



The Corporation of the District of Peachland

5806 Beach Ave
Peachland, BC
V0H 1X4

Phone: 250.767.2647
Fax: 250.767.3433
Website: www.peachland.ca

February 25, 2013

Aplin and Martin Consultants
454 Leon Avenue,
Kelowna, BC V1Y 6J3

Attn: Mathew Temple, EIT

RE: New Monaco – Water Master Plan Update REV 2
Your File #: 12-623

Dear Mr. Temple:

As requested, the District and our consultants have undertaken a review of the recent submission by Aplin & Martin to the District of Peachland for a Water Master Plan Update REV 2 dated December 20th, 2012. The letter is signed by Matthew J. Temple, E.I.T. The intent of this submission is to provide the strategy for servicing New Monaco in the short and long term with water and inform the water servicing requirements for the development of a phased development agreement (PDA) between New Monaco and the District of Peachland.

Per Capita Water Demand Analysis

The current District of Peachland Subdivision Development Servicing (SDS) Bylaw requires an allowance of 2400 L/d/capita for Maximum Day Demand (MDD). The submission makes a case for reduction of that allowance to 1800 L/d/capita, as the City of Kelowna has recently done. In light of the extensive provisions for water demand reductions in modern development practices, the District of Peachland could consider reducing the allowance to 1800 L/d/capita. The developer will need to apply to District council for a variance to the Subdivision Servicing Bylaw to approve this reduction. It is anticipated that District staff will support this request.

The submission makes a further argument to reduce the MDD in multi-family developments to 1080 L/d/capita, on the basis of reduced landscaping irrigation needs for multi-family units, given that "inside use" demands are typically 400 – 500 L/d/capita. A Bylaw amendment that provides for a reduced allowance for multi-family units would need to be accompanied by conditional provisions for extensive use of Xeriscaping to ensure that the low demand could be maintained in the long term.

Projected New Monaco Demands

An approximate phasing plan was submitted in October 2012 and this does not appear to have changed. The timing of phases is not stated. It was previously estimated that build-out was planned for 20 years, so it might be assumed that each of 4 phases could be 5 years.

The expected equivalent populations for each of the four phases appear to be as follows:

Phase 1 (completion 2018):	2580
Phase 2 (completion 2023):	1460
Phase 3 (completion 2028):	1330
Phase 4 (completion 2033):	1130
Total (build-out):	6500

The equivalent population of the retail/office area is given as 661 people in the table on Page 4 of the submission.

If the per capita rate of 1080 L/d/capita is used for the multi-family units, and 1800 L/d/capita is used for all other units, including retail and office equivalent populations, the following MDD results for each phase:

Phase 1: 1420 pop x 1080 = 1,533,600 L/d = 17.8 L/s
1160 pop x 1800 = 2,088,000 L/d = 24.2 L/s
Total MDD (ph.1): 3,621,000 L/d = **42.0 L/s**

Phase 2: 1064 pop x 1080 = 1,149,120 L/d = 13.3 L/s
396 pop x 1800 = 712,800 L/d = 8.3 L/s
Total MDD (ph.2): 1,861,920 L/d = **21.6 L/s**

Phase 3: 1050 pop x 1080 = 1,134,000 L/d = 13.1 L/s
280 pop x 1800 = 504,000 L/d = 5.8 L/s
Total MDD (ph.3): 1,638,000 L/d = **18.9 L/s**

Phase 4: 1050 pop x 1080 = 1,134,000 L/d = 13.1 L/s
80 pop x 1800 = 144,000 L/d = 1.7 L/s
Total MDD (ph.4) = 1,278,000 L/d = **14.8 L/s**

