

Environmental and Social Assessment for EBRD
Brownfield: Category B Project
Ain Ghazal Treatment Plant, Decommissioning and Upgrade Project,
Jordan

NON-TECHNICAL SUMMARY (NTS)



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LIST OF ACRONYMS

AGTP	Ain Ghazal Treatment Plant
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EHSS	Environmental, Health and Safety and Social
ESA	Environmental and Social Assessment
ESAP	Environmental and Social Action Plan
ESP	Environmental and Social Policy
GAM	Greater Amman Municipality
MoEnv	Ministry of Environment
NTS	Non-technical summary
PMD	Programme Management Directorate
SEP	Stakeholder Engagement Plan
SPC	As-Samra Wastewater Treatment Plant Company
WAJ	Water Authority of Jordan
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

The Ain Ghazal Treatment Plant (AGTP) facility owned by Water Authority of Jordan (WAJ) and operated by As-Samra Wastewater Treatment Plant Company (SPC) is located within Marka district along the boundary between North Marka and North Hashmi neighbourhood. AGTP was constructed in 1968 as an activated sludge wastewater treatment plant. Throughout the year, the expansion of Amman urban areas rendered Ain Ghazal inadequate to treat incoming flow. In 1985, As-Samra Waste Stabilization Pond (WSP) facility was constructed, and at the same time AGTP was converted into a pre-treatment facility where wastewater is pre-treated before being discharged to As-Samra.

The first original construction of As-Samra Wastewater Treatment Plant (WWTP) occurred in 2003, and the second phase in 2012. The As-Samra Wastewater Treatment Plant (WWTP) facility is located in Al Khirbeh As-Samra approximately 13 km north of Zarqa and 40 km north of Amman. In 2002, a 1,500mm wastewater conveyor from AGTP was added to this configuration to convey flows to As-Samra WWTP.

A Feasibility Study (FS) financed by European Bank for Reconstruction and Development (the “EBRD” or the “Bank”) was undertaken for AGTP in 2017 and recommended the construction of a new ca. 30.4 km wastewater conveyor from the AGTP to the As-Samra WWTP to accommodate a higher wastewater flow and avoid potential serious pollution to the environment; and improvement of the existing mechanical pre-treatment facilities at the AGTP in order to match the influent requirements of the As-Samra WWTP including assessment and potential inclusion of an optional facility in relation to the existing main Septic Tanks Receiving and Unloading Facility operated by Miyahuna.

Currently, based on the FS recommendations, a new wastewater conveyor (redundancy pipe) from AGTP to As-Samra WWTP is being constructed after a financing agreement was signed between the EBRD and WAJ.

In addition, in 2019, a decision was made to construct a new 24,750 m³/day wastewater treatment facility in the Al Ghabawi area, to replace and relocate the existing inadequate facility currently co-located at the AGTP as well as a two-year phased operational period to ensure sustainability of the investment. The new facility will be located at Al Ghabawi and will serve approximately 5.5 million people, including 600,000 Syrians in Amman and the surrounding area. This creates a sustainable solution to collect, treat and dispose of individual septic tank wastewater effectively. The existing Septic Tank Facility in Ain Ghazal will be decommissioned once the new facility is constructed and commissioned. The timeline for this process could take around 3-4 years.

Both investments outlined above are financed by the EBRD.

Now that these two improvement measures are agreed and signed, WAJ requested an additional support from the EBRD to prepare an additional FS and an Environmental and Social (“E&S”) Assessment to assess the least cost option for expansion and rehabilitation of the AGTP including decommissioning and remediation of the tanker discharge facilities on site. The FS and ESA is undertaken by Fichtner Water & Transportation (FWT, the “Consultant”) and ECO Consult.

WAJ is anticipating securing financing from the EBRD and as such the project is being developed in accordance with the EBRD Environmental and Social¹ Policy (ESP) (2019)². The Project is categorised “B” in accordance with EBRD ESP and an ESA was undertaken, and this report is the Non-Technical Summary (NTS) which provides a description of the project and describes the potential benefits and impacts associated with the development, construction, and operation of the Project. It also describes how these will be mitigated and managed through all phases of the project’s development. In addition, it provides a summary of the public consultation activities and the approach to future stakeholder engagement.

¹ The ESP (2019) defines social as “issues which pertain to project-affected people and their communities and workers and related to socioeconomic status, vulnerability, gender, gender identity, human rights, sexual orientation, cultural heritage, labour and working conditions, health and safety and participation in decision making.”

² Available at <https://www.ebrd.com/documents/comms-and-bis/environmental-and-social-policy.pdf>

2 OVERVIEW OF EXISTING SITUATION AND FACILITIES AND NEEDED INTERVENTIONS

2.1 Overview of Project Location

The AGTP is located in Marka district in the middle of Amman governorate/the eastern part with a total area of 266.8 km² and within the jurisdictions of Greater Amman Municipality (GAM) area. The neighbouring lands and buildings in the vicinity of the AGTP are urbanised, with residential, commercial and industrial properties that surround the plant including the GAM Slaughterhouse and a previous waste transfer station now operated by GAM for storing waste fleet and other vehicles, as well as a railroad (Hijaz Railway) and Seil Azzarqa (Zarqa River) stretched on both sides of the AGTP.

