Help

Bid Notice Abstract

Invitation to Bid (ITB)

Reference Number	12059199
Procuring Entity	BAGUIO WATER DISTRICT - BAGUIO CITY
Title	1 lot SUPPLY, INSTALLATION, AND COMMISSIONING OF WATER TREATMENT AT CAMP 8 WATER SYSTEM
Area of Delivery	Benguet

Solicitation Number:	04-JO-066
Trade Agreement:	Implementing Rules and Regulations
Procurement Mode:	Public Bidding
Classification:	Goods - General Support Services
Category:	Water and Waste Water Treatment Supply & Disposal
Approved Budget for the Contract:	PHP 34,550,350.00
Delivery Period:	120 Day/s
Client Agency:	
Contact Person:	Ma. Luisa C Tenedero Chairperson, Bids and Awards Committee BWD Compound, Utility Road Baguio City Benguet Philippines 2600 63-74-4423456 63-74-4424858 bwd.bac2021@gmail.com

Status	**Pending**
Associated Components	1
Bid Supplements	0
Document Request List	0
Date Published	23/05/2025
Last Updated / Time	22/05/2025 10:30 AM
Closing Date / Time	16/06/2025 13:30 PM

Description

1 lot SUPPLY, INSTALLATION, AND COMMISSIONING OF WATER TREATMENT AT CAMP 8 WATER SYSTEM

SPECIFICATIONS

Feed Water Analysis

Parameter / MCO Deepwell (160 GPM) / Camp 8 Deepwell (440 GPM) / Camp 8 Spring (80 GPM)
Color / 0 / 0 / -
Nitrate / 0.1 – 3.0 mg/L / 0.5 – 5.0 mg/L / -
pH / 3.7 – 4.0 / 3.7 – 4.0 / 4.3 – 4.6
Turbidity / 0 – 2 NTU / 0 – 3.0 NTU / 0 – 5.0 NTU
Total Dissolved Solids / 100 – 200 mg/L / 100 – 270 mg/L / 110 – 150 mg/L
Arsenic / <0.005 mg/L / <0.005 mg/L / -
Cadmium / <0.001 mg/L / <0.001 mg/L / -
Lead / <0.005 mg/L / <0.005 mg/L / -
Iron / 0.8 – 2.0 mg/L / 0.5 – 1.0 mg/L / -
Manganese / 0.05 – 0.2 mg/L / 0.03 – 0.05 mg/L / -
Hydrogen Sulfide / 0.01 – 0.03 mg/L / 0.01 – 0.03 mg/L / -

Treated Water Analysis

Parameter / Value
pH / 6.5 – 8.5
Turbidity / <5.0 NTU
Total Dissolved Solids / <600 mg/L
Iron / <0.3 mg/L
Manganese / <0.05 mg/L
Hydrogen Sulfide / <0.05 mg/L

TECHNICAL SPECIFICATIONS

1. pH Adjustment for MCO Deepwell, Camp 8 Deepwell, and Camp 8 Spring

Component / Specifications
Chemical Tank / 3 sets; Capacity: 220 liters MOC: PE/PVC; Dosing Pump: 7.1 L/h at 7 bar
Static Mixer for Camp 8 Deepwell / 1 unit; Contact time: 10 seconds; Mixer Length: 12 meters; Mixer Internal Diameter: 6 in.; No. of Baffles: min. 8
Static Mixer for Camp 8 Spring / 1 unit; Contact time: 10 seconds; Mixer Length: 12 meters; Mixer Internal Diameter: 3 in.; No. of Baffles: min. 8

2. Diffused Air Aeration for MCO Deepwell

Component / Specifications
Tank / 1 unit; MOC: Stainless Steel; Capacity: 8.5 – 9.0 cu m
Air Blower / Positive displacement rotary lobe (3-lobe); Discharge Bore: 40 – 80 mm; Suction Volume: 1 – 1.50 m^3 / min; Discharge Pressure: 30 – 45 kPa; Motor Output: 3 HP; Blower Speed: 1200 – 1500 RPM
Diffuser / 9” - 12” Bubble Disc
Retention Time / 10 minutes

3. GAC Filtration System for MCO Deepwell (after Aeration)

Component / Specifications
Tank / 1 unit; Vertical Cylinder with torispherical; top and bottom, with top and bottom strainer; MOC: Fiber Reinforced Plastic; Pressure Vessel
GAC Mesh Size / 12 x 40

