu.

In general, each report shall be concise and comprehensive, with detailed descriptions in the appendices. Standard WB forms and templates shall be used where appropriate.

As a rule, the draft version shall be prepared in hard copy as specified below and in electronic version (pdf format) on USB, CD-ROM, which will be submitted to the PIU and Ayil Okmotu. Documents shall also be submitted in MS Word and MS Excel (MS Office 2010) format, and drawings - in AutoCAD and PDF formats.

Hard copies of each design report with corresponding drawings shall be submitted as follows:

- a) English language - two sets with one USB/CDROM/
- b) Russian language - three sets with one USB/CDROM/
- c) Preliminary designs: A3
- d) Detailed design: A3 and A2
- e) Reports, BoQs and technical specifications, etc.: A4 and A3

Drawings shall be submitted in hard copy as follows:

- Site plans: scaled from 1:1000 to 1:2500;
- Shop drawings: scaled from 1:100 to 1:500;
- Sections and elements (structures): scaled from 1:50 to 1:100;
- Pipeline sections: Longitudinal section shall be drawn at a scale of 1:1000 horizontally and 1:100 vertically;
- Construction plans at a scale of 1:1000;
- Cross-section shall be drawn at a scale of 1:200 horizontally and 1:100 vertically;
- The WB procedures and the legislation of the Kyrgyz Republic shall be observed for documents related to environmental and social safeguards. An overview / executive summary is required for each environmental and social safeguards report.

All reports must be submitted in Russian and English in hard copy, as well as in electronic format. The number of copies is given below.

Requested reports

The reports listed below shall be submitted in accordance with the requirements of these Terms of Reference.

The Client shall provide comments on all reports within two weeks (10 working days) after their submission. In case a report needs to be revised (clarified) in accordance with the Client's comments, irrespective of the date of submission of comments. The Consultant shall collect all comments from various stakeholders (SIDWSWD, PIU, AO) during this period to avoid delays in follow-up activities. The Consultant may continue to provide the relevant services beyond this period based on the comments received during the approval period.

The final version of the report must be submitted four (4) weeks after receipt of comments.

The following reports must be submitted in Russian and English:

Initial report 3 (three) copies in Russian and English (for PIU, SIDWSWD, Ayil Okmotu)

The consultant shall prepare and submit to the Client a work performance methodology and a time schedule for all stages under the contract. The deadline for submission shall be two weeks from the signing of the contract.

Interim Report

Before starting the work on developing the detailed design, the Consultant shall prepare a technical report based on the following principles:

The Consultant shall use proven design technologies and established design and construction methods. The Consultant shall recommend any alternative options that can ensure the best technical and economic solutions.

The purpose of the interim report is to analyze and propose to the Client the most effective and appropriate technical solutions to achieve the contract objectives.

In the report, the Consultant shall provide a description of the revised/adapted methodology and, if necessary, a revised work schedule. In addition, it shall contain facts and conclusions, as well as initial results of its activities.

The interim report shall contain the findings of the review and assessment of the initial report.

The report shall describe the order and basis of the design work. This shall include the final determination of the project's key input and output parameters with particular regard to cost-effectiveness. An assessment of the findings of the existing feasibility study shall be presented for further discussion with the Client, the PIU and the WB as appropriate.

In addition, this report shall outline a proposal including the methodology and schedule for the environmental and social (E&S) studies listed above.

This report will serve as the basis for making the final decision on the determination of the applicable technology and technical specifications for each subproject prior to the commencement detailed design activities.

The interim report is therefore intended to provide the Client with confidence that the assignment will be completed in accordance with the plan and contract. The report aims to

draw the Client's attention to key issues that may affect the direction and progress of the work. The interim report sets out the implementation strategy and work plan, as well as the project management.

A draft report shall be submitted 5 months after the commencement of work.

Interim design reports - 3 (three) copies in Russian and English (*for PIU, SIDWSWD, Ayil Okmotu*). Interim design reports must contain the detailed engineering design as well as the most important calculations for the proposed activities, plans and schematic diagrams necessary for the implementation of the project in two project areas (Chui and Issyk-Kul regions).

Final design report and bidding documents - 3 (three) copies in Russian and English (*for PIU, SIDWSWD, Ayil Okmotu*). Final design reports must contain all detailed engineering design and the most important calculations for the proposed activities. Plans and schematic diagrams must be provided if they are necessary for the implementation of the project in two project areas (Chui and Issyk-Kul regions).

The final design report shall include an overview / summary of all works performed and shall be submitted within 18 months after the commencement of works. Bidding documents shall be prepared in accordance with the requirements of the World Bank, including a properly completed standard procurement document, work requirements, bill of quantities (with and without cost estimate [for the Client only]) and drawings.

Documents on environmental and social safeguards - 3 (three) copies in Russian and English (*for the PIU, SIDWSWD, Ayil Okmotu*). The EIA, ESMP, Gender Action Plans (GAP) and RAP must be prepared in accordance with the Terms of Reference included in the ESMF.

These documents will be developed in parallel with the detailed engineering design.

The reports shall include, but not be limited to, information on (technical and cost) deviations from the design and construction deficiencies identified during author's supervision and actions taken. These documents will be approved after each mission during the project implementation in the two project areas. The distribution of payment for the development of design and estimate documentation will be carried out in accordance with the above table and Appendix "B".