The trilogy of sites (AGTP and specifically the Septic Tank facility, GAM slaughterhouse, and the GAM waste transfer station) caused so many E&S issues, nuisances, odour, discharge of raw wastewater and blood to the adjacent wadi, and many others over the years. Additional nuisances are also caused by the illegal discharge of wastewater to the Seil Azzarqa from houses and commercial entities and from tankers not able to access the AGTP for any reason (after work hours or rejected load). GAM has been trying to relocate their slaughterhouse to a new site in Ghabawi area and issued several tenders for design, construction, and operation of the new facility by a private investor/operator but until now this has not been successful. It is still unclear if the relocation of the GAM slaughterhouse will take place any time soon. Now that the GAM waste transfer station is closed, it is becoming clear that the relocation of the Septic Tanks facility is instrumental in enabling improvements in the area and potentially incentivising the relocation of the GAM slaughterhouse under a workable investment scheme for GAM.

The nearby residential buildings are within nearly 35 metres from the site boundary and therefore they are considered within proximity of the existing facility but given that the planned upgrade and decommissioning works are only within the perimeter of AGTP, they are not anticipated to be directly affected. The AGTP site is shown in Figure 1 below.



Figure 1: Ain Ghazal Treatment Plan (Miyahuna, 2021)

Currently, construction works for the Amman-Zarqa Bus Rapid Transit (BRT) project connecting between the central governorates of Amman and Zarqa are underway and this includes the road network surrounding the AGTP. As a result, there is a detour now on the road adjacent to AGTP causing traffic jams in the area. This is only temporary during construction period but on the long run, the operation of the BRT service between Amman and Zarqa would ease traffic jams between the two governorates. There is a station in front of AGTP.

2.2 The As-Samra Wastewater System

The existing wastewater collection and conveyance system is part of the wastewater infrastructure of the Amman-Zarqa River Basin area. The wastewater collection in the Amman-Zarqa River basin is a gravity system based on topography. The majority of the wastewater generated in the Amman area is collected and pre-treated at AGTP. The pre-treated wastewater is conveyed to the As-Samra WWTP.

As-Samra wastewater system generally includes the following main components:

1. Ain Ghazal Pre-Treatment Facility (AGTP): the primary pre-treatment facility that receives wastewater from Amman through the wastewater network in addition to the wastewater discharged at the main septic tanks receiving and unloading facilities. The capacity of the existing facility is 267,000 cubic metres per day and a peak flow of 537,600 cubic metres per day;
2. Septic Tanks Receiving and Unloading Facility: that receives wastewater collected by private tankers from areas and generators not connected to the wastewater network;
3. A 1,500 wastewater conveyor line that connects from AGTP to As-Samra WWTP: constructed in 2000 and operated in 2004, this pipeline conveys wastewater from AGTP to As-Samra WWTP by gravity;
4. A 1,200 wastewater conveyor line, which connects from AGTP to West Zarqa Pumping Station (WZPS) and eventually to As-Samra WWTP: built in 1984 to convey wastewater from the AGTP facility and WZPS to As-Samra WWTP. This siphon was rehabilitated after the construction of the 1,500 mm conveyor line. This pipeline is currently being used as standby for any emergency situations;
5. West Zarqa Pumping Station (WZPS): receives wastewater from other communities in Northeast Amman by gravity where it is combined with wastewater flows from Russeifeh and west Zarqa. The WZPS conveys wastewater to As-Samra WWTP through a 1,200mm siphon;
6. East Zarqa Pumping Station (EZPS): commissioned in 1988 and refurbished in 2006, receives wastewater from east Zarqa, Al Hashmiyeh, King Abdullah City and Al Majd City. The EZPS conveys the wastewater to As-Samra WWTP via one of two 500mm pressurised force mains;
7. As-Samra Wastewater Treatment Plant (As-Samra WWTP): the main WWTP for the Amman-Zarqa basin, which receives wastewater from three main collection points; AGTP, WZPS, and EZPS. The original plant began operation in 2008, before its rehabilitation and expansion in 2012. The capacity of the existing WWTP is 364,800 cubic metres per day. A second expansion is planned to increase the treatment capacity of the plant but implementation plans and financing scheme are still not finalised.

2.3 Previous Studies and ESAs in Relation to As-Samra Wastewater System

Table 1: Previous Studies and ESAs in Relation to As-Samra Wastewater System

Facility	Study	Date	Brief Description
As-Samra WWTP	Technical, Financial, Legal and Environmental and Social Assessment for Second Expansion of the As-Samra WWTP	2016	<ul style="list-style-type: none"> ▪ ESA (2016): the second expansion is important to 1. provide treatment for the increasing wastewater quantities generated from the Amman and Zarqa areas as a result of increase in population, 2. allows generated wastewater to be treated according to relevant national and international standards to be re-used downstream of the plant for many activities such as agriculture, 3. will enhance the standards of living in surrounding local communities by providing employment opportunities and properly treated wastewater, 4. generated energy will allow the development of a self-sufficient plant, and will reduce its dependency on the National Grid. ▪ Plant is being operated in compliance with local legislations, good international industry practices (GIIP), and the EBRD ESP (2014) and PRs (valid at the time). ▪ The SPC implements an environment, health, safety, and social (EHSS) management system and has a suitable organisational capacity. ▪ An Environmental and Social Action Plan (ESAP) and a Stakeholder Engagement Plan (SEP) were prepared with corrective actions to rectify the identified E&S issues and achieve compliance with the EBRD PRs. ▪ The benefits and opportunities expected due to the implementation of the As-Samra WWTP-Second Expansion project outweigh the shortcomings. Proper planning, management and monitoring of all issues will result in better

