**Republic of Yemen**

**Ministry of water and environment**

**Urban Water Supply and Sanitation Project**

**PMU-ADEN**

# UNITED NATIONS OFFICE FOR PROJECT SERVICES (UNOPS)

# YEMEN INTEGRATED URBAN SERVICES EMERGENCY PROJECT II

# (YIUSEP II AF)

## Environmental and Social Management Plan (ESMP)

**For**

**Establishing an Elevated Tank in the Lakamat Aldoky Area, with Transmission and Pipe Line Extending from Hager wells, and Complete connection of Water Network in Lakamat Aldoky and Habeel Alsouq with Connect Transmission Pipe Lines, Al-Dhale' Governorate.**

**21 February, 2024**

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## Abbreviations

| | |
|---|---|
| BOQ | Bill of Quantities |
| CE | European Union's (EU) mandatory conformity |
| CoC | Code of Conduct |
| CPR | Cardiopulmonary resuscitation |
| DIN | Deutsches Institut für Normung - German institute for standardization |
| ESF | Environmental and Social Framework of the World Bank |
| ESHS | Environment, Social (including labor), Health, and Safety |
| ESMF | Environmental and Social Management Framework |
| ESMP | Environmental and Social Management Plan |
| ESS | Environmental and Social Standard |
| FMFA | Financial Management Framework Agreement |
| FCV | Fragility, Conflict and Violence |
| GBV | Gender Based Violence |
| GHS | General Health and Safety guidelines |
| GIIP | Good International Industry Practice |
| GM | Grievance Mechanism |
| GM | Grievance Mechanism |
| GSM | Global System for Mobile Communication |
| IDA | International Development Association |
| IDP | Internally Displace Person |
| L & FS | Life and fire safety |
| LMP | Labor Management Procedures |
| MSDS | Material Safety Data Sheets |
| OHS | Occupational health and safety. |
| PAP | Project Affected People |
| PCB | Polychlorinated biphenyls |
| PPE | Personal protective equipment |
| PCV | Polyvinyl Chloride |
| RF | Resettlement Framework |
| ROY | Republic of Yemen |
| SEA | Sexual Exploitation and Abuse |
| SH | Sexual Harassment |
| SEP | Stakeholder Engagement Plan |
| SMP | Security Management Plan |
| SPD | Surge Protector Device |
| SRPC | Sulphate Resisting Portland Cement |
| SWSLC | Sa'adah Water and Sanitation Local Corporation. |
| TPM | Third Party Monitoring |
| TUV | Technischer Überwachungsverein (Association for Technical Inspection) |
| UL | Underwriters' Laboratories |
| UNOPS | United Nations Office for Project Services |
| XLPE | Cross linked polyethylene cable. |
| YIUSEP II | Second Yemen Integrated Urban Services Emergency Project |

## Summary Sheet

Yemen Integrated Urban Services Emergency Project (YIUSEP II AF). Component 1 Urban Service Restoration

Sub-Component 1.2 Urban Water and Sanitation.

| | |
|---|---|
| **Sub-Project Name** | Constructing an elevated tank with a capacity of 125 m3 in Lakamat Aldoky area with a pumping pipeline from Hajar Wells to the source villages |
| **Sub-Project Location** | Al- Dhalea Governorate |
| **Implementing Partner** | Implemented by UNOPS UWS/PMU Partner in Aden thorough local contractor |
| **Risk level** | Moderate |
| **Date of the field visit** | September 2022 |
| **Date of consultation** | September 2022 |
| **Implementation period** | 6 months |
| **Estimated ESMP cost** | 6,400USD |
| **Estimated Start/Completion Date** | February 2024 to July 2024 |
| **Observations/Comments:** | Indicated below |
| **Signature of ESSO:** | |
| **Date:** | |

# 1. Introduction

The Environmental and Social Management Plan (ESMP) for the construction of water Establishing an Elevated Tank in the Lakamat Aldoky Area, Al Dhalea City under component 1 of YIUSEP II was prepared in accordance with the Environmental and Social Management Framework (ESMF) for YIUSEP II .The ESMF was updated for YIUSEP II-AF and disclosed on November 2021, link provided https://ye.unopsmr.org/wp-content/uploads/2021/11/Final-ESMF-YIUSEP-II-AF.docx.pdf

UNOPS has in parallel prepared a Labor Management Procedures (LMP) to meet the requirements of ESS2, as well as GBV/SEA/SH Plan and a Security Management Plan (SMP) to meet the requirements of ESS4, and a Resettlement Framework (RF) to meet the requirements of ESS5, and a Stakeholder Engagement Plan SEP, to meet the requirements of ESS10

The only relevant ESSs for these subprojects are ESS1, ESS2, ESS3, ESS4 and ESS10. As a result, this subproject will follow the requirements of the prepared LMP for labor working conditions and OHS (Occupational Health and safety), the GBV action plan for any GBV issues, SEP for stakeholder consultation, and the SMP to manage and potential security risks.

The subproject involves civil works which means that the scope of work requires applying ESS1 (Assessment and Management of Environmental and Social Risks and Impacts). The work will involve contractors and workers which requires applying ESS2 (Labor and Working Conditions). The work activities will generate waste which leads to the application of ESS3 (Resource Efficiency and Pollution Prevention and Management). Additionally, the activities and equipment may increase community exposure to risks and impacts, thus ESS4 (Community health and safety) should be applied to address the health and safety risks and impacts on the community. Furthermore, open and transparent engagement with the subproject's stakeholder is an essential element of good international practices, therefore, ESS10 (Stakeholder Engagement and Information Disclosure) will be applied to ensure the environmental and social sustainability of the subprojects, enhance subprojects acceptance and to make a significant contribution to successful design and implementation.

The ESS5 is not relevant because the subproject does not include any land acquisition, restrictions on land use, or involuntary resettlement; also the ESS6 is not relevant because the subproject does not include and will not impact any kind of biodiversity or living natural resources; in addition the ESS7, ESS8, and ESS9 are not relevant because there are no indigenous peoples, cultural heritage in the subprojects' area, and the sub-project will not involve any financial intermediaries that may be affected and have relationships in the subproject. As a result, these subprojects must follow the requirements of the LMP for labor working conditions and OHS, the GBV action plan for any GBV issues, and SEP for consultation and information disclosure. The subproject doesn't involve the use of security or military personnel during the construction and operation, so SMP isn't required in this subproject.

The overall objective of YIUSEP II is to restore access to critical urban services of selected cities within the Republic of Yemen.

It is worth mentioning that this ESMP will be distributed to stakeholders and published on UNOPS and WB websites.

The overall objective of YIUSEP II is to restore access to critical urban services of selected cities within the Republic of Yemen.

**YIUSEP II Components**

Building on the success of YIUSEP I, the Project will be financed through an IDA grant for the restoration of critical urban infrastructure damaged by the conflict and recent flooding (Component 1), whilst strengthening the capacity of local institutions to provide continuity and sustainability of urban service delivery (Component 2). The selection of sub projects under IUSEP-II is based on technical and sustainability criteria, including: (a) ability to address the unmet needs in targeted cities; (b) impact on COVID-19 response; (c) potential to build resilience to urban flooding; (d) feasibility (considering access to goods and supply, conflict, capacities) and potential of integration with other activities; and (e) potential for local job creation. A core Project principle is to prioritize investments which offer the greatest value for money and maximize the number of beneficiaries, including vulnerable groups. Based on the lessons learned from YIUSEP I, this is best achieved through a spatially targeted and integrated approach to investments, with multispectral coordination and participatory identification and planning of interventions. To retain flexibility and adaptability, subproject selection occurred on an incremental basis to respond to changing needs on the ground. Notwithstanding the above, fair distribution of resources across the different cities and sectors during the two years of Project implementation, is also a key consideration in Project design.

YIUSEP II AF consists of the following components:

- **Component 1: Service Restoration.**

This Component will finance the preparation and implementation of infrastructure investments.

- Sub-Component 1.1: Tertiary Municipal Services and Solid Waste Management
- Sub-Component 1.2: Urban Water and Sanitation
- Sub-Component 1.3: Urban Roads
- Sub-Component 1.4: Energy for Critical Services

- **Component 2: Implementation Support and Capacity Development**

- Sub-Component 2.1: Project Implementation and Management Support
- Sub-Component 2.2: Enhanced Capacity Building
- Sub-Component 2.3: Third Party Monitoring

- **Component 3: Contingent Emergency Response**

- Providing immediate response to an Eligible Crisis of Emergency, as needed.

The ESMP focuses on a project under subcomponent 1.2 urban water and sanitation detailed below

**Subcomponent 1.2 Urban Water and Sanitation**

This subcomponent aims to support the COVID-19 response and build gender- related resilience by restoring access to clean water and sanitation. This subcomponent will finance small- to medium-scale goods and infrastructure works, including replacing pumps and repairing pipes, as well as critical supplies (such as fuel) to restore water and sanitation service delivery at the city level. The cities of Lahij, Taiz, Amran, Sana'a, Dhamar, Al Dhale'e, Al Mukalla and Al Hodeida will benefit from support to urban water supply, whilst investments in wastewater and sanitation are proposed for Aden, Al Mukalla, and Al Hodeida. To support public health improvements.

### Sub-Project Objective

The objective of this sub-project is to support the local corporation) Local Corporation for Water and Sanitation in Al Dhalea) to have a water supply system as the following:

. A reinforced concrete elevated distribution tank with a capacity of 140 m3 supplying the regions of Lakamat Aldoky, Habeel Rumaymah, Habeel Al-Dabbah, Asqa, and Al-Shaghadder.

A medium pressure of (GI) galvanized iron pumping line with a diameter of 6 inches from the pumping station to the village of Lakamat Aldoky and Al-Khareba. In addition to a diameter of 4 inches of (GI) galvanized iron from Lakamat Aldoky to the elevated concrete tank, and the interlocking of the galvanized pumping line of 6 inches in the polyethylene line, with a 110 mm polyethylene in Al-Khareba.

Environmental Classification of the Project:

The sub-project is classified as moderate environment and social risk level because the potential impact is reversible and can be mitigated, therefore an ESMP will be prepared to meet the World Bank Environment and Social Framework ESF.

# 2. Sub-Project Justification

Due to the on-going conflict which has negative impact on the access to water and adequate sanitation services for the Yemeni people. The people are in urgent need of water, sanitation and hygiene assistance, access to clean and safe drinking water remains crucial for the good health and survival of children and their caregivers

The vital challenge that has been encountered by the local corporation is the unavailability of potable water supply to the villages and neighborhoods of AL-Dhale' city, as well as the current beneficiaries from the current source of water.

The relevant Yemeni Standards and Characteristics of drinking water and treated wastewater (Yemen Water Law (Law 33/2002, updated by Law 41/2006)[1] link provided. (https://www.yemenwater.org/s/Waterlawamendments1.pdf)).

In fact, the local institution has recently been unable to reach the potentials to provide safe drinking water in the targeted area, and therefore the urgent need is to provide safe drinking water to the villages and neighborhoods of the city of AL-Dhale' as well as the current beneficiaries of the current water source. Water quality sampling is carried out at least once a month. Quality of water is reported to be good, except during the rainy season where there are challenges to control and manage turbidity. The water during the rainy season is being cleaned for the consumption purposes.

[1] https://www.yemenwater.org/s/Waterlawamendments1.pdf)

## 2.1 Current Situation:

### Water source

The depth to the groundwater in existing deep-water wells, varies from about 600 m on the eastern side. To more than 1100 m on the western side of the basin.

The LWSC will conduct regular tests to check the quality of the water from the tank to the users to ensure it is not contaminated.

The subproject activities do not include changing the current well pumps abstraction rate, whose productivity was estimated at a rate of (15) liter/Second. After calculating the recharge rate vs. abstraction rate in the basin through the pumping operation of the wells in the experiment, it was made sure that this intervention will not deplete wells (A field experiment in which a well is pumped at a controlled rate and water-level response (drawdown) is measured in one (Attached the pumping test report) ). . In general, the WLSC and NWRA (National Water Resources Authority) will carry out regular water level tests during the operational phase to check if groundwater will not be depleted from the abstraction, as they are the competent authorities in this sector.

The average depth of groundwater in the subproject area is 500meters, and there is no surface water. The wells' average depth is 600 meters.

An official letter was added (in annexes) stating that the project will not cause Ground Water risks.

**Table 1: Overview of the current water source components.**

| # | Well Number | Depth (M) | Pump Type | Production | Well condition |
|---|---|---|---|---|---|
| 1 | 5 | 400 | Submersible | 3 L/S | Working |
| 2 | 7 | 600 | Submersible | 5 L/S | Working |

### Pumping lines

The current pumping lines have different diameters. The pipeline connecting the wells with the collection tank at the Bajah pumping station and an electric pumping unit has a diameter of 6-4 inches a length of 940 m

There is also a concrete base room for the generator, an electrical network, a 10-inch ductile pump line with a length of 5 km, and polyethylene pipeline with a diameter of 250 mm, a length of 6 km, which transports water from the collection tank at the Bajah pumping station to the Distribution Tank city center. The Water passes through several stages of re-pumping, and a pumping line with a diameter of 110 mm polyethylene, a length of 750 meters, branches off to Al-Khareba tank (distribution tank) to feed Lakamat Aldoky

Figure 1: Wells no. 5, 6, and 7 from left to right.

**Water storage**

The existing water storage system consists of the following:

- Concrete tank with a capacity of 500 $m^3$.
- Stone tank with a capacity of 200 $m^3$.

Table 2: Overview of the current water storage components.

| # | Location | Capacity | Construction Year | Type |
|---|---|---|---|---|
| 1 | Bajah Station | 500 $m^3$ | 2005 | Ground reinforced Concrete |
| 2 | Al-Khareba Village | 200 $m^3$ | 2010 | Stones |

Figure 2: Collection tank, Bajah - re-pumping chamber (Left) and Distribution Tank of Al-Khareba – Source Village (Right).

## 2.2 Sub-Project Objective

The objective of this sub-project is to support the local corporation in to have a water supply system as the following:

- Construct a new 125 $m^3$ reinforced concrete elevated distribution tank (15 meter height) in Lakamat Al Doky that serves the communities of Lakamat Aldoky, Habeel Rumaymah, Habeel Al-Dabbah, Asqa, and Al-Shaghadder.
- Constructing a new medium pressure of (GI) galvanized iron pumping line with a diameter of 6 & 4 inches and 5,800 &980 meter length, respectively,`with a maximum excavation depth of 2 meters from the existing Bajah pumping station to the village of Lakamat Aldoky‘s new tank.
- Rehabilitate an existing line from the pumping station to Al Khareba Tank with a polyethylene pipes of 90 mm dia and total length 1460.

## 2.3 Planned activities:

The proposed activities will be:

- Constructing a new pimping line medium pressure of (GI) galvanized iron pumping line with a diameter of 6 & 4 inches and5,800 &980 meter length, respectively, with a maximum excavation depth of 2 meters from the existing Bajah pumping station to the village of Lakamat Aldoky‘s new tank.
- The Connecting of current tank belonging to the project Bajah tank with the new transmission line 5800m+980mactivity above) to the proposed elevated tank of 125m3capacity.
- Establishing a new distribution tank for the areas of Lakamat Aldoky, Habeel Rumaymah, Habeel Al-Dabbah, Al-Shaghadder, and Asaqa areas, with a capacity of a 125 m3 elevated concrete tank and the height of this tank is (3 meters depth and 15 meters total height above the ground).
- Rehabilitate an existing line from the pumping station to Al Khareba Tank with a polyethylene pipes of 90 mm dia and total length 1460.
- The existing line is connected with a diameter of 110 mm polyethylene, as well as a 4-inch diameter of galvanized iron pump line, medium pressure (GI) from Lakamat Aldoky area to the reservoirs. The proposed water networks rehabilitation will directly improve the water supplies to approximately 7,223 people.

The work will be carried out in portions, the maximum pipeline route length under rehabilitation activities will not exceed 6500m. The rehabilitation of civil work which includes the excavations will be executed with the installation of the new pipes in the same day for every section to avoid any access restriction issues. It will pass in the main road of the city it will need asphalt cut for civil work activities. Around the intervention area, there are 43 business shops, 921 houses, 2 schools, and 1 health center.

The water network that will be constructed and rehabilitated ,include the following :

- Removing the old pipes and their fittings and moving them from the site to be stored in a safe storage area, and Replace them with new UPVC pipes.
- Supply and transportation of new pipes and fittings to site for installation.
- Site leveling of the difference between finished ground level and original ground level

- The excavated trenches will be back filled with same soil without the rocks to avoid damaging the new pipes material, the excavation disposal soil will be backfilled to the maximum excavation depth (2 meters)
- Temporary removing surfaces of paved roads as required.
- Laying and jointing pipes and fittings.
- Earth work supports or shoring of trenches (for water supply) wherever necessary.
- The provision and laying of bedding material .
- Construct valves chambers at location according design drawing.
- Supply and installation of Ductile Iron valves and fittings inside all valve chambers
- Testing of the pipeline.
- The provision and placing of suitable material for backfilling of pipe trench .
- Backfilling shall be with imported clean suitable material (soil obtained from local market).
- Compaction in layers.
- Re-testing of pipelines after complete backfilling as per Specifications.
- Installation of House Connections.
- Rehabilitation of all surfaces of paved roads. The stones will be obtained from the market, and the stone supplier will not use ecologically sensitive zones or zones of community conflict, as well as have a proper OHS for working in quarries and will not use child labor.

The new UPVC pipes dimension: Scope of Work for the Lakamat Aldoky tank

The scope of work to implementation of elevated Water (15m above ground) with tank capacity of 125 m3 – 3 m height, and connect to the extension of existing water supply networks

The reservoir site will be leveled with shovels and mattocks, and waste will be carried to an authorized landfill. In addition to workers, excavators will be used for excavation. The concrete mixer will be used to mix the various components of the concrete (cement, sand, gravel, and water). The external components will be plastered and painted, while the internal parts of the tank will be painted using epoxy. Will be used is a type of epoxy resin that is safe for use with food and drinking water. Workers will use scaffolds to complete the woodworking and blacksmithing tasks, as well as put concrete into the tank's various sections. A water meter will be installed in the tank to measure the amount of water that flows through it.

The work shall also include all needed equipment (crane, trucks, tools ... etc.) to complete the works as required. All works should be done in close coordination with client (WSLC) and the engineer.

All the activities in the subproject will be done according to the technical specifications and OHSSE regulations (lifting safe work practices, working in high space, confined space, welding, WB guidelines, and UNOPS HSSE System).

A pump lifting device will be used to install a pump for the tank.

The old pump will be stored safely in the facility warehouse.

