

**Terms of Reference**  
**Provide Safely Managed Sanitation at Al Bo Eitha Sewage**  
**Treatment Plant (STP) – Baghdad Governorate**

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**March - 2022**

by UV Disinfection

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1. Background	<p>Iraq like many countries face multiple burdens due to the current coronavirus pandemic. COVID-19 is deepening pre-existing inequalities, exposing vulnerabilities in social systems and basic services, which are in turn amplifying the impacts of the pandemic. In addition to these emerging and serious public health challenges including COVID-19, there remains significant potential of outbreak of waterborne diseases in Iraq. Prolonged exposure to poor water quality, inadequate sanitation facilities and services of which contribute to placing vulnerable populations, among them children and women, at increased risk of diseases, including acute watery diarrhea (AWD) and cholera in spring and autumn seasons.</p> <p>The local capacities to sustainably manage sanitation services and facilities are weak and further hampered by outdated sanitation policies, regulations and legal enforcement including weak constitutional and legislative frameworks. Rural-urban disparities are wide with about a quarter of sanitation users reporting unreliable services. Sustainable water resource management remains a key challenge. To enhance sustainable sanitation management capacity at the local level is very critical as treating sanitation facilities continue to increase due to population growth in Baghdad - current population is 9.5 million, with a growth rate of 2.38 per cent increase from 2020 and rapid urbanization with more than 300 informal settlements in Baghdad outskirts, taking into account the aging sanitation facilities which put more burden of treatment efficiency.</p> <p>Based on the municipal survey for water and sanitation services in Iraq which was conducted by the Central Statistical organization at the Ministry of Planning during 2022, showing the total percentage of operational and functioning sanitation facilities reached 36.2 per-cent in Baghdad city. In the same context, the total quantity of untreated wastewater and thrown directly into the fresh rivers reached 700,000 cubic meters per day and significantly affecting on downstream governorates.</p> <p>Many utilities are beginning to evaluate and implement alternative disinfection methods, with UV irradiation among the most popular. UV has long been recognized as an effective disinfectant. However, unlike chlorine, UV does not pose disinfection by products, toxicity, or hazardous materials concerns.</p> <p>The final treatment step in municipal wastewater treatment is the disinfection process. Disinfection is required to reduce and destroy the bacteria, virus, and protozoa populations in the wastewater before discharge into the receiving body of water. The disinfection of wastewater is critical to the protection of public health and the environment. Growing awareness of the long-term public safety and environmental costs of chemical wastewater disinfection has led to adaptation of inherently safer alternatives such as Ultraviolet technology.</p>

<b>2. Objectives, Purpose &amp; Expected results</b>	<p>Specific details of the envisioned project/assignment; the framing and presentation of the objectives, purposes, expected outputs, and results to be achieved:</p> <ul style="list-style-type: none"> <li>• By October 2022, the Ultraviolet systems are operating and functional and meets the national water protection legislation including act No. 27 for the year 2009 on protection and development of Iraqi environment &amp; act No. 25 for the year 1967 for the maintenance of the rivers and public water from pollution.</li> <li>• Over 1.5 million affected people will gain access to safely managed sanitation service through improving the quality of wastewater, preservation of water quality of natural water resources and eliminate the level of pollutants at water body at downstream governorates.</li> <li>• Eliminate the risk of chlorine gas which is highly toxic chemical that must be transported and handled with extreme caution. It is stored under pressure in large tanks and is released into the wastewater as a gas. It is a strong oxidizing agent that can be extremely dangerous to humans. If chlorine gas is inhaled, it comes in contact with moisture inside the lungs and converts to hydrochloric acid. The resulting damage to the respiratory system can be permanent or fatal.</li> <li>• UV wastewater treatment solutions will effectively destroy virtually all harmful microorganisms such as E Coli, Salmonella, Giardia, and many more, making it ideal for wastewater discharge treatment. If left untreated, some of these dangerous pathogens could find their way into rivers and maybe drinking water supplies, so it's essential to take the necessary steps to ensure safe, clean water. The process doesn't create any carcinogenic by-products either and has no negative effect on aquatic life and the environment.</li> <li>• UV is an effective, safe, and environmentally friendly way to disinfect wastewater. Unlike chemical disinfection in which substantial contact tanks and time are needed, UV light provides rapid, effective inactivation of microorganisms through a physical process. When bacteria, viruses and protozoa are exposed to germicidal wavelengths of UV light, they are instantaneously rendered incapable of reproducing and infecting. The process adds nothing to the water but UV light, has no impact on chemical composition or dissolved oxygen content, and does not create disinfection by-products.</li> </ul>
<b>3. Location</b>	<p>Al Bu Eitha Sanitation Treatment Plant – Baghdad Outskirt</p>
<b>4. Description of the assignment</b>	<p><b><u>The assignment includes:</u></b></p> <ul style="list-style-type: none"> <li>• Civil and Mechanical Work: Establish all the required construction needed including the channels and UV holding tanks with the dimensions based on the type of UV system chosen. The construction works including all the required gates and from the final stage of treatment to the final effluent and based on the site visit to propose the best and most probable solution to sterilize the entire wastewater effluent before discharging to the end point.</li> <li>• Design, Supply, install, test, and properly operate water sterilization systems by Ultraviolet Irradiation with proper chemical – mechanical cleaning system , UVt system ,</li> </ul>