			<p>performance and improved outcomes of the As-Samra Wastewater Treatment Plant.</p> <ul style="list-style-type: none"> ▪ Unfortunately, the second expansion has still not been agreed or commissioned. This is still under discussion by WAJ.
AGTP:	Technical, Financial, Legal and Environmental and Social Assessment for Ain Ghazal Wastewater Project	2016	<ul style="list-style-type: none"> ▪ EBRD and WAJ were discussing financing for the construction of a new wastewater conveyor (redundancy pipe) from AGTP to As-Samra WWTP as well as a potential inclusion of an optional facility to the current main Septic Tanks Receiving and Unloading Facility. ▪ The ESA concluded that the project will result in significant environmental and public health benefits and that the project is associated with limited E&S risks and impacts during the construction stage of the project and these can be effectively avoided or mitigated by adhering to GIIP construction practices. ▪ ESA confirmed that WAJ's existing operations and practices generally comply with EBRD PRs. WAJ facilities operator (SPC) has a well-developed environmental policy and operational procedures and its environmental management and occupational health and safety management systems are certified to ISO 14001 and OHSAS 18001 standards, respectively. ▪ An ESAP and a SEP were prepared for the project to mitigate the identified risks and impacts and to structure the Project to meet EBRD's PRs. The main actions are focussed on mitigating safety risks associated with open tranche excavation and temporary restriction of access during the construction works. ▪ Currently, the construction of the new 30.4 km wastewater conveyor from the AGTP to the As-Samra WWTP has been awarded to a contractor and construction works were initiated. In addition, there is a decision to relocate the Septic Tank Facility from AGTP to Ghabawi area. ▪ The other component related to 'expansion and refurbishment of the existing AGTP facilities for mechanical pre-treatment of the wastewater before its transportation to As-Samra WWTP through the new conveyor' are still not implemented. This is currently being considered by EBRD and WAJ and is being assessed by FWT and ECO Consult as part of this feasibility study and ESA (2021).

2.4 Ain Ghazal Treatment Plant

Service Area:

The existing wastewater collection and conveyance system that is served by AGTP is part of the wastewater infrastructure of the Amman-Zarqa River Basin area.

The wastewater collection in the Amman-Zarqa River basin is a predominantly gravity-driven system based on topography. The majority of the wastewater generated in the Amman area is collected and pre-treated at AGTP. The pre-treated wastewater is conveyed to the As-Samra WWTP.

Figure 2 shows the AGTP Catchment Area, Including Trunk Sewer Lines.

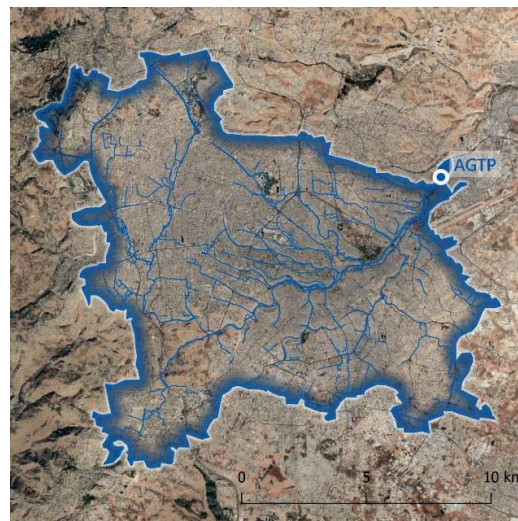


Figure 2: AGTP Catchment Area, Including Trunk Sewer Lines

AGTP Process and Operations

The operations at AGTP aim to physically and biochemically treat the incoming raw WW that would be further treated at As-Samra WWTP. The pre-treatment facility mainly covers three (3) major units; screening, grit and grease removal, and conveyance of the resulting wastewater.

The system at AGTP includes the following operational units; Rock trapping chamber, coarse and fine screening, refusals collection and compacting, grit and grease removal, storage and operational tanks, odour removal unit, conveyor, and wastewater stabilisation ponds (WSP). The units of the pre-treatment facility are presented in Figure 3 and Figure 4 below.

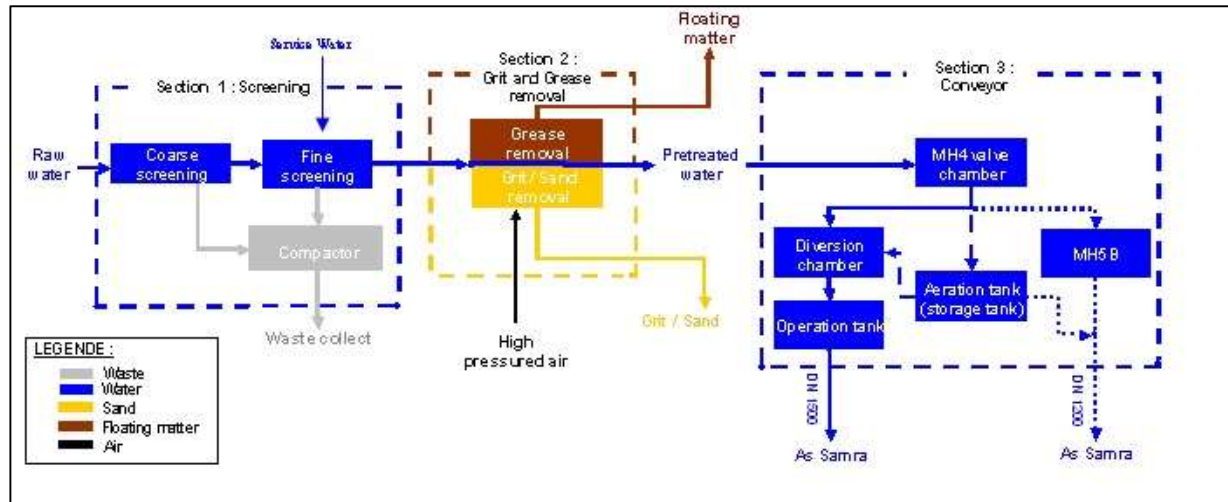


Figure 3: AGTP Pre-Treatment Process Diagram (Mutti, 2009)



Figure 4: Selected Photos for the AGTP Facility (ECO Consult, 2021)

In addition, wastewater from areas not connected to the wastewater network within the Amman Zarqa River Basin is collected in privately owned tanker trucks that would deliver and discharge the wastewater in the Septic Tanks Receiving and Unloading Facility located within the perimeter of AGTP.

