

GOVERNMENT OF THE PUNJAB PLANNING & DEVELOPMENT BOARD (URBAN DEVELOPMENT SECTION)

WORKING PAPER FOR PDWP

1.	Project Title	Lahore Water an of Surface Water	Lahore Water and Waste Water Management Project - Construction of Surface Water Treatment Plant at BRBD Canal Lahore (1^{st} Revised)					
2.	Location	BRBD Canal down Baghbanpura, Fa	nstrea tehga	am of Ravi arh and Sha	Syphon to tl adipura	ne areas	s of Mughalpura,	
3.	Sponsoring Agency	HUD & PHE Depa	artme	nt				
4.	Executing Agency / O&M	Water & Sanitatio	on Ag	ency (WAS	SA), Lahore			
6.	Project Cost	Approved Cost	Co: Pr	st before e-PDWP	Cost afte PDW	er Pre- /P	Difference	
		21,045.710 (PKR million)	21,045.710 54,138.475 44,459. (PKR million) (PKR million) (PKR million)).539 illion)	23,413,829 (PKR million) (111%)		
		133.01 (US \$ Million)	: (US	193.83 \$ Million)	159. (US \$ Mi	18 illion)	26.17 (US \$ Million)	
		@ 1US = Rs 150	@ 1	US = Rs 279	9 @ 1US =	Rs 279	(19%)	
		• Cost Reductio	on by al Cos	Pre-PDWP <u>sts</u>	: Rs.9,678.9	936 mill	ion	
		Foreign Component		Local Co	mponent	Total		
		38,125.182 (PKR million)	6,33 (PKR	334.356 R million) (44,459.539 (PKR million)	
		136.50 2 (US \$ Million) (US \$		22 (US \$	22.67 S \$ Million) (159.18 JS \$ Million)	
7.	ADP 2024-25 (GS.NO. 3037)	F.C Allocation: 126.900 Million L.C Allocation: 0						
8.	Gestation period	Original Appro	oved		Revised Pr	opose	d	
		42 Mo Till Marcl	nths h 202	3	129 Months Till June 2030			

9. <u>HISTORY OF THE PROJECT:</u>

Instant Project is a part of AIIB funded project titled "Lahore Water and Wastewater Management Project (LWWMP). The project was approved from Executive Committee of National Economic Council (ECNEC) on 30.10.2019 with approved cost of **Rs. 21,045.7 million**. The Project is reflected in ADP (2024-25) at GS. No. 3037. Revision of Scheme is required after updated working

of Project Management Consultant (PMC) on New MRS, Change in Scope of work and to account for soaring inflation that occurred after span of five years.

10. <u>DESCRIPTION OF THE PROJECT</u> Underlying Issue:

The population of Lahore district is being increasing exponentially with passage of time. The current population of Lahore District is about 13.004 Million as per Digital Census of 2023. The population count was 11.04 million according to 2017 Census. On the other hand, as per World Bank Report "Getting More from Water", 2019, Pakistan is commonly considered to be both water scarce (low water availability per capita i.e. 1,100 m3/capita) and water stressed (high water withdrawals relative to water availability i.e. 885 m3/capita). The only source of water of Lahore is the part of a vast unconfined aquifer lying under it.

Currently, WASA Lahore is entirely depending on groundwater to meet the water demands of residents of Lahore through network of about 595 tube wells scattered over the entire city. Due to continuous reliance on ground water, average static water level has been declined to about 51.30 m in year 2023 from the level of 15.695 m in year 1980. In this way declination of 35.65 m occurred in 43 years, making average rate of declination of about 1m per annum..

In general, recharge in the area of Lahore District takes place from River Ravi, rainfall, canal seepage and field irrigations whereas public and private tube wells for domestic and irrigation uses are responsible for the discharge. This unabated abstraction has created a cone of groundwater depression, which is deepening and expanding every year; and as the mining of groundwater continues at an ever-accelerating pace, the risk of saline water intrusion from the Raiwind area, in the south, into fresh groundwater further north is increasing day by day.

Solution:

In order to avert this continuous reliance on groundwater and to avoid over exploitation of same, it has been planned to identify alternate sources of Water like Surface Water induction. Master Plan of Water supply Sewerage and Storm water drainage system prepared by MMP in year 2019 for the planning horizon of year 2040. The plan also highlighted the importance of gradual shift to Surface water sources from ground water in phased wise manner up to total induction of 1000 cusec up to year 2040. As per recommendation of consultant, it had been planned to induct 100 cusecs of water in the first phase from BRBD Canal downstream of Ravi Syphon to the areas of Mughalpura, Baghbanpura, Fatehgarh and Shadipura. Phase-I of the project consists of construction of surface water treatment plant of capacity of 54 MGD (245,000 m3/day) at BRBD canal downstream of Ravi Syphon for supply of treated water in four selected serving areas of Lahore city namely Mughalpura, Baghbanpura, Fatehgarh and Shadipura.

In order to construct Surface Water Treatment plant for Phase-I, an area measuring 120 Acres is required. After continuous follow-up with District Administration, possession of land measuring 86.15 acres (excluding 26 acres) has been made in favor of WASA on 06.07.2024. Request for possession of remaining land has also been made to District Administration. Furthermore, No

Objection Certificate (NOC) was sought from Punjab Irrigation Department for induction of 100 cusec water from BRBD Canal in Year 2019.

After carrying out Feasibility Study, PC-I amounting to PKR 21,165.06 million was prepared in year 2019 and accordingly got approved from ECNEC on 30.10.2019. Afterwards, Project Management Consultant JV of M/s Dar Al-Handasah and Asian Consulting Engineers have been hired to prepare detail design, drawings and cost estimates. On the basis of updated working of Project Management Consultant (PMC), scope & design of the project has been changed. Furthermore, as the project is yet to be awarded, therefore new MRS rates have been adopted. Due to these changes in scope and soaring inflation occurred during span of five years, PC-I at a cost Rs. 54,138.473 Million has been submitted for the consideration of PDWP.

11. PROJECT SCOPE:

- 1. Construction of new Ravi Syphon & headwork (5853 Cusec capacity)
- 2. **Construction of a 54 MGD Surface Water Treatment Plant (SWTP)** at BRBD Canal to provide a stable and continuous supply of potable water.
- 3. Development of water infrastructure, including:
 - Potable water pumping station.
 - **Transmission and feeder main pipelines** to distribute water to the four designated areas **total length of 186 Km**:
 - Shadipura
 - Baghbanpura
 - Fatehgarh
 - Mustafabad
- 4. Improvement of the water distribution system through:
 - Network rehabilitation.
 - Leak detection and repair.
- 5. O&M for 2 Years
- 6. Solar Energy System of 5 Mega Watt
- 7. Reduction of Non-Revenue Water (NRW) by:
 - Establishing District Metered Areas (DMAs) and District Metered Zones (DMZs).
 - $_{\odot}$ $\,$ Installing bulk and customer metering.
 - Enhancing the billing system to a metered-based approach.
- 8. Implementation of Environmental and Social Impact Assessments (ESIA) and Resettlement Action Plans (RAP) in line with AIIB guidelines.
- 9. Operation and maintenance support for two years, including:
 - Training and capacity building of L-WASA staff for project operations.
- 10. Development of a Preliminary Engineering Design, exceeding the required level of detail for tendering the project under a Design-Build-Operate (DBO) model.

11. REASONS & JUSTIFICATION FOR REVISED PC-I

Original PC-I, approved in year 2019, was prepared by MMP Consultant under Master Plan study of Lahore District. Afterwards, Project Management Consultant (PMC) JV of M/s Dar Al-Handasah and Asian Consulting Engineers have been hired to prepare detail design, drawings and cost estimates. On the basis of design prepared by the PMC & price hike, PC-I amounting to PKR Rs.54,138.47 million has been prepared. Major reasons / justifications for revision are as under:

i. Change in Market Rates system from 1st Biannual 2019 to 2nd Biannual 2024 & Huge variation in Costs of Non-MRS Items

ii. Increase in Planning Horizon

- Serving Population as per Original PC-I= 1,481,127 People (Planning Horizon 2030)
- Serving Population as per Revised PC-I= 1,786,451 People (Planning Horizon 2050)
 Distribution Area is same
- iii. Increased Length & Sizes of Transmission main, Loop Mains, Strategic Mains and Distribution Mains (Additional Cost: Rs. 1382 million)

Description	Original Approved PC-I	PROPOSED Revised Pc-I	Changes in Cost (Rs Million)	Remarks
Transmission Main	Length=3.5 KM (HDPE, PN-10) Dia =1600mm	Length=4.5 KM (MS) Diameter=1800mm	+2,141	Addition of 1Km inside the treatment plant, missed in original PC-I
Feeding Mains	55 KM HDPE SDR-17 PN-10 Dia=1500mm-450mm	30.4 KM HDPE SDR- 17 PN-10 (1000mm -355 mm) Dia	-1,126	Decrease due to new zoning plan of the area
Distribution Mains	81.743 KM HDPE SDR- 17 PN-10 Dia=800mm-90mm	81.743 KM HDPE SDR-17 PN-10 Diameter= (450mm- 90mm)	+367	Length of distribution network is same . Cost increased Due to increase of rates
Total Network Length	140.27 KM	116.643 KM	1382	

- i. Water meters cost increase from Rs. 1,426 million to Rs.4034 million (Rs.2608 million increase) for water conservation. Proper zoning is planned.
- ii. Ravi Syphon Cost increased from Rs. 4,917 million to Rs.9,935 million (Rs.5,018 million increase):
 - In original PC-I rehabilitation of existing was proposed. In revised PC-I new syphon is proposed at 600 ft downstream in light of fresh Feasibility conducted by PID.
 - Costs of new hydraulic structure of syphon and guide banks in river are added
 - Diversion works in river & length of bypass channel are increased.
- iii. Replacement of open channels with raw water HDPE Pipe with additional cost impact of Rs. 2,967 million.
- iv. Civil works cost of Surface Water Treatment Plant increased from Rs.1,346 million to 4609 million (Rs.3,262 million increase):

- Sludge Thickener (& Tank) (From Rs. 17 million to Rs.331 million): In the design turbidity of average 100 NTU is taken which will prevail most of the year for economical design. However, in the Monsoon turbidity increased exponentially. To handle this Sludge Thickener & Tank are taken.
- Sludge Drying Beds with Shades (from Rs.41 million to 520 million) : On the basis of recalculation of sludge volume, area increased from 2000 Sq m to 5830 Sq m
- **Rapid Gravity (Sand) Filtration Unit (from Rs.177 million to 617 million):** Area increased from 3646 Sq m to 11,837 sq m due to addition of missing essential components backwash tank, backwash pumps and blowers.
- Clear Water Tank, Pump House and Disinfection Room (from Rs.367 million to Rs.1,474 million) due to increase in tank size and inclusion of chlorine gas cylinders, neutralization tower in case of gas leak, etc. as per updated design
- Internal Roads, H.T & Transformers Room etc (from Rs.78 million to Rs.752 million) Additional Internal Roads have been considered in updated design including Civil Structures for Transformers rooms cum HT Costs
- New provision of Parshall Flume and Inlets Works with cost Rs. 71 million for mixing of coagulant
- New provision of Recycled water and sludge Tank with cost Rs.177 million for recycling/water conservation. This is also avoid separate mechanism for drainage
- Increase in O&M cost from Rs. 1,435 million to Rs. 3,774 million (Rs.2,339 million increase on the basis of new rates of chemicals & electricity
 - Project is on DBO mode for sustainability
- vi. New provision of Social Costs including ESIA, ESMP, RP (including IVS and Award) of Syphon and SWTP plant sites (Rs. 912 million)
 - As per Environmental and Social Framework Policy of AIIB and decisions taken in 2nd Project Steering Committee meeting held on 20.10.2021,

IVS study of instant project including Resettlement Plan (RP), Livelihood Restoration Plan (LRP) and Environmental and Social Management Plan (ESMP) of both SWTP and Syphon lands has been completed

- vii. New provision of Solarization (5 Mega Watt) cost Rs.900 million to reduce O&M cost / green energy
- viii. Addition of road restoration amounting **Rs. 207 million** for water supply pipe network
 - ix. Addition of escalation charges amounting **Rs.514 million**: International procurement requirement
 - Project Management Consultancy Cost (PMC) from Rs. 217 million to Rs.1,165 million (Rs. 948 million increase)
 - xi. Project Management Unit (PMU) from Rs.222 million to Rs.382 million (Rs.159 million increase)
 - Revised pay packages by 15th PDWP meeting held on 27.09.2022

12. PROJECT OBJECTIVES:

The objectives of the instant project are as follows;

- Due to continuous reliance on groundwater, aquifer is being depleted with an average rate of about one meter per anum, instant project will assist in averting depletion of groundwater by shifting to alternate source like surface water supplies.
- Provision of 24x7 hours supply of adequate quantity of safe drinking water to the contiguous urban core (four areas of WASA Lahore) through a unified water supply network.
- To rationalize and manage water demand through conservation and metering. Water metering will assist in effective monitoring of water supplies operations and consumptions pattern by keeping an eye on water production and its usage by means of Bulk flow meters and Domestic Meters.
- Ensuring sustainable provision of water through reliance on multiple sources like surface supplies etc, so that overexploitation of ground water may be minimized and conservation of this asset may be ensured.
- Maximizing the efficiency of the water supply system by creating self-sustaining District Metered Areas (DMAs) and District Metered Zones (DMZs), acting as Cost Centers.
- Instituting a robust water measurement and monitoring system at the production, distribution and consumer end to minimize Non-Revenue Water.