Reports on the implementation of author's supervision - 3 (three) copies in Russian and English (*for the PIU, SIDWSWD, Ayil Okmotu*). The table below outlines the reports that must be submitted by Consultants, the deadlines for their submission and the number of submitted electronic and hard copies in Russian and English. The final report must be submitted in Russian and English.

Table 2 Payment schedule for performing author's supervision

No.	Reports	Submission schedule	Number
1	Monthly progress report	Monthly	3 copies

2	Author's supervision report on completion of construction	Upon completion of construction	3 copies
3	Ad hoc report	on an as-needed basis	3 copies
	<i>* Reports must be properly prepared using drawings, sketches, tables, photo reports and diagrams that will help to understand and comprehend their contents</i>		
	<i>** Author's supervision will be performed after signing the contract for construction and installation works.</i>		

Reporting and submission schedule

The Consultant shall prepare and submit to the Client several reports, documents and files covering all work performed by him/her under the Contract. All submitted documents shall include relevant data, maps, drawings, diagrams and other documents as appropriate. They shall be submitted in the required number of copies to the Client in accordance with the Work plan submission schedule. The form, detailed contents, type of cover page and binding of the reports shall be determined by mutual agreement between the Client and the Consultant. The Client may instruct the Consultant to send copies of any reports to various foreign or local addresses. The type and content of the reports to be submitted shall be subject to periodic review as the work progresses. The reports shall be, among other things, of the following types:

Monthly Progress Reports: The report shall list all activities for the reporting period; summary of overall progress and percentage of work completed; analysis of changes in schedule and budgets for individual activities; information on personnel and staff, equipment and materials deliveries, significant achievements and milestones, meetings, expenses, planned activities and anticipated difficulties. The report shall also contain information on the inspection of works and materials with copies of test results and shall indicate the actions taken in case of unsatisfactory results. The report shall provide a detailed analysis of the work to be performed during the following month and a summary of the work to be performed during the next three months. Monthly reports shall be submitted to the Client in 2 copies by the 7th of the following month. During the month, the Consultant shall ensure that a weekly summary of the progress of the project and construction works is prepared on a weekly basis. The information shall include the overall progress and percentage of work completed. Weekly information must be submitted to the Client and the PIU specialists in one copy by the end of the current working week.

The consultant shall submit a monthly progress report indicating the number of man-months spent for each specialist involved. Payment shall be made in accordance with the invoices issued.

Author's supervision report on completion of construction: This report shall be prepared during the defect rectification period (defect period). The report shall summarize key information contained in the previous progress reports so as to provide a clear picture

of the main activities and challenges encountered during construction, as well as the solution of the main problems encountered. In addition, the report shall include contract payment schedules; a statement of the final cost of the design with relevant details, preferably in the form of asset groups suitable for the accounting system, compared with the original estimate, with amounts in local and foreign currencies; a description of the equipment installed; information on human resources employed over time; test and commissioning reports; and a list of remaining defects at the beginning of the defect rectification period (defect period).

Ad hoc reports. Ad hoc reports that are not provided for in the Work Plan, but which may be required to respond to unforeseen circumstances that may arise during the implementation of the Services and which may require immediate intervention by the Client or third parties with respect to important technical findings or future design. Consultants shall prepare such reports on their own initiative or at the request of the Client. Such reports shall be considered as part of, and shall be included in, subsequent quarterly or other reports.

Contract procedure.

The Contract for the author supervision of physical works concluded between the Client and the Consultant shall be a “Time-Based Contract”. Payments under the Time-Based Consulting Contract shall be made monthly based on actual costs and the submitted report in accordance with the reporting requirements specified in this ToR.

V. STAFFING PLAN

Proposed staff

The Consultant shall provide a sufficient number of qualified and experienced personnel to ensure the proper performance of the tasks.

The Consultant's staff shall consist of key personnel and may include non-key (support) personnel. The services shall be provided by a team consisting of key personnel and other professional and administrative support staff as deems necessary by the Consultant. The Consultant shall provide a sufficient number of support staff to complete the assignment at its own expense. Effective management and support services shall be provided.

Table 3 Proposed team composition and their time contribution to the development of design and estimate documentation (DED)

No.	List of key specialists	Duration (man-months)		
		Field	Office	Total
1	Team Leader / Engineer	3		
			2	5
2	Water Supply System Design Engineer	3		
			2	5

3	Civil Engineer / Designer	2		
			2	4
4	Senior Water Supply System Design Engineer	6		
			9	15
5	Hydrogeological Engineer	6		
			9	15
6	Environmental Specialist	7		
			8	15
7	Social development specialist	9		
			6	15
	Subtotal A	36	38	74
	List of non-key specialists			
8	Water Supply System Design Engineer		11	15
		4		
9	Water Supply System Design Engineer		11	15
		4		
10	Civil Engineer / Designer		10	15
		5		
11	Civil Engineer / Designer		10	15
		5		
12	Topographer/ Land Surveyor		5	15
		10		
13	Topographer/ Land Surveyor		5	15
		10		
14	Hydrogeological Engineer		5	13
		8		
15	Geological engineer		5	8
		3		
16	Electrical Engineer/ Mechanical Engineer for electrical equipment		6	11
		5		
17	Quantity Surveyor		15	15
	Subtotal B	54	83	137
	Total A + B	90	121	211