The scope of work includes the following activities:

| NO | Description | Unit | QTY |
|---|---|---|---|
| 1 | Leveling the work site by lifting all the waste out of the work site, breaking the old concrete and doing everything necessary to prepare the work site to build the tank | LS | 1 |
| 2 | Digging the foundations of the tank according to the attached drawings and measurements attached with a depth of not less than 2 meters. The work includes backfilling with suitable soil from the excavation product or with imported soil, provided that the backfill is done on the layers, each layer is 30 cm by spraying and compacting the soil according to the directions and instructions of the supervising engineer. | M3 | 63.48 |
| 3 | Ordinary concrete for floors of 15 cm thickness, with a base of broken stones (soling) under it, with a thickness of 10 cm, with a resistance of not less than 200 kg / cm2. The cement quantity shall not be less than 300 kg/m3 according to the drawings and specifications. | M3 | 8 |
| 4 | Reinforced concrete for bases, foundations, necks, ground beams, bridges and tank using cement resistant to the salt of not less than 350 kg / cm2. The quantity of cement shall not exceed 400 kg / m3 (Wooding, cutting and placing iron , casting, shaking concrete with mechanical vibrator , according to drawings and descriptions | M3 | 96.17 |
| 5 | Supplying and installing of water sealant (plastic slide) width of 30 cm and thickness of 3 cm. The installation is along the floor of the tank to prevent water leakage. The work includes installing and welding thermal with thermal iron, according to the principles of work, under the supervision of the supervisor | ML | 31.6 |
| 6 | Plastering the walls with salt resistant cement , including splatter, basic layer and final layer of concrete cement with a ratio of 1: 3 with spraying three times a day, in addition to Making a mesh with a thickness of 1 mm to connect at the intersection and confluence of the walls and wherever necessary, according to the drawings, specifications and directives of the supervising engineer | M2 | 487 |
| 7 | Internal plastering /coating of the water tank and floor tank using cement resistant to salts and sika material, including splatter, basic layer and final layer of concrete cement with a ratio of 1: 3 as well as spraying three times a day, according to drawings, specifications and instructions of the supervisor. | M2 | 179 |
| 8 | Painting of the external walls or in a location determined by the drawings that is moisture proof consisting of a face and three sides with the paste and stander of desired color, according to the manufacturer's instructions. | M2 | 487 |

| NO | Description | Unit | QTY |
|---|---|---|---|
| 9 | Exterior paint work (grainy plastic):<br>Supplying and executing granular plastic sheeting paint for external walls, and where necessary. It is implemented using an air pressure compressor with insulating paint that is resistant to moisture and weather factors for the outer walls. The spraying is regular with heavy spraying, and it is also carried out on a base layer and an insulating layer that is resistant to weather factors in order to maintain the appropriate color. The price includes preparing the walls from any crusts or cracks, as the engineer receives the work before starting the plastic painting work. The work is carried out according to the instructions of the supervising engineer. " | M2 | 487 |
| 10 | Supplying and installing 3 inch diameter ductile, 16 bar according to the specifications. | No. | 2 |
| 11 | Supplying and installing 4 inch diameter ductile , 16 bar according to the specification | No. | 1 |
| 12 | Supplying and installing Elbow 90º 3 Inch. | No. | 4 |
| 13 | Supplying and installing galvanized steel pipes, medium pressure, diameter 3 inches to ventilate the tank with an elbow and an insect protection net according to the drawings | No. | 4 |
| 14 | Supplying and installing 3 inch diameter galvanized iron pipes according to the British specifications for washing and surplus water. | ML | 14 |
| 15 | Supplying and installing 4 inch diameter galvanized iron pipes according to the British specifications for outlet of water | ML | 18 |
| 16 | Supplying and installing 4 inch diameter galvanized iron pipes according to the British specifications for inlet of water. | ML | 18 |
| 17 | Supply and installation of a 3 mm granulated iron sheet cover for the tank opening, according to the size shown in the drawings. The work includes painting against rust, three facets with color. | No. | 1 |
| 18 | Building inspection chamber measuring 100 x 100 cm,<br>It was built of deaf block (bardine) with a concrete base, thickness of 20 cm. It is covered inside and out with salt-resistant cement, taking into account the slope, and coated with asphalt and reinforced concrete covers of a 3 mm granulated iron , according to the drawings, specifications and instructions of the supervising engineer. | No | 2 |
| 19 | Supply, installation and installation of a steel staircase with a width of 0.5 meters of H Beam (5 x 16) inches. With pre-fixing of the bolt to the concrete for the staircase, the walkway around the tank and all the beams, posts and granulated iron sheets. The protections are also made on both sides of the stairs and the corridor of the tank in a circular motion. The two sides are also painted with anti-rust paint, and three sides are painted in the desired color. In addition, everything necessary to finish the work is done well and satisfactorily according to the specifications, ANSI / AISC 360-10 drawings and instructions of the supervising engineer. | No | 1 |

| NO | Description | Unit | QTY |
|---|---|---|---|
| 20 | The aluminum ladder is internal to the tank with fixing the ladder and doing everything necessary, according to the drawings and specifications. | No | 1 |
| 21 | Filling the tank thoroughly with clean water for testing in case of non-pumping from the water source as directed by the supervisor | LS | 1 |
| 22 | Supplying and installing of a marble plaque for the project with the size of 80 cm * 1 meters according to the model. All the details are written on it , and put in the tank | No | 1 |

Table 3a: Pipe specifications for the proposed (GI) new construction network.

| Pipe size | | Outer diameter mm | Pipe length m | Thickness | | Pipe weight m/mt |
|---|---|---|---|---|---|---|
| MM | Inch | The maximum | m | The lowest | millimeter | Threaded and supplied with sleeve |
| 100 | 4 | 144.6 | 980 ( new network) | 113.3 | 5 | 12.690 |
| 150 | 6 | 166.1 | 5800 (new network) | 164.1 | 5 | 20.710 |

Table 3b: Pipe specifications for the proposed (PE) rehabilitation network**.**

| Pipe size | | Outer diameter | Pipe length |
|---|---|---|---|
| Mm | Inch | | |
| 90 | 3.5 | 90 | 1460 (rehabilitation) |

List of equipment and machine will be used:

- Excavator
- Crane which will be used for lifting and moving heavy loads and machines such as pipes and fittings.
- Tools for digging in the soil.
- Concrete mixer truck.
- Full set of mechanical works tools.
- Full set of civil works tools.

## 2.4 Location

The project is situated in the water source of Al-Dhale'a city (Al-Hajar Wells), which is in the northwest region and 20 km from the city of Al-Dhale'a with coordinates of (North: Tank Location: 13.808471°, L.S.P: 13.821718°, L.E.P: 13.808471°)- (East: Tank Location: 44.655987°, L.S.P: 44.623832°, L.E.P: 44.655987°)..

**Table 4: Tank Location**

| Location | Coordinates | | City |
|---|---|---|---|
| | N | E | |
| Tank Location: | 13.809601* | 44.656137* | Dhale'a |

Google Map shows location of AL-Dhale' Sub-project area

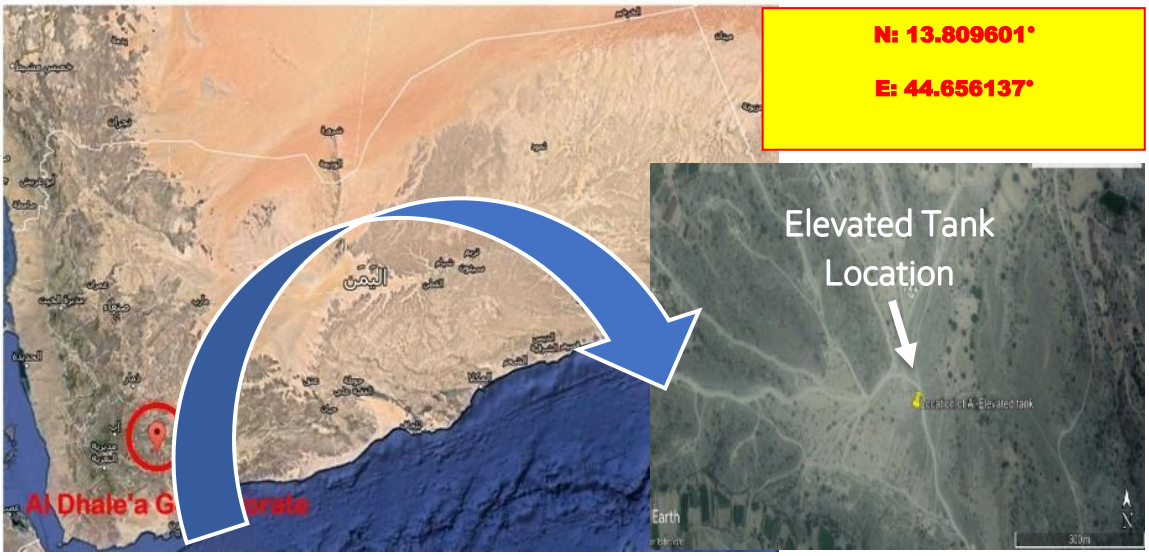


Figure 3: Project Sites (Source: Beneficiary Survey Report)

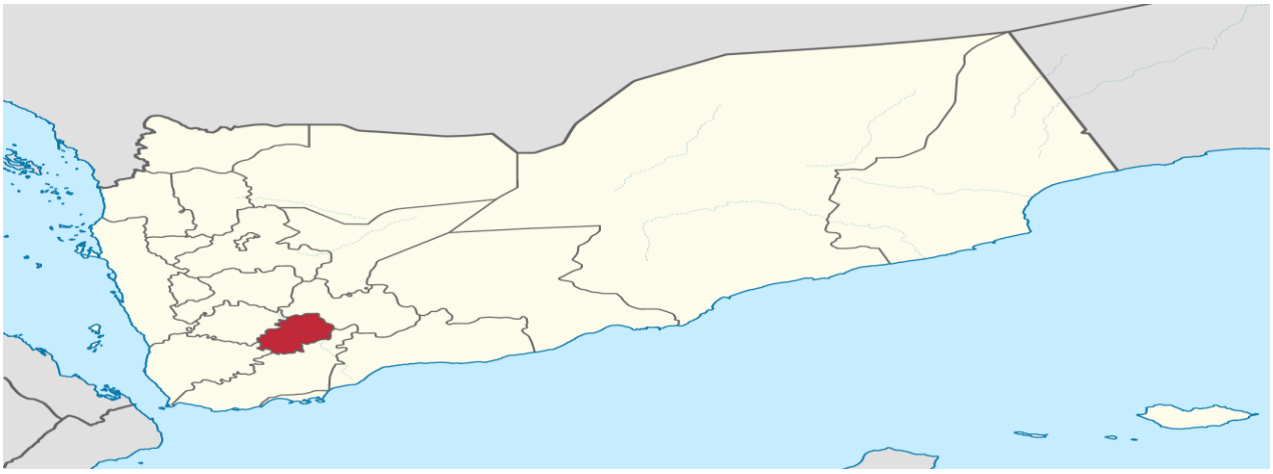

Figure 4: Map of Al-Dhalea governorate indicating the targeted district location.

# 3 Environmental and Social Baseline Data

The governorate of Al-Dhalea is located 245 kilometers south of the capital, Sana'a. It is bounded to the north by the governorate of Al-Bayda, to the east by parts of the governorates of Al-Bayda and Lahj, to the south by parts of the governorates of Lahj and Taiz, and to the west by the governorate of Ibb. Among the nine districts that make up the Governorate of Al-Dhalea are Damt-Qa'tabah, Al-Shuaib, Hajaf, Al-Azariq, Al-Hussein, Al-Dhalea, Cheese, and Al-Hasha. There are 720 000 people living in the 4 098 square kilometer governorate of Al-Dhalea, 344 001 of whom are female and 376 001 males. The typical family has six members. Al-Dhalea was home to 5 551 IDP households and 33 306 IDP individuals as of 2019. Conflict, not a natural disaster, was the primary cause of displacement in Al-Dhalea governorate The water was pumped from the wells to the tanks and then to their house by gravity and due to the presence of beneficiaries away from the tanks and the water pressure that reach to them is light, then women and children have to carry the water from supply points near from the existing tanks, by implementing this sub-project an elevated concrete tank will be built to have enough pressure to reach the beneficiaries' houseAs a result of the light pressures in the water network, the beneficiaries were deprived of meet their water demands, and they turn to water trucks from the private well water supply system to cover their water demands, which is susceptible to pollution, especially during transportation and unloading, and requires time and effort, especially from women and children. In addition, the cost of water in this system is higher than in the public water network (2400 Yemeni riyals per cubic meter, versus 240 Yemeni riyals per cubic meter in the public network. The elevated tank's position, height and capacity were determined to increase water pressure to reach the homes; the average distance between the tank and the beneficiaries' houses is 1,000 meters; The tank' will be filled from the nearby well (existing) and distribute water to the beneficiary's tank by using the existing water network by gravity and the design procedure was completed by a UWSSP engineer**.**

## 3.1 Topography & Geology:

The governorate of Al-Dhale'e is one of the Yemeni governorates established after Yemeni unification in 1990. It is located in the south-central part of the Republic of Yemen and is 250 kilometers from the capital Sana'a. The governorate is divided into nine administrative districts, and the city of Al-Dhale'e is the governorate capital. Al Dhale'e governorate is located in the Sarawat mountain highlands and has relatively low elevations compared with other areas of the mountain range. The basement rocks of the Arabian Peninsula, the Precambrian Shield, are directly visible in parts of Al Dhale'e due to extreme weathering and erosion of mountain tops, which has led to both decreased elevation and expose Precambrian Shield in the region. Minerals such as talc are prolific in Al Dhale'e and are used in industrial production. Hot springs are also found in the governorate[2]

## 3.2 Climate & Meteorology:

Al Dhale'e governorate has three main climates including hot semi-arid climate, hot desert climate and cold semi-arid climate. Average temperatures range from 17.5°C in January and 25.9°C in July. Average annual rainfall measures 469 mm with the lowest amount of rainfall occurring in November and December measuring 7 mm each and the highest amount of rainfall occurring in August with 136 mm. Humidity ranges from 47 percent in June and 66 percent in January. Average annual rainy days are 81 days with 1 day occurring in November and December each and 19 days in August.[3]

[2] https://edepot.wur.nl/493427

[3] https://en.climate-data.org/asia/yemen/ad-dali-governorate-2047/r/july-7/

**Temperature**

In general, the climate of Al-Dhalea Governorate is moderate in summer and cold in winter.

Table 6: Average monthly temperatures in Al-Dhalea throughout the year

| الشهر | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Avg Ann. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Max** | 29 | 29 | 30 | 32 | 33 | 33 | 33 | 33 | 32 | 30 | 28 | 27 | 30.8 |
| **Min** | 11 | 10 | 12 | 15 | 16 | 17 | 13 | 17 | 16 | 12 | 9 | 9 | 13.1 |

## 3.3 Land Use:

Agriculture is the main economic activity for most of the population in the governorate with coffee the most important crop. The governorate also holds some mineral deposits such as talc, which is used to manufacture paper, paints, beauty products, and pesticides, among other things.

## 3.4 Water Resources

Nearly 70 percent of households did not have access to clean drinking water as of 2016/17 a number that has likely increased in recent years. Al-Hajer Water Project supplies water to the residents of the town of Al-Dhalea, but this project has seen long delays, even from the pre-war days. Water supply has been cut and residents are now relying on water tankers for their supply. Recently, a number of wells pumps, and main lines in the city have been rehabilitated, and the local authority is trying to complete the rehabilitation of the distribution network. This effort is being supported by Oxfam and Kuwaiti Relief. As for the sanitation network in the city, it only covers 65% of the residents. Sewage water is collected in a treatment plant. Recently, a plot of land was leased for drainage of surplus flows from the treatment plant. Coordination is ongoing with Mercy Corps in an attempt to address this problem. Irrigation System: Groundwater extraction and runoff irrigation are common in Al Dhale'e. However, water scarcity, falling water tables and increasing fuel costs have impacted the ability of Al Dhale'e's people to access water for irrigation.[4]

## 3.5 Agro ecological Zones & Eco-Regions:

Al Dhale'e falls within the Afrotropical realm and the Southwestern Arabian foothills savanna biome as well as the Desert and Xeric Shrub eco-region. Many habitats in this region are ephemeral, meaning that habitats come-and-go with seasons and weather patterns. For example, water running through wadis can be considered ephemeral and the water is only present when it rains. Communities of animals and plants can also be ephemeral in this region, disappearing when conditions are dry and appearing and thriving when the rain comes. Al-Dhalea region is characterized as the western and central highlands region, which is famous for the cultivation of grain and khat. In these zones sorghum, millet and maize are grown as staple crops while qat is grown as a cash crop and some grains are grown for fodder. Livestock such as sheep, goats and cattle are an important source of livelihoods. Qat is sold locally to traders who distribute it to larger trading centers nationally and in Saudi Arabia.[5]

[4] https://yemenlg.org/governorates/al-dhalea/

[5] https://fews.net/sites/default/files/ye_zonedescriptions_en.pdf

## 3.6 Protected Areas

Protected areas could not be found for this governorate.

## 3.7 Socio-economic

The governorate of Al Dhale'e is 4 098 km2. AL Dhale'e City residents depend on two water distribution systems to meet their water needs, which are the public network water supply system, and water trucks from private wells water supply system. The public network water supply system covers about 60 percent of Al Dhale'e City.

The public network water supply system is managed and operated by AL Dhale'e Water and Sanitation Local Corporation (AWSLC), and this system is characterized by being:

Closed and protected from any external pollutants contaminants.

Saves time and effort to the consumers, especially children and women, because the water supply service reaches to their facility / houses.

Lower water tariff per unit of water

The water is now supplied by this system through pumping water from the wells to the existing distribution tanks and then it is distributed through the water network to beneficiaries by gravity. Where pressures are light in some areas due to their distance from the existing distribution tanks (about 10,000), which requires a long period of time to provide water until they meet their water needs.

The water was pumped from the wells to the tanks and then to their house by gravity and due to the presence of beneficiaries away from the tanks and the water pressure that reach to them is light, then women and children have to carry the water from supply points near from the existing tanks, by implementing this sub-project an elevated concrete tank will be built to have enough pressure to reach the beneficiaries' houses

As a result of the light pressures in the water network, the beneficiaries were deprived of meet their water demands, and they turn to water trucks from the private well water supply system to cover their water demands, which is susceptible to pollution, especially during transportation and unloading, and requires time and effort, especially from women and children. In addition, the cost of water in this system is higher than in the public water network (30000) Yemeni riyals per cubic meter, versus 300Yemeni riyals per cubic meter in the public network). This data was taken during the field visit of the ESSO

Total population is 779 656 as of 2019 (720 000 people as of 2017 with 344 001 female and 376 001 male residents). Average family size is 6 individuals. As of 2019, 33 306 individual IDPs and 5 551 IDP households were located in Al Dhale'e. Almost 100 percent of displacement in Al Dhale'e governorate occurred due to conflict, as opposed to natural disaster.182 An increase in the number of IDPs within the governorate was reported in Al Dhale'e. As of 2019, there were 33 792 individual returnees and 5 632 returnee households in Al Dhale'e. There are no cultural heritage sites in the area. Agriculture is the main economic activity for most of the population in the Project area. Livestock, poultry breeding, and beekeeping are also important economic activities. In addition, artisanal and handicraft production of traditional textiles, ornate glass making, and other traditional crafts remain important for the Project area economy.

According to the 2014 Household Budget Survey, the poverty rate in Al-Dhalea was 59.8%. In light of economic decline, large-scale displacement, and the conflict frontline running through the governorate, this rate has doubtlessly increased significantly during the past few years.

## Population

The total population of the area benefited from this project by the year of 2022 was calculated as 7,223 person.

Table 2: Number of families and population in Al Dhale'a governorate in 2022.

| Village Code | F | M | Population in 2022 | No. of families |
|---|---|---|---|---|
| Lakamat Aldoky | 246 | 243 | 489 | 117 |
| Habeel Asqa | 152 | 130 | 282 | 46 |
| Asqa village | 292 | 170 | 462 | 80 |
| Habeel Ramyma | 182 | 160 | 340 | 73 |
| Habeel Al Dabbah | 371 | 350 | 721 | 130 |
| AL Shaghadder | 380 | 360 | 740 | 110 |
| Al Mazaba | 283 | 250 | 533 | 81 |
| Beer Qais | 192 | 192 | 384 | 78 |
| Al Khareba | 521 | 502 | 1023 | 116 |
| Shab Fage | 393 | 393 | 786 | 116 |
| Habeel Al Sooq | 735 | 728 | 1463 | 198 |
| | 3612 | 3611 | 7223 | 1145 |

### Population growth

Table 4 shows the population growth over the design period. The following criteria were taken into account during the calculation of the population growth:

- The design period is 15 years.
- The population growth rate is 3.2%.

The total population for the design year 2037 is about 11585 people

## Gender

According to the census in 2004, 51.9 percent of the total population is female. It is mostly women who currently spend a lot of their time on collecting water from remote sources. Women largely excluded or underrepresented in WASH decision making processes and structures particularly at higher levels.

- Water situation is critical in all Local Authorities including Al-Dhale' Governorate.
- Socially and culturally ascribed gender roles put the burden of water collection on women and girls.
- Women spending long hours in water queues
- Men sometimes fetch water but mostly when wife is ill or pregnant or when there is a funeral or wedding.
- Men use labour serving technologies such as wheelbarrows, cars
- Because of natural processes of menstruating, sex, pregnancy child birth, and breast feeding women reported that they require more water than men.

## Labors:

Table 5: Expected labors for each sub-project

| # | Labor | Type of Workers | | No. |
|---|---|---|---|---|
| | | Contract | Skills | |
| 1 | Project Manager | Direct | Skilled | 1 |
| 2 | Supervisor | Direct | Skilled | 1 |
| 3 | Supervisor | Contracted | Skilled | 1 |
| 4 | ES Officer | Direct | Skilled | 1 |
| 5 | ES Officer | Contracted | Skilled | 1 |
| 6 | HR Officer | Direct | Skilled | 1 |
| 7 | Accountant | Direct | Skilled | 1 |
| 8 | Procurement Officer | Direct | Skilled | 1 |
| 9 | Construction workers | Contracted | Skilled | 3 |
| 10 | Drivers | Contracted | Skilled | 2 |
| 11 | Dailly worker | Contracted | Unskilled | 5 |
| 12 | Flag Man | Contracted | Unskilled | 1 |
| Total | | | | 19 |

According to the above table, the project requires 13 contracted labors and 6 direct labors, with 13 of the total 19 labors being skilled labors.

There will be no need for accommodations because the contractor will hire skilled and unskilled labors from the available labors in Al- Dhalea area. The contractor will provide mobile latrines that will be connected to the public sewage network, which will be dismantled immediately after the activities are completed.

The contractor will be responsible for protecting the workers and communities during implementation, applying the environmental and social mitigation measures, and providing the required training, tools, and PPE for workers. The daily working hours must not exceed 8 hours 6 days per week.

### 4.8.2 Economy

Agriculture is the main economic activity for most of the population in the governorate. Livestock, poultry breeding, and beekeeping are also important economic activities. In addition, artisanal and handicraft production of traditional textiles, ornate glass making, and other traditional crafts remain important for the governorate's economy. The governorate also holds some mineral deposits such as talc, which is used to manufacture paper, paints, beauty products, and pesticides, among other things.

## 3.8 Social Services

- **Education:**

In Yemen, the literacy rate among the population aged 15 years

and older is 54.1 percent (73.2 percent among males and 35 percent among females).

Between 15 and 24 years old the literacy rate is 77 percent (92.8 percent among males and 60.6 percent among females). Among people 65 years and older the literacy rate is percent (25.7 males and 1.5 percent among females). 4 781 367 people (1 395 248 men and 3 386 119 women) aged 15 years and older and 958 315 people between 15 and 24 years old (150 671 male and 807 644 female residents) are illiterate.