4. Filtration System for Colloidal Iron and Precipitate Removal

Component / Specifications
Total Feed to Filtration System / 400 GPM
Operational Pressure / 150 psi
Tank / Vertical Cylinder with torispherical top and bottom, with top and bottom strainer; MOC: Fiber Reinforced Plastic Pressure Vessel

Manganese dioxide Filter Media
Rection Mechanism = Rapid Oxidation; Adsorption / Autocatalytic Adsorption
Removal Efficiency = Not less than 95%
Mesh Size = 20 x 40
Hydrogen Sulfide Capacity = 100 – 400 gr / cu. Ft
Bulk Density = 1600 – 2000 kg / cu m
Media Color = Black
Manganese Dioxide = 75% - 90%
Operational Range, pH = 6.5 – 9.0
Hydraulic Loading Rate = 8 – 15 GPM / ft^2
Media Life More than 8 years
Relevant Certifications = 1. NSF-61 certified drinking water system components 2. Philippine DFA Approved
Regeneration = Regular backwashing
Pre-oxidation = Yes
Contractor / Supplier must be Authorized Distributor = Certification must be submitted

Glass Filter Media
Mean Roundness = More than 90%
Mesh Size = 30 – 40
Bead Diameter = 0.6 – 4 mm
Bulk Density = 1200 – 1800 kg / m^3
Specific Gravity = >2.0
Hardness = 6.0 – 6.7 (Mohs Scale)
Physical Character = Solid. Odorless, transparent
Uniformity Coefficient = 1 – 1.5
Acidic resistance level = At least S2 (DIN 12116)
Chemical Composition = SiO_2 – 65-70%; Na_2O – 10-15%; CaO – 7-15%; mgO – 2-5%; AI_2O_3 – 1-5%
Regeneration / Reactivation = Regular backwashing
Relevant Certification = NSF-61 Certified Drinking Water System Components
Contractor / Supplier Authorization = Submit proof of Authorization / Certification as proof

5. Backwash System

Component / Specifications
Backwash Cycle / Air Scouring: 3 – 5 minutes; Backwashing: 10 – 15 minutes; Rinsing: 5 – 10 minutes or until water runs clear; Backwash Flow: 8 GPM / ft^2 or as required

Backwash Tank / 1 unit storage tank flat bottom with
intel and outlet; MOC: MDPE; Volume: 4000 L – 7000 L
Air Scouring Blower / Positive displacement rotary lobe (3-lobe); Discharge bore: 80 mm; Suction Volume: 2.5 – 3.0 cu m / min; Discharge Pressure: 50 – 65 kPa; Motor Output: 7.5 hp; Blower Speed: 1200 – 1500 RPM
Bag Filters for Water Recovery System / 3 units; With lid gasket and leg assembly, filter bag element; Housing: SS304 Capacity: 200 GPM; Maximum Operating Pressure: 150 psi

6. Post-Treatment Chlorination System

Component / Specifications
Chemical Tank / 1 set; MOC: PE / PVC; Capacity: 110 L; Dosing Pump: 7.1 L/h at 7 bar
Post Treatment Chlorination Residual Chlorine / 1.0 ppm

Approved Budget Cost: ₱34,55 0,350.00 / lot

PLEASE REFER TO THE ATTACHED TERMS OF REFERENCE

x x x x x

This is a two (2) envelope system:

Envelope "A" to contain the following; among others:

a) A refundable bid bond in the form of cash, Manager's or Cashier's check equivalent to 2% or surety bond callable on demand issued by a surety or insurance company duly certified by the Insurance Commission equivalent to 5% of the total approved budget cost is required for a total purchase bid amount of ₱50,000.00 and above. Validity of the surety bond is 120 days from the date of opening of bids OR Bid Securing Declaration regardless of amount of bid;
b) Terms of payment, delivery, warranty, bid validity and complete specifications;
c) Brochure/s (Original);
d) Proof of payment of a non-refundable fee of ₱25,000.00; otherwise, bids shall not be opened
e) Certificate of Authorized Distributorship / Dealership issued by the Principal Supplier to the participating bidder (with red ribbon) if none has been submitted to the BAC in its Accreditation;

• For bidders who have foreign principal suppliers, the BWD-BAC shall accept an Apostilled Certificate of Authorized Distributorship / Dealership issued by a competent authority of the host government in lieu of the Certificate of Authorized Distributorship / Dealership (with red ribbon), except for noncontracting countries
to the Apostille Convention, which still require the red ribbon requirement.
• For locally produced / manufactured products, only a certificate of Authorized Distributorship / Dealership w/o red ribbon is required if applicable;

f) ISO Certificate issued to the principal supplier/participating bidder for the offered material or equipment brand name (if none has been submitted to the BAC in its Accreditation);
g) International Certificate of Warranty.

