



# PPP SPAM Project Denpasar



# Denpasar PPP SPAM Project Profile

<b>Project name</b>	<b>Development of the Denpasar City Drinking Water Supply System (SPAM).</b>
<b>GCA</b>	Mayor of Denpasar cq Main Director of Perumda Water Drinking Tirta Sewakadarma
<b>Project location</b>	Denpasar City (North Denpasar, West Denpasar, East Denpasar, South Denpasar Districts), Bali province
<b>Planning Data</b>	Infrastructure Type: SPAM Infrastructure Type of sector/sub-infrastructure: Production & Distribution Unit
<b>System State Provision of Drinking Water Denpasar City</b>	The amount of water loss (NRW) is quite large, namely 38% (in 2022), so that the benefits felt by customers are not optimal. Apart from that, the current number of residents of Denpasar City who use Perumdam Denpasar City drinking water is only around 56.09% or 90,023 connections (Domestic & Non-Domestic), the rest prefer to use drilled wells
<b>Land Readiness</b>	The land is in accordance with the Denpasar City RTRW
<b>Shape Recommendations PPP*</b>	D – B – F – M – T ( <i>Design – Build – Finance – Maintenance – Transfer</i> ), with Scheme Refund of Service Fees between Perumda and BUP (where Perumda refers to the Scheme Refund of <i>User Charges/Tariffs</i> )
<b>Estimated costs SPAM Development</b>	DRINKABLE = Rp. 808 billion,-, cooperation period of 20 years.

Source: Preliminary Feasibility Study (OBC) Revision of Denpasar SPAM PPP, 18 July 2023



# Scope of Technical Aspects



Derating  
Water Loss (NRW)



Network Development  
New Customers



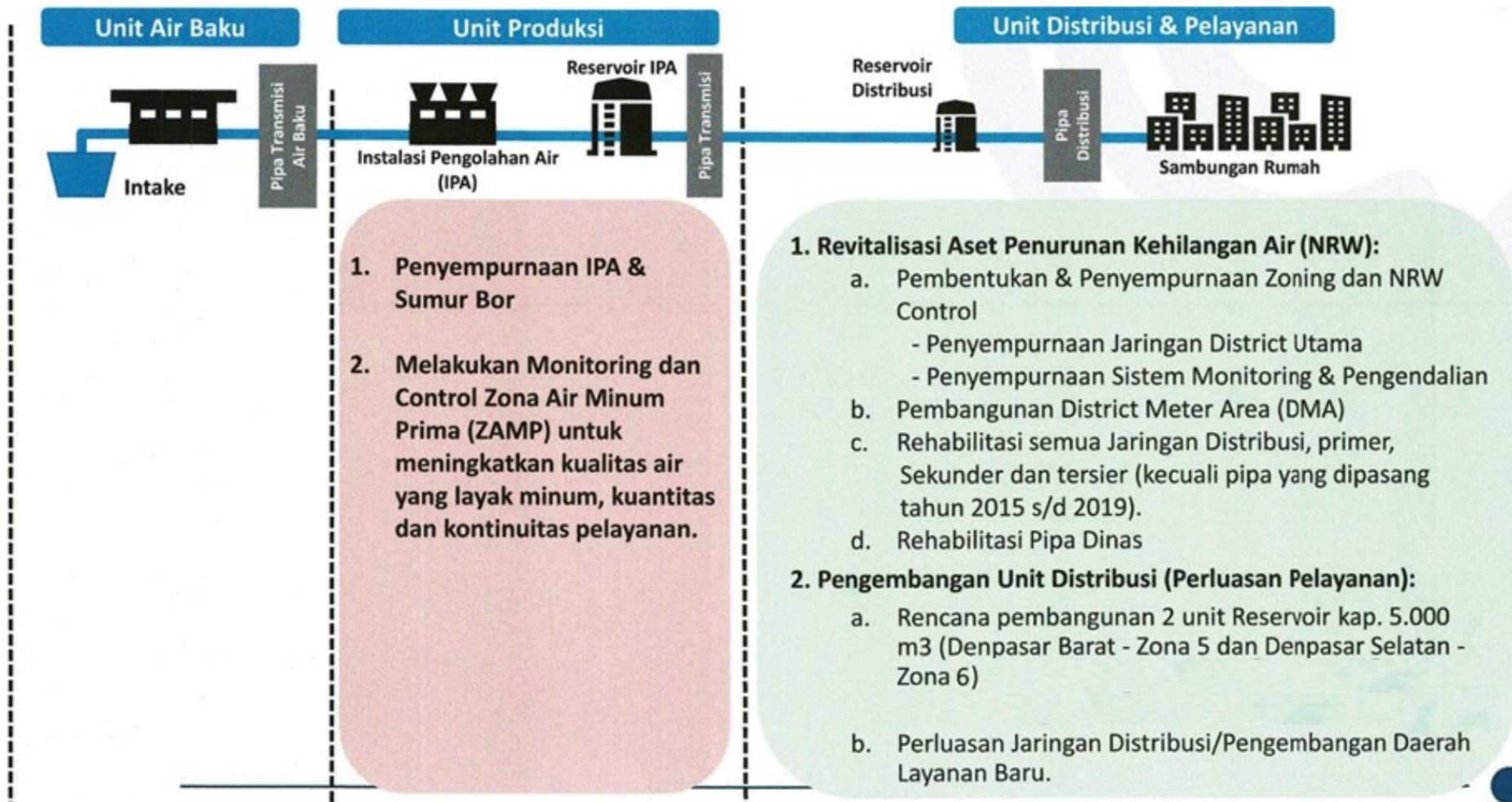
Installation Completion  
Water Treatment (IPA) and  
Drilled wells to produce  
water ready to drink 24  
hours a day