- **Health:**

There have been attempts to provide basic services in Al Dhale'e, but this has succeeded at best in providing the bare minimum due to lack of funds, destruction of infrastructure, and ongoing fighting. Health services, for example, are provided by the main public hospital in the city of Al Dhale'e and several hospitals and health centers in the districts supported by the central government, the local authority, and some international donors. However, the services provided do not meet the increasing needs of the population considering internal displacement and associated crowding and malnutrition. Recently, the government built a new hospital in the governorate and efforts are ongoing to furnish and operate it in cooperation with donors.188 60 058 cases of Cholera and 112 deaths (CFR 0.19 percent) were reported in Al Dhale'e, from 27 April 2017 to 31 August 2019.189 As of 31 May 2021, in Al Dhale'e, 217 COVID-19 total cases were reported, 43 deaths and 29 recovered.19

- **Poverty Profile:**

According to the 2014 Household Budget Survey, the poverty rate in Al Dhale'e was 59.8 percent. In light of economic decline, large-scale displacement, and the conflict frontline running through the governorate, this rate has doubtlessly increased significantly during the past few years.191 According to OCHA's 2018 Humanitarian Response Plan for Yemen, there are nearly 500 000 people, or about 70 percent of the governorate's population, in need of assistance; 53 percent of them are in dire need.192 As of 2017, 59.8 percent of AlDhale' population, or 391 412 individuals, were in poverty.193 As of 2017, PiN in Al-Dhale'e included 54 792 IDPs in catastrophic need, 45 229 in extreme need, 28 901 in severe need, 17 858 stressed and 15 199 in minimal need. Regarding non-IDPs in Al-Dhale'e 82 124 are in catastrophic need, 222 192 are in extreme need, 156 238 are in severe need, 107 027 are stressed and 88 949 are in minimal need.

- **Food Security:**

Al Dhake's had "very high" (≥40 percent) prevalence of inadequate food consumption during March 2021 (57%).195 Food was the main need for the greatest proportion of households in Al-Dhale'e, as opposed to shelter/housing and financial services.196 According to the IPC Acute Food Insecurity Analysis October 2020 –June 2021, in a population of 779 656 people, 180 00 are in IPC Phase 1 (Minimal), 211 500 in IPC Phase 2 (Stressed), 253 000 in IPC Phase 3 (Crisis), 134 000 in Phase (Emergency) and none in Phase 5 (Catastrophe). 50 percent of the population (387 000 people) are in IPC Phase 3 or higher.

# 4 Environmental and Social Screening

## 4.1 Applicability:

YIUSEP II ESMF applies because this sub-project may trigger some HSSE impacts such as Occupational Health and Safety impact.

## 4.2 Eligibility (Exclusion List)

This sub-project is eligible for support because it does not have any of the attributes in the following exclusion list:

*Table 3*: Exclusion List

| # | Question | Answer | |
|---|---|---|---|
| | | Yes | No |
| **1** | Production or activities involving harmful or exploitative forms of forced labor/harmful child labor; | | X |
| **2** | Production or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements; | | X |
| **3** | Production or trade in weapons and munitions; | | X |
| **4** | Gambling, casinos and equivalent enterprises; | | X |
| **5** | Trade in wildlife or wildlife products regulated under CITES; | | X |
| **6** | Production or trade in radioactive materials; | | X |
| **7** | Production or trade in or use of un-bonded asbestos fibers; | | X |
| **8** | Production or trade in wood or other forestry products from unmanaged forests; | | X |
| **9** | Production or trade in products containing PCBs; | | X |
| **10** | Production, trade, storage, or transport of significant volumes of hazardous chemicals, or commercial scale usage of hazardous chemicals; | | X |
| **11** | Production or trade in pharmaceuticals subject to international phase outs or bans; | | X |
| **12** | Production or trade in pesticides / herbicides subject to international phase outs or bans | | X |
| **13** | Production or trade in ozone depleting substances subject to international phase out; | | X |
| **14** | Production or activities that impinge on the lands owned, or claimed under adjudication, by indigenous peoples, without full documented consent of such people. | | X |
| **15** | Landfills and waste transfer stations, | | X |
| **16** | Power plants, | | X |
| **17** | Large-scale transport infrastructure such as highways, expressways, urban metro-systems, railways, and ports, | | X |
| 18 | Investments in extractive industries; commercial logging, | | X |
| 19 | Dams, or projects involving allocation or conveyance of water, including inter-basin water transfers or activities resulting in significant changes to water quality or availability, | | X |
| 20 | Activities that would convert natural habitats or significantly alter potentially important biodiversity and/or cultural resource areas, | | X |
| 21 | Activities that would require the relocation of residential households and/or significant involuntary land acquisition, | | X |
| 22 | Activities in disputed areas. | | X |

## *4.3 Environmental and Social Screening* Form*:*

Environmental and social screening was conducted using the YIUSEP II AF ESMF screening form. The

**Environmental and Social Screening Form**

| Question | Answer | | ESS relevance | Due diligence/ Actions |
|---|---|---|---|---|
| | Yes | No | | |
| Does the subproject involve civil works including new construction, expansion, upgrading or rehabilitation of existing infrastructure? | X | | ESS1 | ESMP, SEP |
| Does the subproject involve land acquisition and/or restrictions on land use? | | X | ESS5 | ESMP and RF |
| Is the subproject associated with any external waste management facilities such as a sanitary landfill, incinerator, or wastewater treatment plant? | | X | ESS3 | ESMP, SEP |
| Does the sub-project use additional technically feasible water conservation measures? | X | | | |
| Does the sub-project consider additional strategies to adopt measures that avoid or minimize negative effects of emissions? | X | | ESS1, ESS3 | ESMP |
| Does the subproject have an adequate system in place (capacity, processes and management) to address waste? | X | | | |
| Does the subproject involve the recruitment of workers including direct, contracted, primary supply, and/or community workers? | X | | ESS2 | LMP, SEP |
| Does the subproject have appropriate OHS | X | | ESS2, ESS4 | LMP |

| | | | | |
|---|---|---|---|---|
| procedures in place, and an adequate supply of PPE (where necessary)? | | | | |
| Does the sub-project have a GM in place, to which all workers have access, designed to respond quickly and effectively? | X | | ESS10, ESS2 | LMP, SEP |
| Does the subproject involve use of security or military personnel during construction and/or operation of healthcare facilities and related activities? | | X | | |
| Does the sub-project establish and implement appropriate quality management systems to anticipate and minimize risks and impacts that services may have on community health and safety. | X | | ESS4 | ESMP, SEP |
| Does the sub-project apply the concept of universal access where technically and financially feasible? | X | | | |
| Is the subproject located within or in the vicinity of any ecologically sensitive areas? | | X | | |
| Is the subproject located within or in the vicinity of any known cultural heritage sites? | | X | | |
| Does the project area present potential Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) or Sexual Harassment (SH) risk? | X | | ESS1/ESS4 | ESMP, SEP/GBV Action Plan |

# *5* Environmental and Social Impacts and Mitigation Measures

The proposed water networks rehabilitation will directly improve the water supplies to the existing networked customers, (approximately 1145 households for each Village), and improve the quantity of water available due to reduced leakages. The project will improve management and operational capability within the Local Water Supply and Sanitation Corporations, leading to improved institutional sustainability and improved service provision. The improved services will decrease women work load especially the girl child (women and girl child are most affected they are carrying water to supply houses). In general, inhabitants of these targeted cities will enjoy enhanced socio-economic, health, and environmental benefits. In particular the rehabilitation works of water supply and water distribution systems would lead to supplying of clean water to these cities. Improve the availability of water reach houses experiencing deficit of public water supply due to several reasons. These reasons include water network damage, the capacity of pipeline to distribute water to benefit all households equally, and to meet population growth in the targeted cities as well. The Improvement of cities water supply is expected to have a significant impact on poverty reduction by reduction household's expenditure in water. The project will result in increased production output, this gives women and girls more time to do productive work. Such as employment generation and improved availability of water resulting in improved livelihoods

The sub-projects assigned risk is moderate, thus, it requires the preparation of an Environmental and Social Management Plan ESMP as detailed in the Environmental and Social Management Framework ESMF for YIUSEP II AF. However, some environmental and OHS impacts may be triggered. Therefore, UNOPS will include environmental and social requirements for contractor including all OHS requirements.

**Land Acquisition**

There is no land acquisition under this subproject as the additional line will go in parallel with the old one on the same path and there is no need for more land other than the existing which is public.

## 5.1 Sub-project Positive Impact

- The most significant positive impact of the program is the provision of safe drinking water to the targeted people.
- This reduction in burden allows women and girls time for other activities including furthering their education and participating in income generating activities.
- Other positive benefits are outlined below as follows:
- Use of appropriate labor intensive methods for some of the construction Programme (e.g. excavation, building etc. will present employment opportunities to local people and generate direct income benefits to local community. .
- Reduction in water-borne diseases,
- Reduction in the potential for outbreaks of epidemic infectious diseases such as cholera caused by un-clean water.,
- Provision of employment for construction and operation workers.

## 5.2 Expected impacts and their sources:

### 6.2.1 Physical environment impacts and risks**:**

Dust generation during excavation, backfilling, compaction, or transportation of construction materials

Air pollution due to emissions from construction machinery and vehicles.

Increased levels of noise and vibration due to heavy vehicles and construction machineries, which are a nuisance to the community around the site and excavations

Water use/water contamination, due to improper use of water during civil work (water overexploitation), and accidental risks from sewage and water mixing, water and soil contamination from machineries and equipment from accidental oil spills.

Poor management disposal of petrochemical waste and other chemicals and construction materials

Risks of vegetation clearing are present.

6.2.2. **Waste management**

Soil or groundwater pollution, due to excavation works will make the soils loose hence making them susceptible to soil erosion through runoff.

Poor disposal of construction debris and waste materials

### 6.2.3 Socio-economic impacts and risks

- Temporary disruption of social and economic activities, due trenches excavation and laying down of the pipes.
- Temporary disruption of social and economic activities, excavation, due trenches excavation and laying down of the pipes. The project will not cause economic losses or prevent people from accessing it. Its impacts on these aspects are minimal and can therefore be easily mitigated.
- The number of the effected shops in the project area is four shops

- Poor coordination, planning and sequencing of work could lead the breakage of underground services connections (electric power cables, telephone lines, water distribution network) or paved roads, due lack of coordination with proper local agencies
- Risks of water network and sewage network mixing
- Water logging and increase of disease vectors such as pests and mosquitoes (public health risk)
- Impact of aesthetic value of landscape due to during construction work and improper management of waste and debris.
- Public safety during construction, due trenches left open and lack of clear signs around the site and lack of construction sites fencing.
- Traffic safety, due to lack of traffic management and coordination with local authorities

- Interaction with/ disruption of other services

- **Risks of GBV/SH**
    - Gender-Based Violence GBV, Sexual Exploitation and Abuse SEA and Sexual Harassment SH
    - The contractor and workers should sign the Code of Conduct (CoC) and ensure workers respect and adhere to the Code of Conduct. CoC to respect the local community cultures, and adhere to the social safeguard issues on Gender, SEA/SH and GBV. Raise awareness on the grievance mechanism (GM) system and how it can be used to report any GBV cases.
    - UNOPS, UW-PMU and Contractor should provide the workers with required training

and daily toolbox talk in the OHS, GBV and SEA. Contractor should provide the work site with GM system for all workers including providing complaints box and awareness training and posters.

- UNOPS has already taken the following steps in GBV/SEA/SH:
- In the stakeholder consultation meetings UNOPS has presented the project GBV and SEA/SH action plan and during the meetings we focused on female's participants and ensured to explain about the GM mechanism and highlighted how it is transparent, secure and confidential to use any of the GM access point.
- UNOPS has developed visibility materials to promote awareness for PSEA/SH in local language (Arabic) the materials and messages used adapted to be suitable for Yemen context and sensitivity of the subject.
- GM focal point received specialized training about SEA/SH cases and the way to deal with it using victim centered approach.
- UNOPS is developing SOP and protocol for GM in how to deal with SEA/SH cases.
- UNOPS has conducted refresh sessions for Project Personnel in GBV/SEA/SH and trained retainer's sites engineers as well.
- UNOPS has prepared risk assessment tools for GBV and will require contractors (UW-PMU in this case) to fill a checklist on GBV/SEA/SH and to prepare code of conduct for their workers/staff.
- AS part of YIUSEP GBV SEA/SH action plan UNOPS will roll out SEA/SH prevention and response plans for UW-PMU and contractors , where the contractors need to prepare the action plan as part of the tender documents , UNOPS is supporting to enhance the contractors capacity in this area looking to the fact that almost they have zero knowledge and capacity , for that UNOPS developed contractors action plan template where it covers the most priority areas and UNOPS conducted induction session for contractors about this requirement and presented to contractors on how to prepare their own GBV SEA/SH prevention and response plans (GBV Action Plans) using the developed template , other in depth training sessions will follow and will continue during project life span . The training records and plans will be maintained by UNOPS ESSO and uploaded into UNOPS server
- UNOPS will train contractors' PSEA/SH focal points.

- Lack of safety for labor
  - The contractor shall:
  - Ensure all working conditions as per national law and the ESS2 requirements are met
  - Ensure all workers are more than 18 Years old.
  - Ensure gender equality as possible in the subproject's cycle as a core principle for success.
  - Maintain occupational health and safety system in the site to protect workers from hazards and risks and provide adequate health and safety training, required PPE, first aid box, and toilets and potable drinking water
  - Avoid all forms of forced, involuntary, unpaid or compulsory labor
  - Provide insurance for all employees involved in onsite activities
  - Ensure the contractor meets the requirements of the LMP
  - Mobile latrines for workers must be implemented and connected to the public sewage network through the inspection rooms on the site, and it must contain wash hand and soap. It must be removed after the completion of the sub-project work.
  - Impact of presence of labor and community interactions

### **6.2.4** Occupational Health and safety impacts and risk

- Issues related accidents and injuries, vehicular accidents due increase traffic, accidents from operation of construction machinery especially excavator.

- Work related accidents and injuries from vehicles running into workers
- Falling loads (Pipes and fittings) from loads lifted using cranes

- Issue and accidents related to working at mountains and steep cliffs, due working in pipelines laying over mountains and steep cliffs and heights.
- Spillage and stagnant water may generate mosquitos and health hazards, due to spillage and mud and trenches for laying pipes, when left for a long time open will create mosquito breeding grounds.

- Poor onsite sanitation or water supply, leading to illness and disease, due to lack of toilets for workers.
- Risks from falling from height (i.e elevated tank) 15 meters above surface and 3 meters high
- Falling into excavated zones causing injuries to workers and dust from excavated zones causing breathing difficulties
- Risks from accidents during transporting equipment and materials
- Noise emissions from equipment and from work activities that may disturb the workers; ears
- Risks from physical exhaustion
- Environmental risks (heat exposure, sand storms, rainfall etc)
- Risks from accidental electrical shocks from electrical poles
- Hazardous materials and chemicals handling during machine maintenance and during civil work including cement, epoxy, paint and other chemicals
- Risk of asphyxia from working in confined area and drowning while conducting tests within the (tank)
- Work related accidents and injuries from vehicles running into workers
- Eye and skin injuries from welding activities

### **6.2.5** Risks during operational and maintenance phase

- Water overexploitation
- Water network and tank deterioration/lack of maintenance
- OHS risks (working from height, asphyxia from working in tank etc..) and pollution, solid waste, community risks during maintenance

# 6 ENVRONMENTAL AND SOCIAL MANAGEMENT PLAN

Table 4 and table 5 summaries the environmental and social management plan for the proposed works. The Plan includes the various actions, identified environmental and social impacts, proposed mitigation measures, to be carried out and monitoring indicators to report on performance and compliance of the ESMP against the applicable environmental and social standards for the sub-projects.

## Environmental and Social Mitigation Plan

To mitigate expected impacts during excavation (civil work) the Contractor should implement this Environmental and Social Mitigation Plan (table 5) with supervision from the PMU. This Plan will form a binding document to the agreement with the Contractor. Actions required by this Plan is embedded in the Contractor's daily activity in the construction site. The contractor takes a full responsibility for maintaining enough provisions and safe environments for implementing the work. Mitigation measures proposed for these sub-projects follow WB and RoY policies, guidelines and standards. It is considered for avoiding, minimizing, and mitigating adverse impacts brought about by various types of activities of the sub-projects. The Plan focuses more on impacts linked to socio-economic aspects, pollution and health and safety including occupational health, and suggests the best practices to alleviate them. As preventive and mitigation actions are inherent in the Contractor's daily activities, so are the costs assumed for implementation, which form the overall contract price. The Contractor is deemed responsible for collecting all necessary approvals before commencing constructions, one of which is the ESMP. The Appointed by the project management unit ESS WASH/unops consultant should ensure that the Grievance Redress Mechanism (GRM) handling process and GRM tools are introduced to the contractors, PMU and contractors' supervisions, staff and more important to the beneficiaries living or those practicing any type of activities on the vicinity of the sub-projects implementation sites as well as to the stakeholders.

UNOPS and contractor will ensure that all GM communication channels (including the GM box) are available and placed in a visible and accessible place inside the sub-project site with the required GM information posters.

The PMU is expected to hire at sub-projects level consultants and supervisions, who will be responsible for overseeing day-to-day activities, and will report back to PMU management, the second (PMU) will report to unops. These supervisors would ensure full adherence to environmental and social measures and monitoring parameters thereof. Costs of a supervision contract is covered by the project. However, the Water Supply and Sanitation Local Corporations (WSSLC) engineers will take their responsibility on assisting to ensure the plan smooth implementation as a part of their budget

## *Environmental and Social Mitigation Measures*

Environmental and Social Mitigation Plan

The following mitigation measures are required and contractors are responsible for the implementation of these mitigation measures in all work activities while UWS/PMU will be responsible of the monitoring of implementation of the mitigation measures during maintenance work.

UNOPS by the Urban Water and Sanitation Projects (UWSP – Aden) by the ESS WASH consultant will mitigate the impacts by including environmental and social clauses in the contract and ensure that contractor personnel are familiar with such clauses, and by requiring contractors to comply with the World Bank Environmental Health and Safety (EHS) Guidelines and National Labor Law (Decree 5/1995) and applicable International Labor Organization conventions on workplace conditions. The following table includes the mitigation measures for the main generic related impact

**Table 4: Environmental and Social Mitigation Measures**

| Potential Impact Factor | Mitigation Measure | Implementation Responsibility[6] | Estimated cost for each subproject (USD) |
|---|---|---|---|
| Occupational Health and Safety | | | |
| Working at Height<br>(i.e elevated tank 15 m high) | For step ladders: all four feet must be in contact with the ground, rungs shall be facing the work activity, never work higher than three steps down from the top of the ladder<br>Ensure proper use of ladders use by trained workers and inspected, tested regularly by competent inspectors,<br>Use of fall prevention devices, including safety belt and lanyard to prevent access to fall hazard area, or fall protection devices such as full body harnesses and head helmet used in conjunction with shock absorbing lanyards.<br>Ladders must not be painted - paint can hide damaged parts. Any defected Ladders should be removed from site immediately. Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area.<br>Ladders and hiabs must be well fixed to the ground.<br>All workers at high areas must wear helmets<br>Any scaffold should be officially inspected at least once a week to ensure it remains in safe condition. Each scaffolding and ladder shall be marked with the appropriate scaff tag, indicating inspection dates and whether scaffolding/ladder is safe for use. It is suggested that scaffolds that are not completed or not safe to be used shall have a red tag with clear 'No Entry' | Contractor, UWS/PMU and UNOPS | $600 |

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| | sign and the ones which are passed the inspection successfully shall have green tag.<br>Scaffolds inspection shall be carried out by a competent and trained person.<br>Consider the risks involved from objects falling from above<br>Review and implement suitable means to prevent fall<br><br>Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall and a fall protection plan should be in place which includes the following aspects:<br>Training and use of temporary fall prevention devices, such as rails or other barriers able to support a weight of 200 pounds, when working at heights equal or greater than two meters or at any height if the risk includes falling through an opening in a work surface.<br>Training and use of personal fall arrest systems, such as full body harnesses and energy absorbing lanyards able to support 5000 pounds.<br><br>Health and safety training should also be provided to workers on how to properly wear PPEs. | | |
| Lifting Operations Impacts: Failure of lifting equipment; Falling loads (timbers ،cement and paint for finishing work …etc ); and workers being crushed by a moving Load or lifting equipment which all might result in fatalities or injuries. | Close the lifting area with fence to prevent access to the lifting area during lifting work.<br>Install warning signs for lifting activities<br>Prevent accessibility to non-workers at lifting zones or any construction zone<br>Ensure safe distance from lifting sites<br>Carry out lifting work by well trained, qualified, and certified lifting team and with proper communication means and flagman.<br>Provide workers with all necessary Personal Protective Equipment PPEs and safety materials.<br>Use well-maintained equipment for lifting that are appropriate for the weight; well checked and tested by a third party. | Contractor, UWS/PMU and UNOPS | 300$ |

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| | Secure loads when lifting and use strong and reliable fixation materials to make sure that the load is well tighten and no solid parts falls from the load during lifting.<br>Protect the units against staining, discoloration and other damage until they are installed in their final location.<br>Lifting device capacity shall be 1.65 times the maximum calculated static load at that point.<br>An ultimate load shall be ≥ 4 times the maximum static load.<br>Prevent workers from standing close to the lifting area and ensure the presence of a buffer zone between lifting area and safe zone for standing.<br>Ensure a flagman is present to manage vehicles and machines and workers movements | | |
| Risks from accidental electrical shocks from electrical poles | • The safe clearance required beneath the overhead lines should be be specified by contacting the distribution network operator. The contractor should clearly adhere to the safe distance specified.<br>• Vehicles, machinery, equipment, or materials that could reach beyond the safe clearance distance should not be taken near the electrical line (High vehicles must not reach the electrical lines and also machineries that have extending parts ( Crane) must not touch the electrical lines)<br>• Operators should be instructed not to carry out any work on top of the machinery near overhead electrical lines;<br>• The work should be under direct supervision to ensure that safety precautions are observed.<br>• The contractors should ensure the safety of workers (appropriate collective protection equipment as well as PPEs are adhered to) while working near the electrical poles<br>• Provide occupational health and safety training to all workers involved in works<br>• The contractors should submit daily report on the movement of workers, approved and trained workers list, for workers working near the electrical poles | Contractor, UWS/PMU and UNOPS | Na |