TOTAL MDD (build-out): 8,400,000 L/d = 97.3 L/s

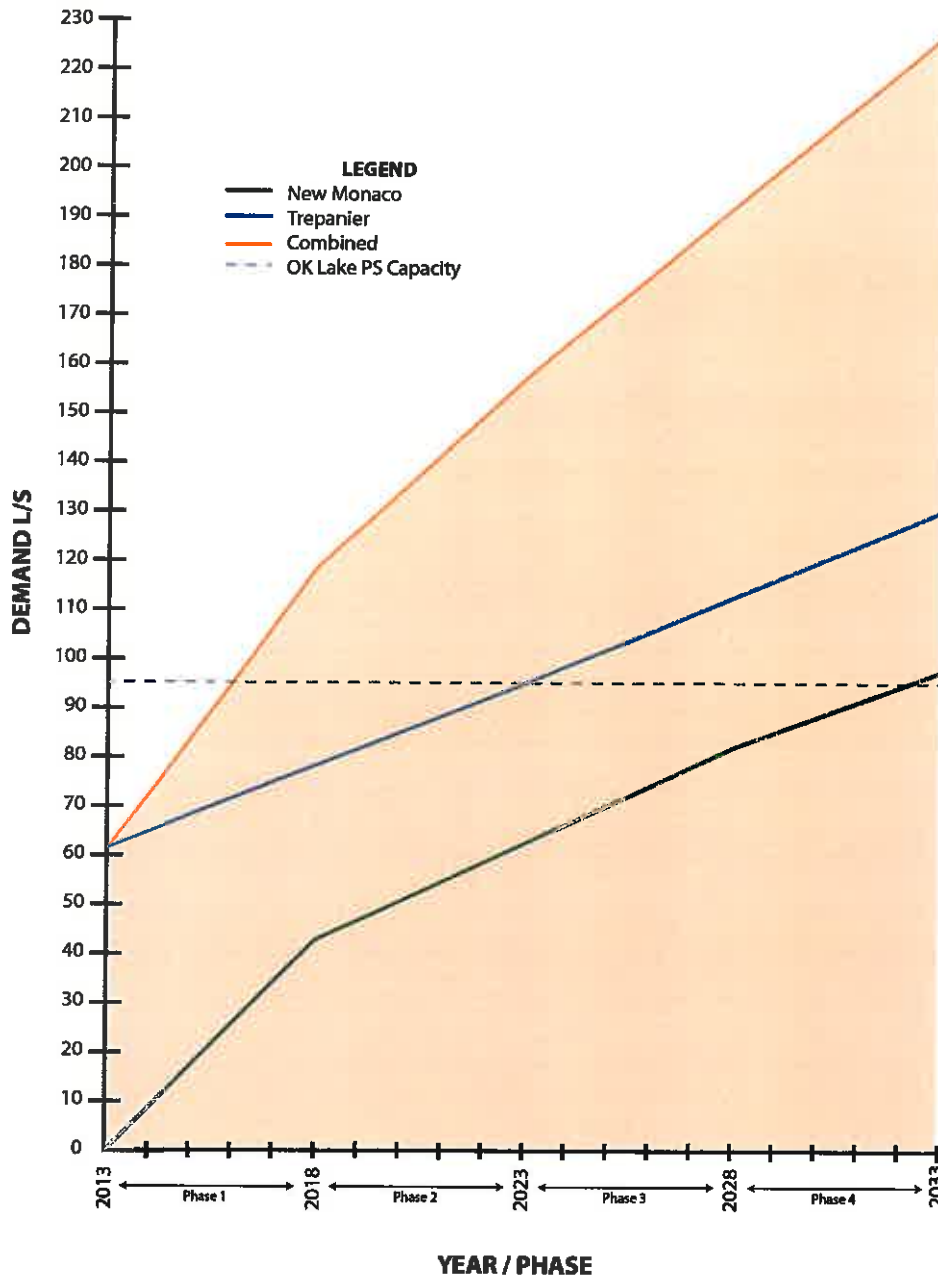
The foregoing are somewhat different than the numbers in the tables submitted on pages 9 and 10 of the letter. We believe that's due to a discrepancy in the equivalent population allowance for the retail/commercial/office space. Incidentally, Peachland's SDS Bylaw allocates 75 people/hectare of commercial development area. The New Monaco proposal is based on square metres of built floor space, so it's not possible to make a comparison. We have used the 661 equivalent people declared on page 3 of their letter.

Source Discussion

The letter recognizes that the water source in the long term will be supplied from Peachland Creek. However, this source will not be available until 2023 or 2024, when completion of Phase 2 is anticipated. As a result, a short term source of acceptable water is required. We have assumed for the purpose of discussion, that the proposed water source should supply the MDD rate, while finished water storage will deal with the fire flow and peak hourly demand rates.

