



West Karachi Recycled Water Project 1 Project Information Document

April 2023

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- Karachi Water and Sewerage Board (“**KWSB**”) has mandated the Asian Development Bank (“**ADB**”) to be the transaction advisor in relation to an unsolicited proposal (the “**USP**”) for **West Karachi Recycled Water Project 1** comprising the design, finance, construction, operations and maintenance and transfer of a 35 million imperial gallons per day (MIGD) wastewater treatment plant at Haroonabad near Sindh Industrial Trade Estate (“**SITE**”) along with a recycling plant and recycled water distribution network within SITE (“**Project**”).
- The scope of the Project for the private sector developer includes constructing a new 35 MIGD wastewater treatment plant with its own influent delivery pipeline branching from the Lyari interceptor and pumping station, recycling plant (including desalination) to produce not less than 28 MIGD of high grade industrial water for consumers and recycled water distribution network within SITE designed for 50 MIGD industrial demand and smart consumer metering system.
- **KWSB with assistance of ADB has tendered the Project in accordance with international best practice, where the RFQ stage was initiated on 17 April 2023.**

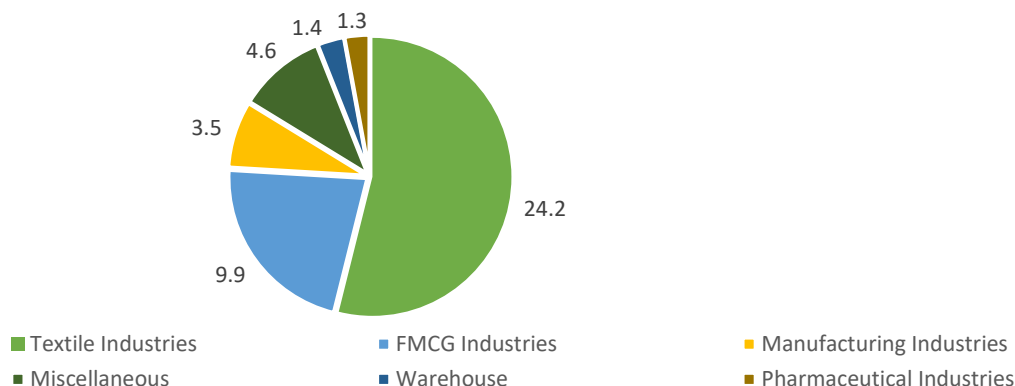
Project Scope	<ul style="list-style-type: none"> • Design, Build, Finance, Own, Operate, Maintain and Transfer 35 MIGD WWTP and recycling facility to supply not less than 28 MIGD industrial grade water and distribution network. • Metering, billing and collection of revenues from industrial customers in SITE.
Project Size & Concession Term	<ul style="list-style-type: none"> • Recycling plant to supply not less than 28 MIGD at consumer meters in SITE. • 25 years from commercial operations date (COD) with transfer to KWSB at end of the term.
Legal Framework	<ul style="list-style-type: none"> • The Project will be the first utility scale wastewater PPP project in Pakistan and will be procured under Sindh Public Procurement Rules 2010 and Sindh Public Procurement Act 2009. • Two step procurement process (RFQ and RFP) to be used.
USP Status	<ul style="list-style-type: none"> • USP proponent to have rights and obligations as per Sindh Public Procurement Act 2009.
Private Partner	<ul style="list-style-type: none"> • Sponsors to be single entity, an entity together with its subsidiaries, or consortium to be prequalified according to financial resources and experience of developing and executing similar projects.
Public Partner	<ul style="list-style-type: none"> • KWSB as signatory of the Concession Agreement while SITE to provide right to build pipelines and collect water sales revenue from industrial customers in SITE area. • Local Government Department (administrative department) to enter into relevant contractual arrangements, to the extent required, on behalf of Government of Sindh.
ADB Support	<ul style="list-style-type: none"> • Viability Gap Funding (VGF) for the Project to be provided via an existing ADB loan approved in 2017 (Sovereign (Public) Project 46538-002: Supporting Public–Private Partnership Investments in Sindh Province).
Lenders	<ul style="list-style-type: none"> • Potential bidders to provide detailed financing plan in their bid submission including high level term-sheets from potential financiers.

PPP Policy Board	Apex decision-making body in charge for formulation and implementation of PPP Policy and other related rules/guidelines.
PPP Unit (Department of Finance)	Reviews and evaluates PPP projects, develops PPP pipeline, develop procedures, model documents and operating guidelines.
Local Government Department	Responsible govt department for development, coordination, supervision and monitoring of provincial, foreign-aided and mega projects of Local Government / Councils.
KWSB	Project procurer and concession granting authority.
SITE Limited	Development and maintenance of infrastructure within SITE and provide right of way for development works within SITE.
Project Support Facility	Approve any financial support including viability gap funding (VGF) and any guarantees required for PPP projects.