13. PROJECT COST SUMMARY

Before Pre-Difference Sr. Approved Cost After Pre-PDWP Description PDWP (C) (A) (B) (C-A) PACKAGE-I (TO BE EXECUTED BY PID) New Ravi Syphon, Head Regulator, Escape Channel Structure and Intake Structure for proposed SWTP (as 1.1 per feasibility conducted provided by Punjab Irrigation Department) Α **CIVIL WORKS** 1. 388,976,658 Raw Water Channel for WASA -388,976,658 2. Care and Handling of Water 1,147,549,466 813,949,385 813,949,385 3. Main Syphon 2,450,589,867 5,536,994,614 5,458,553,511 3,007,963,644 4. Inlet and Outlet Structures 173,884,961 266,026,364 344,416,122 92,141,403 5. 906,538,910 735,639,894 Bypass Channels (U/S & D/S) 97,718,321 637,921,573 6. BRBD bank for raising and lining of 35,850,199 -35,850,199 raised part 7. Extension of Guide Banks 1,049,337,750 640,679,741 640,679,741 8. **Operator's Hut** 135,439,690 50,437,474 50,437,474 9. Rehabilitation of Escape channel RD. 500,000,000 352,073,374 0 -500,000,000 279+500 of BRBD Link Canal 10. Rehabilitation of Bridges of BRBD Link 352,751,987 411,454,714 418,997,988 66,246,001 Canal 11. Intake Structure for Proposed SWTP 77,013,686 258,427,535 258,427,535 181,413,849 of WASA Sub-Total-A 4,104,211,657 10,142,232,175 8,642,711,892 4,538,500,235 **MECHANICAL WORKS** В. 317,668,730 317,668,730 317,668,730 10 New Ravi Syphon -Sub-Total-B 317,668,730 317,668,730 317,668,730 Sub-Total (A+B) 4,104,211,657 10,459,900,905 8,960,380,622 4,856,168,965

(Rupees)

Sr.	Description	Approved Cost	Before Pre- PDWP	After Pre-	Difference
	-	(A)	(B)	PDWP (C)	(C-A)
	PRA @ 5%	205,210,899	522,995,045	448,019,031	242,808,132
	Physical Contingencies @ 2% on Sub-Total (A+B)	123,126,540	522,995,045	179,207,612	56,081,072
	Design Review & Construction Supervision	164,168,719	522,995,045	168,811,419	4,642,700
	Price variation	266,773,114	711,273,262	179,207,612	-87,565,502
	Land Acquisition	54,166,648	-	-	-54,166,648
	Total Cost (PACKAGE-1)	4,917,413,257	12,740,159,302	9,935,626,297 MASA)	5,018,213,040
2.1	Surfac	e Water Treatmen	t Plant (SWTP) - Civ	vil Works	
	Raw Water Pipe		3,677,714,136	3,356,987,826	3,356,987,826
1	Raw Water Tank and Raw Water Pump House	23,382,578	185,380,174	127,368,603	103,986,025
2	Primary Sedimentation Tanks	134,394,726		-	-134,394,726
3	Coagulation Chamber	2,465,446			-2,465,446
4	Flocculation & Clarifiers	431,100,941	768,254,069	481,771,450	50,670,509
5	Sludge Thickener (& Tank)	16,949,157	551,647,191	331,085,536	314,136,379
6	Sludge Drying Beds with Shades	41,276,902	975,636,004	520,316,401	479,039,499
7	Rapid Gravity Filtration Unit	177,839,916	856,818,223	617,580,549	439,740,633
8	Clear Water Tank, Pump House and Disinfection Room	367,312,461	2,184,801,168	1,474,437,199	1,107,124,738
9	Chemical Storage Building and Alum Dozing Station	47,223,396.00	37,933,026	32,760,619	-14,462,777
10	Admin Building	6,128,388.00	30,000,282	17,126,343	10,997,955
11	Staff Quarter	20,410,380.00	4,148,680	3,992,323	-16,418,057
12	Internal Roads, H.T & Transformers Room etc	78,023,556.00	996,279,163	752,331,136	674,307,580
13	Parshall Flume and Inlets Works		146,306,397	71,593,591	71,593,591
14	Recycled water and sludge Tank	-	228,112,160	177,797,743	177,797,743
	Sub Total Cost (2.1)	1,346,507,847	10,643,030,673	7,965,149,318	6,618,641,471
2.2	Electrica	al & Mechanical W	orks including SCAI	DA System	
2.2	Electrica Supplying and Installation of Mechanical Equipment including Pumping Machinery etc.	al & Mechanical W 3,103,316,532	orks including SCAI 3,652,465,479	DA System 3,645,118,455	541,801,923
2.2 1 2	Electrica Supplying and Installation of Mechanical Equipment including Pumping Machinery etc. Supplying and Installation of Electrical Equipment etc.	al & Mechanical W 3,103,316,532 2,154,787,632	orks including SCAI 3,652,465,479 694,947,679	DA System 3,645,118,455 643,209,569	541,801,923 -1,511,578,063
2.2 1 2 3	Electrica Supplying and Installation of Mechanical Equipment including Pumping Machinery etc. Supplying and Installation of Electrical Equipment etc. SCADA and Instrumentation	al & Mechanical W 3,103,316,532 2,154,787,632 241,412,076	orks including SCAI 3,652,465,479 694,947,679 1,726,587,734	DA System 3,645,118,455 643,209,569 1,726,587,734	541,801,923 -1,511,578,063 1,485,175,658
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2.2 1 2 3 4 3.1 3.2 4 4.1 5.1 5.2 5.3	Electrica Supplying and Installation of Pumping Machinery etc. Supplying and Installation of Electrical Equipment etc. SCADA and Instrumentation Process Piping Sub Total Cost (2.2) Total Cost (2.1+2.2) Total Cost (2.1+2.2) Transmission Main including Valves, Fittings etc. (DI Pipe/HDPE - Length 3.5 km) Transmission & Loop Mains including Valves, Fittings etc. (M.S Pipe - Length 4.8+9.4 km) Sub Total Cost (3) Feeding Feeding Main including Valves, Fittings etc. (HDPE Pipe) Sub Total Cost (4) Construction and Re Distribution Network including Valves, Fittings etc (HDPE Pipe) Supply and Fixing Leakage Detection Equipment (NRW) Domestic & Commercial Water Meters and Water Flow Meters	al & Mechanical W 3,103,316,532 2,154,787,632 241,412,076 5,499,516,240 6,846,024,087 Transm 677,445,300 677,445,300 g Main for 04 Serv 2,882,332,880 habilitation of Dis 496,239,683 158,220,000 1,426,100,148	orks including SCAI 3,652,465,479 694,947,679 1,726,587,734 6,074,000,892 16,717,031,565 ission Main 2,819,399,142 2,819,399,142 1,755,729,942 tribution Network i 1,275,830,109 225,000,000 3,988,663,273	3,645,118,455 643,209,569 1,726,587,734 257,441,424 6,272,357,182 14,237,506,50 0 2,819,399,142 2,819,399,142 2,819,399,142 2,819,399,142 1,755,729,942 1,034,565,613	541,801,923 -1,511,578,063 1,485,175,658 257,441,424 772,840,942 7,391,482,413 -677,445,300 2,819,399,142 2,141,953,842 -1,126,602,938 -1,126,602,938 -1,126,602,938 2,608,465,465
2.2 1 2 3 4 3 3.1 3.2 4 4.1 5.1 5.2 5.3 	Electrica Supplying and Installation of Pumping Machinery etc. Supplying and Installation of Electrical Equipment etc. SCADA and Instrumentation Process Piping Sub Total Cost (2.2) Total Cost (2.1+2.2) Total Cost (2.1+2.2) Transmission Main including Valves, Fittings etc. (DI Pipe/HDPE - Length 3.5 km) Transmission & Loop Mains including Valves, Fittings etc. (DI Pipe/HDPE - Length 3.5 km) Transmission & Loop Mains including Valves, Fittings etc. (M.S Pipe - Length 4.8+9.4 km) Sub Total Cost (3) Feeding Feeding Main including Valves, Fittings etc. (HDPE Pipe) Sub Total Cost (4) Construction and Re Distribution Network including Valves, Fittings etc (HDPE Pipe) Supply and Fixing Leakage Detection Equipment (NRW) Domestic & Commercial Water Meters and Water Flow Meters Sub Total Cost (5)	al & Mechanical W 3,103,316,532 2,154,787,632 241,412,076 5,499,516,240 6,846,024,087 Transm 677,445,300 g Main for 04 Serv 2,882,332,880 2,882,332,880 babilitation of Dis 496,239,683 158,220,000 1,426,100,148 2,080,559,831	orks including SCAI 3,652,465,479 694,947,679 1,726,587,734 6,074,000,892 16,717,031,565 ission Main 2,819,399,142 2,819,399,142 1,755,729,942 1,275,830,109 225,000,000 3,988,663,273 5,489,493,382	3,645,118,455 643,209,569 1,726,587,734 257,441,424 6,272,357,182 14,237,506,50 0 2,819,399,142 2,819,399,142 2,819,399,142 9PE Pipe) 1,755,729,942 ncluding Water Mo 863,607,567 225,000,000 4,034,565,613 5,123,173,180	541,801,923 -1,511,578,063 1,485,175,658 257,441,424 772,840,942 7,391,482,413 -677,445,300 2,819,399,142 2,141,953,842 -1,126,602,938 -1,126,602,938 -1,126,602,938 eters 367,367,884 66,780,000 2,608,465,465 3,042,613,349
2.2 1 2 3 4 3 3.1 3.2 4 4.1 5.1 5.2 5.3 6	Electrical Supplying and Installation of Mechanical Equipment including Pumping Machinery etc. Supplying and Installation of Electrical Equipment etc. SCADA and Instrumentation Process Piping Sub Total Cost (2.2) Total Cost (2.1+2.2) Transmission Main including Valves, Fittings etc. (DI Pipe/HDPE - Length 3.5 km) Transmission & Loop Mains including Valves, Fittings etc. (M.S Pipe - Length 4.8+9.4 km) Sub Total Cost (3) Feeding Feeding Main including Valves, Fittings etc. (HDPE Pipe) Sub Total Cost (4) Construction and Re Distribution Network including Valves, Fittings etc (HDPE Pipe) Supply and Fixing Leakage Detection Equipment (NRW) Domestic & Commercial Water Meters and Water Flow Meters Sub Total Cost (5)	al & Mechanical W 3,103,316,532 2,154,787,632 241,412,076 5,499,516,240 6,846,024,087 Transm 677,445,300 g Main for 04 Serv 2,882,332,880 habilitation of Dis 496,239,683 158,220,000 1,426,100,148 2,080,559,831 Miscellar	orks including SCAI 3,652,465,479 694,947,679 1,726,587,734 6,074,000,892 16,717,031,565 ission Main 2,819,399,142 2,819,399,142 1,755,729,942 1,755,729,942 1,275,830,109 225,000,000 3,988,663,273 5,489,493,382 Beous Works	3,645,118,455 643,209,569 1,726,587,734 257,441,424 6,272,357,182 14,237,506,50 0 2,819,399,142 2,819,399,142 2,819,399,142 0 1,755,729,942	541,801,923 -1,511,578,063 1,485,175,658 257,441,424 772,840,942 7,391,482,413 -677,445,300 2,819,399,142 2,141,953,842 -1,126,602,938 -1,126,602,938 -1,126,602,938 367,367,884 66,780,000 2,608,465,465 3,042,613,349

Sr.	Description	Approved Cost (A)	Before Pre- PDWP (B)	After Pre- PDWP (C)	Difference (C-A)
6.2	Shifting of Services of Electricity, SuiGas, PTCL Cable and Electric Poles	158,220,000	-	-	-
6.3	Restoration of Roads	52,740,000	-	-	-
6.4	General Items with Allied Works	63,288,000	134,683,797	134,683,797	71,395,797
6.5	Rehabilitation of Existing Tubewells	-	335,000,000	335,000,000	-
6.7	Site Facilities		182,200,000	-	-
	Sub Total Cost (6)	748,908,000	651,883,797	469,683,797	71,395,797
	Total Cost (PACKAGE-II)	13,235,270,09 8	27,433,537,828	24,405,492,56 1	11,582,445,005
7		Sola	rization		
7.1	Solarization (5 M.W)		900,000,000	900,000,000	900,000,000
	Sub Total Cost (7)		900,000,000	900,000,000	900,000,000
	Total Cost (PACKAGE-III)		900,000,000	900,000,000	900,000,000
	Capital Cost (PACKAGE I +II+III)	18,152,683,35 5	41,073,697,130	35,241,118,85 8	17,088,435,503
i	Provisional sum @ 4.16% on Civil Works	59,084,333	1,178,675,174	-	-59,084,333
ii	PRA @ 5 %	698,028,145	1,416,676,891	1,265,274,628	567,246,483
iii	Project Management Consultants	217,478,664	1,165,998,600	1,165,998,600	948,519,936
iv	PMU-LWASA Establishment	222,787,683	382,256,275	382,256,275	159,468,592
v	Plantation Cost (L.S)	10,548,000	10,000,000	0	-10,548,000
vi	ESMP, RP, IVS, LRP, GAP, H/S etc (SWTP & Syphon)	-	1,062,480,000	912,480,000	912,480,000
vii	Contingencies @ 2 %	288,863,938	566,670,757	506,109,851	217,245,913
viii	Escalation @2%		566,670,757	506,109,851	506,109,851
ix	O&M Cost of the project	1,435,319,100	4,774,345,584	3,774,345,584	2,339,026,484
х	Substation for External Electrification by LESCO		450,000,000	350,000,000	350,000,000
Xi	Shifting of Services of Electricity, SuiGas, PTCL Cable and Electric Poles		283,335,378	148,177,151	148,177,151
xii	Restoration of Roads		1,207,668,674	207,668,674	207,668,674
	GRAND TOTAL AMOUNT (PKR)	21,045,710,000	54,138,475,220	44,459,539,472	23,413,829,472
	GRAND TOTAL AMOUNT (USD million)	133.01	193.83	159.18	26.17

