

Little Bow Resort Water – Issues/Status

- Water Management
 - Treated
 - High Consumption
 - Domestic and Home Irrigation
 - Bible Camp
 - Monitoring (no problems, FYI)
 - Daily – Cl, pH, Temp, Turbidity
 - Weekly – Water Sample to Calgary Health Lab (1 at plant, 1 random and in summer 1 swim area)
 - 2/yr – Water Sample for pollutants
 - Raw
 - Shared Raw Water Pump
 - Submerged Seasonal Irrigation Pump

Normal System Operation

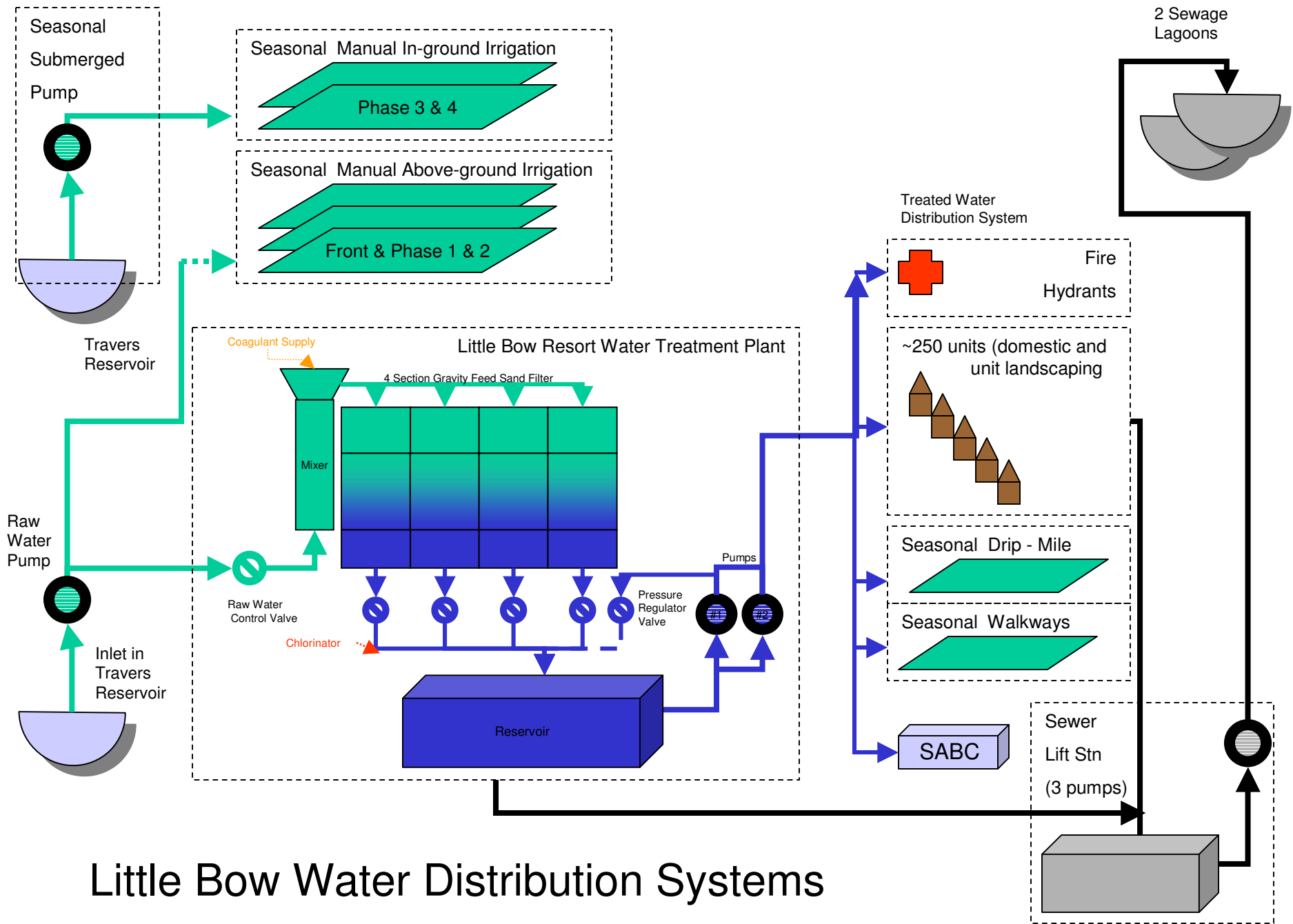
- Lift Station capacity (3 m³ capacity before alarm)
 - Grease Build-up on floats (adding degreaser –reduced alarms)
 - High Load
 - Water Treatment Backwash
 - In summer divert to holding tank for irrigation?
 - Or pump directly to lagoon
- Backup Operator
- Operational / Preventive Maintenance
 - Pump out Lift Station (on-going)
 - Clean Reservoir (1st time since opened)
 - Replace / Rebuild Raw Water Pump (1st time)
 - Re-do corroded control line in Treatment Plant (1st time except minor repairs)