- Karachi is one of the most water-stressed cities in the world as the city has a population of more than 20 million and requires around 1,100 MIGD of water supply but only receives around 550 MIGD due to severe lack of investment in water supply and treatment infrastructure.
- Municipal wastewater recycling for industrial use is a proven way to reduce stress on freshwater resources without compromising on industrial growth. KWSB is considering wastewater recycling at major WWTP locations in the city to alleviate the potable water deficit by substituting current water supply to industries with recycled water.
- The main consumers of the output of the Project will be Sindh Industrial Trade Estate (“SITE”) which is the oldest and the largest designated industrial area of Pakistan, encompassing 9,700 acres of land containing more than 3,000 industrial units of varying sizes including all kinds of textiles, heavy mechanical, beverages, automobiles, silk, oil, soap, foodstuffs, chemicals, pharmaceuticals, steel, glass etc.
- The industries based in SITE suffer from intermittent and varying quality water supply which impacts their production processes and quality of products produced. The Project will resolve these issues as recycled water from West Karachi Recycled Water Project 1 will supply a steady supply of water with pre-agreed water quality parameters. Industries will pay the water tariff (in PKR/gallon) to the concessionaire while KWSB will be the concession agreement counterparty for the concessionaire.

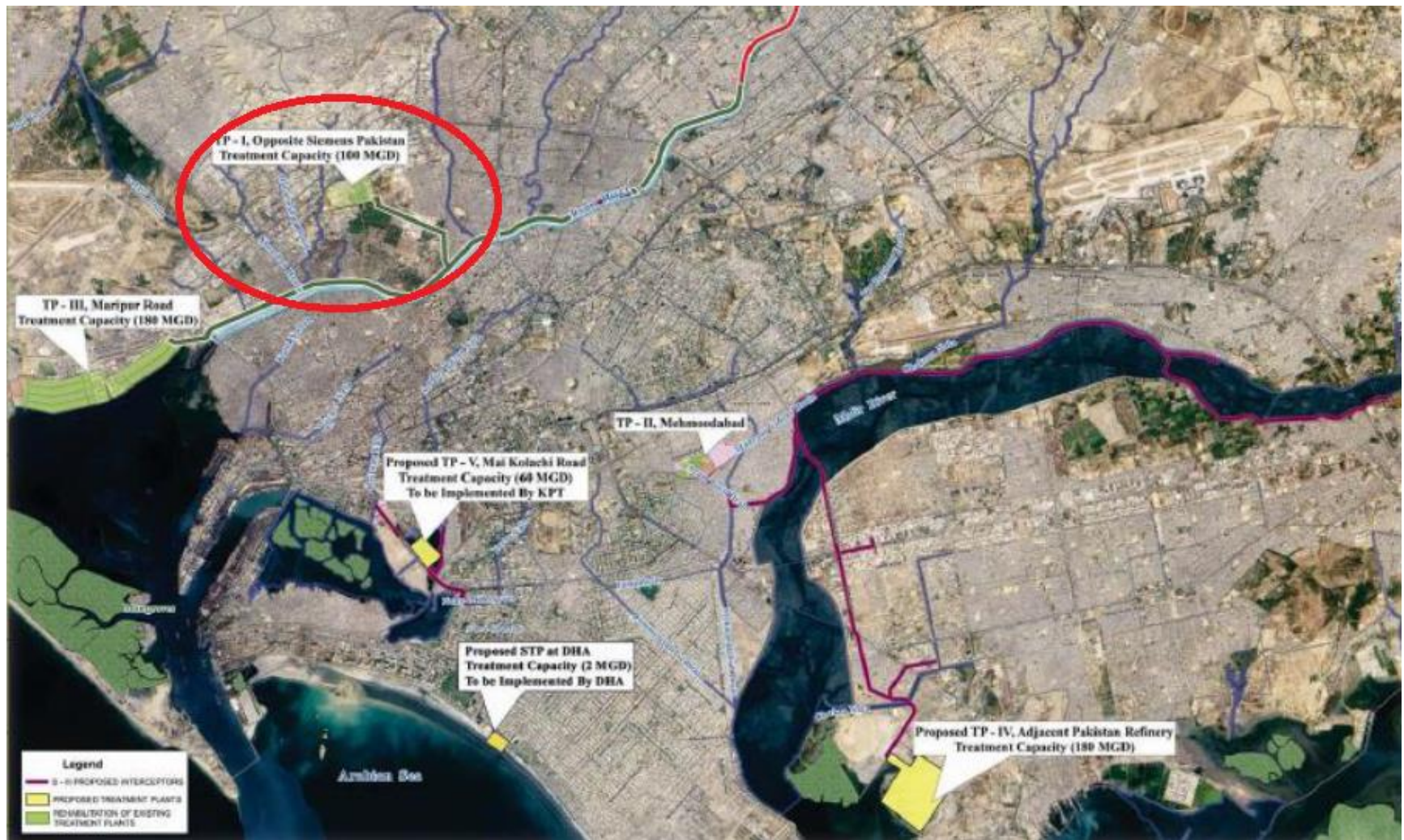
- Market survey shows that the present water demand of industries in SITE is ~40-50 MIGD. Due to water shortage KWSB is only able to supply around ~2-3 MIGD while the balance is fulfilled through informal water suppliers who (through unconventional means) have laid their own pipe network supplied by ground water. This practice utilizes water that can potentially be used for potable purposes and should be stopped to conserve the resource.