14. PHYSICAL PHASING OF PROJECT

Sr.	Description of Packages	Year Wise Physical Activities (%)		
		2024-25	2025-26	2026-27
1	Construction of Surface Water Treatment Plant &	20%	40%	40%
	Transmission Mains and Distribution Network	(37.22 km)	(74.44 km)	(74.44 km)

15. FINANCIAL PHASING OF PROJECT

Sr.	Description	Year Wise FinancialUtilization (%		on (%)
		2024-25	2025-26	2026-27
	Construction of Surface Water Treatment Plant &	20%	40%	40%
1	Transmission Mains and Distribution Network	(10,879)	(21,757	(21,757)

16. SECTOR ISSUES AND STRATEGY

i.	Sector Issues	Sewerage Issues Bain water and storm water management issues
		Rain water and storm water management issues
ii.	Sector	 Improvement of urban Infrastructure
	Strategy	Provision of wastewater treatment and improvement of sewerage lines
		Construction of water storage tanks and nullahs for better management of heavy rains and flood waters.

iii.	Other Major Ongoing & Potential Projects in the Sector	 Rainwater Management- Drainage arrangement for sore point at Qaddafi Stadium Storm water drainage system from Haji Camp to River Ravi via Laxmi Chowk, McLeod Road, Nabha Road, Chauburji and Sham Nagar Lahore
iv.	PMU	Effective human resource management is a critical component of any project. The following are the team members for the particular project: Project Director (PPS-12) Manager (Civil) (PPS-10) Manager (Electrical & Mechanical) (PPS-10) Manager (Procurement & Contract) (PPS-10) Manager (Environmental & Social) (PPS-9) Manager (Admin & Finance) (PPS-9) Assistant Manager (Civil) (PPS-8) Assistant Manager (Civil) (PPS-8) Assistant Manager (Electrical) (PPS-8) Assistant Manager (Mechanical) (PPS-8) Assistant Manager (Legal) (PPS-8) Accounts Assistant (PPS-5) Sub Engineer (1 Civil, 1 Electrical & 1 Mechanical) (PPS-6) GIS Operator (PPS-5) Office Assistant (PPS-3) Vehicle Driver (PPS-2) Naib Qasid (PPS-1) Security Guard (PPS-1) Sweeper (PPS-1) *Post of Office & HR manager is part of PMU as per requirement of the Bank and was part of final position paper & total budget approved from PDWP.
v .	Annual Income after completion	No applicable
vi.	Total Annual O&M cost	Rs.2033 million per year

(PART-B)

TECHNICAL APPRAISAL

17. <u>Pre-PDWP Deliberations:</u>

Instant project was discussed in in Pre-PDWP meetings held on 11.12.2024 under the Chairmanship of Member (UD/LG/PHE), P&D Board. The comments/observations of P&D Board, Lahore and replies of Administrative Department/Executing Agency are given as under:

Α.	Comments of UD Wing, P&D	Board					
1	Accumulative cost (\$371.644	As per amended Cost in light of P&D comments, Foreign Component and					
	million) of Sewerage project as	Local Compon	ent becomes:				
	cleared by PDWP (\$177.072	Project	Foreign	Local	Total		
	million) and proposed revised	-	Component	Component	(US\$		
	cost to instant project		(US\$	(Counterpart	Million)		
	(\$194.572 million), exceeds the		Million)	Funding)			
	loan amount of \$329 million.		_	(US\$ Million)			
	Therefore, additional scope &	LARECHS	160	17	177		
	design of the instant project	Project					
	should be optimized to keep	SWTP	149	27	176		
	the projects' cost within loan	Project					
	amount.	Total	309	44	353		
		Although the	Total Cost of th	ese projects is 35	53 MUSD, however, the	2	
		overall Foreig	n Component of	f both projects is	309 MUSD which falls	5	

2	The original PC L of the project	within the AIIB financing remaining amount will be that the expenditure that between both parties. Lo PMU, O&M Cost and Tax has been conceived with objectives rather than ju design does not need to Although the original PC-	g window of 329 M e financed by the G entails Local financi cal share contains E es. Further, addition n an aim to ensure ust overall cost util be rationalized.	AUSD for this ProjoPb. It is worth monopole is to ensure equination of the second seco	ject. The entioning uity share cial Cost, nt project n desired scope &	Submit
 2.	was approved on 30.10.2019 by ECNEC and the Project Management Consultants (PMC) were hired on 30.01.2023. In this way a period of 3 years and 3 months was wasted just for hiring of the PMC which resulted in tremendous cost over-run. This needs justification. Further, the proposed extension of the gestation period until June 2030 appears to be quite lengthy. A justification for this extension should be provided, or it may be shortened.	Although the original PC-J of the project cannot be a to the fact that the project hiring process of consultar litigations at Treatment P The Gestation Period inclu- for execution followed Maintenance of the Treat refer to the Implemental PC-I. The prequalification Procurement Guidelines. shortened.	twas approved on 3 attributed towards hi act has been subject ant during Covid-19 lant Land. udes four months of by 2 years' time ment Plant and Network tion plan of the pro- n of DBO contractor The extension is rat	detailed design, the cos ring of PMC for SW to delay owing to pandemic and long detailed design, th period for Opera vorks. In this regar ject attached in th s is in progress as ional and cannot b	TP owing o delay in o pending ree years tion and rd, please in instant per AIIB be further	Submit ted before PDWP
3.	The original PC-I for the project was prepared by MMP consultants. After approval, the PMC proceeded to develop a 'preliminary design'. Now, the project is planned to be implemented in a Design-Build- Operate (DBO) mode, where the contractor will prepare their own design. Doesn't this repetition of design efforts lead to unnecessary time and cost wastage? Executing Agency to explain.	It is to apprise that the need for carrying out the instant project on DBO mode was deliberated and duly approved by each competent forum i.e. PDWP, CDWP and ECNEC during appraisal of original prepared PC-I. Since the executing agency does not have prior experience of carrying out such projects, therefore, the project cannot be carried out on BOQ mode. It is inevitable that preparation of Detailed Design is required as an ultimate goal before execution. The steps involved to prepare the detailed design includes preparation of concept design followed by preliminary/Tender design. All these steps have been bifurcated to be carried out based on its need from time to time, therefore, it may not be considered as repetition of design effort since it is the requirement of the process for bringing the DBO contractor on board. It is pertinent to mention that original PC-I was prepared on the basis of Concept design in which the provision of hiring of consultants was taken for preparation of preliminary design, topographic and geotechnical reports and tender documents and updating the E&S studies. Further, the initial concept level design was prepared by M/s MMP with limited time and scope, after which the need for updating the concept design with redefined scope as per AIIB approved TORs was initiated and an International Project Management Consultant was hired to prepare preliminary design, cost estimates/PC-I with updated scope and bidding documents for hiring of DBO.				Noted
4.	Per liter rate of water treatment may be provided to access project's financial viability.	Detailed E&F Analysis is p of the project. The per liter rate of the v	orovided in PC-I to c vater Treatment is a Original PC-I (Rs/Liter)	theck the financial s follows: Revised PC-I (RS/Liter)	viability	Noted
		CAPEX 02-Yr OPEX CAPEX+OPEX	0.01 0.0076 0.0176	0.03 0.02 0.05		
5.	A single & compressive PMU may be establishment for the instant project and Sewerage System from LARECHS Colony to Gulshan-e-Ravi, as both projects are the part of AIIB Loan.	J Currently preparatory design phase of both projects is underway, wherein as per the Bank/Donor suggestion, key staff of both PMUs is essential for smooth transition from design to execution phase. However, staff of PMU LARECHS has already been hired whereas hiring of key staff of SWTP Project is in progress. Further, AIIB during its Mission in Aug 2024, also emphasized for strengthening of PMU by engaging the full time Project Director and key staff. The serving areas & sites for execution of both the projects are at distant				Submit ted before PDWP
		geospatial locations comp related to surface water	rising entirely different treatment &, water	ent nature of work, supply system wh	with one hile other	

		related to conveyance & disposal of wastewater using micro-tunnelling technology. It would be very difficult to find experts for PMU who have experience of working on both projects. Moreover, multiple activities i.e. review of deliverables, site supervisions of multiple sites at same instant, processing of invoices etc. received periodically from 2 independent PMCs and 3 different Contractor's will become very cumbersome for 1 PMU to manage. Therefore, any delay due to lack of effective command & control due to inadequacy of supervisory staff especially during the execution phase may result in undue claims from EPC and DBO contractors and eventually hamper the overall cost of the projects. Hence in view of above, dedicated PMUs for both projects are inevitable.	
		However, amended structure of the PMU for instant Project of SWTP has been made part of PC-I	
6.	Taxes, duties & other components which are not admissible in foreign component should be bifurcated for their approval from local side.	Since the taxes & duties are already in-built in the quotations from the local vendors/ importers used for the cost estimation by PMC, therefore no bifurcation is required. Moreover, provision regrading PRA Tax has already been bifurcated.	Noted
7.	Domestic and commercial water meters should be deleted from here and WASA should install these meters through their own resources or charge the consumer for that.	The main aim of the project is water conservation, which is possible through metering the water supply. Currently, in the absence of metering, area-wise slab Tariff is applicable to consumers, which does not promote sense for judicious use of water among the consumers. Moreover, Non-Revenue Water through zoning & isolation of serving areas in District Metered Zones (DMZs) and District Metered Areas (DMAs) shall also embark practices for water conservation, for which procurement of about 189,047 residential, 13501 commercials, 111 Bulk meters is inevitable. It will also ensure water availability with adequate pressure by controlling leakages & unauthorized consumption. The estimated cost of these meters is around PKR 4 Billion, which cannot be borne by WASA from own sources. Further, same are inevitable to be installed at time of execution for water Audit and water balance to achieve desired objectives of Zoning/Isolation and formulation of DMAs. Moreover, owing to aforementioned reasons the cost of water meters was also part of the approved PC-I.	Noted
8.	In Build-Operate-Design (BOD) contracts, the rates are fixed, and price escalation costs are not admissible. Thus, the proposed new provision of escalation at 2% is not justified. It should be deleted.	Being the AIIB funded project, AIIB procurement guidelines including FIDIC standard document for EPC works has been used while formulating Tender Documents. As per FIDIC Yellow Book GCC sub-clause 13.7 "Adjustment for Changes in Cost", procedure has been specified in which the price adjustment has to be made due to variation of prices of specified cost elements under Schedule of Cost Indexation keeping in view soaring inflation and abrupt fluctuation in market values of materials. Moreover, as per PEC document Standard Procedure and Formula for Price Adjustment – 2022 dated 27 July 2022, the following is reiterated: "It is not in the best interest of the Employer to ask tenderers to quote firm prices with no provision of adjustments, especially for long-term contracts. In bidding documents having provisions for price adjustment, the Employer is expected to receive more competitive offers from reputable parties and will have to meet the net variations in cost as may actually occur". It is evident from aforementioned guidelines that in order to attract more competitive bids from local and international markets, price adjustments need to be provided.	Price escalati on cost has been rational ized
9.	Provisional sum @ 4.16% on Civil works amounting Rs.1,179 million doesn't seem justified. It should be deleted as cost of all components of the projects has been included.	Since the costing is primarily based on preliminary design and costing based on provision of contractors profit as per locally established MRS System which may not be in accordance with the budgeting requirements of the DBO Contractor who might embed risk costs in the bid owing to the position of international market, therefore, the sponsoring bank opined that the PC-I costing seemed to be on meager side and advised to add provisional sum to ensure that the loan negotiation process is not hampered in case the bid prices received higher than the approved allocated provision. Furthermore, in accordance with Sub Clause 13.4 of FIDIC Yellow Book, Provisional Sums may be required for parts of the Works which are not required to be priced at the risk of the Contractor and all things necessary for the proper design, execution and completion of the Works, the remedying of any defects and the provision has been deleted	Resolve d

