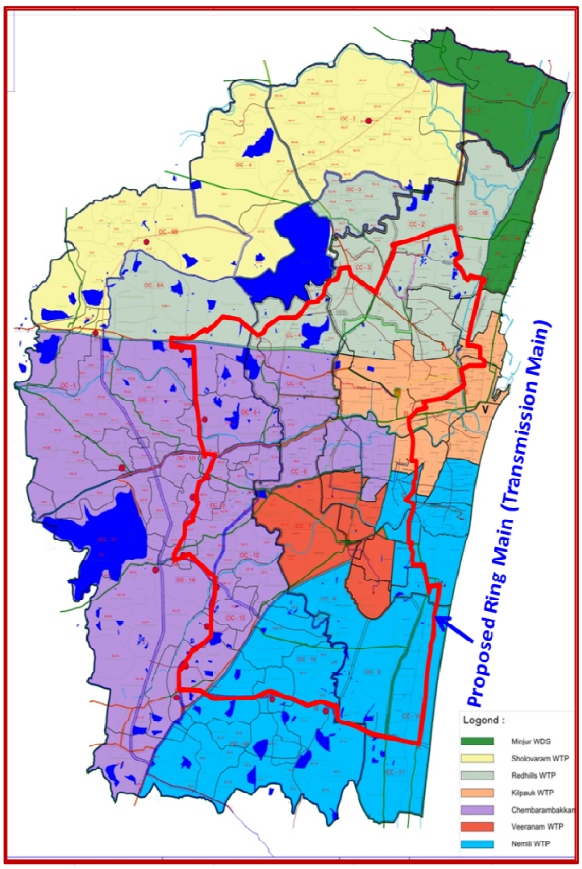
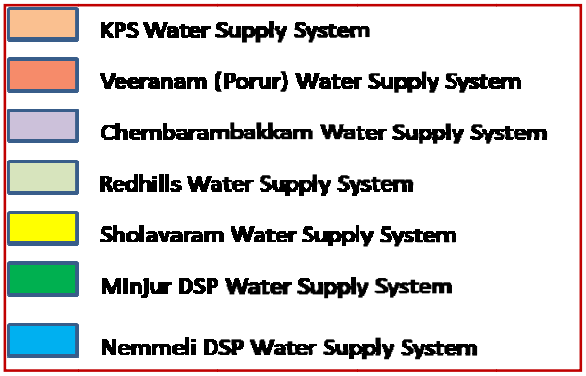
CHAPTER – X WATER SUPPLY SYSTEMS, TRANSMISSION MAINS AND FEEDER MAINS (MODIFIED)

10.1. Water Supply Systems

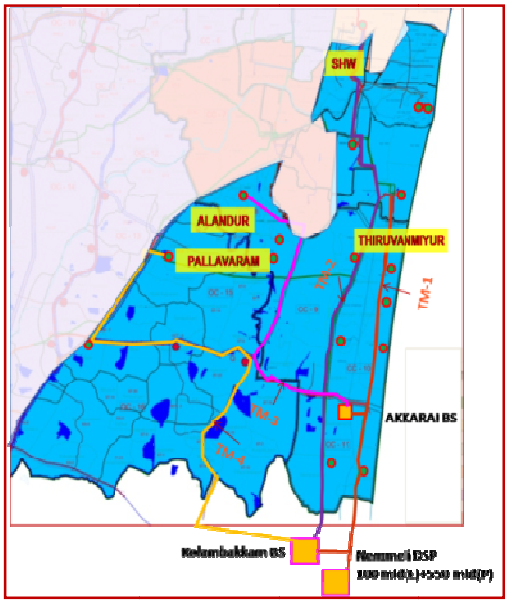
The entire project area is delineated into seven major water supply systems based on the source of supply and on the treatment plant locations. The systems are:

1. Nemmeli Sea Water Desalination Plant water supply system
2. Veeranam (Porur WDS) Water supply system
3. Chembarambakkam water supply system
4. Redhills water supply system
5. Cholavaram water supply system
6. Minjur Sea water Desalination Plant water supply system
7. KPS Water Supply System





10.1. Nemmeli DSP Water Supply System



The Nemmeli Sea Water Desalination Plant is a reverse osmosis, desalination Plant located at Nemmeli, on the coast of the Bay of Bengal about 35 km south of the Chennai, along the East Coast Road. The plant is the second desalination plant in the city after the DS plant at Minjur and has also a capacity of 100 MLD. The plant commissioned during February 2013, was built to provide piped water to residents of south Chennai and the newly merged areas. The Plant was constructed by V.A.Tech-Wabag in consortiam with IDE Technologies of Israel. Sea water is drawn through 1600mm dia HDPE pipe at 1042 meters inside the sea. The reject is disposed back to sea through 1200mm Dia HDPE pipe of 680m of length inside the sea with Pumping arrangement and diffusor at the tail end.

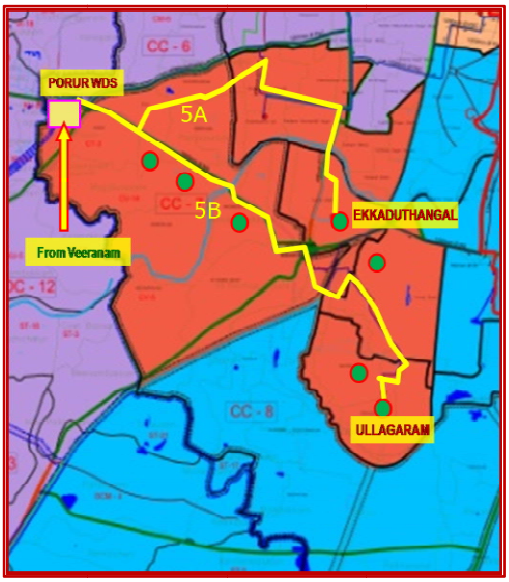
New Plants of capacity of 150 MLD and 400 MLD have been proposed at Nemmeli and Perur (near Nemmeli), respectively.

Comprising the existing and proposed sources, it has been proposed to cover under this Nemmeli WS system, 5 existing zones viz. 12, 12A, 13, 14 & 16 of core city, 4 areas viz. CC8, CCC9, CC10, CC11 of Expanded City and 2 areas viz. OC15, OC16 of Rest of CMA.

Table 10-12 : Zone wise & Year wise fresh water demand of Nemmeli system

NEMMELI DSP								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY	**13**	17	17	18	18	19	19	19
	14	36	37	37	37	38	38	38
	16	26	27	27	28	28	29	29
	12	16	16	17	17	18	18	18
	12A	21	22	22	23	23	24	25
	6A	4	4	5	5	5	5	5
Sub Total		**119**	**123**	**125**	**127**	**131**	**134**	**136**
ADDED AREA	**CC8**	23	25	37	42	46	60	69
	CC9	15	18	27	31	35	46	52
	CC10	19	20	35	39	44	63	78
	CC11	14	19	32	38	44	59	69
Sub Total		**71**	**81**	**131**	**149**	**170**	**228**	**267**
REST OF CMA	**OC15**	40	45	72	82	94	137	154
	OC16	19	22	39	46	54	80	91
Sub Total		**59**	**67**	**111**	**129**	**148**	**217**	**245**
TOTAL		**249**	**271**	**367**	**405**	**448**	**579**	**649**

10.2. Veeranam WS System:



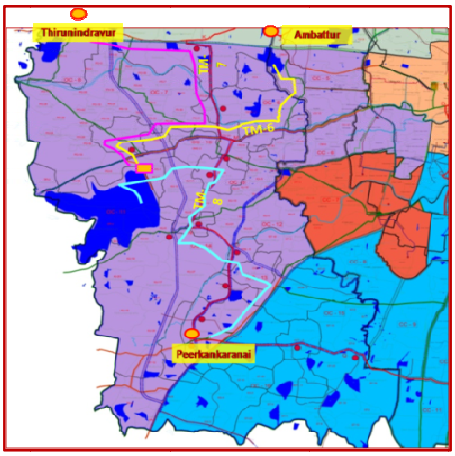
The Veeranam Water Supply Project was implemented as additional source of water to Chennai City. The Project was commissioned during the year 2005 to supply 180 MLD of water to Chennai City by drawing water from Veeranam Lake. This lake receives water from Cauvery River system through Kollidam, Lower Anicut and Vadavar Canal besides rainwater from its own catchment area. The capacity of the lake is 1465 Mcft. The lake water is treated at Vadakuthu Water Treatment Plant by pumping raw water at a distance of 20.38 km from Sethiathope to Vadakuthu through 1775 mm dia mild steel pipe. The treated water is then pumped at a distance of 7.6 km. to Break Pressure Tank at Kadampuliyur through 1750 mm dia mild steel pipe and from there the water is conveyed to a distance of about 200 km. through the mild steel pipe of 1875 mm and 1500 mm dia by gravity to Porur Water Distribution Station near Chennai. From this Distribution Station, water is pumped to a distance of 1.2 km. and distributed to Chennai City through Trunk mains and Water Distribution Stations.

In this master plan it has been proposed to cover under this Veeranam WTP (Porur WDS) source are, existing WS Zones 5-(Kk Nagar (Old & New)), 6- (Velachery), 6A- (Velachery-New), 7-(Ekkaduthangal) and CC7(Area Under Expanded City).

Table 10-11 : Veeranam system-Fresh water demand for design years

VEERANAM WTP (PORUR WDS)								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY	**5**	54	56	57	58	60	61	62
	6	27	28	29	30	31	32	32
	7	5	5	6	6	6	6	6
Sub Total		**87**	**89**	**92**	**94**	**96**	**99**	**101**
ADDED AREA	**CC7**	25	27	41	45	49	64	73
Sub Total		**25**	**27**	**41**	**45**	**49**	**64**	**73**
REST OF CMA		0	0	0	0	0	0	0
Sub Total		0	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL		**112**	**116**	**132**	**138**	**145**	**163**	**174**

10.3. Chembarambakkam WS System:



The Chembarambakkam Lake was earmarked as water supply source to Chennai City in the year 2005. The capacity of the tank is 3645 MCFT and water spread area is 25.27 sq.km. The minor irrigation is being allowed from this tank; due to rapid urbanization the size of agriculture land is being reduced. In addition to the water received from own catchment area, water from the poondi reservoir has been diverted. In order to treat the water received from Krishna water source under the Telugu Ganga Project, 530 MLD water treatment plant at Chembarambakkam was constructed. The plant was commissioned on July 2007.

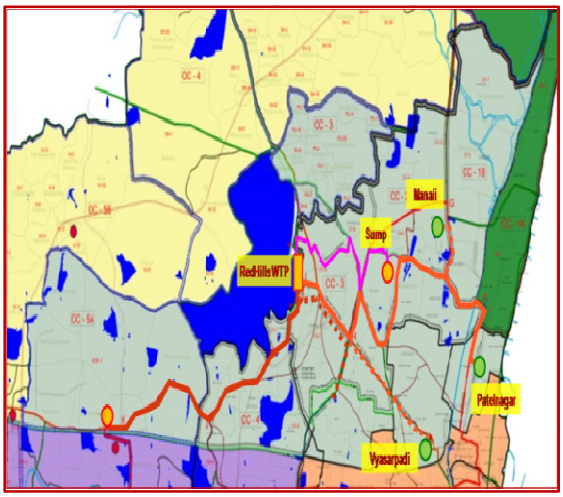
The proposed commendable areas that will cover under this Chembarambakkam System are 8-(Choolaimedu) of Core City, CC5, CC6, of Expanded City and OC6, OC8, OC9, OC10, OC11, OC12, OC13, OC14 in Rest of CMA.

The year wise demand and additional capacities of WTPs for each stage are given below is as given below:

Table 10-10: Zone wise & Year wise fresh water demand of Chembarambakkam System

CHEMBARAMBAKKAM WTP								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY	**8**	84	85	87	89	91	92	94
Sub Total		**84**	**85**	**87**	**89**	**91**	**92**	**94**
ADDED AREA	**CC5**	34	38	57	64	72	93	105
	CC6	25	28	41	45	50	64	71
Sub Total		**59**	**66**	**98**	**109**	**122**	**156**	**176**
REST OF CMA	**OC6**	13	14	24	29	34	52	62
	OC7	13	16	27	33	39	60	72
	OC8	16	19	35	42	49	74	85
	OC9	14	15	28	33	39	57	65
	OC10	8	10	16	19	22	33	37
	OC11	8	9	18	21	24	38	42
	OC12	10	10	19	22	26	38	43
	OC13	23	25	38	42	47	68	75
	OC14	13	15	25	29	32	48	53
Sub Total		**117**	**132**	**230**	**269**	**312**	**468**	**534**
TOTAL		**260**	**283**	**416**	**467**	**524**	**716**	**804**

10.4. Red Hills WS system



Raw water source to this system is from Puzhal Lake. The capacity of the tank is about 3300 mcft and water spread area of this tank is 18.13 sq.km water received from its own catchment area. Apart from this water from poondi reservoir is being received for treatment process. The Water drawn from this lake by intake arrangements is treated in the WTP of capacity of 300 MLD at Puzhal. Already a small WTP at Surapet of 14 MLD capacity which was taken over from TWAD Board is also under use. Therefore the Redhills system comprises of 314 MLD WTP.

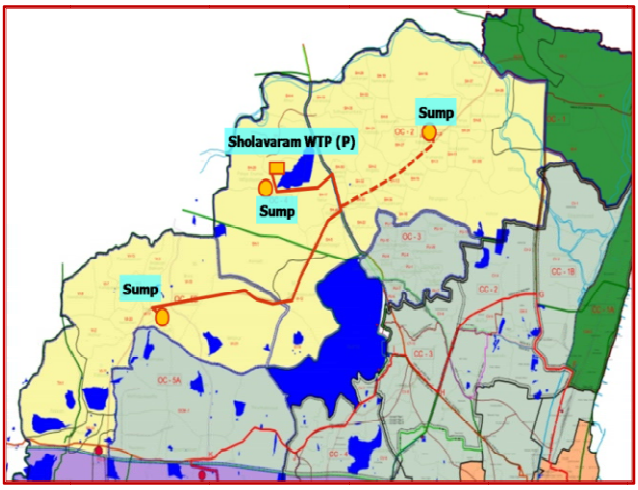
It is proposed to cover area 9 - (Kolathur),area 10-(Vyasarpadi), area11-(Patel Nagar) of Core city, CC-1B, CC2, CC3, CC4, of Expanded City and OC3, OC-5A in Rest of CMA. The year wise demand and an additional capacity is given below:

Table 10-7 : Year Wise Demand of Redhills system

REDHILLS WTP AND SURAPET								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY	**9**	29	30	31	32	32	33	34
	10	59	60	61	61	62	63	64
CORE CITY	**11**	30	31	31	32	33	33	34
Sub Total		**119**	**121**	**123**	**125**	**127**	**130**	**131**
ADDED AREA	**CC1-B**	7	7	13	15	17	24	29
	CC2	25	30	45	51	58	74	82
	CC3	6	7	11	13	16	22	28
	CC4	33	37	54	60	67	86	96
Sub Total		**70**	**81**	**123**	**140**	**158**	**206**	**234**
REST OF CMA	**OC3**	6	6	13	15	17	25	28
	OC5A	27	34	55	68	83	131	161
Sub Total		**33**	**40**	**68**	**82**	**100**	**156**	**189**
TOTAL		**222**	**241**	**314**	**347**	**385**	**492**	**555**

10.5. Cholavaram WS system

Cholavaramtank of capacity 881 Mcft which is fed by its own catchmentarea,diverting flood water from Kosathalaiyar river during rainy season,and received water from Poondiresevoir by a linking canal. Since there is no serving area at present therefore, no WTP is available. However, a new WTP is proposed near the tank for the commanding area proposed.



