REGIONAL DISTRICT
of
NORTH OKANAGAN

TM3
SUMMARY PAPER

File No. 5700.15.11

SUBJECT: 2012 Greater Vernon Water Master Water Plan
Technical Memorandum No. 3.
Source Storage and Supply

Summary date: August 2015

TM3 PURPOSE:

Greater Vernon exists in a semi-arid climate where the summers are hot and dry and the majority of precipitation comes in the fall, winter and spring. Stream flows are the lowest when water demand is the highest. Flows in surface water sources alone could not support high density populations and large scale irrigation without storing water so it is available for use during the summer periods. Hence, storage is a key element to understanding how much water GVW has available for use.

Technical Memorandum No. 3 (TM3) builds upon the work completed in TM1 and TM2 and looks at how much total storage licenses GVW holds, how much water GVW can currently store and examines opportunities to increase storage to support growth within the GVW service area.

METHODS:

The following was completed to assess the storage capacity and availability for GVW:

- An inventory of the total usable storage licenses GVW holds for each source was compared to the current amount of storage available,
- A comparison of current and future water demands was completed to assess if increasing storage is required, and
- An options assessment with cost estimates was completed to increase supply and storage.

RESULTS:

Kalamalka Lake provides natural storage for the 8,842 ML/yr GVW has license to use on this source. All other surface sources GVW currently uses require storage in the form of a dam and reservoir to support the consumption licenses. The following table provides a summary of the current storage capacity GVW has and the amount of storage licenses that GVW holds:

	Current Available Storage	Total Storage License
Aberdeen Reservoir	10,330	
Haddo Reservoir	2,730	
Grizzly Reservoir	5,280	
Total Aberdeen Plateau	**18,340**	**28,369**
Goose Lake Reservoir	2,360	4,515
Diversion to Kalamalka Lake		167
Total Duteau Storage	20,700	33,051
King Edward/Deer Creek	1,357	1,357
Total GVW Storage	**22,057**	**34,408**

As outlined in TM1, the domestic demands for GVW will increase from 27,100 ML/yr to 30,800 ML/yr by 2052 while the agricultural demand remains consistent at 17,500 ML/yr. Based on this forecast, it is predicted that GVW will face increased water supply shortages in the future unless storage is increased to support the predicted growth in the domestic sector.

To avoid increasing water supply shortages, GVW can increase its available storage to fully utilize its storage licenses and provide additional water during peak water use times. Within TM3, an options analysis was completed to increase storage and supply that examined opportunities to increase storage on existing reservoirs, construct new reservoirs and construct diversions to ensure sufficient supply to the areas of increased storage.

The following table provides a summary of the options examined to increase supply and storage in GVW and identified the viability of completing each project:

Year	Project/Location	Storage Increase	Supply Increase	Total Cost	Cost of Supply	Potential for Construction
		(ML)	(ML/yr)	Million $	$/ML	
Options within the Duteau Creek Watershed						
2022	Aberdeen Dam Raise by 2m	5,316	5,000	3.39	678	Good
2022	Aberdeen Dam Raise by 4m	11,670	10,000	6.41	641	Good
2027	Goose Lake Expansion	2,000	0	1.4	N/A	Fair
2037	Gold-Paradise Extension	0	3,000-7,600	3.6	475-1200	Poor
2042	MacKay Reservoir	4,000	3,000	4	1333	Fair
>2052	Lower Duteau Creek Dam	10,000	8,000	17.7	2200	Fair
>2052	Flyfish Diversion	0	3,000	3.3	1100	Poor
Options within the BX Creek Watershed						
>2052	Grey Line	0	3,000	15	5000	Poor
>2052	Swan Lake Pump PS	0	3,000	8.7	2900	Poor
>2052	Greenhow Diversion	0	500	5.4	10800	Nil
>2052	Okanagan Lake License	50,000	50,000	N/A	N/A	Good

Details of the cost/benefit analysis for each project listed above and figures providing locations of the above projects are available in TM3.

Groundwater was identified as a potential water supply source for non-potable within some areas of GVW. Wells would be installed at point of use and used directly in the non-potable mains without treatment. However, the drawback is that this supply would be more expensive due to pumping costs when a gravity fed source is available such as Duteau.

The potential transfer of water licenses from one point of diversion to another was also examined as some of the licenses GVW hold are unfeasible to develop and could be used more economically at other intake locations. There is uncertainty about transferring water licenses to Kalamalka Lake due to indications from the Ministry that any water transferred would be held for fisheries and due to restrictions within the *Water Protection Act* that limits transfers from one watershed to another. Other small transfers from within the same watershed are much more feasible such as transferring BX Creek, Coldstream Creek and other small licenses to either Kalamalka Lake or Okanagan Lake.