OPTIMIZATION OF RESERVOIR CAPACITY & GRAVITY MAIN SIZE
with MONSOON SURGE FLOW and LIMITED BASE FLOW

Name of village	=	**Khawhlatak**	
Circle	=		
Division	=		
Sub-Division	=		
District	=		
Last census year	=	**2011**	**AD**
Last census population	=	**559**	**souls**
Base year	=	**2013**	**AD**
Base year population	=	**576**	**souls**
Design period	=	**20**	**years**

Projected year	=	**2013 AD**	**2020 AD**	**2027 AD**	**2033 AD**
Projected population	=	**576**	**633**	**690**	**746**

Source discharge on March, 2013	=	**17.000**	**lpm**	
Predicted lpcd at driest period for design population with existing source discharge with no depletion	=	**32.815**	**lpcd**	=17lpm x 60mins x 24hrs/746 souls
lpcd targetted at user end	=	**40.00**	**lpcd**	
lpcd for reservoir capacity design adding 10% institution demand, 10% d/b loss	=	**48.00**	**lpcd**	

G/Main flow wrt lpcd of normal reservoir capacity design	=	**0.4144**	**lps**	= 48 plcd x 746 souls/(24 hrs x 60 mins x 60 secs)
Number of surplus days	=	**245**	**days**	
Number of deficit days	=	**120**	**days**	
G/Main flow for additional storage	=	**0.0601**	**lps**	=cumulative deficiency/(surplus days x 24 hrsx60minx60 sec)
Total flow for G/Main design	=	**0.4745**	**lps**	= 0.4144 lps + 0.601 lps
Optimum total capacity of reservoir including fire demand	=	**13,58,179**	**litre**	= 1271808 lts + Fire Demand (i.e 100000x √746 souls/1000)
Reservoir i/c fire demand at the beginning to give design lpcd till the end of 1/3rd of design period	=	**7,00,489**	**litre**	=(633souls x 48 lpcd x 120 days) - (supply of Jan, Feb, March, April) + Fire demand of 633 souls i.e 100000 x √633 souls/1000
Additional reservoir i/c fire demand to give design lpcd for population increase between 1/3rd and 2/3rd of design period	=	**3,52,195**	**litre**	(690-633) = (57 souls x 48 lpcd x 120 days) + Fire demand of 57 souls
Additional reservoir i/c fire demand to give design lpcd for popultion increase between 2/3rd and 3/3rd of design period	=	**3,46,224**	**litre**	(746-690) = (56 souls x 48 lpcd x 120 days) + Fire demand of 56 souls

Hence, to provide design lpcd till the end of 1/3rd of design peroid,

Capacity of Reservoir to be provided = ***1 no. 7,00,000 litre***

Optimization of Reservoir Capacity for Khawhlatak

Sl	Month	Days	Source Discharge	Water to be withdrawn from source i.e. Supply		Water Demanded by Public		Supply - Demand	Cumulative Deficiency
			lps	lps	litre	lps	litre	litre	litre
1	January	31	0.3100	0.3100	8,30,304	0.4144	11,10,048	-2,79,744	-2,79,744
2	February	28	0.2900	0.2900	7,01,568	0.4144	10,02,624	-3,01,056	-5,80,800
3	March	31	0.2833	0.2833	7,58,880	0.4144	11,10,048	-3,51,168	-9,31,968
4	April	30	0.2833	0.2833	7,34,400	0.4144	10,74,240	-3,39,840	-12,71,808
5	May	31	0.4310	0.4745	12,70,971	0.4144	11,10,048	1,60,923	
6	June	30	0.4600	0.4745	12,29,972	0.4144	10,74,240	1,55,732	
7	July	31	0.5300	0.4745	12,70,971	0.4144	11,10,048	1,60,923	
8	August	31	0.6500	0.4745	12,70,971	0.4144	11,10,048	1,60,923	
9	September	30	0.6200	0.4745	12,29,972	0.4144	10,74,240	1,55,732	
10	October	31	0.5190	0.4745	12,70,971	0.4144	11,10,048	1,60,923	
11	November	30	0.4280	0.4745	12,29,972	0.4144	10,74,240	1,55,732	
12	December	31	0.4200	0.4745	12,70,971	0.4144	11,10,048	1,60,923	
	Surplus Days	245							
	Deficit Days	120					Capacity	12,71,808	