In this master plan the proposed areas that will be covered under this Cholavaram System are OC2, OC4, OC-5B in Rest of CMA. The year wise water demand and the additional capacity of WTP required is as given below:

Table 10-8 : Zone wise & Year Wise fresh Water Demand of Cholovaram System

CHOLAVARAM WTP (PROPOSED)								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY	**-**	-	-	-	-	-	-	-
Sub Total		-	-	-	-	-	-	-
ADDED AREA	**-**	-	-	-	-	-	-	-
Sub Total		-	-	-	-	-	-	-
REST OF CMA	**OC2**	10	10	23	28	32	55	61
	OC4	6	6	14	17	20	33	37
	OC5B	6	6	11	13	17	28	34
Sub Total		**22**	**23**	**48**	**58**	**69**	**115**	**133**
TOTAL		**22**	**23**	**48**	**58**	**69**	**115**	**133**

10.6. Minjur DSP WS system

A Sea water Desalination plant of 100 mld capacity has been commissioned on 31.07.2010 at Kattupalli Village near Minjur. For this plant sea water drawn through 1600 mm dia HDPE pipe at 635 m to form sea shore and reject disposed back to sea through 1600 mm dia HDPE pipe at a length of 700 m inside the sea through gravity flow with diffuser at the end. The plant was constructed by DBOOT (Design, Build, Own, Operate & Transfer) basis by M/s. Chennai Water

Desalination Ltd. (CWDL) and CMWSSB has entered bulk water purchase agreements with the firm for 25 years.

In this master plan it has been proposed to cover under this Minjur DSP source are, CC-1A of expanded city and OC1 in Rest of CMA.

The year wise (stage wise) Water demand is as given below:

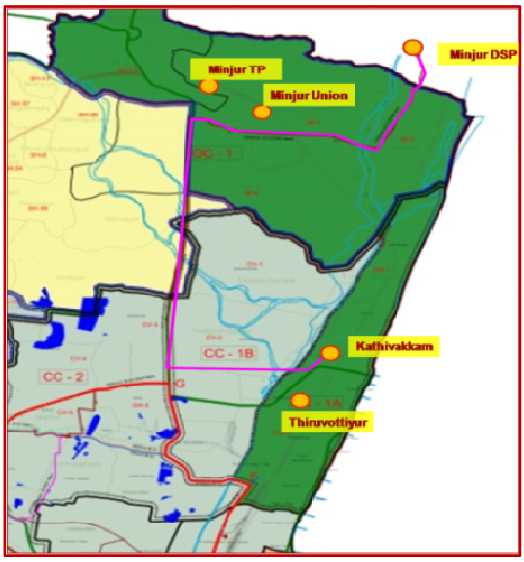
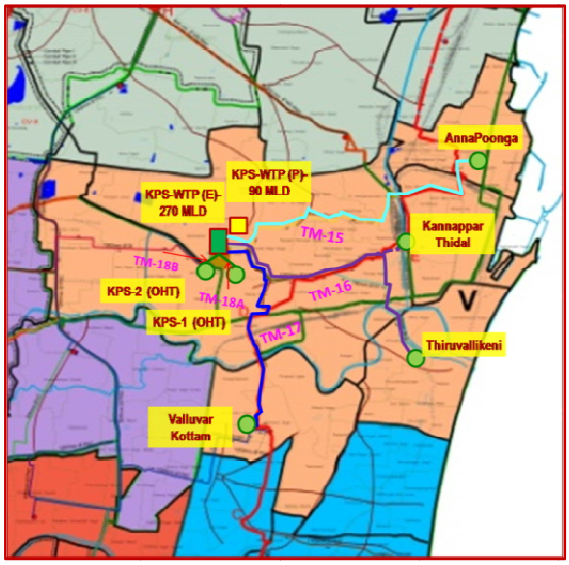


Table 10-13 : Zone wise & year wise fresh water demand of Minjur systems

MINJUR DSP								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY		0	0	0	0	0	0	0
ADDED AREA	CC1-A	34	36	50	52	55	66	69
Sub Total		34	36	50	52	55	66	69
REST OF CMA	OC1	5	6	11	13	16	26	30
Sub Total		**5**	**6**	**11**	**13**	**16**	**26**	**30**
TOTAL		**39**	**42**	**61**	**66**	**71**	**93**	**100**

10.7. Kilpauk WS system

Kilpauk water supply system is more than 100 years old. The first filtered water supply was commissioned during 1914. Raw water from Puzhal Lake is being conveyed through three numbers closed conduits vide Conduit I,Conduit II & Conduit III are the 3 Conduits convey water with carrying capacity of 104Mld,146Mld and 90 Mld respectively to the Kilpauk water treatment plant of its capacity 270 Mld. Conduit I&II are being used to draw raw water and the Conduit III is not in use. The damaged Conduit III is under



reconstruction.The raw water after treatment is being supplied to the core area of Chennai City.

The serving commendable area of water distribution is mostly parts of the core city (erstwhile Corporation). Subsequent additions of local bodies and increase in population have increased in drinking water demand. Development of Additional sources viz., Redhills, Veeranam, Chembarambakkam supplement to the additional requirement of water.

In this master plan it has been proposed to cover under this KPS WTP source are, existing WS Zones 1- (KPS), 2-(Anna Poonga), 3-(KannapparThidal), 4- (Triplicane) and 15-(Valluvar Kottam).

Table 10-9 : Zone wise & Year wise fresh water demand of Kilpauk (KPS) system

KILPAUK WTP								
AREA	**ZONE NOS.**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CORE CITY	**1**	167	170	174	176	180	183	186
	2	47	48	49	49	50	51	52
	3	46	46	47	47	48	48	49
	4	31	31	31	31	30	30	29
	15	26	26	27	27	28	28	29
	-	0	0	0	0	0	0	0
Sub Total		**317**	**322**	**327**	**331**	**336**	**340**	**344**

10.8. Total fresh water demand of all the 7 systems:

The total demand of all the 7 systems for the years 2020, 2025, 2030, 2035, 2040, 2045 and 2050 are given below:

Table 10-14 : Total fresh water raw water demand

ABSTRACT							
Name of Systems	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Nemmeli DSP-System	249	271	367	405	448	579	649
Veeranam (Porur WDS)	112	116	132	138	145	163	174
Chembarambakkam System	260	283	416	467	524	716	804
Redhills System	222	241	314	347	385	492	555
Cholavaram System	22	23	48	58	69	115	133
Minjur DSP-System	39	42	61	66	71	93	100
Kilpauk System	317	322	327	331	336	340	344
TOTAL	**1221**	**1298**	**1665**	**1812**	**1978**	**2498**	**2759**

10.9. Transmission System

After the water has been properly treated and made safe and wholesome, it has to be supplied to the consumers to their individual houses. The treated water has therefore to be taken from the treatment plant (WTP/DSP) and conveyed through pipes laid along the roads and streets in the city, so as to reach the individual houses. The function of carrying water from treatment Plant to the individual homes is acomplised through a well planned transmission and distribution system. Transmission system comprises of pipe network, main pipes and or brances which convey water by gravity or pumping from source to the sumps / service reservoirs which may be at ground level or elevated. The distribution pipe system consists of supply mains, sub mains branches and laterals; usually made of Cast Iron (CI), DI and Joints by means of spigot and socket joints. Sluice valves are placed along the straight length of the pipe at suitable intervals and also at all the junctions and branching off points so as to control the flow of water into the different sections.

Airvalves are placed at all high points so as to remove air from the pipe during the filling operations and also to admit air while emptying the pipe. The transmission mains / distribution mains are generally laid one side of the roads/streets.

Further the water may be supplied to the public either continuously for all the 24 hours of the day or it may be supplied intermittently during certain fixed hours of the day.Also water may either be pumped directly in to the distribution pipes, or it may first be stored in a distribution reservoir and then fed in to the distribution pipes.

The distribution pipes are generally laid on one side of the roads and the streets,usually below the footpaths at about 1.5m to 2m depth and 3m away (horizontally) from the sewers so as to avoid contamination of water through the leaky joints. Generally sewer lines run on one side of the streets and the water pipes run on the other side of the streets.

10.10. Transmission Mains

Each system will consist of number of transmission mains as per the locations of the beneficiaries and their requirements.

Design of transmission mains were carried out and furnished in the Annexurtes.

The design details will consist of

- Transmission Main No
- Details regarding its source such as Name, type of Treatment, Capacity etc.
- Starting Point
- Terminal Point

- Total Length
- No. of Tapping Points / Branches
- No. of Beneficiaries, type of local body wise
- Starting Flow
- Tail end flow
- Pipe details, material wise, and diameter wise for existing and proposed pipelines.
- Change of Tapping point
- Flow in the branches
- Flow in MLD for 2035 and 2050 in the reaches (between tapping points)
- Frictional loss in metre for 2035 and 2050 in the reaches.
- Hydraulic level for 2035 and 2050 at Tapping points, Starting and Terminal points.
- Low Water Level (LWL) at pumping Stations.
- Maximum Water Level in the Sump / Headworks at end of branch mains and Transmission Main.
- Pumping hours adopted : 23 hours

The table below shows the name of transmission mains under each system.

Table 10-19: Name of Transmission Mains

Sl.No	TM No	Title of Flow Diagram	Source
1	1	Transmission Main from P.S. at Nemmeli DSP 100 MLD to Thiruvanmiyur WDS	Nemmeli - 100 mld Existing DSP
2	2A	Transmission Main from Kelambakkam Sump to Semmencheri	Nemmeli - 100 mld (Exist.) & 150 mld (Prop.)
3	2B	Transmission Main from Akkarai Sump to Pallipattu	Nemmeli - 100 mld (Exist.) & 150 mld (Prop.)
4	3	Transmission Main from B.S. at Akkarai to Velachery (New)	Nemmeli - 100 mld (Exist.) & 150 mld (Prop.)
5	4	Transmission Main from B.S. at Kelambakkam to PORUR SUMP	Nemmeli - 100 mld (Exist.), 150 mld (Prop.) & Peru - 400 mld (Prop.)
6	5A	Transmission Main from Porur Sump to Ekkattuthangal WDS	Veeranam HW
7	5B	Transmission Main from Porur Sump to Velachery	Veeranam HW
8	6	Transmission Main from P.S. at existing 530 MLD WTP at Chembarambakkam to Choolaimedu	Chembarambakkam WTP
9	7	Transmission Main from P.S. at existing 530 MLD WTP at Chembarambakkam to Thirunindravur H.W	Chembarambakkam WTP
10	8	Transmission Main from P.S. at proposed 305 MLD WTP at Chembarambakkam to Peerkankaranai H.W	Chembarambakkam WTP
11	9	Transmission Main from P.S. at existing 300 MLD WTP at Redhills to Patel Nagar WDS	Redhills WTP
12	10	Transmission Main from P.S. at existing 300 MLD WTP at Redhills to Avadi H.W	Redhills WTP

Sl.No	TM No	Title of Flow Diagram	Source
13	11	Transmission Main from P.S. at existing14 MLD WTP at Soorapattu to Soorapattu Sump	Redhills WTP
14	12	Transmission Main from P.S. at proposed 260 MLD WTP at Redhills to Edayanchavadi & Others	Redhills WTP
15	13A	Transmission Main from Cholavaram to Sump OC4	Redhills WTP
16	13B	Transmission Main from Cholavaram to Sump OC5B	Cholavaram WTP
17	14	Transmission Main from P.S. at Kattupalli for Minjur DSP 100 MLD to Tiruvottiyur	Minjur 100 mld DSP
18	15	Transmission Main from P.S. at 360 MLD WTP at Kilpauk to Annapoonga WDS	KPS
19	16	Transmission Main from P.S. at 360 MLD WTP at Kilpauk to Triplicane WDS	KPS
20	17	Transmission Main from P.S. at 360 MLD WTP at Kilpauk to Valluvarkottam Head Works	KPS
21	18A	Transmission Main from P.S. at 360 MLD WTP at Kilpauk to 6.7 ML OHT (Old Tank)	KPS
22	18B	Transmission Main from P.S. at 360 MLD WTP at Kilpauk to 9.0 ML OHT (New Tank)	KPS
23		Pumping mains from DSPs around Nemmeli to Boosters stations at Kelamangalam and Akkarai	Nemmeli, Perur DSPs

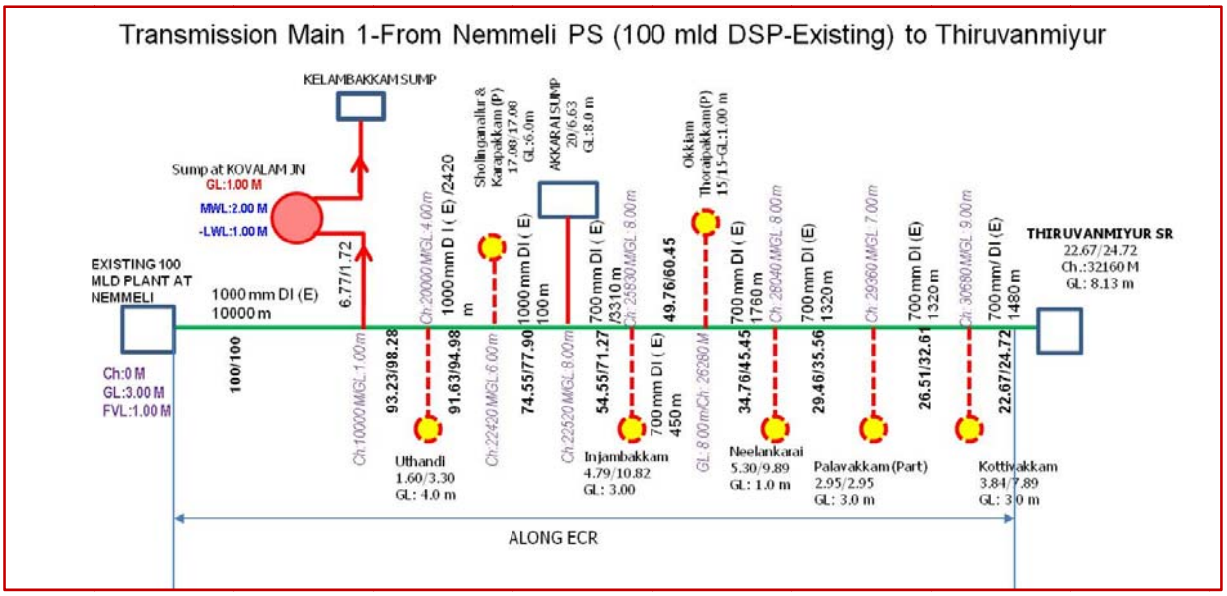
10.11. TRANSMISSION MAINS - DETAILS

NEMMELI SYSTEM

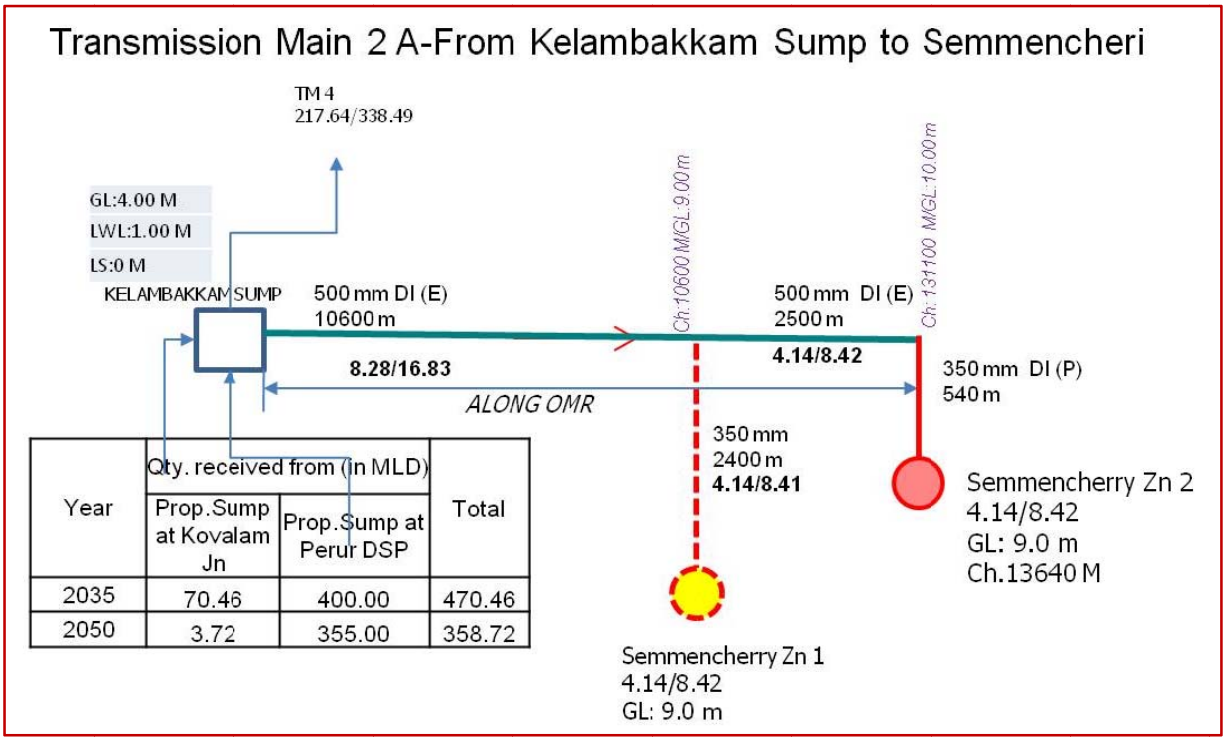
Nemmeli system consists of 4 Transmission mains viz. TM1, TM2A, TM2B, TM3 & TM4.