Eco light test with discharge capacity of 205,000 m<sup>3</sup> / day for Al Bu Eitha Sewerage Treatment Plant using quartz-mercury vapor lamps with a light wavelength of 253.7nm and intensity depended to calculation designs with All that the work requires from installing and checking the efficiency of the system by taking samples before and after sterilization, provided that the measurements are taken on site.

- UV light is normally effective against all viruses, bacteria, and protozoa.
  - The result of the Effective UV system could provide expected results that meet the Iraqi Sewage Regulation 25, 1967 Limits for Discharge of Sewage Effluents to Rivers as shown in the table below.
  - On-site training for (6) technical staff on operation and maintenance, while the contractor shall submit certificates of training for local staff and the outcome of training (report).
  - The system should be operated properly for 6 months as a liability period complying with related national and international standard specifications (MoB, MoEnv, WHO) before finally handing over process.
  - The contractor is responsible and required to supply all the required highly qualified technical and academic expertise, tools, manpower, highly experienced management, etc. as required to implement all the required activities as per the BoQs, and ToR.
  - Child labour is forbidden.
  - Corruption and fraud are zero tolerance when working with UNICEF.
  - The contractor is obligated to implement all project components in accordance with the specifications and technical conditions attached and approved by Baghdad Sewerage Administration at the Mayoralty of Baghdad.
  - The contractor is obligated to implement the work while taking all measures to ensure that the project does not affecting on the regular operation of the project.
  - It is not allowed to make any modification in the above paragraphs without the approval of the Designs and Audit Committees at Baghdad Sewerage Administration.
  - One origin has been specified in some paragraphs because the equipment required in these paragraphs is tools that are installed within equipment implemented in project which requires that they be the same model and manufacturer of the original equipment to ensure its functionality working properly.
  - The contractor is obligated to supply backup materials for the above systems, provided that the materials required by Baghdad Sewerage Administration.
  - The contractor under guidance the supervising committee shall take samples of influent and effluents to analyze the efficiency of the product and operationally.
- The contractor is committed to a trial operation of the systems for a period of three months.

No	Description	Time required in days
1	Supply and install and operate of Ultraviolet	90
2	Construction and other civil works	90
3	Operation	15
4	On-site training for 6 local staff	10
5	Operating and maintain of (warranty Period)	180

#### 4 Deliverables

- All the work shall accomplish according to UNICEF- General Terms and Conditions codes and the direction of the supervising engineers (supervising committee) formulated by the Baghdad Sewerage Administration and the below requirements:

- The contractor shall prepare and submit calculation design and manuals on operating and maintenance, technical sheets of materials supplied and repairing activities time schedule plan.
- The contractor shall also be deemed to have read and examined the terms of reference, technical specifications, drawings, and all other relevant documents before completing the Bills of Quantities.
- Unless otherwise indicated, the prices and rates entered in the following Bills of Quantities shall be deemed to cover and include the provision by the contractor of all equipment, materials, and labors and shall allow for all and every expense and for all works not specifically described or which may be incidental, contingent or deemed necessary by the contractor for completing and maintaining all works in strict conformity with the terms of reference, specifications, drawings and other terms of the contract;
- Quoted prices for Ultraviolet treatment systems, civil works, mechanical works, electrical works and any other required parts or materials necessary for the contract implementation, shall include transportation fees, on-site handling of materials (including unloading from trucks) and storing.
- Unless otherwise directed by the supervising committee, the dismantled parts (not in use any longer) shall be delivered by the contractor to the project warehouse and receive signed good receipt note to be submitted at the end of the project to the formulated handing over committee.
- No alterations or modifications shall be allowed without prior written approval from both parties, Baghdad Sewerage Administration and UNICEF. In case such approval is granted, it will not relieve the contractor from his responsibilities under the contract.
- All works should include the provision of all required complementary supplies and works (not necessarily mentioned in the bills of quantities) such as sand, gravel, cement, washers, elbows, bolts, nuts, screws, welding, etc. and laborers.
- The contractor shall familiarize him/herself with the characteristics of the project and the location where the contractor will have to deliver the assignment in the actual conditions of the project location as it is.
- Environmental safeguarding to be seriously considered.
- Any variation needed must be agreed upon by both parties and documented in writing and the contract must be amended before execution of the works. No such variation shall be made by the contractor without an order in writing by UNICEF who shall determine the amount (if any) to be added to or deducted from the sum named in the tender in respect of any extra or additional work done or work omitted by its order.
- Should the contractor fails to fulfil any of his/her obligations under the contract, UNICEF may in the absence of any other remedy provided under the terms of the contract and after giving the contractor seven days' notice in writing of its intention so to do cause such obligations to be carried out by other persons or contractors and deduct the costs incurred from the money due or payable to the contractor or UNICEF shall recover them as a debt from the contractor and in such case, UNICEF shall certify the reasonable costs incurred.
- The work will not be considered approved/completed and will not be certified unless approved by the UNICEF WASH programme at the country office and the main stakeholder, Baghdad Sewerage Administration.

<b>5 Reporting requirements</b>	<ul style="list-style-type: none"> <li>➤ The contractor shall report about the official date of <b>site handover</b> in coordination with UNICEF.</li> <li>➤ The contractor shall submit a <b>weekly progress report/each Thursday</b> and be submitted to WASH team officially by email.</li> <li>➤ The contractor shall prepare and share periodic/monthly progress reports.</li> <li>➤ The contractor shall report to WASH specialist at country office for any miscommunications either with beneficiaries or the government representative staff/supervision committee.</li> <li>➤ The contractor shall follow up and submit the <b>work completion certificates</b> approved by UNICEF WASH staff and Baghdad Sewerage Administration.</li> <li>➤ UNICEF shall conduct regular performance evaluation throughout the contract, and the final evaluation at the closure of the contract.</li> </ul>
<b>6 Duration</b>	<ul style="list-style-type: none"> <li>➤ The contractor shall commence the contract works within a <b>maximum period (5) working days from the site handover</b>. Strong justifications must be submitted if fail to start within this limited period.</li> <li>➤ Site handing over should be conducted and completed in coordination with UNICEF/supervision committee within max <b>(5 working days)</b> after signing the contract and work to start immediately, Strong justifications must be submitted if fail to start within this limited period.</li> <li>➤ The duration of the project should not exceed <b>180 calendar</b> days starting from the date of work commencement.</li> <li>➤ The contractor must submit the invoices as per the assigned delivery dates. Notification of extension or changes of the contract expiry date will be approved by UNICEF-WASH team only.</li> </ul>
<b>7 Administrative issues</b>	<p>For site visit please coordinate with Eng. Hussein Al Azzawi/WASH Specialist, (<a href="mailto:halazzawi@unicef.org">halazzawi@unicef.org</a>) and Eng. Kareem Al Bakhati (<a href="mailto:kaziz@unicef.org">kaziz@unicef.org</a>) for the project's location</p>
<b>8 Payment Schedule</b>	<p>UNICEF shall make payments <b>in US Dollars</b> through electronic bank transfer. The contractor shall provide UNICEF with details of bank account in Iraq.</p> <ul style="list-style-type: none"> <li>➤ There will be a maximum of 1 payment after completion of 100% of overall works as specified in the BOQs</li> <li>➤ Payments <b>within 30 days of receipt of the contract's invoice(s)</b> for the completed documentation which should be certified by UNICEF and the assigned committees.</li> <li>➤ Payment shall be based on only <b>fully completed activities, reports, tasks</b> and deliverables.</li> <li>➤ If the contract fails to complete the works within the time prescribed, then the contractor shall be fined for each day delay an amount of money as liquidated damages of 0.5 % (one-half of one percent) of the value of the contract per day of delay, up to a maximum of 10% of the value. Without prejudice to any other method of recovery, UNICEF may deduct the number of such damages from any moneys in its hands due or which may become due to the contractor. The payment or deduction of such damages shall not relieve the contractor from his obligation to complete the works or from any other of his obligations and liabilities under the contract.</li> </ul>
<b>9 Project management</b>	<p>The project will be managed by UNICEF WASH team at Country Office. All matters pertaining to the contract regarding this project should be referred to the below focal persons:</p> <ul style="list-style-type: none"> <li>• Eng. Hussein Al Azzawi, Email: <a href="mailto:halazzawi@unicef.org">halazzawi@unicef.org</a>, cell phone: 07801964525 (WASH country office).</li> </ul>

