



## Anderton Corridor Servicing Study

### Volume 3 Water System Plan

Town of Comox

Presented to:

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# 1. INTRODUCTION

The Town of Comox is experiencing growth and there is a need to provide additional lands for development within the Town. The Anderton Corridor has been identified as an area that will be annexed into the Town of Comox as demand for new homes and development land occurs. There have been extensions of the Town boundary to include the southern most portions of this block. Further extension of the Town boundary requires a servicing plan that identifies aspects of the future development in terms of the engineering and infrastructure necessary for future growth, the phasing of the growth, and an estimate of the costs attributable to the provision of the infrastructure.

Mr. Jim Dumont has been retained by the Town of Comox to undertake a study of servicing requirements of the Anderton Corridor.

The servicing study focused primarily on the aspect of stormwater management while providing a review of the water and sanitary sewer requirements. The results of the study area in separate report volumes.

## 1.1 Study Area

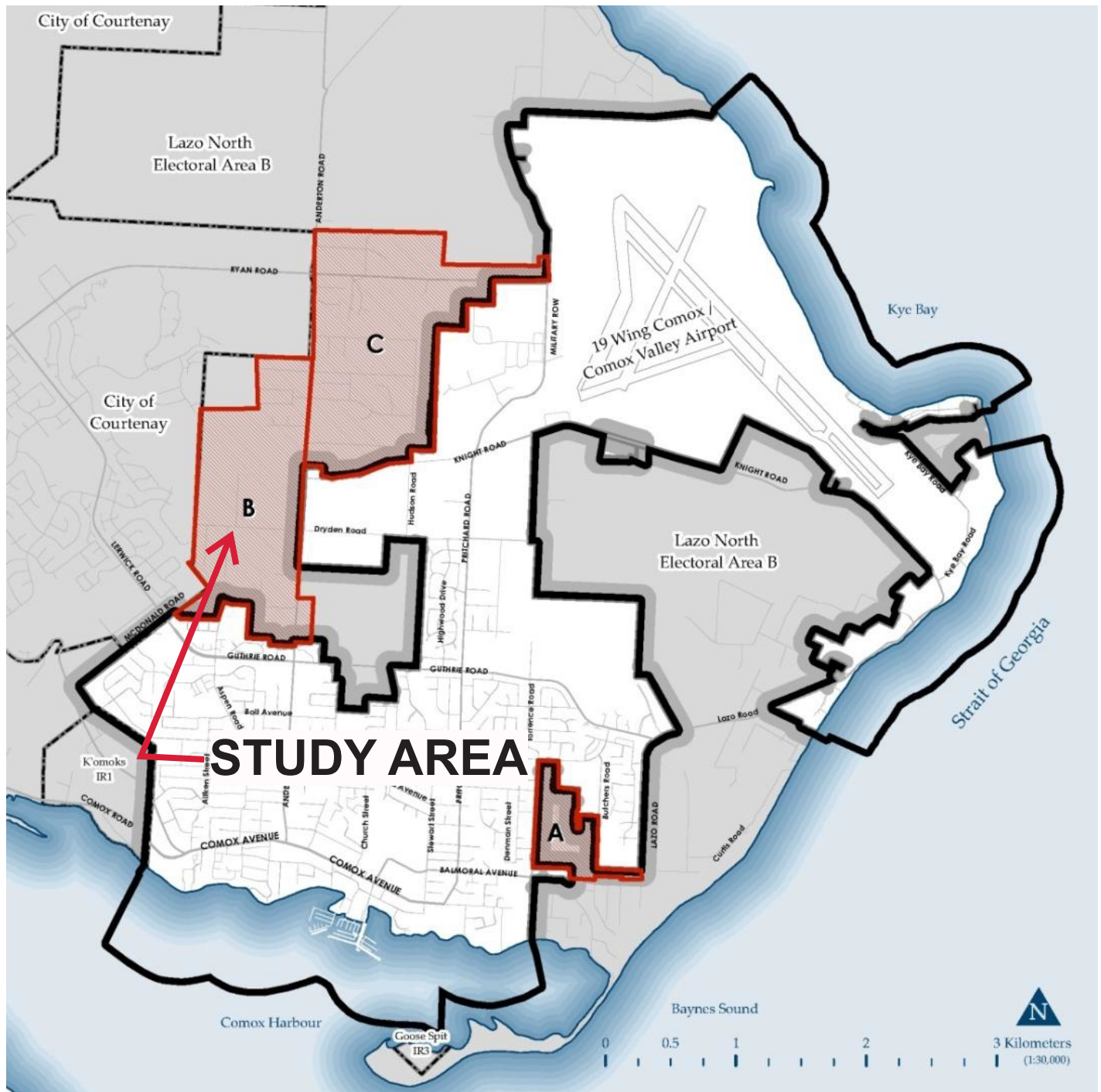
The Anderton Corridor which is shown on **Figure 1-1** is described as future annexation Area B in the Town of Comox Official Community Plan, Bylaw 1685 (OCP).

The existing water system within the Anderton Corridor is interconnected with that in the Comox Valley Regional District (CVRD), the City of Courtenay, and the Town of Comox. The ownership, operation, planning, and upgrading of different components of the water system vary depending upon responsibility. The CVRD manages the water transmission system delivering potable water to the Town of Comox. The Town owns and operates the local water distribution system within the Town boundaries. As the future development areas are annexed into the Town the service area will be enlarged as will the distribution system. The transmission system from the supply to the Town will continue to be the responsibility of the CVRD. This will affect the future scheduling and budgeting of the Town and the CVRD within the Anderton Corridor annexation area.