Sector-wise Industrial Demand in MIGD



- The informal sector via its own pipeline network provides ~30-35 MIGD of water to industry which is unreliable which is a major issue for industries and is not industrial grade and has high salinity with total dissolved solids (TDS) content of up to 6000 mg/L.
- Due to the poor quality of the water major industrial units have in-house reverse osmosis (RO) plants installed to reduce the TDS of the water supplied by the informal sector to ensure smooth running of their respective industrial unit.

Project Location



Project Scope (i)

Scope of Work

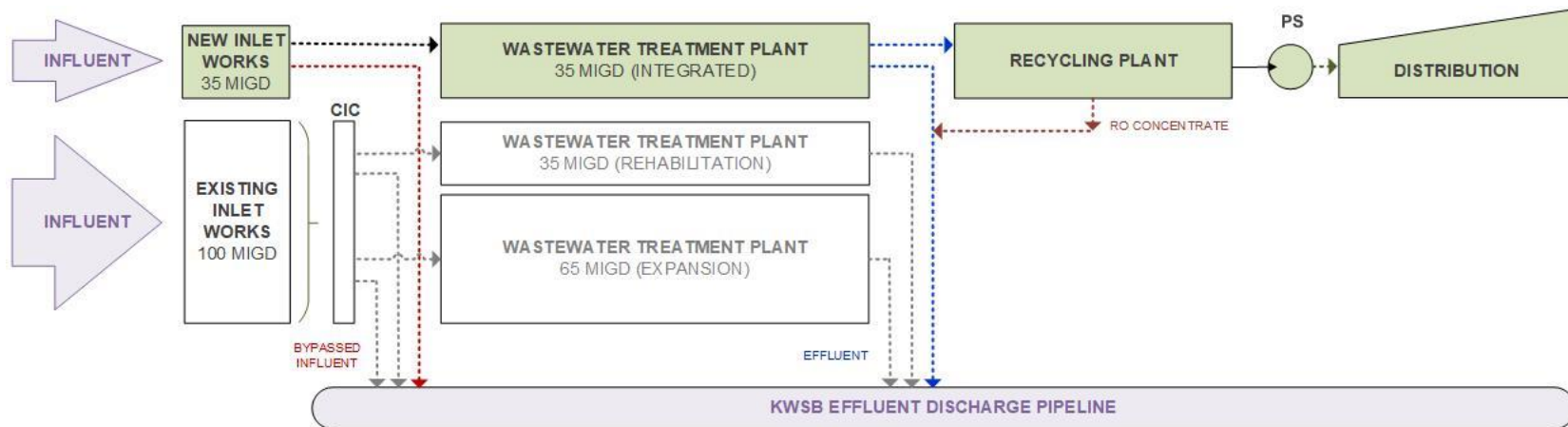
- (a) Implement earthworks to remove mounds of excavated fill stockpiled in the Project area and relocate to an adjacent area within Treatment Plant 1 (TP1) site upon which works are being carried out by a KWSB appointed contractor;
- (b) Design and implement influent delivery system comprising a new branch to be installed on the existing raw wastewater interceptor, influent delivery pipeline and influent pumping station with a capacity of 35 MIGD;
- (c) Design and implement 35 MIGD Wastewater Treatment Plant (WWTP) incorporating biological nutrient removal (BNR);
- (d) Design and implement on-site Bypass to the WWTP;
- (e) Design and implement Treated Effluent recycling facility incorporating any additional processing and desalination necessary to supply not less than 28 MIGD of high-grade industrial water, *inter alia*, with TDS not exceeding 1000 mg/L to consumers in S.I.T.E.;
- (f) Design and implement reverse osmosis (RO) concentrate discharge from the Project site with TDS dilution for regulatory compliance;
- (g) Design and implement Recycling Plant, Recycled Water Pumping Station and Recycled Water Pipeline to deliver a minimum of 28 MIGD of Recycled Water to Offtakers for industrial use within S.I.T.E.;

Scope of Work

- (h) Design and implement Distribution Network that in aggregate will deliver 50 MIGD of Recycled Water to industries in S.I.T.E. and install smart consumer meters and operate part of the network to supply not less than 28 MIGD to Offtakers in S.I.T.E.;
- (i) Design and implement monitoring systems for influent, treated effluent, effluent, RO concentrate, recycled water, dewatered sludge and residuals;
- (j) Metering, billing and collection of payment for Recycled Water supplied to S.I.T.E. industries;
- (k) Design and implement a new entrance to the Project site from the public road (Estate Avenue) and an access road through the site to the Project area; and
- (l) O&M of the entire system excluding the part of the Distribution Network that is designated for future use by others.