Table 5 Proposed reimbursable costs for the development of DED

No.	Description	Quantity	Note
1	Per diem (international experts)	176	
2	Accommodation rent (for non-residents)	8	
3	Per diem (local experts)	1188	

4	Hotel (local experts)	1188	
5	International air travel (international experts)	8	City-Bishkek-City
7	Geotechnical surveys and tests, hydrological and other surveys	44	Sites/villages
8	Topographic survey	44	Sites/villages
9	Procurement of a car for travel / transportation costs	30000	Upon completion of the contract shall be handed over to the Client
12	Office rent	15	months
13	Office supplies, equipment, materials, etc.	15	months
14	Mobile communication	15	months
15	Hiring a translator	15	months
16	Costs for state expert review and obtaining architectural and urban-planning permission	44	on a paid-on-delivery basis
17	Preparation and replication of reports (44 villages x 5 reports)	220	

Table 6 Proposed team composition and their time contribution during the author's supervision

№	List of key specialists	Duration (man-months)		
		Field	Field	Field
	Team leaders			
1	Team Leader / Engineer	4,5		
			4,5	9
2	Water Supply System Design Engineer	4,5		
			4,5	9
3	Civil Engineer / Designer	4,5		
			4,5	9
	Subtotal A	13,5	13,5	27
	List of non-key specialists			
4	Senior Water Supply Design Engineer	4,5		
			4,5	9
5	Water Supply System Design Engineer	4,5		
			4,5	9
6	Water Supply System Design Engineer	4,5		
			4,5	9

7	Topographer/ Land Surveyor	0,9		
			0,9	1,8
8	Hydrogeological Engineer	0,9		
			0,9	1,8
9	Electrical Engineer/ Mechanical Engineer for electrical equipment	0,6		
			0,6	1,2
10	Environmental, Occupational Health and Safety Specialist	0,9		
			0,9	1,8
	Subtotal B	16,8	16,8	33,6
	Total A + B	30,3	30,3	60,6

Table 7 Proposed reimbursable costs for author's supervision

No.	Description	Quantity	Note
1	Per diem (international experts)	324	on a paid-on-delivery basis
2	Accommodation rent + per diem (for non-residents)	324	on a paid-on-delivery basis
3	Per diem (local experts)	403,2	on a paid-on-delivery basis
4	Hotel (local experts)	403,2	on a paid-on-delivery basis
5	International air travel (international experts)	18	on a paid-on-delivery basis
6	Domestic air travel (local experts)	18	on a paid-on-delivery basis
10	Office rent	27	on a paid-on-delivery basis
11	Office supplies, equipment, materials, etc.	27	on a paid-on-delivery basis
12	Mobile communication	27	on a paid-on-delivery basis
13	Hiring a translator	27	on a paid-on-delivery basis

VI. REQUIREMENTS FOR THE CONSULTANT'S COMPETENCE

The consultant or its sub-consultants must have a license for design activities issued by the State Agency for Architecture, Construction and Housing and Communal Services of the Kyrgyz Republic. However, the absence of a license will not be a reason for rejecting the proposals. If the successful Consultant does not have such a license, the Consultant will be given a 30-day period to obtain such a license.

The consulting company must meet the following minimum requirements to be shortlisted:

1. Overall experience in the design and supervision of water supply investments as a leading consulting company for the past ten (10) years;
2. Specific experience in implementing at least one water supply system design contract covering a population of at least 70,000 residents in the last ten (10) years;
3. with a consulting contract of at least US\$1.0 million for each contract for the past five (5) years;
4. Experience in successful design of water supply systems, including at least one similar contract with a total construction cost of at least \$20 million in the last 5 years.

Consultant's material and technical support

The Consultant's head office shall provide continuous support to the team operating in the Kyrgyz Republic. The consultant shall organize an adequately equipped office in Bishkek, Kyrgyz Republic.

The Consultant shall procure the necessary office supplies, including fax, computers, software, printers, scanners, copiers and other communication equipment required for its activities, as well as equipment. The Consultant shall be responsible for the maintenance of equipment, premises and communications.

The Consultant shall bear all expenses of its employees, including all travel expenses, compensation, insurance, emergency medical care, accommodation and communications, translation of documents and reports, preparation of drawings and all other expenses necessary for the proper functioning of the Consultant's team.

All furniture, technical and office equipment, cars, software procured by the Consultant under these Terms of Reference shall be handed over to the Client upon completion of the services.

Appendix “A” - List of settlements in Issyk-Kul and Chui oblasts (Sokuluk, Panfilov and Aksu districts)