Table 10-20 : The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Nemmeli system

Transmission Main 1 - from Nemmeli DSP to Thiruvanmiyur WDS								
ZONE / GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
CC11	Uthandi	0.68	0.72	1.38	1.6	1.83	2.64	3.3
CC11	Sholinganallur.(Part)	5	7	12	17.08	17.08	17.08	17.08
CC10	Karapakkam (Part)							
CC10	Injambakkam	2.18	2.27	4.09	4.79	5.58	8.34	10.82
CC10	Oggiam Thuraipakkam (Part)	5	6	10	15	15	15	15
CC10	Neelankarai	2.86	2.94	4.84	5.3	5.8	8.12	9.89
CC10	Palavakkam (Part)	1	1	1.5	2.95	2.95	2.95	2.95
CC10	Kottivakkam	1.97	2.02	3.41	3.84	4.32	6.26	7.89
12A	THIRUVANMIYUR	20.724	21.604	22.11	22.671	23.463	24.156	24.717
	TOTAL	**39.414**	**43.554**	**59.33**	**73.231**	**76.023**	**84.546**	**91.647**

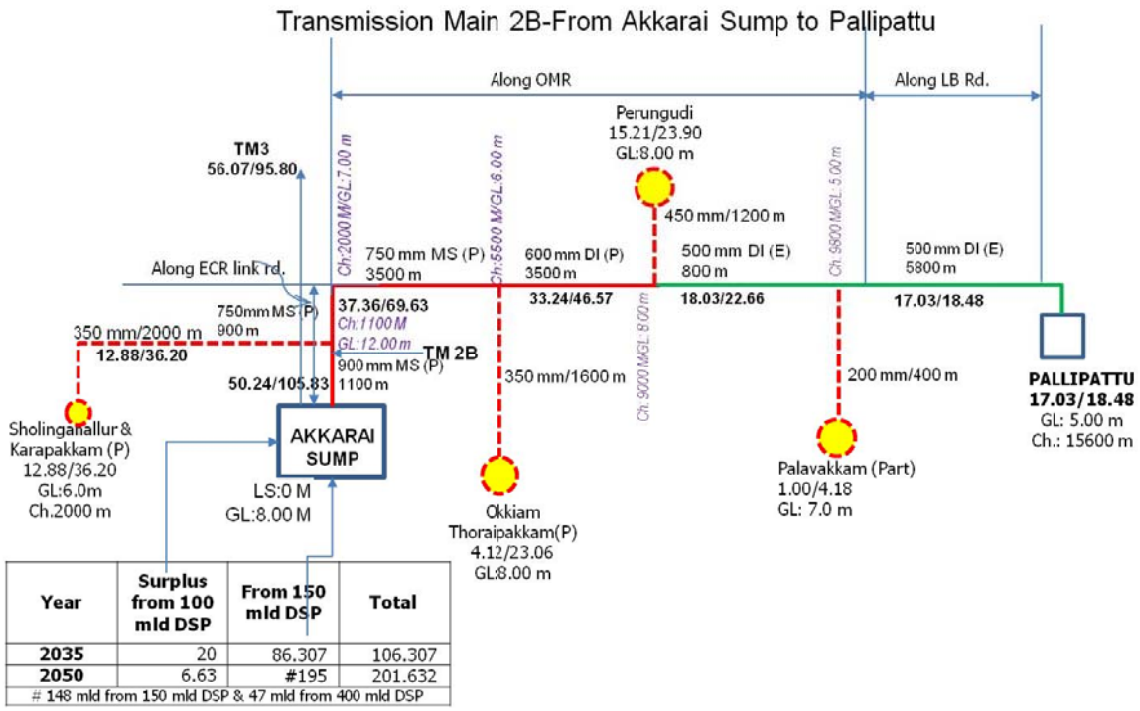


Transmission Main 2A - from Kelambakkam Sump to Semmencheri								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
CC11	Semmancheri	3.76	3.93	7.23	8.28	9.38	13.5	16.83



Year	Qty. received from (in MLD)		Total
	Prop.Sump at Kovalam Jn	Prop.Sump at Perur DSP	
2035	70.46	400.00	470.46
2050	3.72	355.00	358.72

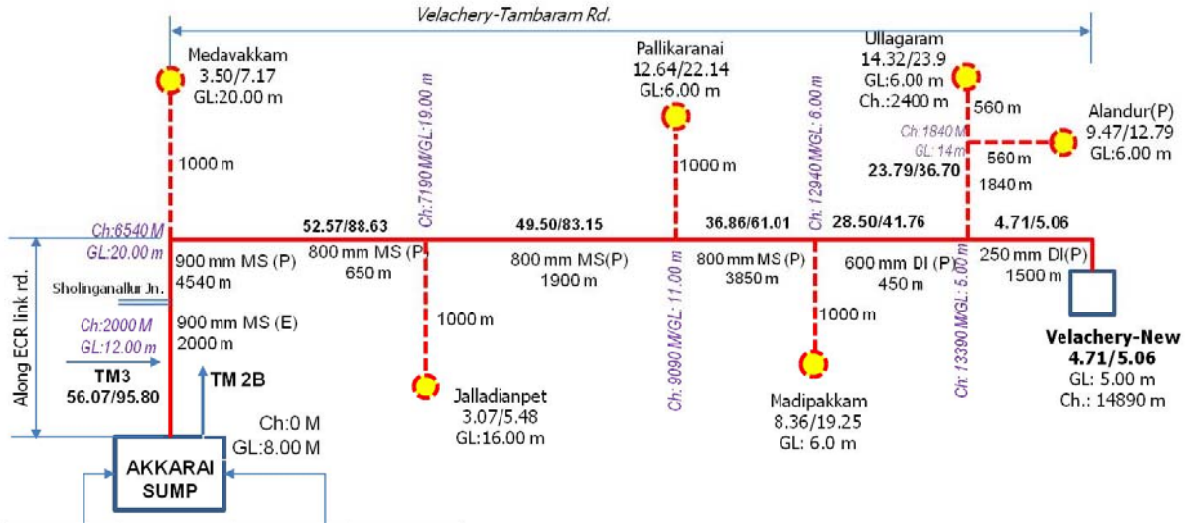
Transmission Main 2B - from Akkarai Sump to Pallipattu								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
CC10	Palavakkam (Part)	1.25	1.3	2.15	1	1.32	2.96	4.18
CC11	Sholinganallur (Part)	5.82	7.83	12.72	12.88	18.3	29.68	36.2
CC10	Karapakkam (Part)							
CC10	Oggiam Thuraipakkam (Part)	4.07	3.43	6.88	4.12	6.46	15.7	23.06
12	PALLIPATTU	15.62	16.247	16.61	17.028	17.567	18.095	18.48
CC9	Perungudi.	7.22	8.78	13.31	15.21	17.21	21.78	23.91
	TOTAL	**33.98**	**37.587**	**51.67**	**50.238**	**60.857**	**88.215**	**105.83**



Year	Surplus from 100 mld DSP	From 150 mld DSP	Total
2035	20	86.307	106.307
2050	6.63	#195	201.632
# 148 mld from 150 mld DSP & 47 mld from 400 mld DSP			

Transmission Main 3 - from BS at Akkarai to Velachery (New)								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
OC15	Medavakkam (Part)-Mouny Union-VP	1.55	1.605	2.96	3.5	4.12	6.195	7.17
CC9	Jalladianpet	1.78	1.81	2.85	3.07	3.3	4.55	5.48
CC9	Pallikkaranai	6	7.11	10.81	12.64	14.73	19.35	22.14
CC8	Madippakkam	3.74	3.87	7.11	8.36	9.82	14.75	19.25
CC8	Ullagaram-Puzhudhivakkam	7.19	8.37	12.5	14.32	16.41	21.23	23.91
CC8	Alandur (Part)	5.934	6.423	8.898	9.471	10.095	12.156	12.792
6A	Velachery new	4.345	4.488	4.598	4.708	4.829	4.983	5.06
	TOTAL	**30.539**	**33.676**	**49.726**	**56.069**	**63.304**	**83.214**	**95.802**

Transmission Main 3-From Akkarai Sump to Velachery-New

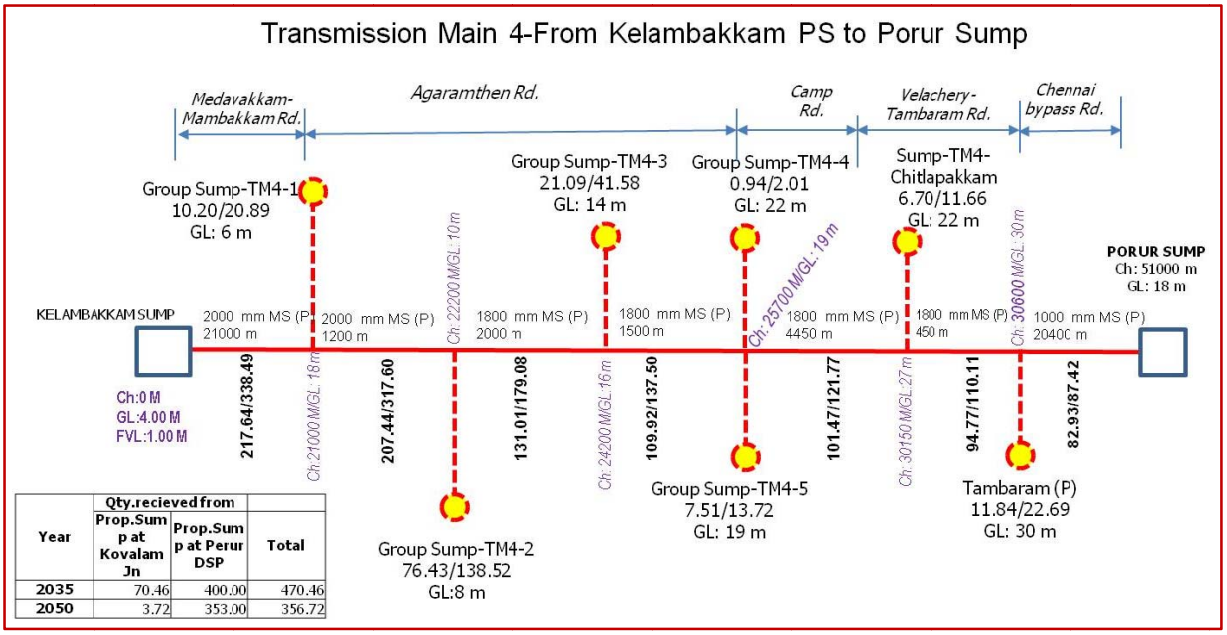


Year	Surplus from 100 mld DSP	From 150 mld DSP	Total
2035	20	86.307	106.307
2050	6.63	#195	201.632
# 148 mld from 150 mld DSP & 47 mld from 400 mld DSP			

Transmission Main 4 - from BS at Kelambakkam to Porur Sump								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
OC16	Mount Union-14 VPs	14.04	16.96	30.03	36.04	42.33	63.32	72.35
OC15	Mount Union-9VPs	30.785	34.375	55.5175	63.7425	72.64	105.91	119.1275
CC8	Alandur (Part)	5.934	6.423	8.898	9.471	10.095	12.156	12.792
OC16	Kattankulathur Union-12 VPs	2.5625	2.6575	5.4225	6.165	6.8975	10.2225	11.2325
OC16	Peerkankaranai (Part)	0.385	0.42	0.7	0.75	0.805	1.15	1.22

Transmission Main 4 - from BS at Kelambakkam to Porur Sump								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
OC15	Chitlapakkam	3.6	4.03	6.02	6.7	7.44	10.58	11.66
OC15	Tambaram (Part)	4.255	4.8575	7.415	8.46	9.6575	14.1975	16.2075
OC16	Tambaram (Part)	1.702	1.943	2.966	3.384	3.863	5.679	6.483
13	NANDANAM*	16.665	17.237	17.644	18.04	18.612	19.052	19.492
14	MYLAPORE*	35.618	36.608	36.85	37.114	37.774	38.379	38.445
16	SOUTHERN HEAD WORKS*	26.059	26.609	27.258	27.775	28.38	28.897	29.48
	TOTAL	**141.60**	**152.12**	**198.721**	**217.64**	**238.49**	**309.54**	**338.49**

- The requirement of Nandanam, Mylapore and SHW will be taken to proposed sump at Porur. From the porur sump along with the quqntity received from Veeranam, Chebmbarambakkam sources, water is pumped through the TM 5A to supply to Valasaravakkam (Chembarambakkam system) and through TM 5B, to supply to Nandanam, Mylapore and SHW (Nemmeli system). *(Refer to Designs of TM 5A & 5B)*



Year	Qty.recieved from		
	Prop.Sump at Kovalam Jn	Prop.Sump at Perur DSP	Total
2035	70.46	400.00	470.46
2050	3.72	353.00	356.72

10.12. VEERANAM SYSTEM (PORUR WDS)

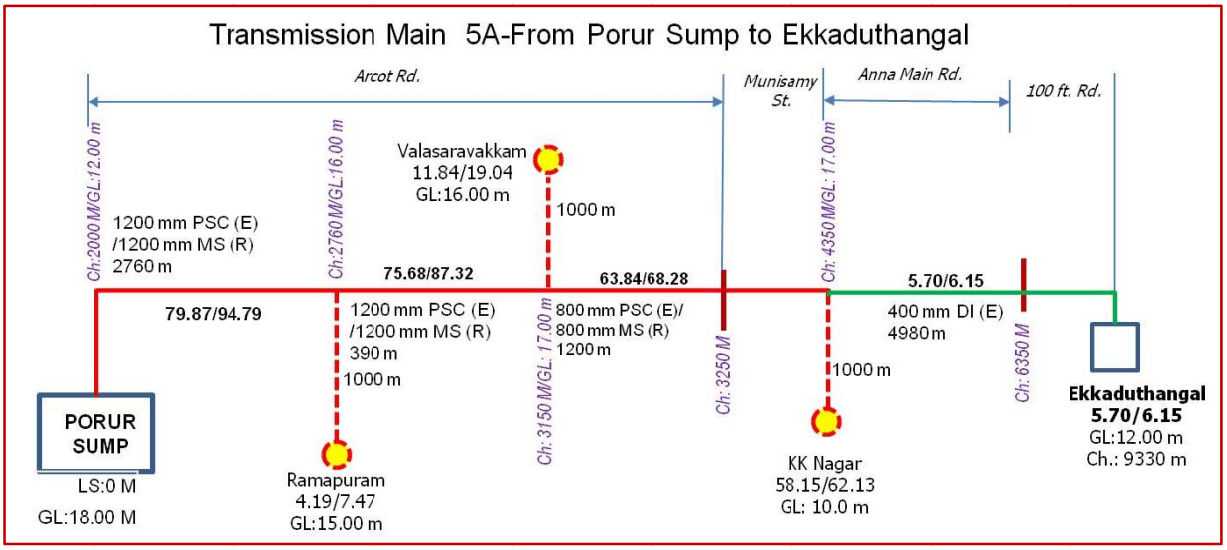
Veeranam system (Porur WDS) cosits of 2 Transmission Mains viz., TM 5A & TM 5B.