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| | • Provide warning systems such as mobile equipment, barricades, hand or mechanical signals, or stop logs, to alert workers working near electrical pole<br>• Never touch an overhead line that has been brought down by machinery, or has fallen, until confirmation is received by relevant authority that the electrical line has been de-energized and made safe<br>• Avoid working during rainy seasons | | |
| Manual Handling Impacts:<br>Manual Handling Injuries that includes fractures damage to muscles, ligaments and tendons<br>spinal disc injuries, trapped nerves<br>abrasions, cuts, burns and Hernias | Provide required information and training on manual handling to the site workers including safe lifting methods to avoid back injuries and strains.<br>Ensure applying safe handling techniques.<br>Remove space constraints, ensure good housekeeping and providing improved layouts<br>Keep manual handling to one level, improve floor conditions and improve the environmental conditions. The floor must be clean from any obstacles and well protected.<br>Ensure use of appropriate PPE and safety materials (safety boots, masks, helmets etc.).<br>Addressing potential use of handling aids with matching safety measures. | Contractor, UWS/PMU and UNOPS | NA |
| Excavation Impacts:<br>Dust generated by excavation activities, waste generated from the excavation/falling in excavated zones. | • Excavation will be from 1m to 2m depth. Excavation area to be appropriately secured using barricades, fences and precaution tapes. Reflective Safety signs to be placed. Continuously remove the waste and transfer it to the approved disposal site by the local district authorities<br>• Excavation activities will be away from facility people access way and out of their working/ attendance hours.<br>• Wear masks during excavation work<br>• Install barriers and warning signs around excavated areas<br>• Grade soil away from the excavation<br>• Fence or barricade trenches left overnight<br>• Use a flagger during the excavation work | Contractor, UWS/PMU and UNOPS | NA |

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| | • Keep materials or equipment that might fall or roll into an excavation at least two (02) feet from the edge of excavations, or have retaining devices, or both.<br>• Provide warning systems such as mobile equipment, barricades, hand or mechanical signals, or stop logs, to alert operators of the edge of an excavation. If possible, keep the grade away from the excavation.<br>• Provide scaling to remove loose rock or soil or install protective barricades and other equivalent protection to protect employees against falling rock, soil, or materials.<br>• Prohibit employees from working on faces of sloped or benched excavations at levels above other employees unless employees at lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.<br>• Prohibit employees from standing under loads that are handled by lifting or digging equipment. To avoid being struck by any spillage or falling materials, require employees to stand away from vehicles being loaded or unloaded. .<br>• A competent person must make daily inspections of excavations, areas around them and protective systems:<br>• Before work starts and as needed,<br>• After rainstorms, high winds or other occurrences which may increase hazards. | | |
| Work related accidents and injuries from vehicles running into workers | Ensure a flagman is present to manage vehicles and machines and workers movements<br>Add warning signs to warn vehicles and road users of work ahead and at a safe buffer distance from work area, to allow more time for road users and vehicles to slow down their speed and avoid crashing into workers | Contractor, UNOPS and UWSSP ESSO | NA |

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| | Add barriers around the work area to prevent any vehicles from running into workers<br>All workers must wear high visibility clothes<br>Avoid working during night time | | |
| Spillage and stagnant water may generate mosquitos and health hazards, due to spillage and mud and trenches for laying pipes, when left for a long time open will create mosquito breeding grounds. | • Provide adequate supplies of potable drinking water from a Faucets with an upward jet with a sanitary means of collecting the water for the purposes of drinking such as bottles<br>• Ensure that water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) meets drinking water quality standards<br>• Provide mobile latrines, which must contain wash hands and soap that will be connected to cesspits that he will construct. The cesspits will be dismantled immediately after the activities are completed, discharged to the nearest manhole in the public network, and filled with gravelly soil.<br>• Ensure proper leveling of ground and inspect the surface for any open trenches | Contractor, UNOPS and UWSSP ESSO | 800$ |
| risks from welding activities | • It is vital to wear the appropriate PPE to protect against contact with molten metal materials and hot solids that can be projected or drip from a surface into an area where an operative is working.<br>• Provide equipment conforms to the appropriate international (ISO) or British (BS) standards<br>• Provide fixed welding equipment is carried out by a suitably qualified make sure person and is connected as recommended by the manufacturer<br>• the insulation on the welding and current return leads is undamaged and the conductor is thick enough to carry the current safely<br>• all connectors are clean, undamaged and correctly rated for the current required | | |

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| | • insulation on the welding cables, plugs, clamps or torch/electrode holder on welding equipment is undamaged<br>• welders use the appropriate personal protective equipment for the task | | |
| Risks from accidents during transporting equipment and materials | • Ensure drivers received awareness sessions on good driving practices such as maintaining speed limits and wearing seat belts<br>• Conduct drug checkups on drivers. | Contractor, UNOPS and UWSSP ESSO | NA |
| Noise emissions from equipment and from work activities that may disturb the workers | • Provide occupational health and safety training to all employees involved in works.<br>• Provide workers in high noise areas and dealing with high noise equipment with earplugs or earmuffs.<br>• Ensure proper maintenance of equipment is maintained. | Contractor, UNOPS and UWSSP ESSO | NA |
| Skin and eye irritation from chemical handling, storage and disposal (cement, oil, epoxy, paint, and other chemicals during conducting civil works and during maintenance work for vehicles etc. | • Provide the required first-aid kit and the Portable Eye Wash<br>• All workers have to be equipped with required PPE that are suitable for chemical handling<br>• Training for the first-aid techniques is required for the work site team.<br>• Handling and storing and disposing materials according to their material safety data sheet (MSDS) by trained workers<br>• Train workers to handle and store hazardous materials and wastes as per their material safety data sheets (MSDSs).<br>• Provide proper PPEs for workers handling hazardous materials and wastes | UNOPS and Contractor | 300$ |
| Environmental pressures on workers (heat strokes, dust (storms) | Not working during high temperatures and start the work early in the morning and working in calm weather conditions.<br>raise awareness on the importance of drinking enough water and regular breaks | Contractor, UWS/PMU and UNOPS | NA |

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| | Provide proper PPEs against heat and dust<br>Do not allow working during bad weather, rain, dust storms<br>Provide adequate and suitable breaks and supply workers with drinking/potable water | | |
| Risk assessment | Ensure that all risk associated in all construction activities have been identified, communicated and all risk control measures have been taken. JSA will be performed on site for all non-routine jobs. HSE Supervisor and Construction Manager are required to take time with their workers to prepare a JSA prior starting the job, identifying what could go wrong and organizing control measures for everybody to work safely. The job is divided into steps. For each step, HSE risks and control measures are identified and discussed by the team. A facilitator or the supervisor records the analysis. JSA is then displayed in working area | Contractor, UWS/PMU and UNOPS | |
| Inspections & verifications of the equipment | Ensure that all tools and equipment are subjected to periodically inspection by a competent person. | Contractor, UWS/PMU and UNOPS | |
| Emergency procedures, equipment & response | The most important on-site resources such as fire extinguishers, spills containment equipment, and first aid kits must be maintained and clearly identified. Construction equipment may be included among potential emergency resources. Personnel, especially on-site medical staff or workers trained in first aid, should be included in the plan.<br>There may be situations where outside resources are so far away that an adequate response is not possible. In these situations, resources may have to be obtained and kept on site. Examples would include fire protection or ambulance/medical resources in remote areas.<br>Report any major accidents to UNOPS within 24 hours and to the WB within 48 hours such as major equipment failures, exposure to hazardous materials, slides, or cave-ins to UNOPS.<br>Make widely available written emergency procedures for dealing with cases of trauma or serious illness, including procedures for transferring | Contractor, UWS/PMU and UNOPS | 200$ |

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| | patient care to an appropriate medical facility.<br>• Immediately investigate any serious or fatal injury or disease caused by the progress of work by the Contractor and submit a comprehensive report to UNOPS and within 48 hours to the WB.<br>• Details of the nearest hospital should be present on site.<br>• Ensure availability of first aid box and train workers on first aid measures | | |
| Permit To Work | Ensure that permit to work system is applied for all work site activity that has any significant risk. | Contractor & UNOPS | NA |
| Risk of working activities involving entry into confined spaces, including water tank and risks from drowning during testing the tank | • Maintain insurance for workers in sub-project site according to the requirements and conditions of insurance in the bidding documents which should comply with labor law, UNOPS, and the World Bank regulations.<br>• Provide occupational health and safety training to all employees involved in works.<br>• Ensure availability of first aid box.<br>• The contractors should submit daily report on the movement of workers, approved and trained workers list, for workers working on the tank.<br>• Maintain insurance for workers in the sub-project site according to the requirements and conditions of insurance in the bidding documents which should comply with labor law, UNOPS and the World Bank regulations.<br>• The contractors should ensure the safety of workers (appropriate collective protection equipment as well as PPEs)<br>• Ensure all workers in confined areas are supervised<br>• The contractors should provide suitable lighting inside the tank during work hours. | Contractor, UNOPS and UWSSP ESSO | NA |

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| | • Contractors shall prepare and submit method of statement and OHS risk assessment for high-risk work activities including, lifting operations and confined spaces work.<br>• Provide self-contained breathing apparatus (oxygen cylinders) to all workers working in confined spaces and provide full body harness and lifelines for workers when working in confined spaces.<br>• Provide safety helmets for workers<br>• Apply Permit to Work to ensure full compliance with OHS system and that all the measures are in place to ensure safety of public and workers.<br>• The contractor should conduct all works using trained workers using appropriate PPEs, should be provided.<br>• The contractors should provide necessary PPEs, including self-contained breathing apparatus (SCBA) provided to workers inside tank with proper training on how to use them properly.<br>• Workers should spend limited time in confined spaces including tank.<br>• Ensure presence of extra oxygen tanks.<br>• Ensure workers are attached to safety ropes in case of dizziness in confined places.<br>• Ensure limited time spend in confined spaces with all applicable PPEs by trained workers<br>• Ensure life jackets are present as well for workers testing the tanks along with oxygen breathing apparatus and emergency pull out line etc. | | |
| Welding activities risks such as burning | All hot works must have a work permit approved by the person in charge - Ensure welding machine is in a good condition and well maintained - Inspect welding machine daily prior working - Ensure only trained and | Contractor, UNOPS and UWSSP ESSO | NA |

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| | qualified people can operate the welding machine - Ensure working area is clear of any material that could catch fire or explode<br>Ensure proper PPE are providing i.e. fire-resistant clothing The welder should be equipped with the following PPEs: 1- An integrated safety helmet made from heat-resistant polycarbonate for Head Protection. Welders are protected from overhead hazards all day long giving them compliance without compromise. 2- Fire resistant coverall including gloves | | |
| Other OHS impacts during implementation of subproject | • Ensure skilled workers are hired for each work.<br>• Conduct regular awareness sessions and daily Toolbox Talks on OHS requirements before commencing any work.<br>• Periodic inspection to ensure that mitigation measures are implemented and stop any unsafe act or unsafe situation.<br>• Emergency response plan to be in place with details and contact of the nearest hospital or medical center, responsibilities are understood for all works, first aid boxes are available and a list of trained first aiders is posted and known by all workers with available transportation.<br>• Immediately report all accidental occurrences with serious accident potential such as major equipment failures, contact with high-voltage lines, and exposure to hazardous materials, slides, or cave-ins to UNOPS<br>• Contractor shall monitor, keep records and report on the following environmental and social issues:<br>- Safety: hours worked, lost time injury (LTI), lost workdays, recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth). | Contractor, UWS/PMU and UNOPS | NA |

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| | - Environmental incidents and near misses: environmental incidents and high potential near misses and how they have been addressed, what is outstanding, and lessons learned.<br>- Major works: those undertaken and completed, progress against project schedule, and key work fronts (work areas).<br>- ESHS requirements: noncompliance incidents with permits and national law (legal noncompliance), project commitments, or other ESHS requirements.<br>- ESHS inspections and audits: by Project Company, Independent Engineer, UNOPS and its implementing partners, or others—to include date, inspector or auditor name, sites visited and records reviewed, major findings, and actions taken.<br>- Maintaining a record of injuries and accidents specifying cause and location<br>- Provide a list of trained workers, whom will be checked for their training skills. Measures will be implemented onsite and followed by regular monitoring visits.<br>- Ensuring the contractor is taking care of the safety of workers while working in the site and give all necessary vaccines to workers to prevent any infection with epidemic and pandemic diseases<br>- Maintain insurance for workers in the sub-project site according to the requirements and conditions of insurance in the bidding documents which should comply with labor law, UNOPS and the World Bank regulations. | | |
| Poor onsite sanitation or water supply, leading to illness and disease, due to lack of toilets for workers. | Ensure that the contractor will provide the safe water supply and toilets with water and soap for workers.<br>Ensure that these toilets are connected to the nearest sewer lines.<br>Ensure good housekeeping is kept | Contractor, UWS/PMU and UNOPS | NA |

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| | Report any major injuries to the the WB within 48 hours | | |
| **Environmental Impacts Mitigation** | | | |
| Pollution of the natural waterways via surface water drain caused by water contaminated by concrete or by accidental oil spills | Implement regular monitoring of the watercourse including water quality testing<br><br>Where possible plan to pump/ deliver concrete away from drains and natural waterways.<br><br>- Sweep or shovel spills and allow residue to set before moving<br>- Use of spill mats and sandbagging in drains<br>- Ensure machine maintenance and oil change is carried out away from surface water areas and at designated zones well insulated from the soil<br>- Ensure oil spill prevention kits are present<br>- Ensure all chemicals and hazardous materials are stored at well insulated areas from the ground and according to their MSDSs)<br>- In case of mobile latrines and cesspits, ensure locating them away from surface water zones<br>- Use of sand bags, baffles, settlement tanks to encourage settlement of fine particles<br>- Use filter cloth to filter water at the outlets<br>- Implement regular monitoring of the watercourse incl. water quality testing<br>- Ensure no wastes or excavated materials are stored inappropriately to prevent contamination of ground water and water sources<br>All chemicals and wastes must be handled, stored and disposed according to their MSDSs | Contractor | NA |

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| Vegetation removal | Install highly visible barriers around the perimeter of the construction site and around the trees irrigation areas.<br>Install signs clearly identifying areas of protected vegetation.<br>Use only designated areas for parking, materials and waste storage<br>Undertake regular inspections of vegetation management measures to ensure they are in place and effective.<br>Avoid the removal of vegetation to the extent possible | Contractor, UWS/PMU and UNOPS | 1000$ |
| Dust Control and Air and Gaseous emissions and ambient noise emissions from equipment and transportation trucks and excavation works | Develop and implement a series of dust management measures and monitoring measures<br>Monitoring<br>Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust and noise, record inspection results, and make the log available all the time.<br>Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.<br>Keep site fencing, barriers and scaffolding clean using wet methods where there is the risk of dust accumulation.<br>Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below<br>Site Dust Management<br>Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.<br>Ensure that all workers are equipped with the required mask when exposed to any activity that may generate dust<br>Provide workers with proper PPEs<br>Use minimal water and preferably grey water for dust suppression<br>Minimize wasting water in dust suppression by increasing sweeping activities | Contractor, UWS/PMU and UNOPS | NA |

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| | Use well maintained equipment and ensure regular maintenance is performed<br>Conduct work during day time<br>Cover transfer trucks to avoid dust and particulate emissions | | |
| Solid waste produced by work accumulated and pollutes the environment. | Ensure that work wastes are properly stored and regularly at designated waste zones and regularly collected and transported by an approved<br>Ensure waste areas are properly fenced and insulated. | Contractor, UWS/PMU and UNOPS | 500$ |
| Soil and groundwater contamination from chemicals (i.e fuel, paint, epoxy etc.) | Ensure no wastes or excavated materials are stored inappropriately to prevent contamination of ground and away from runoffs and areas with potential surface and ground water presence and according to their material safety data sheet (MSDSs)<br>Provide secondary containment for all chemical contained vessel or rumps.<br>Presence of suitable spill prevention kits<br>Proper storage of hazardous substances and away from soil and water resources. | UNOPS and contractor | 2000$ |
| **Socio- impacts** | | | |
| , SEA and GBV and GBV Complaints. | Contractor and workers to sign the code of conduct, and ensure workers respected and adhere to the code of conduct.<br>Conduct regular awareness session on site in GBV prevention.<br>GM system is in place to handle any issue on Gender SEA and GBV.<br>Develop programs and strategies to reduce the factors that put people at risk of violence<br>GM system for all workers including providing complaints box and complaint means. | Contractor, UWS/PMU and UNOPS | $200 |
| Child Labor | All workers should be more than 18 years old.<br>Verifying age of workers by checking IDs and official documents.<br>Ensure a worker log is available, and all workers are registered. | Contractor, UWS/PMU and UNOPS | NA |

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| Low aesthetic value | Ensure proper waste management and good housekeeping is kept<br>Ensure all construction materials are stored properly and away from the public | Contractor, UWS/PMU and UNOPS | NA |
| for damage of public networks or building | Coordinate with local councils/authorities and other responsible agencies and partners<br>Postpone asphalt pavement until the water distribution networks are completed<br>Protect underground pipes during construction<br>Repair damaged infrastructure directly on the completion of the works<br>Ensure construction crew is well briefed on positions of other existing services<br>Close supervision of work in areas around other existing services | Contractor, UWS/PMU and UNOPS | NA |
| Access of public into working site. Impacts:<br>Public Exposure to high risk activities (Lifting, Excavation,) | Install barriers, danger warning signs and restriction signs to only authorized persons and signs showing the potential danger to the public.<br>And establish barriers around the working site rooftop, equipment area and excavation area.<br>Do not allow public to access working sites in all cases<br>Avoid construction work during academic seasons<br>Ensure proper storage of construction material and fencing the storage area to prevent accessibility. | Contractor, UWS/PMU and UNOPS | 500$ |
| Noise, nuisance | The working sites will be isolated and fenced. | Contractor, UWS/PMU and UNOPS | NA |
| Operational Phase /maintenance | | | |
| Maintenance of water network and related activities | Inform the public of maintenance times.<br>Perform periodical inspections and maintenance on pipelines and water networks and tanks. | Local Authority/WSLC | NA |

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| ▪ Water overexploitation<br>▪ Water network and tank deterioration/lack of maintenance<br>▪ OHS risks (working from height, asphyxia from working in tank etc..) and pollution, solid waste, community risks during maintenance | Contractor to provide training to WSLC on maintenance and OHS,Env,Soc, risks and measures prior subproject handing over<br><br>- Carry out awareness raising to local communities on goof water user practices such as closing the faucet when brushing the teeth etc.<br>- Good management of water resources<br>- Carry out regular water quality and quantity tests<br>- Ensure same management measures in construction phase are implemented during operation and maintenance | Contractor (training purposes) | |

**Table 5 : Environmental and Social Monitoring Plan**

| Risks and monitored aspects | **Measurements (incl. methods & equipment)** | **Frequency** | **Implementation responsibility** |
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| | **Community Health and Safety** | | |
| Public safety during the construction work. | Visual observation and photographic documentation of safety measures.<br>Visual observation for installing of warning signs, barricading of working area with safety tapes and fencing/barricades to prevent unauthorized access of public to the working site including workers entrance.<br>Visual observations and records of any construction or storage areas without fencing | Daily | Contractor and UNOPS |

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| | Visual observations of any non-allowed public access<br>Indicator: Number of grievances, number of recorded complaints. Number of incidents related to public safety. | | |
| The risk of employing children for work activities. | Site inspection, checking and documentation of contractor employee records and checking/verifying age documents.<br>Indicator:<br>Number of occurred cases of employing workers under 18 years old during the regular inspection | Weekly during site inspection and regularly by TPM | UNOPS and TPM |
| External stakeholder engagement: | Highlights, including formal and informal meetings, and information disclosure and dissemination—to include a breakdown of women and men consulted and themes coming from various stakeholder groups, including vulnerable groups (e.g., disabled elderly, children, etc.).<br><br>Indicators:<br>Number of engagement sessions<br>Number of persons per session ( gender disaggregated) | Continuous/ Monthly | Contractor, LWSC , ESSO and UNOPS |
| Low aesthetic value of landscape such as accumulation of waste and debris in the site. | Site inspection and documentation of general landscape<br><br>Indicators:<br>Number of reported complaints related to landscape<br>Presence of waste at undesignated zones | Monthly | Contractor and UNOPS |
| Complaints. | Number of GRM Reports and number of solved issues. | Weekly | Contractor and UNOPS |
| External stakeholder grievances | Number of grievances and date submitted, action(s) taken and date(s), resolution (if any) and date, and follow-up yet to be taken grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. Grievance data should be gender disaggregated. | Continuous Monthly | Contractor, UNOPS and TPM |

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| | Indicators:<br>Number of Grievance / complaint received | | |
| GBV and SEA issues | Number of reported and registered cases of SEA/SH through project GM<br>Number of reported cases of contractor's noncompliance to PSEA/SH obligations in work sites | Weekly | Contractor, UNOPS and TPM |
| | **General Environmental Impacts** | | |
| Dust generation during work implementation. | Visual observation and photographic documentation of equipment induced dust clouds during work activities.<br>Indicator: Number of complaints regarding noise and air emissions | Weekly | Contractor and UNOPS |
| Increased level of noise and vibration. | Site supervision/inspection and documentation to ensure compliance with the noise mitigation measures<br><br>. Indicator:<br>Number of complaints GRM related to noise | Weekly | Contractor and UNOPS |
| Waste generation, proper disposal and disposal of works debris and waste materials. | Inspection and photographic documentation.<br><br>Indicators:<br>Presence of waste at undesignated zones<br>Presence of pests and flies<br>Presence of waste receipt<br>Number of GM related to waste and emissions | Daily | Contractor and UNOPS |
| Risks on vegetation | Inspection and photographic documentation.<br><br>Indicators:<br>% decrease in vegetation cover<br>Presence of dead vegetation | Weekly | Contractor and UNOPS |