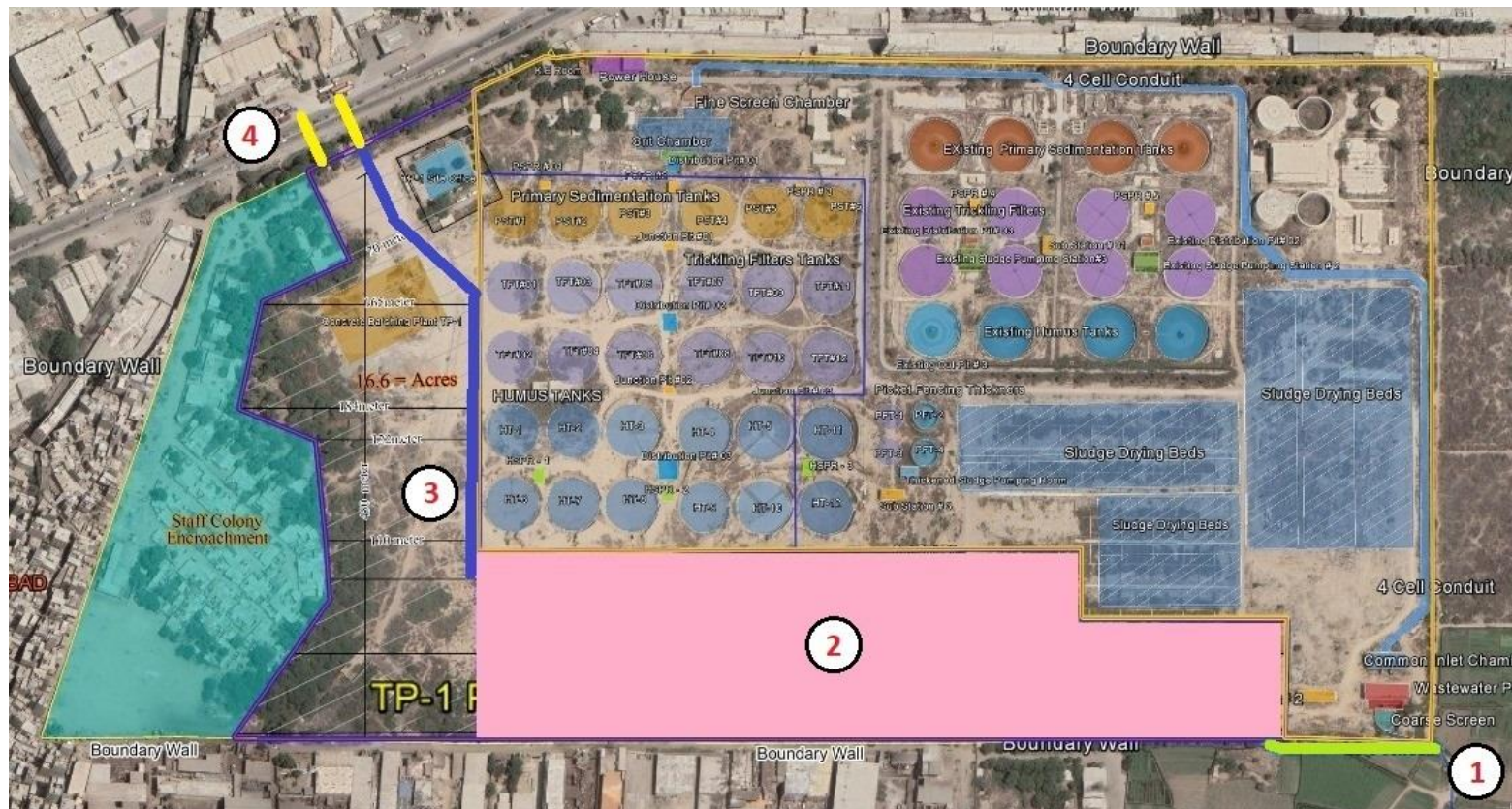
Project Scope (iii)

- 35 MIGD influent delivery system and bypass.
- 35 MIGD wastewater treatment plant.
- Recycling plant to produce not less than 28 MIGD of high grade industrial water for consumers with TDS not exceeding 1000 mg/L.
- Recycled water delivery system with pumping station and distribution network within S.I.T.E. designed for 50 MIGD and smart consumer metering system.



