

# TECHNICAL MEMO

---

<b>To</b> John Marsh CPA, CMA, Administrator Deep Bay Improvement District	<b>From</b> Chris Pogson P.Eng., Project Manager
<b>Re</b> Deep Bay Improvement District - Water System Evaluation Report – 2023 Update	<b>Date</b> June 13, 2023

---

## 1.1. INTRODUCTION

In 2008, the Deep Bay Improvement District (DBID) retained McElhanney Ltd. (McElhanney) to undertake a detailed water system evaluation report (2008 Report). That report formed the basis for identifying system deficiencies and infrastructure upgrades required for growth within the community. Included in that report are the following components:

- A review of the existing data and system information;
- Development of a water model for the system;
- Estimates of future growth;
- A system analysis to identifying deficiencies and recommended improvements;
- Updates to the existing Capital Works Plan; and,
- Recommendations for the Capital Expenditure Cost Bylaw.

In 2014, McElhanney was further retained to provide an update to the 2008 Report. The purpose of that report (2014 Report) update was the following:

- Review and update the list of Capital Works Projects;
- Review and update the list of Capital Expenditure Charge Projects;
- Provide current cost estimates; and,
- Review the current Capital Expenditure Cost Charge.

Given nine (9) years has passed since the previous report update and fifteen (15) years since the original 2008 Report was published, the District has requested a review for 2023. As such, the work was carried out in accordance with McElhanney proposal dated October 5, 2022.

## 1.2. SYNOPSIS OF THE 2008 WATER SYSTEM EVALUATION REPORT

The following provides a summary of the key conclusions and recommendations contained in the 2008 Report which remained largely unchanged in the 2014 Report:

- System served 565 customers with an estimated population of 1243 persons;
- Total growth to build-out was estimated to be 1081 connections with a population of 2376 persons;
- The historical growth rate is 3%. Projecting that growth rate forward we anticipated that build-out will be realized by year 2030;
- Storage is provided by a single reservoir constructed in 1975 with a capacity of 545 cubic meters;
- DBID implemented a universal metering program in 2004 which resulted in a drop in Average Day Demand from 1.49 m<sup>3</sup>/service to 0.80 m<sup>3</sup>/service;
- The system has eight wells with a total capacity of 48.8 litres per second. The year 2030 Projected Maximum Day Demand was 31.9 litres per second;
- Eleven Capital Projects were identified to meet current and future demand with a total estimated construction cost of \$4.9 Million;
- Five of these projects, valued at \$1.6 Million, were identified as “Capital Works Projects” that are required to serve existing customers;
- A Capital Works Plan was presented that would have seen these five projects completed by year 2018 based on a renewal reserve fund of \$150,000 per year
- The remaining six projects, valued at \$3.3 Million, were identified as “Capital Expenditure Projects” that were required to serve future development;
- The recommended Capital Expenditure Cost Charge for new development was \$6,500 per door.

## 1.3. CURRENT STATUS OF CAPITAL PROJECTS

The status of Capital Projects identified in the 2008 Water System Evaluation along with 2014 update are presented in Table 1 below:



**Table 1: Current Status of 2008 and 2014 Capital Projects**

<b>Project No.</b>	<b>Capital Works Projects</b>	<b>Current Status</b>
1-1	Miscellaneous Improvements to Wells and Reservoir	Partially Complete
1-2	Shoreline Main Replacement (200 mm)	Partially Complete
1-3	Deep Bay Drive Watermain Replacement (200 mm)	Proposed
1-4	Crome Point / Burne Road Watermain Replacement (200 mm)	Proposed
Added in 2014	Supervisory Control and Data Acquisition (SCADA)	Completed
Added in 2014	Longview and Seaview Drive Watermain Replacement	Completed
Added in 2014	Existing Reservoir Replacement	Proposed
Added in 2014	Dedicated Reservoir Feed Line (200 mm)	Proposed
	<b>Capital Expenditure Projects</b>	
2-1	Additional Reservoir(s)	Proposed
2-2	Western Trunk Main (250 mm)	Proposed
2-3	DL 28 Main	Proposed
2-4	Morgan Loop (150 mm)	Proposed
2-5	Pumping Main (300 mm)	Proposed

Refer to the 2008 & 2014 Reports for detailed project descriptions.

#### 1.4. AREA GROWTH POTENTIAL REVIEW

Projects identified above have been developed based on population estimates within the current Improvement District Boundaries. Growth was developed using existing Regional District of Nanaimo (RDN) Zoning requirements.

The 2008 Report along the 2014 Report had previously assumed an anticipated re-zoning of existing Agricultural Land Reserve (ALR) lands (2008 Report Figure 2.1), this assumption allowed for a proposed total of 1081 total connections in the District.

Based on feedback from Trustee's and knowledge of a general effort of the Province to protect ALR lands, McElhanney has removed this previous assumption and only included growth potential based on current permitted RDN zoning. All other growth assumptions remain unchanged.

Based on current zoning there is a growth potential of an additional 126 single family residential lots; with current connections at 623 (as of 2022), this would allow for proposed total of 749 metered connections in the District.

Should a RDN zoning amendment allow greater densification in particular areas, the District will need to review those projects on a case-by-case basis.



## 1.5. CAPITAL PROJECT REVIEW

The proposed Capital Works & Capital Expenditure Project list was reviewed and has been undated based on the following:

- Removal of completed projects.
- Revised projects based on reduction in area growth.
- Re-allocated of projects based on benefit to existing ratepayers vs growth.