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| Soil and water contamination from chemicals | Inspection and photographic documentation<br><br>Indicators:<br>Change in soil color<br>Number of spills recorded<br>Chemicals are properly labelled and stored on insulated areas | Daily | Contractor and UNOPS |
| **Occupational Health and Safety** | | | |
| Working at Height Activities | Visual inspection to ensure that all working at height activities are monitored and all safety associated instructions are implemented according to OSH requirements.<br>Indicator: Number of injured workers and the specific activity required PPE worker adherence | Daily | Contractor and UNOPS |
| Lifting Operations and falling loads | Visual inspection to ensure that all lifting activities in the work site are executed safely and as per the standard lifting safety rules.<br>Indicator: number of times falling loads occurred and number of injuries from falling loads if any | Daily | Contractor and UNOPS |
| Electricity Operation | Visual inspection to Ensure that all electricity safety rules are implemented, followed and communicated.<br>Ensure that only skilled workers are authorized to perform any electrical operations through qualification inspections. | Daily | Contractor and UNOPS |
| Manual Handling | Visual inspection to ensure that all manual handling activities are performed according to the OSH manual handling safety rules and instructions.<br>Ensure that the implementation of the safety techniques to control the manual handling risk is monitored continuously.<br><br>Indicators:<br>• Number of injured workers<br>• Number of workers not wearing proper PPEs | Daily | Contractor and UNOPS |

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| Falling in Excavation zones, breathing difficulty from dust emissions | Visual inspection to ensure that all excavation activities are executed safely and all safety rules are implemented.<br><br>Indicators:<br>Number of fall incidents<br>Presence of PPEs and masks<br>Number of workers adhering to PPEs | Daily | Contractor and UNOPS |
| Hazardous Substances and Wastes | Visual inspection to ensure batteries are well placed in a safe and proper ventilated room with appropriate fire extinguisher and conduct regular monitoring.<br><br>Indicators:<br>Presence of hazardous wastes in undesignated zones<br>Ensure oil is stored at an inaccessible ventilated area, away from heat and unattainable by animals and pedestrians<br>Number of fire events umber of incidents such as skin irritation from handling chemicals | Daily | Contractor and UNOPS |
| Work related accidents and injuries. | Inspection and photographic documentation<br>Ensure the following aspect are applied:<br>Maintaining a record of injuries and accidents specifying cause and location.<br>Provide a list of trained workers, whom will be checked for their training skills. Measures will be implemented onsite and followed by regular monitoring visits.<br><br>Indicator in the records: number of injured worker and activity leading to injury | Daily | Contractor, UNOPS and TPM |

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| Working in confined areas (tanks) | Visual inspections<br><br>Indicators:<br>Presence of confined areas PPEs and life jackets<br>Number of incidents and causes<br>Presence of supervisor in place | Daily | Contractor, UNOPS and TPM |
| Poor coordination, planning and sequencing of work could lead to breakage of underground pipes (electric power cables, telephone lines, water distribution. | Inspection and photographic documentation.<br>The contractor and UNOPS engineers should ensure that the site supervisor shall submit daily report on the movement of workers, approved and trained workers in place and conduct monitoring to ensure Permit to Work PTW and TBT applied and workers to be well informed about risks, mitigation measures and OHS requirements before commencing any work | Continuous/Daily | Contractor, LWSC , ESSO and UNOPS |
| Poor onsite housekeeping, toilet and water supply, leading to illness and disease. | Visual site inspection and photographic proof<br>Indicators: presence of pests, domestic waste located outside designated bins, use of soap and sanitizer not observed | Weekly during site inspection and regularly by TPM | UNOPS and TPM |
| Safety | Hours worked, recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases, first aid cases, high potential near misses, remedial and preventive measures required (for example, revised job safety analysis, new or different equipment, manual handling and skills training etc. | Daily | Contractor and UNOPS |
| Environmental incidents and near misses | Records of Environmental incidents and high potential near misses and how they have been addressed, how they have been reported, incidents review, and lessons learned.<br>Monitoring working in good weather conditions. | Daily | Contractor and UNOPS |
| Major works: | Work undertaken and completed, progress against project schedule, and key work fronts (work areas). | Daily | Contractor and UNOPS |
| E&S and OHS requirements: | Non-compliance with OHS requirements, national law (legal noncompliance), project commitments and E&S requirements. | Daily | Contractor and UNOPS |

| | | | |
|---|---|---|---|
| E&S/OHS inspections and audits: | By contractor, engineer, or others, including authorities to include date, inspector or auditor name, sites visited and records reviewed, major findings, and actions taken. | Daily | Contractor and UNOPS |
| Workers: | Number of workers, indication of origin (expatriate, local, nonlocal nationals), gender, age with evidence that no child labor is involved, and skill level (unskilled, skilled, supervisory, professional, management). | Daily | Contractor and UNOPS |
| Training on E&S issues | Including dates, number of trainees, and topics. | Weekly | Contractor and UNOPS |
| Footprint management: | Details of any work outside boundaries or major off-site impacts caused by ongoing work—to include date, location, impact, and actions taken. | Monthly | Contractor and UNOPS |
| Details of any security risks | Details of risks the contractor may be exposed to while performing its work—the threats may come from third parties external to the project | When occurred | Contractor and UNOPS |
| Worker grievances: | Number of grievances and details including occurrence date, grievance, and date submitted; actions taken and dates; resolution (if any) and date; and follow-up yet to be taken grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. | Weekly | Contractor, UNOPS and TPM |
| Major changes to contractor's environmental and social practices. | Monitor contractor's environmental and social practices noncompliance through visual inspections. | Weekly | Contractor, UNOPS and TPM |
| Deficiency and performance management | Actions taken in response to previous notices of deficiency or observations regarding E&S performance and/or plans for actions to be taken—these should continue to be reported until UNOPS determines the issue is resolved satisfactorily. | Weekly | Contractor, UNOPS and TPM |

| | | | |
|---|---|---|---|
| Complaints Handling | Complaints register will be kept on site and this will feed into the GRM. Details of complaints received will be incorporated into the audits as part of the monitoring process. | Weekly | Contractor and UNOPS |
| Workers are not wearing full PPEs | Visual inspection and photographic documentation | Continuous daily | Contractor, UNOPS and TPM |
| Operation and Maintenance (Staff Health and Safety) | Ensure that all operation and maintenance safety procedures and awareness are implemented, followed and monitored.<br>Indicators:<br>Number of trainings and details of trainings provided to WSLC prior handing over | Daily | Contractor and UNOPS |
| Operation and Maintenance | | | |
| Training to facility workers by contractor before project handover | Indicators:<br>• Number of trainings including OHS trainings and social trainings | Before project handing over | Facility administration and contractor |
| Operation and maintenance | • For inspection workers along with safety rope /harness etc.<br>Indicator:<br>• Number and type and details on maintenance performed<br>• Number of times water was cut<br>• Number of times presence of deterioration, leaks in the system was recorded<br>• Number of complaints received on water quality or availability | monthly | Facility administration |
| | Method: | Continuous daily | |

| | | | |
|---|---|---|---|
| OHS risks from working in confined areas and risks of low oxygen in the tank and risk of asphyxiation | - Ensure same monitoring measures are implemented during operation and maintenance for relevant risks<br>Indicator:<br>- Number of workers injured<br>- Number of trainings on OHS health and safety measures and on maintenance received by facility workers | | Facility administration |
| Risk of depletion of groundwater and contamination risks | Indicator:<br>- significant drop in the groundwater level<br>- Water quality results above the legal parameters<br>- Number of awareness campaigns provided on good water use practices | monthly | Facility administration |
| All costs will be under the responsibility of each party including the contractor and will be included in the contract BoQ. | | | |

# 7 Public Consultation

He preparation of the ESMP and of the project selection and design was highly dependent on stakeholder consultations, conducted as per the YIUSEP Stakeholder Engagement Plan (SEP)[7]

UNOPS consulted with public authorities and the Implementing Partners (PWP, RMF-IU, and Urban PMU) to ensure that YIUSEP II _AF responds to the "urgent" priority needs identified during the implementation of YIUSEP I The consultations were carried during field missions and official meetings, virtual meetings, and through phone calls., between September 2020 and March 2021.

UNOPS consulted with its Implementing Partners (IPs) and ten selected Yemeni civil society organizations to discuss and seek their inputs and feedback on the YIUSEP II environmental and social risk management instruments. The consultations were carried during 17-29 April 2021, through phone calls.

As for the consultation carried out by the UWSSP (IP), Initially the UWSSP designing team for the period from 22 May28 May 2022 through meeting in the WSLC HQ and wells field, was coordinating with LWSC to provide technical data and information to assess the project and prepared complete study. Another consultation activities were held on 4 February 2022by UWSSP ESSO with LWSC through mobile call on proposed Project (Nature, purpose and scale of sub- project and scope of work...etc.), the Impact Assessment and the mitigation measures.

On 25 June, to28 June,2022 UWSSP ESSO consulted 40 persons that utilize water, such as housewives, as well as the old and young, as well as the educated and illiterate as presented in table 11, to identify the purpose, scale and scope of work of sub-project, and to discuss and seek their inputs and feedback on impact assessment, the mitigation measures. The consultation carried out through individual call phone. On the other hand, UWSSP Manager consulted with H.E. The Minster of Water and Environment to identify the purpose, scale and scope of work of sub-project, and to discuss and seek his inputs and feedback on impact assessment, the mitigation measures,

The consultations with men and women were conducted in the sub-project' areas on September, 2022 with 40 persons which are (25) male and (15) female.

## *7.2 Topics of the consultations are to:*

During the consultation process, social and environment team briefed the proposed subprojects including fencing the sites, civil works, grievance redress mechanism, etc. Local residents and LWSC staff considered the subprojects very positive for the community and emphasized that the work in both subprojects should be completed as early as possible. The work in this site will increase the employment and business

[7] https://ye.unopsmr.org/wp-content/uploads/2021/06/Stakeholder-Engagement-Plan-SEP-Integrated-Urban-Services-Emergency-Project-II-P175791.pdf

opportunities for the locals. The various concerns raised related with their responses during the site visit are given below:

- Ensure of communities' needs and confirm the selection priority;
- Inform local communities about the sub-project and its activities to be undertaken, its timetable;
- Inform them about their rights to have a job opportunity during implementation.
- Raise their awareness about sub-projects potential risks such as safety, health, environmental, and social risks and required control measures.
- Document and address the local communities' concerns, expectations, and feedback.
- Ensure the participation of sub-project beneficiaries both females and males.
- Minimize the effects of noise, dust, vibration, traffic associated with excavation and other work activities on the nearby communities living along the subprojects' areas.

The Contractor shall dispose solid waste on regular basis.

Install galvanized steel safety railing to the tank roof to maintain the safety of workers during the operation and maintenance period;

- Discuss sub-projects possible negative impacts such as traffic and safety and proposed mitigation measures and how to avoid and mitigate them.
- Inform them that the road traffic may temporarily be interrupted during implementation and how to coordinate with sub-project supervisors and contractors to manage the traffic.
- Raise their awareness regarding social safeguards such as GBV, SH, and abuse, that may occur during the implementation and the required measures that should be taken in case of occurrence.
- Inform them about how to use the GM to give their opinions regarding social requirements, OHS, and any complaints and concerns without fear.
- Raise their awareness for the COVID-19 pandemic and the precautionary measures as well as raise awareness on other diseases, such as Cholera.

## *7.3 Public Consultation Findings and Feedback*

Table. Concerns raised during the field visits and their Responses

| # | Concerns Raised | Mitigation measures discussed |
|---|---|---|
| During the consultation process, social and environment team briefed the proposed subprojects including fencing the sites, civil works, grievance redress mechanism, etc. Local residents and LWSC staff considered the subproject very positive for the community and emphasized that the work in subprojects should be completed as early as possible. The work in this site will increase the employment and business opportunities for the locals. The various concerns raised related with their responses during the site visit are given below: | | |
| | Minimize the effects of noise, dust, vibration, traffic associated with | If the contractor encounters a solid, challenging rock that cannot be |

| | | |
|---|---|---|
| | excavation and other work activities on the nearby communities living along the subprojects' areas. | removed with traditional tools, he may use a variety of machineries to speed up the process, but he will keep them in good working order, properly tuned, and maintained to reduce exhaust emissions and vibration issues. The Contractor will also ensure that the suggestions made in this ESMP are implemented. |
| | The Contractor shall dispose solid waste on regular basis. | It was brieved that the Contractor will be bound to |
| | install galvanized steel safety railing to the tank roof to maintain the safety of workers during the operation and maintenance period | Safely dispose all the solid waste generated in demarcated waste disposal sites. |
| | Exposure of residents, especially women, to undesirable behavior by workers | Workers are obligated, according to the contract, not to be subjected to any behavior that is undesirable to society, whether men or women, unless he will be punished |
| | Risks that the community may be exposed to during the implementation of the project on sit | Ensure installing fences, barriers, and appropriate signs around the construction area |
| | The community fear that the project will not complete | The project will be completed on time but sometimes the ESMP approval take time |

Concerns raised during the consultations

- Only some concerns raised about excavation works which could create some traffic during the daytime and all required mitigation measures were discussed with the consulted people.

☒ Consultation during implementation

- Consultations will continue during implementation with the previously consulted representative local communities to assess beneficiaries' satisfaction on implementation of mitigation measures and accommodation of all their concerns and will conduct broader consultation with more beneficiaries and wider representatives of local communities' citizens. Such consultations will be conducted by UWSSP- and UNOPS. SEP Link (https://ye.unopsmr.org/publications)
- To ensure citizen engagement during subproject implementation, the following

mechanism will be adapted:

- Continue consultation with local communities by interviews and using questionnaires to assess beneficiaries' satisfaction on the implementation of activities and safeguards.
- Consultation need to take place during implementation on Bi-Monthly bases. The first consultation will commence at the end of the second month from the start of implementation, and subsequent consultation will continue that way.
- Hold interviews during implementation of subproject in the targeted areas with both male and female citizens/ beneficiaries conducted by male and female moderators/facilitators in separate sessions;
- Utilize GIS-based portal mapping for all activities including sub projects supported to promote transparency to reach more citizens.
- Utilize citizen engagement findings conducted for Yemen integrated urban services emergency project – phase II YIUSEP II Additional Fund which include a wide range of stakeholders.
- Receive feedback from citizens through the UWS-PMU/ADEN and UNOPS established GRM during implementation of subprojects.
- Explore using UNOPS' remote monitoring tools for engaging citizens in monitoring and quality assurance of subproject activities.

## 7.4 *Stakeholder Engagement and Information Disclosure*

Stakeholder engagement and in information disclosure took place in July organized by UNOPS and by UWSP – Aden. The project documents were disclosed in the World Bank web site and the UNOPS site and will be translated to Arabic language, and stakeholders were engaged. UWSP – Aden and UNOPS will ensure stakeholder engagement and information disclosure also during implementation and operation with all representatives and communities affected by the sub-project. Furthermore, the sub-project contractor will be required to undertake a process of stakeholder engagement with representative persons and communities directly affected by the activities it undertakes, including, in the public disclosure of its C- ESMP. The sub-project contractor will also maintain throughout the sub-project good relations with local communities and will give these communities prior notice of plans and schedules as they might affect local people. Thus, the stakeholder engagement process and information disclosure will also be applicable in the sub-project cycle.

Dedicated approaches and an increased level of resources may be needed for communication with such differently affected groups so that they can obtain the information they need regarding the issues that will potentially affect them.

- When the stakeholder engagement with local individuals and communities depends substantially on community representatives, UNOPS will make reasonable efforts to verify that such persons do, in fact, represent the views of

such individuals and communities, and that they are facilitating the communication process in an appropriate manner.

For more information, related to the stakeholder engagement plans refer to these links:

YEHCP-SEP link:

https://ye.unopsmr.org/wp-content/uploads/2022/06/YEHCP-Additional-Financing-Stakeholder-Engagement-Plan-SEP.docx.pdf

YIUSEP-II-AF SEP Link:

https://ye.unopsmr.org/wp-content/uploads/2022/01/Additional-Financing-Stakeholder-Engagement-Plan-SEP.docx.pdf

### *7.5 Sustainability of Sub-project*

UWSP – Aden Region engages various stakeholders in implementation and the consultation process continues during and after implementation. To ensure sustainability of the sub-project, a community committee has been formed before the commencement date which will work to ensure and confirm community participation, help in facilitating implementation. The beneficiary committees are formed from local councils, utilities, representatives of youth and women. The key duty of such committees to ensure sustainability of the sub-project after implementation phase. Also, coordination with Local Authorities / Councils took place to inform them on the planned activities, and of their important role in facilitation during implementation.

### 7.6 Grievance Mechanism GM

Bank procedures require that Grievance Mechanisms (GMs) be established and operational prior to commencement of the sub-projects, and that they continue to operate for one year following completion of the works for third party settlement of disputes arising from resettlement. This GM should take into account the availability of judicial recourse as well as traditional and community dispute resolution mechanisms.

UNOPS has established Grievance Mechanism (GM) for is YIUSEP II YEHCP to enable beneficiaries to communicate their concerns regarding the project activities. More specifically, the GM details the procedures that communities and individuals, who believe they are adversely affected by the project or a specific sub-project, can use to submit their complaints, as well as the procedures used by UNOPS and its local partners to systematically register, track, investigate and promptly resolve complaints.

Accordingly, hard copies of the translated application of the GM (which attached in Annex 1) was provided to interviewed people and they have been informed that the GM contact information will be posted at the sub-project site to ensure any grievance can be addressed in an amicable manner. Resolving complaints at community level is always encouraged to address the problem that a person may have during implementation and/or operation phase.

In any case, the project implementing partners must maintain records of grievances and complaints, including minutes of discussions, recommendations and resolutions made.

## 7.7 GM Procedures for Complaints

**Registering Complaints**

UNOPS is providing multiple access points to the UNOPS GRM focal point for beneficiaries to voice their concerns. These access points will be advertised at sub-project level and put on the sign boards on each sub-project site, and include GRM contact information including hotline, landline, mobile SMS, email and website:

Address: Haddah Street, former European Union Office Building, Sana'a

Tel: +967 1 504914 and +967 1 504915

SMS: +967 739888388

Email grm-yemen@unops.org.

Email; info@ussp-pmu-ye.org.

Tel: +96702-275585

Website: www.unops.org

The GM contact information will be posted in Arabic and be communicated through multiple channels to ensure all groups can easily access contact information and relevant mechanisms to provide feedback.

People can complain through a variety of channels, including complaints boxes distributed at work sites, WhatsApp messages, short text messages, email, and toll-free numbers, with explanations of each method provided at the work site in Arabic.

Grievances can be brought up by affected people in case of: (i) non-fulfillment of contracts or agreements; (ii) disputes related to destruction of assets or livelihoods; (iii) disturbances caused by rehabilitation activities; (iv) concerns around safety and protection related to project's activities.

Anonymous complaints will be admissible to their attention verbally or in writing by sub-projects affected communities or individuals, and will relay these concerns in writing to UNOPS on a next day basis. UNOPS will determine if these concerns rise to the level of a complaint.

UNOPS will register the complaint in a dedicated log by gender, age, and location, and include a copy of the complaint and supporting documents. A draft template for registering grievances is annexed.

UNOPS will record and document complaints received in the sub-project file and the sub-project progress reports, including the number and type of complaints and the results of their resolution.

For project level grievance redress mechanism, a grievance redress cell is established in the project implementation unit; ESSU Safeguards Officers, with support from the UNOPS Social Security Specialist, are responsible for holding periodic community meetings with affected communities to understand their concerns and assist them through the grievance redress process. Registering the grievances of illiterate victims

and explaining the mechanism for handling grievances. Plan all appropriate and small grievances for resolution at field level.

**Tracking, Investigating and Resolving Complaints**

The GRM log maintained by UNOPS will track the date the complaint was received, date responded to, the type of response, and if the complaint was resolved to the satisfaction of the plaintiff.

The ESSO will coordinate with local partners, local field staff and local government officials to ensure prompt follow up action in response to each complaint. More specifically, the GRM focal point will register all complaints in the GRM log.

Inform the plaintiff if the complaint is accepted or rejected within 3 days from receiving the complaint; any technical input from project engineers; if necessary the response will require input from project engineers.

If the complaint is accepted, send the plaintiff an officially stamped review card indicating:

- plaintiff name or legal representative
- plaintiff address
- complaint title
- review date
- list of annexes submitted with the complaint

Work with engineers, local partners, and contractors to resolve the complaint within 28 days of its submission.

**Grievance Categories**

The grievance could be among but not limited to the following categories:

- Sexual Exploitation and Abuse and gender-based violence
- Access to project benefits (e.g., no or insufficient jobs created for local communities);
- Non-equal distribution of project services among target beneficiaries;
- Disputes (e.g. matters raised by/related to beneficiaries.
- Disturbance (e.g., noise, traffic road access and public safety etc.).