System Improvements  
Monitoring to  
ensure that the water  
distributed to  
customers is ready to drink



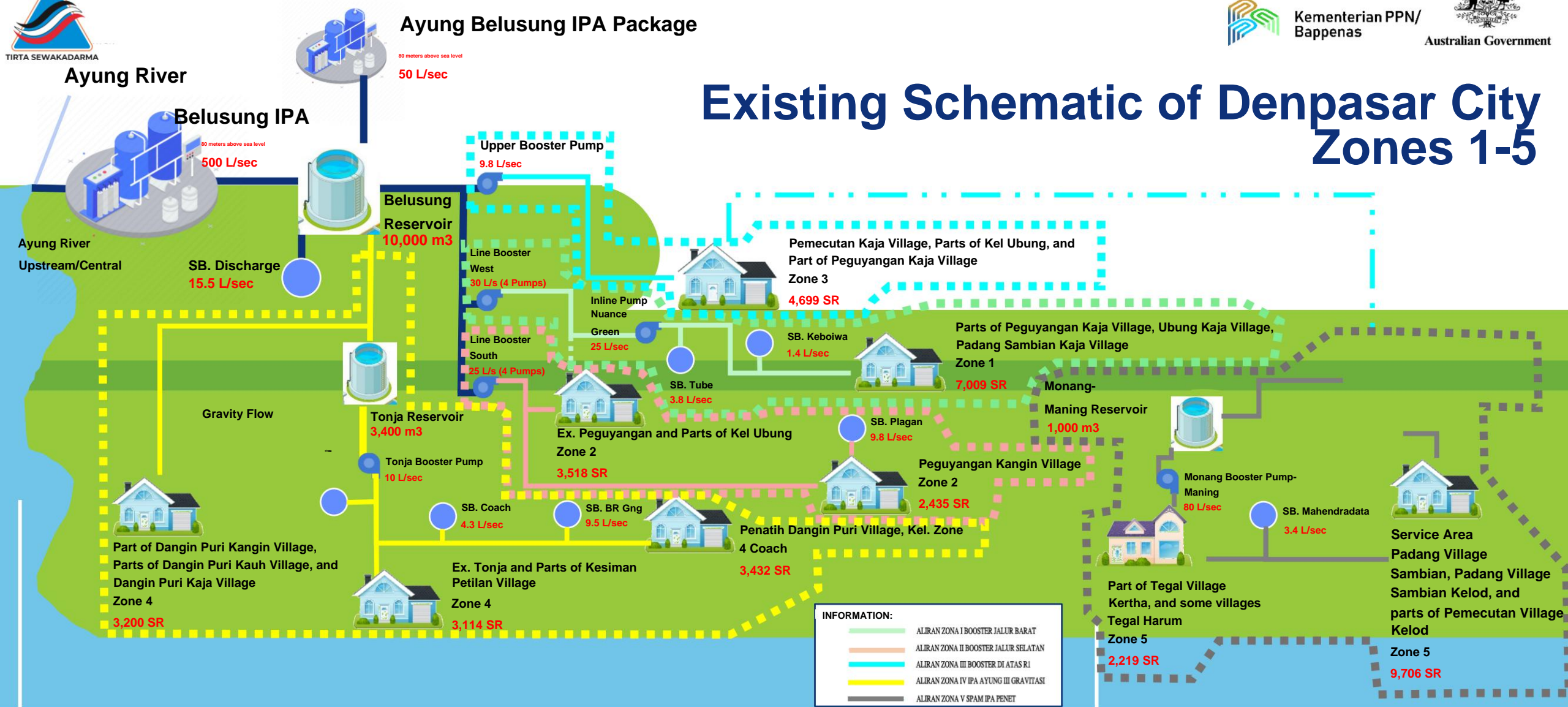
# Scope of Denpasar City SPAM PPP



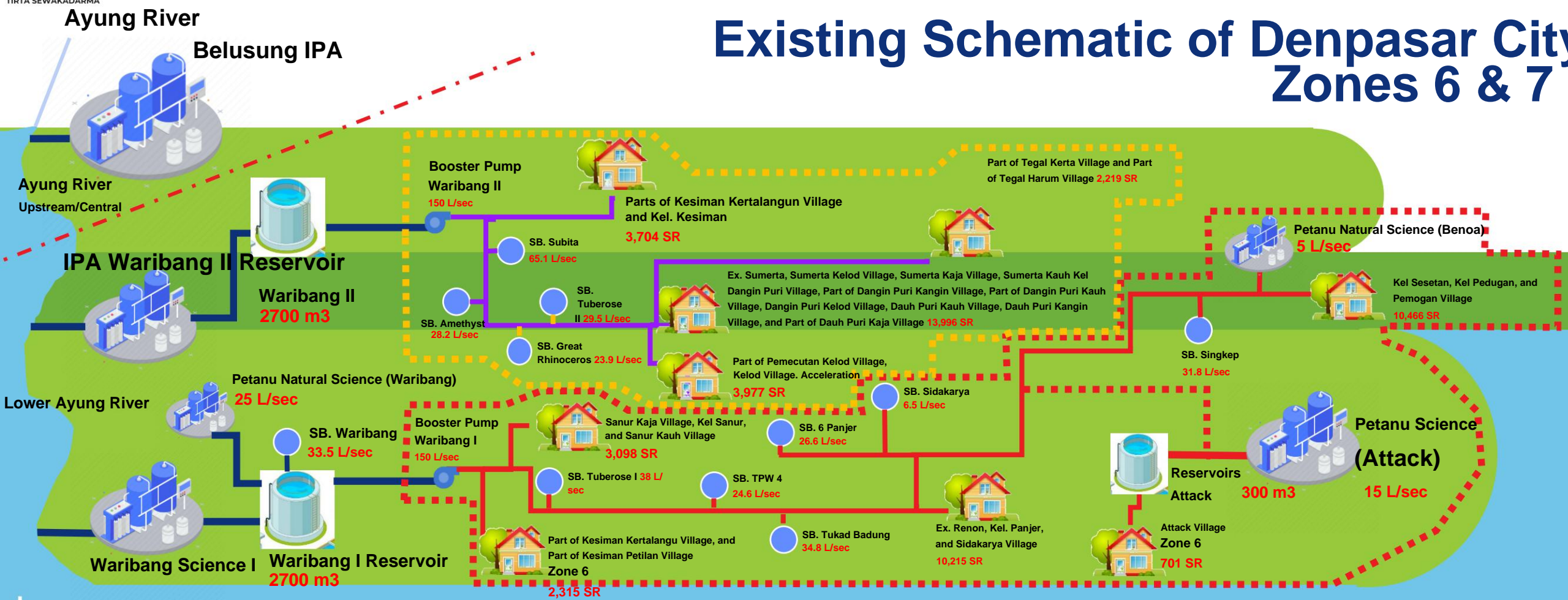


### Ayung Belusung IPA Package

# Existing Schematic of Denpasar City Zones 1-5



# Existing Schematic of Denpasar City Zones 6 & 7

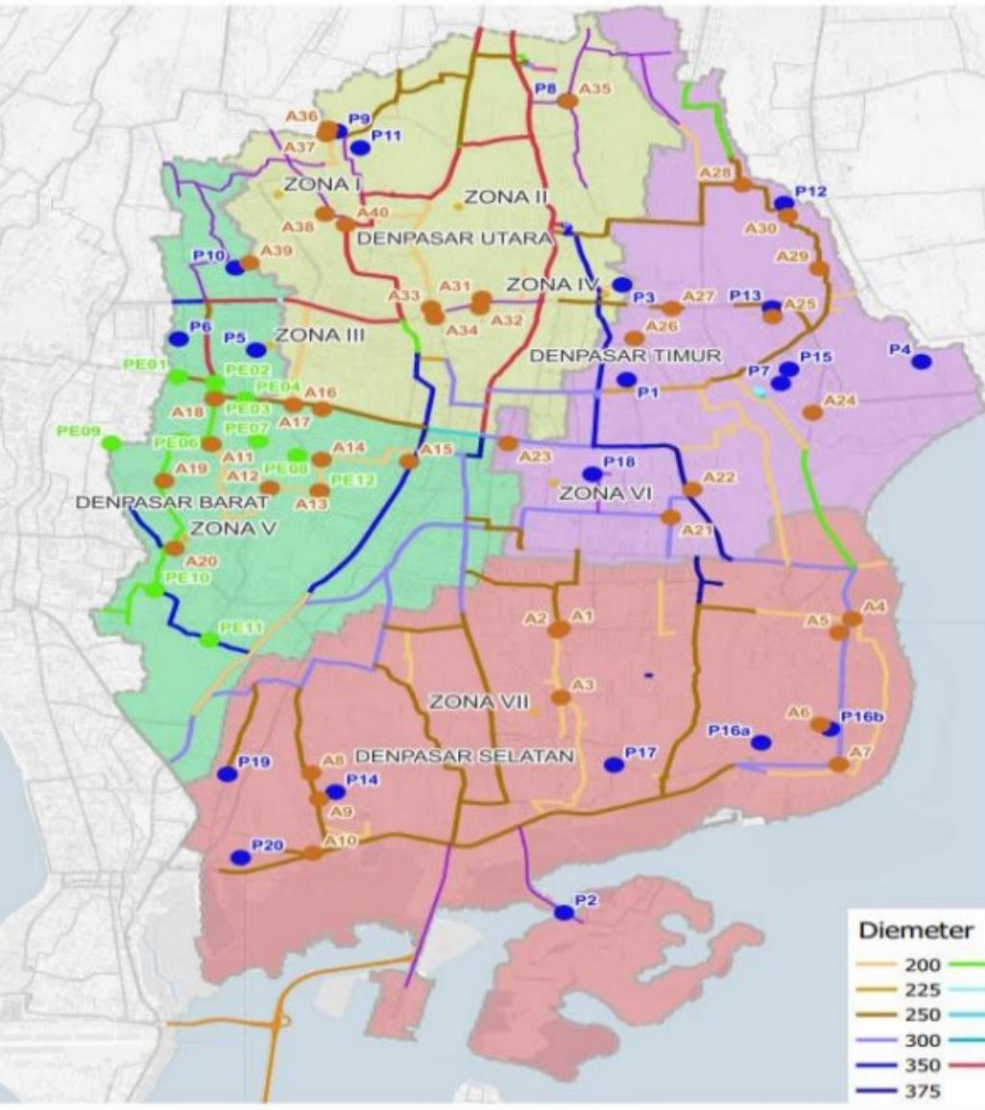


**INFORMATION:**

	ALIRAN ZONA VI IPA WARIBANG I & SPAM PETANU
	ALIRAN ZONA VII IPA WARIBANG II