Emergency

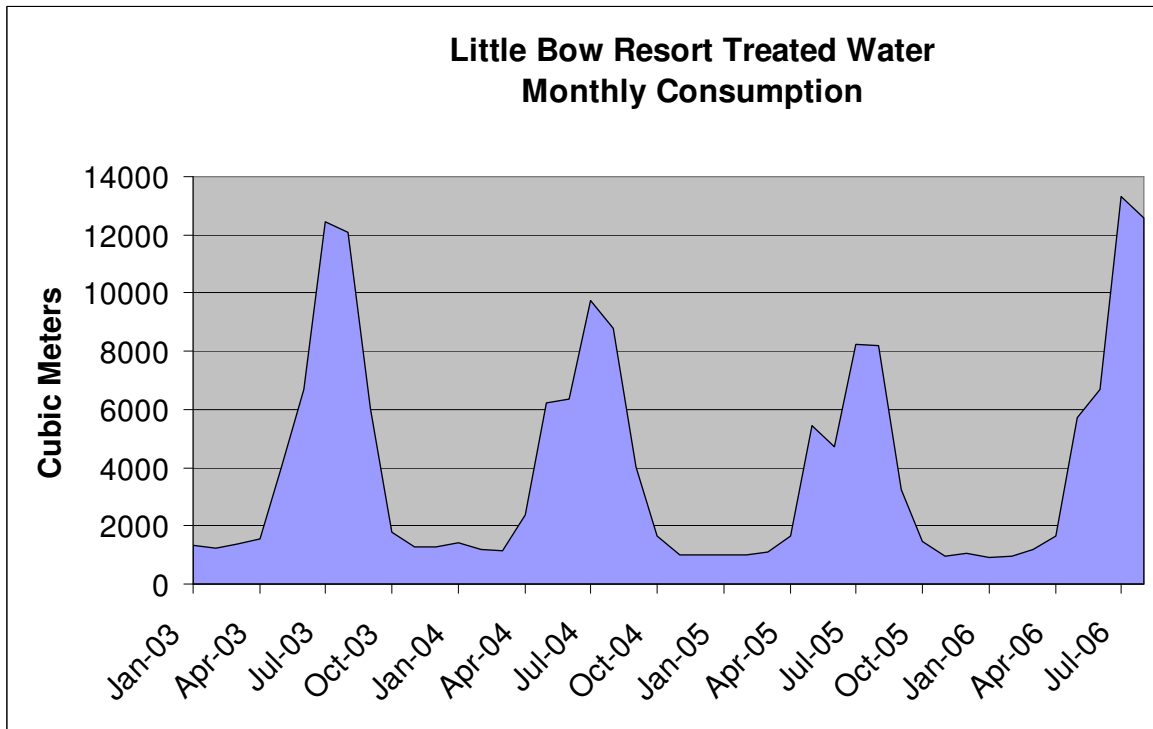
- No Backup Power
 - for Lift Station
 - or for Water Treatment Plant
- Fire Hydrants

License Renewal (2010)

- Water Meters
- Ability to maintain operation
 - Will require 2nd reservoir or modify existing
- Continuous Monitoring
 - Computer monitor / 24 chart recording / internet
- Operator Licensing
- Backup operator