The tanker discharge station (See Figure 5) is located adjacent to AGTP and shares the same vehicle entrance. The tanker discharge station was recently expanded and consists of the following main components:

- Discharge area with covered collection channel and 14 discharge points
- Odour control unit treating air from a collection channel and from manhole MH 4A
- Operators building
- Toilets and electrical building

The expansion of the collection channel has alleviated some of the operational issues described in earlier studies by allowing more tankers to discharge wastewater in parallel and thereby reducing the waiting times and associated traffic problems.



Figure 5: Selected Photos for the Septic Tanks Receiving and Unloading Facility (ECO Consult, 2021)

The AGTP land and facility is owned by WAJ. All of the As-Samra wastewater system components above, *excluding the Septic Tanks Receiving and Unloading Facility*, falls under the responsibility of the As-Samra Treatment Plant Company (SPC), based on a Project Agreement (PA) signed between SPC and WAJ in 2003 and again in 2012 as a Restated Project Agreement (RPA). The Septic Tank Facility is not managed by SPC, but by the Miyahuna – Jordan Water Company.

Conveyance System to As-Samra WWTP

The effluent from the pre-treatment facility is transferred to As-Samra WWTP through an existing conveyer system. The increasing flow of wastewater to As-Samra WWTP is causing operational problems in AGTP and in As-Samra WWTP, e.g., any required shutdown of one of the existing pipelines leads directly to a discharge of excess wastewater quantities to the Wadi.

A second DN 1500 conveyor and associated operation tank and scraper launching unit is currently under construction in order to increase the system capacity. The works mainly will be the construction of a 32.1 km wastewater conveyor from AGTP to As-Samra WWTP (design-build contract) including site survey and development of design, construction of a new wastewater pipeline, and connection with AGTP as pipeline inlet and connection with As-Samra WWTP as pipeline outlet. Contract was awarded for a duration of 24 months. The Contractor has recently started his activities.



Figure 6: Overview of Wastewater Treatment and Conveyance Facilities

The works are mainly from AGTP to As-Samra WWTP and there are some interface works within the perimeter of the AGTP in order to undertake the required works and connections. According to SPC they are still not aware if there is a clear plan for this interface period.

2.5 The Proposed Investment

Wastewater Flow Projections

Based on an assessment of the wastewater flow projections as well as calculation of increasing amount of stormwater arriving at AGTP, in order to accept and treat the expected incoming flows at AGTP of 726,712 m³/d in 2045, the peak treatment capacity at AGTP of 330,000 m³/d needs to be expanded by an additional 396,712 m³/d.

In 2019, wastewater volumes delivered by tankers accounted for about 11,000 m³/d, most of which is discharged from the tankers and mixed with the wastewater at the old pre-treatment plant (AGTP). It is assumed that the amount of wastewater generated in tanker-serviced areas will increase by 1.5 % per year, and that from

2025 onward this wastewater will be delivered to the new tanker discharge station at Al-Ghabawi rather than to AGTP.

Necessity for Capacity Expansion

- The sewer network in the AGTP catchment collects wastewater as well as stormwater from road surface and roof drainage during winter seasons. The current hydraulic capacity of AGTP does not allow for the treatment of all wastewater arriving during storm events. Flows exceeding the facility's peak design capacity of 330,000 m³/d have to be diverted at the inlet weir and are discharged to the adjacent wadi without any treatment in order to avoid flooding the facilities. Photo of adjacent wadi/Seil Azzarqa is shown in Figure 7 below.



Figure 7: Wastewater Arriving During Storm Events Exceeding the AGTP Peak Design Capacity is Diverted at the Inlet and Discharged to the Adjacent Wadi Without any Treatment in Order to Avoid Flooding the Facilities

- In addition, flows exceeding plant capacity results in reduction of grit removal efficiency of the grit and grease chambers which can cause operational problems such as sedimentation in the conveyance system downstream of AGTP and increases abrasion of pumps and turbines at As-Samra WWTP. At high flows the screens are overloaded forcing the operator to alter the process which allows large particles to flow with the wastewater to As-Samra WWTP resulting in operational and mechanical problems in the WWTP.
- With the construction of the new wastewater conveyor from AGTP to the As-Samra WWTP, the conveyance system capacity will become 660,000 m³/d which is nearly equal to the treatment capacity in As-Samra WWTP. The planned expansion in As-Samra WWTP will increase the treatment capacity to fit the future wastewater flow projections. Without expanding the treatment capacity of AGTP, AGTP will become the limiting factor preventing this new conveyance capacity and the new treatment capacity at As-Samra WWTP from being fully utilised.

*As such the **upgrade of the AGTP** is important to: 1. prevent any E&S issues and nuisances in the area due to the overflow of raw untreated wastewater to the adjacent Wadi (Seil Azzarqa), 2. protect the integrity of the As-Samra Wastewater System and specifically the As-Samra WWTP caused by operational problems in AGTP, and 3. enable the achievement and utilisation of the new conveyance capacity and the new treatment capacity at As-Samra WWTP which is important to the performance of the whole system.*

The Proposed Investment in AGTP

In order to **cope with the currently encountered wet-weather flows and with the projected increase of wastewater flows in the future (without being forced to discharge untreated or only partially treated wastewater to the environment)**, and to keep in step with the **planned capacity expansions of the wastewater conveyance system and of the As-Samra WWTP**, the capacities of the following treatment facilities at AGTP need to be expanded: stone trap, fine screens, coarse screens, aerated grit and grease channels, and retention

capacity. This requires also expanding the capacities of the following ancillary facilities: screenings conveyor and compactor, grit classifier, blower system for aerated grit and grease channels, and service water supply.