An overall water system model has been created by Koers & Associates Engineering Ltd. for use in evaluating the CVRD water system.

The overall model includes existing transmission mains and future development scenarios which have been used in designing the transmission system. Moving forward, the OCP land uses, tempered by the latest projections prepared by the Town should form the basis for the future servicing scenarios.





Base Plan: Town of Comox Official Community Plan, 12 May, 2011, Page 104,  
Figure 9 - Town of Comox Potential Boundary Expansion Areas



## 1.2 Scope of Analysis

The list of tasks to be completed as part of the water system component of the servicing study included:

1. Review the Town and CVRD water system reports.
2. Prepare a list of any outstanding questions and meet with the CVRD and Koers to obtain the information as necessary.
3. Locate any transmission main upgrades required to service the Anderton Corridor and formulate a development phasing plan for the water system transmission upgrades which are the responsibility of the CVRD and those of the Town in establishing a local distribution system.
4. Prepare cost estimates for the system which will allow the Town to update the DCC Bylaw.
5. Document the findings of the study in a clear and concise report outlining the background information, findings of the analysis, opportunities and constraints for future development.

## 1.3 Background Documents

Background information for water system was derived several diverse sources that included:

1. Town of Comox GIS,
2. Town of Comox record documents;
3. CVRD Mapping;
4. Official Community Plans (OCP's);
5. Comox Valley Regional Water Supply Strategy, Wedler Engineering, April 1, 2011
6. 2012 Comox Valley Water Study Update. Final Report, Koers & Associates Engineering Ltd., May 21, 2013.
7. Town of Comox Water System Study, September 2013, Koers & Associates Engineering Ltd.
8. Town of Comox Subdivision and Development Servicing Bylaw, 1261
9. Planning information for the future from the Town of Comox

As additional information becomes available the Water System Plan of the Anderton Corridor Servicing Study can be updated.



## 2. BACKGROUND INFORMATION

There have been a number of studies completed in the recent past related to the water system in the study area:

1. Comox Valley Regional Water Supply Strategy, Wedler Engineering, April 1, 2011
2. 2012 Comox Valley Water Study Update. Final Report, Koers & Associates Engineering Ltd., May 21, 2013.
3. Town of Comox Water System Study, September 2013, Koers & Associates Engineering Ltd.

A summary of the relevant information from these studies has been included in Appendix A.

It must be stated that the information derived from all of these **sources are not consistent**. The standards, land uses, boundaries, and assumptions vary between documents. The different information will be noted and this report which includes a cohesive plan for the area that is consistent with the latest standards and planning of the Town of Comox.

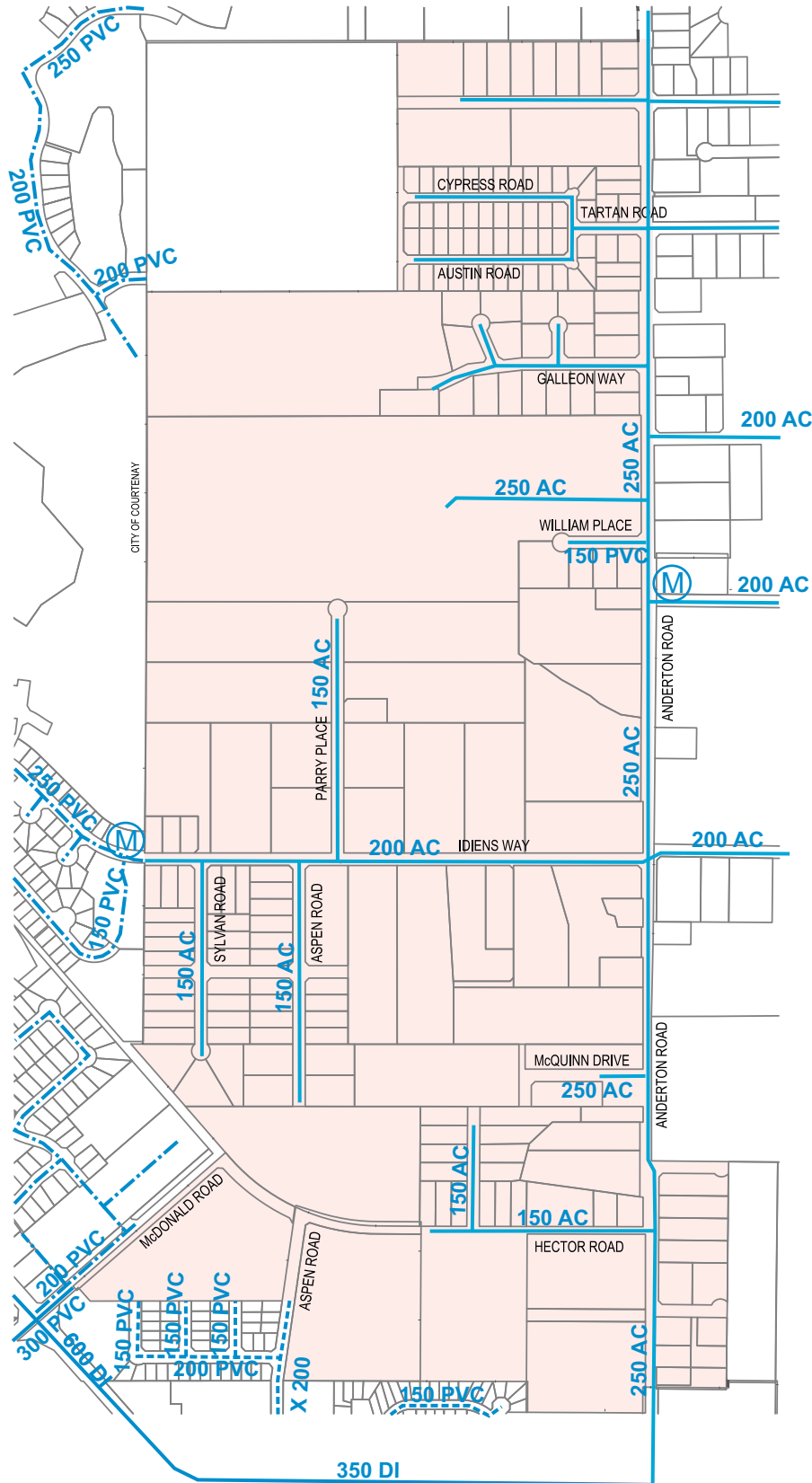
### 2.1 Anderton Corridor Distribution System