**Steps to handle GRM**

- Publicizing: stakeholder's consultation, printed materials;
- Receiving and registering complaints: staff at local and central level who will be responsible for receiving registering and tracking complaints;
- Acknowledging: The GRM staff (team) acknowledges receipt of the complaint within 2-3 working days. Inform the complainant on the eligibility of his/her complaint;
- Anonymous complaints: To be studied as well;
- Reviewing and investigating, collect, review and analyze related documents;
- Conducting interviews of the involved persons, officers and staff;
- Analyzing the related national legislations & regulations, World Bank Policies & Guidelines and UNOPS standards;
- Summarizing the facts and findings;

- Developing resolution options: based on the collected evidence, the GRM staff (team) will draw conclusions, make recommendations for solutions, and present it to the complainant;
- If the solution is not accepted, complaint will be presented to the Program Manager as a second level to appeal who can make the resolution and/or can delegate an arbitrary to investigate on the complaint and propose recommendations for resolution;
- Implementing resolution: If the solution is accepted, then will be implemented;
- Monitoring and closing: the complaint should be monitored for a reasonable period of time to make sure that the complainant does not express additional concerns, and then complaint could be closed.
- Reporting (recording): prepare concise summary reports of the complaints received, with the resolutions taken and status of resolutions implementation, and filled in the database with detailed record. The table below summarizes the complaints management review process.

**Gender Based Violence**

The GM will address gender-based violence (GBV), sexual exploitation and abuse (SEA), and sexual harassment (SH) in a manner that avoids stigmatization, rejection, and reprisals against survivors.

The GM will assist SEA/SH survivors by referring them to GBV service providers for support immediately after receiving a complaint directly from a survivor. The information in the GM relative to GBV/SEA/SH will be confidential, especially when related to the identity of the complainant.

UNOPS will also make the GM gender sensitive by recruiting female staff to:

- Inform women about the project and its possible benefits to women, in a culturally sensitive manner
- Inform women of the project's gm and its procedures

Receive any project-related complaints from women.

Tracking, Investigating and Resolving Complaints

The GRM log maintained by UNOPS will track the date the complaint was received, date responded to, the type of response, and if the complaint was resolved to the satisfaction of the plaintiff.

The ESSO will coordinate with local partners, local field staff and local government officials to ensure prompt follow up action in response to each complaint. More specifically, the GRM focal point wills forename complaints:

Inform the plaintiff if the complaint is accepted or rejected within 3 days from receiving the complaint; any technical input from project engineers; if necessary, the response will require input from project engineers.

If the complaint is accepted, send the plaintiff an officially stamped review card

indicating:

- Plaintiff name or legal representative
- Plaintiff address
- Complaint title
- Review date
- List of annexes submitted with the complaint

Work with engineers, local partners, and contractors to resolve the complaint within 28 days of its submission.

Grievance Categories

The grievance could be among but not limited to the following categories:

- Access to project benefits (e.g., no or insufficient jobs created for local communities);
- Non-equal distribution of project services among target beneficiaries;
- Disputes (e.g. matters raised by/related to beneficiaries).
- Disturbance (e.g. noise, traffic road access and public safety etc.).
- GBV/SH grievance.
- Internal grievance (worker's grievance).
- Steps to handle GRM
- Publicizing: stakeholder's consultation, printed materials;
- Receiving and registering complaints: staff at local and central level who will be responsible for receiving registering and tracking complaints;
- Acknowledging: The GRM staff (team) acknowledges receipt of the complaint within 2-3 working days. Inform the complainant on the eligibility of his/her complaint;
- Anonymous complaints: To be studied as well;
- Reviewing and investigating, collect, review and analyze related documents;
- Conducting interviews of the involved persons, officers and staff;
- Analyzing the related national legislations & regulations, World Bank Policies & Guidelines and UNOPS standards;
- Summarizing the facts and findings;
- Developing resolution options: based on the collected evidence, the GRM staff (team) will draw conclusions, make recommendations for solutions, and present it to the complainant;
- If the solution is not accepted, complaint will be presented to the Program Manager as a second level to appeal who can make the resolution and/or can delegate an arbitrary to investigate on the complaint and propose recommendations for resolution;
- Implementing resolution: If the solution is accepted, then will be implemented;
- Monitoring and closing: the complaint should be monitored for a reasonable period of time to make sure that the complainant does not express additional concerns, and then the complaint could be closed.

Reporting (recording): prepare concise summary reports of the complaints received, with the resolutions taken and status of resolutions implementation, and

filled in the database with detailed records.

Right of appeal. A worker should have the right to appeal to the World Bank or national courts if he or she is not happy with the initial finding.

# Annex 1: GM Complaint and Suggestion Form

| | | |
|---|---|---|
| **Yemen Integrated Urban Services Emergency Project**<br>**YIUSEP II AF**<br>**Sample of GRM**<br>**Complaint and Suggestion Form** | استمارة توثيق ومتابعة شكاوى المستفيدين من المشروع الطارئ للخدمات الحضرية المتكاملة – المرحلة الثانية التمويل الاضافي | المشروع الطارئ للخدمات الحضرية المتكاملة المرحلة الثانية- التمويل الاضافي<br>نموذج لألية التظلمات والشكاوى |

**"Documenting and Monitoring Complaints Form of Beneficiaries of Yemen Integrated Urban Services Emergency Project YIUSEP II AF"**

| | | | | |
|---|---|---|---|---|
| الاسم الثلاثي للمستفيد:<br>Beneficiary Name | | | | |
| رقم البطاقة الشخصية:<br>ID No. | | رقم الهاتف للمتابعة Tel No.<br>for follow up | | |
| العنوان الدائم:<br>Permanent Address | | | | |
| اسم النشاط المنفذ (مركز/وحدة)<br>Name of activity under implementation | | | | |
| مكان تنفيذ النشاط:<br>Place of activity under implementation | القرية:<br>Village | المديرية:<br>District | المحافظة:<br>Governorate | |

| نوع الشكوى<br>Complaint Type | إدارية<br>Administrative | فنية<br>Technical | مالية<br>Financial | أخرى<br>Other |
|---|---|---|---|---|
| | | | | |

موضوع الشكوى:
**Complaint Subject**

| | | | |
|---|---|---|---|
| الوضع الحالي:<br>Current Situation | | | |
| أسباب المشكلة:<br>Reason of the problem | | | |
| التاريخ:<br>Date | | صاحب الشكوى:<br>Complainant Signa | |

- الجهة التي يجب أن يقدم لها الشكوى:.. **UNOPS/Sana'a – Tel: 01 504914/915 - SMS:739888388 Email: GRM.yemen@unops.org**.....
The entity which the complaint should be forwarded to:
-الرأي في جدية الشكوى:.....
Opinion on the seriousness of the complaint
-الجهة المحول لها الشكوى :.....
The complaint transferred to
- المدة الزمنية اللازمة للبت في الشكوى:.....
Time required for response
-مدى رضى المستفيد عن الاستجابة لحل شكواه:.....
Satisfaction of beneficiary in responding to his/her complaint

| | | | |
|---|---|---|---|
| الإجراءات المتخذة :<br>Action taken | | | |
| ما ترتب عليها من نتائج:<br>The results of the action taken | | التاريخ:<br>Date | |

اسم مستلم الشكوى ووظيفته: .....
Name of person received the complaint and his/her position

التاريخ Date : .....

توقيع الموظف المختص/
Signature

# Annex 2: Environmental and Social Requirements for Contractors

These requirements for contractors are generic and clauses applied as relevant to each sub-project.

Contractors shall meet the following Environmental, Health, Safety and Social (including labor) requirements – thereafter called ESHS requirements8.
The ESHS requirements include 10 sections

Contractor Environmental and Social Management Plan (C-ESMP)
ESHS Training
Construction Site Management
Occupational Health and Safety (OHS)
Road safety and Traffic Safety
Chance Find Procedures
Emergency Preparedness and Response
Stakeholder Engagement
Code of Conduct
Contractor Environmental and Social Reporting

## Contractor Environmental and Social Management Plan (C-ESMP)

Prepare and submit to UNOPS for approval a Contractor Environmental and Social l and Social Management Plan (C-ESMP).

Include in the C-ESMP a detailed explanation of how the contractor's performance will meet the ESHS requirements.

Ensure that sufficient funds are budgeted to meet the ESHS requirements, and that sufficient capacity is in place to oversee, monitor and report on C-ESMP performance.

Put in place controls and procedures to manage their ESHS performance.

Get prior written approval from UNOPS Engineers before starting construction or rehabilitation activities.

## ESHS Training

Determine ESHS training needs in collaboration with UNOPS.
Maintain records of all ESHS training, orientation, and induction.
Ensure, through appropriate contract specifications and monitoring that service providers, as well as contracted and subcontracted labor, are trained adequately before assignments begin.
Demonstrate that its employees are competent to carry out their activities and duties safely. For this purpose, the Contractor shall issue a Competence Certificate for every person working on site (relative to aspect of work

[8] The ESHS requirements build on the General EHS Guidelines of the World Bank Group, but also take into account other World Bank guidelines, and good practice notes

assignment) that specifies which tasks can be undertaken by which key personnel.

**Orientation Training**

Provide ESHS orientation training to all employees, including management, supervisors, and workers, as well as to subcontractors, so that they are apprised of the basic site rules of work at/on the site and of personal protection and preventing injury to fellow employees.

Training should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

**Visitor Orientation**

Establish an orientation program for visitors, including vendors that could access areas where hazardous conditions or substances may be present.

Visitors shall not enter hazard areas unescorted.

Ensure that visitors shall always be accompanied by an authorized member of the contractor, or a representative of UNOPS or of its implementing partners, who has successfully fulfilled the ESHS orientation training, and who is familiar with the project site construction hazards, layout, and restricted working areas.

**New Task Employee and Contractor Training**

Ensure that all workers and subcontractors, prior to commencement of new assignments, have received adequate training and information enabling them to understand work hazards and to protect their health from hazardous ambient factors that may be present. The training should adequately cover the step by step process that is needed for Project activities to be undertaken safely, with minimum harm to the environment, including:

Knowledge of materials, equipment, and tools.

Known hazards in the operations and how they are controlled.

Potential risks to health.

Precautions to prevent exposure.

Hygiene requirements.

Wearing and use of protective equipment and clothing.

Appropriate response to operation extremes, incidents and accidents.

**Construction Site Management**

***Vegetation***

Prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the construction site.

Protect all trees and vegetation from damage by construction operations and equipment, except where clearing is required for permanent works, approved construction roads, or excavation operations.

Re-vegetate damaged areas on completion of the Works, and for areas that cannot be revegetated, scarifying the work area to a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Use, as much as possible, local species for replanting and species that are not listed as a noxious weed or invasive species.

Repair, replant, reseed or otherwise correct, as directed by UNOPS or its representative, and at the Contractor's own expense, all unnecessary destruction, scarring, damage, or defacing of the landscape resulting from the Contractors operations.

Transport labor and equipment in a manner to avoid as much as possible damage to grazing land, crops, and property.

**Protection of the Existing Installations**

Safeguard all existing buildings, structures, works, pipes, cables, sewers, or other services or installations from harm, disturbance or deterioration during construction activities.

Coordinate with local authorities to identify existing infrastructure that might not be visible.

Repair any damage caused by the Contractor's activities, in coordination with concerned authorities.

Take all reasonable precautions to prevent or reduce any disturbance or inconvenience to the owners, tenants or occupiers of properties to the construction activities, and more generally to the public.

Maintain safe access to public and private properties that might be affected by construction activities. If necessary, provide acceptable alternative means of passage or access to the satisfaction of the persons affected.

Avoid working during night hours.

**Waste from Construction Activities**

Collect and properly store and manage all solid wastes and hazardous wastes resulting from the construction activities, including construction debris and spoils, to prevent the contamination of soil and groundwater. Hazardous E-waste should be managed stored and disposed according to widely accepted guidelines. In case chemicals are present they should be stored and disposed according to their Material Safety Data Sheets (MSDSs)

Remove unneeded excavation material from construction sites as soon as possible.

Agree with relevant municipalities about solid waste disposal during construction.

Carefully select waste disposal sites, to be approved by UNOPS or its implementing partner.

Minimize littering of roads by ensuring that vehicles are licensed and loaded in such a manner as to prevent falling off or spilling of construction materials, and by sheeting the sides and tops of all vehicles carrying mud, sand, other materials or debris.

Transfer construction waste to assigned places in the selected waste disposal sites with documented confirmation.

Properly dispose of solid waste and hazardous wastes and debris at designated permitted sites waste disposal sites allocated by the local authorities, and obtain a receipt of waste from the authorized landfill authority.

**Air Quality**

The Contractor shall:

Use dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles, or controls, including air extraction and treatment through a bag house or cyclone for material handling sources, such as conveyors and bins.

Use water suppression for control of loose materials on paved or unpaved road surfaces. Oil and oil by-products is not a recommended method to control road dust.

Use wheel washes at quarries, ready-mix plants, construction sites, and other facilities to prevent track-out of mud, dust and dirt on to public road.

Regularly clean road surfaces within the construction sites to remove accumulated fine material, and regularly clean transportation vehicles.

Cover open bodied trucks handling sand, gravel or earth.

Minimize smoke from diesel engines by regular and proper maintenance, in particular by ensuring that the engine, injection system and air cleaners are in good condition.

**Hazardous and Toxic Materials**

The Contractor shall take precautions relative to the conditions specified herein.

Train workers regarding the handling of hazardous materials.

Store hazardous materials as per the statutory provisions of the Manufactures, Storage and Import of Hazardous Chemicals Rules (1989), under the Environment (Protection) Act, 1986.

Provide adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.

Use impervious surfaces for refueling areas and other fluid transfer areas.

Train workers on the correct transfer and handling of fuels and chemicals and the response to spills.

Provide portable spill containment and cleanup equipment on site and training in the equipment deployment.

Deposit or discharge toxic liquids, chemicals, fuels, lubricants and bitumen into containers for salvage or subsequent removal to off-site locations.
Treat hazardous waste separately from other waste.
Avoid the storage or handling of toxic liquid adjacent to or draining into drainage facilities.
Keep absorbent materials or compounds on Site in sufficient quantities corresponding to the extent of possible spills.
Locate landfill pits for the disposal of solid waste at least 100 m from water courses, and fencing them off from local populations.
Ensure adequate primary treatment of sanitation effluents and installing septic tanks away from village watering points.

**Area Signage**

Appropriately mark hazardous areas.
Install warning signs
Ensure that signage is in accordance with international standards and is well known to, and easily understood by workers, visitors and the general public as appropriate.
Demarcate work sites with safety tape, fencing or barricades, as appropriate, to prevent unauthorized access to the construction sites
Safeguard public safety by covering holes and by installing guardrails along temporary pathways.

**Health and Safety**

***Severe Weather and Facility Shutdown***

Design and build work place structures to withstand the expected elements for the region and designate an area designated for safe refuge, if appropriate.
Develop Standard Operating Procedures (SOPs) for project or process shut-down, including an evacuation plan.

***Lavatories and Showers***

Provide adequate lavatory facilities (toilets and washing areas) for the number of people expected to work at the construction sites, and make allowances for segregated facilities, or for indicating whether the toilet facility is “In Use” or “Vacant”.
Provide toilet facilities with adequate supplies of hot and cold running water, soap, and hand drying devices.
Where workers may be exposed to substances poisonous by ingestion and skin contamination may occur, provide facilities for showering and changing into and out of street and work clothes.

***Potable Water Supply***

Provide adequate supplies of potable drinking water from a fountain with an upward jet or with a sanitary means of collecting the water for the purposes of drinking

Ensure that water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) meets drinking water quality standards

***Clean Eating Area***

Where there is potential for exposure to substances poisonous by ingestion, make suitable arrangements to provide clean eating areas where workers are not exposed to the hazardous or noxious substances.

***Personal Protective Equipment (PPE)***

Identify and provide at no cost appropriate PPE to workers, the workers of subcontractors, as well as to visitors, which gives adequate protection without incurring unnecessary inconvenience to the individual.

Ensure that the use of PPE is compulsory.

Provide sufficient training in the use, storage and maintenance of PPE to its workers and workers of its subcontractors.

Properly maintain PPE, including cleaning when dirty and replacement when damaged or worn out;

Determine requirements for standard and/or task-specific PPE based on of Job specific Safety Analysis (JSA).

Consider the use of PPE as a last resort when it comes to hazard control and prevention, and always refer to the hierarchy of hazard controls when planning a safety process.

***Noise***

Institute appropriate measures to reduce the exposure of workers to construction noise, including but not limited to:

Avoid exposure to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).

Enforce the use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110 dB(A).

Provide hearing protective devices capable of reducing sound levels at the ear to at most 85 dB(A).

Reduce the “allowed” exposure period or duration by 50 percent for every 3 dB(A) increase in in excess of 85 dB(A).

Perform periodic medical hearing checks on workers exposed to high noise levels.

Rotate staff to limit individual exposure to high levels.

Install practical acoustical attenuation on construction equipment, such as mufflers.
Use silenced air compressors and power generators
Keep all machinery in good conditions.
Install exhaust silencing equipment on bulldozers, compactors, crane, dump trucks, excavators, graders, loaders, scrapers and shovels.
Post signs in all area where the sound pressure level exceeds 85 dB(A).
Shut down equipment when not directly in use.
Provide advance notice to occupants if an activity involving high level impact noise is in close proximity to buildings.

***First Aid and Accidents***

Ensure that qualified first-aid by qualified personnel is always available. Appropriately equipped first-aid stations should be easily accessible throughout the place of work.
Provide workers with rescue and first-aid duties with dedicated training so as not to inadvertently aggravate exposures and health hazards to themselves or their co- workers. Training would include the risks of becoming infected with blood–borne pathogens through contact with bodily fluids and tissue.
Provide eye-wash stations and/or emergency showers close to all workstations where immediate flushing with water is the recommended first-aid response.
Provide dedicated and appropriately equipped first-aid room(s) where the scale of work or the type of activity being carried out so requires.
Equip first aid stations and rooms with gloves, gowns, and masks for protection against direct contact with blood and other body fluids.
Make widely available written emergency procedures for dealing with cases of trauma or serious illness, including procedures for transferring patient care to an appropriate medical facility.
Immediately report all accidental occurrences with serious accident potential such as major equipment failures, contact with high-voltage lines, and exposure to hazardous materials, slides, or cave-ins to UNOPS.
Immediately investigate any serious or fatal injury or disease caused by the progress of work by the Contractor, and submit a comprehensive report to UNOPS.

***Communicable Diseases***

The Contractor shall implement a combination of behavioral and environmental modifications to mitigate communicable diseases:

Conduct Information, Education and Consultation Communication (IEC) campaigns, at least every other month, addressed to all construction site staff (including all the Contractor’s employees, all subcontractors of any tier, consultants' employees working on the site, and truck drivers and crew making deliveries to the site for Works and Services executed under the

Contract, concerning the risks, dangers and impact, and appropriate avoidance behavior of communicable diseases.

Provide treatment through standard case management in on-site or community health care facilities.

Ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers.

Promote collaboration with local authorities to enhance access of workers families and the community to public health services and ensure the immunization of workers against common and locally prevalent diseases.

Provide basic education on the conditions that allow the spread of other diseases such as COVID-19, Lassa fever, Cholera and Ebola. The training should cover sanitary hygiene education.

Prevent illness in immediate local communities by:

Implementing an information strategy to reinforce person-to-person counselling addressing systemic factors that can influence individual behavior as well as promoting individual protection, and protecting others from infection.

Training by health workers in disease treatment.

Conducting immunization programs for workers in local communities to improve health and guard against infection.

Providing health services.

***COVID-19***

In the context of the COVID-19 pandemic, Contractors shall develop and implement measures to prevent or minimize an outbreak of COVID-19, and develop procedures indicating what should be done if a worker gets sick. The measures shall include:

Assessing the characteristics of the workforce, including those with underlying health issues or who may be otherwise at risk.

Confirming that workers are fit for work, including temperature testing and refusing entry to sick workers.

Considering ways to minimize entry/exit to site or the workplace, and limiting contact between workers and the community/general public

Training workers on hygiene and other preventative measures, and implementing a communication strategy for regular updates on COVID-19 related issues and the status of affected workers.

Treating workers who are or should be self-isolating and/or are displaying symptoms

Assessing risks to continuity of supplies of medicine, water, fuel, food and PPE, taking into account international, national and local supply chains

Reducing, storing and disposing of medical waste

Adjusting work practices, to reduce the number of workers and increase social distancing

Expanding health facilities on-site compared to usual levels, developing relationships with local health care facilities and organize for the treatment of sick workers

Building worker accommodations further apart, or having one worker accommodation in a more isolated area, which may be easily converted to quarantine and treatment facilities, if needed

Establishing a procedure to follow if a worker becomes sick (following WHO guidelines)

Implementing a communication strategy with the community, community leaders and local government in relation to COVID-19 issues on the site.

***Vector-Borne Diseases***

Reducing the impact of vector-borne disease on the long-term health of workers is best accomplished by implementing diverse interventions aimed at eliminating the factors that lead to disease. The Contractor, in close collaboration with community health authorities, shall implement an integrated control strategy for mosquito and other arthropod-borne diseases that includes the following measures:

Prevent of larval and adult propagation through sanitary improvements and elimination of breeding habitats close to human settlements

Eliminate unusable impounded water

Increase water velocity in natural and artificial channels

Consider the application of residual insecticide to dormitory walls

Implement integrated vector control programs

Promote the use of repellents, clothing, netting, and other barriers to prevent insect bites

Use chemoprophylaxis drugs by non-immune workers and collaborating with public health officials to help eradicate disease reservoirs

Monitor and treat circulating and migrating populations to prevent disease reservoir spread

Collaborate and exchange in-kind services with other control programs in the project area to maximize beneficial effects

Educate project personnel and area residents on risks, prevention, and available treatment

Monitor communities during high-risk seasons to detect and treat cases

Distribute appropriate education materials

Follow safety guidelines for the storage, transport, and distribution of pesticides to minimize the potential for misuse, spills, and accidental human exposure

**Road safety and Traffic Safety**

The Contractor shall ensure traffic safety by all project personnel during displacement to and from the workplace, and during the operation of project equipment on private or public roads. The Contractor shall adopt best transport safety practices across all aspects of project operations with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public, including:

Emphasize safety aspects among drivers.
Improve driving skills and requiring licensing of drivers.
Institute defensive driving training for all drivers prior to starting their job.
Adopt limits for trip duration and arranging driver rosters to avoid overtiredness.
Avoid dangerous routes and times of day to reduce the risk of accidents.
Use speed control devices (governors) on trucks, and remote monitoring of driver actions.
Require that drivers and co-passengers wear seatbelts, and duly sanction defaulters.
Regularly maintain vehicles and use manufacturer approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.