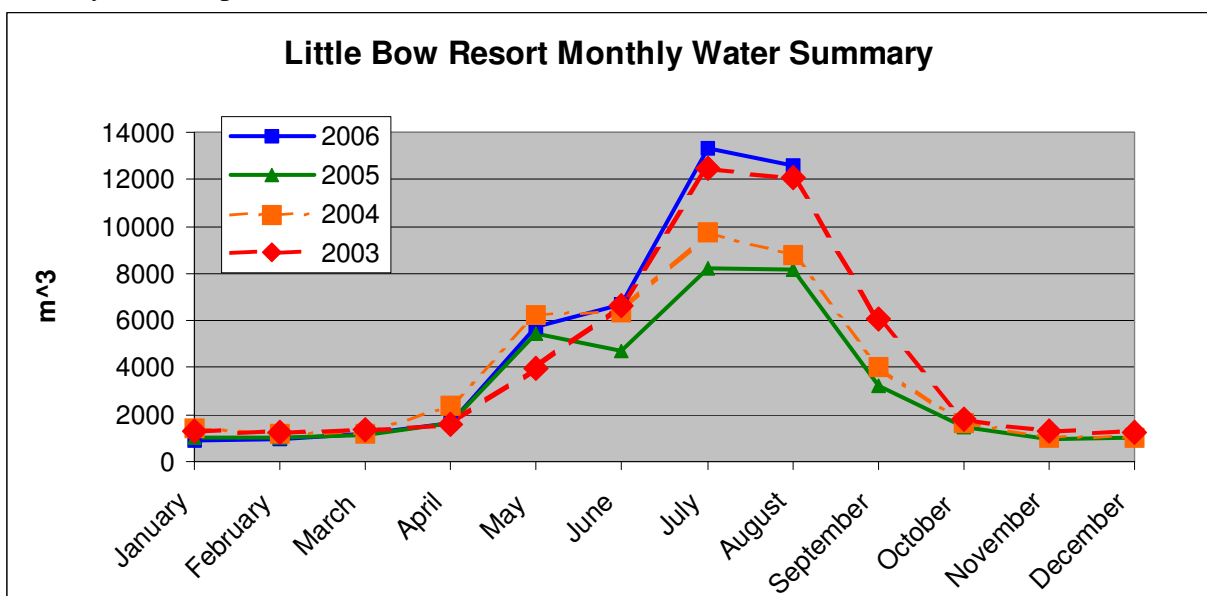
Little Bow Water Distribution Systems



The Chart show very similar annual consumption profiles

- Winter months at similar levels
- Large jump in mid-May as sprinkler systems turned on
- July and August are double May/June with High weekend peaks
- September big drop as irrigation systems shut down
- October through March/April remain relatively constant except for holidays and weekends