Envelope "B" to contain the bid cost per unit.

Pre-bid conference: June 2, 2025
9:30am via Zoom Application
Meeting ID: 452 718 8447
Password: 9Buvqr

Pre-bid Conference

Date	Time	Venue
02/06/2025	9:30:00 AM	Pre-bid conference: June 2, 2025 9:30am via Zoom Application Meeting ID: 452 718 8447 Password: 9Buvqr

Created by	Ma. Luisa C Tenedero
Date Created	22/05/2025

	BAGUIO WATER DISTRICT **BWD Compound, Utility Road, Baguio City 2600**	Document No.	ADM-PUR-F003
	REQUEST FOR BIDS/QUOTATION (RQ)	Effectivity & Revision Date	July 7, 2023
		Revision No.	02

To: _____
(Name of Supplier)
Contact Person: _____
Address: _____
_____
Contact no.: _____

RQ No.: **04 – JO – 066**
PR / JO No.: **JO – 066**
Date of RQ: **April 30, 2025**
Purpose of RQ:
Water treatment for low pH, and presence of Iron, and Hydrogen Sulfide for MCO and Camp 8 Sources

NOTE: DATA REQUIRED MUST BE FILLED UP COMPLETELY. FAILURE TO INDICATE THE PRICE VALIDITY, TERMS, WARRANTY PERIOD AND DELIVERY PERIOD SHALL MEAN OUTRIGHT DISQUALIFICATION OF BIDS

	Qty.	Description	U-Price	Total
VALIDITY DATE: _____ day **(30 days minimum)** **DELIVERY:** _____ working days _____ calendar days _____ FOB warehouse **WARRANTY** _____ calendar days upon acceptance. **TERMS:**	**1 lot**	**SUPPLY, INSTALLATION, AND COMMISSIONING OF WATER TREATMENT AT CAMP 8 WATER SYSTEM** **SPECIFICATIONS** **Feed Water Analysis**		

Parameter	MCO Deepwell (160 GPM)	Camp 8 Deepwell (440 GPM)	Camp 8 Spring (80 GPM)
Color	0	0	-
Nitrate	0.1 – 3.0 mg/L	0.5 – 5.0 mg/L	-
pH	3.7 – 4.0	3.7 – 4.0	4.3 – 4.6
Turbidity	0 – 2 NTU	0 – 3.0 NTU	0 – 5.0 NTU
Total Dissolved Solids	100 – 200 mg/L	100 – 270 mg/L	110 – 150 mg/L
Arsenic	<0.005 mg/L	<0.005 mg/L	-
Cadmium	<0.001 mg/L	<0.001 mg/L	-
Lead	<0.005 mg/L	<0.005 mg/L	-
Iron	0.8 – 2.0 mg/L	0.5 – 1.0 mg/L	-
Manganese	0.05 – 0.2 mg/L	0.03 – 0.05 mg/L	-
Hydrogen Sulfide	0.01 – 0.03 mg/L	0.01 – 0.03 mg/L	-

Treated Water Analysis

Parameter	Value
pH	6.5 – 8.5
Turbidity	<5.0 NTU
Total Dissolved Solids	<600 mg/L
Iron	<0.3 mg/L
Manganese	<0.05 mg/L
Hydrogen Sulfide	<0.05 mg/L

TECHNICAL SPECIFICATIONS
1. pH Adjustment for MCO Deepwell, Camp 8 Deepwell, and Camp 8 Spring

Component	Specifications
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Static Mixer for Camp 8 Deepwell	1 unit Contact time: 10 seconds Mixer Length: 12 meters Mixer Internal Diameter: 6 in. No. of Baffles: min. 8
Static Mixer for Camp 8 Spring	1 unit Contact time: 10 seconds Mixer Length: 12 meters Mixer Internal Diameter: 3 in. No. of Baffles: min. 8

2. Diffused Air Aeration for MCO Deepwell

Component	Specifications
Tank	1 unit MOC: Stainless Steel Capacity: 8.5 – 9.0 cu m
Air Blower	Positive displacement rotary lobe (3-lobe) Discharge Bore: 40 – 80 mm Suction Volume: 1 – 1.50 m^3 / min Discharge Pressure: 30 – 45 kPa Motor Output: 3 HP Blower Speed: 1200 – 1500 RPM
Diffuser	9" - 12" Bubble Disc
Retention Time	10 minutes