10.	Rs. 182 million under the head of site facilities should be removed. This category is not plausible, charges for all PMU, PMC & Contractor are being provided separately.	Temporary site offices are essential for round the clock effective monitoring and supervision of mega scale projects. These offices will be established by the DBO for its supervisory staff as well as for the PMU and PMC. The cost of the same is neither part of the agreement cost of PMC nor part of the PMU cost. Only cost of rental building for office staff has been considered in approved PMU structure and same shall be allowed to be retained in PC-I. However, as per observation of P&D, the provision has been deleted from the PC-I.	Resolv ed
11.	Rs. 8 Billion has been increased in the component to be executed by Irrigation department. In this regard, a detailed justification for the 50 acres of additional land and the impact on local communities should be provided. Further, A thorough cost- benefit analysis of rebuilding versus repairing the syphon, if feasible. Year of construction of syphon & existing condition to be shared.	As per feasibility study conducted by PID in year 2023 under consultancy services of NESPAK- MM Pakistan-BARQAAB JV, it was envisaged from the study that existing syphon constructed in year 1952 has passed its useful life and owing to deteriorated condition of existing syphon and reduction in discharge capacity of same from 5853 cusecs to 4853 cusecs, same requires immediate replacement (Refer updated Feasibility of PID Component attached in PC-I). It has been reviled from site investigation that there are structural distresses, concrete chip off, steel exposure, joint leakages & severe abrasion. Therefore, rehabilitation is no more a feasible option to be considered. Accordingly, during AIIB Mission dated June 2022, it was opined by PID that since existing syphon is no more feasible, entirely new syphon & canal head regulator is mandatory to be constructed at downstream side of existing syphon at an offset of 600ft for which about 50 acres land would be required of entirely New Ravi Syphon. Therefore, the land acquisition was initiated based on land requirements of PID. Updated estimate has been framed by Design Consultants of PID and has been made part of PC-I. Moreover, PID components of Ravi Syphon rehabilitation, intake structure and raw water channel were part of previously approved PC-I. An updated design & cost has been taken in revised PC-I.	Cost rational ized
12.	Proposed the design capacity from 49 MGD to 70 MGD and increase in Length of transmission by 1Km & network by 47Km is not endorsed. Originally approved scope should be uphold in this regard, keeping in view of financial impacts.	The network design has been worked out based on several scenarios, in which one of the scenarios accounts for 70MGD, However, it is to clarify that the Project has been designed based on water production of 54 MGD, hence capacity of treatment plant has been kept same with even reduced Per capita water demand of 30GPCD up to planning horizon of 2050 with serving Population of 1,786,451 (kindly refer to relevant excepts of Design Report attached in PC-I). Hence the capacity of plant is kept same, thus no additional costs is required owing to design capacity. Whereas as per previous Feasibility study, overall evaluated water production was 55 MGD against serving population of 1,481,127 at Per capita water consumption rate of 40 GPCD for planning horizon of 2030. In addition, it is pertinent to mention that E&F analysis as already made part of PC-I has also been prepared while considering planning horizon of 2050. <u>Justification for increase in 1km length of Transmission Main</u> In original PC-I the length of Transmission Main(3.5km) was determined from boundary of Treatment Plant, whereas, in Updated PC-I the Transmission main is considered from Treated water tank 1km within SWTP boundary. <u>Justification for increase in length of Loop Mains, Strategic/Feeding Mains and Distribution Mains:</u> During extensive survey, hydraulic modeling and diagnostic analysis of complaints record from the field staff, it has been estimated by PMC that most of the old pipe laid about 30-40 years ago has passed its design life to meet the water demand of serving areas upto Planning Horizon of 2050, hence requires immediate replacement for which about 181.6 km out of 700 km has been proposed to be replaced and upsized to meet water requirement with terminal pressure of 2 bars. The exact details for pipe replacement will be determined at the time of execution after pressurizing the network. However, the proposed length is backed by pipe conditions which is analyzed through Pipe Inventory and field information.	Noted
13.	It has been narrated in the project's justification that precious ground water source will be conserved with this intervention.	 The instant project of Surface water induction has been framed in light of recommendation of Master Plan 2040. The following impacts are expected with implementation of the project: Reduction in abstraction from ground water: 54MGD Reduction in draw-down of ground water: avg.1m/year Conservation of water due to Installation of water meters: 20% 	Noted

	Anticipated outcomes & impacts may be quantified in this regard. Further, have WASA-L any plans to control ground water withdrawal in the beneficiary area?	In order to avert this situation, phase wise surface water induction was proposed in the Master Plan study upto 1000Cfs for whole Lahore. After the implementation of this project, about 67 Tubewells of area would be ceased in operation. Induction of 54MGD from surface water will reduce same amount of withdrawal from ground water, which will result in providing relief to the ground water to ensure inter-generational equity.	
14.	Before making such a significant investment, the sponsors or executing agency should ensure that the quality of the treated water will be suitable for drinking purposes. A model study should be carried out to assess this. Whether the participation of community has been involved willing of the people to use treated surface water and payment of bills has been ascertained.	Under instant project, it has been ensured to induct water supply conforming to PEQS. Since its DBO based contract, the contractor will be bound to ensure provision of water supply as per required Quality. Further provision of pre and post chlorination has also been ensured for provision of potable water. Hydraulic Model in this regard was also prepared to ensure requisite pressure of 15m at remote ends of network existing in serving zones to avert the complaints relating to water contamination and shortage. WASA carries out water quality monitoring on continuous basis to ensure this. As far as the matter of recovery is concerned, it is to apprise that currently WASA has recovery rate of 90- 95% in the serving areas of Baghbanpura, Mughalpura, Fathegarh and Shadipura. In addition, public consultation survey was conducted by PMC during formulation of E&S studies as per AIIB Environmental and Social Framework.	Noted
15.	It has been observed that the water quality in various tap water systems is often not satisfactory, leading to frequent public complaints. The Executing Agency is requested to provide a detailed explanation of the underlying causes and take necessary measures in the instant project, drawing on past experiences to prevent such issues.	Please refer to response of the Comment No. 14. The existing water supply network is dendritic in nature with no proper zoning/ isolation or existence of DMZs and DMAs, which is therefore resulting in causing inadequate water supply with low pressure and water contamination complaints owing to operation of individual household pumps. Mainly the reason for compromised water quality is low water pressure. However, under this project it has been ensured to supply water with terminal pressure of 15m at customer ends with residual chlorine of 1 ppm at the consumer end as per PEQ standards by splitting of existing network into DMZs/DMAs. These steps will result in supply of water with adequate pressure with minimal chances of contamination upto consumer ends, thereby leading to reduction in complaints relating to water losses and theft.	Noted
17.	Whether NOC has been granted by Irrigation Department? Whether the impacts of withdrawal of water from canal or agriculture has been accounted for.	NOC for provision of 100cfs has been issued by PID vide letter bearing No 280/124-G dated 16.01.2019. The impacts of withdrawal of water from canal have been accounted for as per feasibility study conducted by PID. After implementation of this project, No, shortage of Water on Canal command area would occur owing to withdrawal of 100 cusec water from canal due to reason that instant project also involves construction of New Ravi Syphon, by which design capacity of same would be increased upto 5853 cusec from existing capacity of 4853 cusec which would facilitate in meeting water shortages of canal command area. This increase in capacity of syphon has already been approved in Original PC-1.	Noted
18.	Rationale for selection of site of Ravi Syphon may be given. Further, suitability of site in terms of scalability may be explained.	The site for Ravi Syphon is required for construction of New Syphon structure at 600ft downstream of Existing Syphon Structure as identified by the PID where scalability is not a concern. Whereas, as far as site of SWTP is concerned, it is to pertinent to mention scalability of the water treatment plant is also a major concern of Donor Bank which was highlighted in various missions and was also recommended in previously approved PC-I, subsequent to which land acquisition proceedings were started for acquiring 120 Acres land for both phases of the project.	Noted
19.	Recycling of dirty backwash water & reject water has been proposed in revised scope. The provision may be reviewed, considering the minimal quantity of such water vis-à-vis upfront cost & operational cost of pumping.	The estimated quantity of the backwash water is 5 cusecs out of the 100 cusecs, that is 5 percent water per day and cannot be ignored. Further, water requirement of serving area has been estimated based on available water threshold of 100 cusecs thus any reduced amount other than 100 cusecs would impact the availability of water to the serving areas. NOC for only 100 cusecs water from Irrigation Department has been granted for supply to Phase I of the project. Further, disposal of dirty backwash water back into the canal would also involve higher pumping cost of about 3 km length and increased sizing of raw water pumps therefore, it is not recommended by PMC.	Noted

20.	Dry beds are simple and low cost and preferred in plants with limited budgets or when space is available. Whereas, centrifuges are relatively have high capital & operational costs. These aspects should be considered. Due proposed intervention of tube settlers, required settling area will be reduced. Therefore, size of	Dry beds have only been used for dewatering of collected sludge from treatment plant and no provision of centrifuges has been taken under instant costing Tube Settlers has been considered under instant PC-I to increase efficiency and optimize sizes as compared to the traditional design of sedimentation tanks. Accordingly, optimized size of sedimentation tanks has been worked out by the PMC. In addition, owing to better efficiency	Noted
	sedimentation tanks should be optimized accordingly.	of sedimentation tanks with tube settlers, no provision of primary sedimentation tank has been considered under instant PC-I as proposed earlier in previous PC-I.	
22.	The reasons for revision of the cost of PC-I speak that most of the items were underestimated in the original PC-I and some major items of works were also not included. This raises a question mark on the design and estimation of the original PC-I which requires explanation.	Refer Reply to comment No 12. The original PC-I was based on Concept Design on the basis of MRS 1 st Biannual 2019. Therefore, changes in design & costs were expected as already mentioned in approved PC-I since the detailed design is yet to be carried out. Moreover, the instant PC-I has been based on updated 2 nd Biannual of 2024. Further, beside updated scope, owing to variation in prices of non-schedule items, Cost of new Syphon, updated consultancy Cost of Project Management Consultant and Project Management Unit, the overall cost of project gets increased as compared to previously approved PC-I	Noted
23.	Land acquisition for Ravi Siphon has been delayed. Protracted issues / delays may be justified along with its status.	Ravi syphon was already part of Original approved PC-I, however, rehabilitation cost of same was only considered in it. In order to construct new syphon land measuring about 50 acres would be required. Bifurcation of same is as follows: Notification U/s 4 for land measuring 18.5 acres as required for rehabilitation of syphon was made on 22.06.2020. Addendum in Notification U/4 was issued on 28.06.2021 for 18.5 acres for which Notification U/s 5 was notified on 24.08.2021. During discussions with AIIB Mission dated 22.06.2022, it was decided and opined by PID that existing syphon has passed its useful life, hence entirely new syphon is required to be constructed. Accordingly, land acquisition proceedings for additional land measuring 34.5 acres were started. Notification U/s 4 was issued on 26.08.2022, Owing to non-availability of funds, further land acquisition proceedings get hampered. Section U/s 5 was notified on 27.05.2024 for 34.5 Acres. Award of Land 18.5 acres for syphon was made on 05.12.2024. Moreover, the notification U/s Section 6 for 34.5 acres additional land is in process for which the enquiry report has been marked by Dy. Commissioner Sheikhupura to the Commissioner, Lahore Division.	Noted
24.	ESIA, Land Acquisition and Resettlement Plan (LARP) were earlier reviewed by AIIB in 2023. The Department may submit revised documents including Gender Action Plan and Stakeholders Engagement Plan as per AIIB guidelines and make it part of PC-I.	 Since all these Plan are comprehensive, therefore, Executive Summaries of the following E&S Documents are already made part of PC-I: 1. Resettlement plan (RP) of Surface Water Treatment Plant Component 2. Livelihood Restoration Plan (LRP) of Networks of Surface Water Treatment Plant Component 3. Environmental and Social Impact Studies for the Surface Water Treatment Plant Component and Networks 4. Resettlement Pan (RP) of Syphon Component 5. Environmental and Social Impact Studies of Syphon Component 6. Stakeholders Engagement Plan of SWTP and Networks 7. Gender Action Plan of SWTP and Networks 	Noted
25.	Update on the pre-qualification process and on detailed designs may be provided.	Pre-Qualification Process for the project was initiated after seeking No Objection Letter form the Bank. Nine (09) Applications have been received on 27.11.2024 which are under review by the PMC. Since the instant project is going to be executed on DBO Mode, hence, detailed design will be prepared by DBO before commencement of Execution Phase. Preliminary Evaluation Report has been forwarded to the bank for review on 15.01.2025. Further clarifications have also been sought from bidders.	Noted
В.	Comments of Technical Secti	on, P&D Board	1