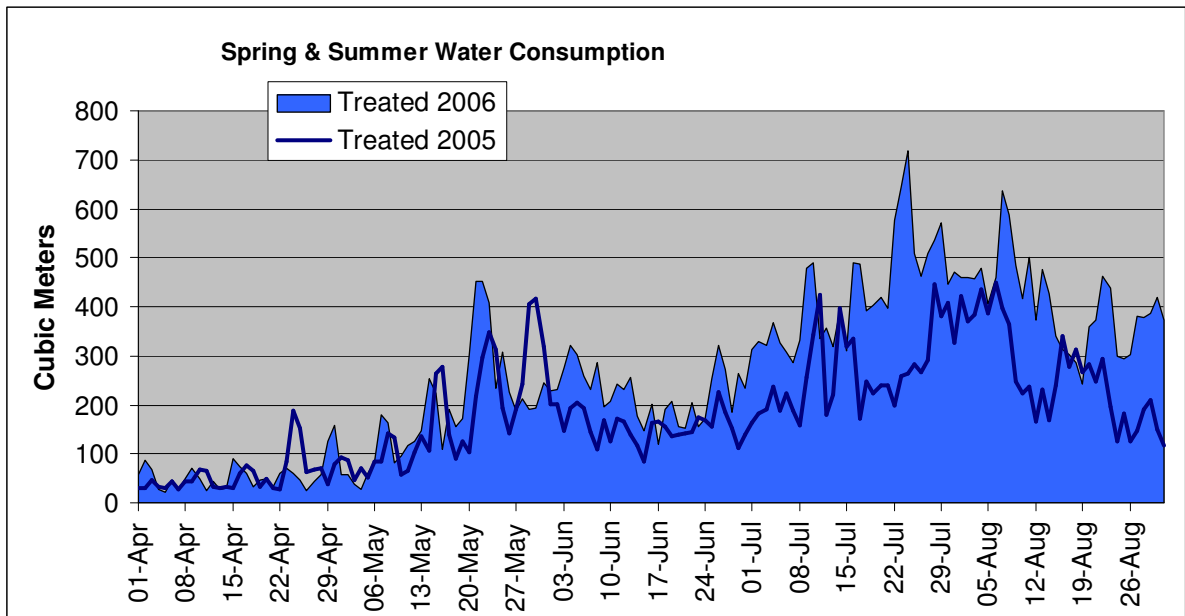
Monthly Consumption overlaid



Annual Water Summary

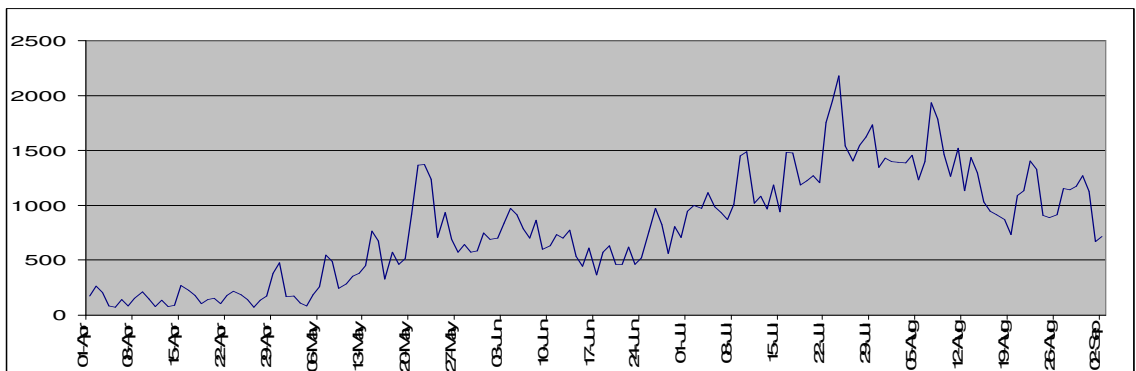
Treated Water Cubic Meters

Month	2003	2004	2005	2006
January	1331	1398	1019	892
February	1254	1206	1008	972
March	1371	1162	1109	1198
April	1561	2400	1664	1665
May	3959	6223	5450	5739
June	6659	6339	4717	6682
July	12448	9738	8244	13300
August	12080	8804	8189	12571
September	6054	4028	3258	
October	1788	1653	1465	
November	1282	1008	965	
December	1264	997	1043	
Total	51050	44957	38130	43020

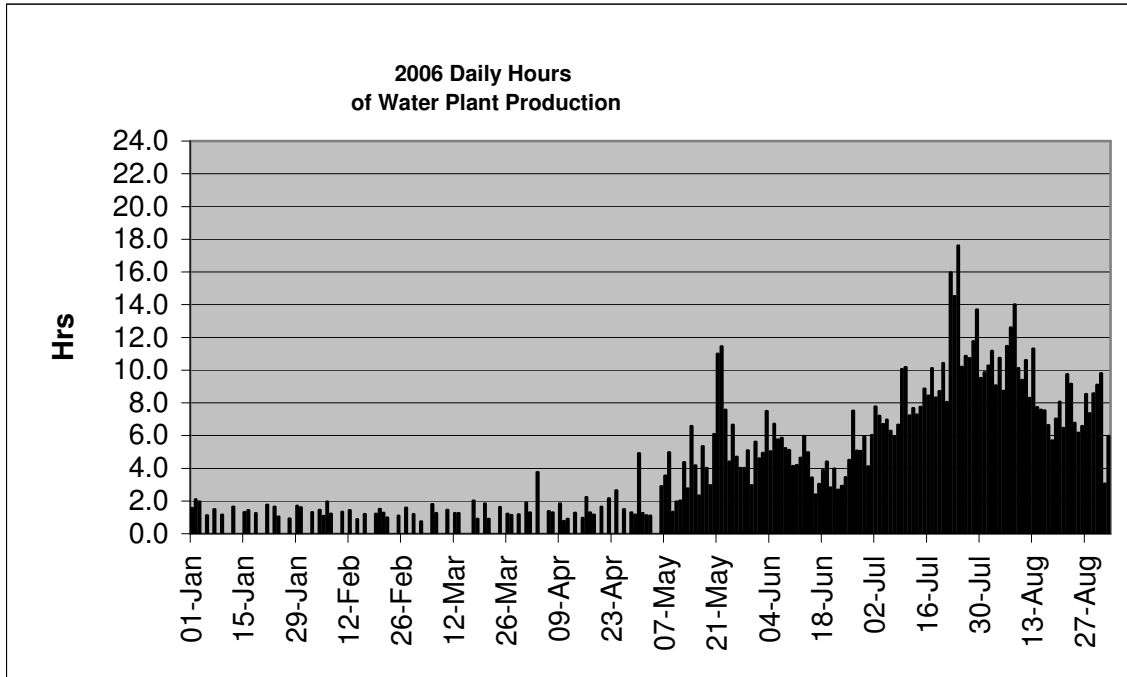


Was our population?