3. GAC Filtration System for MCO Deepwell (after Aeration)

Component	Specifications
Tank	1 unit Vertical Cylinder with torispherical top and bottom, with top and bottom strainer MOC: Fiber Reinforced Plastic Pressure Vessel
GAC Mesh Size	12 x 40

4. Filtration System for Colloidal Iron and Precipitate Removal

Component	Specifications
Total Feed to Filtration System	400 GPM
Operational Pressure	150 psi
Tank	Vertical Cylinder with torispherical top and bottom, with top and bottom

	strainer MOC: Fiber Reinforced Plastic Pressure Vessel
Manganese dioxide Filter Media	**Rection Mechanism** / **Rapid Oxidation; Adsorption / Autocatalytic Adsorption** Removal Efficiency / Not less than 95% Mesh Size / 20 x 40 Hydrogen Sulfide Capacity / 100 – 400 gr / cu. Ft Bulk Density / 1600 – 2000 kg / cu m Media Color / Black Manganese Dioxide / 75% - 90% Operational Range, pH / 6.5 – 9.0 Hydraulic Loading Rate / 8 – 15 GPM / ft^2 Media Life / More than 8 years Relevant Certifications / 1. NSF-61 certified drinking water system components 2. Philippine DFA Approved Regeneration / Regular backwashing Pre-oxidation / Yes Contractor / Supplier must be Authorized Distributor / Certification must be submitted
Glass Filter Media	Mean Roundness / More than 90% Mesh Size / 30 – 40 Bead Diameter / 0.6 – 4 mm Bulk Density / 1200 – 1800 kg / m^3 Specific Gravity / >2.0 Hardness / 6.0 – 6.7 (Mohs Scale) Physical Character / Solid. Odorless, transparent Uniformity Coefficient / 1 – 1.5 Acidic resistance level / At least S2 (DIN 12116) Chemical Composition / SiO_2 – 65-70% Na_2O – 10-15% CaO – 7-15% mgO – 2-5% Al_2O_3 – 1-5%

Regeneration / Reactivation	Regular backwashing
Relevant Certification	NSF-61 Certified Drinking Water System Components
Contractor / Supplier Authorization	Submit proof of Authorization / Certification as proof

5. Backwash System

Component	Specifications
Backwash Cycle	Air Scouring: 3 – 5 minutes Backwashing: 10 – 15 minutes Rinsing: 5 – 10 minutes or until water runs clear Backwash Flow: 8 GPM / ft^2 or as required
Backwash Tank	1 unit storage tank flat bottom with intel and outlet MOC: MDPE Volume: 4000 L – 7000 L
Air Scouring Blower	Positive displacement rotary lobe (3-lobe) Discharge bore: 80 mm Suction Volume: 2.5 – 3.0 cu m / min Discharge Pressure: 50 – 65 kPa Motor Output: 7.5 hp Blower Speed: 1200 – 1500 RPM
Bag Filters for Water Recovery System	3 units With lid gasket and leg assembly, filter bag element Housing: SS304 Capacity: 200 GPM Maximum Operating Pressure: 150 psi

6. Post-Treatment Chlorination System

Component	Specifications
Chemical Tank	1 set MOC: PE / PVC Capacity: 110 L Dosing Pump: 7.1 L/h at 7 bar
Post Treatment Chlorination Residual Chlorine	1.0 ppm

Approved Budget Cost: ₱34,55 0,350.00 / lot

PLEASE REFER TO THE ATTACHED TERMS OF REFERENCE

x x x x x

June 16, 2025

This is a two (2) envelope system:
Envelope "A" to contain the following; among others:

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b) Terms of payment, delivery, warranty, bid validity and complete specifications;
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g) International Certificate of Warranty.

Envelope "B" to contain the bid cost per unit.

Pre-bid conference: June 2, 2025
9:30am via Zoom Application
Meeting ID: 452 718 8447
Password: 9Buvqr

By: Supplier or Authorized Representative:_____(sign over printed name)

Deadline of submission of bids: **June 16, 2025** Opening of bids: **1:30 pm**

signed	signed	signed
Prepared by: **PAUL TRAJANO**	**Noted by:** **ATTY. MA. LUISA C. TENEDERO**	**ENGR. REYNALDO C. JAYCO**
OIC - PURCHASING	BAC IN-HOUSE	BAC-TECHNICAL

BWD RESERVES THE RIGHT TO REJECT BIDS &/OR DECLARE A FAILURE OF BIDDING PURSUANT TO THE PERTINENT PROVISIONS OF RA 9184
BWD DOES NOT ENGAGE IN SOLICITATION OF FUNDS FROM ANY INDIVIDUALS OR ENTITIES, AND WE STRONGLY ADVISE AGAINST RESPONDING TO ANY UNAUTHORIZED REQUESTS CLAIMING ASSOCIATION WITH OUR ORGANIZATION.