The existing water distribution system within the Anderton Corridor study area is shown on **Figure 2-1**. The water transmission system within the study area is owned and operated by the CVRD. The 200 AC pipe along Idiens Way and the 250 AC pipe along Anderton Road serve dual roles as part of both the transmission and the distribution systems within the CVRD.





TOWN OF  
**COMOX**



- CVRD System
- - - Town of Comox
- · - City of Courtenay
- 200 AC Size and Material

Anderton Corridor Servicing Study  
Volume 3 Water System Plan  
Existing Distribution System  
Figure 2-1



### 3. ANDERTON CORRIDOR AREA

The potential land uses for the study area have been provided by the Town of Comox and are shown on **Figure 3-1**. The Town estimates that the ultimate housing density and population for the study area would include approximately 38 units per ha and a total population of 8,910 persons.

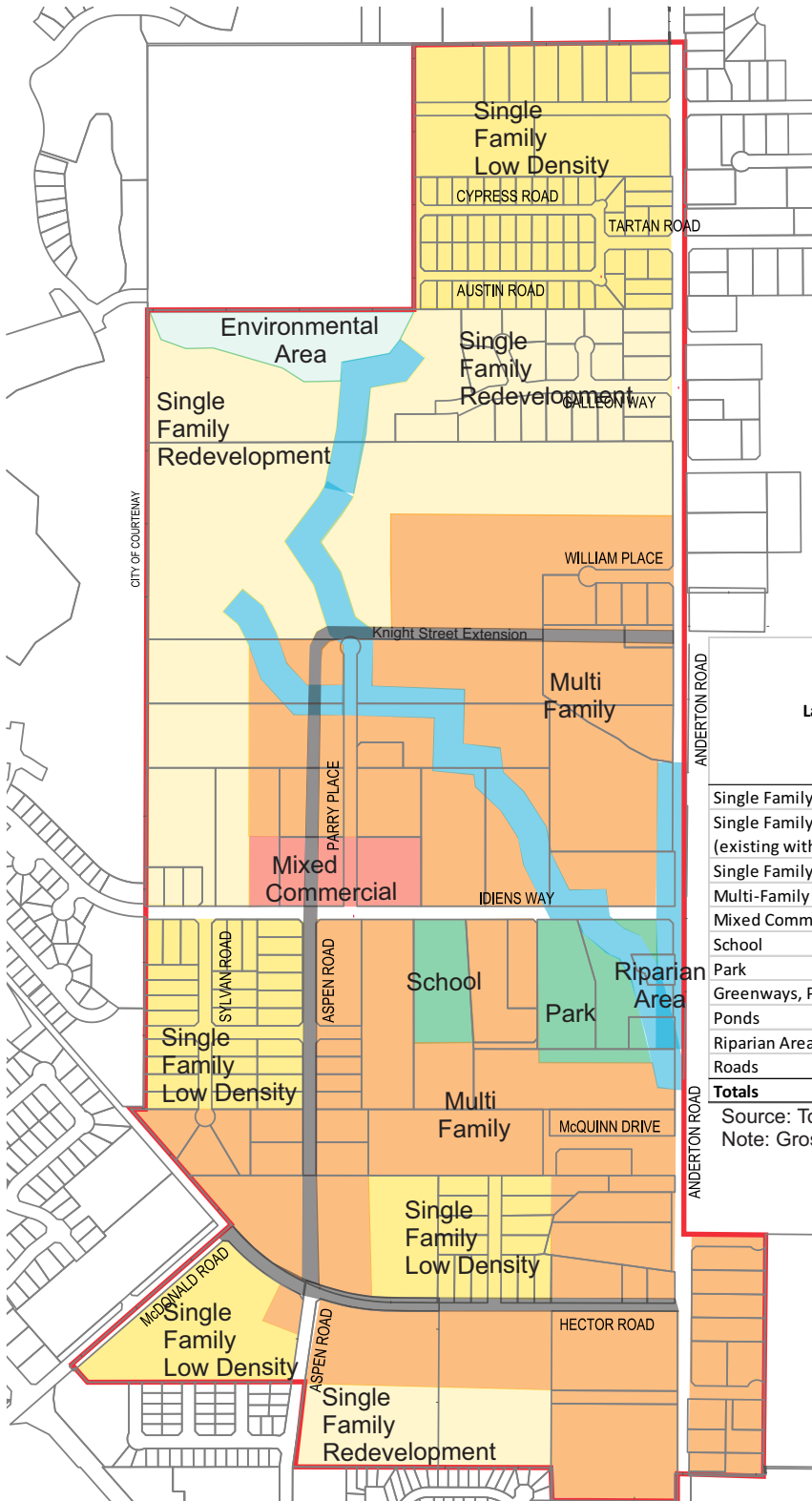
As the future detailed planning, rezoning, and subsequent subdivision design occurs the information in this report may be updated to represent a more accurate view of the study area. The preliminary information provided herein may be superseded for a number of reasons which may include:

- Accuracy of the topographic mapping, and
- Market conditions that result in different land use requirements.