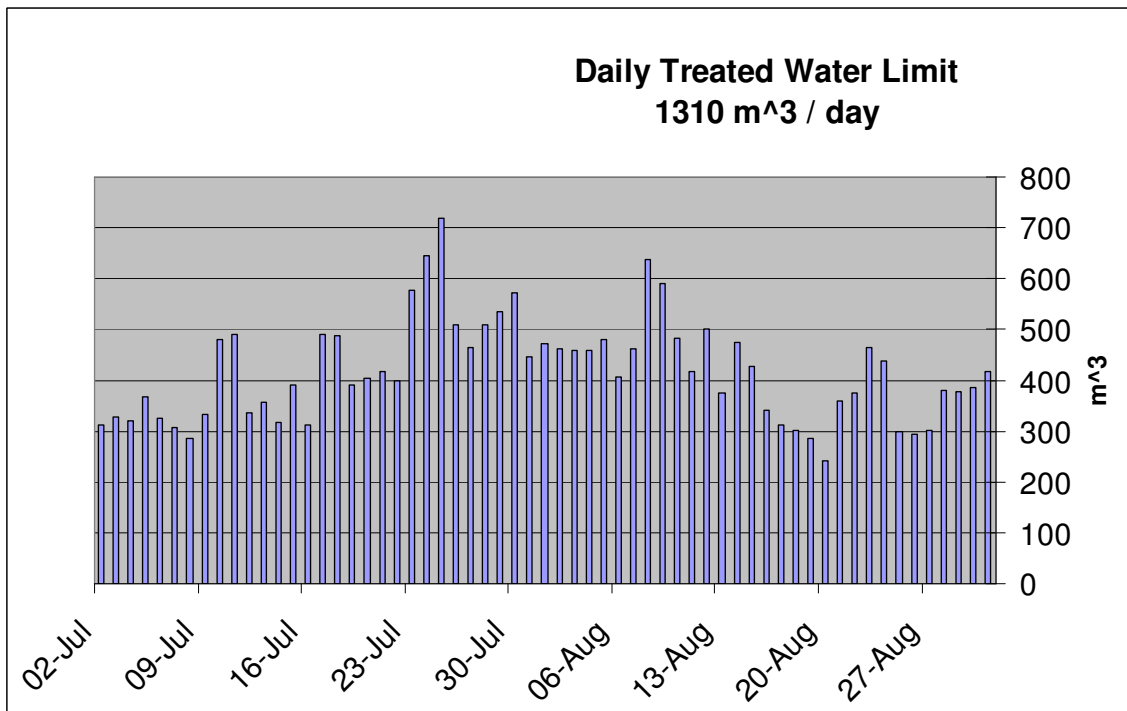
(By City of Calgary Daily Consumption Rate this is what are population should have been)