District No.	District	Village No.	Village	Population size as of 2024
Chui oblast			29	147 703
1	Sokuluk	1	Aral Blizhniy	1 251
	Sokuluk	2	Asylbash	4 318
	Sokuluk	3	Kirovskoe	1 820
	Sokuluk	4	Pervoe maya	1 494
	Sokuluk	5	Sokuluk	31 343
	Sokuluk	6	Ak-Zhol	3 073
	Sokuluk	7	Tort-Kol	1 092
	Sokuluk	8	Tosh-Bulak	2 124
	Sokuluk	9	Pervomaiskoe	2 057
	Sokuluk	10	Voenno-Antonovka	40 000
	Sokuluk	11	Chat-Kol	3 550
	Sokuluk	12	Frunze	4 318
	Sokuluk	13	Ozernoe	1 040
	Sokuluk	14	Studencheskoe	2 814
	Sokuluk	15	Kamyshanovka	3 159
	Sokuluk	16	Nizhnechuiscoe	2 796
	Sokuluk	17	Sadovoe	1 599
	Sokuluk	18	Severnoe	1 189
	Sokuluk	19	Zhany Pakhta	4 279
	Sokuluk	20	Mirnyi	1 454
	Sokuluk	21	Zhal	2 624
	Sokuluk	22	Manas	4 891
	Sokuluk	23	Niznevostochnoe	1 326
2	Panfilov	24	The town of Kaiyndy	9 755
	Panfilov	25	Oktyabrskiy	1 179
	Panfilov	26	Kirova	1 250
	Panfilov	27	Telman	1 900
	Panfilov	28	Bukhara	1 368
	Panfilov	29	Chaldybar	8 640
Issyk-Kul region			15	36 937
3	Aksu	30	Jol-Kolot	2 889
	Aksu	31	Teploklyuchenka	14 277
	Aksu	32	Jany-Aryk	2 688
	Aksu	33	Shapak	1 005
	Aksu	34	Jyldyz	1 077
	Aksu	35	Otuz-Uul	1 435
	Aksu	36	Tepke	1 017
	Aksu	37	Kurбу	1 033

	Aksu	38	Ichke-Jergez	2 078
	Aksu	39	Sary-Kamysh	2 014
	Aksu	40	Kayirma-Aryk	1 703
	Aksu	41	Karakol	1 885
	Aksu	42	Orlinoe	1 200
	Aksu	43	Ak-Chii	1 570
	Aksu	44	Sovetskoe	1 066
Total		44	44	184 640

Appendix "B" - Payment schedule for each village

№	District/Village	%	% of payment for each village					VI- Stage	VII- Stage	VIII- Stage
			I- Stage	II- Stage	III- Stage	IV- Stage	V- Stage			
		100 %	10%	15%	20%	25%	30%			
	Sokuluk									
1	Aral Blizhniy	0,29	0,029	0,029	0,029	0,029	0,059	0,044	0,044	0,029
2	Asylbash	1,01	0,101	0,101	0,101	0,101	0,203	0,152	0,152	0,101
3	Kirovskoe	0,43	0,043	0,043	0,043	0,043	0,085	0,064	0,064	0,043
4	Pervoe maya	0,35	0,035	0,035	0,035	0,035	0,070	0,053	0,053	0,035
5	Sokuluk	7,35	0,735	0,735	0,735	0,735	1,471	1,103	1,103	0,735
6	Ak-Zhol	0,72	0,072	0,072	0,072	0,072	0,144	0,108	0,108	0,072
7	Tort-Kol	0,26	0,026	0,026	0,026	0,026	0,051	0,038	0,038	0,026
8	Tosh-Bulak	0,50	0,050	0,050	0,050	0,050	0,100	0,075	0,075	0,050
9	Pervomaiskoe	0,48	0,048	0,048	0,048	0,048	0,097	0,072	0,072	0,048
10	Voenno-Antonovka	9,39	0,939	0,939	0,939	0,939	1,877	1,408	1,408	0,939
11	Chat-Kol	0,83	0,083	0,083	0,083	0,083	0,167	0,125	0,125	0,083
12	Frunze	1,01	0,101	0,101	0,101	0,101	0,203	0,152	0,152	0,101
13	Ozernoe	0,24	0,024	0,024	0,024	0,024	0,049	0,037	0,037	0,024
14	Studencheskoe	0,66	0,066	0,066	0,066	0,066	0,132	0,099	0,099	0,066
15	Kamyshanovka	0,74	0,074	0,074	0,074	0,074	0,148	0,111	0,111	0,074
16	Nizhnechuiscoe	0,66	0,066	0,066	0,066	0,066	0,131	0,098	0,098	0,066
17	Sadovoe	0,38	0,038	0,038	0,038	0,038	0,075	0,056	0,056	0,038

1 8	Severnoe	0,28	0,028	0,028	0,028	0,028	0,056	0,042	0,042	0,028
1 9	Zhany Pakhta	1,00	0,100	0,100	0,100	0,100	0,201	0,151	0,151	0,100
2 0	Mirnyi	0,34	0,034	0,034	0,034	0,034	0,068	0,051	0,051	0,034
2 1	Zhal	0,62	0,062	0,062	0,062	0,062	0,123	0,092	0,092	0,062
2 2	Manas	1,15	0,115	0,115	0,115	0,115	0,230	0,172	0,172	0,115
2 3	Niznevostochno e	0,31	0,031	0,031	0,031	0,031	0,062	0,047	0,047	0,031
	Panfilov									
2 4	The town of Kaiyndy	2,29	0,229	0,229	0,229	0,229	0,458	0,343	0,343	0,229
2 5	Oktyabrskiy	0,28	0,028	0,028	0,028	0,028	0,055	0,041	0,041	0,028
2 6	Kirova	0,29	0,029	0,029	0,029	0,029	0,059	0,044	0,044	0,029
2 7	Telman	0,45	0,045	0,045	0,045	0,045	0,089	0,067	0,067	0,045
2 8	Bukhara	0,32	0,032	0,032	0,032	0,032	0,064	0,048	0,048	0,032
2 9	Chaldybar	2,03	0,203	0,203	0,203	0,203	0,405	0,304	0,304	0,203
	6	16,9	1,7	2,5	3,4	4,2	5,1			
	Ak-Suu									
3 0	Jol-Kolot	0,68	0,068	0,068	0,068	0,068	0,136	0,102	0,102	0,068
3 1	Teploklyuchenk a	3,35	0,335	0,335	0,335	0,335	0,670	0,503	0,503	0,335
3 2	Jany-Aryk	0,63	0,063	0,063	0,063	0,063	0,126	0,095	0,095	0,063
3 3	Shapak	0,24	0,024	0,024	0,024	0,024	0,047	0,035	0,035	0,024
3 4	Jyldyz	0,25	0,025	0,025	0,025	0,025	0,051	0,038	0,038	0,025
3 5	Otuz-Uul	0,34	0,034	0,034	0,034	0,034	0,067	0,051	0,051	0,034
3 6	Tepke	0,24	0,024	0,024	0,024	0,024	0,048	0,036	0,036	0,024
3 7	Kurbu	0,24	0,024	0,024	0,024	0,024	0,048	0,036	0,036	0,024
3 8	Ichke-Jergez	0,49	0,049	0,049	0,049	0,049	0,098	0,073	0,073	0,049
3 9	Sary-Kamysh	0,47	0,047	0,047	0,047	0,047	0,095	0,071	0,071	0,047