TERMS OF REFERENCE

Supply, Installation and Commissioning of Water Treatment at Camp 8 Water System

I. OBJECTIVE

To treat the raw water at Camp 8 sources (deep well, spring and the MCO deep well) to comply with the Philippine National Standards for Drinking Water 2017, and to mitigate any negative effects from compliant yet elevated levels of inorganic and metal contaminants (hydrogen sulfide and iron).

II. PROJECT BACKGROUND AND REQUIREMENT

The proposed treatment will be constructed at the BWD facility at Camp 8 Baguio City.

The proposed water treatment must be capable to treat 400GPM of water, cumulative of all the sources from Camp 8 deep well, MCO Deep well and Camp 8 Spring (Hilmut).

Water Quality Indicator of Camp 8

Parameter	MCO Deepwell (160 GPM)	Camp 8 Deepwell (440 GPM)	Camp 8 Spring (80 GPM)
Color	0	0	-
Nitrate	0.1 – 3.0 mg/L	0.5 – 5.0 mg/L	-
pH	3.7 – 4.0	3.7 – 4.0	4.3 – 4.6
Turbidity	0 – 2 NTU	0 – 3.0 NTU	0 – 5.0 NTU
Total Dissolved Solids	100 – 200 mg/L	100 – 270 mg/L	110 – 150 mg/L
Arsenic	<0.005 mg/L	<0.005 mg/L	-
Cadmium	<0.001 mg/L	<0.001 mg/L	-
Lead	<0.005 mg/L	<0.005 mg/L	-
Iron	0.8 – 2.0 mg/L	0.5 – 1.0 mg/L	–
Manganese	0.05 – 0.2 mg/L	0.03 – 0.05 mg/L	–
Hydrogen sulfide	0.01 – 0.03 mg/L	0.01 – 0.03 mg/L	–

The results of the treatment must comply with the PNSDW 2017 Guidelines.

III. COMPONENT REQUIREMENTS, SPECIFICATIONS, CERTIFICATIONS

a. pH Correction- installation of pH correction step to correct the hydrogen ion concentration from the water sources (deep wells and spring).

i. Must utilize dosing pumps for proper dosage
ii. Must ensure that compliant pH range via appropriate mixing time is achieved before collection into temporary holding tank
iii. Must be able to adjust dosing rate to correspond to the flowrate fluctuations.

b. Filtration System

i. The filtration system must include pre-treatment steps (GAC, Pre-oxidation or aeration) to ensure effective removal of relevant contaminants.
ii. *Filter Tank- Fiber Reinforced Plastic*
   1. inclusive of accessories (top and bottom flanges for piping connections.
   2. Inclusive of tank internals (diffusers, bottom lateral distributors, base and adaptors

3. Design pressure must be 150 psi and must include pressure safety/relief valves
4. Inclusive of any media support or under bedding
5. Must be brand new

iii. Filter Media

1. Manganese Dioxide Media – must comply with the following:

Reaction Mechanism	Rapid Oxidation; Adsorption/Autocatalytic Adsorption
Removal Efficiency	Not less than 95%
Mesh size	20 x 40
Hydrogen Sulfide Capacity	100-400 gr/cu. ft
Bulk Density	1600-2000 kg/cu m
Media color	black
Manganese Dioxide	Greater than 80%
Operational Range, pH	6.5-9.0
Hydraulic Loading Rate	8-15GPM/ft^2
Media life	More than 8 years
Relevant certifications	1. NSF-61 certified drinking Water system components 2. Philippine FDA Approved
Regeneration	Regular backwashing
Pre-oxidation	yes
Contractor/Supplier must be Authorized distributor	Certification must be submitted

iv. Glass Filter Media – for the removal precipitate material and water polishing step, must comply with the following specification:

Mean Roundness	More than 90%
Bulk density	1200-1800 kg/m^3
Specific gravity	>2.0
Hardness	6.0-6.7 (Mohs Scale)
Physical character	Solid. Odorless, transparent
Uniformity coefficient	1-1.5
Acidic resistance level	At least S2 (DIN 12116)
Chemical Composition	SiO_2 – 65-70% Na_2O – 10-15% CaO- 7-15% MgO – 2-5% Al_2O_3 – 1-5%
Regeneration/reactivation	Regular backwashing
Relevant Certification	NSF-61 Certified Drinking Water System Components
Contractor/supplier authorization	Submit proof of authorization/certification as proof

c. Backwashing and Valve Controls

i. Automatic with motorized actuation, with manual override.