Additionally, in order to **reduce the odour nuisance for the neighbouring communities, an odour control facility should be added that treats exhaust air from the screens, channels and skips.** To **increase system resilience in case of power failures, an emergency generator should be added.** The initial total cost estimate for the long-term investment strategy is 7,621,000 United States Dollars (USD).

The proposed peak treatment capacity is expected to exceed the conveyance capacity to As-Samra WWTP and this triggers the need to temporarily store the excess flow for discharge at a later time, which could be accommodated by constructing a new retention tank in AGTP to create an additional storage capacity without having to discharge any partially treated wastewater in the network or to the wadi.

Proposed layout for expansion of the pre-treatment unit as well as proposed location for the new retention tank are shown in Figure 8 and Figure 9 below.

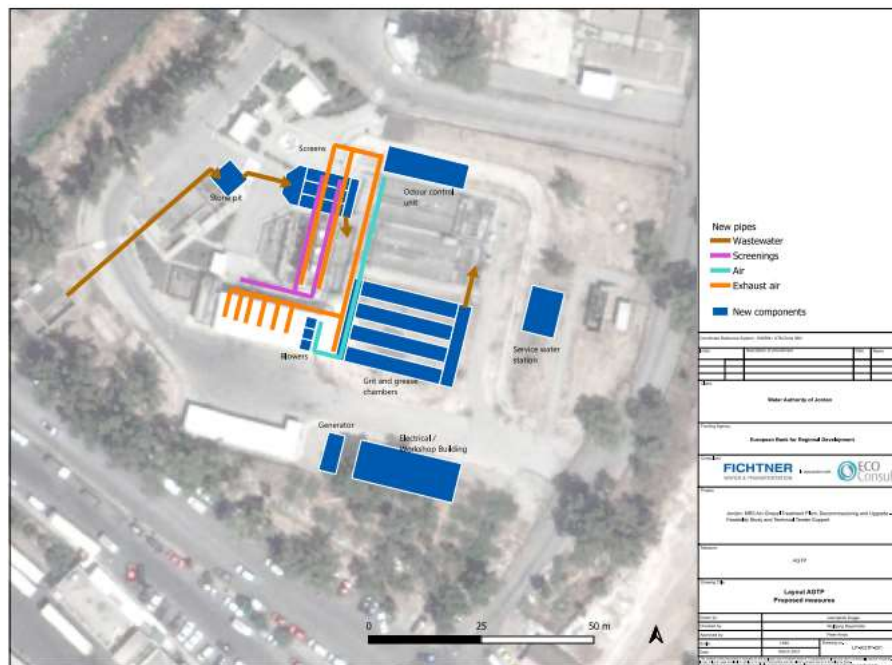


Figure 8: Proposed layout for expansion of the pre-treatment unit

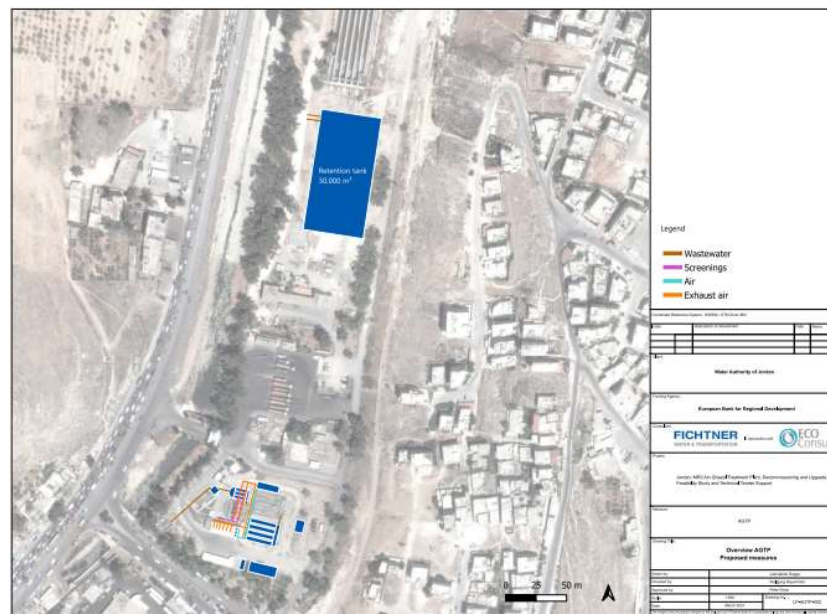


Figure 9: Proposed location for the new retention tank

Decommissioning of the Current Tanker Discharge Station and Associated Pre-Treatment Plant in AGTP

The existing tanker discharge station at the site of AGTP will be replaced by new facilities at Al Ghabawi. After commissioning of the new facilities, the existing tanker discharge station is no longer required. It is therefore recommended to decommission the tanker discharge station by draining all water bearing structures and subsequently demolishing. As no alternative use for the areas is currently envisaged, the civil structures might be retained. In Figure 10, the components which can be demolished as part of the decommissioning of the tanker discharge station are highlighted.