	<ul style="list-style-type: none"> <li>• Ali Al Agha, cell phone: 07809131568 (Supply section in Baghdad). <ul style="list-style-type: none"> <li>➤ The implementation of the project must be in coordination with (UNICEF and local authorities).</li> </ul> </li> </ul>
<b>Payment Schedule</b>	<p>Payments shall be made to the contractor in instalments upon accomplishment of the deliverables and as follows:</p> <ul style="list-style-type: none"> <li>• First Payment: 30% of contract value upon completion of 30% of works;</li> <li>• Second Payment: 30% of the contract value upon completion of 60% of works</li> <li>• Third Payment: 30% of the contract value upon completion of 100% of works</li> <li>• Warranty Payment: 10% of the total contract value upon completion of warranty period (6 months) and the issuance of final handing over by the formulated handing over committee embedded a minute of handing over enclose with cover letter. Warranty period will include training of (6) technical local staff identified and assigned by the project manager on operation and maintenance.</li> </ul> <p>UNICEF shall make payments in US\$ Dollars through bank transfer modality only: the contractor shall provide UNICEF with details of bank account</p>

<p><b>Any other information</b></p>	<p>If the contractor fails to complete the works within the time prescribed with in Terms of Reference, hereof or extended time (approved by UNICEF), UNICEF shall have the right to deduct from any payment due to the Contractor the amount of one tenth of a per cent (0.1 %) of the Contract Price per day of delay up to a maximum of ten per cent (10%) of the Contract Price. These liquidated damages shall not relieve the contractor of his obligations and/ or responsibilities that he may have under the contract.</p> <ul style="list-style-type: none"> <li>• If the delays exceed 10 days over the total time determined within this ToR, UNICEF has the right to terminate the contract if not extended by UNICEF after submission of eligible delay causes report by supervising committee of the project. The contractor will be totally responsible for all damages caused by the delay and UNICEF will be not responsible of any legal, political, economic, humanitarian, environmental losses might be occurred as result of delays in implementation and contract cancelation including any compensations to the those who may be affected.</li> <li>• Tenderers shall have previously executed in a satisfactory manner works of a similar character and magnitude to those for which they are tendering and shall supply evidence to UNICEF to this effect in a letter of capacity accompanying their tender in order that UNICEF may be satisfied that the tenderers are technically and financially capable of executing the proposed works. The evidence submitted shall contain the following information: <ul style="list-style-type: none"> <li>• Nature of the works previously executed.</li> <li>• Employing authorities and the supervising engineers.</li> <li>• Value of the various contracts.</li> <li>• Locations of implemented works.</li> <li>• Dates when they were implemented.</li> <li>• Names of engineers and technicians to be employed for carrying out the proposed works together with their experience and CVs.</li> <li>• Details of the special equipment in his possession for carrying out the proposed works.</li> <li>• Any other information the tender may present as evidence for his capability.</li> </ul> </li> <li>• Each tenderer shall submit with his tender details of other contracts awarded to him at the time of submission of the tender and shall indicate the commencement and completion dates of each contract.</li> <li>• It is not permissible for employees of official or semi-official government departments to participate directly or indirectly in the tender.</li> <li>• UNICEF shall make any variation in the form of quality or quantity of the works that may in its opinion be necessary and for that purpose or if for any other reason, it shall have the power to order the contractor to do and the contractor shall do any of the following: <ul style="list-style-type: none"> <li>• Increase or decrease the quantity of any works included in the contract.</li> <li>• Omit any work included in the contract.</li> <li>• Change the character or quality or kind of any work included in the contract.</li> <li>• Execute additional work of any kind necessary for the completion of the works, hence, adjustment shall be applied on BOQs and endorsed by formulated supervising committee and UNICEF.</li> <li>• No such variation shall be made by the contractor without an order in writing by UNICEF who shall determine the amount (if any) to be added to or deducted from the sum named in the tender in respect of any extra or additional work done or work omitted by its order. All such work shall be valued as follows:</li> </ul> </li> </ul>