Raw water sources come from: 1. Lower Ayung River for Waribang WTP 2. 19 Drilled Wells (11 drilled wells in zones 6 & 7) There are 3 reservoirs in zones 6 & 7 (Waribang I, Waribang II, and Serangan)

The source of raw water comes from the Ayung River, for Belusung and Waribang IPA



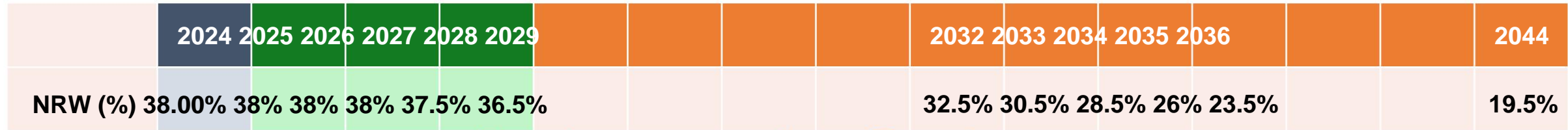
# NUMBER OF DMA = 78

YEAR	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7			
1	0	0	0	0	12	5*	0	0		
2	0	0	0	0	0	0	30	0		
3	0	0	0	0	0	0	0	16		
4	10	4	6	0	0	0	0	0		
TOTAL	10	4	6	12	5	30	16			

Source: DMA Perumda Requirements Data, 2023 (Excel General Data) \*has been/is in the process of being built by Korea



# COMPARATIVE REDUCTION OF NRW



2025 to 2027 NRW is considered the same because it is still deep construction stages



2037 to 2044  
 Assumes a decline of 0.5% per





# COMPARISON OF ADDITIONAL CUSTOMER QTY

	2024	2025	2026	2027	2028	2029	2030	2031	2032	..	..	2044
Customer Addition	90,689	90,689	90,689	91,454	93,017	95,351	97,720	100,887	104,103			138,163
Customer Water Balance (Idt)	0	0	0	765	1,563	2,334	2,369	3,167	3,216			2,076
Water Balance (Idt)	94.0	94.0	94.0	180.4	175.8	172.3	168.6	165.9	162.9			90.7