Figure 10: Components to be Demolished for Decommissioning of the Tanker Discharge Station

2.6 Definition of the Project and Associated Facilities

Project:

1. **Improvement, rehabilitation and expansion of the AGTP facilities and addition of components.** All this is instrumental to improve the performance of the AGTP, prevent E&S nuisance and issues in the area, increase system resilience in case of power failures, and to keep in step with the planned capacity expansions of the wastewater conveyance system and of the As-Samra WWTP. The implementation period has been defined as 18 months for Design and Construction, followed by a 12 months Defects Notification Period.
2. In addition, the required improvements in the AGTP cannot be achieved unless the Septic Tanker facility is relocated. This has been repetitively emphasised in several studies. As a result, a decision is already made for establishing a new tanker discharge station and associated WWTP at Al-Ghabawi and this is covered under separate studies and tenders. The new facility in Al Ghabawi is not part of the scope of the Consultant. The **decommissioning of the current tanker discharge station** can take place once the new tanker discharge station at Al-Ghabawi is in operation. Tendering of the works should only commence after the new tanker discharge station at Al-Ghabawi has been successfully commissioned and as such, the existing tanker discharge station at AGTP shall remain available as a backup during the initial operation phase of the new Al-Ghabawi tanker discharge station. After stable operation of the new tanker discharge station at Al-Ghabawi has been established, procurement of the works for decommissioning of the tanker discharge station at AGTP may proceed. The implementation period has been defined as 6 months.

Associated Facilities:

The associated facilities or activities that are not financed by EBRD as part of the project but which in the view of EBRD are significant in determining the success of the project or in producing agreed project outcomes. These are **NEW** facilities or activities: (i) without which the project would not be viable, and (ii) would not be constructed, expanded, carried out or planned to be constructed or carried out if the project did not exist.

These associated facilities that may not be covered by the direct EBRD financing under this assignment but have an impact on the Project's ability to comply with the EBRD ESP 2019 include the following:

1. The new/second full operable 30 km wastewater conveyor from the AGTP to the As-Samra WWTP which aims to accommodate a higher wastewater flow and avoid potential serious pollution to the environment.
2. As-Samra WWTP planned second expansion

The AGTP, and conveyance system are all part of the As-Samra wastewater system. Without expanding the treatment capacity of AGTP, AGTP will become the limiting factor preventing this new conveyance capacity and the new treatment capacity at As-Samra WWTP from being fully utilised.

As indicated in Table 1, previous ESAs commissioned by EBRD in 2016 indicated that E&S risks arising from these associated facilities are managed and mitigated in accordance with applicable law, GIIP and the objectives of the PRs.

3 ENVIRONMENTAL BENEFITS, ADVERSE IMPACTS AND MITIGATION MEASURES

3.1 Key Benefits

The AGTP, and conveyance system are all part of the As-Samra wastewater system. Without expanding its treatment capacity, AGTP will become the limiting factor preventing this new conveyance capacity and the new treatment capacity at As-Samra WWTP from being fully utilised. Key benefits of the Project are listed below:

- Improving the effluent wastewater quality and quantity from AGTP to As-Samra WWTP and as a resulting improving quality and increasing quantity of treated wastewater made available for irrigation downstream of As-Samra WWTP which increases potable water available for drinking purposes.
- Improve the performance of the AGTP allowing it to deal with and accommodate increased amounts of wastewater flows due to increased population and in peak flow to prevent discharge of untreated wastewater to the adjacent wadi and as a result preventing a number of negative E&S impacts and nuisances.
- The proposed project components provide higher storage/retention capacity in AGTP which prevents the overflow of untreated raw wastewater to the adjacent wadi causing environmental pollution and nuisance which allows compliance with the national legislations, EBRD PRs, and the related European Union (EU) Directives.
- Improving the EHSS management and compliance capacity of WAJ (Programme Management Directorate (PMD)) and the SPC and thus increasing the compliance in the As-Samra wastewater system including the AGTP.
- The SPC/Samra O&M which operate the As-Samra wastewater system including the AGTP has and implements a proper EHSS management system and undertakes regular monitoring and reporting to ensure that potential impacts and emissions are mitigated and controlled. On the other hand, the organisational capacity of WAJ/PMD in relation to EHSS aspects is limited and is in need of improvement and strengthening. This ESA has highlighted the existing issues in the EHSS management capacity and provided recommendations for improvement. The implementation of these measures eventually leads to EHSS governance, and improvement of E&S measures and situation in the AGTP and the As-Samra wastewater system.

3.2 Key Issues and Impacts

There are some adverse E&S impacts that are easily managed with proper management systems and monitoring on the ground. These are summarised below.

Impact	Description	Additional Measures
Public health and safety impacts:	<ul style="list-style-type: none"> ▪ Key impacts related to public health and safety is during the operation phase, and which is related to potential for odour emissions from the processes in AGTP. ▪ An odour removal system is installed, which is maintained regularly by SPC. ▪ SPC implements monitoring for air emissions and noise with a third party at AGTP to ensure the levels are in accordance with the national 	<ul style="list-style-type: none"> ▪ Add sampling points for ambient air quality and noise at different locations at the fence (e.g., up-wind and down-wind) and preferable up wind from the closest community or sensitive receptor. ▪ Detailed engineering shall include measures to ensure required odours and air quality emissions are according to national legislations and Good International Practice (GIP).