The Water Treatment Plant Ran this number of hours in 2006

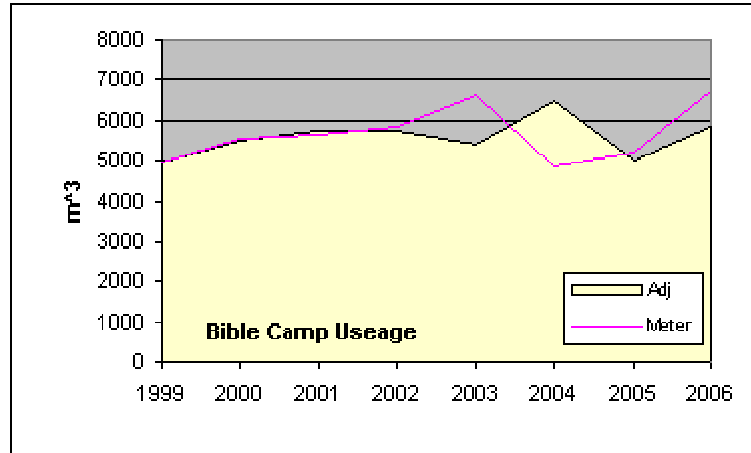


Summer 2006 Daily Consumption



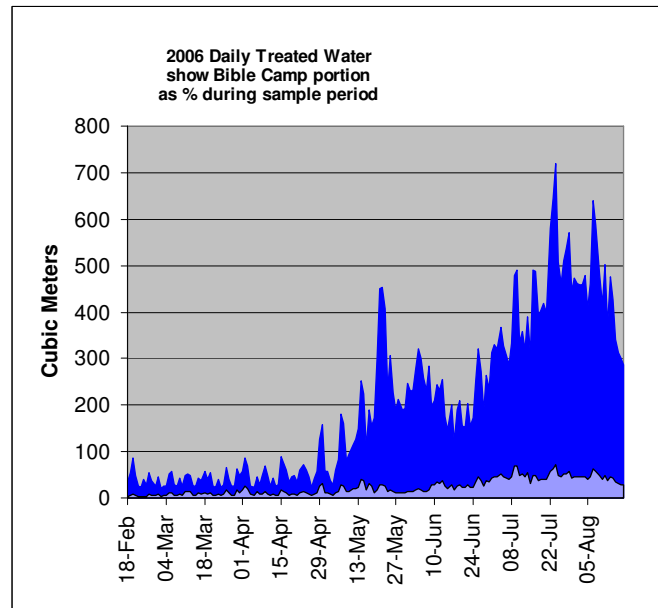
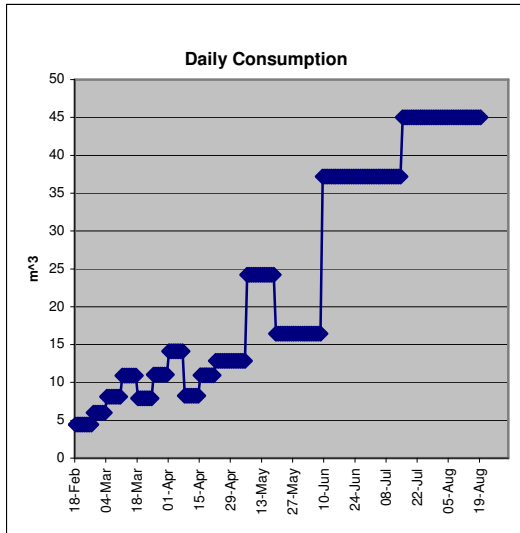
Bible Camp Usage

	Meter	Adj
19-Aug-06	6718	
18-Jul-06		5863
03-Aug-05	5220	
18-Jul-05		4995
06-Aug-04	4849	
18-Jul-04		6469
15-Aug-03	6634	
18-Jul-03		5419
18-Jul-02	5821	5731
17-Jul-01	5661	5751
18-Jul-99	4937	4937



Reading were not taken at same date, so adjusted to annualize

This summer we did some extra reading to understand their use.



We have spoken with Bible Camp about their usage.

They have 75 m³ reservoir a typical draw of 26 to 34 m³.

They are looking at timing their draw to evening hours.

Bible camp is generally closed on Holiday weekends.

Reservoir Facts

	meters	m ³	US Gal
H	3.7		
W	11.6		
L	12.6		
Overall Volume		533.3	
Emergency High Water Level	3.3	475.0	125399
Normal High Water Level	3.2	460.4	121550
Normal Low Water Level	2.5	358.4	94608
Raw Water Processing			
per Section per minute		0.2	50
Total per minute		0.8	200
Total per Hour		45.5	12000
Total per Day		1090.9	288000

Lift Station Facts

	meters	m ³	US Gal
H	4.9		
W	2.4		
L	2.4		
Top of Intermediate Floor	1.8	10.9	2870
Emergency Alarm Water Level	1.0	5.9	1569
Alarm Level	0.8	4.5	1177
Normal High Water Level	0.5	3.0	785
Normal Low Water Level			

In summer months each pump (x3) runs for 30 hours

Bible Camp

	meters	m ³	US Gal
Overall Volume		75.8	20000
Typical Draw		34.1	9000
Range		26.5	7000
Average Summer Daily Draw		45	11880

How much water does an average household use each day...

Activity/Appliance	Water consumption per use
Toilet (full flush)	6 to 18 litres
Bath	50-150 litres
Shower	40-250 litres
Dishwasher	20-50 litres
Washing Machine	40-170 litres
Running tap while brushing teeth	5 litres
Shaving	8 litres
Drinking, cooking and cleaning	8 litres
Activity/Appliance	Water consumption per use
Sprinkler (per hour)	1000 litres
Washing car with running hose (10 minutes)	100-300 litres
Hosing driveway	50-100 litres
Dripping tap (per day)	30-200 litres

1000 litres = 1 m³

Sample Irrigation Usage

	m ³ /min	min/day	days/yr	daily	annual
Zone 1 (drip)	0.008	20	100	0.16	16
Zone 2 (4x20')	0.033	10	50	0.33	16.5
Zone 3 (6x10')	0.033	20	50	0.66	33
Zone 4 (4x25')	0.04	30	50	1.2	60
Total				2.35	125.5