2024 to 2026 there will be no additional customers because it is still in the construction stage



Total additional SR during concession= 47,474 SR\*  
Service coverage in 2044= 64.5%

The additional SR per year figure adjusts the planned volume of water sold with water usage of **19.42 m<sup>3</sup>/month/SR (equivalent to 140L/person/day)**. This is taking into account that the increase in water prices causes water use by the community to decrease (savings occur). This figure is below the standard daily needs of people from PUPR, namely 170 L/person/day



## Rencana Pipa Yang Akan Direhabilitasi

**TOTAL PANJANG PIPA YANG AKAN DI REHABILITASI  
1.457.849 M**



**SEMUA PIPA AKAN DIGANTI  
DENGAN JENIS HDPE**

No.	Ø PIPA	PANJANG (M')	BAHAN	ZONA
1.	1"	94.610	GI, PVC	1,2,3,4,5,6,7
2.	1½"	308.134	GI, PVC	1,2,3,4,5,6,7
3.	2"	401.172	GI, PVC	1,2,3,4,5,6,7
4.	3"	211.674	GI, PVC	1,2,3,4,5,6,7
5.	4"	164.545	AC, PVC, GI, GWI	1,2,3,4,5,6,7
6.	6"	109.906	AC, PVC, DCI, GI, GWI	1,2,3,4,5,6,7
7.	8"	48.924	AC, PVC, DCI, GI	1,2,3,4,5,6,7
8.	9"	2.385	AC, PVC	3,6
9.	10"	42.843	AC, PVC, JIS	2,4,5,6,7
10.	12"	28.060	AC, PVC, STEEL	2,3,4,6,7
11.	14"	14.829	AC, STEEL	3,4,5,6
12.	15"	3.648	AC, DCI,	6,7
13.	16"	9.495	PVC, PE, STEEL	3,4,5,7
14.	20"	610	PVC, STEEL	5
15.	21"	730	AC	6
16.	24"	16.284	AC, STEEL	3,4,6
<b>TOTAL (M')</b>		<b>1.457.849</b>		

PELAKSANAAN	PANJANG PIPA (M')	DIAMETER PIPA (inch)	ZONA
Tahun 1	45.596	14, 15, 16, 20, 22, 24	1,3,4,5,6,7
Tahun 2	73.288	9, 10, 12.	2,3,4,5,6,7
Tahun 3	669.483	1, 1½, 2, 3, 4, 6, 8	1,2,3,4,5,6,7
Tahun 4	669.483	1, 1½, 2, 3, 4, 6, 8	1,2,3,4,5,6,7
<b>TOTAL (M')</b>	<b>1.457.849</b>		