The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period, are given below:

Table 10-21: The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Veeranam system

Transmission Main 5A - from Porur Sump to Ekkattuthangal WDS									
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR							Remarks (source)
		2020	2025	2030	2035	2040	2045	2050	
5	KK NAGAR (OLD & New)	54.23	55.59	56.91	58.15	59.57	60.92	62.13	Veeranam System
CC7	Porur	5.79	6.34	8.88	9.54	10.25	12.43	13.17	
CC7	Ramapuram (Part)	2.44	2.49	3.90	4.19	4.51	6.21	7.47	
	TOTAL	**62.46**	**64.42**	**69.69**	**71.87**	**74.32**	**79.56**	**82.77**	
CC6	Valasarawakkam@	6.23	7.13	10.47	11.84	13.39	17.09	19.04	Chembarambakkam system
	TOTAL-FOR TM 5A	**68.69**	**71.55**	**80.16**	**83.71**	**87.71**	**96.65**	**101.81**	

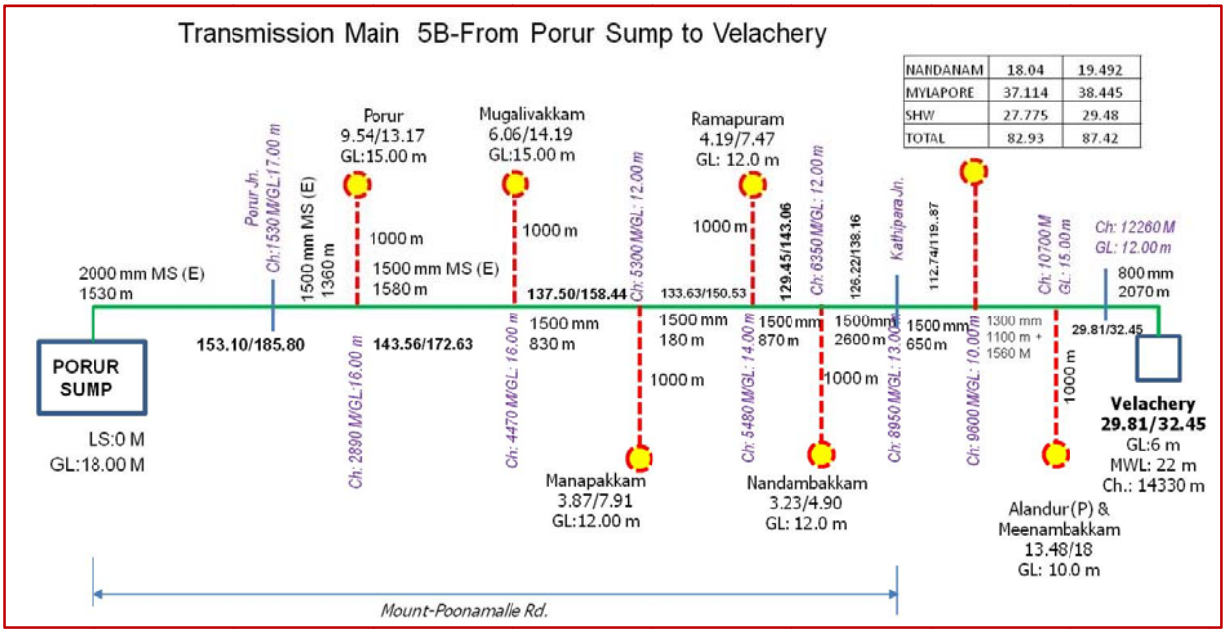
@ Beneficiary of Chembarambakkam system



Transmission Main 5B - from Porur Sump to Velachery									
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR							Remarks (source)
		2020	2025	2030	2035	2040	2045	2050	
6	VELACHERY	27.30	28.44	29.06	29.81	30.83	31.75	32.45	Veeranam System
6A	VELACHERY-NEW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7	EKKADUTHANGAL	5.27	5.43	5.57	5.70	5.86	6.02	6.15	
CC7	Ramapuram (Part)	2.44	2.49	3.90	4.19	4.51	6.21	7.47	
CC7	Manapakkam	1.73	1.8	3.38	3.87	4.4	6.35	7.91	
CC7	Nandambakkam	1.66	1.96	2.88	3.23	3.61	4.51	4.9	

Transmission Main 5B - from Porur Sump to Velachery									
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR							Remarks (source)
		2020	2025	2030	2035	2040	2045	2050	
CC7	Meenambakkam	0.52	0.55	0.79	0.85	0.93	1.16	1.24	
CC7	Mugalivakkam	2.65	2.75	5.12	6.06	7.16	10.82	14.19	
CC7	Alandur (Part)	7.912	8.564	11.864	12.628	13.46	16.208	17.056	
	TOTAL	**49.48**	**51.98**	**62.56**	**66.33**	**70.76**	**83.02**	**91.37**	
13	NANDANAM#	16.665	17.237	17.644	18.04	18.612	19.052	19.492	Nemmeli System
14	MYLAPORE#	35.618	36.608	36.85	37.114	37.774	38.379	38.445	
16	SOUTHERN HEAD WORKS#	26.059	26.609	27.258	27.775	28.38	28.897	29.48	
	TOTAL	**78.34**	**80.45**	**81.75**	**82.93**	**84.77**	**86.33**	**87.42**	
	TOTAL-FOR TM 5B	**127.82**	**132.43**	**144.31**	**149.26**	**155.53**	**169.35**	**178.78**	
TOTAL SUPPLY FROM PORUR WDS (SUMP) (SUPPLY THROUGH TM-5A & 5B)		**196.51**	**203.98**	**224.47**	**232.97**	**243.24**	**266.00**	**280.59**	

Beneficiaries of Nemmeli system



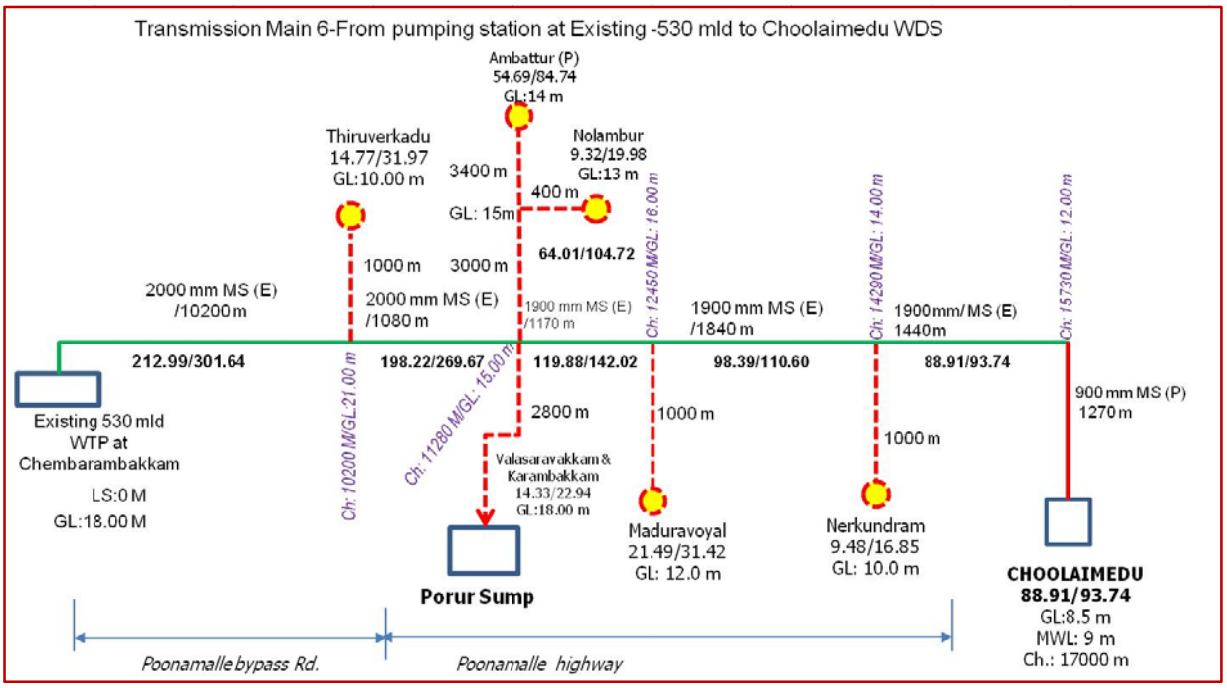
10.13. CHEMBARAMBAKKAM SYSTEM

Chembarambakk system with source of Chembarambakkam laake consists of 3 Transmission Mains viz., TM6, TM7 & TM8.

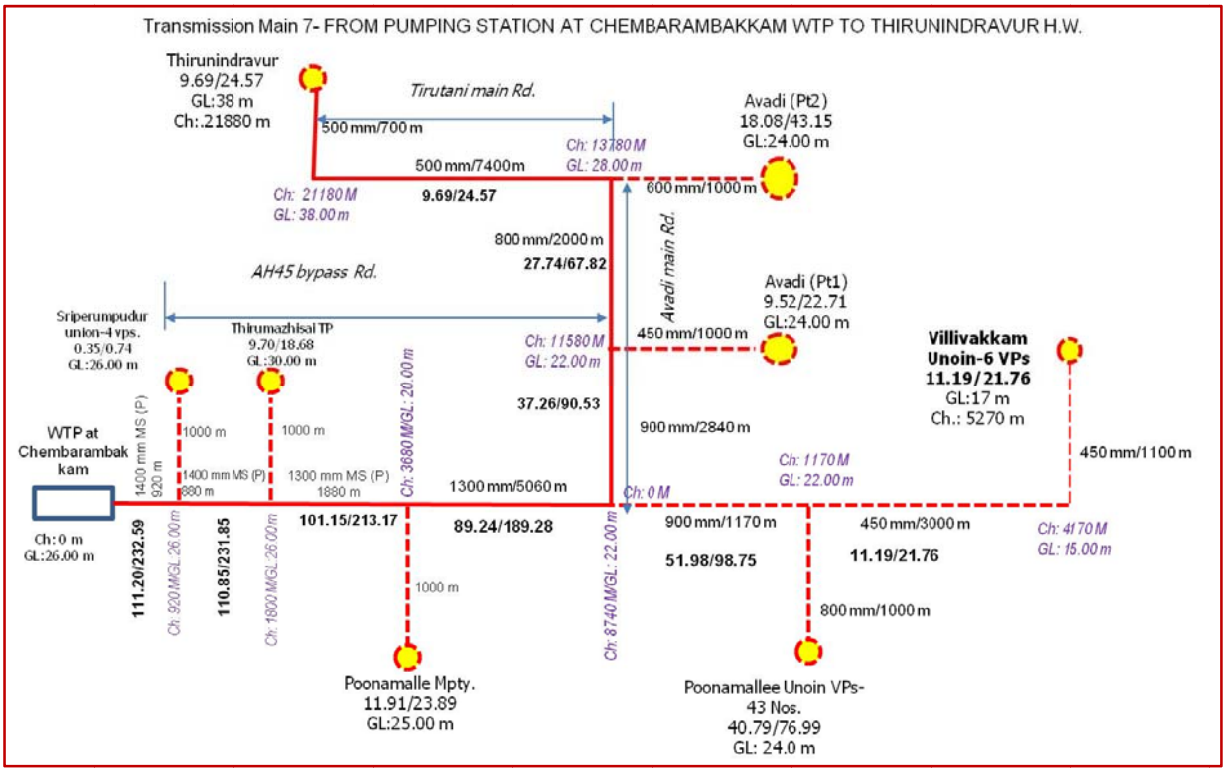
The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period, are given below:

Table 10-22 : The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Chembarambakkam system

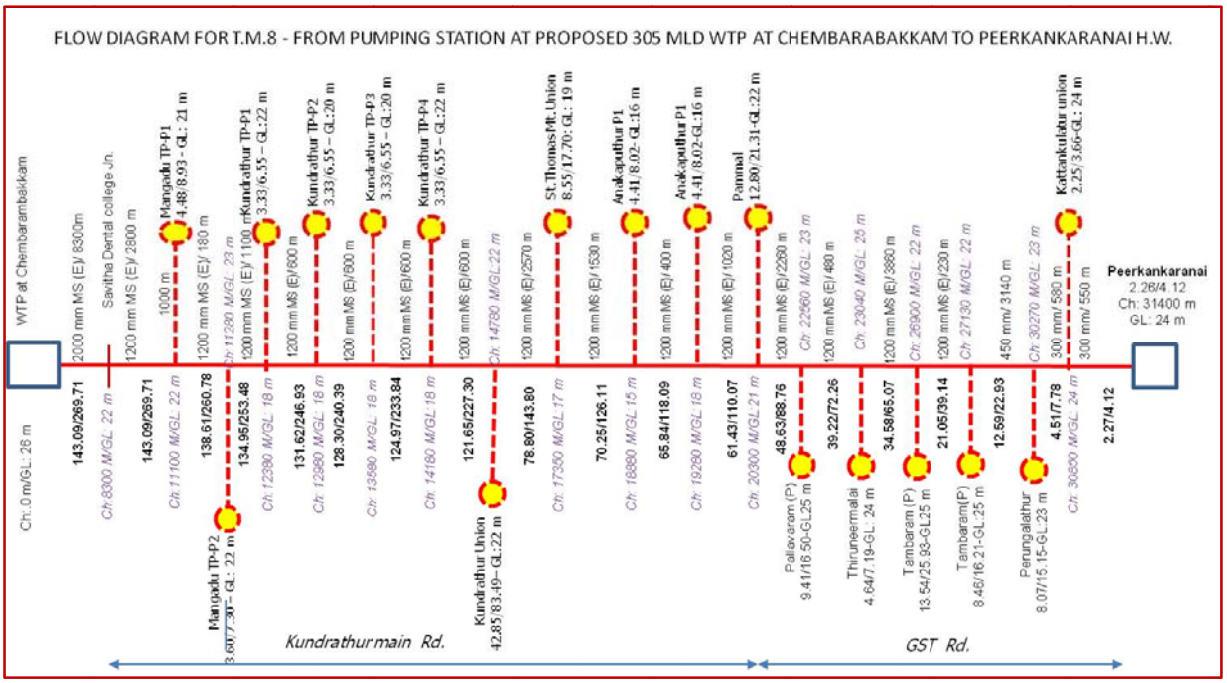
Transmission Main 6 - from Chembarambakkam to Choolaimedu								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
8	CHOOLAIMEDU	83.897	85.382	87.362	88.913	90.717	91.905	93.742
CC5	Ambattur (Part)	29.98	33.865	49.075	54.69	61.035	76.955	84.735
CC5	Nolambur	3.67	3.89	7.89	9.32	10.78	15.81	19.98
CC6	Maduravoyal	11.81	13.46	19.48	21.49	23.62	29.19	31.42
CC6	Nerkunram	5.54	5.65	8.82	9.48	10.19	14.02	16.85
OC7	Thiruverkadu (Part)	0.987	1.173	1.8645	2.2155	2.634	4.035	4.7955
OC6	Thiruverkadu (Part)	4.606	5.474	8.701	10.339	12.292	18.83	22.379
OC9	Thiruverkadu (Part)	0.987	1.173	1.8645	2.2155	2.634	4.035	4.7955
CC6	Valasarawakkam	6.23	7.13	10.47	11.84	13.39	17.09	19.04
CC6	Karambakkam	1.73	1.74	2.44	2.49	2.55	3.37	3.9
	TOTAL	149.437	158.937	197.967	212.993	229.842	275.24	301.637