	<p>legislations. In case of any non-compliance or exceedances, SPC immediately implements corrective actions in addition to a Follow-Up Action Plan to track the continuous improvement and implementation of corrective actions.</p> <ul style="list-style-type: none"> Measurements are undertaken in different locations within the AGTP plot and not at the fence or perimeter meaning that these results represent levels related to occupational health and safety (OHS) and not ambient air quality and noise or public health. Even though the measurements were related OHS but they were all within legislations and no exceedances were reported. The main existing source of odour nuisance in AGTP is caused by the existing septic tank facility which is planned for relocation in the next 3-4 years. Once the septic tank facility is relocated, the odour stemming from the AGTP plot is expected to be eliminated or reduced significantly within acceptable limits. This has been confirmed by the community living in vicinity of the AGTP during consultations undertaken for the purpose of this ESA. 	<ul style="list-style-type: none"> Ensure that the 'Odour Management Plan' prepared and implemented by the SPC extends and applies to the AGTP. The odour management plan shall be implemented by the SPC throughout the operation of the Project
Air Quality and Noise impacts:	<ul style="list-style-type: none"> Construction activities will likely result in an increased level of dust and particulate matter emissions, which will temporarily impact ambient air quality. In addition, the use of machinery and equipment are expected to be a source of noise and vibration within the Project site and its surrounding. 	<ul style="list-style-type: none"> The Contractor is required to implement adequate dust control and suppression measures as well as noise suppression measures to control such impacts.
GHG emissions:	<ul style="list-style-type: none"> Increase in the amount of wastewater treated at AGTP as well as increased energy efficiency of the aerations system due to replacement of the blowers results in GHG emissions. Based on a GHG emissions assessment undertaken by the FS team according to the 2017 "EBRD protocol for assessment of greenhouse gas emissions", the net GHG emissions attributable to the project being 0.08 kt CO₂-eq/a which is not considered high. 	<ul style="list-style-type: none"> Detailed engineering and construction plans shall include measures to ensure GHG emission reduction.
Climate change impacts:	<ul style="list-style-type: none"> Higher temperatures may potentially lead to problems in the operation of the electro mechanical equipment (pumps etc.). It should be made sure that these are chosen according to the predicted temperature range – minor significance. Higher temperatures will potentially have a slight impact on the per capita water demand during heat waves, and may thus lead to a seasonal increase of the wastewater flow towards the AGTP. It should be ensured that the plant's capacity is covering these potential peak flows – minor significance. The number of heavy rainfall events is likely to increase and will temporarily lead to a higher wastewater flow into the system. It should be ensured that the plant's capacity is covering these occasionally higher flows – minor significance. 	<ul style="list-style-type: none"> Detailed engineering shall take into account climate change impacts on the project.
Geology, hydrology and hydrogeology (soil and groundwater) impacts:	<ul style="list-style-type: none"> Potential soil and water resources pollution during construction and operation. However, this is resolved by the implementation of the Project since the overflow of untreated wastewater to the wadi will be prevented. As such this impact will be irrelevant Impacts during the construction and operation phase from improper waste management onsite (to include solid waste, wastewater and hazardous 	<ul style="list-style-type: none"> The SPC has and implements a waste management plan for the operation phase. The Contractor will be required to prepare an Environmental and Social Management Plan (ESMP) for the construction phase including measures to prevent such impacts.

	<p>waste) which could pollute the soil and water resources.</p> <ul style="list-style-type: none"> Impacts from erosion and runoff due to the various construction activities. 	
Biodiversity impacts:	<ul style="list-style-type: none"> AGTP is not located within an area of importance in relation to biodiversity. The key impacts on biodiversity are mainly from the site preparation activities during construction, as well as improper conduct and housekeeping practices by workers (i.e. Discharge of hazardous waste to land, etc.) during the construction and operation phase. 	<ul style="list-style-type: none"> It should be noted that in case any tree cutting is required to make space for the planned investment at AGTP, WAJ will have to officially contact the Ministry of Agriculture (MoA) to obtain a no-objection prior to any work commencement. The Contractor is required to implement proper mitigation measures which aim to control such impacts and ensure proper conduct and housekeeping practices are implemented.
Archaeology and cultural heritage impacts:	<ul style="list-style-type: none"> AGTP is located within an area of historical importance in relation to cultural heritage. Based on review of secondary data, there are no documented archaeology sites within the perimeter of AGTP land. However, there are a number of archaeology sites within the vicinity and proximity of the AGTP. These sites were identified as important sites. Cultural heritage and archaeology could be found within the AGTP in case any excavations are undertaken for the planned investment. Improper management (if such sites are discovered) could potentially disturb or damage such sites. 	<ul style="list-style-type: none"> If any construction works are to take place on the empty land plots within the borders of the AGTP; this important area should be considered in a detailed archaeological survey in coordination with the DOA prior to any construction works. A no-objection/permit from DoA is required prior to undertaking any excavation and construction works. In addition, provisions should be developed for managing chance finds to be applied in the event of discovery in coordination with the DoA. A chance-find procedure must be prepared to ensure proper handling of items during construction. This procedure should also be addressed in the induction sessions provided by the contractor as well as the enforcement of a proper code of conduct for construction workers. In addition, as required by the DoA, such sites – if found - should be properly demarcated and fenced.
Occupational health and safety impacts:	<ul style="list-style-type: none"> OHS risks during construction and operation of the Project. Currently SPC implements a comprehensive EHSS management system including OHS plans and procedures which prevents and mitigates the occurrence of such OHS risks. 	<ul style="list-style-type: none"> The Contractor is required to prepare an OHS plan tailored to the Project's site and activities to ensure the health and safety of all personnel onsite.
Social impacts:	<ul style="list-style-type: none"> Stakeholder engagement and grievance mechanism - there are no significant stakeholder engagement activities implemented by WAJ or SPC in relation to the AGTP. Both entities do not implement any grievance mechanism with the community to allow stakeholders to express any concerns or submit complaints through a structured documented system. The only means for complaints is through contacting WAJ which in turn directs the complaint to SPC to investigate and undertake corrective action as relevant. There is no system for documentation and contacting complainants to follow up on the issues raised. 	<ul style="list-style-type: none"> WAJ shall implement and update the Stakeholder Engagement Plan (SEP) for the Project. This shall also include a grievance redress mechanism to be implemented for the AGTP. WAJ shall also disclose the Non-technical summary (NTS) of the Project and SEP in English and Arabic to the community living within the vicinity of the AGTP. WAJ should identify responsible person within the entity for implementation of the SEP. SPC, Contractor(s), and other related parties should be also informed of this SEP and made aware of their responsibilities for implementation, follow up, and reporting. This shall be reflected in tenders issued and agreements signed for AGTP. SPC shall implement the SEP prepared for the AGTP and ensure regular follow up and documentation. They shall also implement the grievance redress mechanism prepared for the project.
	<ul style="list-style-type: none"> Gender Based Violence and Harassment (GBVH) <ul style="list-style-type: none"> GBVH risks during construction and operation. SPC already included articles on prevention of bullying and GVBH in their Human Resources Policy. However, there is also an opportunity for improvement in the management system implemented by SPC. 	<ul style="list-style-type: none"> GBVH in the work place and in the construction site is possible. The risk cannot be eliminated. Measures to prevent such incidents from occurring are important. GBVH should be classified as 'zero tolerance' behaviour. In order to ensure suitable and proper mitigation measures are implemented by all parties in relation to the Project (WAJ, SPC, and the Contractor) during all phases of the Project, a Gender and GBV Prevention Action Plan shall be prepared and implemented.

