

PLANT CAPACITY

Pre-treatment System (Silica reduction)

S. No	Description	Unit	Value
1.	Service flow rate	m ³ / hr	89.0

Ultra-Filtration system

S. No	Description	Unit	Value
1.	Feed	m ³ /Day	2026.1
2.	Filtrate Flow rate	m ³ /Day	1826.1
3.	Recovery	%	90.1

High TDS Reverse Osmosis System

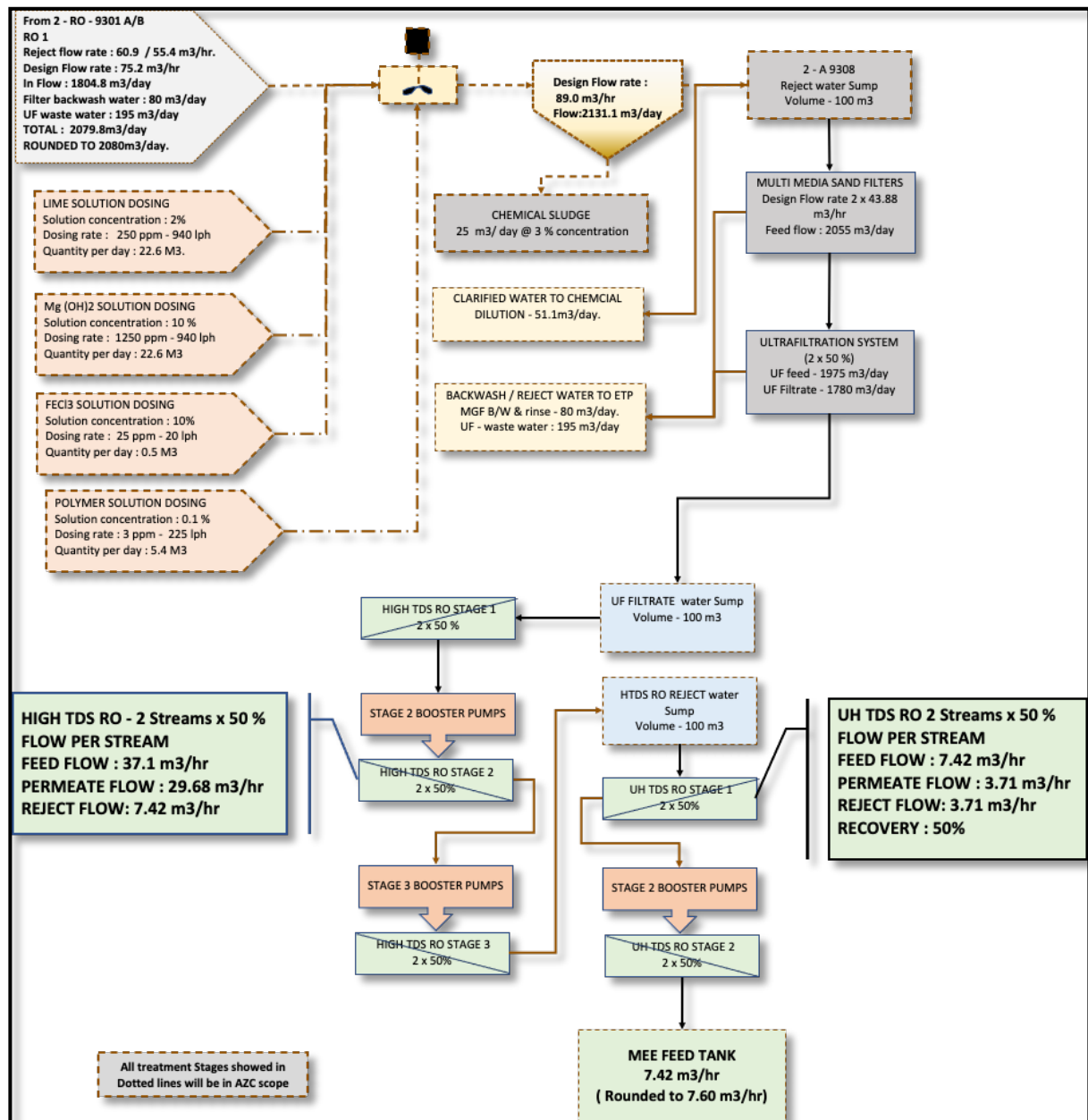
S. No	Description	Unit	Value
1.	Feed flow rate	m ³ /Day	1826.1
2.	Permeate Flow rate	m ³ /Day	1460.9
3.	Reject	m ³ /Day	365.2
4.	Recovery	%	80

Ultra-High TDS Reverse Osmosis System

S. No	Description	Unit	Value
1.	Feed flow rate	m ³ /Day	365.2
2.	Permeate Flow rate	m ³ /Day	182.6
3.	Reject	m ³ /Day	182.6
4.	Recovery	%	50

CONVENTIONAL PRE-TREATMENT STEP, AN AMX RO + NEW AMX UHPRO + AN EVAPORATOR [CONCENTRATOR]

BLOCK DIAGRAM



Note: UHTDS RO feed has been taken as 7.6 m3/hr for design for balancing the RO feed flow.