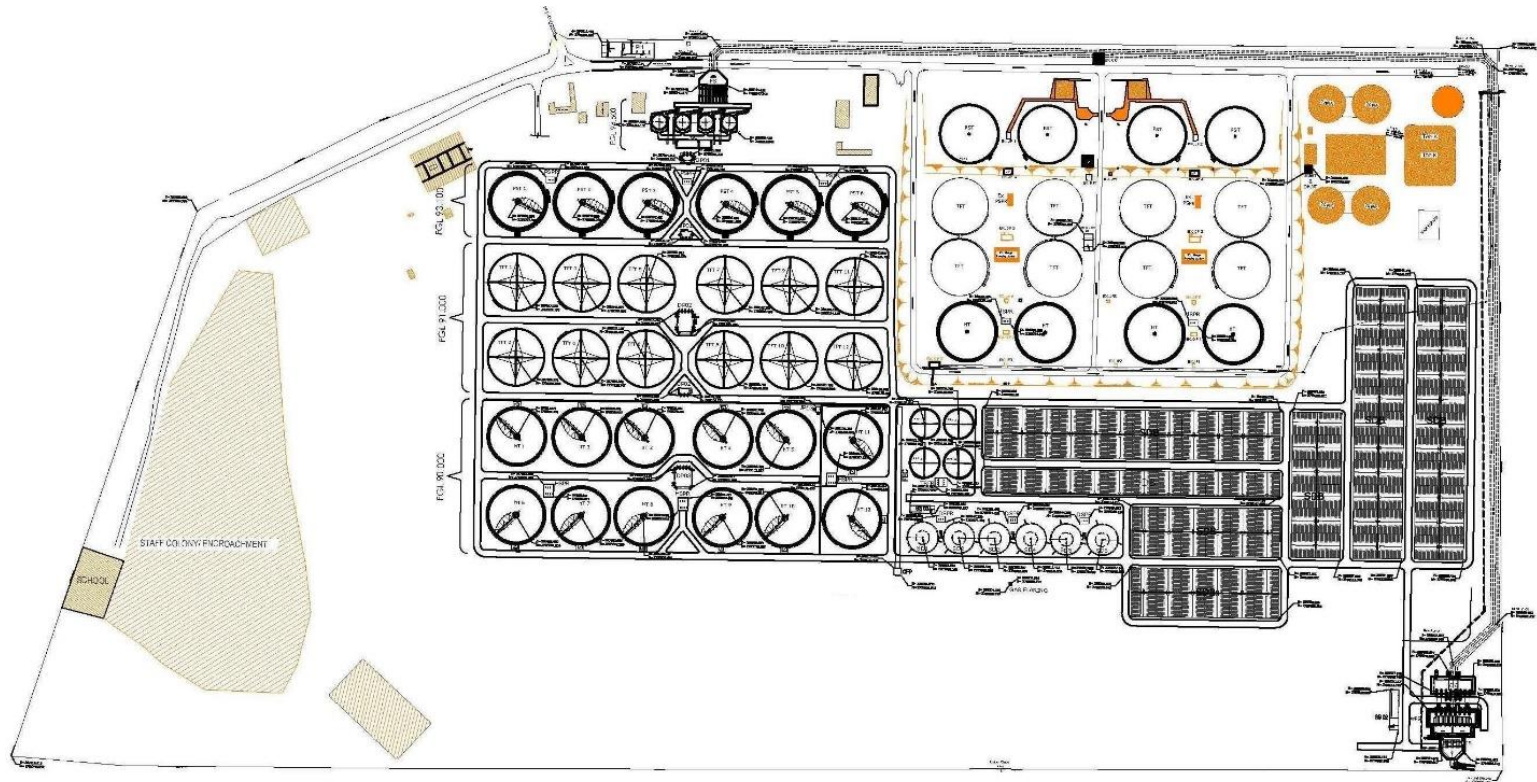
Key: The components shaded green represent the scope of work in the Project

Project Land Allocation adjacent to the TP1 Site



- 1 – Influent delivery pipeline from branch on the interceptor
- 2 – Project area of 8 ha for influent PS, WWTP, recycling plant and PS, and buildings
- 3 – Recycled water pipeline through the TP 1 site
- 4 – Road crossings to Sindh Industrial Trading Estates (SITE) for recycled water pipelines (one for future use)

Ongoing Construction Contract on the TP1 Site



Note: There are no interfaces between the ongoing construction contract on TP1 site and the Project.

Discharges from the site of Treated Effluent not used for recycling and RO Concentrate shall comply with Sindh Environmental Quality Standards (SEQS) for *into inland waters*.