At this time, the Town has indicated that majority of the land is within “blanket” 9.0 m height limit for construction near the Comox Airport. Ongoing discussions between the Town of Comox, City of Courtenay and DND are occurring to clarify future requirements. Some creative designs may be required to achieve the target 38 uph density. Given the potential height restrictions, the mid-density areas may need to be expanded. Single-family would remain on Acacia Rd block, east of Aspen Rd and north of (extension) Knight Road, but “Single-Family Redevelopment” labelled lands may need higher density than SF.







Land Use	Area		Density		Population		Totals	
	Gross (ha)	Net (ha)	Net	UPHa	People/ha	Units	People	
Single Family East of Anderton	4.5	4.5	38.0	20	68	135	304	
Single Family Low Density (existing with infill)	16.0	13.6		14	31	186	419	
Single Family Redevelopment	65.3	38.7		24	54	959	2,158	
Multi-Family	61.4	52.7		46	104	2,680	6,030	
Mixed Commercial - Residential	2.0	2.0						
School	2.0	2.0						
Park	2.0	2.0						
Greenways, Pocket Parks		4.1						
Ponds	7.5	7.5						
Riparian Areas		9.0						
Roads		24.6						
<b>Totals</b>	<b>160.7</b>	<b>160.7</b>	<b>38.0</b>			<b>3,960</b>	<b>8,910</b>	

Source: Town of Comox

Note: Gross development areas include parks riparian ways and parks.

Anderton Corridor Servicing Study  
Volume 3 Water System Plan  
Potential Land Use  
Figure 3 - 1



## 4. IMPLEMENTATION

Design and implementation of the water distribution system within the study area will, by necessity, follow the phasing of the stormwater and sewer system. The two reasons for this include the need to implement stormwater management at the same time as the water and sanitary sewer systems and the infrastructure and pipe systems are likely to follow the same alignments within the road dedication and other Statutory Rights-of-Way, or road dedications. The study area has been divided into six phases and one area set aside for future planning.

The area set aside for future planning, a small portion of the area which includes Tartan Road has been excluded from the sanitary sewer service area of the Hudson Trunk and there are no plans for the provision of sanitary sewer servicing to these properties. As this area nears development a water distribution system can be planned along with the downstream systems for both the sanitary and the storm sewer system. Both the storm and sanitary sewers from this 13.6 ha area would flow by gravity to the north and east, away from the infrastructure serving the remaining 146.5 ha of the study area. At that time of development the servicing details in this small portion (9%) of the study area can be established.

The CVRD will retain responsibility and ownership of the transmission system delivering water to the Town of Comox, City of Courtenay, and areas within the CVRD.

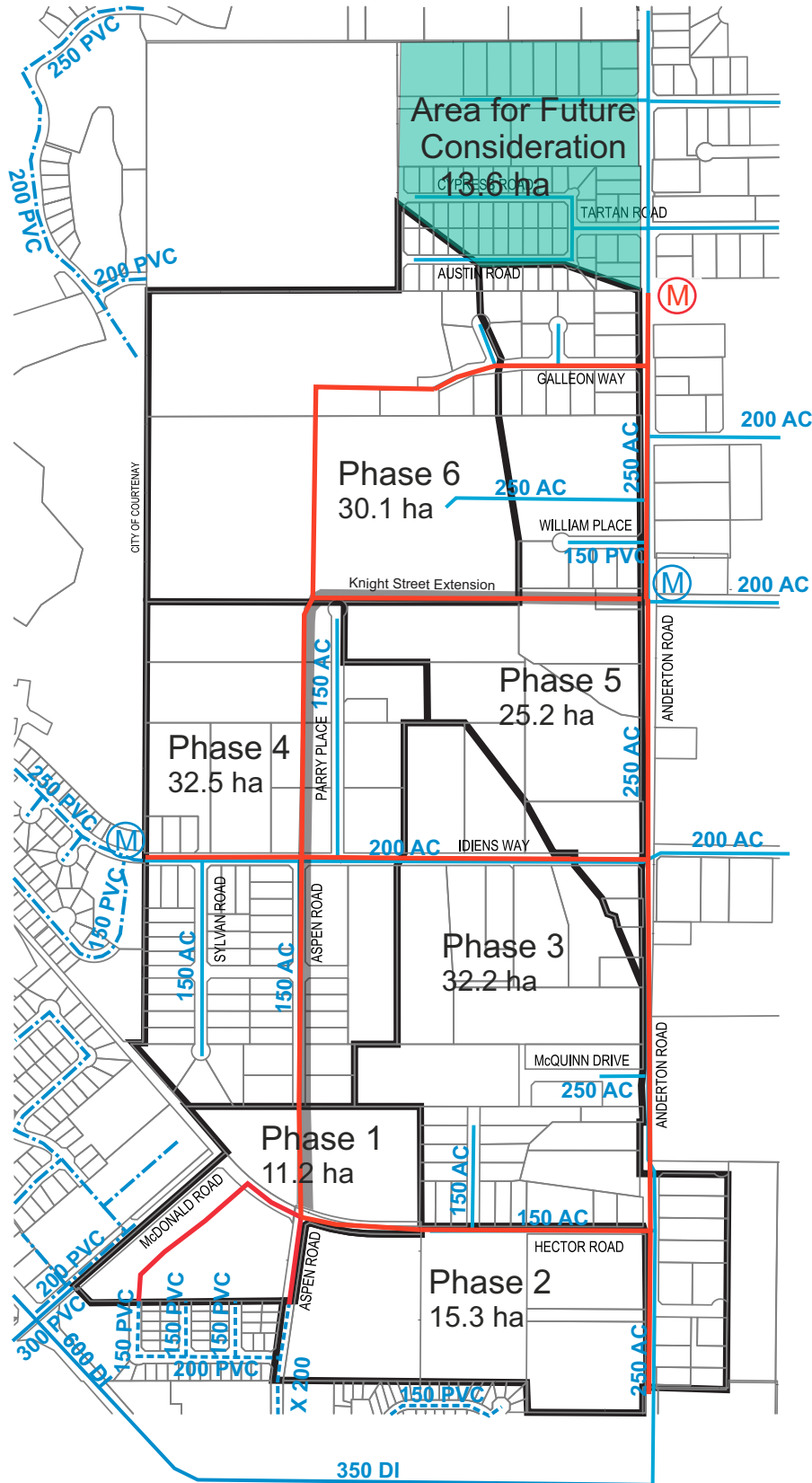
The Town will own and operate the future water distribution infrastructure which will consist of distribution mains, gate valves, fire hydrants, air release valves, blow-off assemblies, drain assemblies, and individual service connections and individual water meters.