26.	The provision of road restoration (Rs. 1207.668M) is to be justified as previously Rs. 50.000M have already been provided in PC-I.	The provision of Road Restoration has been taken as 1% of the work outlay cost as in approved PC-I. Actual restoration will be worked out by the DBO contractor. Keeping in view that about 151.20 km of distribution main, 4.5 km of transmission mains and 30.4 KM of Feeding Mains/Loop Mains have been taken in instant PC-I, the current provision of Road Restoration is justified.	Noted
27.	The LESCO substation provision is to be justified by WAPDA quotations.	The provision has been taken for electrification of SWTP. The cost has been taken from LESCO. However, the quotation has not been provided by LESCO.	Noted
28.	Contingency is to be capped at original approved cost.	Contingency of 2-5% is inevitable to meet unforeseen situation that are expected to be occurred during course of work. Same is also emphasized in B&R Code to meet petty unforeseeable expenditures. However, 2% contingency has been kept in PC-I.	Noted
29.	The inclusion of new scope of work "Transmission & Loop Mains" (Rs.2,819.399M) is to be justified.	Kindly refer to reply at Sr. 12 of UD Wing comments.	Noted
30.	The increase in cost of "Overhead Tank, Pump House and Disinfection room" (2,184.801M) is to be justified.	In updated design, Clear Water Tank size is (132.5 m x 126.2m x 5.5m) with additional pump room of (76 m x 18.04m x 9.87m) as compared to previous size of 82.35mx39.98mx6m is required with 8 hours storage capacity. Further updated design also includes chlorine gas cylinders, neutralization tower in case of gas leak, etc.	Noted
31.	The increase in cost of the provision "Internal Roads, H.T & Transformer Rooms Etc." (996.279M) is to be justified.	Internal Roads, have been proposed under instant project based on update design of consultant for ease of mobility from and to the treatment plant site. The sludge generated from treatment plant will be disposed off to ultimate disposal points through dump trucks using these roads, further, Chemicals and other coagulants will be also be transported to plant using these roads. HT and Transformer rooms will also be necessary for avoiding any incidence of Electric shock or surge to human life, requirement of same has been increased load calculated by consultant as per the updated design	Cost decrea sed by Pre- PDWP after rational izing the road widths
32.	The reason for increase in cost of SCADA instrumentation is to be clearly stated (from Rs.228.870M to 1,726.578M).	In Updated design, PMC has considered Costs of some of the electric components as taken in approved PC-I under head 2.2 (2) "Supplying and Installation of Electrical Equipment etc. "Consultants have considered some of the electrical equipment under head of 2.2 (3) "SCADA and Instrumentation "which resultantly caused decrease in cost of electrical equipment under head 2.2(2) and increase in cost under head 2.2 (3). The overall cost of SCADA and electrical equipment has been increased in revised PC-I. The reason for increase in cost is due to updated Market rates as evident from Quotations attached along with estimate	Noted
33.	The provision of 1% plantation in the work to be executed by Irrigation Department, Government of Punjab is to be deleted.	No provision of plantation has been kept in PC-I for Irrigation component.	Resolv ed
34.	The use of N.S items in the building civil works is to be rationalized.	Instant design and costing are Preliminary in nature for which the detailed design will be prepared by DBO contractor.	Noted
35.	The provision of separate CCTV in each building component is to be rationalized.	The provision of CCTV cameras has been rationalized as per P&D comments. CCTV have been proposed at only Prominent and Critical areas of Plant site.	
36.	The department is to explain why telephone and fire alarm systems have been taken separately for each building.	Each building of plant shall have separate room for operators for monitoring of operations, hence in order to ensure effective communication cum command-and-control nominal provision of telephone system has been considered in estimate, further provision of fire alarm is requisite for ensuring surveillance and effective control of fire of especially electrical and mechanical equipment's during fire outbreaks.	Cost has been rational ized
37.	80 mm Tuff Pavers is to be only used for areas that have heavy traffic (i.e. WASA machinery) only.	The design of carriage way has been revised as per P&D board comments and accordingly the cost has been rationalized.	Noted
С.	Comments of Water Sector, F	P&D Board	

38.	The Sponsor have made the provision of physical contingencies @ 5% which is unjustified. Sponsor may provide the same @ 3% as per Planning Commission Islamabad instructions.	It would be an International bidding / procurement and for unforeseen circumstances 5% provision of contingencies were made.	Contin gency provisi on reduce d / rational ized
39.	Similarly construction supervision charges have been provided @ 5% which are on much higher side. Sponsor may rationalize the same to 3%.	As mentioned above as per AIIB's criteria it would be an International procurement and for the instant case an International Consultant would be highired for Design Review and Construction Supervision therefore, keeping in view the hiring of International Consultants 5% is justified.	Provisi on reduce d / rational ized
40.	Rs. 711.273 Million has been provided for price escalation @ 6.8% of sub total (A+B) which may be deleted from the PC-I as per decisions of P&D Board Punjab.	Agreed	Provisi on reduce d / rational ized
41.	The earth work quantities taken for construction of plug bunds curved portions and common bank are not based on the X- Sections for care and handling of water. Sponsor may draw the proper X-Sections of the aforementioned structures and incorporate the same in the revised PC-I.	These quantities are worked out as per average NSL . In the T.S Estimate proper X- Sections will be drawn and quantities will be taken as per X-Section.	Noted
42.	The quantity of earth work in ordinary soil for embankment upto 5 Km lead for construction of plug bunds, curved portion and common bank has been taken 10692000 cft, while the same quantity has been taken as a item earth work excavation in irrigation channels. Which is a duplicate provision. Sponsor may deleted the same.	Quantity of earth work in ordinary soil for embankment upto 5 Km lead for construction of plug bunds, curved portion and common bank has been taken 10692000 cft with 95 to 100 % compaction. Item No.1.1 is for the construction of coffer dam. After serving the purpose of coffer dam item No.1.2 is provided for its removal & disposal to clear the river bed.	Noted
43.	The depth of stone pitching over 1.0 ft graded bajri has been provided 2.0 ft which is not in practice in irrigation department. Sponsor may provide 1.0 ft thick stone pitching as per departmental practices as it is a temporary structure.	As per IRI, recommendation stone thickness = 2.5ft and spawl = 0.75 (copy attached)	Noted
44.	The quantity of 297000 cft has been taken in respect of dismantling stone or spawl pitching and apron in silted condition which is incorrect. Sponsor may take correct quantity i.e 135000 cft, more over 10% extra has been taken in graded bajri 1/8" to 1/2" and 1/2" to 2" size which is not admissible. Sponsor may correct the same.	Agreed	Noted
45.	Composite items for the serial No. 1.4, 1.5, 1.10 & 1.11 has been taken in the estimate while separate labour rate has also been provided. Sponsor may delete the duplicate items 1.15 to 1.18.	Agreed	Noted

46.	10% extra taken for item No. 2.8, 2.9, 2.10, 2.12, 2.15, 2.17, 2.18 & 2.19 which is not admissible. Sponsor may provide the exact quantities in the PC-I.	Agreed for deletion of factor for 2.8, 2.9, 2.10, 2.11, 2.12, 2.16, 2.17 & 2.19 Except 2.18 where carriage is provided & factors may be corrected.	Noted
47.	The Sponsor have made the provision of 10 Ibs/cft fabrication for RCC work for inlet & outlet structures which is on much higher side. Sponsor may rationalize the same.	Rationalized upto 7.5 lbs / cft	Noted
48.	The provision of uprooting sarkanda growth u/s 295 ft and d/s 326 ft has been taken which is on higher side. Sponsor may rationalize the same as well as deduct voids @ 30%.	Agreed	Noted
49.	The Sponsor have made the provision of pad u/s & d/s of channel along with opening of mouth u/s & d/s for by pass channel but the excavated material has not been reused in the filling of embankment. Sponsor may deduct the quantity of excavation from embankment filling. Similarly compaction may be adjusted.	Agreed with the 50% recouped quantity of earthwork.	Noted
50.	The provision of cement plaster 1/2" ratio 1:6 on bed and 1/2" thick ratio 1:10 on slope has been made by the Sponsor beneath the PCC lining. Sponsor may provide 11/2" thick cement plaster ratio 1:6 under the PCC lining as per criteria approved by the irrigation department.	Agreed	Noted
51.	Similarly thickness of cement concrete lining has been provided 0.25 ft which may also be replaced to 0.33 ft as per approved criteria by the Irrigation Department.	Agreed	Noted
52.	The thickness of brick pavement has been provided 0.25 ft while it may also be 0.375 ft as per usual practice.	Agreed	Noted
53.	The Sponsor have made provision of extra 10% on all items which is not practiced in the department. It may be deleted from the PC-I.	Agreed except for the items of carriage of stone or boulders.	Noted
54.	Voids @ 30% may be deducted from the quantity of uprooting sarkanda growth.	Agreed	Noted

55.Thickness of stone pitching may be rationalized from 2.0 ft to 1.0 ft as per Irrigation Department practice.As per (copy a	IRI, recommendation stone thickness = 2.5ft and spawl = 0.75 ttached)	Noted
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SN				REPLY	Remar
	PAGE	CAPTION	COMMENTS		ks of Pre- PDWP
В.	Comm	ents of Cons	sultant (SI), P&D Board		TEM
Α	Design	& Drawing	S		
1		Raw Water main	The route of the raw water main shown at page-2 is not located along any beaten track or road. It will require acquisition of land and construction of track requiring lot of investment. Instead of this route the Bhaini road route can be adopted which will be 4.5 km long as mentioned in the revised PC-I.	Land for the raw water channel has already been acquired as per recommendation of consultant in previously approved PC-I. Based on the new design where the raw water channel is converted form open channel to closed pipes, a service track is proposed above the buried pipes. The raw water main is running by gravity based on the design water levels in the BRBD canal. Increasing the length of raw water pipes with Bends will increase the cost and will also lead to having deeper structures at the SWTP site (more head losses) that will also require increasing the head of raw water pump station and increased Pumping cost for whole lifecycle of Project. The raw water pipes are designed for the ultimate capacity of SWTP (108MGD) as 4 x 1600 MM HDPE Pipes in addition to 2x 400mm HDPE drainage force mains. However, under instant PC-I, costing of 2x1600 MM HDPE Pipes and 1x 400 MM HDPE force main has only been considered. Raw water through Bhaini Road was not a feasible option as Raw water channel was proposed earlier based on which land acquisition for raw water has already been completed. The available Right of Way (ROW) of 6-7 ft on each side is insufficient for laying of 4x1600MM HDPE Pipes for forcemain, for which land acquisition would be inevitable during installation of these. Considering that the final destination is to transfer water from BRBD to the four service areas, the most efficient design it to consider the location of SWTP as close as possible to the water source to reduce the length of the raw water conveyance. As such, the corridor of the raw water channel is acquired as a straight line from BRBD	Noted
2	-	Coordinates in drawings	The coordinates of the SWTP shown in the PC-I at page-2 are correct but those shown on other drawings are totally incorrect.	The difference in coordinates is owing to different georeferenced system used in respective set of drawings. However, the same coordinate system will be used in PC-I.	Noted
3	2	Location of SWTP	The location described in the Feasibility Report is near village Bhaini whereas on page-2 it is not like that. It needs justification.	The Feasibility Report attached is for original PC-I, however, as per updated report, Surface Water Treatment plant is proposed to be constructed near Bhaini Road as per the Location plan attached at Page No 2. The proposed SWTP will cover two villages: most of it will be situated in village Ganja Sindhu, while an Intake Channel will pass through three villages - Ganja Sindhu, Jandiala and Bhaseen. Updated Feasibility Study/ design report excerpts will be made part of Revised PC-I.	Noted

COMMENTS OF KPMG/ SNG :

FINANCIAL APPRAISAL

SR.	OBSERVATIONS	REPLY	Remarks
NO.			

4	-	DRG-TR 301, 302 & 303	 All roads except the entrance road up to 1st junction and parking lots should have maximum 18 feet metalled width 	 Agreed, necessary changes have been made in the Design & PC-I. 	Noted
			 All road should have camber on one side and only one side drain. 	2) Agreed, necessary changes have been made in the Design & PC-I.	
			 The top slab on the drain is missing in all sections of the roads. 	3) Agreed, the drain is proposed with perforated concrete top slab.	
			 Foot path should be on one side and only at required locations and not along every road. 	 The right of way is required for utilities on both side of road. All roads should be provided with foot path to allow for ease of access of maintenance staff. Layout plans for potable water network indicate the roade where patable water network is required. The 	
			 Water supply, sewer, electric line and ICT line will run along only those roads where these are required and not 	network coverage is required for the whole site to serve fire hydrants. ICT lines are indicated in layout plan drawings where required as well.6) The design has changed and the drain top cover is	
			 along every road. 6) Why compacted earth on the top slab of drain under the footnath has been provided. 	 perforated concrete cover. 7) The design has changed and the drain top cover is perforated concrete cover. 8) The roads required to provide access to surrounding. 	
			 Totput has been provided. It should be deleted. Granular sub base is not required on foot path over the RCC top slab of drain and 	land are outside the site fence and have the same level as surrounding land. On the other side, the SWTP site can be graded for drainage purposes. The fence will follow the level of the site and any cross	
			 should be deleted. 8) If the road is to run along boundary, there should be no earth slope on the fence side. 	9) The fence is proposed to be at a distance from the boundary wall of the SWTP as per recommendations of the Bank to account for issues of severance of land.	
			 The fence should be along the boundary of the land for SWTP and no distance should be left between the boundary line and the fence, 		
5	-	DRG SD- 501	Storm drains are being provided 7 along all the roads. Vertical water to entrance gratings at adequate 0 distance should be provided in the these drains and the main drain • should carry storm water to the discharge point. No side ditch & top grating should be provided. The storm pipes should also be deleted.	 The proposed system consists of grated ditch has better efficiency and requires less regular maintenance. On the other hand, adopting vertical curb inlets will have the following drawbacks: High clogging probability Low collection efficiency specially for areas with high rainfall rate like the project location. As per pre PDWP comments, Storm drainage system is changed to box drain along one side of the road. The top of ditch will be perforated concrete slab. 	Noted
6	-	DRG SD- 502	This drawings is not required as F only side drains with vertical gratings at adequate distance should be provided.	Reply same as that of Sr No.5	Noted
7	-	DRG SD- 503	Drains should be provided instead F of pipes.	Reply same as that of Sr No.5	Noted
8	-	DRG GW- 501	The need of sub surface drainage F should be clearly explained	Reply same as that of Sr No.5	Noted
9	-	DRG PW- 100	PN-8 pressure rating will be A adequate for firefighting and potable water supply and should be accordingly provided.	Agreed, necessary changes will be made in the PC-I.	Resolve d
10	-	DRG WE- 102	The pressure rating of all pipes is T missing.	The required information is added to the process drawing of design report	Noted
11	-	DRG WE- 300	Raw water pumping station has been provided in all connected v drawings but it is missing from the F flow diagram given in this drawing	The diagram is intended to show the treatment process which starts from the distribution chamber. Raw Water Pumping Station will be added to the flow diagram.	Noted