Where the project may contribute to significant changes in traffic along existing roads the contractor shall:
Commence activities that affect public motorways and highways, only after all traffic safety measures necessitated by the activities are fully operational.
Arrange diversions for providing alternative routes for transport and/or pedestrians.
Minimize pedestrian interaction with construction vehicles, particularly at crossing points to schools, markets, and any animal crossing points of significance, through appropriate signage, engineered footpaths or traffic slowing devices.
Organize meaningful road accident awareness events at all roadside schools and communities within 150 meters of the road centerline, covering safe road crossing, road accident hazards from weather conditions and vehicle roadworthiness, overloading and driver alertness, dangers posed by parked and broken-down vehicles, etc.
Collaborate with local communities and responsible authorities to improve signage, visibility and overall safety of roads, particularly along stretches located near schools or other locations where children may be present.
Collaborate with local communities on education about traffic and pedestrian safety (e.g. school education campaigns).
Coordinate with emergency responders to ensure that appropriate first aid is provided to all affected persons in the event of accidents.
Use locally sourced materials, whenever possible, to minimize transport distances, and locate associated facilities such as worker camps close to project sites.
Employ safe traffic control measures, including road signs, traffic cones, removable barriers, and flag persons to warn of dangerous conditions.

**Emergencies**

Establish and maintain an emergency preparedness and response system, in collaboration with appropriate and relevant third parties including to cover: (i) the contingencies that could affect personnel and facilities of the project to be financed; (ii) the need to protect the health and safety of project workers; (iii) the need to protect the health and safety of the Affected Communities. The emergency preparedness and response system shall include:

Identification of the emergency scenarios.

Specific emergency response procedures.

Training of emergency response teams.

Emergency contacts and communication systems/protocols (including communication with Affected Communities when necessary).

Procedures for interaction with government authorities (emergency, health, environmental authorities).

Permanently stationed emergency equipment and facilities (e.g., first aid stations, firefighting equipment, spill response equipment, personal protection equipment for the emergency response teams).

Protocols for the use of the emergency equipment and facilities.

Clear identification of evacuation routes and muster points.

Emergency drills and their periodicity based on assigned emergency levels or tiers.

Decontamination procedures and means to proceed with urgent remedial measures to contain, limit and reduce pollution within the physical boundaries of the project property and assets to the extent possible.

**Stakeholder Engagement**

The Project Company will be required to undertake a process of stakeholder engagement with representative persons and communities directly affected by the activities it undertakes, including if necessary, the public disclosure of its C-ESMP. The Project Company shall also maintain throughout the Project good relations with local communities and will give these communities prior notice of plans and schedules as they might affect local people.

The stakeholder engagement process will also be applicable in the event of land acquisition associated with changes in the footprint of activities.

## Labor Force Management

### *Labor Conditions*

***Table 5: Expected labors for each sub-project***

| # | Labor | Type of Workers | | No. |
|---|---|---|---|---|
| | | Contract | Skills | |
| 1 | Project Manager | Direct | Skilled | 1 |
| 2 | Supervisor | Direct | Skilled | 1 |
| 3 | Supervisor | Contracted | Skilled | 1 |
| 4 | ES Officer | Direct | Skilled | 1 |
| 5 | ES Officer | Contracted | Skilled | 1 |
| 6 | HR Officer | Direct | Skilled | 1 |
| 7 | Accountant | Direct | Skilled | 1 |
| 8 | Procurement Officer | Direct | Skilled | 1 |
| 9 | Construction workers | Contracted | Skilled | 3 |
| 10 | Drivers | Contracted | Skilled | 2 |
| 11 | Dailly worker | Contracted | Unskilled | 5 |
| 12 | Flag Man | Contracted | Unskilled | 1 |
| Total | | | | 19 |

Implement the measures and commitments defined in the Labor Management Procedures. A copy of the LMP can be found in the Project ESMF
Provide all workers with terms and conditions that comply with Yemeni Labor Legislation, most particularly Decree 5/1995) and applicable International Labor Organization conventions on workplace conditions.

### *Insurance*

Provide insurance for call employees involved in onsite activities, as indicated by Yemen's Labor Law
Compensate any employee for death or injury.

### Grievance Mechanism for Workers

The Contractor shall put in place a Grievance Mechanism for workers and the workers of its subcontractors that is proportionate to its workforce. The GM shall be

distinct from the Project level Grievance Mechanism for affected individuals and communities, and shall adhere to the following principles:

*Provision of information.* All workers should be informed about the grievance mechanism at the time they are hired, and details about how it operates should be easily available, for example, included in worker documentation or on notice boards.

*Transparency of the process.* Workers must know to whom they can turn in the event of a grievance and the support and sources of advice that are available to them. All line and senior managers must be familiar with their organization's grievance procedure.

*Keeping it up to date.* The process should be regularly reviewed and kept up to date, for example, by referencing any new statutory guidelines, changes in contracts or representation.

*Confidentiality.* The process should ensure that a complaint is dealt with confidentially. While procedures may specify that complaints should first be made to the workers' line manager, there should also be the option of raising a grievance first with an alternative manager, for example, a human resource (personnel) manager.

*Non-retribution.* Procedures should guarantee that any worker raising a complaint will not be subject to any reprisal.

*Reasonable timescales.* Procedures should allow for time to investigate grievances fully but should aim for swift resolutions. The longer a grievance is allowed to continue, the harder it can be for both sides to get back to normal afterwards. Time limits should be set for each stage of the process, for example, a maximum time between a grievance being raised and the setting up of a meeting to investigate it.

*Right of appeal.* A worker should have the right to appeal to the World Bank or national courts if he or she is not happy with the initial finding.

*Right to be accompanied.* In any meetings or hearings, the worker should have the right to be accompanied by a colleague, friend or union representative.

*Keeping records.* Written records should be kept at all stages. The initial complaint should be in writing if possible, along with the response, notes of any meetings and the findings and the reasons for the findings. Any records on SEA shall be registered separately and under the strictest confidentiality.

*Relationship with collective agreements.* Grievance procedures should be consistent with any collective agreements.

*Relationship with regulation.* Grievance processes should be compliant with the national employment code.

**Protection from Sexual Exploitation and Abuse**

Provide repeated training and awareness raising to the workforce about refraining from unacceptable conduct toward local community members, specifically women.

Inform workers about national laws that make sexual harassment and gender-based violence a punishable offence which is prosecuted.

Prohibit its employees from exchanging any money, goods, services, or other things of value, for sexual favors or activities, or from engaging any sexual activities that are exploitive or degrading to any person.

Develop a system to capture gender-based violence, sexual exploitation and workplace sexual harassment related complaints/issues.

Adopt a policy to cooperate with law enforcement agencies in investigating complaints about gender-based violence.

### Protection from Child Labor

Verify that workers are older than 18 when hiring.

Exclude all persons under the age of 18.

Review and retain copies of verifiable documentation concerning the age of workers.

### Code of Conduct

Contractors shall ensure that all employees, including those of subcontractors, are informed about and sign the following Code of Conduct:

**CODE OF CONDUCT FOR CONTRACTOR'S PERSONNEL**

We the Contractor [enter name of Contractor] have signed a contract with UNOPS for [enter description of the activities]. These activities will be carried out at [enter the Site and other locations where the activities will be carried out]. Our contract requires us to implement measures to address environmental and social risks related to the activities, including the risks of sexual exploitation and assault and gender-based violence.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the activities. It applies to all our staff, including laborers and other employees at the at all the places where the activities are being carried out. It also applies to the personnel of every subcontractor and any other personnel assisting us in the execution of the activities. All such persons are referred to as "Contractor's Personnel" and are subject to this Code of Conduct.

***This Code of Conduct identifies the behavior that we require from all Contractor's Personnel.***

Our workplace is an environment where unsafe, offensive, abusive or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

**Required Conduct**

Contractor's Personnel shall:

Carry out his/her duties competently and diligently.

Comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person.

Maintain a safe working environment including by:

Ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health.

Wearing required personal protective equipment.

Using appropriate measures relating to chemical, physical and biological substances and agents; and Following applicable emergency operating procedures.

report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health.

treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children.

not engage in any form of sexual harassment including unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel.

not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In Bank financed projects, sexual exploitation occurs when access to or benefit from Bank financed Goods, Works, Consulting or Non-consulting services is used to extract sexual gain.

not engage in Sexual Assault, which means sexual activity with another person who does not consent. It is a violation of bodily integrity and sexual autonomy and is broader than narrower conceptions of "rape", especially because (a) it may be committed by other means than force or violence, and (b) it does not necessarily entail penetration.

not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage.

complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, and Sexual Exploitation and Assault (SEA).

report violations of this Code of Conduct; and

Not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the [Project Grievance [Redress] Mechanism].

**Raising Concerns**

If any person observes behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

Contacting the Individual designated by the Contractor [enter name of Contact)
In writing at this address]
By telephone at [ ]
In person at [ ]
Calling [ ] to reach the Contractor's hotline and leave a message (if available)

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action.

We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

**Consequences of Violating the Code of Conduct**

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

**For Contractor's Personnel**

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [enter name of Contractor's contact person with relevant experience in handling gender-based violence] requesting an explanation.

Name of Contractor's Personnel: [insert name]
Signature: _____
Date: (day month year):
_____
Countersignature of authorized representative of the Contractor:
Signature: _____
Date: (day month year):
_____

A copy of the code shall be displayed in a location easily accessible to the community and project affected people. It shall be provided in languages comprehensible to the local community, Contractor's personnel (including sub-contractors and day workers), Project Company's and Project Manager's Personnel, and affected persons.]

**Contractor Environmental and Social Reporting**

***Contractors*** shall monitor, keep records and report on the following environmental and social issues:

***Safety:*** hours worked, lost time injury (LTI), lost workdays, recordable incidents and corresponding Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and remedial and preventive activities required (for example, revised job safety analysis, new or different equipment, skills training, and so forth).

***Environmental incidents and near misses****:* environmental incidents and high potential near misses and how they have been addressed, what is outstanding, and lessons learned.

***Major works****:* those undertaken and completed, progress against project schedule, and key work fronts (work areas).

***ESHS requirements****:* noncompliance incidents with permits and national law (legal noncompliance), project commitments, or other ESHS requirements.

***ESHS inspections and audits****: by Project Company, Independent Engineer, UNOPS and* its implementing partners, or others—to include date, inspector or auditor name, sites visited and records reviewed, major findings, and actions taken.

***Workers:*** list of workers at each site, confirmation of ESHS training, indication of origin (expatriate, local, nonlocal nationals), gender, age with evidence that no child labor is involved, and skill level (unskilled, skilled, supervisory, professional, management).

***Training on ESHS issues****:* including dates, number of trainees, and topics.

*Footprint management:* details of any work outside boundaries or major off-site impacts caused by ongoing construction—to include date, location, impacts, and actions taken.

***External stakeholder engagement****:* highlights, including formal and informal meetings, and information disclosure and dissemination—to include a breakdown of women and men consulted and themes coming from various stakeholder groups, including vulnerable groups (e.g., disabled, elderly, children, etc.).

***Details of any security risks****:* details of risks the Project Company may be exposed to while performing its work—the threats may come from third parties external to the project.

***Worker grievances****:* details including occurrence date, grievance, and date submitted; actions taken and dates; resolution (if any) and date; and follow-up yet to be taken grievances listed should include those received since the preceding report and those that were unresolved at the time of that report.

***External stakeholder grievances****:* grievance and date submitted, action(s) taken and date(s), resolution (if any) and date, and follow-up yet to be taken grievances listed should include those received since the preceding report and those that were unresolved at the time of that report. Grievance data should be gender disaggregated.

*Major changes to Contractors environmental and social practices*.

*Deficiency and performance management:* actions taken in response to previous notices of deficiency or observations regarding ESHS performance and/or plans for actions to be taken should continue to be reported to UNOPS until it determines the issue is resolved satisfactorily.

## Annex3: General Technical Specifications

***Scope of Work of the Contract***

- The engineers shall hand over to the contractor the (bench marks), and the contractor must maintain it. He must also fix other anchor points around the facility away from traffic and work.
- The contractor should review the plans to ensure the accuracy of the information based on them before starting work, and he should inform the engineer in case of any discrepancies.
- The contractor shall carry out all the necessary planning work for implementation, surveying, and calculating quantities on his responsibility in accordance with the plans and instructions of the engineers.
- The contractor is required to provide a site report and set a fixed, immovable bench mark (B.M.) before the work begins. The engineer must verify and approve these works.
- The contractor shall provide all the necessary tools and materials for planning operations, surveying, and fixing the axes of the water and sewage lines accurately.
- The contractor must remove plants and surface obstructions if they appear during the excavation process, in addition to making sure that there are electrical, water or other extensions. He must also take all the necessary precautions to preserve it, repair what may be damaged, and inform the concerned authority of this and coordinate with it.
- Leveling is reaching the required levels for excavation and backfilling. Accordingly, soil suitable for backfilling is taken and filled with low areas that are determined by the supervising engineer.
- Determining the levels of excavation according to drawings and plans practically according to the engineer's experience, and the excavation process should be according to the sizes that are based on the drawings.
- Excavating in any type of soil, including rock and the excavation floor shall have flat levels for the bases and the backfill to obtain the resistance of the foundation soil. After completing the backfilling, the surplus of the soil should be moved to the pits, and the wastes should be moved outside the site.

### Concrete Works

- Concrete works and materials shall conform to the British Standard Specifications BS or its equivalent.
- The sand must be of a graded size, clean and coarse, free from salts, cuffs, and organic materials, and it should not contain more than 3% weight of aggregate or suspended matter.
- The aggregate must be clean, free of clay or any organic impurities, and its granules must be sized and angled, and it should conform to the British Standard Specifications BS 882.

### Cement

- Portland cement must be manufactured in accordance with BS 12 or ASTM - C145 standards, and from a brand approved by the engineer. It should be also guaranteed and has protection from moisture. The cement that has been produced of more than 10 months should not be used.

### Water

- The water used for the required work must be clean, free of all salts and impurities, and it should be suitable for drinking.

### Reinforcing steel

- Should have a resistance of not less than 4200 kg/cm2 and the skewers should be free of any suspended materials that prevent cohesion between them and the concrete.
- The overlap must be at least 40 times the diameter of the rod, and the rods must be tied with at least 20 Cage wires.
- The iron is not cut or stopped in areas that have tensile stresses.

### Ordinary concrete

- is made of cement, sand and aggregate with a mixing ratio of (1: 3: 6), so that its resistance is not less than 15 kg / cm2, and they are used in floors as curing of concrete.
- Reinforced concrete
- It consists of cement, aggregate and sand with a mixing ratio of (1: 1.5: 3), so that the concrete resistance is not less than 25 kg / cm 2 according to the construction data.
- All tests for materials used in concrete are carried out in a laboratory that is approved by the project.
- The contractor must not start any concrete work before obtaining the approval of the laboratory of the results of the tests or the approval of the supervising engineer.

### Tensioning of Concrete works

- Concrete tensioning must be in conformity with the dimensions of the shapes and levels required in the drawings. They should be tensioned with a smooth surface, so that the cement mortar does not leak out.
- It must be durable and able to bear the weight that will fall on it, and it must be approved by the supervising engineer in writing before placing the irons.
- It is not allowed to loosen the tensions except after two days for the sides of the bridges and columns, and twenty-one days for the ceilings and sills.
- The tensions must be level with identical welded surfaces, so that the cement mortar does not leak. In general, the contractor is responsible for the durability of all tensioning works.
- The wooden strength of the tank must be of clean, smooth of white plate, and the condition of the timber must be good, taking into account that they are muffled, not allowing the mortar to come out of it, and the wood should not be loosened until after 21 days.
- The concrete should be sprayed regularly three times a day for a sufficient period of not less than a week.
- Making a slope of the surface with 3% in order to drain the water, and for the floor it should be with 3% in the direction of the washing and drain pipe.
- The water of the tank should be drained to a place that is far from the tank, so as not to affect the foundations.
- Concrete mix should be according to the British Standard specifications, and it must be with mechanical mixers with the use of a correct water ratio and that the ratio of water to cement does not exceed 50-70% of the mixture. The mixing should be not less than two minutes to make sure that the mixture is completely homogeneous.

### Plumbing works for the tank

- Plumbing works for the pipes entering and leaving the tank are carried out by installing them in the specified position before pouring according to the drawings and designs.

- An iron joint must be welded and wrapped around the circumference of the pipe with two iron skewers. It is attached to the tank wall to ensure that it does not vibrate during pouring. Ventilation pipes are also fixed in the surface of the tank with a diameter of 4 inches and a length of 60 cm, and it is bent down and covered with an insect repellent net.
- The filter pipe should be with the tank floor level, and the exit pipe should be at a height of 15 cm from the tank floor. A ventilation pipe should be fixed on the liquefaction line, at the height of the tank and with a diameter of not less than 2 inches.

### Concrete pouring

- The concrete that is required to be available on the site shall be transferred to the place of casting in an appropriate manner and approved by the engineer, provided that it does not cause dispersal or contamination of the concrete compounds. Concrete must be poured within a period not exceeding ten minutes from its mixing and before it begins to harden, otherwise it will be rejected.
- Pouring of concrete should not be from a height of more than two meters, and metal drivers should be used that are homogeneous and free of air.
- Using mechanical vibrators for reinforced concrete correctly and the pouring of any part of the structure must be in a continuous process.

### Coatings

- Wash the walls from the suspended soil after rubbing with the cleaning wire.
- The general spraying with cement mortar should be with a mixing ratio of (1:3) and sprayed with water for two days.
- The final facade of the coating is cement mortar and sand with a ratio of (1:3), and by using sica, and it is implemented on two layers with 1.5 cm thickness
- The exterior paint is double sided.
- The interior paint should be of epoxy or polybond, approved by the engineer to prevent the leakage.

### Valve rooms

- Valve rooms should be away from the motorway.
- It should be performed according to the dimensions indicated on the drawings and diagrams.
- Wall shall be coated inside and outside.
- An iron lid that is tightly opened and closed with a lock must be provided and painted with two layers and provided with anti-rust paint. It must also be arched in order to prevent water collection on the lid.

### Concrete Pillars and Supports

- Implementing supports of ordinary concrete.
- The contractor must take adequate care during the implementation of the supports and pillars so that they do not collapse or fall during or after testing.

### Pipes and its accessories

Supplying all medium pressure pipes according to British Standards (BS1387) of the latest version.

### Components

- Valves.
- Steel gate valve.

- It is manufactured with a gate to withstand high pressure of 16-100 bar, and it should be in accordance with British Standard Specifications BS 5157 and thermal pressure.
- The gate ratchet shall be solid and manufactured with the materials specified in the special specifications.
- The operation is performed manually by a wheel.
- The valve is provided with a drain device.
- It is provided with GAST IRON gate valve.
- Manufactured with a gate to withstand high pressure of 16-25 bar, and it should be in accordance with the British Standard Specifications BS 5157.

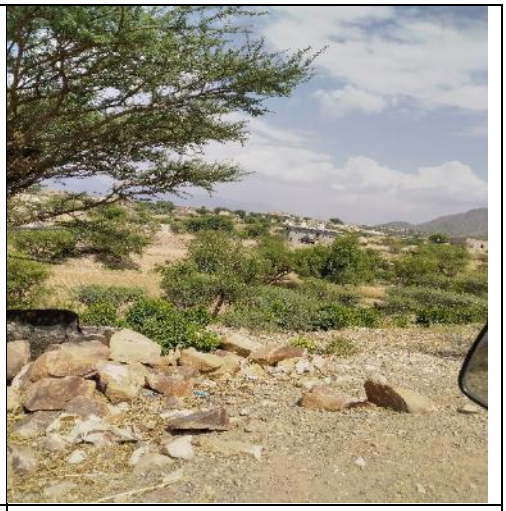
### The Meter

- The meter shall be of the turbo type and in accordance with BS 5728 ISO 40064 standards.
- The meter works with a water temperature of 50 degrees and a pressure of no less than 24 bar.
- The meter contains a sealed magnetic readings recorder that can be read from the top, and it contains 7 readings. The numbers for the total readings, and a central hour hand are read up to 100 liters.

# Annex 4: Public Consultation Questionnaires – available upon request

General Views of the subproject

beneficiary villages



Project topography

tank location

# Annex 5. Selected Photos (Consultation)

# Annex 6. Official letter UWS-Aden

بسم الله الرحمن الرحيم

الجمهورية اليمنية

REPUBLIC OF YEMEN
Ministry of Water & Environment
National Water@ Sanitation Authority
Head Office – Aden
No: .....
Date: .....
Inch:.....