A preliminary layout and phasing of the water transmission system is shown on **Figure 4-1**. Within each of the phases there will be the need to provide both the local distribution system for each development and the transmission system to service the entire Anderton Corridor Area. Care should be taken to provide a looped system with a minimum of single flow direction to dead end pipes. This practice would provide a more secure supply to all locations in the event of failure, or closure, of any portion of the system and would allow fire flows to be provided from more than one direction within the system thus reducing the ultimate size of the distribution mains.

### Phase 1

The new water transmission system within Phase 1 would extend the existing Town system northward. The distribution pipes would be extended northward to Aspen Road and a future extension into Phase 4. The pipe would also be extended eastward along Hector Road.





**Existing Pipes**

- CVRD System
- Town of Comox
- City of Courtenay
- 200 AC** Size and Material
- Flow Meter

**Future Pipes**

- Town of Comox

Anderton Corridor Servicing Study  
Volume 3 Water System Plan  
Water Phasing Plan  
Figure 4-1



## **Phase 2**

The water distribution system in Phase 2 would include an extension of the Town pipe along Anderton Road with a stub for future extension. A pipe along Hector Road would connect the Anderton Road pipe with Phase 1.

## **Phase 3**

The water distribution mains in Phase 3 would be an extension northward on Anderton Road and then west along Idiens Way.

## **Phase 4**

The distribution system within Phase 4 would see the extension of the main along Idiens Way from Phase 3. An extension along Aspen Road would provide a future connection to the Phase 5 pipe on the Knight Street extension.

## **Phase 5**

The distribution system within Phase 5 would include an extension northward on Anderton Road to ultimately connect to the CVRD system with a new meter station. An extension westward from Anderton on the Knight Street extension would connect to the main constructed within Phase 4.

## **Phase 6**

The distribution main in Phase 6 would be a connection of the main along Anderton Road to the main on the Knight Road extension at Parry Place.



## 5. FUNDING AND COST ESTIMATES

In the Town of Comox, development and sale of new neighbourhoods funds the construction of new infrastructure that taxpayers will own, operate and maintain. As costs paid by developers are reflected in the price of housing, the cost of new development is ultimately borne by new homeowners. Where the infrastructure constructed by one developer will benefit other developer then a cost sharing mechanism is required. This cost sharing mechanism will be administered by the Town of Comox.

Establishing the funding mechanism must precede the determination of the development costs that become a Town of Comox administrative responsibility. The method of funding will determine the individual infrastructure components which will need to be tracked and administered by the Town. Therefore, discussion of, and establishment of a funding mechanism must occur prior to establishing the cost estimates of the infrastructure that will fall directly under the administrative responsibility of the Town.

New infrastructure eligible for cost sharing may be financed by one of three sources:

1. The Town can fund new infrastructure through Development Cost Charges (DCC) where developers can pay for new infrastructure directly and have all or part of the cost rebated through a reduction in DCC's; or
2. Utilize a Late Comers Agreement or Front-end Financing Agreement is where the first developer constructs the infrastructure and recovers costs that are in excess of their development need from future benefiting developers; or
3. Establish a Local Service Area to fund construction and operations through a parcel tax levee. The Local Service Area could also be used to fund future operation and maintenance costs.

The financial plan for the Anderton Corridor will be based on a series of fundamental assumptions that facilitates the need to provide the Town of Comox with investment in municipal infrastructure for new developments while utilizing a process that is equitable to both the municipality and developers. The investment is balanced so that neither the taxpayer nor the developer is penalized or providing subsidies to support the other.

It is recommended that any future funding and cost sharing system be based on the "oversizing" concept, which has a significant impact on the assumptions in the financial report/analysis. This means that the "base" cost of all works are the responsibility of the adjacent developer and it is only the oversizing from base to trunk standards that are covered by funds from either the DCC program or other funding mechanism. An example would be for water mains where the minimum pipe system is considered base and the construction cost associated with the development and any additional capacity would be the responsibility of the other funding mechanism.



A limited amount of the water infrastructure will be larger than that required to provide service to any development. This limits the applicability for DCC funding. However, DCC funding can be considered to provide. If this option is selected then the calculations contained in the current DCC program, adopted on May 4<sup>th</sup>. 2016 through Bylaw Number 1830 will require updating. To include the eligible portions of the water infrastructure in the study area.