# CAPEX - DRINKABLE

## UPDATED DESIGN ON OBC

### Rp. 808 AD

No	Uraian Pekerjaan	TAHUN PERTAMA	TAHUN KEDUA	TAHUN KETIGA	TAHUN KEEMPAT	Total Biaya Rp.
		Jumlah Biaya Rp.	Jumlah Biaya Rp.	Jumlah Biaya Rp.	Jumlah Biaya Rp.	
1	REHABILITASI PIPA DISTRIBUSI					-
1.1	Pipa Distribusi Primer	116.398.730,597	57.887.799,719	58.718.547,366	154.869.246,631	387.874.324.313,05
1.2	Pipa Distribusi Sekunder	6.425.429.890,19	14.636.553.564,49	14.626.505.511,17	9.869.713.866,24	45.558.202.832,09
1.3	Pipa Distribusi Tersier	31.894.818.297,29	29.011.026.233,15	28.442.799.248,88	46.152.106.523,02	135.500.750.302,35
	<b>Total 1</b>	<b>154.718.978.784,91</b>	<b>101.535.379.516,95</b>	<b>101.787.852.125,79</b>	<b>210.891.067.019,83</b>	<b>568.933.277.447,48</b>
2	PEMBANGUNAN RESERVOIR 2 Unit KAP. 5.000 M3					-
2.1	Reservoir Kap. 5.000 m3	17.337.616.939,03	17.977.375.004,08			35.314.991.943,12
	<b>Total 2</b>	<b>17.337.616.939,03</b>	<b>17.977.375.004,08</b>			<b>35.314.991.943,12</b>
3	PENYEMPURNAAN JARINGAN DISTRIBUSI UTAMA					-
	<b>Total 3</b>	-	-	-	-	-
4	REHABILITASI PIPA DINAS					-
	<b>Total 4</b>	<b>9.072.875.000,00</b>	<b>9.407.664.087,50</b>	<b>9.754.806.892,33</b>	<b>10.114.759.266,66</b>	<b>38.350.105.246,48</b>
5	PEMBANGUNAN DISTRICT METER AREA (DMA)					-
	<b>Total 5</b>	<b>9.332.100.000,00</b>	<b>24.191.136.225,00</b>	<b>13.378.020.880,91</b>	<b>17.339.587.314,27</b>	<b>64.240.844.420,17</b>
6	PENGADAAN DAN PEMASANGAN SISTEM MONITORING & PENGENDALIAN					-
	<b>Total 6</b>	-	-	-	<b>3.495.660.802,56</b>	<b>3.495.660.802,56</b>
7	PENGADAAN MONITORING & CONTROL ZAMP					-
	<b>Total 7</b>	-	-	-	<b>1.398.726.710,02</b>	<b>1.398.726.710,02</b>
8	PENGADAAN LEAKAGE DETECTOR					-
	<b>Total 8</b>	-	-	-	<b>2.612.497.822,02</b>	<b>2.612.497.822,02</b>
9	PENYEMPURNAAN IPA DAN SUMUR BOR					-
9.1	IPA Belusung	8.803.281.000,00	-			8.803.281.000,00
9.2	IPA Waribang	-	2.623.394.328,40	-		2.623.394.328,40
9.3	Sumur Bor 19 Unit	1.208.481.027,50	4.385.758.920,95	1.948.968.610,77	-	7.543.208.559,22
	<b>Total 9</b>	<b>10.011.762.027,50</b>	<b>7.009.153.249,35</b>	<b>1.948.968.610,77</b>	-	<b>18.969.883.887,62</b>
10	PENGEMBANGAN CAKUPAN PELAYANAN/PERLUASAN JARINGAN DISTRIBUSI					-
	<b>Total 10</b>	<b>18.839.827.884,92</b>	<b>18.839.827.884,92</b>	<b>18.839.827.884,92</b>	<b>18.839.827.884,92</b>	<b>75.359.311.539,67</b>
11	PENGGANTIAN PIPA DINAS SAMBUNGAN BARU (DILAKUKAN OLEH PERUMDAM)					-
12	PENGGANTIAN METER AIR PELANGGAN (DILAKUKAN OLEH PERUMDAM)					-
	<b>GRAND TOTAL</b>	<b>219.313.160.636,36</b>	<b>178.960.535.967,81</b>	<b>145.709.476.394,72</b>	<b>264.692.126.820,26</b>	<b>808.675.299.819,15</b>



# CONSTRUCTION IMPLEMENTATION PLAN

NO.	URAIAN PEKERJAAN	TAHUN PERTAMA	TAHUN KEDUA	TAHUN KETIGA	TAHUN KEEMPAT	PERKIRAAN WAKTU PELAKSANAAN
1	REHABILITASI PIPA DISTRIBUSI					
1.1	Pipa Distribusi Primer					4 TAHUN
1.2	Pipa Distribusi Sekunder					4 TAHUN
1.3	Pipa Distribusi Tersier					4 TAHUN
2	PEMBANGUNAN RESERVOIR 2 Unit KAP. 5.000 M3					
2.1	Reservoir Kap. 5.000 m3					2 TAHUN
3	PENYEMPURNAAN JARINGAN DISTRIBUSI UTAMA					1 TAHUN
4	REHABILITASI PIPA DINAS					4 TAHUN
5	PEMBANGUNAN DISTRICT METER AREA (DMA)					4 TAHUN
6	PENGADAAN DAN PEMASANGAN SISTEM MONITORING & PENGENDALIAN					1 TAHUN
7	PENGADAAN MONITORING & CONTROL ZAMP					1 TAHUN
8	PENGADAAN LEAKAGE DETECTOR					1 TAHUN
9	PENYEMPURNAAN IPA DAN SUMUR BOR					
9.1	IPA Belusung					1 TAHUN
9.2	IPA Waribang					1 TAHUN
9.3	Sumur Bor 18 Unit					3 TAHUN
10	PENGEMBANGAN CAKUPAN PELAYANAN/PERLUASAN JARINGAN DISTRIBUSI					4 TAHUN
11	PENGGANTIAN PIPA DINAS SAMBUNGAN BARU (DILAKUKAN OLEH PERUMDAM)					
12	PENGGANTIAN METER AIR PELANGGAN (DILAKUKAN OLEH PERUMDAM)					

# Scope of Financial Aspects



Improving Tariff Calculations / *Tariff Sharing*



# Improvement of Tariff Calculation / *Tariff Sharing*

## REVISION OF TARIFF ASSUMPTIONS

Rata-Rata Juni 2023	Tahun	Jenis
8,886	2023	Tarif Non Drinkab
8,886	2025-2027	Tarif Non Drinkab
11,730	2028	Tarif Drinkable