FEED WATER CHARACTERISTICS

FEED WATER TO PRE-TREATMENT SECTION

S NO	PARAMETER	UNIT	Values
1.	pH	-	7.5 to 9.5
2.	Temperature	°C	7 to 35
3.	Calcium	ppm	92.3
4.	Magnesium	ppm	21

CONVENTIONAL PRE-TREATMENT STEP, AN AMX RO + NEW AMX UHPRO + AN EVAPORATOR [CONCENTRATOR]

5.	Potassium	ppm	4.3
6.	Ammonium	ppm	99.6
7.	Barium	ppm	Max 0.001
8.	Strontium	ppm	Max 0.001
9.	Iron	ppm	Max 0.001
10.	Manganese	ppm	Max 0.001
11.	Aluminum	ppm	Max 0.001
12.	Zinc	ppm	Max 0.001
13.	Cu	ppm	Max 0.001
14.	Ni	ppm	Max 0.001
15.	Cr	ppm	Max 0.001
16.	Hg	ppm	Max 0.001
17.	Pb	ppm	Max 0.001
18.	As	ppm	Max 0.001
19.	Cd	ppm	Max 0.001
20.	Se	ppm	Max 0.001
21.	Phenol	ppm	Max 0.001
22.	Formaldehyde	ppm	1.5
23.	Carbonates	ppm	0.1
24.	Bicarbonates	ppm	1.6
25.	Sulfate	ppm	2022
26.	Chlorides	ppm	5254
27.	Fluorides	ppm	BDL
28.	Nitrites (NO ₂)	ppm	4.1
29.	Nitrates (NO ₃)	ppm	291
30.	Total PO ₄	ppm	291
31.	Silica	ppm	262
32.	Total Dissolved Solids	mg/l	12,336
33.	Total Hardness (as CaCO ₃)	mg/l	500
34.	BOD (3 Days @27°C)	mg/l	38
35.	COD	mg/l	145
36.	Suspended Solids	mg/l	130 to 250
37.	Total Silica (as SiO ₂)	mg/l	262
38.	Oil	mg/l	<1
39.	Urea	ppm	40
40.	Any Solvent	mg/l	BDL
41.	Any Oxidizing Agent	mg/l	BDL

NOTE:

CONVENTIONAL PRE-TREATMENT STEP, AN AMX RO + NEW AMX UHPRO + AN EVAPORATOR [CONCENTRATOR]

AFTER PRE-TREATMENT THE FOLLOWING PARAMETERS WILL HAVE TO BE WITHIN THE FOLLOWING LIMITS.

The pre-treatment recommended is for reducing these parameters. Some fine tuning of the chemicals added maybe needed during project execution.

S NO	PARAMETER	UNIT	Values
1.	pH	-	7.5 to 9.0
2.	Temperature	°C	7 to 35
3.	Total Hardness (as CaCO ₃)	mg/l	200
4.	BOD (3 Days @27°C)	mg/l	< 30
5.	COD	mg/l	< 100
6.	Suspended Solids	mg/l	< 20
7.	Total Silica (as SiO ₂)	mg/l	< 20
8.	Total PO ₄	ppm	<5

TREATED WATER QUALITY

Reverse Osmosis Permeate,

S. NO	PARAMETERS	UNIT	H TDS RO	UH TDS RO
1.	pH	-	5.5 - 6.5	5.5 - 6.5
2.	Calcium	ppm as CaCO ₃	< 30	< 30
3.	Magnesium	ppm as CaCO ₃	< 20	< 20
4.	Sodium	ppm as CaCO ₃	< 230	< 1000
5.	Chlorides	ppm as CaCO ₃	< 50	< 1000
6.	Sulfate	ppm as CaCO ₃	< 160	< 150
7.	Phosphate	ppm as CaCO ₃	Nil	< 1
8.	Nitrate	ppm as CaCO ₃	< 39.4	< 450
9.	Total Hardness	ppm as CaCO ₃	< 50	< 50
10.	Silica	ppm as CaCO ₃	< 37	< 10
11.	COD*	ppm	< 5	< 100
12.	Total Suspended Solids	ppm	< 1	< 2

CONVENTIONAL PRE-TREATMENT STEP, AN AMX RO + NEW AMX UHPRO + AN EVAPORATOR [CONCENTRATOR]