Given the characteristics of the water distribution system the portions of the system that could be larger than the minimum required would be eligible for cost sharing. All portions of the distribution system that are the minimum pipe size would not be eligible, except for the potential of “front ending” some portions by developers where a later developer would receive a benefit.

Taking the above concept of funding the upsizing in infrastructure forward the estimated installed price for the pipes plus appurtenances less taxes, engineering, administrative and contingencies are shown in **Table 5.1**. Also shown is the cost difference to upsizing beyond the minimum size required.

Table 5.1 – Water Distribution Pipe Costs			
Item	Unit	Rate	Difference in Cost from 150 mm
250 mm PVC supply and install	Lm	300	90
200 mm PVC supply and install	Lm	240	30
150 mm PVC supply and install	Lm	210	0
Contingencies, Engineering, Administrative Costs, and Taxes are not included above			

Preliminary estimated sizing of the transmission main would include a 250 mm diameter pipe along Anderton Road and along Idiens Way. The remaining transmission main is estimated to be 200 mm diameter. The distribution pipes are estimated to be 150 mm diameter based upon the existing distribution system in the Town.

The estimated cost of upsizing the water distribution system within the Anderton Corridor study area is shown included in **Table 5.1**:

Table 5.2 – Water Distribution Upsizing Costs				
Item	Unit	Quantity	Rate	Cost
250 mm PVC supply and install	Lm	2,600	90	234,000
200 mm PVC supply and install	Lm	3,500	30	105,000
Meter station	LS	1	50,000	50,000
subtotal				389,000
Contingencies, Engineering, Administrative Costs, and Taxes are not included above				

Confirmation of the sizing of the water distribution system as identified on **Figure 4-1** will be required through updating the existing water distribution model to test the proposed system to deliver the necessary flows. This would



include consideration to the proposed school and mixed commercial development along Idiens Way.



## 6. RECOMMENDATIONS

The Town of Comox adopt the Water System Plan for the Anderton Corridor. The engineering and funding aspects of the Plan will be completed as part of future annexation, subdivision, and development of land within the area. The major components of the plan include:

1. Confirmation of the water transmission and distribution sizing complete with an updated estimate of costs.
2. Provision of a funding mechanism to facilitate the construction of the required infrastructure.





## 7. CORPORATE AUTHORIZATION

This document entitled:

**Anderton Corridor Servicing Study**

**Volume 3 Water System Plan**

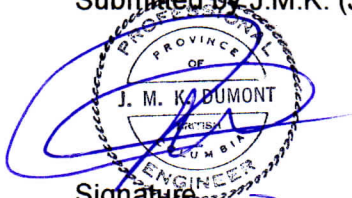
Client Name:

**Town of Comox**

This document is intended solely for the use of the Town of Comox, and for the purposes and within the limitations stated in the document. The material in this report reflects the best judgement of J.M.K. (Jim) Dumont, P.Eng. in the light of the information available at the time of preparation. Any use of, or reliance placed upon, the material contained in this report by third parties, or decisions based upon this report are the sole responsibility of those third parties. J.M.K. (Jim) Dumont, P.Eng. accepts no responsibility for damages suffered by any third parties as a result of decisions made, or actions taken, based upon information contained within this report. Duplication or distribution of this report or any portion hereof is forbidden and requires approval from the client and J.M.K. (Jim) Dumont, P.Eng.

I certify this to be a report prepared by: J.M.K. (Jim) Dumont, P.Eng.

Submitted by J.M.K. (Jim) Dumont, P.Eng.



Signature December 7, 2022

Professional Stamp

Permit to Practice 1003061



## APPENDIX A - Summary of Background Information



A summary of the relevant information from the following background reports:

1. Comox Valley Regional Water Supply Strategy, Wedler Engineering, April 1, 2011
2. 2012 Comox Valley Water Study Update. Final Report, Koers & Associates Engineering Ltd., May 21, 2013.
3. Town of Comox Water System Study, September 2013, Koers & Associates Engineering Ltd.

It must be stated that the information derived from all of these **sources are not consistent**. The standards, land uses, boundaries, and assumptions vary between documents. The different information will be noted.

## **Comox Valley Regional Water Supply Strategy**

The CVRD has a vision for the water system, the report that states "*We provide a long term, high quality, reliable water supply to the entire Comox Valley while protecting ecosystems and the environment.*" The report provides a high level planning process for establishing and managing the water supply and transmission system of the CVRD.

## 2012 Comox Valley Water Study Update

The report updated an earlier 1997 Water Study completed by Koers & Associates identified capital projects required to support growth in the Comox Valley Water Service Area to a population level of 74,500 people, with cost estimates. The relationship of the Anderton Corridor within the overall CVRD water service is shown on **Figure A-1**. The Anderton Corridor is a small, centrally located part of the overall CVRD water service area. The CVRD will continue to plan and upgrade their water supply and transmission system to meet the demand of the growing population within the region.