				Instant drawing is more related to process of proposed Surface Water Treatment Plant. Separate dedicated drawing WE-304 for Raw Water Pumping Station has already been made part of Drawings of design report	
12	-	DRG WE- 303 ST-303	1) The pump house is in the underground. Where from the approach to this pump house has been given, is not clear from these drawings.	 Access to the pump house will be provided from Top. Details will be provided in the detailed design stage. 	Noted
			 Some silt may settle in the raw water tank especially when the water carries more silt in the rainy season. The arrangements for desilting of this tank are missing. 	2) Course as well as fine rotating screens are located at the intake from BRBD canals. In addition, the raw water tank is accessible from Top and provision has been made to empty the tank and also raw water pipe using the raw water pumps back to BRBD for maintenance and desilting as needed.	
13	-	DRG ST-305	The tank is circular and hence the wall thickness of 600 mm is excessive and should be reduced.	In reference to ACI 224 for control of cracking in concrete structure and to limit the crack width in water retaining structure as per code, we can only achieve by increasing the steel quantity or by increasing the concrete section. Here we used lesser steel and thick concrete section to fulfill the crack limits as per ACI 224 code. This will reduce the cost of the project. Also, at preliminary design stage we kept a cushion which will be economized in detailed design through precise calculations. However, the width/wall thickness has be reduced to 500mm as per observations of P&D.	Noted
14	-	DRG ST-308	The thickness of floor (600 mm) is excessive and should be reduced.	Reply same as that of Sr No. 13	Noted
15	-	DRG ST- 315, 315-A, 322, 324	The side wall thickness of the tanks (600mm) seems to be higher and should be reduced.	Reply same as that of Sr No. 13	Noted
16	-	DRG ST-330	The floor thickness of the sludge drying beds to too much and should be reduced.	Reply same as that of Sr No. 13	Noted
17	-	DRG EI-201, 202 & 203	 The poles inter distance has nowhere been mentioned. Extensive Street light has been provided but no light has been provided near and for important installations and structures. The number of lights in lesser activity zones should be reduced to minimum to reduce capital as well as Q&M cost. 	 Drawing has been updated to include the poles Drawing has been updated. Agreed. 	Noted
18	-	DRG El-629, 630 & 631	Excessive Nos of CCTV cameras have been proposed along the boundary fence which is already electrified. Hence these cameras should be deleted and cameras should be proposed only at those places where surveillance is required for the activities going on for the operation of the plant and where excessive watch and ward is required,	The project area is surrounded by open fields with low density population, hence surveillance through cameras along the boundary of treatment plant would be inevitable. Further Instant Design is preliminary in nature typically illustrating the requirements of Surveillance like CCTV Cameras etc. Detailed design of treatment plant including allied accessories will be prepared by DBO Contractor. The CCTV design was originally based on covering the boundary fence (~ 3 km in length) with surveillance cameras spaced approximately 75 meters apart to ensure proper monitoring and security of the project, as requested during the initial design phase. While the electrified fence adds an additional layer of security, it is not intended to replace the need for all cameras. Therefore, it is highly recommended to retain at least the PTZ cameras at the corners of the fence, as well as at the entry gate area, to effectively mitigate potential risks. The drawing has been updated accordingly.	Number of CCTV reduced
19	-	DRG-PL-912 (a&b)	 Excessive office space has been provided in the office building for operation of the plant which should be rationalized. 	Instant Design is preliminary in nature, hence all typical details preliminary in nature but essential have been provided/made part of design. However, detailed requirements would be assessed by DBO during preparation of detailed design.	Covered areas reduced / rationali zed by

			2)	Lockers and bath for the workers proposed on the	The minimum estimated staff as follows is required to operate the SWTP is as follows:	Pre- PDWP
				ground floor are enough and	Plant Manager, Deputy Director 1	
				be deleted.	Assistant Director Process 1	
					Assistant Director Maintenance 1	
					Sub Engineer Civil / Mechanical /	
					Elec. 8	
					Operators 5	
					Lab Technician 6	
					Accountant and account assistant 6	
					Electrician 1	
					Electrician Assistance 2	
					Mechanic 1	
					Mechanic Assistance 2	
					Instrument technician 1	
					Naib Qasid 6	
					Security Guard 6	
					Store Keeper 1	
					Drivers 2	
					Labour (Skilled, Unskilled) 24	
					However, it is to highlight that most of this staff will be deputed from in-house WASA Labore HR Limited	
					budget has been allocated from budget for HR	
					However, there will be requirement for occupancy of the	2
20	682 &	Raw water	1)	It is mentioned in the	 It is to apprise that as per updated design by PMC 	Noted
	370	channel and	,	Feasibility Report on page-682	Raw water channel is no more a feasible option	
		raw water mains		that a raw water channel will be taken off from BRBD link	for conveyance of raw water from BRBD to SWTF	•
				canal at RD 315+310 by	Site. Raw water channel would be of 3 km length (2	2
				construction of head	HDPE Pipes of 1600mm) PN-6. The instant	
				channel will be 3.0 Km.	Irrigation Department, however, now would be	
					carried out by WASA. Same details would be added	
					2) The plan/ sketch of Raw water channel would be	2
					made part of PC-I	
			2)	No route, plan, sketch or		
			,	drawings to show the location		
				and structure of these	 Length of raw water channel is about 3km from BRBD to SWTP site. Two HDPE Pipes of (1600mm) 	
				included anywhere in the	diameter each are required for transmission of	
			2)	Feasibility Report or PC-I.	100cfs of water. The raw water conveyer is	5
			3)	On the other hand, 2 Nos HDPE pipes of 1600 mm	2xDN1600 HDPE pipes per phase.	
				diameter PN-6 and a length of	4) The diameter of this pipe is 400mm (HDPE Pipe PN-	
				11,483 Rft each have been	10 SDR 17) Length of 3km (approx.). The purpose	
				cost estimate which is not	storm water runoff of plant site back to BRBD Canal	
				understood.	5) Route and longitudinal plan of Raw Water Pipe wil	
			4)	Further another nine of the	be made part of PC-I	
			''	unknown diameter with the		
				same length has also been		
				on page-370 which is not		
				understood.		
			5)	No location plan route and		
			5)	longitudinal plan of the raw		
				water mains has been		
				Feasibility Report.		
			L			

21	-	Terminal	The terminal pressures at the	Noted. Same has been made part of PC-I	Noted
		pressures	pump delivery in the SWTP and all		
			nodes of the strategic and feeder		
			mains should be shown on A-3		
P			Cost Estimates Package-II		
22	77	Project	Tremendous increase in cost of this	As per original approved PC-I 206.18 MPKR was	Noted
		Managemen t Cost	sub head has been observed from Rs 206.18 million to Rs 1165.998 million which needs justification and rationalization.	approved against for Project Management Consultancy. However, the lowest financial bid received was USD 2,388,705.11+ PKR 259,179,308 (exclusive of taxes). Principal approval to award the consultancy work at increased cost was accorded in the 4th Project Steering Committee meeting held on 28.09.2022 in P&D Department. The amount inclusive of Taxes and CPI Index Cost is 1,165.998 MPKR with SBP current exchange rate.	
23	79,	Item-1.2	1) Transportation of excavated	1) As per the Soil investigation encountered from	Transpo
	92, 107, 120, 135, 157, 249, 254, 283, 316, and all other relate d pages		earth has been proposed to be disposed-off at 10 km distance. This earth should be used for filling under roads, as sweet earth and be spread in the premises of the SWTP to raise its level above the NSL. The cost of lead up to 10 km should be deleted and its re- handling along with compaction under roads should be added	 borehole logs at project site, the general stratigraphy is 'silty clay' which cannot be generally used for filling except for limited landscape areas (softscape). Further trenches of all process pipes should be filled with well graded sand. Hence, owing to limited use of Excavated soil about sixty percent of same has been considered for rehandling, whereas, thirty percent of same has been used for Transportation and ten percent as wastage. Exact quantities will be worked out during detailed design stage. 2) Correction have been made in the light of reply at Sr. no 1. 	rtation of earth work reduced for use on site
24	82,	Item-1.5	 This item has been used in many other subheads which should be modified as proposed. The correction should be made on all pages containing such item for all subheads. The meaning of ib is not 	1) 'ib' is typo error. It may be read as 'lb' (Pound).	Noted
	96, 110, 124, 138, 146, 160, 176, 194, 214, 237, 251, 258, 282, 292, 303, 319. 330	and similar items in the entire cost estimate	 understood. 2) The steel quantity in RCC should not exceed 5.5 lbs per cubic foot depending upon the type of RCC component (foundation, columns and beams etc). The calculations in these item show a steel quantity of 195.5 lbs per cubic meter which seems to be OK but the quantities of steel have been shown in Kgs instead of lbs and the rate of steel has also been used per Kg. 3) The mistake should be corrected in all subheads on all 	 However, now metric system has been used for all quantities. 2) As discussed with Consultant SI, Steel quantity of 144.21 kg/m³ has been used for costing. 3) Correction have been made in the light of reply at Sr. no 2. 	
			the pages wherever the steel		
25	All	Quantities	At some pages the metric system	Metric system has been used for all quantities.	Noted
	pages	of works	and at other pages imperial system of measurement has been used. Only one system should be used for all subheads and in the entire cost estimate.		
26	-	Design of	All the RCC structures in the project	At Preliminary design stage, the design approach is to	Noted
		the RCC structures	seem to be hefty and over designed. Preliminary & economical design of these structures should be carried out and then included in the PC-I.	reduce the amount of steel by increasing thickness of the sections in order to curtail the overall project cost. Reducing the concrete thickness will increase the steel requirement. However, the wall thickness of hydraulic structures has been reduced to 500mm as per observations of P&D.	

27	80, 94, 108, 122, 136, 143	Item 1.10	 The life of epoxy coating is only 10 years and after that it will start peeling off and contaminating the water. The item should be deleted. 	 The provision of epoxy coating has been deleted as per comments of P&D. 	Noted
	158, 191, 250, 255,		 The walls of the tanks have sufficient width to resist the seepage / leakage if properly constructed and as such do not qualify the application of this coating. 	2) Kindly refer to reply of Sr. 26. Further provision of internal coating has been deleted, only membrane protection has been considered for substructures for protection against seepage owing to perched or sub soil water which is likely possible.	
28	-	Non MRS items	Rate analysis for all non-MRS items should be included in the cost estimate	Rate analysis and quotations are included in PC-I.	Noted
29	85	Item-2.14	120 Watts LED Street lights should be used instead of 150 watts.	Costing of 120-watt LED street lights have been used in estimate.	Noted
30	105	Item-5.1	The rate of submersible pumping unit is excessive and should be rationalized.	The rate of submersible pumps has been used as per the quotations obtained from the different vendors of market	Noted
31	121, 172, 189, 208, 233, 298, 325,	Weather Shield	All exposed surfaces of brick masonry should be struck pointed and not plastered in view of shorter life and greater maintenance cost of the plastered surfaces. This item should be deleted from all subheads of the project.	As per Pre PDWP comments, provision of Weather shield has been removed and struck pointing has been used on all exposed surfaces where Brick masonry has been used.	Noted
32	203, 266 and other relate d pages	DI pipes	HDPE pipes of 1200 mm diameter and below are manufactured in Pakistan and may be cheaper than the imported DI pipes which should be considered for use in the project. On this page 62 mm and 32 mm DI pipes have been proposed to be installed. All such pipes should be HDPE pipes indigenously manufactured.	62mm & 32mm DI Pipes will be required for suction and delivery pipes of pumps as per manufactures recommendations, where HDPE pipes cannot be used. Elsewhere, HDPE pipes are used for pipes under 1500mmm for Water supply loop mains and Distribution Network.	Noted
33	220	Gate valves	The rates of gate valves are excessive and should be rationalized.	Rates of gates valves have been taken from the vendor for which the Quotation is attached	Noted
34	268	Item-1.5	The earth excavated from the structures of SWTP should be used and should not be imported from 25km. As such this items should be deleted.	The earth excavated from the Structures of SWTP would be rehandled as much as possible for which provision of about 60% has been considered for backfilling and rest of 30% has been considered for transportation by considering 10% of some excavated soil as wastage during rehandling operation. Further, it is pertinent to mention that all of the excavated soil can't be used as backfilled material since as per soil investigation report, it has been envisaged that most of sub-soil in shallow depth is silty clay which cannot be used as backfill- material being poorly graded soil, however, instant item has been deleted as per P&D comment.	Noted
35	269	Item-1.16	The original soil of this area is quite fertile and is growing all types of grass in fields. Hence this item should be deleted.	Agreed. Item has been deleted	Noted
36	299	Item-1.29	False sealing is not required in any portion of the plant and should be deleted.	False ceiling is only provided in Office building, hence as discussed it is recommended that provision of same may be retained.	Noted
37	349	Item-3.8	 The reason for use of MS pipes in the transmission main should be explained especially when 1600 mm HDPE pipe has been proposed to be used in the raw water transmission main. 	 It is to apprise that the Pressurized HDPE Pipe of bigger diameter are not being manufactured locally, hence, these can be only used for non- pressurized operations like in case of transmission of raw water through BRBD Canal, for which HDPE Pipes PN6 having 1600mm size has been proposed. Further, it is pertinent to mention that Cost of Pressurized HDPE imported pipes for bigger 	Noted