PART-I

THE SINDH GOVT. GAZETTE EXT. JAN. 28, 2016

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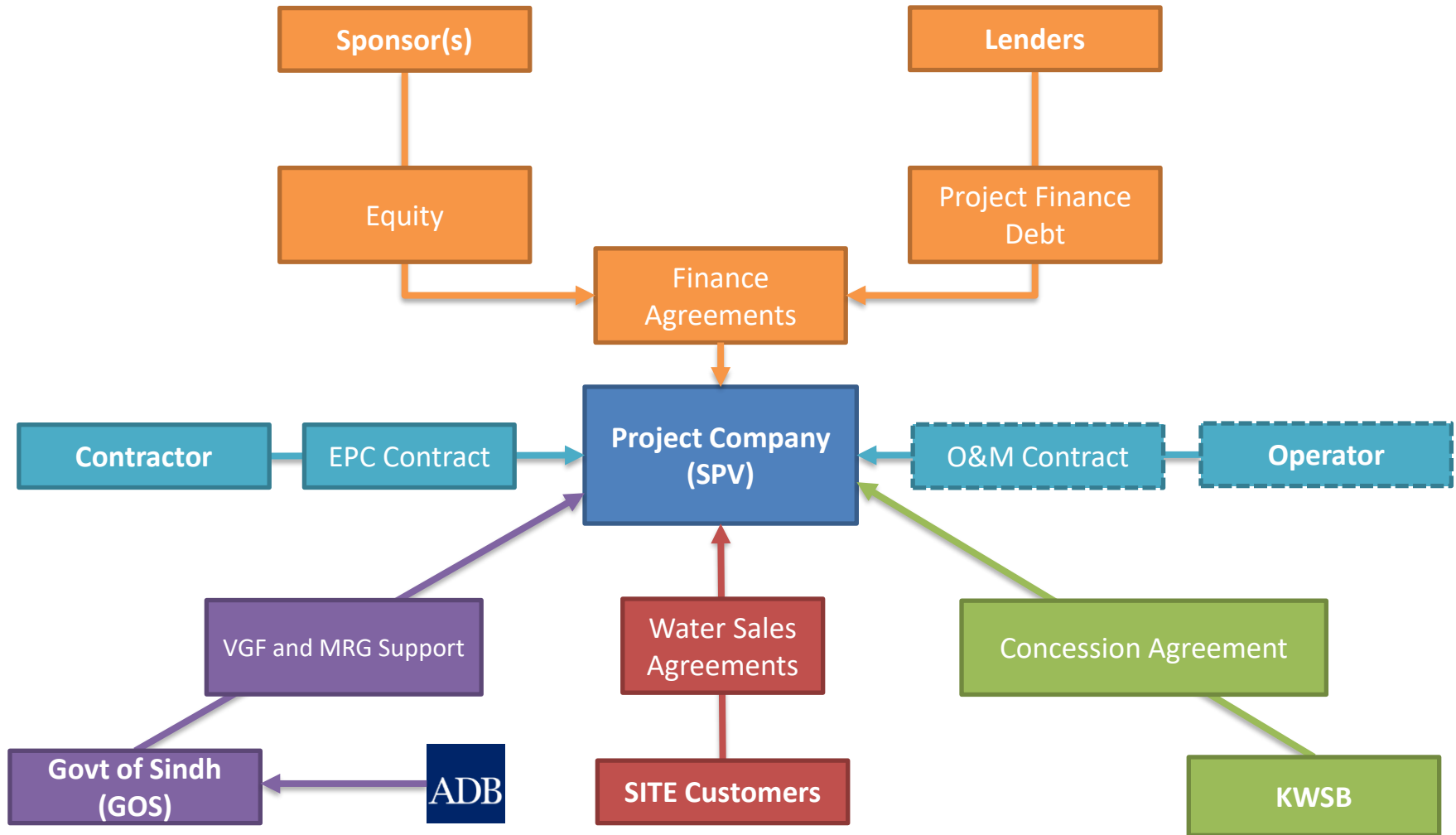
SINDH ENVIRONMENTAL QUALITY STANDARDS FOR MUNICIPAL AND LIQUID INDUSTRIAL EFFLUENTS (mg/l, UNLESS OTHERWISE DEFINED)

S. No.	Parameter	Into Inland Waters	Into Sewage Treatment ⁽⁵⁾	Into Sea ⁽¹⁾
1	2	3	4	5
1.	Temperature 40 ⁰ C or Temperature Increase *	≤3 ⁰ C	≤3 ⁰ C	≤3 ⁰ C
2.	pH value (H ⁺) .	6-9	6-9	6-9
3.	Biochemical Oxygen Demand (BOD) ₅ at 20 ⁰ C ⁽¹⁾	80	250	80**
4.	Chemical Oxygen Demand(COD) ⁽¹⁾	150	400	400
5.	Total Suspended Solids (TSS)	200	400	200
6.	Total Dissolved Solids (TDS)	3500	3500	3500
7.	Oil and Grease	10	10	10

Above is an extract from SEQS. The standard comprises 32 parameters.