Stated design standard is based upon the ability of the water transmission system to deliver water while meeting the following conditions as shown on Page 3 of the CVRD study:

### **Peak Hour Demand**

1. Minimum Service Pressure 275 kPa (40 psi)
2. Maximum main velocity 1.5 m/s

### **Fire Flow Conditions**

1. Minimum residual pressure at hydrant 138 kPa (20 psi)
2. Minimum residual pressure at property line 34 kPa (5 psi)

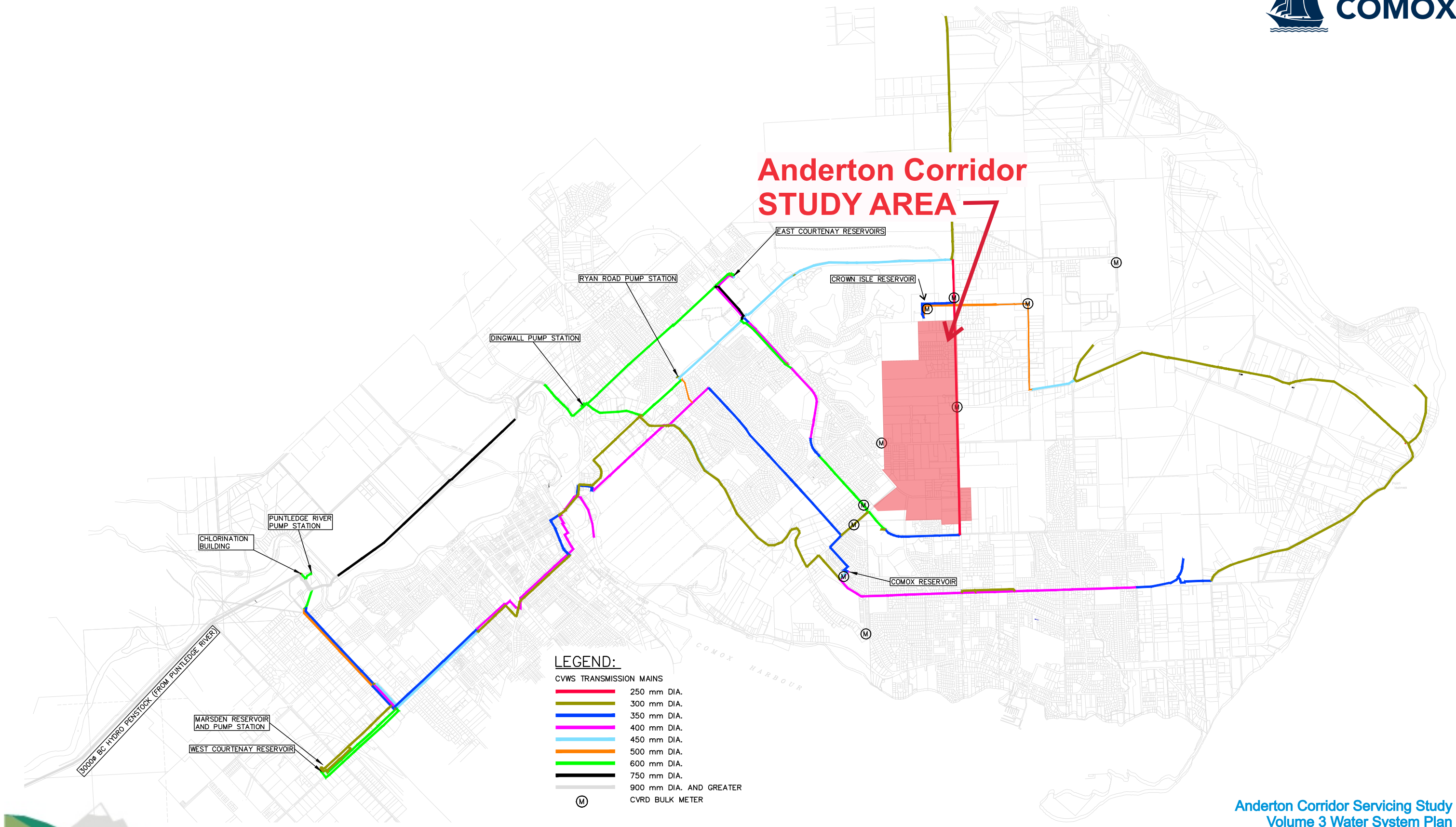
The water demand for the population within the CVRD was listed on page 4 of the CVRD study and is:

- Average Daily Demand 520 L/c/day
- Maximum Daily Demand 1,025 L/c/day
- Peak Hourly Demand 2,100 L/c/day

The demands listed in the CVRD study were for the populations of the Town of Comox and the City of Courtenay. The demands were established using MMCD guidance rather than the higher values specified within the design guidelines of those municipalities.

Fire flow demand for the Town of Comox in relation to water reservoir storage was identified as 300 L/s for a 4 hour duration as shown on page 10 of the CVRD study.

## Anderton Corridor STUDY AREA



**LEGEND:**

CVWS TRANSMISSION MAINS

- 250 mm DIA.
- 300 mm DIA.
- 350 mm DIA.
- 400 mm DIA.
- 450 mm DIA.
- 500 mm DIA.
- 600 mm DIA.
- 750 mm DIA.
- 900 mm DIA. AND GREATER
- M CVRD BULK METER

Base Plan: Town of Comox Water System Study, September 2013, Koers & Associates Engineering Ltd.

## Town of Comox Water System Study

The report outlines the results of the computer network analysis of the water system and the improvements required to meet the pressure and flow requirements for a future population of 19,000 in accordance with the Official Community Plan build-out to Year 2031.

The Anderton Corridor Study Area was not specifically included within the Water System Study as a portion of future development within the Town of Comox. The study area was included within the overall CVRD water supply model however there was no indication of consideration for future development within the Anderton area, nor were any results reported from the analysis for the area.

The Town owned and operated infrastructure consists of distribution mains, pressure reducing valve stations, gate valves, fire hydrants, air release valves, blow-off assemblies, drain assemblies, and individual service connections and individual water meters.

The water system within the Town of Comox has two pressure zones; an 89 meter and a 120 meter pressure zone as shown on **Figure A-2**. While the two pressure zones within the Town boundaries are shown there is no information regarding the derivation of the boundary conditions and how they may affect the study area.