			 MS pipes have shorter life than HDPE and DI pipes especially when buried in the ground. HDPE imported pipes or DI pipes should be considered for this main. When 1600 mm HDPE pipe is available then 1500mm should also be available. As regards 1800 mm MS pipe, If HDPE or DI pipe of this size is not manufactured 	 diameters like 1500mm and above is more than MS pipes, hence, MS pipes have been proposed for diameter more than 1600mm. 2) MS pipes with Epoxy coating and cathodic protection have been used for Transmission and Feeding Mains in order to ensure its continued operation upto design life of project. Further, Cost of MS pipe is lesser as compared to imported HDPE and DI pipes thus it is more preferrable option to use MS pipe instead of HDPE or DI pipes for high pressure bigger dia pipes. 3) 1500mm HDPE pressure pipe is not available locally. HDPE pipes have been proposed based on the approved material selection study (part of the previous version of PC-I) except for cases where the required diameter is not available, MS pipes are used. Using imported HDPE pipes for larger diameters (PN10) is not recommended as it will be more expensive than MS 	
			 worldwide then protection measures of MS pipes should be proposed as under: a) Cathode protection should be provided. b) Hot bitumen in three layers should be applied on these pipes and wrapped with double layer of thick polythene sheet. Necessary provision should be made in the PC- I. 	 pipes and will also cause problems for maintenance and repairs. Ductile Iron Pipes will also require the construction of thrust blocks which be very difficult considering the space availability. 4) Cathodic protection and pipe coating is already considered in the design. Quotation for Pipe including cathodic protection and pipe coating is attached in PC-I. 	
38	360	Item-3.1, 3.2 3.3 & 3.4	Installation of ball float valves is not the responsibility of WASA and should be installed by the private consumers. The item should be deleted	Instant Provision is necessary for ensuring control on water losses and maintaining water pressure. It is necessary for getting desired project objectives. The upfront cost of which would not be borne by consumer. Public awareness regarding the necessity of such item would be carried out.	Noted
39	361	Item-2.19	The consumer service connections are the responsibility of the consumers and should be deleted from here.	Instant Project involves replacement of about 181.6 km out of 700 km has been proposed to be replaced and upsized to meet water requirement with terminal pressure of 2 bars. Hence its necessary that all house connections be shifted to new distribution lines from the previously replaced/augmented lines and which cannot be borne by consumers being new connection for meeting the desired project objectives.	Noted
40	369	Item-1.1	Excavation for building is not applicable for water supply pipelines. Correct item should be used.	Necessary corrections have been made	Noted
41	369	Item-1.3	Borrow pit excavation has been included at this page? Where this earth will be used, should be explained.	Necessary corrections have been made	Noted
42	370	Item-2.2	The size of this pipe is not readable and further where this pipe will be used?	Necessary corrections have been made	Noted
43	370	Item-2.4	Where this sub base will be used should be indicated.	Necessary corrections have been made	Noted
44	369 & 370	Back-up quantities	The back-up quantities for items shown at page-369 & 370 are missing.	It will be carried out during detailed design stage.	Noted
С		Cost Estima	tes Package-I		
45	372	Abstract of cost		 Being the AIIB funded project, AIIB procurement guidelines including FIDIC standard document for EPC works has been used while formulating Tender 	Noted

			 The price escalation of 6.18% per annum should be deleted. 	Documents. As per FIDIC Yellow Book GCC sub- clause 13.7 "Adjustment for Changes in Cost", procedure has been specified in which the price adjustment has to be made due to variation of prices of specified cost elements under Schedule of Cost Indexation keeping in view soaring inflation and abrupt fluctuation in market values of materials. Moreover, as per PEC document Standard Procedure and Formula for Price Adjustment – 2022 dated 27 July 2022, the following is reiterated: "It is not in the best interest of the Employer to ask tenderers to quote firm prices with no provision of adjustments, especially for long-term contracts. In bidding documents having provisions for price adjustment, the Employer is expected to receive more competitive offers from reputable parties and will have to meet the net variations in cost as may actually occur". It is evident from aforementioned guidelines that in order to attract more competitive bids from local and international markets, price adjustments need to be provided. However, as per Pre PDWP comments, provision of Escalation has been rationalized	
D	Pr		 The percentage cost increases due to additional scope of work and due to price escalation should be worked out separately. 		
D	PC	J-1 Droiset	A transportation in success to the second	As not original answered DCT 200 to MDVD	Noted
4/	13	Managemen t Consultancy & PMU cost	A tremendous increase in the cost of Project Management Consultancy (PMC) has been observed from Rs 206.18 million to Rs 1165.998 million which is 5.65 times the original cost. This huge increase needs justification and cost rationalization.	As per original approved PC-I, 206.18 MPKR was approved against for Project Management Consultancy. However, the lowest financial bid received was USD 2,388,705.11+ PKR 259,179,308 (exclusive of taxes). Principal approval to award the consultancy work at increased cost was accorded in the 4th Project Steering Committee meeting held on 28.09.2022 in P&D Department. The amount inclusive of Taxes and CPI Index Cost is 1,165.998 MPKR with SBP current exchange rate.	Noted
49	20	E&S Cost	No cost for this purpose was provided in such a mega project in the original PC-I whereas Rs 1062.48 million has now been provided in the revised PC-I. The reason for its non-provision in the original PC-I should be elaborated.	E&S Cost has been worked out to ensure compliance of E&S safeguard as per Bank policy. The same has been endorsed by the PSC. Details have already been provided in PC-I.	Noted
50	38	Capital cost	The capital cost of the project on the tile page and in the comparative statement is Rs 54,138.473 million whereas in the economic analysis on this page the total Capex works out to be Rs 49,365 million. Similar is the case on all other pages pertaining to Economic Analysis.	Updated cost as rationalized in light of P&D comments will be used for Economic Analysis.	Noted
51	38	Benefits from the project	The project will be completed in 2026-27 as mentioned at page-14 and will be commissioned in 2027-28. How the benefits will be accrued in the year 2025 to 2027, should be elaborated and corrected.	Since the DBO Contractor shall be replacing the pipelines and install water meters to prepare District metered areas & Zones from start of the construction phase for the most vulnerable areas rather than waiting till completion of SWTP, therefore, benefits of the project start to incur from start of the construction phase. Details are mentioned in Section of E&F analysis of Amended PC-I.	Noted
52	77	O&M cost during construction	When the 2 years O&M cost has been included then the O&M cost during construction should be deleted.	Since the DBO Contractor shall be replacing the pipelines from start of the project for the most vulnerable areas rather than waiting till completion of SWTP, therefore,	Noted

				O&M cost during construction is required. Details are mentioned in Section of F&F analysis of Amended PC-I.
53	77	Leakage detection equipment	The cost has been increased to Rs 225.00 million from Rs 150 million in the revised PC-I and no breakup has been provided. The cost is very excessive, should be reduced and break-up included in the PC-I.	Instant project involves distribution of project zones into DMAs which includes reduction of non-revenue water (NRW) by installation of Bulk and Consumer meters, hence, provision of Leak Detection equipment is inevitable for meeting the desired objectives
54	77	Addition in scope of work	break-up included in the PC-I. The following new scope has been added in the revised PC-I which was not included in the original PC-I; 1) Raw water transmission pipe line 2) Parshall flume and inlet works. 3) Recycled water and sludge tank 4) Rehabilitation of existing tubewells 5) Site facilities 6) Solarization 7) E&S cost 8) O&M during construction. The non-inclusion of these components in the original PC-I but	 Raw water Channel is not recommended by the PMC as pipeline can serve the purpose in a more efficient way while avoiding matters of severance of land and water theft. Parshall Flume & inlet works are required for better hydraulic model of the treatment plant and for mixing of the chemical required for coagulation & flocculation at subsequent stages of the plant. Recycling Water will help reduce water losses. Whereas sludge tank will be required to collect the separated sludge from sedimentation/clarifier tanks. Provision of rehabilitation is required as the 67 tubewells will be required to be operated during the canal closure period for 21 days. In order to keep the tubewells in working condition, rehabilitation of tubewell is required. Site facilities are temporary facilities which are required for provision at each construction site to ensure supervision. However, provision of same has been deleted as per P&D comments. Solarization is required to shift reliance towards renewable green energy resource. E&S Cost has been worked out to ensure compliance of E&S safeguard as per Bank policy. The same has been endorsed by the PSC. Since the DBO Contractor shall be replacing the pipelines from start of the project for the most vulnerable areas rather than waiting till completion of SWTP, therefore, O&M cost during construction is required.
	-	_	their addition in the revised PC-I should be explained.	
		Issue/Gap Increase in @ 4.16%	1: Significant Since the cost n Provisional sum costing based established MR budgeting requ risk costs in th therefore, the s to be on meage that the loan n prices received Furthermore, in Book, Provision which are not n all things neces all things neces	Ing is primarily based on preliminary design and on provision of contractors profit as per locally S System which may not be in accordance with the irrements of the DBO Contractor who might embed e bid owing to the position of international market, ponsoring bank opined that the PC-I costing seemed er side and advised to add provisional sum to ensure negotiation process is not hampered in case the bid higher than the approved allocated provision. In accordance with Sub Clause 13.4 of FIDIC Yellow hal Sums may be required for parts of the Works equired to be priced at the risk of the Contractor and sary for the proper design, execution and completion

		of the Works, the remedying of any defects and the provision of the Operation Service.	
		However, as per Pre PDWP comments, provision has been deleted .	
2.	Issue/Gap 2: Price Escalation / Inflation Charges	Being the AIIB funded project, AIIB procurement guidelines including FIDIC standard document for EPC works has been used while formulating Tender Documents. As per FIDIC Yellow Book GCC sub-clause 13.7 "Adjustment for Changes in Cost", procedure has been specified in which the price adjustment has to be made due to variation of prices of specified cost elements under Schedule of Cost Indexation keeping in view soaring inflation and abrupt fluctuation in market values of materials. Moreover, as per PEC document Standard Procedure and Formula for Price Adjustment – 2022 dated 27 July 2022, the following is reiterated: "It is not in the best interest of the Employer to ask tenderers to quote firm prices with no provision of adjustments, especially for long-term contracts. In bidding documents having provisions for price adjustment, the Employer is expected to receive more competitive offers from reputable parties and will have to meet the net variations in cost as may actually occur". It is evident from aforementioned guidelines that in order to attract more competitive bids from local and international markets, price adjustments need to be provided	Noted
3.	Issue/Gap 3: Unnecessary O&M Cost in Construction Phase	Since the DBO Contractor shall be replacing the pipelines from start of the project for the most vulnerable areas rather than waiting till completion of SWTP, therefore, O&M cost during construction is required.	Noted
4.	Issue/Gap 4: Increase in Project Management Cost	As per original approved PC-I, 206.18 MPKR was approved against for Project Management Consultancy. However, the lowest financial bid received was USD 2,388,705.11+ PKR 259,179,308 (exclusive of taxes). Principal approval to award the consultancy work at increased cost was accorded in the 4th Project Steering Committee meeting held on 28.09.2022 in P&D Department. The amount inclusive of Taxes and CPI Index Cost is 1,165.998 MPKR with SBP current exchange rate.	Noted
5.	Issue/Gap 5: Lack of Revised Landscaping Plan for Plantation	Rs. 10 million has been kept as per originally approved PC-I for land scaping/plantation.	Land scaping plan will be developed at detailed design stage.
6.	Issue/Gap 6: Non-MRS Rates	Quotations and rate analysis for Non MRS items have already been made part of PC-I	Noted
7.	Issue/Gap 7: Outdated Quotations	Updated Quotations have been used for formulation of Non MRS rates	Noted
8.	Issue/Gap 08: Discount Rate	Discount Rate of 12% has been used for Economic and Financial Analysis of project in line with originally approved PC-I	

ECONOMIC APPRAISAL

Sr. N	OBSERVATIONS	REPLY	Remarks
1.	Issue/Gap 09: Unclear Quantification of Economic Benefits	 Many benefits including tangible and intangible benefits are associated with project including benefits relating to health like: i) Reduction of mortality rate owing to provision of clean water. ii) Non operation of house hold pumps owing to supply of water with adequate pressure from surface water source Detailed breakup of 2161 MPKR has been made part of PC-I 	Economic/Financial Analysis of component of Ravi sipher will be made part of PC-I along with detailed breakup.