Month 2023 Average Rates	
Jan	8,827
Feb	8,851
Mar	8,928
Apr	8,883
May	8,857
Jun	8,982
<b>Average</b>	8,888

Rate Increase

32.00%

Rate Increase Period

3 years



## Revised Drinkable Rate Assumptions

		2025	2026	2027	2028	2029	2030	2031	2032	2033
Eskalasi		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%
Indeks Kenaikan Tarif	1.00	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1
Indeks Kenaikan Tarif Tertimbang		1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10	1.10
	▲ ▼									
<b>ASUMSI TARIF</b>		100.00%	100.00%	100.00%	68.27%	68.27%	68.27%	68.27%	68.27%	68.27%
<b>Tarif Air Perumda</b>	<b>Rp./m3</b>	<b>8,886</b>	<b>8,886</b>	<b>8,886</b>	<b>8,008</b>	<b>8,008</b>	<b>8,008</b>	<b>8,809</b>	<b>8,809</b>	<b>8,809</b>
<b>Tarif Air ke BUP</b>	<b>Rp./m3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3,722</b>	<b>3,722</b>	<b>3,722</b>	<b>4,094</b>	<b>4,094</b>	<b>4,094</b>
	▲ ▼	0.00%	0.00%	0.00%	31.73%	31.73%	31.73%	31.73%	31.73%	31.73%
	31.73% 68.27%									
	8,886	8,886	8,886	8,886	11,730	11,730	11,730	12,902	12,902	12,902
	1,777	100%	100%	100%	100%	100%	100%	100%	100%	100%
	10,663									

The average tariff for 2023-2027 is IDR. 8,886,- where in 2028 the Drinkable rate will be IDR 11,730,-. And there will be an increase every 3 years of 10%.



## Revised Drinkable Rate Assumptions

		2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Eskalasi		10.00%	0.00%	0.00%	10.00%	0.00%	0.00%	10.00%	0.00%	0.00%	10.00%	0.00%
Indeks Kenaikan Tarif	1.00	1.2	1.2	1.2	1.3	1.3	1.3	1.5	1.5	1.5	1.6	1.6
Indeks Kenaikan Tarif Tertimbang		1.21	1.21	1.21	1.33	1.33	1.33	1.46	1.46	1.46	1.61	1.61
	▲											
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<b>ASUMSI TARIF</b>		68.27%	68.27%	68.27%	68.27%	68.27%	68.27%	68.27%	68.27%	68.27%	68.27%	68.27%
<b>Tarif Air Perumda</b>	<b>Rp./m3</b>	9,689	9,689	9,689	10,658	10,658	10,658	11,724	11,724	11,724	12,897	12,897
<b>Tarif Air ke BUP</b>	<b>Rp./m3</b>	4,503	4,503	4,503	4,954	4,954	4,954	5,449	5,449	5,449	5,994	5,994
		31.73%	31.73%	31.73%	31.73%	31.73%	31.73%	31.73%	31.73%	31.73%	31.73%	31.73%
	▲											
	▼											
		31.73%	68.27%									
	8,886	14,193	14,193	14,193	15,612	15,612	15,612	17,173	17,173	17,173	18,891	18,891
	1,777	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	10,663											

The average tariff for 2023-2027 is IDR. 8,886,- where in 2028 the Drinkable rate will be IDR 11,730,-. And there will be an increase every 3 years of 10%.





# Review Results

## 1. Capex for Denpasar SPAM PPP Development

No.	Description	OBC Update
1	Total Capex (RAB)	Rp. 808 Billion
2	Length of pipe rehabilitated	1,460,649 m
3	Number of installations DMA	78
4	Years Construction/ Implementation	4 years
5	Total Inventory	1.027 T

**216.26 M/Year**  
**(in year 1 of construction)**

2. Total Opex will be IDR 1,703 T during the collaboration period,

3. Reducing NRW to 19.5% at the end of the Collaboration period and increasing the number of customers to 47,474 SR.

## Economic and Financial Studies

1. Revise RDS results related to project WTP to around IDR 80,000-90,000 per month (according to the limit below 88.7% of respondents who were able to pay a water bill of IDR 80,000-IDR 120,000 per month), compared to the figure of IDR 125,755 per month (OBC 2022) which is considered too high (*overestimate*) *• The need to deepen RDS, especially for Non-Customer WTC and Options Drinkable*



## 2. Revision of Tariff / *Tariff Sharing* calculations including:

- Determination of *Tariff Sharing* between Perumda and BUP which uses a flat tariff, but every 3 years the tariff will increase by 10% according to existing regulations; • initial tariff of IDR 8,886 (average tariff from 2023 to 2027) increased to IDR 11,730 in 2028 which will later be used as *Tariff Sharing* for Perumda and BUP;