Transmission Main 7 - from PS at Chembarambakkam to Thirunindravur HW								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
OC6	Villivakkam Union-2 VPs	3.13	3.22	5.65	6.53	7.55	11.14	12.72
OC9	Villivakkam Union-4VPs	2.2	2.26	4	4.66	5.37	7.91	9.04
OC7,OC8,OC9&OC11	Poonamalle Union-42VPs	16.12	16.96	34.87	40.79	46.8	69.12	76.99
OC7	Poonamallee (Part)	1.72	1.98	3.084	3.573	4.143	6.183	7.167
OC10	Poonamallee (Part)	4.00	4.64	7.19	8.33	9.66	14.42	16.72
OC7	Avadi (Part)	7.30	8.96	14.72	18.08	22.20	35.13	43.15
OC6	Avadi (Part)	3.84	4.71	7.75	9.516	11.68	18.49	22.71
OC8	Thirumazhisai	3.66	4.86	8.1	9.7	11.31	16.62	18.68
OC8	Thirunindravur (Part)	3.69	4.61	7.73	9.68	12.14	19.61	24.56
OC8 & OC11	Sriperumbudur Union-4 VPs	0.15	0.17	0.3	0.35	0.39	0.68	0.74
	TOTAL	**45.81**	**52.40**	**93.41**	**111.22**	**131.27**	**199.32**	**232.49**



Transmission Main 8 - from PS of proposed WTP at Chembarambakkam to Peerkankaranai HW								
ZONE/ GROUP	Name of Beneficiary	DESIGN YEAR						
		2020	2025	2030	2035	2040	2045	2050
OC9	Mangadu (Part)	2.10	2.45	3.83	4.47	5.20	7.76	8.92
OC10	Mangadu (Part)	1.71	2.00	3.13	3.66	4.26	6.34	7.30
OC9	Kundrathur (Part)	1.13	1.47	2.79	3.32	3.84	5.84	6.54
OC10	Kundrathur (Part)	1.13	1.47	2.79	3.32	3.84	5.84	6.54
OC11	Kundrathur (Part)	1.13	1.47	2.79	3.32	3.84	5.84	6.54
OC14	Kundrathur (Part)	1.13	1.47	2.79	3.32	3.84	5.84	6.54
OC9,OC10, OC11, OC12 & OC14	Kundratyhur Union-30 VPs	16.84	17.76	36.44	42.85	49.29	75.03	83.49
OC11, OC12 & OC14	Mount Union-3 VPs	3.64	3.77	7.21	8.55	10.04	15.29	17.7
OC12	Anakaputhur (Part)	2.28	2.34	3.905	4.41	4.965	7.17	8.02
OC13	Anakaputhur (Part)	2.28	2.34	3.905	4.41	4.965	7.17	8.02
OC13	Pammal	7.13	7.91	11.66	12.8	14	19.65	21.31
OC13	Pallavaram (Part)	5.05	5.65	8.44	9.40	10.46	14.93	16.50
OC13	Thiruneermalai (Part)	1.38	1.5	2.165	2.32	2.48	3.4	3.595
OC14	Thiruneermalai (Part)	1.38	1.5	2.165	2.32	2.48	3.4	3.595
OC13	Tambaram (Part)	6.80	7.77	11.86	13.53	15.45	22.71	25.93
OC14	Tambaram (Part)	4.25	4.85	7.41	8.46	9.65	14.19	16.20
OC14	Perungalathur.	3.12	3.83	7	8.07	9.16	13.7	15.15
OC14	Peerkankaranai (Part)	1.15	1.26	2.1	2.25	2.41	3.45	3.66
OC14	Kattankulathur Union-1 VP	0.93	0.98	1.98	2.26	2.54	3.75	4.11
	TOTAL	**64.64**	**71.84**	**124.4**	**143.08**	**162.76**	**241.35**	**269.70**



32 mld of supply from the existing water supply projects, in the rest of CMA of Chembarambakkam system, has been taken into account in this main as such this quantity is received at Chembarambakkam Head works.

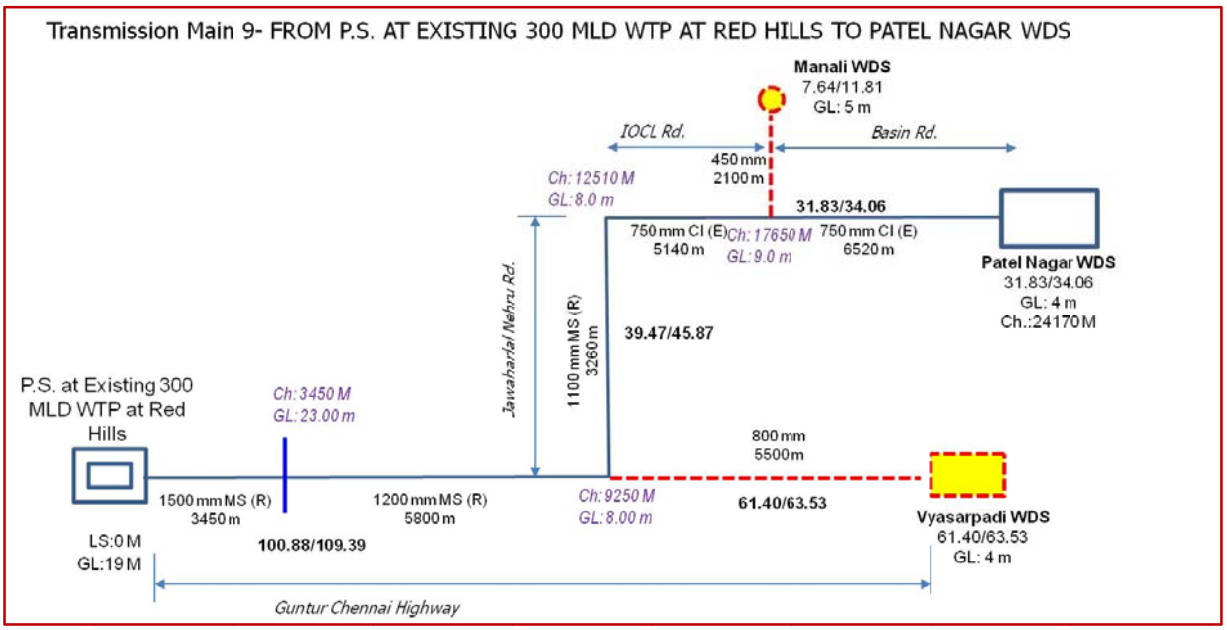
10.14. REDHILLS SYSTEM

Redhills system with source of Puzhal lake and WTPs at Puzhal and Surspet, consists of 4 transmission mains viz., TM9, TM10, TM11 & TM12.

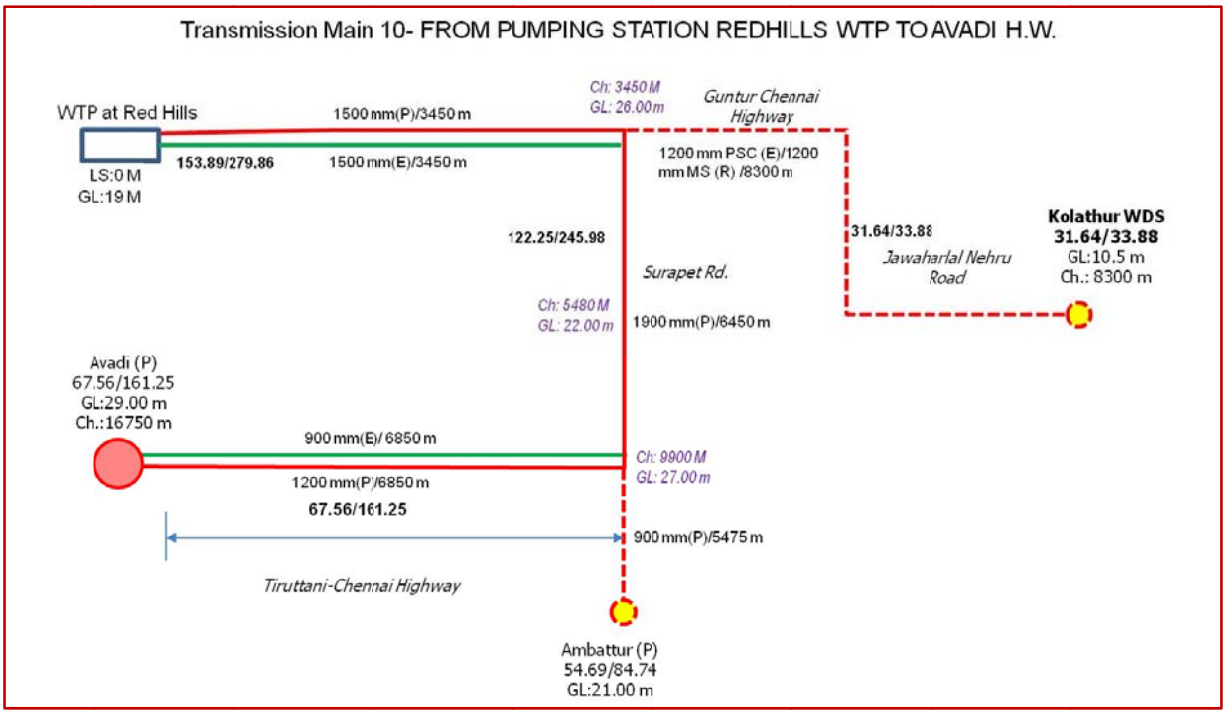
The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period, are given below:

Table 10-23 : The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Redhills system

Transmission Main 9 - from PS of existing WTP at Redhills to Patel Nagar WDS								
Zone / Group No.	**Name**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
10	Vyasarpadi	59.42	60.45	61.00	61.40	62.22	63.07	63.52
CC1-B	Manali (Part)	2.18	2.42	3.46	3.82	4.24	5.34	5.90
CC2	Manali (Part)	2.18	2.42	3.46	3.82	4.24	5.34	5.90
11	PATEL NAGAR	29.77	30.6	31.29	31.83	32.68	33.39	34.05
	TOTAL	**93.56**	**95.99**	**99.23**	**100.87**	**103.39**	**107.16**	**109.39**

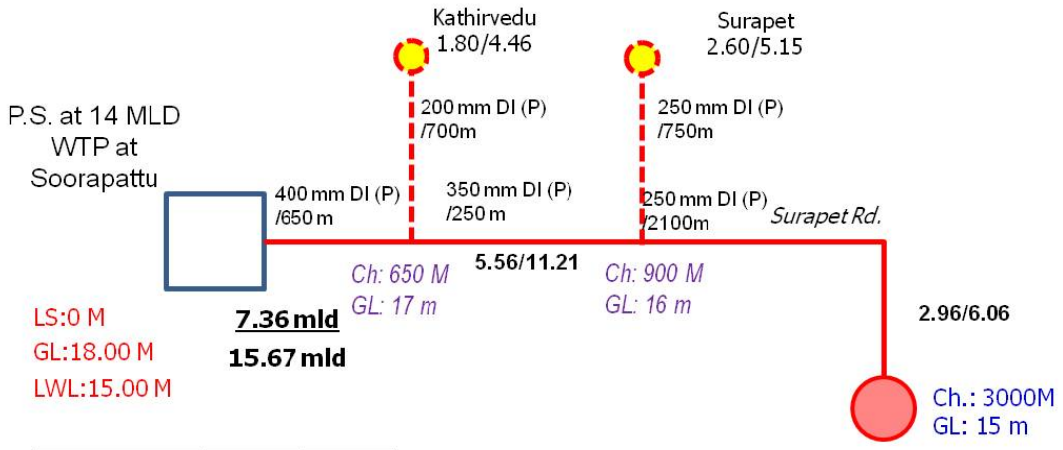


Transmission Main 10 - from PS of existing WTP at Redhills to Avadi HW								
Zone/Group No.	**Name**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
9	KOLATHUR	29.30	30.26	30.94	31.63	32.41	33.29	33.88
OC5A	Avadi (Part)	27.27	33.50	55.02	67.56	82.99	131.29	161.24
CC4	Ambattur (Part)	29.98	33.8	49.07	54.69	61.03	76.95	84.73
	TOTAL	**86.56**	**97.63**	**135.04**	**153.88**	**176.44**	**241.54**	**279.86**



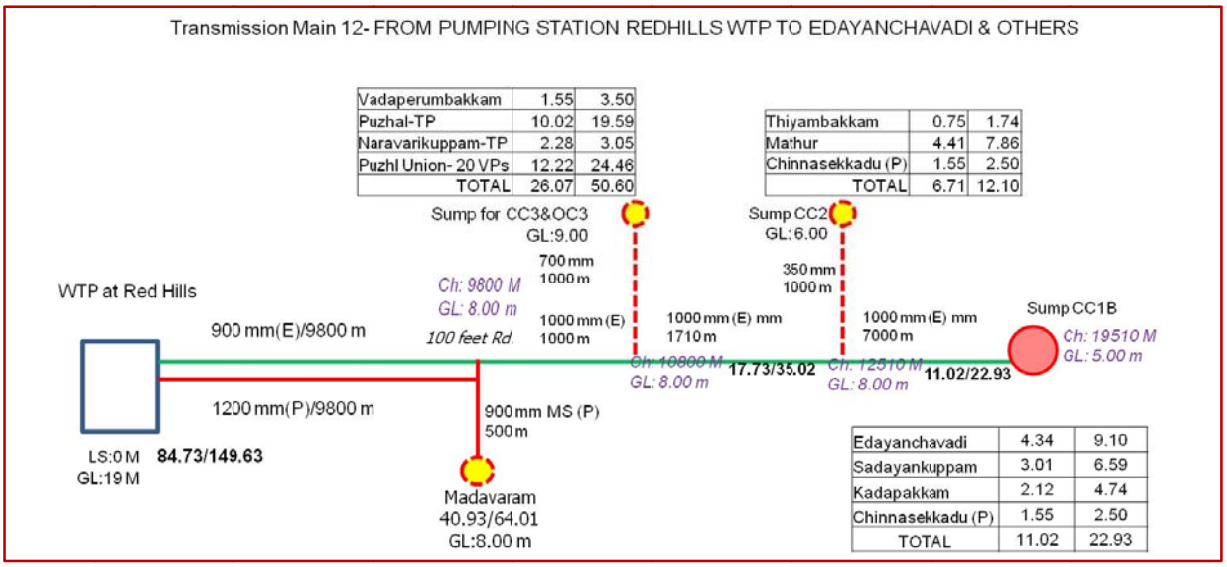
Transmission Main 11 - from PS of existing WTP at Soorapattu to Soorapattu Sump								
Zone/Group No.	**Name**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CC3	Kathirvedu	0.8	0.83	1.52	1.8	2.15	3.31	4.46
CC4	Soorapattu	1.23	1.28	2.29	2.6	2.9	4.15	5.15
CC4	Puthagaram	1.33	1.39	2.58	2.96	3.37	4.86	6.06
	Total for TM 13B & branch	**3.36**	**3.5**	**6.39**	**7.36**	**8.42**	**12.32**	**15.67**

Transmission Main 11- FROM P.S. AT WTP AT SOORAPATTU TO SUMP AT SOORAPATTU



Kathirvedu	1.80	4.46
Soorapattu	2.60	5.15
Puthagaram	2.96	6.06
TOTAL	**7.36**	**15.67**

Transmission Main 12 - from PS of proposed WTP at Redhills to Edayanchavadi & Others								
Zone/Group No.	**Name**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CC2	Madhavaram	19.62	23.74	35.87	40.93	46.2	58.39	64.01
CC3	Vadaperumbakkam	0.52	0.56	1.27	1.55	1.84	2.74	3.5
CC3	Puzhal	4.51	5.43	8.39	10.02	12.04	16.41	19.59
OC3	Naravarikuppam	1.64	1.67	2.26	2.28	2.31	3.01	3.05
OC3	Puzhal Union-20 VPs	4.11	4.37	10.24	12.22	14.2	21.78	24.46
CC2	Thiyambakkam	0.22	0.24	0.59	0.75	0.9	1.35	1.74
CC2	Mathur	2.57	2.62	4.1	4.41	4.74	6.53	7.86
CC2	Chinnasekkadu(Part)	0.82	0.935	1.375	1.55	1.755	2.245	2.495
CC1-B	Edayanchavadi	1.79	1.89	3.72	4.34	4.98	7.24	9.1
CC1-B	Sadayankuppam	1.11	1.18	2.51	3.01	3.52	5.18	6.59
CC1-B	Kadapakkam	0.75	0.8	1.76	2.12	2.51	3.72	4.74
CC1-B	Chinnasekkadu(Part)	0.82	0.935	1.375	1.55	1.755	2.245	2.495
	Total for TM 13B & branch	**38.48**	**44.37**	**73.46**	**84.73**	**96.75**	**130.84**	**149.63**