2.	Issue/Gap 10: Inadequate Baseline Data and unsupported Assumptions in Assessment of Waterborne Disease Impact	The mortality rates referenced in the analysis were derived from the World Bank Mortality Rate indicator (refer <i>World Bank General Data portal regarding Mortality rate</i>) To adopt a conservative approach and ensure that estimated cost savings are not overstated, only 50% of the reported mortality rate was considered for this analysis. The 10% increase applied in the calculations aligns with the average inflation rate observed over the past 10 years, ensuring that the figures are adjusted for inflationary trends and reflect realistic estimates. The prevalence of diarrhea was referenced from the Demographic and Health Survey (DHS) , as conducting field visits was beyond the scope of this consultancy. The DHS is a reliable and widely accepted source for such data. The referenced publication is "2017-18 Demographic and Health Survey by the National Institute of Ponvlation Studies (NIPE)"	Base line data on waterborne diseases of the specific target area will be made part of PC-I.
3.	Issue/Gap 11: Standardized Assumptions and Methodology to Calculate CBA	Standardized assumptions have been used for assessment of CBA e.g., <i>World Bank Mortality Rate indicator</i> for assessing mortality, and 2017-18 Pakistan Demographic and Health Survey (PDHS) by the National Institute of Population Studies (NIPS). Further WASA Lahore is responsible for operation and maintenance of water supply infrastructure existing in these areas, hence information regarding household pumps including pumping hours was taken from WASA field staff.	Noted

RISK MANAGEMENT

Sr. No	OBSERVATIONS	REPLY	Remarks
1.	Issue/Gap 12: Contingency Fund Allocation	Contingency provision is essential for meeting the petty expenditures expected to be incurred for meeting the unforeseen situations of project and same is in-lined with original approved PC-I and B&R code	Noted
2.	Issue/Gap 13: Justification of the Contingency and Escalation Fund	Refer reply to Sr No.1 above, further provision of escalation has been deleted based on comments of P&D department	Noted
3.	Issue/Gap 14: Risk Monitoring and Review Mechanism	Risk Mitigation Matrix is already part of submitted PC-I.	Noted

ENVIRONMENTAL ANALYSIS

Sr.	OBSERVATIONS	REPLY	Remarks
No.			
1.	Gap 1: Missing EIA report The project falls under the Schedule II of Punjab Review of IEE/EIA Regulations 2022. EIA is mandatory requirement and as per Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework (ESF), the Environmental and Social Impact Assessment (ESIA) report for the PC-1 must be prepared. It is mentioned in PC-1 that the ESIA report has been already prepared and the Government of the Punjab, Environmental Protection Agency (EPA) has already accorded approval to the ESIA report is not attached to the PC-1 only the executive summary is given.	 Executive Summaries of the following E&S Documents are already made part of PC-I: 1. Resettlement plan (RP) of Surface Water Treatment Plant Component 2. Livelihood Restoration Plan (LRP) of Networks of Surface Water Treatment Plant Component 3. Environmental and Social Impact Studies for the Surface Water Treatment Plant Component and Networks 4. Resettlement Pan (RP) of Syphon Component 5. Environmental and Social Impact Studies of Syphon Component 6. Stakeholders Engagement Plan of SWTP and Networks 7. Gender Action Plan of SWTP and Networks Further, E&S documents were also emailed to KPMG vide email dated 18.12.24 	Project to be considered subject to provision of NOC/Re- validation of EIA report by Environment Protection Department on revised PC-I

2.	Gap 2: Missing Sludge and Wastewater Management There is insufficient focus on the safe treatment and disposal of sludge generated during operations. Lack of planning for reuse or recycling of treated water and sludge, missing an opportunity for sustainability.	It seems that the reviewer is confusing sludge from sewage treatment plants (STP's) with sludge from water treatment plants (WTP's). Sludge from water treatment plants is composed mostly by soil/mineral particles and does not contain any biological solids. Sludge produced from STP's contains biological solids which can be reused in agriculture, for composting, or energy recovery from biogas production since biological sludge contains carbon, nutrients (N, P, etc.) and has a calorific value. Sludge from WTP's is mainly inorganic, mineral nature and does not contain mineral or carbon.	Noted
3.	Gap 3: Missing Water Resource Management The plan does not adequately address the long-term impacts on the BRBD Canal's ecosystem due to water extraction. Measures to prevent contamination or salinization of nearby water bodies are unclear.	Instant Project involves rehabilitation of existing syphon constructed in year 1952, which has passed its useful life and owing to deteriorated condition of existing syphon and reduction in discharge capacity of same from 5853 cusecs to 4853 cusecs, same requires immediate replacement. Hence no impact will be occurred on ecosystem owing to water shortage as water availability will be enhanced after implementation of project.	Noted

SOCIAL ANALYSIS

Sr. No.	OBSERVATIONS	REPLY	Remarks
1.	Gap 4: Insufficient Social Analysis	 Executive Summaries of the following E&S Documents are already made part of PC-I: 1. Resettlement plan (RP) of Surface Water Treatment Plant Component 2. Livelihood Restoration Plan (LRP) of Networks of Surface Water Treatment Plant Component 3. Environmental and Social Impact Studies for the Surface Water Treatment Plant Component and Networks 4. Resettlement Pan (RP) of Syphon Component 5. Environmental and Social Impact Studies of Syphon Component 6. Stakeholders Engagement Plan of SWTP and Networks 7. Gender Action Plan of SWTP and Networks Further, Complete E&S documents were also emailed to KPMG vide email dated 18.12.24 	Noted
2.	Carbon Emission Calculations Gap 5: Insufficient Carbon footprint analysis	Carbon Emission calculations have been added in PC-I	Detailed estimation related to Carbon crediting will be part of PC-I
3.	Gap 6: No consideration of Climate Adaptation Measures 1. Does project lie in flood zone?	No as described in point No. 1 of climate deseased. Drainage system is provided to mitigate the unforeseen floodings phenomena	Noted
4.	2. Does project lie in storms or landslides area?	No	Noted
5.	3. Does project lie in active earthquake zone?	Project lies in Seismic Zone 2A. Further design of structures has been done by keeping under consideration the seismic values. Building Code of Pakistan has been followed accordingly.	
6.	4. Will weather conditions impact material selection throughout the project's lifespan?	HDPE pipes and MS pipes have been used for project which have lifespan of more than 100 years	Noted
7.	5.Will weather and extreme events likely affect the	No. Design of Structures have been made in order to ensure	Noted

	project's maintenance schedule and costs?		
8.	6. Is the project designed to withstand extreme weather conditions?	Design of Structures has been made to ensure durability against temperature and shrinkage stresses in conformity of ACI code	Noted
9.	7.Will the project impose risks to local environment or dependent ecosystem	The project has been ensured to pose positive impact on environment since after implementation of project more water availability will be ensured at Downstream side of Syphon thereby ensuring increase canal command area and crop yield. Further as per Cabon credit assessments, it has been envisaged that 67 Tubewells along with about 109674 house hold pumps will be ceased in operation after implementation of project thus resulting in saving of carbon emissions as compared to original PC-I	Noted

CLIMATE RESILIENCE

1.	Elevating critical components (e.g., electrical panels, pumps) above projected flood levels, and installing flood walls or levees around the perimeter of the plant would be a strong adaptive measure	The project is outside the flood plain of Ravi River and is located in the safe area according to Flood Plain and Flood Risk Mapping report issued June 2015 under development of national flood protection plan -IV and related studies to enhance the capacity of Federal Flood Commission. As per the topography of the areas surrounding the SWTP site, the catchment attaching the site is very small (about 1.87km2) and is not extending to the BRBD canal. As such, floods and spills from BRBD should not be directly attaching the site boundary. Finally, the conveyor connecting the BRBD canal to the SWTP site is converted from open channel (that can be flooded) to closed pipes. The pipes are equipped with isolation valves at the SWTP side that can be closed in case excessive water levels are encountered in BRBD canal (higher than the maximum design water level advised by PID). It is worth noting that the walls of the raw water receiving tank in the SWTP is extended to height above the maximum design water level in BRBD canal by 75cm (refer to Figure 3.7 of the a/m report). The site is also graded by raising the edge facing the catchments by 75cm so that incoming rainfall do not enter the site. Rainwater is directed along the northern edge and is directed to a culvert to continue its natural flow path. No runoff is generated from the site towards the surrounding areas.	Noted
2.	The design should include a stormwater drainage system with retention ponds to manage heavy rainfall events	All runoff generated within the site is directed to on-site detention ponds sized to hold the volume of 25 years event.	Noted
3.	Wastewater treatment plants, especially those with biological processes, are vulnerable to heat stress. Implementing evaporative cooling for critical equipment (e.g., pumps, blowers) is a viable measure. Ensure that cooling systems are designed to be energy-efficient and that critical machinery is equipped with heat-resistant materials.	Instant Design is for Surface Water Treatment Plant and Not Wastewater Treatment Plant and no any blowers are part of instant design Further all kind of precautionary measures like cooling system for Generators and Transformers are part of design as per manufacturers recommendations	Noted
4.	Given Pakistan's susceptibility to seismic activity, the plant should be designed to withstand earthquakes. Seismic-resistant design for all critical components (e.g., storage tanks, foundations) is necessary. Incorporate reinforced concrete foundations and flexible connections in pipelines to	Project lies in Seismic Zone 2A. Further design of structures has been done by keeping under consideration the seismic values	Noted

	accommodate potential ground movement during seismic events.		
5.	Vegetative Buffers: Planting buffer zones of vegetation between the facility and surrounding water bodies can help reduce erosion, improve water quality, and create natural habitats, increasing ecosystem resilience.	Land scaping and provision of horticulture is already part of estimate	Noted

MITIGATION MEASURES (GHG AND ENVIRONMENTAL IMPACT REDUCTION) ROADMAP:

1.	For GHG Emission Reduction biogas utilization from sludge for electricity generation and installation solar panels to reduce reliance on grid electricity is suggested.	Instant Project is related to Surface Water Treatment and not Wastewater Treatment, hence sludge produced from plant can't be used as source for energy production being Non Biodegrabale	Noted
2.	Energy-efficient equipment (motors, pumps, lighting) are recommended to use. Optimize process efficiency to reduce energy use.	Energy Efficient Equipment are already part of costing for which quotations are attached in PC-I. Further being DBO contract, detailed design and final selection of different electromechanical equipment would be part of contract of contractor. Same highlighted recommendations would be made part of Employers requirements	Noted
3.	For Sludge Management, it is recommended to implement anaerobic digestion for biogas production and reduce landfill usage. Use efficient sludge dewatering technologies to reduce sludge volume.	Instant Project is related to Surface Water Treatment and not Wastewater Treatment, hence sludge produced from plant can't be used as source for energy production being Non Biodegrabale	Noted
4.	Air Quality and Odor Control is recommended by installation of odor control systems (biofilters, activated carbon). And dust emissions through water spraying and barriers can be controlled. and lower temperatures around the plant.	Instant Project is related to Surface Water Treatment and not Wastewater Treatment, hence no disturbance to Air Quality or Odour is likely to be occurred by this project	Noted
5.	SCADA (Supervisory Control and Data Acquisition) system to remotely monitor and adjust operations based on weather conditions, ensuring plant resilience during climate extremes can be implemented.	SCADA system is already part of the project, to ensure supervisory control of different components of project and remotely monitor its operation	Noted
6.	It is recommended to allocate contingency funds specifically for maintenance and repairs caused by extreme weather events. This could include flood damage to electrical systems, erosion around foundations, or damage to access roads.	Provision of Contingency is part of Estimate to meet unforeseen situation that are expected to be occurred during course of work. Same is also emphasized in B&R Code to meet petty unforeseeable expenditures.	Noted
7.	The incorporation of green roofs and shading structures over buildings and outdoor equipment areas can reduce heat absorption and improve energy efficiency. Green roofs would reduce heat impact, improve insulation, and	Solarization is part of PC-I to ensure renewable energy for sustainable operation of plant during its design life	Noted

	contribute to local biodiversity. Shading structures (e.g., solar panels acting as shades) can also enhance cooling.		
8.	Climate Awareness Programs: It is recommended to engage local communities and plant staff in climate resilience training to ensure understanding of the risks posed by climate change and the actions required to mitigate these risks.	Noted. Stakeholder Engagement Plan has been prepared for instant project to engage local communities and project staff in climate resilience training to ensure understanding of the risks posed by climate change and the actions required to mitigate these risks.	Noted
9.	It is suggested to collaborate with local government, environmental organizations, and research institutions to continuously monitor and update climate resilience measures based on the latest climate data and projections.	Noted. Stakeholder Engagement Plan has been prepared for instant project, which is already part of Environmental and Social Documents of project. Purpose of this plan is to promulgate significance of this project among different stakeholders of society for timely execution of project	Noted
10.	It is recommended to ensure that the project follows international climate resilience frameworks, such as the World Bank's Climate Resilience Guidelines or the Asian Development Bank's (ADB) Climate Change Adaptation Practices. This can ensure that the project is built and operated with climate- resilient standards.	Noted. Environmental and Social Impact Assessment report of the project has been prepared with special focus on Climate change adaption and resilience	Noted

18. <u>RECOMMENDATION:</u>

Project is placed before PDWP for consideration at rationalized cost of **Rs. 44,459.539 million** in light of observations of P&D and response submitted by Sponsoring & Executing Agency.