ii. Automatic backwash must be triggered either by pressure drop across the tank, or time set up

iii. Backwash water must be filtered to remove any particulates and recycled in a water recovery system
iv. Backwash water must be from product water for proper cleaning of the media filters
v. Backwashing to be integrated to SCADA system

d. Piping System, Appurtenances, and Accessories

i. The system must be inclusive of all relative valving system (butterfly valve), pipes and fittings, pressure and flow gauges, pressure relief valves, etc.

e. Other Specifications

i. System must be inclusive of backwash pump, booster pump to product water tank.
ii. The post-treatment disinfection (chlorination) step will require a separate dosing pump to ensure no coliform contamination during collection in the product tank.

f. Diffused Air Aeration System

i. Design must be able to properly aerate the MCO DW with a feed flowrate of 160 GPM, utilizing an adequately sized blower, an air diffusion system, and a dedicated aerating tank to remove hydrogen sulfide from the deep well water source.
ii. Contact/retention time must be at least 10 minutes to ensure proper aeration of water source. iii. Diffused air aeration system must include design considerations for overflow, and valving to prevent water backflow into the blower.
iii. Must satisfy the following specifications:

Air Blower

Discharge Bore: 40 – 80 mm
Suction Volume: 1-1.50 m3/min
Discharge Pressure: 30 – 45 kPa
Motor Output: 3 HP
Blower Speed: 1200 – 1500 RPM

Aeration Tank

Capacity: 8.5 – 9.0 cu.m.
MOC: Stainless Steel
Retention Time: 10 mins

IV. INSTALLATION, COMMISSIONING AND TESTING

a. The contract shall include the installation, testing and commissioning of all installed systems.
b. Contractor must conduct a 30-day process proving to ensure that all parameters are compliant with PNSDW 2017. Any parameter not compliant shall be rectified to align with the requirements.
   i. Flowrate: the system must be capable of treating up to 400 GPM (25 LPS) of raw water.
   ii. Backwashing control system must be tested for its functionality, as well as determining optimal schedules for backwashing.
c. The treatment system shall be capable to treat 400GPM flow
d. Optimal use of the backwash control system shall be check for the functionality.
e. All Physico-Chemical stated in the PNSDW 2017 shall be compliant for Camp 8 deep well, MCO deep well, Camp 8 spring after the treatment, with the following additional specific treatment results to be targeted:

Parameter	Result
Manganese	0.05mg/li
Iron	0.30mg/li
Hydrogen Sulfide	0.05mg/li

f. The Contractor shall conduct a one-week orientation and training for BWD personnel/operator on the proper operation and maintenance and to provide a complete manual of the water treatment system.

g. The Contractor shall conduct a one-year Operations and Maintenance period of the treatment facility after completion, covering all defects and replacement of defective parts.

h. Regular conduct of Physico-Chemical and Microbiological tests of the raw and product water shall be done covering the one-year O & M period, the cost will be at the expense of the Contractor.

i. Official turnover of the treatment facility shall be done after the one- year O & M period.

PROJECT SCOPE AND DURATION

The total project duration shall be 120 calendar days, inclusive of a 30-day process proving before operation.

a. Engineering Design Phase
Comprises of the following main scope of works:

i. Initial mobilization.

ii. Acquisition of all the necessary permits, licenses, clearances, and other regulatory requirements on behalf of Baguio Water District.

iii. Preparation and submission of engineering drawings, mass balances, process flow diagrams, piping and instrumentation diagrams, reports, performance specifications, and design criteria for approval of Baguio Water District. Only approved plans shall be signed and sealed by the Contractor, and shall be used during the Supply, Delivery, Installation, and Construction Phase.

iv. Preparation and submission of the duly signed detailed work program/construction schedule, construction methodology, Gantt Chart with S-Curve, and manpower and equipment schedules.

v. Submission of material brochures, method statements, and technical specifications. b. Supply, Delivery, Installation, and Construction Phase Comprises of the procurement, supply, installation, construction (civil, mechanical, electrical works) of all the components as written for this project. The main scope of works are as follows:

b. Supply, Delivery, Installation, and Construction Phase
Comprises of the procurement, supply, installation, construction (civil, mechanical, electrical works) of all the components as written for this project. The main scope of works are as follows:

i. Contractor's mobilization, and construction of temporary facilities;
ii. Procurement, fabrication, supply, and installation of all unit components of the required systems (pH Dosing, Diffused Air Aeration, Water Treatment Plant).