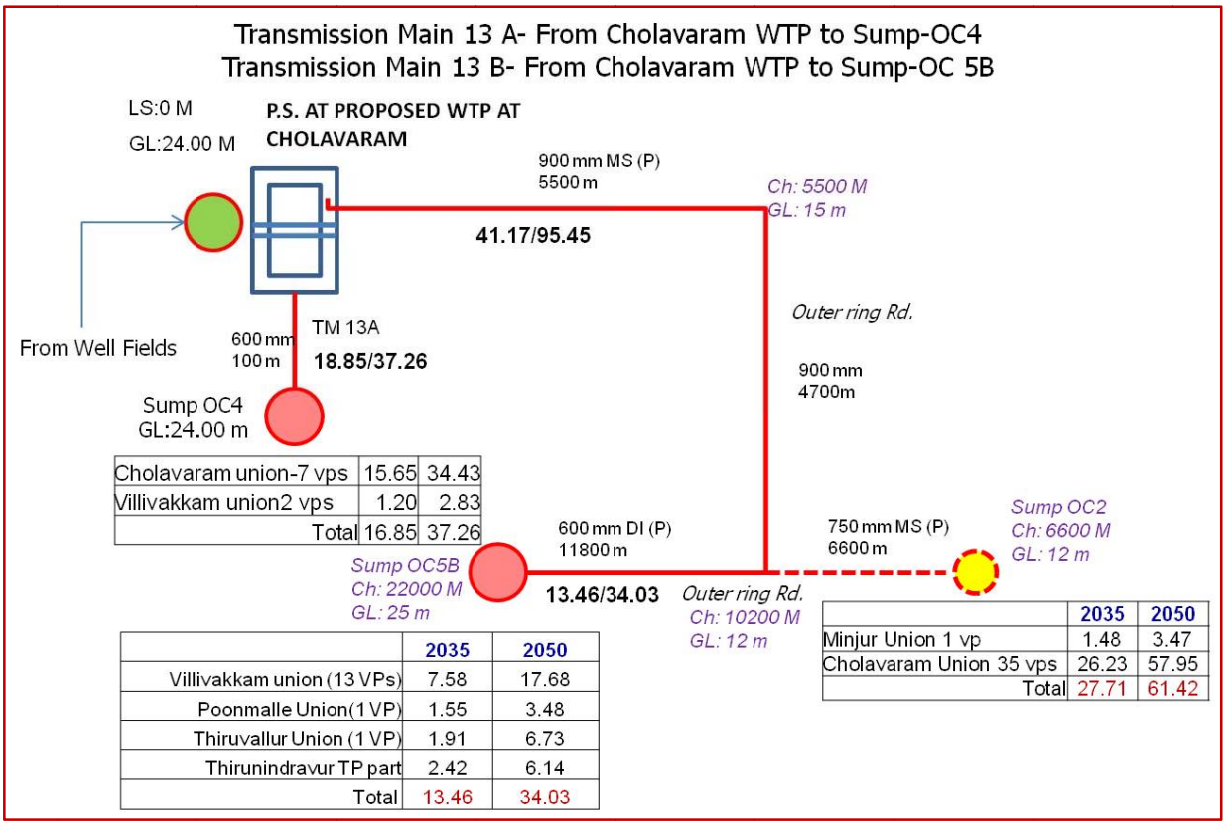
10.15. CHOLAVARAM SYSTEM

Cholavaram system with source of Cholavaram lake WTPs atCholavaram, consists of 2 transmission mains viz., TM13A & TM13B.

The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period, are given below:

Table 10-24 : The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Cholavaram system

Transmission Main 13A - from Cholavaram WTP at Redhills to Sump-OC 4								
Zone / Group No.	**Name**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
OC4	Cholavaram Union-7 VPs	5.46	5.84	12.98	15.65	18.27	30.58	34.43
	Villivakkam Union-2 VPs	0.59	0.6	1.04	1.2	1.4	2.47	2.83
	Total for TM 13A	**6.05**	**6.44**	**14.02**	**16.85**	**19.67**	**33.05**	**37.26**
Transmission Main 13B - from Cholavaram WTP at Redhills to Sump-OC 5B								
Zone / Group No.	**Name**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
OC2	Minjur Union-1 VPs	**0.532**	**0.568**	**1.22**	**1.48**	**1.732**	**3.064**	**3.468**
OC2	Cholavaram Union-33 VPs	9.18	9.85	21.77	26.23	30.67	51.51	57.95
OC5B	Villivakkam Union-13 VPs	3.65	3.75	6.56	7.58	8.77	15.55	17.68
OC5B	Tiruvallur Union-1 VP	0.85	0.88	1.21	1.91	3.53	4.21	6.73
OC5B	Poonamalle Union-1 VP	0.66	0.69	1.33	1.55	1.79	3.11	3.48
OC5B	Thirunindravur TP(Part)	0.922	1.154	1.934	2.422	3.036	4.904	6.142
	Total for TM 13B & branch	**15.794**	**16.892**	**34.024**	**41.172**	**49.528**	**82.348**	**95.45**
	Total for Cholavaram System	**21.844**	**23.332**	**48.044**	**58.022**	**69.198**	**115.398**	**132.71**



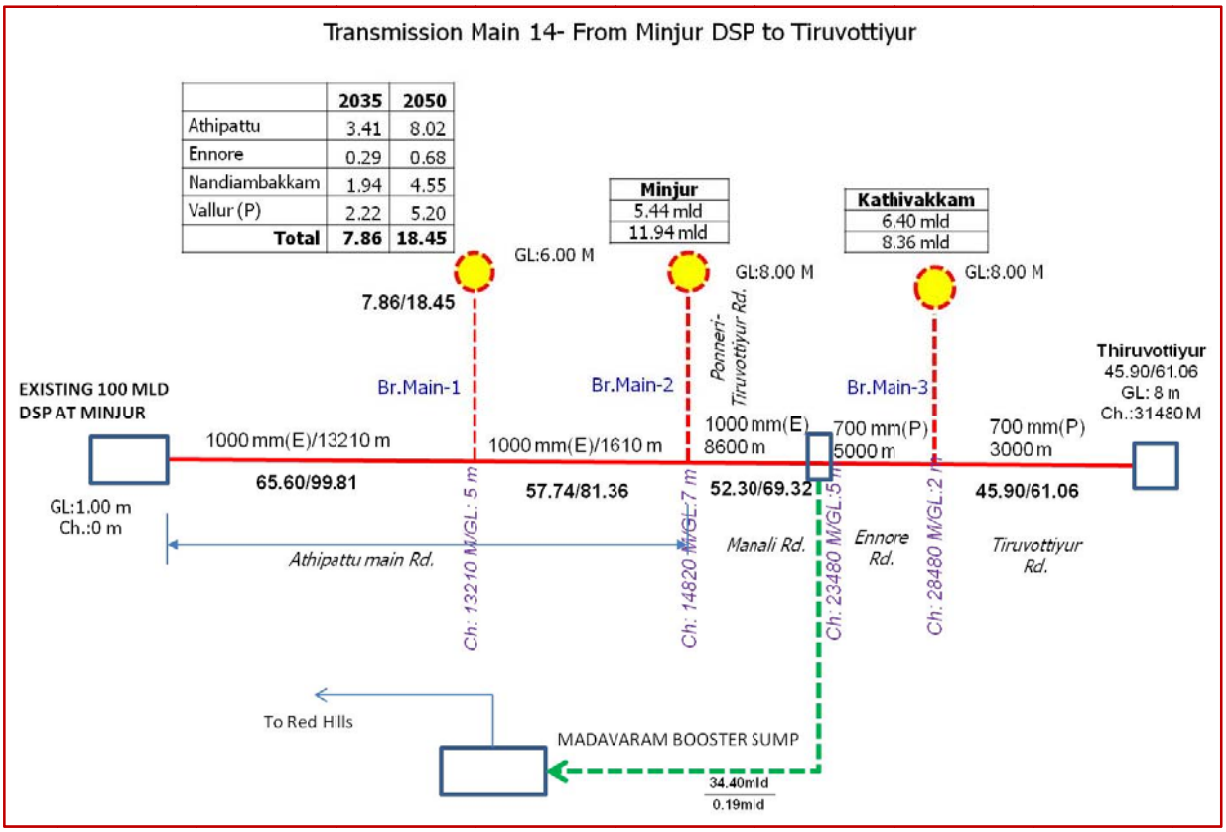
10.16. MINJUR SYSTEM

Minjur system with source of Minjur DSP located at Kattupalli consists of 1 Transmission Main viz., TM14.

The beneficiaries covered under this Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period, are given below:

Table 10-25 : The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Minjur system

Transmission Main 14 - from PS at Minjur DSP to Tiruvottiyur								
Group No.	**NAME**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CC1-A	Kathivakkam	4.21	4.48	6.1	6.4	6.73	8.03	8.36
CC1-A	Thiruvottiyur	29.44	31.57	43.42	45.9	48.65	58.29	61.06
OC1	Minjur	2.16	2.54	4.62	5.44	6.41	10.12	11.94
OC1	Athipattu	1.22	1.31	2.83	3.41	3.99	7.08	8.02
OC1	Ennore	0.1	0.11	0.23	0.29	0.34	0.59	0.68
OC1	Nandiambakkam	0.69	0.75	1.61	1.94	2.28	4.03	4.55
OC1	Vallur (Part)	0.798	0.852	1.83	2.22	2.598	4.596	5.202
	TOTAL OF MINJUR SYSTEM	**38.61**	**41.61**	**60.64**	**65.6**	**70.99**	**92.73**	**99.81**



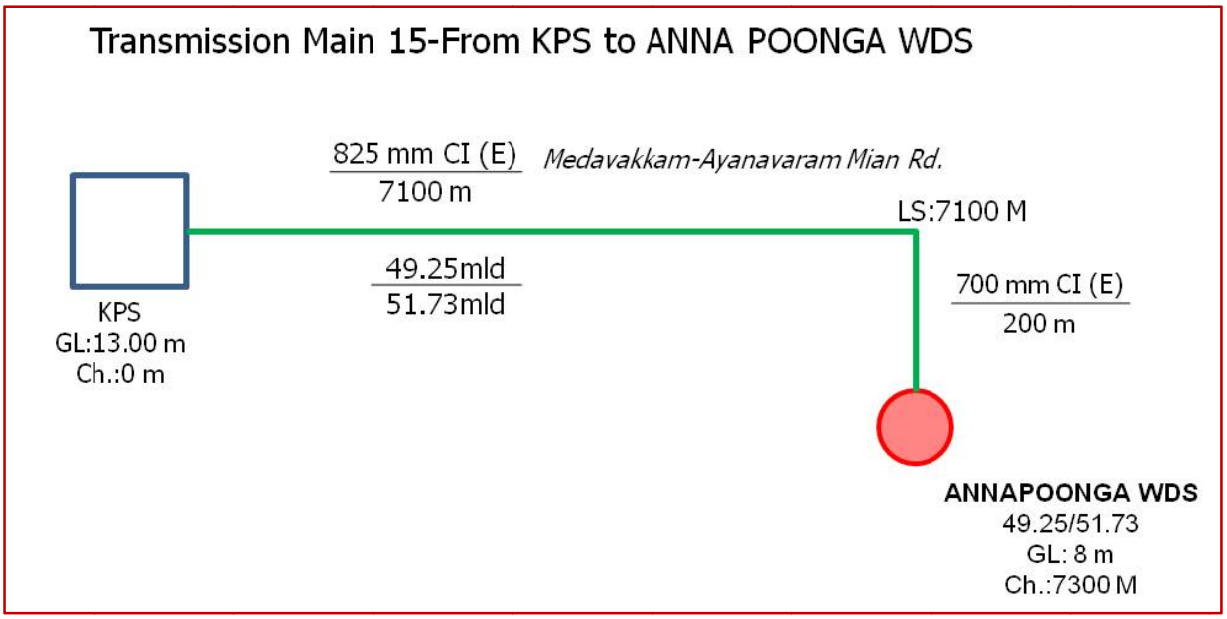
10.17. KPS SYSTEM

KPS system with source of raw water from Puzhal lake and WTP located at KPS consists of 5 Transmission Mains viz., TM15, TM16, TM17 and TM18A & 18B.

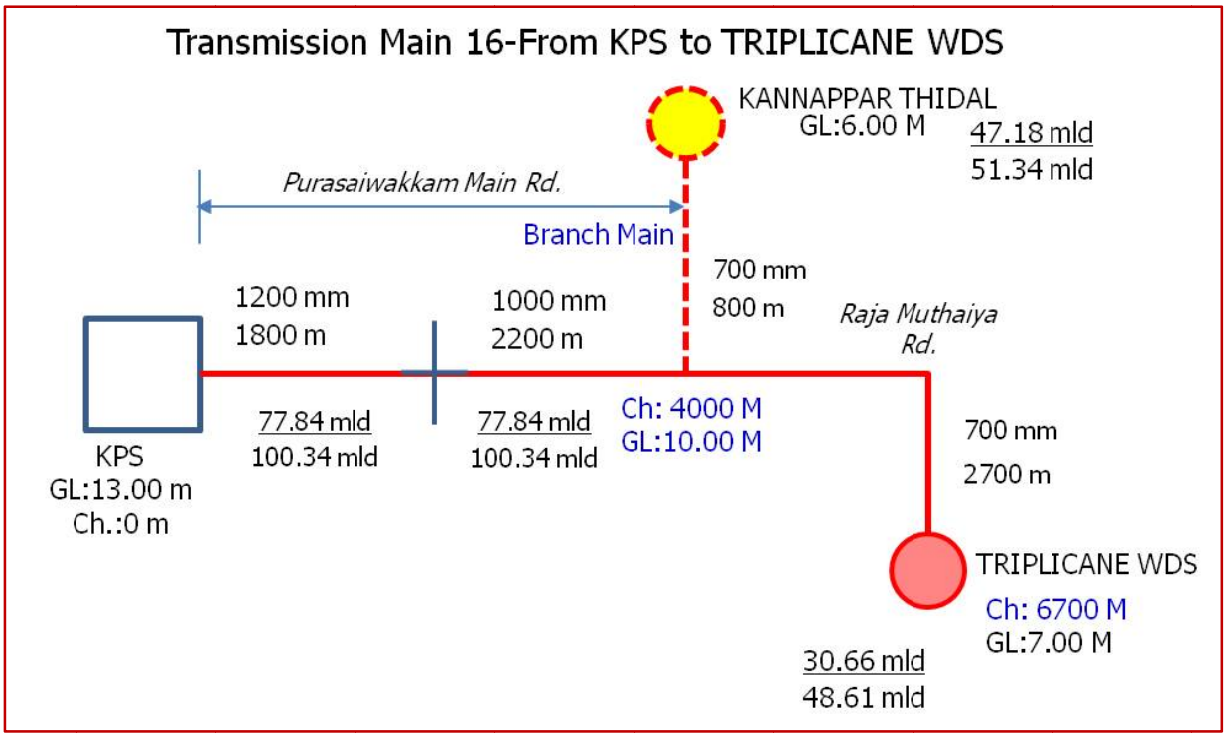
The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period, are given below:

Table 10-26 : The beneficiaries covered under each Transmission Main along with the demands for the design years viz. 2020 to 2050 with the interval of 5 years period for Kilpauk system