4 0	Kayirma-Aryk	0,40	0,040	0,040	0,040	0,040	0,080	0,060	0,060	0,040
4 1	Karakol	0,44	0,044	0,044	0,044	0,044	0,088	0,066	0,066	0,044
4 2	Orlinoe	0,28	0,028	0,028	0,028	0,028	0,056	0,042	0,042	0,028
4 3	Ak-Chii	0,37	0,037	0,037	0,037	0,037	0,074	0,055	0,055	0,037
4 4	Sovetskoe	0,25	0,025	0,025	0,025	0,025	0,050	0,038	0,038	0,025
	44	51,9 9	5,20	5,20	5,20	5,20	10,40	7,80	7,80	5,20

Appendix “C” - Requirements for the Consultant's personnel

KEY SPECIALISTS:

K-1. Team Leader / Water Supply Specialist/

Qualifications and skills

The Project Manager must have international experience and a Master's degree in civil/hyrotechnical engineering or related field. S/he should be fluent in English and have good team management skills.

Overall work experience

At least 10 years of experience in planning, design, construction, operation and maintenance of water supply systems in large projects, of which at least 10 years of experience as a Project Manager or Team Leader in international projects.

Specific work experience

At least 5 years of experience in planning and management of studies, detailed design and construction in the field of drinking water supply and sanitation (hydraulic calculations for the design of water intakes and water supply networks, sewerage systems, wastewater disposal systems, pumping stations, treatment facilities) involving IFIs and / or at least three similar completed projects involving IFIs with an investment value of at least \$ 40 million for the past 10 years. Experience of working in the CIS countries, such as the Kyrgyz Republic, will be an advantage.

K-2. Water Supply System Design Engineer

Qualifications and skills

The Water Supply System Design Engineer must have international work experience and a university degree (Master's degree) in environmental/engineering or civil engineering with specialization in the water supply and sanitation sector; s/he should be fluent in English. Knowledge of Kyrgyz and/or Russian will be an advantage.

Overall work experience

At least 10 years of professional experience in designing water supply systems, water intakes, reservoirs, pumping stations and drinking water treatment facilities.

Specific work experience

At least 5 years of professional experience in designing water supply systems in large water supply projects and/or 3 completed large projects within the last 5 years. Experience of working in the CIS countries will be an advantage.

K-3. Civil engineer/designer

Qualifications and skills

S/he must have international work experience and at least a Bachelor's degree in civil engineering or related field.

Overall work experience

At least 10 years of experience in planning, design, construction, operation and maintenance of wastewater and water supply systems in large water intake projects.

Specific work experience

At least 5 years of experience in planning, detailed design and construction of water supply and wastewater projects involving IFIs and/or at least three similar completed projects involving IFIs for the past 7 years. Experience of working in the (Commonwealth of Independent States) CIS countries is preferred.

K-4. Senior Water Supply System Design Engineer

Qualifications and skills

The Water Supply System Design Specialist must have a university degree (Master's degree) in environmental/engineering or civil engineering with specialization in the water supply and sanitation sector. Knowledge of Kyrgyz and/or Russian languages is mandatory.

Overall work experience

At least 10 years of professional experience in designing water supply systems, water intakes, reservoirs, pumping stations and drinking water treatment facilities.

Specific work experience

At least 5 years of professional experience in designing water supply systems in large water supply projects and/or 3 completed large projects within the last 5 years.

K-5. Hydrogeological Engineer

Qualifications and skills

A hydrogeological engineer must have a university degree (in science or engineering) in the field of engineering and surveying. S/he must have knowledge of international best practice in the field of surveying.

Overall work experience

At least 5 years of professional experience in engineering and surveying, hydrological assessments and design of water supply systems.

Specific experience in determining the location and design of wells / water intake structures for water supply or irrigation system.

Knowledge of local context/conditions and experience of working in the CIS countries is preferred.

Fluency in Russian is mandatory.

K-6. Environmental, Occupational Health and Safety Specialist

Qualifications and skills

The Environmental Specialist must have a university degree (Master's degree) in environmental protection, sanitation or related field. S/he must have knowledge of international best practices in the field of environmental protection.