The MDD required for Phase 1 and Phase 2 is 63.6 L/s. The existing MDD in the Trepanier system is 61.2 L/s, resulting in a total MDD of 124.8 L/s. It is our understanding that the existing Okanagan Lake pump station can supply approximately 95 L/s with one duty pump operating. The second duty pump is used for standby. With an existing MDD of 61.2 L/s, the "spare" capacity is approximately 34 L/s. This amount of capacity could support the New Monaco development into the first 3 years of Phase 1. **Figure 1** below shows the growth in demands over a 20-year period.

Figure 1 – 20 Year Growth Demands



Based on the above, the developer should outline in the final submission what the total short term MDD is (including New Monaco and the Trepanier Bench) and compare those against the capacity of the existing OK Lake booster pumps to ensure that:

- a) The pumps have the flow capacity to push to the existing reservoir site; and
- b) The pumps can reach the revised Cousins Road reservoir location at the total interim MDD flow rate.

Notwithstanding the design capacity, the Okanagan Lake pump station (constructed in 1987) does not meet current standards and codes:

- electrical equipment is in the pump room with inadequate offset to the pumps and motors;
- the intake is at 12.8 m depth; less than the 30m depth required to be under the thermocline; and
- the gas chlorination facility requires upgrading to meet WorkSafe BC requirements.

These deficiencies would need to be corrected if the pump station is to function other than for periodic emergency events.

Storage Discussion

The current reservoir at Cousins Road has a capacity of 1,335 m³. The Water Master Plan proposes that it be upsized in the long term to approximately 6,000 m³. The submission suggests that the long term storage be increased to 6,525 m³ to satisfy the New Monaco requirements.

The top water level (TWL) of the existing reservoir is 530 m. The letter suggests that an ideal TWL to gravity service all the New Monaco development is 578m. This elevation may not be achievable in the area south of HWY 97C. The elevation of the Trepanier Creek intake is 580 m, so that location could be suitable; however, it lies on the north side of Highway 97C. It appears there may be suitable locations above the Cousins Road reservoir, and depending on the available site, a booster pump station would be required to service higher portions of the New Monaco development.

Treatment

The Trepanier Creek source is slated to be decommissioned in the Water Master Plan, so is not being considered for long term use. The submitted letter reports that Interior Health requires a plan to meet the 4-3-2-1-0 objectives for water quality. While there is no indication of the required timing, it's assumed that 2023 might be too far into the future for a temporary arrangement. The District of Peachland has stated a preference to avoid two water treatment facilities. Trepanier Creek does not appear to be a suitable source for domestic water for neither the short or long term.

Nevertheless, water is available from this source and there is existing infrastructure for its delivery. Depending on the comments received from IH and if the proposed Phase 1 is to be largely multi-family developments, the proponent could consider a strategy where Point-of-Entry (POE) treatment technology is used within each building complex. POE devices can achieve the 4-3-2-1-0 objectives. Monitoring, sampling and reporting would have to follow the Interior Health protocol and would have to be undertaken by the proponent or other responsible organization. These smaller POE systems might suffice until the Peachland Creek filtered water transmission main is completed.

Finances

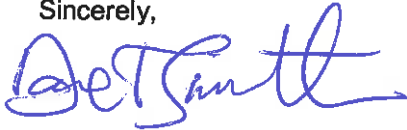
Section 4.3 of the submission refers to adding projects to future updates to the DCC bylaw. This includes "Upgrading mains from the Ponderosa Area up to the reservoir". This pipe upgrade is already included from the 2007 WMP. It is anticipated that any over-sizing due to New Monaco (400mm→500mm diameter) would not be included in the DCC update as this need for additional increased capacity is attributable to New Monaco.

Proposed Strategy

1. Determine the upgrades necessary to bring the OK Lake pump station up to current codes.
2. Determine the potential increase in pumping capacity to provide sufficient water to the Trepanier system and the New Monaco requirements up to the end of Phase 2.
3. Determine the feasibility/cost of creating a dedicated line from OK Lake pump station to the Cousins Road reservoir site and relocation of disinfection facilities to the Cousins Road site.
4. Determine if there are other suitable sites above the Cousins Road reservoir and if other sites could be purchased. Compare this approach to construction of additional storage and booster pump at the existing site.
5. Determine the cost of extending the OK Lake inlet to a depth of 30m.
6. Prepare the best apparent optional configurations that would meet New Monaco and Peachland needs for the 10-year term.

Please contact the undersigned if you have any questions or require any clarification. We can set up a further meeting with USL on the contents of this letter if desired.

Sincerely,



Dave Smith RPP, MCIP
Approving Officer