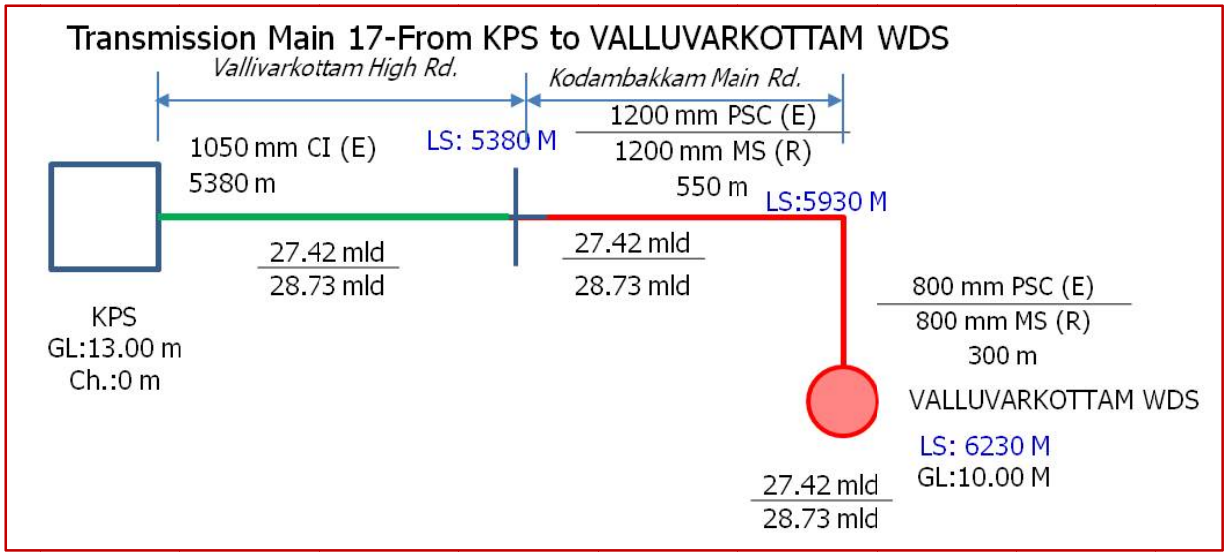
Transmission Mains 15 - from KPS to Anna Poonga WDS								
ZONE NO.	NAME	2020	2025	2030	2035	2040	2045	2050
2	ANNA POONGA	46.76	47.92	48.55	49.24	50.18	51.15	51.73



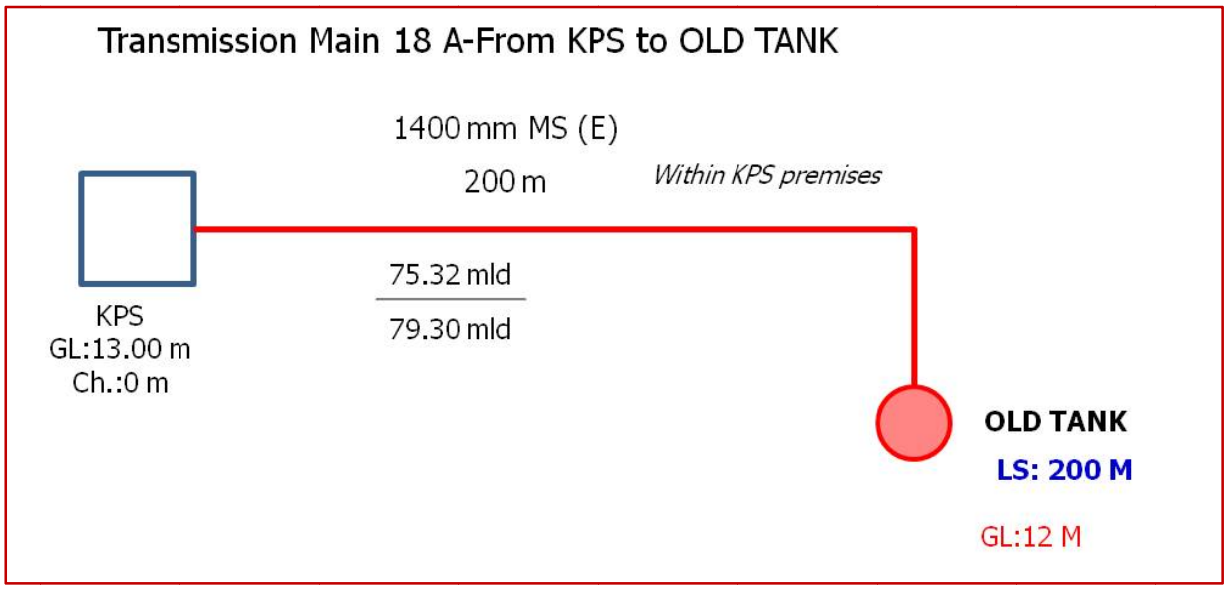
Transmission Mains 16 - from KPS to Triplicane WDS								
ZONE NO.	**NAME**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
3	KANNAPPAR THIDAL	45.68	46.46	46.78	47.17	47.74	48.41	48.6
4	TRIPLICANE	31.27	31.41	31.18	30.65	30.45	30.2	29.43
	Total	**76.95**	**77.87**	**77.96**	**77.82**	**78.19**	**78.61**	**78.03**

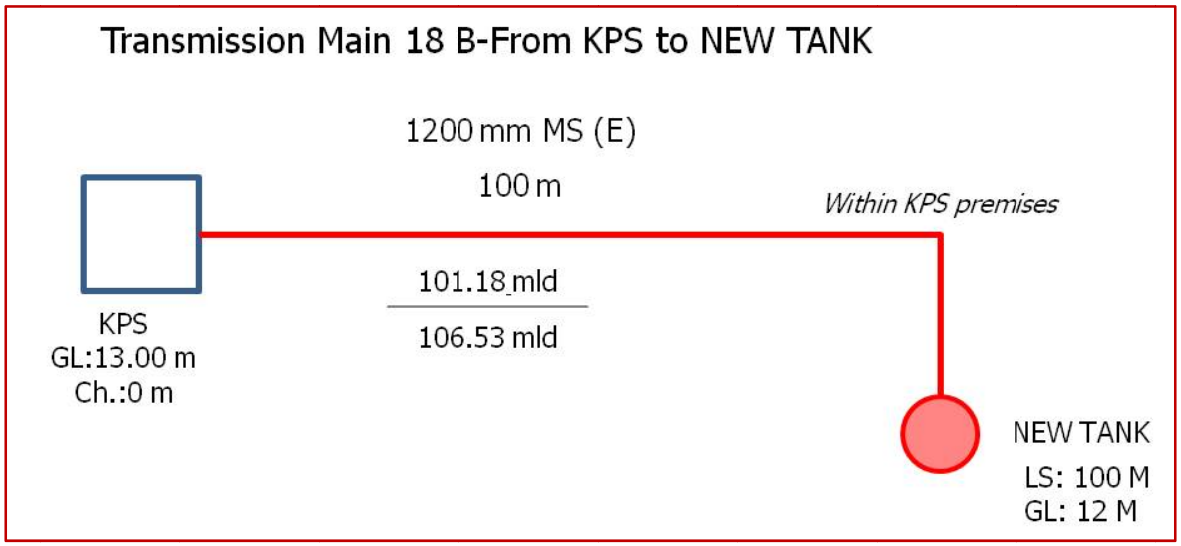


Transmission Mains 17 - from KPS to Valluvarkottam WDS								
ZONE NO.	**NAME**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
15	VALLUVAR KOTTAM	26.08	25.97	27.06	27.42	27.88	27.81	28.73



Transmission Mains 18 A – from KPS to Old Tank & 18 B – from KPS to New Tank								
ZONE NO.	NAME	2020	2025	2030	2035	2040	2045	2050
1	18 A & 18 B	166.87	169.95	173.82	176.49	179.81	182.67	185.83
TOTAL OF KPS SYSTEM		316.66	321.72	327.4	331	336.03	340.26	344.34





The salient details of the proposed Transmission mains are furnished below:

Table No. 10.27 Salient Details of Transmission Mains

Sl No	TM No.	Source Details				Transmission Main				Start Flow in MLD (2050)	Tail end Flow in MLD (2050)	No. of Beneficiaries Covered							Pipe Details		Remarks
												Core city	Added Area			Rest ofg CMA					
		Name	Capacity in MLD	Type of Treatment	Location	From	To	Total Length in 'm'	Route Along Roads			WDS	Mpty	TPs	VPs	Mpty	TPs	VPs	Max Dia in mm	Min Dia in mm	
1	1	Nemmeli DSP	100 (E)	DSP	Nemmeli	DSP PS	Thiruvanmiyur WDS	32160	ECR	100	24.72	1	-	1(P)	4+ 3 (P)	-		-	1000	700	
2	2A	Nemmeli DSP	150(E)	DSP	Nemmeli	Kelambakkam B.S.	Semmencheri	13640	OMR	16.83	8.42		-	-	1	-	-	-	500	350	
3	2B	Nemmeli DSP				Akkarai Sump	Pallipattu HW	15600	Along ECR link Rd, OMR, LB Rd.	105.83	18.48	1		1+1 (P)	3 (P)				900	500	
4	3	Nemmeli DSP				Akkarai Sump	Velachery-NEW - HW	14890	Along ECR link Rd, Velachery-Tambaram Rd.	95.8	5.06	1	2(P)		4				900	250	

Sl No	TM No.	Source Details				Transmission Main				Start Flow in MLD (2050)	Tail end Flow in MLD (2050)	No. of Beneficiaries Covered							Pipe Details		Remarks
												Core city	Added Area			Rest ofg CMA					
		Name	Capacity in MLD	Type of Treatment	Location	From	To	Total Length in 'm'	Route Along Roads			WDS	Mpty	TPs	VPs	Mpty	TPs	VPs	Max Dia in mm	Min Dia in mm	
5	4	Nemmeli DSP	400(P)	DSP	Perur	Kelambakkam B.S.	Porur WDS	51000	Medavakkm-Mambakkam RD, Agaramthen Rd, Camp Rd. Velachry-Tambaram Rd., Chennai bypass Rd.	338.49	87.42	3	1(P)			2	4	25	2000	1000	
6	5A	Veeranam Lake	180(E)	WTP	Vadakkuthu	Porur B.S.	Ekkattuthangal HW	9330	Mount to Poonamallee Rd, Arcot Rd, Anna Main Rd.	94.79	6.15	2	1(P)	1(P)		-	-	-	1200	400	
7	5B	Veeranam Lake	180(E)	WTP	Vadakkuthu	Porur B.S.	Velachery HW	14330	Mount-Poonamalle Rd.	185.80	32.45	1+3(Nemmeli sys)	1(P)	3	3	-	-	-	2000	800	
8	6	Chembarm-bakkam Lake	530 (E)	WTP	Chembarambakkam	PS at 530 MLD WTP Chembarambakkam	Choolaimedu HW	17000	Poonamalle bypass RD., Poonamallee High Rd	301.64	93.74	1	3	-	3	1	-	-	2000	900	
9	7	Chembarm-bakkam Lake	310(P)	WTP	Chembarambakkam	-do-	Thirunindraur H.W.	21880	AH45 by pass Rd., Avadi Main Rd., Tiruttani Main Rd.	232.59	24.57	-	-	-	-	1	2	53	1400	500	

Sl No	TM No.	Source Details				Transmission Main				Start Flow in MLD (2050)	Tail end Flow in MLD (2050)	No. of Beneficiaries Covered							Pipe Details		Remarks
												Core city	Added Area			Rest ofg CMA					
		Name	Capacity in MLD	Type of Treatment	Location	From	To	Total Length in 'm'	Route Along Roads			WDS	Mpty	TPs	VPs	Mpty	TPs	VPs	Max Dia in mm	Min Dia in mm	
10	8	Chembarm-bakkam Lake	530 (E) & 310 (P)	WTP	Chembarambakkam	P.Sat Proposed 310 MLD WTP Chembarambakkam	Peerkankaranai	31400	Kundrathur Main Rd, GST Rd.	269.71	4.12	-	-	-	-	5	5	35	2000	300	
11	9	Redhills Lake	300 (E) & 300(P)	WTP	Redhills	P.S. at 300 MLD WTP at Redhills	Patel Nagar WDS	24170	Guntur – Chennai Highway, Jawaharlal Nehru Rd., IOCL Rd., Basin Rd.	109.39	34.06	2	1	-		-	-	-	1500	750	
12	10	Redhills Lake	300 (E) & 300(P)	WTP	Redhills	-do-	Avadi H.W.	16750	Tiruttani Chennai High way-Surapet Rd., Guntur – Chennai Highway	279.87	161.25	1	1	-		1	-	-	1500	900	
13	11	Redhills Lake	14(E)	WTP	Soorapattu	P.S.at 14 MLD WTP at Soorapattu	Soorapattu Sump	3000	Soorapattu Rd	15.67	6.06	-	-	-	3	-	-	-	400	400	
14	12 A	Redhills Lake	300 (E) & 300(P)	WTP	Redhills	WTP at REDHILLS	Madhavaram	8600	100 feet Rd.	64.01	64.01	-	1	2	7	-	1	20	750	750	

Sl No	TM No.	Source Details				Transmission Main				Start Flow in MLD (2050)	Tail end Flow in MLD (2050)	No. of Beneficiaries Covered							Pipe Details		Remarks
												Core city	Added Area			Rest ofg CMA					
		Name	Capacity in MLD	Type of Treatment	Location	From	To	Total Length in 'm'	Route Along Roads			WDS	Mpty	TPs	VPs	Mpty	TPs	VPs	Max Dia in mm	Min Dia in mm	
15	12 B	Redhills Lake	300 (E) & 300(P)	WTP	Redhills	WTP at REDHILLS	Madhavaram Booster station	8600	100 feet Rd.	85.62	38.57	-	1	2	7	-	1	20	900	900	
16	12 C	Redhills Lake	300 (E) & 300(P)	WTP	Redhills	Madhavaram Booster station	Sump CC1B	4300	100 feet Rd.	38.52	20.43	-	1	2	7	-	1	20	600	450	
17	13 A	Cholavaram Lake	145 (P)	WTP	Cholavaram	P.S.at Proposed 145 MLD WTP at Cholavaram	Sump OC4	100	Outer ring Rd.	37.26	37.26	-	-	-	-	-	-	9	600	600	
18	13 B	Cholavaram Lake	145 (P)	WTP	Cholavaram	– do -	Sump OC5B	22000	Outer ring Rd.	95.45	34.03	-	-	1	-	-	1	51	900	600	
19	14	Minjur	100 (E)	DSP	Kattupalli	P.S. at Kattupalli DSP 100 MLD, Minjur	Thiruvottiyur H.W.	31480	Athipattu main Rd., Ponneri Tiruvottiyur Rd.	99.81	61.06	-	2			-	1	4	1000	700	
20	15	Kilpauk	225 (E) + 135 (P)	WTP	Kilpauk	P.S at WTP at Kilpauk	Annapoonga WDS	7300	Medavakkam-Ayanavaram Mian Rd.	51.73	51.73	1	-	-	-	-	-	-	825	700	

Sl No	TM No.	Source Details				Transmission Main				Start Flow in MLD (2050)	Tail end Flow in MLD (2050)	No. of Beneficiaries Covered							Pipe Details		Remarks
												Core city	Added Area			Rest ofg CMA					
		Name	Capacity in MLD	Type of Treatment	Location	From	To	Total Length in 'm'	Route Along Roads			WDS	Mpty	TPs	VPs	Mpty	TPs	VPs	Max Dia in mm	Min Dia in mm	
21	16						Triplican WDS	6700	Purasavakkam High Rd., Rajamuthiya Rd.	100.34	48.61	2	-	-	-	-	-	-	1200	700	
22	17						Valluvar kottam WDS	6230	Valluvar kottam high Rd., Kodambakkam Main Rd.	28.73	28.73	1	-	-	-	-	-	-	1050	800	
23	18 A						6.7 ML OHT	200	Same Campus	79.3	79.3	1 (Part)	-	-	-	-	-	-	1400	1400	
24	18 B						9.0ML OHT	100	-do-	106.53	106.53	1 (Part)						-	1200	1200	

10.18. Hydraulic Designs

10.18.1. Transmission Mains

a. Single ReachDedicated Transmission Mains (Without any Tapping for any beneficiary)

The following TMs are available as single reach transmission mains.

i. Kilpauk P.S to Existing 6.8 ML Capacity of OHT

ii. Kilpauk P.S to Existing 9.0 ML Capacity of OHT

iii. Kilpauk P.S to Existing Valluvarkottam WDS Capacity of OHT

iv. Kilpauk P.S to Existing Anna Poonga WDS Capacity of OHT

v. Proposed 400 MLD DSP to Existing/proposed booster station at Kelambakkam

vi. Proposed 150 MLD DSP to Existing/proposed booster stations at Akkarai and peoposed sump at Kovalam Jn.