Overall work experience

At least 5 years of experience in conducting social assessments for the development of large-scale sanitation and water supply projects involving IFIs and/or at least 3 completed projects within the last 7 years. The candidate should have full knowledge of international best practices, including land acquisition, compensation, etc., as well as IFI standards, guidelines, procedures and policies/directives (knowledge of WB, ADB standards will be considered an advantage). Experience of working in Central Asia and/or CIS will be an advantage.

K-7. Social Specialist

Qualifications and Skills

A Social Specialist shall have a university degree (Master's Degree) in Sociology or similar subjects. Shall have knowledge of international best practices in the field of sociology.

General Experience

Minimum 5 years of experience in conducting social assessments for the design of large-scale sanitation and water systems projects with IFIs and/or a minimum of 3 completed projects within the last 7 years. The candidate shall have full knowledge of international

best practices, including issues of social research methods, etc., as well as IFI standards, guidelines, procedures and policies/directives (knowledge of WB, ADB standards will be considered as an advantage). Experience of working in Central Asia and/or CIS will be an advantage.

NON-KEY SPECIALISTS:

K-8. Water supply system design engineer

Qualifications and skills

The Water Supply System Design Specialist must have a university degree (Master's degree) in environmental/engineering or civil engineering with specialization in the water supply and sanitation sector. Knowledge of Kyrgyz and/or Russian languages is mandatory.

Overall work experience

At least 5 years of professional experience in designing water supply systems, water intakes, reservoirs, pumping stations and drinking water treatment facilities.

Specific work experience

At least 5 years of professional experience in designing water supply systems in large water supply projects and/or 2 completed large projects within the last 5 years.

K-9. Civil Engineer/Designer

Qualifications and skills

S/he must have at least a Bachelor's degree in civil engineering or related field.

Overall work experience

At least 5 years of experience in planning, design, construction, operation and maintenance of wastewater and water supply systems in large water supply projects.

Specific work experience

At least 5 years of experience in planning, detailed design and construction of water supply and wastewater projects in large water supply projects and/or 2 completed large projects within the last 5 years.

K-10. Land Surveyor/ Topographer

Qualifications and skills

The Land Surveyor/Topographer must have a university degree (in science or engineering) in the field of engineering and surveying. S/he must have knowledge of international best practice in the field of surveying.

Overall work experience

At least 5 years of professional experience in engineering and surveying.

Specific experience in managing survey teams and in conducting topographic surveys and mapping for water supply systems is preferred.

Knowledge of local context/conditions and experience of working in the CIS countries is preferred.

Fluency in Russian is mandatory.

K-11. Hydrogeological Engineer

Qualifications and skills

A hydrogeological engineer must have a university degree (in science or engineering) in the field of engineering and surveying. S/he must have knowledge of international best practice in the field of surveying.

Overall work experience

At least 5 years of professional experience in engineering and surveying, hydrological assessments and design of water supply systems.

Specific experience in determining the location and design of wells / water intake structures for water supply or irrigation system.

Knowledge of local context/conditions and experience of working in the CIS countries is preferred.

Fluency in Russian is mandatory.

K-12. Electrical Engineer/ Mechanical Engineer

Qualifications and skills

An electrical/mechanical engineer must have a university degree (in science or engineering) in the field of electrical systems design or mechanical engineering.

Overall work experience

At least 5 years of professional experience in the design of electrical and mechanical structures (including pumping stations, piping assemblies, automation and communication control equipment, etc.)

Specific experience in the design of electrical and mechanical structures for at least two similar rural water supply systems.

Knowledge of local context/conditions and experience of working in the CIS countries is preferred.

Fluency in Russian is mandatory.

K-13. Geological Engineer

Qualifications and skills

A Geological Engineer must have a university degree (in science or engineering) in the field of engineering and surveying. S/he must have knowledge of best practices in the field of surveying.

Overall work experience

At least 5 years of professional experience in engineering and surveying, geological assessments, laboratory and field studies.

Specific experience in determining and classifying soils and design loads of water supply or irrigation systems.

Knowledge of local context/conditions and experience of working in the CIS countries is preferred.

Fluency in Russian is mandatory.

K-14. Quantity Surveyor

Qualifications and skills

The specialist must have a university degree (in science or engineering) in the field of construction, architecture and engineering. S/he must have knowledge of estimating software.

Overall work experience

At least 5 years of professional experience in preparing estimates, pricing and calculating the cost of works.

Fluency in Russian is mandatory.

Appendix "D" - Responsibilities of the Consultant's personnel

KEY SPECIALISTS:**K-1. Team Leader / Water Supply Specialist****General duties and responsibilities:**

S/he shall work in direct coordination with the Client/PIU and will perform the key tasks, including but not limited to the following:

- i) Providing necessary support to the Client/PIU within the project, ensuring relationships with the WB, relevant stakeholders, government agencies;
- ii) Providing general guidance on all aspects of the Client/PIU activities related to the preparation and implementation of projects, training on operation and maintenance of relevant facilities, monitoring and evaluation of project implementation, land management, social issues, as well as development of relevant staff capacity within the project;
- iii) Providing technical guidance (guiding actions) to the team of consultants preparing detailed designs and bidding documents; ensuring timely preparation of designs, technical specifications, bills of quantities and other relevant documentation included in the bidding documents for the procurement of civil works;
- iv) Ensuring compliance of all design documents with national and, where applicable, international standards;
- v) Reviewing procurement plans prepared by Procurement Specialists;
- vi) Providing guidance and supervision to the team of consultants responsible for the development of detailed technical specifications;
- vii) Providing assistance to the Client/PIU and the Procurement Review Team in evaluating bidding documents and awarding contracts to contractors and suppliers.