An updated project summary is provided in Table 2 below:

**Table 2: Capital Project Review**

Project No.	Capital Works Projects	Comment
1-1	Miscellaneous Improvements to Wells and Reservoir	Still Applicable
1-2	Shoreline Main Replacement (200 mm)	Still Applicable. Reduced scope based on previously completed works.
1-3	Deep Bay Drive Watermain Replacement (200 mm)	Still Applicable
1-4	Crome Point / Burne Road Watermain Replacement (200 mm)	Still Applicable
2-2	Western Trunk Main (250 mm)	Still Applicable. Re-allocated, as benefit is now primarily to existing ratepayers.
Added in 2014	Existing Reservoir Replacement	Still Applicable
Added in 2014	Dedicated Reservoir Feed Line (200 mm)	Still Applicable
	<b>Capital Expenditure Projects</b>	
2-1	Additional Reservoir(s)	Still Applicable. Reduction in size based on revised growth scenarios.
2-3	DL 28 Main	Still Applicable
2-4	Morgan Loop (150 mm)	Still Applicable
2-5	Pumping Main (300 mm)	Still Applicable



## 1.6. CURRENT (2023) COST ESTIMATES

The District currently services approximately 623 metered connections. Analysis of the land base presented in this updated report indicates the potential to develop a total of 749 units within the current District boundaries leaving 126 connections to build-out. This is a reduction from the 466 build-out connections estimated in the 2008 Report.

Cost estimates presented in the 2014 Report have been updated and revised to include the revisions identified above. Apart from the following:

- Project 1-2 Shoreline Main Replacement – Costs taken from recently completed AC Pipe Replacement Report (McElhanney, 2023).
- Project 1-3 Deep Bay Drive Watermain Replacement - Costs taken from recently completed AC Pipe Replacement Report (McElhanney, 2023).
- Project 1-4 Chrome Point / Burne Road Watermain Replacement - Costs taken from recently completed AC Pipe Replacement Report (McElhanney, 2023).
- Existing Reservoir Replacement – Costs taken from the Class “B” Construction Estimate, recently completed (McElhanney, 2023).

Current cost estimates are included as Appendix 1 and summarized in Table 3 with appropriation of cost between Capital Works Projects and Capital Expenditure (CEC) Projects.

**Table 3: Appropriation of Project Costs**

Project No.	Capital Works Projects / Capital Expenditure Projects	2023 Est.	Capital	CEC
1-1	Miscellaneous Improvements to Wells and Reservoir	\$ 205,000	\$ 205,000	
1-2	Shoreline Main Replacement (200 mm)	\$ 780,000	\$ 780,000	
1-3	Deep Bay Drive Watermain Replacement (200 mm)	\$ 1,177,000	\$ 1,177,000	
1-4	Crome Point / Burne Road Watermain Replacement (200 mm)	\$ 445,000	\$ 185,417	\$ 259,583
2-2	Western Trunk Main (250 mm)	\$ 1,165,000	\$ 969,019	\$ 195,981
2014	Existing Reservoir Replacement	\$ 1,225,000	\$ 1,225,000	
2014	Dedicated Reservoir Feed Line (200 mm)	\$ 389,000	\$ 323,561	\$ 65,439
2-1	Additional Reservoir(s)	\$ 374,000		\$ 374,000
2-3	DL 28 Main	\$ 392,000	\$326,056	\$ 65,944
2-4	Morgan Loop (150 mm)	\$ 225,000		\$ 225,000
2-5	Pumping Main (300 mm)	\$ 336,000		\$ 336,000
	<b>Totals:</b>	<b>\$ 6,713,000</b>	<b>\$ 5,191,053</b>	<b>\$ 1,521,947</b>



Note where projects benefit both existing ratepayers and development (growth), allocation has been made based on percentage of growth (i.e., benefit to existing and benefit to new users).

## 1.7. PROPOSED REVISIONS TO THE CAPITAL EXPENDITURE COST BYLAW

Proposed Capital Expenditure Charges (CEC's) are defined in District Bylaw No. 222 Schedule A. CEC's can vary per type of development; however, Bylaw 222 is generally based off single-family residential. As such, the revised single-family CEC fee is as follows:

- Total Attributable CEC's = \$ 1,521,947.
- Total Renewal Reserve Fund = \$ 440,000.
- Potential Future Single Family Connections = 126 each.
- Cost Per Connection =  $(\$ 1,521,947 - \$ 440,000) / 126 = \$ 8,586.88$  per connection.

Please note, the current CEC Fund has been estimated by the District at \$440,000, which has been reflected in the above per lot calculation.

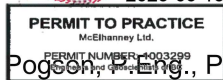
## 1.8. CLOSING

Please contact the undersigned if you have any questions or require additional information.

Sincerely,  
McElhanney



2023-06-13



Chris Pogson, Project Manager  
[cpogson@mcelhanney.com](mailto:cpogson@mcelhanney.com) | 778 762 0667



# APPENDIX A

## Statement of Limitations

## Statement of Limitations

**Use of this Report.** This report was prepared by McElhanney Ltd. ("McElhanney") for the particular site, design objective, development and purpose (the "Project") described in this report and for the exclusive use of the client identified in this report (the "Client"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

**Standard of Care and Disclaimer of Warranties.** This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering/planning/etc and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

**Information from Client and Third Parties.** McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

**Effect of Changes.** All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment/report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Construction activities can significantly alter soil, rock and other geologic conditions on the site. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations, construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.





**Independent Judgments.** McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

**Cost Estimates.** This construction cost estimate has been prepared using the design and technical information currently available, and without the benefit of Survey, Geotechnical, Environmental, etc information. Furthermore, McElhanney cannot predict the competitive environment, weather or other unforeseen conditions that will prevail at the time that contractors will prepare their bids. The cost estimate and construction schedule are therefore subject to factors over which McElhanney has no control, and McElhanney does not guarantee or warrant the accuracy of such estimate or schedule.