## Study of PPP Forms

1. The PPP form refers to the DBFMT scheme with Tariff Revenue (*User Charge*) and a certain portion for BUP which increases every 3 years, but the *demand* risk is still shared between Perumda and BUP;
2. The project implementation schedule will start from 2025 to 2044 (period 20 year concession, including 4 year construction period (2025-2028))

## Study of Government Support and Guarantees

1. VGF support and Government Guarantees from PT PII are needed for the implementation of the PPP project

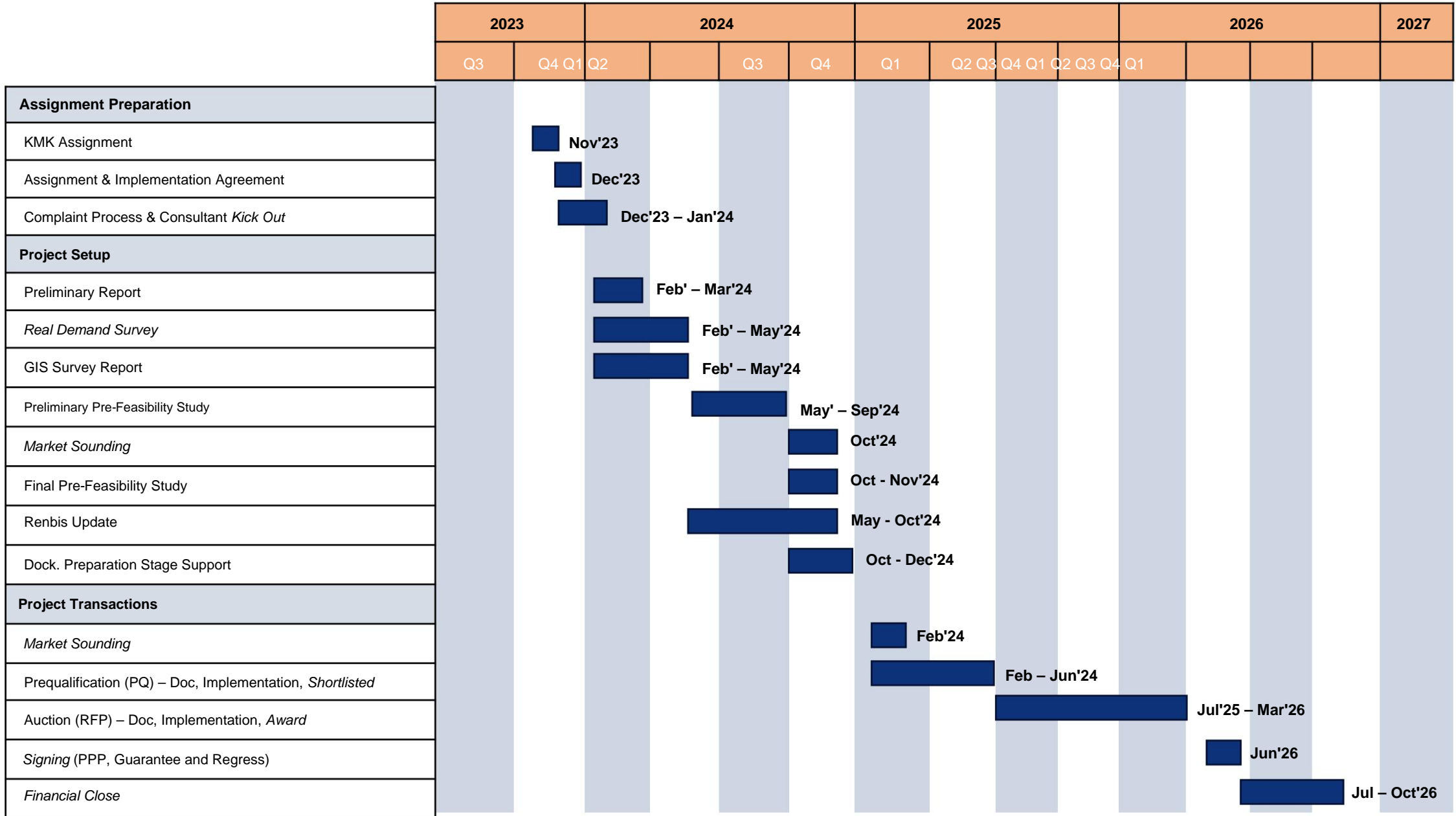




# Implementation Schedule PPP Project



# Indication of Denpasar City SPAM PPP *Timeline* PDF





**Thank you Suksma :)**