The specification for recycled water delivered to SITE shall be:

No.	Parameters	Units	Design Upper Limit
1	pH	-	6.5—8.5
2	Suspended Solids (SS)	mg/L	-
3	Turbidity	NTU	5
4	Color	Degree	30
5	Biochemical Oxygen Demand (BOD5)	mg/L	10
6	Chemical Oxygen Demand (COD)	mg/L	60
7	Iron (Fe)	mg/L	0.3
8	Manganese (Mn)	mg/L	0.1
9	Chloride (Cl-)	mg/L	250
10	Silica (SiO2)	mg/L	30
11	Total Hardness (CaCO3 mg/L)	mg/L	450
12	Total Alkalinity (CaCO3 mg/L)	mg/L	350
13	Sulphate (SO42-)	mg/L	250
14	Ammonia-Nitrogen (NH3-N)	mg/L	10
15	Phosphorous (P)	mg/L	1
16	Total Dissolved Solids (TDS)	mg/L	1000
17	Grease and Oil	mg/L	1
18	Anionic Detergents (as MBAS)	mg/L	0.5
19	Chlorine Residual (* mimimum)	mg/L	0.05 *
20	Fecal coliform	MPN/L	2000



ADB Sovereign Loan to provide funds for Govt to provide VGF support to the SPV

- For the bid process, a fixed starting tariff will be provided in the RFP while the required VGF amount to achieve the starting tariff will be the bid parameter with lowest required VGF bid to be considered as the preferred bidder.
- The tariff will be escalated at a fixed percentage every year to account for inflation and the escalation figure in percentage will be provided in the RFP and tariff for a given year will be notified annually by the competent authorities.
- The Project will work on a regulated utility model and no capacity or availability payments are expected from GOS.
- GOS will provide support via VGF either by way of equity injection or junior debt during the construction period while to mitigate the risk of timely removal of the informal water suppliers, GOS will provide a minimum revenue guarantee (MRG) in the initial few years of the concession agreement.
- Relief event payments will be offered in case of low volume of influent or if the influent is out of pre agreed specifications and a bankable termination payment regime will be offered based on successfully financed precedents.



Proposed Risk Allocation (i)

Risks		Govt*	Concessionaire	Comments
Site delivery and approvals	<ul style="list-style-type: none"> Land delivery 	✓		GoS to deliver the land free of all encumbrances for the plant to the concessionaire. GoS to provide right of way for influent and recycled water delivery pipelines outside of project site and distribution network within SITE.
	<ul style="list-style-type: none"> Permits, Consents, Approvals (failure of any Government entity to grant or renew a required license or consent) 	✓	✓	Concessionaire to apply for and GoS to facilitate provision of all permits, consents, licenses and necessary approvals
Design	<ul style="list-style-type: none"> WWTP Design 		✓	Concessionaire to take design risk of entire facility and pipeline network while GoS takes risk of changing design due to non-compliance with the specified influent quality parameters
	<ul style="list-style-type: none"> Recycling Facility Design 		✓	
	<ul style="list-style-type: none"> Distribution Network Design 		✓	
	<ul style="list-style-type: none"> Changes to Design 	✓	✓	
Construction	<ul style="list-style-type: none"> Construction quality 		✓	Concessionaire to take all risks related to construction of new plant similar to international DBFOMT projects of this nature
	<ul style="list-style-type: none"> Construction timeline 		✓	
	<ul style="list-style-type: none"> Cost overruns 		✓	
	<ul style="list-style-type: none"> Environment, social and safety 		✓	
	<ul style="list-style-type: none"> Utilities 		✓	

* Includes KWSB, SITE, Local Government Department and other Governmental entities and agencies

Proposed Risk Allocation (ii)

Risks		Govt	Concessionaire	Comments
Influent	<ul style="list-style-type: none"> Volume and quality of influent at delivery point (branch on interceptor) 	✓		GoS to guarantee availability of 35 MIGD wastewater at the branch with a certain specified quality (generally as SEQs with some parameters amended to minimize incidence of relief events and reduce salinity)
Demand	<ul style="list-style-type: none"> Revenues Offtake Volume Tariff billing and collection Non-revenue water 	✓	<ul style="list-style-type: none"> ✓ ✓ ✓ ✓ 	In the initial years the demand risk is expected to be shared via an MRG from the GoS while concessionaire takes full market risk later on during the concession period
O&M	<ul style="list-style-type: none"> Maintenance Operations 		<ul style="list-style-type: none"> ✓ ✓ 	Full O&M risk for influent delivery system, WWTP, recycling facility and pipeline network resides with the concessionaire while the tariff shall cater for inflation of O&M costs

Proposed Risk Allocation (iii)