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- Where there are rates for comparable work in the bills of quantities such rates are to be used.
- Where no such comparable rates are available from the bills of quantities UNICEF shall determine such rates as it considers fair and reasonable, due allowance shall be made for the market value of articles purchased, the intricacy and the location of the work involved and the current value of similar work in other contracts.
- Should the contractor fail to fulfil any of his obligations under the contract, UNICEF may in the absence of any other remedy provided under the terms of the contract and after giving the contractor seven-days' notice in writing of its intention so to do cause such obligations to be carried out by other persons or contractors and deduct the costs incurred from the money due or payable to the contractor or UNICEF may recover them as a debt from the contractor and in such case, UNICEF shall certify the reasonable costs incurred.
- There will be no variation in the contract price because of any variation in the costs of materials for permanent or temporary works or of consumable stores fuel or power or in the rates of wages or allowances payable to or in respect of labour or as a result of any changes in the labor employment conditions or as a result of the introduction or operation of any law statute or order.
- The contractor shall submit samples of the materials used in the project to the supervisor engineer from the supervising committee and UNICEF for approval prior using them in works. The supervising committee may reject any material that does not comply with the required specifications, in which case the contractor without any extra cost should replace the failed materials. The site engineer can ask for any test to ensure the quality of the material used and work. Only approved materials and workmanship should be used.
- The Bills of Quantities shall be priced and totalled in U\$ Dollars. The tenderer shall make sure that all clauses are priced, and the calculations are accurate. The tenderer will bear responsibility for the nonprice clauses and inaccurate calculations in the submitted offer.

<b>Evaluation process and methods</b>	<b>4.1 Initial Technical Evaluation Pass/Fill approach:</b>		
	<b>MANDATORY REQUIREMENTS</b>	<b>SUPPORTING DOCUMENTS</b>	<b>SCORE</b>
	1- Lead bidder is a legal entity regulated and licensed in Iraq	A copy of the certificate of incorporation (i.e. company legal registration) or equivalent document verifying legal status/capacity in Iraq. The contractor to submit a valid contractor classification card. International companies are not excluded provided by to be registered in Iraq.	Pass / Fail
	2- The bidder shall submit evidence of implementing similar projects	List of similar projects on treatment of medical waste	Pass / Fail
	3- Bidder must be registered in UNGM through the link: <a href="https://www.ungm.org/">https://www.ungm.org/</a>	Supporting documents: the bidder must provide UNGM number.	Pass/ Fail
<p><b>4.2 Scoring Technical Evaluation:</b></p> <p>The Bid shall be evaluated based on technical and financial criteria. The ratio weight between technical and financial criteria is <b>(60:40)</b>. <b>Please refer to Annex A (Technical evaluation criteria)</b></p> <p><b>a. Technical Evaluation:</b></p> <ul style="list-style-type: none"> <li>- The Bid shall be technically evaluated as below:</li> <li>- The passing score of the technical criteria is 40 out of 60. See the criteria on annex below.</li> </ul> <p><b>b. Financial Evaluation:</b></p> <ul style="list-style-type: none"> <li>- The bidder will be financially scored based on formula below:</li> </ul> <p><b>Bidder (A) = (Maximum score for price proposal (40 points) x Price of lowest priced proposal among technically passed bidders)/Price of proposal (A)</b></p> <p><b>c.</b> The total weight of the bidder will be the <b>cumulative of the two above formulas</b> (Technical and Financial).</p> <p>Below are the selection criteria to be used in Bid Evaluation:</p>			