iii. Construction, supply, and installation of required materials, systems, components, and equipment based on the approved drawings and documentation.
iv. Preparation and submission of duly signed As-Built Plans, Final Completion Report, and Final Testing and Commissioning Criteria/Procedure.

c. Supply, Delivery, Installation, and Construction Phase

Comprises of the process proving, testing, and commissioning of all installed components and systems, including training of personnel of Baguio Water District who will operate the facility.

i. Testing and Commissioning of completed works in accordance with the approved Final Testing and Commissioning Criteria and Procedure.

ii. Contractor shall conduct both wet and dry tests of the completed water treatment facility, and shall submit water samples for the physical and chemical parameters to a DOH-accredited laboratory for laboratory tests and analyses.
iii. Certificate of Final Acceptance shall be issued upon successful compliance to the tests and requirements of PNSDW 2017, and upon approval of the final inspection.

d. Operations and Maintenance Services

Comprises a one-year operations and maintenance services by the contractor, to ensure that all installed systems and facilities are operating normally as designed, compliant with PNSDW 2017 and specific treatment targets.

i. Official turnover of the plant shall be after the O&M period
ii. Knowledge transfer, capacity building, and training of Baguio Water District personnel for the operations and maintenance of the installed systems for water treatment shall be conducted prior to the official turnover. A one-week orientation and training shall be conducted.

iii. A comprehensive engineering manual shall be provided by the Contractor prior to the official turnover and after the conduction of the one-week orientation and training of Baguio Water District personnel.

V. TERMS OF PAYMENT

In consideration of the works and services required by this Terms of Reference, payment shall be made as follows:

15% **Downpayment**
35% **Billing 1** – Progress Billing until Project Completion.
25% **Billing 2** – After 4 months of O&M Services.
25% **Billing 3** – After 8 months of O&M Services.

Where the contractor refuses or fails to satisfactorily complete the work within the specified contract time, plus any time extension duly granted and is hereby in default under the contract, the contractor shall pay the procuring entity for liquidated damages, and not by way of penalty, an amount, as provided in the conditions of contract, equal to at least one

tenth (1/10) of one (1) percent of the cost of the unperformed portion of the works for every day of delay.

In case that the delay in the completion of the work exceeds a time duration equivalent to ten percent (10%) of the specified contract time plus any time extension duly granted to the contractor, BWD may rescind the contract, forfeit the contractor's performance security and takeover the prosecution of the project or award the same to a qualified contractor through negotiated contract.

VI. WORKMANSHIP AND WARRANTIES

Works shall be of the highest quality, and any defects/imperfections found and observed shall be rectified by the Contractor without any additional cost to the Contract. The Contractor shall be responsible for correcting, resubmitting, and absorbing the expenses of any errors, omissions, inconsistencies, inadequacies, or failures that do not satisfy the standards as required by the Contract. Any amendments to previously submitted, reviewed, and authorized designs or documentation must be in writing and within a reasonable timeframe to notify the procuring entity. Any costs associated with these modifications shall be incurred by the Contractor.

BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	COST
1	**General Items**			
	Mobilization / Demobilization	lot	1.00	
	Implementation of Construction Health and Safety Program	lot	1.00	
	Plan Development, Detailed Design, As-Built Drawings and Other Documentation	lot	1.00	
	Permits, Bonds and Insurance	lot	1.00	
	Temporary Facility	lot	1.00	
	Project Billboards	lot	1.00	
	Camp 8 Facility			
2	**Civil & Structural Works (For Facilities and Other Structures)**			
	Includes pavement breaking, site clearing and preparation, concrete works.	lot	1.00	
	Clearing & Grubbing, including Hauling & Disposal, Gravel Bedding. Treatment plant enclosure.	lot	1.00	
3	**Mechanical Works**			
	Supply and Installation of the following:			
3a	***Backwash Tank - Camp 8 Water Treatment Plant***	lot	1.00	
	Storage Tank Flat Bottom with inlet and outlet. Food grade			