K-2. Water Supply System Design Engineer**General duties and responsibilities:**

The Water Supply System Design Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system, including water storage facilities, pumping stations.

In particular, the Water Supply System Design Engineer shall:

- i) Develop survey requirements for the water supply system, including water sources, pumping stations and distribution networks;
- ii) Provide overall direction, management, supervision and coordination of all survey and design work;
- iii) Participate in the preparation of surveys and participate in (be responsible for) the design work;
- iv) Coordinate, participate and supervise all surveys, studies and researches of existing and proposed water supply systems;
- v) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with agreed standards and regulations, including environmental standards;
- vi) Review detailed design calculations, drawings, progress reports and cost estimates prepared by national experts and ensure their compliance with standards and regulations. Obtain budget prices for process equipment supplied from abroad for process equipment;

- vii) Prepare preliminary design report for water supply system for submission to the Client for review and approval;
- viii) Prepare detailed design for water supply system in accordance with applicable standards and regulations including environmental standards;
- ix) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;
- x) Coordinate the work of the Auto-CAD drawing team in preparing of preliminary and detailed designs;
- xi) Coordinate the work of international and national procurement specialists in preparing bidding documents required for the tender including drawings, specifications and bills of quantities;
- xii) Ensure quality control of preliminary design, detailed design, cost estimates and bidding documents including bills of quantities and specifications.

K-3. Civil Engineer/Designer

General duties and responsibilities:

S/he shall work closely with national and international specialists and other specialists in the engineering sector and shall carry out the following main activities:

- i) Carrying out structural calculations of all other civilians involved in the rehabilitation and construction of water supply systems; developing methodologies and providing competent advice to engineers on the optimization of trench profiles for laying pipes;
- ii) Carrying out preliminary structural calculations and guide drawings for pumping stations and other infrastructures;
- iii) Reviewing construction and production drawings prepared by the design consultant and contractors and providing competent advice to ensure compliance of all detailed designs and construction works with national norms and construction codes;
- iv) Providing support and necessary resources in optimizing individual designs and preparing technical specifications for the procurement of civil works for the construction of water pipelines and other associated civil infrastructure;
- v) Providing technical support and advice as required during the evaluation of bidding documents;
- vi) Providing assistance to the Client during commissioning of pumping stations and water intakes, as well as during the warranty period;
- vii) Providing initial data required for the preparation of design deliverables/reports.

K-4. Senior Water Supply System Design Engineer

General duties and responsibilities:

The Senior Water Supply Design Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system including water storage facilities, pumping stations.

In particular, the Water Supply Design Engineer shall:

- i) Develop survey requirements for the water supply system including water sources, pumping stations and distribution networks;
- ii) Provide overall management, supervision and coordination of all survey and design work on site;
- iii) Participate in the preparation of surveys and participate in (be responsible for) the design work;
- iv) Coordinate, participate and supervise all surveys, studies and researches of existing and proposed water supply systems;

- v) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with agreed standards and regulations, including environmental standards;
- vi) Review detailed design calculations, drawings, progress reports and cost estimates prepared by national experts and ensure their compliance with standards and regulations. Obtain budget prices for process equipment supplied from abroad for process equipment;
- vii) Prepare preliminary design report for water supply system for submission to the Client for review and approval;
- viii) Prepare detailed design for water supply system in accordance with applicable standards and regulations, including environmental standards;
- ix) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;
- x) Coordinate the work of the Auto-CAD drawing team in preparing of preliminary and detailed designs;
- xi) Coordinate the work of international and national procurement specialists in preparing bidding documents required for the tender, including drawings, specifications and bills of quantities;
- xii) Ensure quality control of preliminary design, detailed design, cost estimates and bidding documents including bills of quantities and specifications.

K-5. Hydrogeological Engineer

General duties and responsibilities:

The Hydrogeological Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system, including facilities for wells and pumping equipment.

In particular, the Hydrogeological Engineer shall:

- i) Develop survey requirements for the water supply system including water sources, pumping facilities;
- ii) Participate in the preparation of the surveys and participate in (be responsible for) the design work;
- iii) Coordinate, participate and supervise all surveys, studies and researches of existing and proposed design solution for water sources;
- iv) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with the agreed standard and regulations, including environmental standards;
- v) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;

K-6. Environmental, Occupational Health and Safety Specialist

General duties and responsibilities:

- i) Ensure compliance with the project EHS (environment, health and safety) requirements at the site, propose corrective actions in case of non-compliance and monitor their implementation;
- ii) Ensure awareness of project stakeholders and local community members and their participation in project discussions, including discussion of EHS mitigation measures associated with priority investments;

- iii) Prepare environmental training materials (assessment, monitoring and implementation tools) and conduct training for relevant government agencies, contractors and design institutes;
- iv) Assist in the development of occupational health and safety guidelines for the protection of local communities and project personnel;
- v) Monitoring compliance with the EHS Management System (SEMS), the Environmental and Social Management System (ESMS) during the implementation of the Project, if necessary, organization of environmental monitoring of air, water and soil conditions, including the use of analytical and laboratory methods, sampling, assistance in conducting laboratory tests and analysis of the results obtained with the preparation of relevant acts and reports on the observations carried out.