**ANNEX-A:** TECHNICAL EVALUATION

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All BIDs will be technically evaluated according to below criteria, considering;

No.	Criteria	Weight
	<b>Company and organizational profile</b>	<b>20</b>
(i)	Company background; years in business in related assignment being sourced, financial strength, accreditations on matters such as quality control. Registration documents of the company is required	5
	Experience in managing similar projects; client portfolios with evidence in the form of recommendation letters from clients demonstrating work completed and project outcome.	11
	Experience with working with multiple stakeholders in a project particularly Government and International organisations	4
(ii)	<b>Proposed work plan and approach</b>	<b>20</b>
	Extent of understanding of the project requirements (brochures for the exact units required by UNICEF)	7
	Practicality of the proposed methodology relative to the context of the service and in line with the standards specifications presented and in compliance with the proposed technical standards including ISO standards. The Technical specifications and conditions required in Annex 1 shall be considered	4
	Risk assessment and mitigation strategies integrated into the service	4
	Appropriateness of the implementation schedule to the project timelines and project quality assurance measures to ensure successful implementation	5
(vi)	<b>Company Key Staff</b>	<b>20</b>
	Bidder is authorized (officially) and have certificate from the global manufacturing companies of this particular kind of technology along with evidence of the technical expertise for the staff	10
	Appropriateness of the mix of expertise/skills of team members, including providing C.Vs for each team member	6
	Evidence of Key managerial skills and cultural knowledge of the individual team members	4
	<b>Total</b>	<b>60</b>

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|--|---|
|  | <p>1- Minimum passing score should be <b>40 out of 60 of the below criteria weights</b>.</p> <p>2- All bidders are required to submit <b>enough evidence</b> of the proof of skills/expertise and their capacity and capability to execute the assignment. All documents related to below should be sent with the fully filled Vendor Profile Form.</p> <p>1- Submitted files must be titled/named with the same item titles below. UNICEF will not be liable for any errors in evaluation, if the documents are not in order.</p> <p>Below table represent the selection criteria shall be used in Bid Evaluation:</p> |
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**Wastewater Treatment Standards<sup>ii</sup>**

The following table represents Iraq's treated wastewater standards:

Component	Unit	Standard
Color	Mg/L	Normal
Temperature	Mg/L	-
Suspended solid	Mg/L	-
PH	Mg/L	6.5 – 6.8
Dissolved Oxygen	Mg/L	More than 5
B.O.D.5	Mg/L	Less than 3
C.O.D. (Cr207method)	Mg/L	-
Cyanide CN -	Mg/L	0.02
Fluoride F -	Mg/L	0.02 or more as naturally present
Free chlorine	Mg/L	Trace
Chloride	Mg/L	200 or more as naturally present
Phenol	Mg/L	0.005
Sulfate	Mg/L	200 or more as naturally present
Nitrate (No3)	Mg/L	15
Phosphate (Po4)	Mg/L	0.4
Ammonium (NH4)	Mg/L	1
DDT	Mg/L	N.L.
Lead (pb)	Mg/L	0.05
Arsenic AS	Mg/L	0.05
Copper Cu	Mg/L	0.05
Nickel Ni	Mg/L	0.1
Selenium Se	Mg/L	0.01
Mercury Hg	Mg/L	0.001
Cadmium Cd	Mg/L	0.005
Zine Zn	Mg/L	0.5
Chromium Cr	Mg/L	0.05
Aluminum AL	Mg/L	0.1
Barium Ba	Mg/L	1
Boron B	Mg/L	1
Cobalt Co	Mg/L	0.05
Iron Fe	Mg/L	0.3
Manganese Mn	Mg/L	0.1
Silver Ag	Mg/L	0.01

**Bassam Al Bayati**

**WASH Officer**

**11 April 2022**

**Hussein Al Azzawi**

**WASH Specialist**

**11 April 2022**

**Dr. Ali Al Khateeb**

**WASH Chief**

**11 April 2022**

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**OIC Dep. Rep  
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