Risks		Govt	Concessionaire	Comments
Force Majeure	<ul style="list-style-type: none"> • Insurable events • Uninsurable events • Political Force Majeure 	 ✓ ✓	✓	Force Majeure risk to be shared between concessionaire and GOS in line with international best practice Pandemic related risk allocation to be discussed considering evolving best practice
Macroeconomic	<ul style="list-style-type: none"> • Currency Risk • Inflation • Interest Rate risk 		✓ ✓ ✓	Concessionaire to take risks of FX depreciation, interest rate increase and inflation

Key Investment Highlights – Sindh

- The GOS has embarked on a modernization program over the past decade to transform the economy via a market led growth model by improving the participation of the private sector in infrastructure via PPP's.
- Structural and policy reforms have been undertaken since 2010 which has resulted in a favorable regulatory environment for PPP project selection, fairness and openness of bidding processes and contracts and offering a bankable risk allocation to the private sector.
- The PPP policy framework was revised in 2010 to include the establishment of a PPP policy board to develop strategic goals and monitor PPP implementation, as well as strengthening of the PPP unit located within the finance department which works with contracting agencies to identify, prepare and tender PPP projects in an open and transparent manner.
- Sindh's regulatory framework also provides clear procedures for dispute resolution and unsolicited bids. As per EIU 2018 Infrascope report on PPP's in Asia, Sindh rates highly in regulation and institutional capacity as seen below:

Category scores Domain 1: Regulations			Category scores Domain 2: Institutions		
Rank		Score/100	Rank		Score/100
1	Thailand	87	1	Thailand	97
2	Philippines	85	2	Sindh province	95
3	Indonesia	78	=3	PRC	94
4	India	77	=3	India	94
5	Sindh province	74	=3	Philippines	94
=6	PRC	70	6	Bangladesh	90
=6	Gujarat state	70	7	Pakistan	88
8	Bangladesh	65	=8	Gujarat state	86
9	Timor-Leste	64	=8	Kazakhstan	86
10	Kyrgyz Republic	63	10	Viet Nam	84
11	Viet Nam	61	11	Kyrgyz Republic	82
12	Georgia	58	12	Timor-Leste	73
=13	Kazakhstan	54	13	Mongolia	71
=13	Mongolia	54	14	Indonesia	53
15	Armenia	51	15	Tajikistan	43
16	Pakistan	47	16	Sri Lanka	36
17	Tajikistan	43	17	Georgia	8
18	Sri Lanka	30	18	Armenia	5
19	Papua New Guinea	27	19	Papua New Guinea	0

MATURE (80-100)
DEVELOPED (60-79)
EMERGING (30-59)
NASCENT (0-29)

Key Investment Highlights – Sindh

- The GOS has an impressive track record of closed PPP transactions as highlighted below:
 - HYDERABAD MIRPURKHAS DUAL CARRIAGEWAY - HMDC
 - Karachi Thatta Dual Carriageway Project - KTDC
 - Enhancing Public Private Partnership (EPPPs) - EPPP
 - Performance Based Contracts for Health Facilities -
 - Safety & Security at National Institute of Child H - NICH
 - Sindh Ambulance Service - SAS
 - Sindh Nooriabad Power Project - SNPC
 - Sir Aga Khan Jhirk Mulla Katiyar Bridge - JMK
- GOS enacted the Sindh Local Government (amendment) Ordinance of February 1983 leading to creation of the Karachi Water & Sewerage Board and in the year 1996, a new Act called the Karachi Water & Sewerage Board Act 1996 was enforced.
- KWSB has been at the forefront of developing water supply and wastewater infrastructure in Karachi and manages a pipeline network of 11,000 km, more than 100 pumping stations and dozens of small-scale sewage treatment plants.

Key Investment Highlights

Key Parameter	Present under the project structure	Explanation
Commercial Viability	Yes	Tariff to be competitively discovered via an international competitive bid and concessionaire to be selected based on international best practices
Strong Government support	Yes	VGF options to be provided keeping in view market dynamics and in order to enhance project viability for the private sector with lowest VGF bid (by indicating a starting tariff in the RFP) or vice versa being the key criteria for bidder selection
Market Risk mitigation	Yes	In order to improve bankability market risk is proposed to be shared in the initial few years of the concession via MRG from GoS which falls away once steady state revenues are achieved
Regulated tariff	Yes	Regulated utility model (key KPIs and tariff inflation to be specified in the concession agreement)
Incentives for efficiency and innovations	Yes	Concessionaire to be adequately incentivized to reduce cost and provide innovative solutions (reduction of nonrevenue water, dynamic water demand projections, use of smart meters and electronic billing etc.)

Indicative Tender Timeline

RFQ Issued	17 April 2023
Prospective Bidders Conference(s) (Virtual)	9 May 2023
RFQ Responses are due	12 June 2023
Shortlisted bidders selected and announced	21 July 2023
RFP launch	28 July 2023
Preferred bidder announced	November 2023
Negotiation and signing of concession agreement	December 2023

Thank You

The ADB logo consists of the letters 'ADB' in a white, serif font, centered within a dark blue square.