K-7. Social Specialist

General duties and responsibilities:

- i) Conduct socio-economic surveys of the population in the project coverage area;
- ii) Organize and conduct public hearings and consultations during the project preparation stages;
- iii) Monitoring social risks during the design stages.
- iv) Assisting in the development of health and safety guidelines to protect local communities and project staff.
- v) Ensuring that social requirements of donors (World Bank, ADB, etc.) are met.
- vi) Monitoring compliance with the Safety and Environmental Management Systems (SEMS), Environmental and Social Management System (ESMS) during implementation. Analysis of collected data and preparation of analytical reports.

NON-KEY SPECIALISTS:

K-8. Water Supply System Design Engineer

General duties and responsibilities:

The Water Supply System Design Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system, including water storage facilities, pumping stations.

In particular, the Water Supply System Design Engineer shall:

- i) Develop survey requirements for the water supply system including water sources, pumping stations and distribution networks;
- ii) Participate in the preparation of surveys and participate in (be responsible for) the design work;
- iii) Supervise all surveys, studies and researches of existing and proposed water supply systems;
- iv) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with agreed standards and regulations, including environmental standards;
- v) Prepare detailed design for water supply system in accordance with applicable standards and regulations, including environmental standards;

- vi) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;
- vii) Develop the Auto-CAD drawings in preparing of preliminary and detailed designs;
- viii) Ensure quality control of preliminary design, detailed design, cost estimates and bidding documents including bills of quantities and specifications.

K-9. Civil Engineer/Designer

General duties and responsibilities:

S/he shall work closely with international specialists and other specialists in the engineering sector and shall carry out the following main activities:

- i) Carrying out preliminary structural calculations and guide drawings for pumping stations and other infrastructures;
- ii) Preparing construction and production drawings and providing competent advice to ensure compliance of all detailed designs and construction works with national norms and construction codes;
- iii) Providing support and necessary resources in optimizing individual designs and preparing technical specifications for the procurement of civil works for the construction of water pipelines and other associated civil infrastructure;
- iv) Providing technical support and advice as required during the evaluation of bidding documents;
- v) Providing assistance to the Client during commissioning of pumping stations and water intakes, as well as during the warranty period;
- vi) Providing initial data required for the preparation of design deliverables/reports.

K-10. Land Surveyor/ Topographer

General duties and responsibilities:

S/he shall work closely with national and international specialists and other specialists in the engineering sector and shall carry out the following main activities:

- i) Surveying of complex measurements, calculations and constructions on the ground.
- ii) Carrying out surveying of the specified structures, field tracing of the water supply system, determining the scope of work to be performed and leveling the pipeline route on the terrain.
- iii) Providing assistance to the Client in determining the calculations and scopes of work to be performed;
- iv) Providing initial data required for the preparation of design deliverables/reports.

K-11. Hydrogeological Engineer

General duties and responsibilities:

The Hydrogeological Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system, including facilities for wells and pumping equipment.

In particular, the Hydrogeological Engineer shall:

- vi) Develop survey requirements for the water supply system including water sources, pumping facilities;
- vii) Participate in the preparation of the surveys and participate in (be responsible for) the design work;
- viii) Coordinate, participate and supervise all surveys, studies and researches of existing and proposed design solution for water sources;

- ix) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with the agreed standard and regulations, including environmental standards;
- x) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;

K-12. Electrical Engineer/ Mechanical Engineer

General duties and responsibilities:

The Electrical/Mechanical Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system, including facilities for wells, water supply system and pumping equipment.

In particular, the Electrical/Mechanical Engineer shall:

- i) Develop requirements for water supply system equipment, including deep-well and centrifugal pumps and pumping equipment, etc.;
- ii) Participate in the preparation of electrical design work;
- iii) Coordinate, participate and supervise all surveys, studies and researches of existing and proposed electrical and mechanical design solutions;
- iv) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with the agreed standards and regulations, including environmental standards;
- v) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;

K-12. Geological Engineer

General duties and responsibilities:

The Geological Engineer shall be responsible for the preliminary design, detailed engineering design of the water supply system, including providing an opinion on the determination of the category of soil, rocks and complexity of the works.

In particular, the Geological Engineer shall:

- i) Participate in the preparation of surveys and participate in (be responsible for) the design works;
- ii) Carry out and supervise all surveys, studies and researches of existing and proposed construction sites.
- iii) Develop preliminary design, cost estimates and specifications for the water supply system in accordance with the agreed standards and regulations, including environmental standards;
- iv) Prepare a detailed design report, cost estimates and specifications for water supply system for the preparation of bidding documents;

K-14. Quantity Surveyor

General duties and responsibilities:

S/he shall work closely with national and international specialists and other specialists in the engineering sector and shall carry out the following main activities:

- i) Assistance in the development of design and estimate documentation, preparing cost estimates and calculating the cost of works.
- ii) Performing design analysis, preparation of specifications and other design documents for the purpose of cost estimation.
- iii) Providing assistance to the Client in determining the calculations and scopes of work to be performed;

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- iv) Providing initial data required for the preparation of design deliverables/reports.