4 COMMUNITY SURVEYS AND RESULTS

The E&S Consultant carried out engagement and consultation activities with a sample of stakeholders (residents, commercial activities) within the vicinity of the AGTP in order to understand their views and opinions on environmental, social, and health and safety aspects and concerns they may have in relation to AGTP.

Some residents did not know the difference between Ain Ghazal Pre-treatment Facility and Ain Ghazal Septic Tank, they consider both of the facilities as the treatment plant. A simple clarification was provided regarding the differences between the two facilities in order for them to differentiate between the impacts of each facility.

Nearly all residents have reported the same issues in relation to the environmental and social issues they suffer from in the area, these include:

- Polluted & unhealthy environment.
- Very bad odours, especially in summer.
- Noise resulting from Trucks movement.
- Insect & rodent infestation, especially in summer.
- Existence of stray dogs.
- High rates of immigration.
- Property prices and rents fell due to the area's environmental conditions.
- Over half of the survey participants have indicated that the construction works of Bus Rapid Transit (BRT) routes and the detours is affecting their daily living conditions such as increasing the duration and distance of any daily journey.

When the participants were asked which measures must be taken in order to improve the area's situation, especially regarding projects with harmful environmental impacts, around 58% requested to shut down Ain Ghazal Pre-treatment Plant and relocate it, and around 67% requested to shut down Ain Ghazal Septic Tank and relocate it.

In addition, a number of residents have reported that the area lack of public services such as public transport, public parks, and waste collection services. Also, most of the participants stated that the immigration rate is high, a lot of families have left the area for reasons related to the area's E&S conditions.



Figure 11: Example Photos Documenting Surveying Process

5 THE KEY ACTION AREAS AND MEASURES FOR THE PROJECT

An Environmental and Social Action Plan (ESAP) was initially developed as part of the previous FS and ESA undertaken in 2016. This ESAP is now updated to take into account changes and updates (construction of the wastewater conveyor is already underway, the Septic Tank facility will be relocated to another location within the coming 3-4 years).

The ESAP sets out the programme, identifies those responsible and defines success criteria, and as such provides a framework for monitoring the implementation of the measures.

6 ENGAGEMENT WITH STAKEHOLDERS AND CONTACT DETAILS

Stakeholder engagement is an ongoing process involving (i) the client's public disclosure of appropriate information so as to enable meaningful consultation with stakeholders, (ii) meaningful consultation with potentially affected parties, and (iii) a procedure or policy by which people can make comments or complaints. This process should begin at the earliest stage of project planning and continue throughout the entire life of the project.

WAJ and SPC do not have a stakeholder engagement plan for the AGTP and do not undertake consultation with the stakeholders in the vicinity of the AGTP. WAJ receives comments from stakeholders on any of their grievance channels and transfers complaint to SPC for review and action.

A SEP has been developed with the objective of identifying key stakeholders and ensuring that, where relevant, they are informed in a timely manner of the project updates and any potential impacts. The SEP also identifies a formal feedback and grievance mechanism to be used by stakeholders for dealing with complaints, concerns, queries and comments.

The SEP is a living document and will be updated as required. It will also be reviewed periodically during project implementation and updated as necessary.

The SEP shall include the following:

- Identification of stakeholders and other affected parties;
- Public consultations and information disclosure requirements;
- Overview of previous engagement activities;
- SEP programme/strategy including methods of engagement and resources;
- Grievance mechanism with a template for provision of comments/complaints and resolution forms.

Stakeholders could be individuals and organisations that may be directly or indirectly affected by the project either in a positive or negative way, who wish to express their views.

All general comments, queries and grievances can be submitted to WAJ and SPC through the following communication channels:

WAJ/PMD

- WAJ Complaints Direct Line - E&S compliance manger: (+962) 779698808
- WAJ Complaints E-mail Address: rana_albashtawi@mwi.gov.jo
- WAJ's Social Media Platform (Facebook): <https://www.facebook.com/mwi.gov.jo/>

WAJ/CLO

PMD-Director: Eng. Sultan Mashaqbah

- Email: sultan_mashaqbah@mwi.gov.jo
- Mobile: (+962) 65680100

SPC

- SPC Complaints Direct Line - hotline: (+962) 53901242

- SPC Complaints E-mail Address: spc.filling@samra.com.jo

The grievance form (in Arabic and English) will be made available on the web site (www.mwi.gov.jo), and in hard copy at the SPC offices in AGTP. Grievance boxes shall be provided at AGTP gate.