وزارة المياه والبيئة
المؤسسة العامة للمياه والصرف الصحي
الإدارة العامة - عدن
الرقم: م.ع.م.ل.ع/٢٩٤/٢٠٢٣
التاريخ: ٢٠٢٣/١٢/٢٠
المرفقات:

الأخوة/ مشروع المدن الحضرية المحترمين

تحية طيبة وبعد،،،

**الموضوع/ مشاريع آبار المياه الخاصة بالمؤسسة العامة**

نهديكم أطيب التحايا متمنين لكم دوام التوفيق في مهامكم بالإشارة إلى الموضوع أعلاه، وبناء على طلبكم للتأكيد حول المشاريع المتعلقة بآبار المياه للمؤسسة العامة للمياه والصرف الصحي نود التأكيد التزامنا بما يلي:

١- ان تستخدم لأغراض مياه الشرب فقط.
٢- لن يؤدي الى تأثير بيني سلبي على كمية ونوعية المياه.
٣- سيتم اجراء مراقبة منتظمة ودورية لنوعية المياه وكميتها من قبل المؤسسة.

وعليه وجب التأكيد في هذا الامر بناء على طلبكم.

شاكرين تعاونكم دوما...

وتفضلوا بقبول كل الشكر والتقدير،،،

م/علي سالم عسكر
رئيس المؤسسة



مكتب الحفري
لتقنيات المياه والبيئة
استكشاف – اشراف –صيانة - حفر ابار
ضخ تجريبي – دراسات – استشارات
عقارات (بيع – شراء – عقود –توثيق)


# Subject / Water test for Basin water well,

# Aldhalea District Aldhalea. Governorate

## Pumping Test Report Sheet

## تقرير اختبار الضخ التجريبي لبئر مشروع الحوض المائي

## للمؤسسة المحلية للمياه والصرف الصحي

## محافظة الضالع


الاستشاري /

م. بدر الحميدي

Eng. Bader AL-Homidi


مكتب الحفري
لتقنيات المياه والبيئة
استكشاف – اشراف –صيانة - حفر ابار
ضخ تجريبي – دراسات – استشارات
عقارات (بيع – شراء – عقود –توثيق)

# Pumping Test Report Sheet

## FIRST : THE CURRENT SITUATION OF THE REGION

Hajer area is within the administrative division of the, Al- Dhalee Directorate and it is located around 35 km the center of the Directorate in the northeast direction

**Well location:**

The well of is located in the village of Al Bajh the Hajer area of Al Dhalee ,District , Al-Dhalee Governorate

تقع البئر في قريه باجه – حجر حوش محطة اعادة الضخ التابع لمؤسسة المياه الضالع

**Coordinates: الاحداثيات**

| | |
|---|---|
| Lat .N: | 13.822587 |
| Long .E : | 44.624297 |
| Elev: | 1240 m |

**Well Specifications معلومات البئر**

- Total Depth:600 m
  عمق البئر
- Well diameter : 14in to 250 m
  قطر البئر 14 هنش الى عمق 250 متر
- Well diameter : 10 in of 250 m to 600 m
  قطر البئر 10 هنش من عمق 250 الى عمق 600 متر
- Casing type : Iron
  نوع الاكساء : حديد
- Casing Size : 12 in as tall as 250 m
  حجم الاكساء 12 هنش الى عمق 250 متر
- Static water level : 270 m
  منسوب الماء قبل بدء التجربة
- water column (m): 330 m
  عمود الماء

## SECOND - TECHNICAL SPECIFICATIONS OF THE PUMP

- Pump Type :
  نوع المضخة :
- Pump Capacity : 45 Kw
  قدرة المضخة
- Number of tubes :
  عدد الانابيب
- Pipe diameter : in
  قطر الانابيب
- Pump depth : 500 m
  عمق تركيب المضخة

**Pumping test analysis results**

On this day Thursday 30/12/2021 the filed went down to conduct an pumping test for the water Corporations well in the water basin which is being implemented by the contractor the Ali Abu Baker Al-Sulaimani foundation in the presence of the Humanitarian Response Foundation team .

تم في يومنا هذا الخميس الموافق 2021/12/30 م النزول الميداني لأجراء تجربة الضخ التجريبي لبئر مؤسسة المياه في الحوض الماني والذي يقوم بتنفيذه المقاول مؤسسة علي ابو بكر السليماني وبحضور فريق مؤسسة استجابة للأعمال الانسانية

**Static and continuous pumping test method**

pumping began at 11:00, am and the water level before pumping began was 270 m. The pumping was done at a rate of 5 liters per second, and the decrease and production were monitored as in the attached table, where the level gradually decreased until it reached a depth of 320 m, after 12 hours of start of pumping then the level was .

بداء الضخ في الساعة11:00 صباحا وكان منسوب الماء قبل بداء الضخ 270متر تم الضخ بمعدل 5 لتر / الثانية وتم رصد الانخفاض والانتاج كما في الجدول المرفق حيث انخفض المنسوب تدريجيا حتى وصل الى عمق 320 متر بعد 12 ساعة من بدء عملية الضخ ثم ثبت المنسوب عند هذا العمق حتى توقف الضخ بعد 24 ساعه

**Recovery test method .**

The recovery level reading was recorded starting at 320 and gradually reaching 270 m after 4 hours of end of pumping.

تم مراقبة اختبار العودة بداء من 320 م وارتفع المنسوب تدريجيا الى 270 متر بعد 4 ساعة من نهاية الضخ

**Hydrologic parameters .**

- (T) Transmissivity) :13 m2/day
- ( Specific storage or storability ): 6.2 m
- ( Specific yield)) -: 5 (l/ s)

**Staff team.**

| | |
|---|---|
| Eng. Bader Al-Homidi | consulting Engineer |
| Eng. . Emad Saleh Hamood | Engineer |
| Magdi Mohamed Hezam | Team member |
| Amin Ahmad Ali | Driver |

**Recommendations and Suggestions: المقترحات والتوصيات**

- suggested depth for Pump installation 500 m
  العمق المقترح لتركيب المضخة 500 متر
- installing a pump with a productivity (Specific yield) 5 L /S and its capacity to raise 530 m

تركيب مضخة ذات انتاجية 5 لتر / ثانية وقدرة رفع 530 م

# STEP DOWN TEST Data Form

| | | | |
|---|---|---|---|
| Borehole Name: اسم البئر | Basin water well | Borehole Location: موقع البئر | Bajh باجة |
| BH diammeter قطرا البئر | 10 | BH casing type نوع جدران البئر | iron |
| Date of Test: تاريخ الاختبار | 30/12/2021 | Name of Person completing form: Eng\ Emad Saleh Hamood Ahmed ادخل البيانات اسم الشخص الذي | |
| Rest-water Level (m below datum): منسوب الماء قبل بدء (التجربة (متر | 270 | This step Number: رقم المرحلة | |
| Start Time of This Step: وقت بدء المرحلة | 11:00 AM | Planned Duration of Step: فترة المرحلة الخطط لها | |
| Target Pumping Rate for this Step: في كمية التدفق الموصي بها هذ المرحلة | 5 L/s | Calculated Average Pumping Rate for this Step: متوسط كمية التدفق المحسوبة في هذه المرحلة | 5 |

Weather Conditions حالة الطقس — e.g dry, rainy, جاف رطب ,

| Time Elapsed Since Start of Step (min.) الزمن المنقضي منذ بدء المرحلة (دقيقة) | Water Level (m below datum) منسوب (الماء (متر | Calculated Drawdown (m) الهبوط المحسوب (للماء (متر | Pumping Rate كمية التدفق ( L/S ) | Comments ملاحظات |
|---|---|---|---|---|
| 0 | 270.00 | 0.0 | 5.0 | |

| | | | | |
|---|---|---|---|---|
| 1 | 270.07 | 0.07 | 5.0 | |
| 2 | 270.14 | 0.14 | 5.0 | |
| 3 | 270.20 | 0.20 | 5.0 | |
| 4 | 270.27 | 0.27 | 5.0 | |
| 5 | 270.34 | 0.34 | 5.0 | |
| 6 | 270.41 | 0.41 | 5.0 | |
| 7 | 270.48 | 0.48 | 5.0 | |
| 8 | 270.55 | 0.55 | 5.0 | |
| 9 | 270.62 | 0.62 | 5.0 | |
| 10 | 270.69 | 0.69 | 5.0 | |
| 15 | 271.00 | 1.00 | 5.0 | |
| 20 | 271.38 | 1.38 | 5.0 | |

| | | | | |
|---|---|---|---|---|
| 25 | 271.72 | 1.72 | 5.0 | |
| 30 | 272.07 | 2.07 | 5.0 | |
| 35 | 272.42 | 2.42 | 5.0 | |
| 40 | 272.76 | 2.76 | 5.0 | |
| 45 | 273.10 | 3.10 | 5.0 | |
| 50 | 273.45 | 3.45 | 5.0 | |
| 55 | 273.79 | 3.79 | 5.0 | |
| 60 | 274.14 | 4.14 | 5.0 | |
| 90 | 276.22 | 6.22 | 5.0 | |
| 120 | 278.30 | 8.30 | 5.0 | |
| 150 | 280.38 | 10.38 | 5.0 | |
| 180 | 282.50 | 12.50 | 5.0 | |

| | | | | |
|---|---|---|---|---|
| 210 | 284.54 | 14.54 | 5.0 | |
| 240 | 286.61 | 16.61 | 5.0 | |
| 270 | 288.70 | 18.70 | 5.0 | |
| 300 | 290.80 | 20.80 | 5.0 | |
| 330 | 292.86 | 22.86 | 5.0 | |
| 360 | 294.94 | 24.94 | 5.0 | |
| 390 | 297.00 | 27.00 | 5.0 | |
| 420 | 299.10 | 29.10 | 5.0 | |
| 450 | 301.20 | 31.20 | 5.0 | |
| 480 | 303.25 | 33.25 | 5.0 | |
| 510 | 305.34 | 35.34 | 5.0 | |
| 540 | 307.42 | 37.42 | 5.0 | |

| | | | | |
|---|---|---|---|---|
| 570 | 309.49 | 39.49 | 5.0 | |
| 600 | 311.58 | 41.58 | 5.0 | |
| 630 | 313.65 | 43.65 | 5.0 | |
| 660 | 315.74 | 45.74 | 5.0 | |
| 690 | 317.81 | 47.81 | 5.0 | |
| 720 | 320.00 | 50.00 | 5.0 | |
| 750 | 320.00 | 50.00 | 5.0 | |
| 780 | 320.00 | 50.00 | 5.0 | |
| 810 | 320.00 | 50.00 | 5.0 | |
| 840 | 320.00 | 50.00 | 5.0 | |
| 870 | 320.00 | 50.00 | 5.0 | |
| 900 | 320.00 | 50.00 | 5.0 | |

| | | | | |
|---|---|---|---|---|
| 930 | 320.00 | 50.00 | 5.0 | |
| 960 | 320.00 | 50.00 | 5.0 | |
| 990 | 320.00 | 50.00 | 5.0 | |
| 1020 | 320.00 | 50.00 | 5.0 | |
| 1050 | 320.00 | 50.00 | 5.0 | |
| 1080 | 320.00 | 50.00 | 5.0 | |
| 1110 | 320.00 | 50.00 | 5.0 | |
| 1140 | 320.00 | 50.00 | 5.0 | |
| 1170 | 320.00 | 50.00 | 5.0 | |
| 1200 | 320.00 | 50.00 | 5.0 | |
| 1230 | 320.00 | 50.00 | 5.0 | |
| 1260 | 320 | 50.00 | 5.0 | |

| | | | | |
|---|---|---|---|---|
| **1290** | **320** | 50.00 | **5.0** | |
| **1320** | **320** | 50.00 | **5.0** | |
| **1350** | **320** | 50.00 | **5.0** | |
| **1380** | **320** | 50.00 | **5.0** | |
| **1410** | **320** | 50.00 | **5.0** | |
| **1440** | **320** | 50.00 | **5.0** | |

# Recovery-Rate-Test Data Form

| | | | |
|---|---|---|---|
| **Borehole Name:** اسم البئر | **Basin water well** بئر مؤسسة المياه في الحوض المائي حجر | **Borehole Location:** موقع البئر | **Bajh** باجه |
| **Date of Test:** تاريخ الاختبار | **30/12/2021** | **Name of Person completing form:** ادخل اسم الشخص الذي البيانات | **Eng\ Emad Saleh Hamood Ahmed** |
| **Original Rest-water Level (m below datum):** منسوب الماء قبل بدء التجربة (متر) | **270** | **Start Time of Recovery:** وقت بدء استعادة المنسوب | **11:00** |
| **Average Pumping Rate During Pumping Period:** متوسط كمية التدفق خلال فترة الضخ | **5 L/S** | **Length of Pumping Period (min.):** طول فترة الضخ (دقيقة) | **1440** |

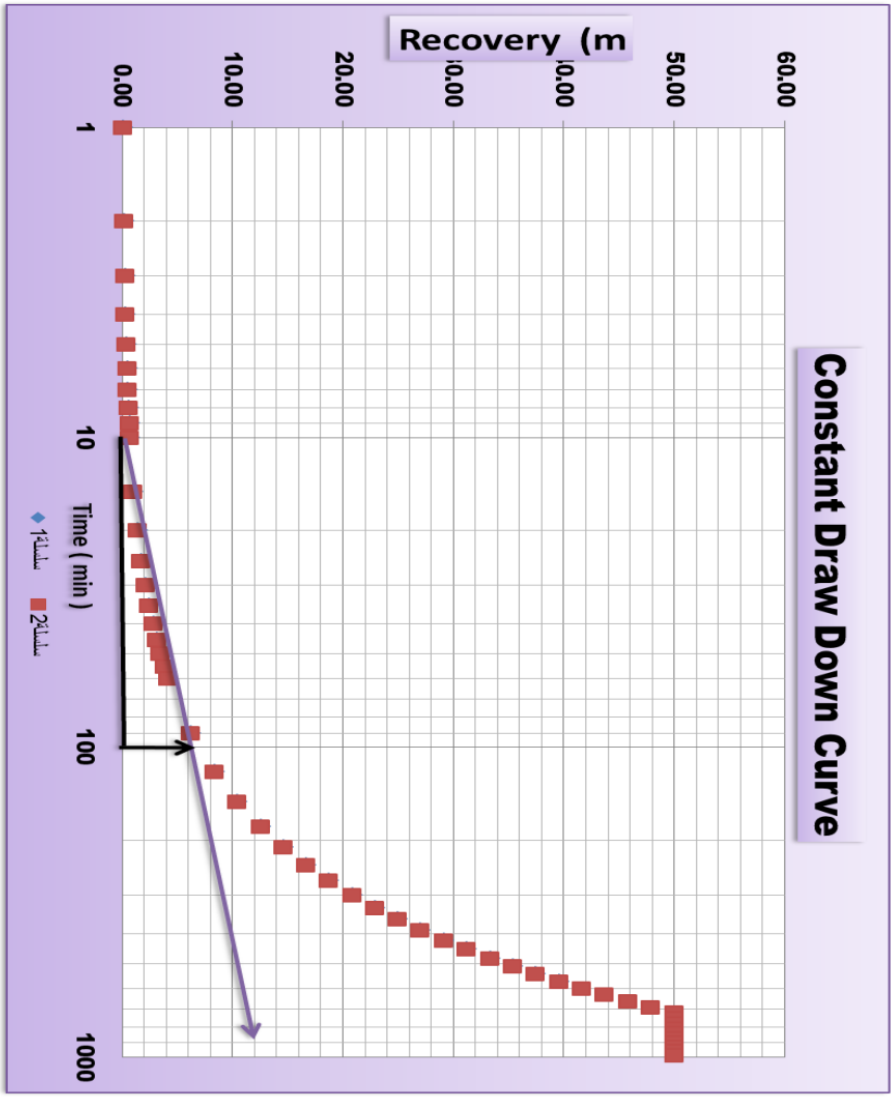
| **Time Elapsed Since Start of Recovery t' (min.)** الزمن المنقضي منذ بدء استعادة المنسوب (دقيقة) | **Water Level (m below datum)** منسوب الماء (متر) | **Calculated Residual Drawdown s' (m)** تراجع منسوب الماء (متر) | **Time Since Start of Pumping, t (min.)** الزمن منذ بدء الضخ (دقيقة) | **Calculated Ratio** النسبة المحسوبة **t/t'** | **Comments** ملاحظات |
|---|---|---|---|---|---|
| 0 | 320.00 | 50.00 | 1440 | | |
| 1 | 319.70 | 49.70 | 1441 | 1441 | |

12

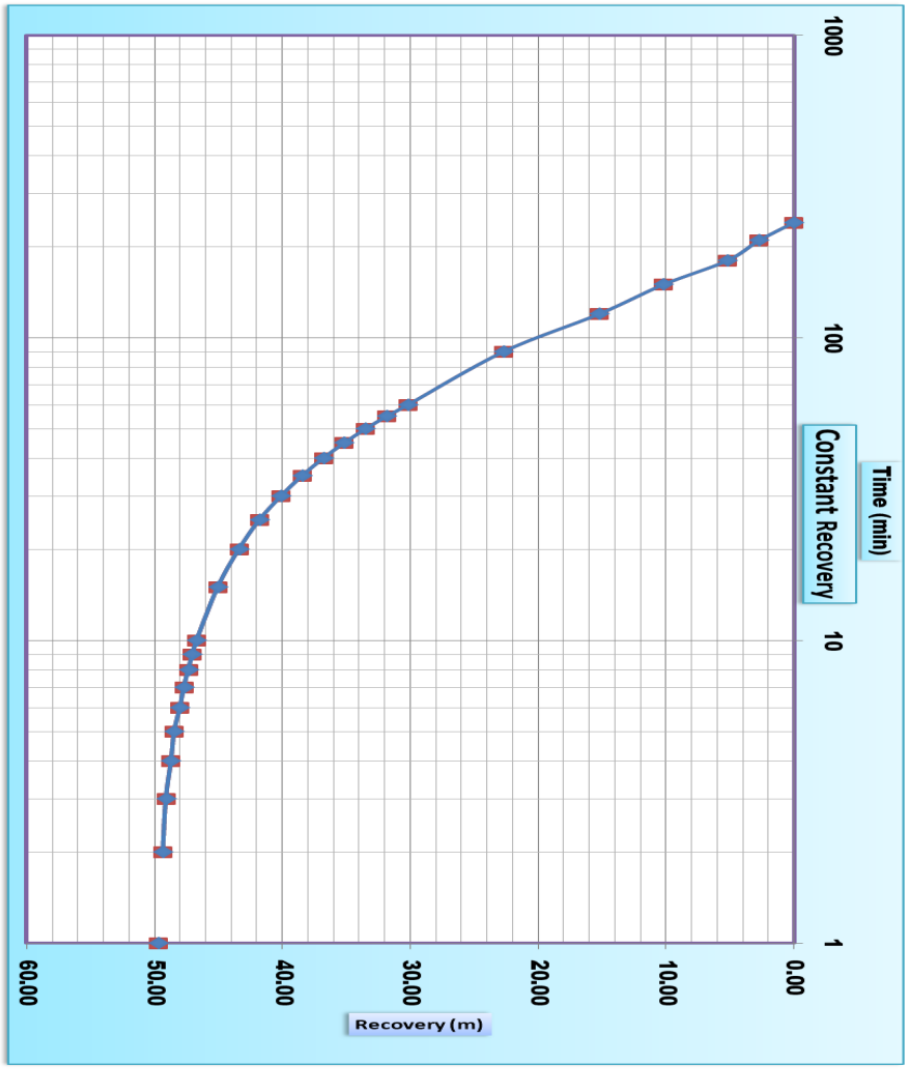
| | | | | | |
|---|---|---|---|---|---|
| 2 | 319.34 | 49.34 | 1442 | 721 | |
| 3 | 319.10 | 49.10 | 1443 | 481 | |
| 4 | 318.69 | 48.69 | 1444 | 361 | |
| 5 | 318.45 | 48.45 | 1445 | 289 | |
| 6 | 318.00 | 48.00 | 1446 | 241 | |
| 7 | 317.70 | 47.70 | 1447 | 206.7143 | |
| 8 | 317.35 | 47.35 | 1448 | 181 | |
| 9 | 317.03 | 47.03 | 1449 | 161 | |
| 10 | 316.70 | 46.70 | 1450 | 145 | |
| 15 | 315.05 | 45.05 | 1455 | 97 | |
| 20 | 313.40 | 43.40 | 1460 | 73 | |
| 25 | 311.80 | 41.80 | 1465 | 58.6 | |

| | | | | | |
|---|---|---|---|---|---|
| 30 | 310.10 | 40.10 | 1470 | 49 | |
| 35 | 308.46 | 38.46 | 1475 | 42.14286 | |
| 40 | 306.80 | 36.80 | 1480 | 37 | |
| 45 | 305.15 | 35.15 | 1485 | 33 | |
| 50 | 303.50 | 33.50 | 1490 | 29.8 | |
| 55 | 301.85 | 31.85 | 1495 | 27.18182 | |
| 60 | 300.20 | 30.20 | 1500 | 25 | |
| 90 | 292.70 | 22.70 | 1530 | 17 | |
| 120 | 285.20 | 15.20 | 1560 | 13 | |
| 150 | 280.20 | 10.20 | 1590 | 10.6 | |
| 180 | 275.20 | 5.20 | 1620 | 9 | |
| 210 | 272.70 | 2.70 | 1650 | 7.857143 | |

| | | | | | |
|---|---|---|---|---|---|
| 240 | 270.02 | 0.02 | 1680 | 7 | |


Recovery (m
0.00
10.00
20.00
50.00
60.00
1
10
100
1000
Time ( min )
سلسلة1
سلسلة2
Constant Draw Down Curve

16


Time (min)
Constant Recovery
1000
100
10
1
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Recovery (m)

17