ITEM	DESCRIPTION	UNIT	QTY	COST
	and FDA approved. Virgin medium density polyethylene material with UV stabilizers.			
3b	***Filtration Tank - Camp 8 Water Treatment Plant***			
	Fiber Reinforced Plastic (FRP) Pressure Vessel. Vertical Cylinder with torispherical top and bottom.With top and bottom strainer.	**set**	**5.00**	
3c	***Filter Media - Camp 8 Water Treatment Plant***			
	Manganese Dioxide Media. 8 - 15 GPM/sq.ft. service flowrate, 1600-2000 kg/cu.m. bulk density. For iron and manganese removal. 27.2 kg/bag.	**bags**	**406.00**	
	Glass Bead Filter Pack. Mesh 30-40. Bead Diameter 0.6 - 04 mm. For water polishing and further removal of precipitates. 20 kg/bag.	**bags**	**428.00**	
	Granulated Activated Carbon. 12 x 40 Mesh (25 kg/bag)	**bags**	**60.00**	
7	**Dosing System**			
	Camp 8 Water Treatment Plant. Post Treatment Chlorination. Dosing Pump. Q: 7.1 LPH at 7 bar. Chemical tank. 110L set 1.00 Camp 8 Spring. Dosing	**set**	**1.00**	
	Camp 8 Spring. Dosing Pump. Q: 7.1 LPH at 7 bar. Chemical tank. 110L	**set**	**1.00**	
	Camp 8 Deep Well. Dosing Pump. Q: 7.1 LPH at 7 bar. Chemical tank. 110L	**set**	**1.00**	
8	**Static Mixers**			
	Camp 8 Deep Well. Static Mixer. Mixer ID: 6 in., # of Baffles: 8 min	**lot**	**1.00**	
	Camp 8 Spring. Static Mixer. Mixer ID: 3 in., # of Baffles: 8 min	**lot**	**1.00**	
9	**Backwash Pump**			
	Camp 8 Water Treatment Plant			
	Q: 53 cu.m/hr at 20m (80 mm suction and discharge). MOC:	**set**	**1.00**	

ITEM	DESCRIPTION	UNIT	QTY	COST
	Stainless Steel (bowls, shaft, impellers). Mechanical seal type, 7.5 HP electric motor. 3Phase, 3600 RPM, 220/440 V, 60 Hz operation.			
10	**Booster Pump**			
	Camp 8 Water Treatment Plant.	**set**	**1.00**	
11	**Air Scouring Blower**			
	Camp 8 Water Treatment Plant. Air Blower. Positive displacement rotary lobe (3-lobe). 80 mm discharge bore. 2.5 – 3.0 cu.m/min suction volume. 50-65 kPa discharge pressure. 7.5HP motor output. 1200-1500 RPM blower speed.	**set**	**1.00**	
12	**Bag Filters - Camp 8 Water Treatment Plant**			
	With lid gasket and leg assembly. Housing - SS304, 200 GPM capacity. 150 psi MOP. With filter bag element	**set**	**3.00**	
	Pressure Gauge. 100 mm dial face. SS 304. 0-100 psi operating pressure.	**set**	**3.00**	
13	**Wires, Cables, Pipes, Fittings, and Accessories**			
	Camp 8 Water Treatment Plant	**set**	**1.00**	
	Motorized Valves and Instruments - Camp 8 Water Plant	**set**	**1.00**	
14	**Electrical Works & Automatic Controls - Motorized Valving**			
	Camp 8 Water Treatment Plant.	**lot**	**1.00**	
	MCO Deepwell			
	Civil & Structural Works (For Facilities and Other Structures)	**lot**	**1.00**	
	pavement breaking, site clearing and preparation.			
	Clearing & grubbing, including Hauling & Disposal, Gravel Bedding.			
15	**Mechanical Works**			
	MCO Deepwell: Dosing Pump. Q: 7.1 LPH at 7 bar. Chemical tank. 110L	**set**	**1.00**	
	Diffused Air Aeration Tank - MCO Deep Well			

ITEM	DESCRIPTION	UNIT	QTY	COST
	Aeration Tank. Stainless Steel Sheets. 8.5-9.0 cu.m. capacity.	lot	1.00	
	Blower	lot	1.00	
	Diffusers, piping, check valve, overflow line.	lot	1.00	
16	Testing and Commissioning	lot	1.00	
17	**Operations & Maintenance (one year)**	lot	1.00	
	TOTAL			

VII. APPROVED BUDGET FOR THE CONTRACT

The approved budget for the contract is Thirty-four Million, five hundred fifty thousand and three hundred and fifty pesos only (Php. 34,550,350.00).

Prepared by:

signed
ENGR. BASILIO C. MUNAR Jr.
Quality Control/Assurance Chief

Recommended for approval by:

signed
ENGR. FERNANDO A. PERIA
NRWM Division Manager

signed
ENGR. REYNALDO C. JAYCO
OIC, Assistant General Manager for Technical Operations

Approved by:

signed
ENGR. SALVADOR M. ROYECA
General Manager