These pipelines may be called “Dedicated Transmission mains” and these are designed adopting principles based on the Design of Economical diameter of new pipe lines.

In respect of existing pipelines, its frictional loss is computed and the total head required for pumpset is computed by adding static Head, other losses for fittings and fixtures, pumping station loss and terminal head at sump / OHT.

b. Transmission Main System

These pipelines will have more than one reach (feeding more than one no. of sump / WDS / OHT).

First reach is designed adopting the principles for design of Economical diameter. Diameters for subsequent reaches till its tail end Sump / OHT are designed considering the flow in the reaches and economic size principles

In respect of existing pipelines, if its diameter is equal to or more than the designed economical diameter, frictional loss for the existing pipeline is computed.

If dia. of existing pipeline is less than dia. as per designed economical dia. strengthening main is designed considering the gradient for the designed economical diameter.

c. Branch Mains

Branch mains from TMs are designed considering the available residual head at tapping point, MWL of Sump, length of branch main and the rate of flow.

These mains are designed adopting economic principles for the demand for 2050. For the demand for 2035 friction loss for the system is computed and total head required is computed as explained earlier.

Hydraulic design for Pumping Mains and TMs for years 2050 and 2035 are furnished in Appendix. Hydraulic designs for Branch Mains are furnished in Appendix.

10.19. Design of Pumpsets

Design for all required pumpsets for all TMs are furnished in Appendix No. 10.21 and Abstract of pumpsets duty and total head for TMs is furnished in Table No.10.14

Table No. 10.28: Statement of Total Head and Duty for Pumpsets for Transmission Mains

Sl No	T.M No	Location		Intermediate (2035) Demand		Ultimate (2050) Demand	
		From	To	Duty in m^3/sec	Total Head in m	Duty in m^3/sec	Total Head in m
1	1	P.S. at 100 MLD DSP Nemmeli	WDS at Thiruvanmiyur	1.208	72.77	1.208	83.33
2	2A	B.S. at Kelambakkam	Semmenchari	0.100	16.84	0.203	32.10
3	2B	B.S. at Akkarai	WDS at Pallipattu	0.61	25.94	1.28	47.59
4	3	B.S. at Akkarai	WDS at Velachery-New	0.677	30.20	1.157	49.83
5	4	B.S. at Kelambakkam	PPORUR SUMP	2.629	45.56	4.09	54.41
6	5A	HW at Porur	WDS at Ekkattuthangal	0.96	20.31	1.14	21.65
7	5B	HW at Porur	WDS at Velachery	1.849	12.42	2.244	13.75
8	6	P.S. at Existing 530 MLD WTP at Chembarambakkam	WDS at Choolaimedu	2.573	7.30	3.64	9.84
9	7	P.S. at Existing 530 MLD WTP at Chembarambakkam	Thirunindravur TP	1.343	23.14	2.809	56.01
10	8	P.S. at Proposed 305 MLD WTP at Chembarambakkam	HW at Peerkankaranai	1.71	26.44	3.27	70.88
11	9	P.S. at 300 MLD WTP Redhills	WDS at Patel Nagar	1.21	19.89	1.32	20.27
13	10	P.S. at 300 MLD WTP Redhills	HW at Avadi	1.86	16.92	3.38	28.74
14	11	P.S. at Existing WTP at Soorapattu	Soorapattu Sump	0.09	18.32	0.19	24.99
15	12	P.S. at Proposed 260 MLD WTP at Red Hills	Sump CC1B	1.01	7.94	1.81	13.98
16	13A	P.S. at Proposed 160 MLD WTP at Sholavaram	Sump OC4	0.20	3.07	0.45	3.31
17	13B	P.S. at Proposed 160 MLD WTP at Sholavaram	Sump OC5B	0.49	14.67	1.15	58.44
18	14	P.S. at Kattupalli for 100 MLD Minjur DSP	HW at Tiruvoittyur	0.792	44.40	1.206	62.84
19	15	P.S. at 360 MLD WTP Kilpauk	WDS at Annapoonga	0.595	9.21	0.625	9.99
20	16	P.S. at 360 MLD WTP Kilpauk	WDS at Triplicane	0.94	8.16	1.21	13.42
21	17	P.S. at 360 MLD WTP Kilpauk	WDS at Valluvar kottam	0.331	3.19	0.347	3.27
22	18 A	P.S. at 360 MLD WTP Kilpauk	6.7 ML OHT	0.91	19.08	0.958	19.09
23	18 B	P.S. at 360 MLD WTP Kilpauk	9.0 ML OHT	1.222	19.03	1.287	19.03

10.20. Details of New Sumps proposed

New Sumps are proposed at end of TMs and branch mains for detention time of one hour except in existing Water Distribution Stations for Chennai Core City and Head works in added area. Details of capacity of Sumps are furnished in Table No. 10.17 Capacity is proposed in multiples of 10000 litres.

Table No. 10.31: Capacity of Sumps for Transmission Mains and Branch Mains

Sl. No	T.M No	Location	Demand in MLD (2050)	LPM	60 MTS DETENTION-CAP.REQD.	Round to next 5000 lts
1.	**TM 1**	Uthandi	3.3	2291.667	137500	140000
		Injambakkam	10.82	7513.889	450833	455000
		Neelankarai	9.89	6868.056	412083	415000
		Kottivakkam	7.89	5479.167	328750	330000
2.	**TM 2**	Semmanjeri	16.83	11687.5	701250	705000
		Sholinganallaur	48.78	33875	2032500	2035000
		Karapakkam	4.5	3125	187500	190000
		OkkiyamThuraipakkam	38.06	26430.56	1585833	1590000
		Perungudi	23.91	16604.17	996250	1000000
		Pallikaranai	22.14	15375	922500	925000
3.	**TM 3**	Medavakkam	14.34	9958.333	597500	600000
		Jalldianpet	5.48	3805.556	228333	230000
		Madipakkam	19.25	13368.06	802083	805000
		Ulagaram	23.91	16604.17	996250	1000000
		Alandur	25.58	17763.89	1065833	1070000
4.	**TM 4**	Kattankulathur Union VPs 5 Nos	12.61	8756.944	525417	530000
		St.Thomas Mount Union VPs 13 Nos	32.34	22458.33	1347500	1350000
		Peerkankaranai	2.44	1694.444	101667	105000
		Madambakkam	40.01	27784.72	1667083	1670000
		Sembakkam	25.78	17902.78	1074167	1075000
		St.Thomas Mount Union VPs 7 Nos	51.01	35423.61	2125417	2130000
		Chitlapakkam	11.66	8097.222	485833	490000
		Tambaram East	9.72	6750	405000	405000
		Tambaram West	16.21	11256.94	675417	680000
		Pallavaram	49.51	34381.94	2062917	2065000
5.	**TM 5**	Porur	13.17	9145.833	548750	550000
		Mugalivakkam	14.19	9854.167	591250	595000
		Manapakkam	7.91	5493.056	329583	330000
		Ramapuram	22.41	15562.5	933750	935000
		Nandambakkam	4.9	3402.778	204167	205000
		Alandur	17.06	11847.22	710833	715000
		Meenambakkam	1.24	861.1111	51667	55000
		Valasaravakkam	19.04	13222.22	793333	795000
		Ekkattuthangal	6.15	4270.833	256250	260000
6.	**TM 6**	Thiruverkadu	9.6	6666.667	400000	400000
		Ambattur	84.74	58847.22	3530833	3535000
		Nolambur	19.98	13875	832500	835000
		Maduravoyal	31.42	21819.44	1309167	1310000
		Nerkundram	16.85	11701.39	702083	705000
7.	**TM 7**	Thirumazhisai	18.68	12972.22	778333	780000
		Poonnamallee	23.89	16590.28	995417	1000000
		Poonnamallee Union VPs 43 Nos	74.05	51423.61	3085417	3090000

Sl. No	T.M No	Location	Demand in MLD (2050)	LPM	60 MTS DETENTION-CAP.REQD.	Round to next 5000 lts
		Villivakkam Union VPs 6 Nos	21.76	15111.11	906667	910000
		Avadi Part 1	22.71	15770.83	946250	950000
		Avadi Part 2	43.15	29965.28	1797917	1800000
		SPP Union VPs -4 Nos	0.74	513.8889	30833	35000
		Thirunindravur	24.57	17062.5	1023750	1025000
8.	**TM 8**	Mangadu Part 1	8.93	6201.389	372083	375000
		Mangadu Part 2	7.3	5069.444	304167	305000
		Kundrathur Part1	6.55	4548.611	272917	275000
		Kundrathur Part2	6.55	4548.611	272917	275000
		Kundrathur Part3	6.55	4548.611	272917	275000
		Kundrathur Part4	6.55	4548.611	272917	275000
		Kundrathur Union VPs 21 Nos	82.55	57326.39	3439583	3440000
		St. ThomasMount Union VPs 4 Nos	17.7	12291.67	737500	740000
		Anakaputhur Part1	8.08	5611.111	336667	340000
		Anakaputhur Part2	8.08	5611.111	336667	340000
		Pammal	21.31	14798.61	887917	890000
		Pallavaram	16.5	11458.33	687500	690000
		Thiruneermalai	3.6	2500	150000	150000
		Tambaram Part1	25.93	18006.94	1080417	1085000
		Tambaram Part2	12.97	9006.944	540417	545000
		Perungalathur	15.15	10520.83	631250	635000
		Kattankulathur Union VPs 2 Nos	7.08	4916.667	295000	295000
		Peerkankaranai	2.44	1694.444	101667	105000
9.	**TM 9**	Manali	9.73	6756.944	405417	410000
10.	**TM 10**	Avadi	161.25	111979.2	6718750	6720000
		Amabttur	84.74	58847.22	3530833	3535000
11.	**TM 11**	Soorapattu	15.67	10881.94	652917	655000
12.	**TM 12**	Sump CC3	27.96	19416.67	1165000	1165000
		Sump CC2	12.1	8402.778	504167	505000
		Sump CC1B	22.93	15923.61	955417	960000
13.	**TM 13**	Sump OC4	37.26	25875	1552500	1555000
		Sump OC2	57.95	40243.06	2414583	2415000
		Sump OC5B	34.03	23631.94	1417917	1420000
14.	**TM 14**	Sump OC1	18.45	12812.5	768750	770000
		Minjur	11.94	8291.667	497500	500000
		Kathivakkam	8.36	5805.556	348333	350000
		Thiruvottiyur	61.06	42402.78	2544167	2545000
				1285715	**77142920**	**77345000**

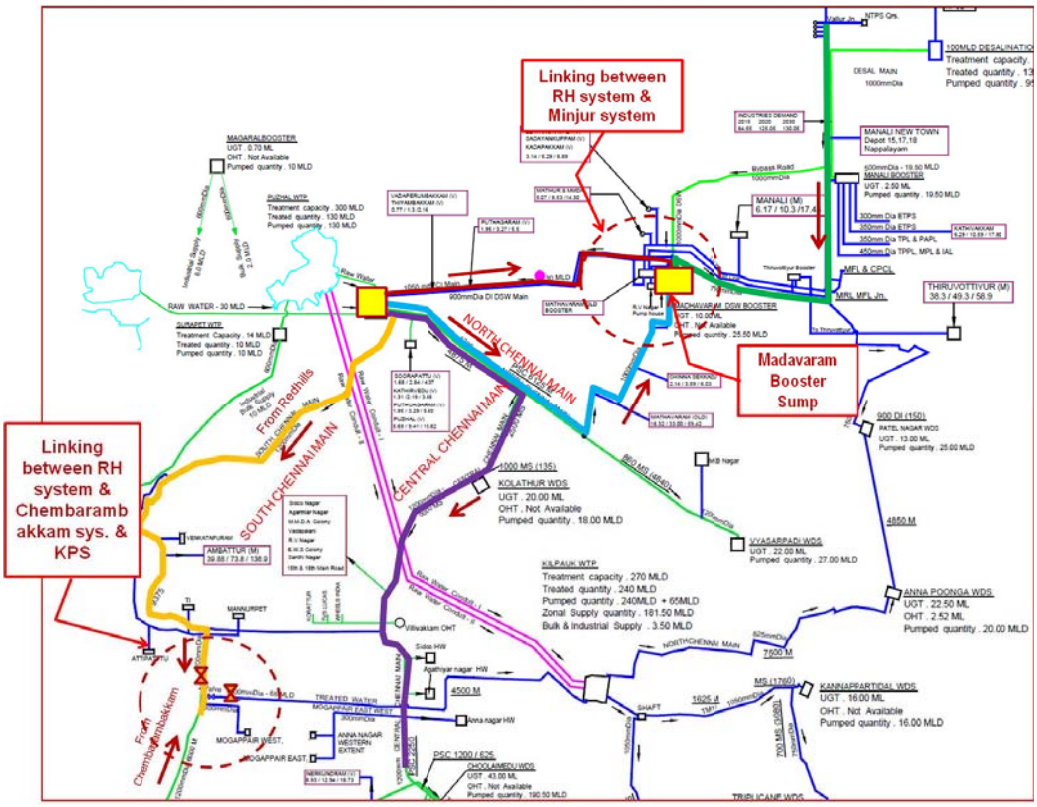
In addition to the above sumps are proposed at Kovalam Jn. (30 LL), Kelambakkam (100 LL), Akkarai (40 LL) and Porur (100 LL) to receive the additional flow.

LINKING BETWEEN THE SYSTEM

Existing Linking Between the Systems

Already the Redhills system consisting of South Chennai Main, Central Chennai Main and North Chennai Main are connected to the Chembarampakkam System, Veeranam System and Minjur System, respectively.

The figure below shows the connecting of systems.



Proposed Linking Between the Systems

Now the Nemmeli system, the TM4 ends at Porur Sump. Already Veeranam water is received at this sump. A part of chambarambakkam Water is also received at this sump. Therfore the water received at this sump can be spared to other systems without any difficulty.

From Porur sump TM5A & TM5B are emerging out. Under TM5A the demand of Valasravakkm and Karambakkam, which come under Chembarambakkam system) is supplied. Similarly TM5B supplies the demand of Naanadanam, Mylapore and SHW, which come under Nemmeli sytem.

One part of Ambattur, located at North of the Railway line, is supplied by Redhills source, through TM 10 and one part of Ambattur, which is locarted at south of Railway line is supplied with Chembarambakkam source, through TM6. Therfore these mains shall be linked with flow control valves are provided at appropriate locations, surplus water from Redhills system can be spared to Chembarambakkam system and vice versa.

Sl. No.	System	No. of TM	Year	Demand	1	2A	2B	3	4	
1	Nemmeli	4	2035	405	73.231	8.28	50.238	56.069	217.64	405
			2050	649	91.647	16.83	105.83	95.802	338.49	649
					5A	5B				
2	Veeranam	2	2035	138	71.87	66.33				138
			2050	174	82.77	91.37				174
3	Chembarambakkam	3			6	7	8			
			2035	467	212.993	111.22	143.08			467
			2050	804	301.637	232.49	269.7			804
4	Red Hills	4			9	10	11	12		
			2035	347	100.87	153.88	7.36	84.73		347
			2050	555	109.39	279.96	15.67	149.63		555
5	Cholavaram	2			13 A	13 B				
			2035	58	16.85	41.172				58
			2050	133	37.26	95.45				133
6	Minjur	1			14					
			2035	66	60.64					61
			2050	100	99.81					100
7	KPS	5			15	16	17	18 a	18 b	
			2035	331	49.42	77.82	27.42	176.49		331
			2050	344	51.73	78.03	28.73	185.83		344