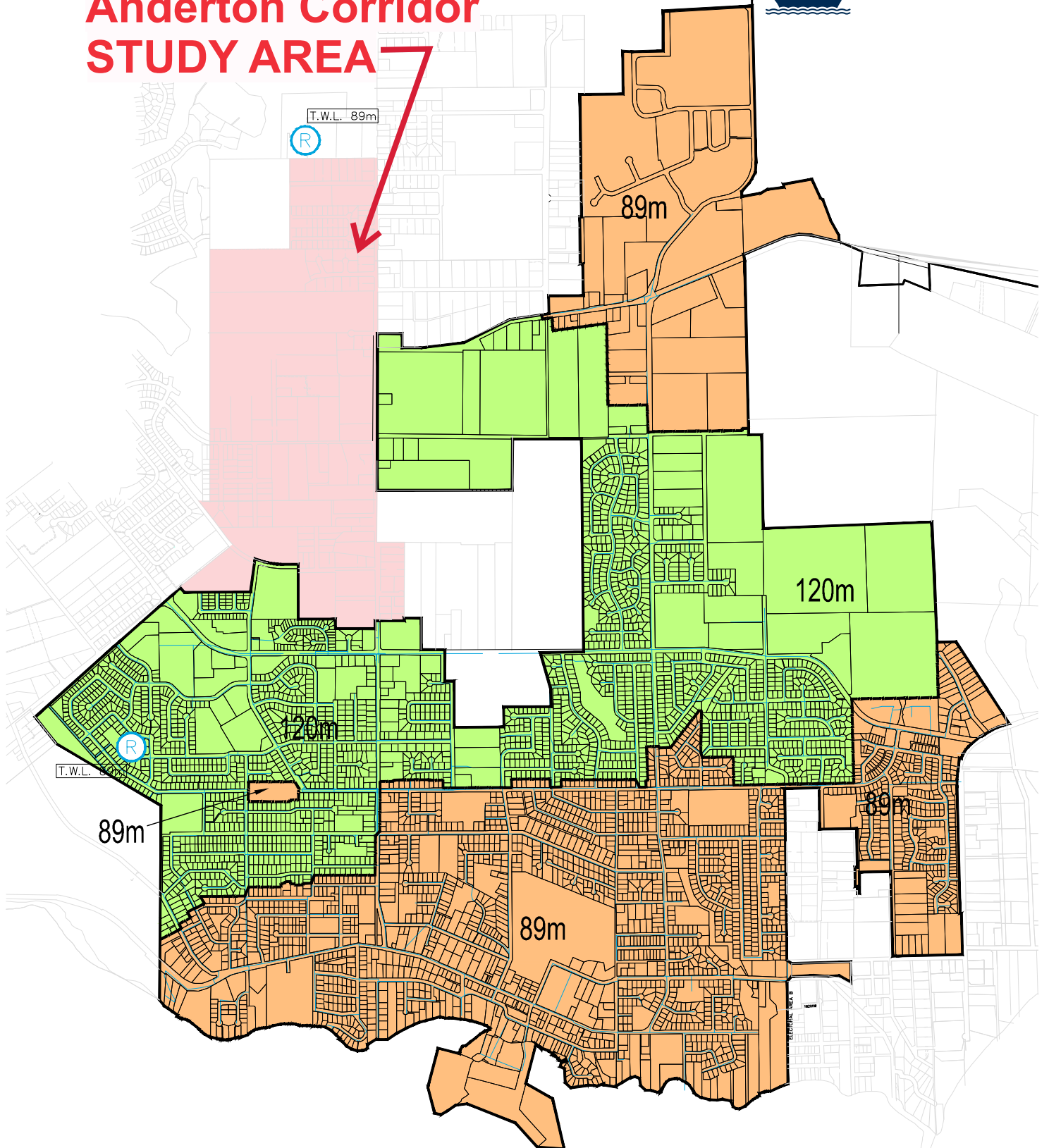
The water demand assumptions used within the Town of Comox Water Study did not use the criteria listed in the Town of Comox Subdivision and Development Servicing Bylaw or the CVRD study. The demand values used in each of the studies is compared to those listed in the Town's bylaw in **Table A.1**.

Table A.1 – Water Demand			
Description	Per Capita Demand (L/c/d)		
	Town Bylaw	CVRD Study	Town Study
Average Day Demand (ADD)	635	520	560
Maximum Day Demand (MDD)	2,100	1,025	1,300
Peak Hour Demand (PHD)	3,000	2,100	2,050





# Anderton Corridor STUDY AREA





The water distribution system is required to have an adequate capacity to deliver both the peak hourly demand plus any necessary fire flows. The fire flows used in the Town of Comox Water Study are shown in **Table A.2**.

Table A.2 – Fire Flow Demand		
Land Use	Assumed Minimum Fire Required Flow	
	Demand (L/s)	Duration (hours)
Residential	75	1.75
Commercial	150	2
Institutional / Industrial	300	4

The fire demand listed on in the Town’s bylaw are no less than 75 L/s and not more than 300 L/s which corresponds to the minimum and maximum values shown in **Table A.2**.

The design values utilized in future developments within the Town and within the study area should be verified prior to commencing any designs of the distribution system.

The Water Study determined the available pressures within the Town water system given a peak hour demand for the OCP Buildout in 2031 as shown on **Figure A-3**. As can be seen the values estimated for the Anderton Corridor Study Area was not reported.

The 2013 Water Supply Study also tested the water system under a variety of fire flows and locations and reported the available flows for the Ultimate OCP Buildout as shown on **Figure A-4**. As can be seen the values estimated for the Anderton Corridor Study Area were not reported.









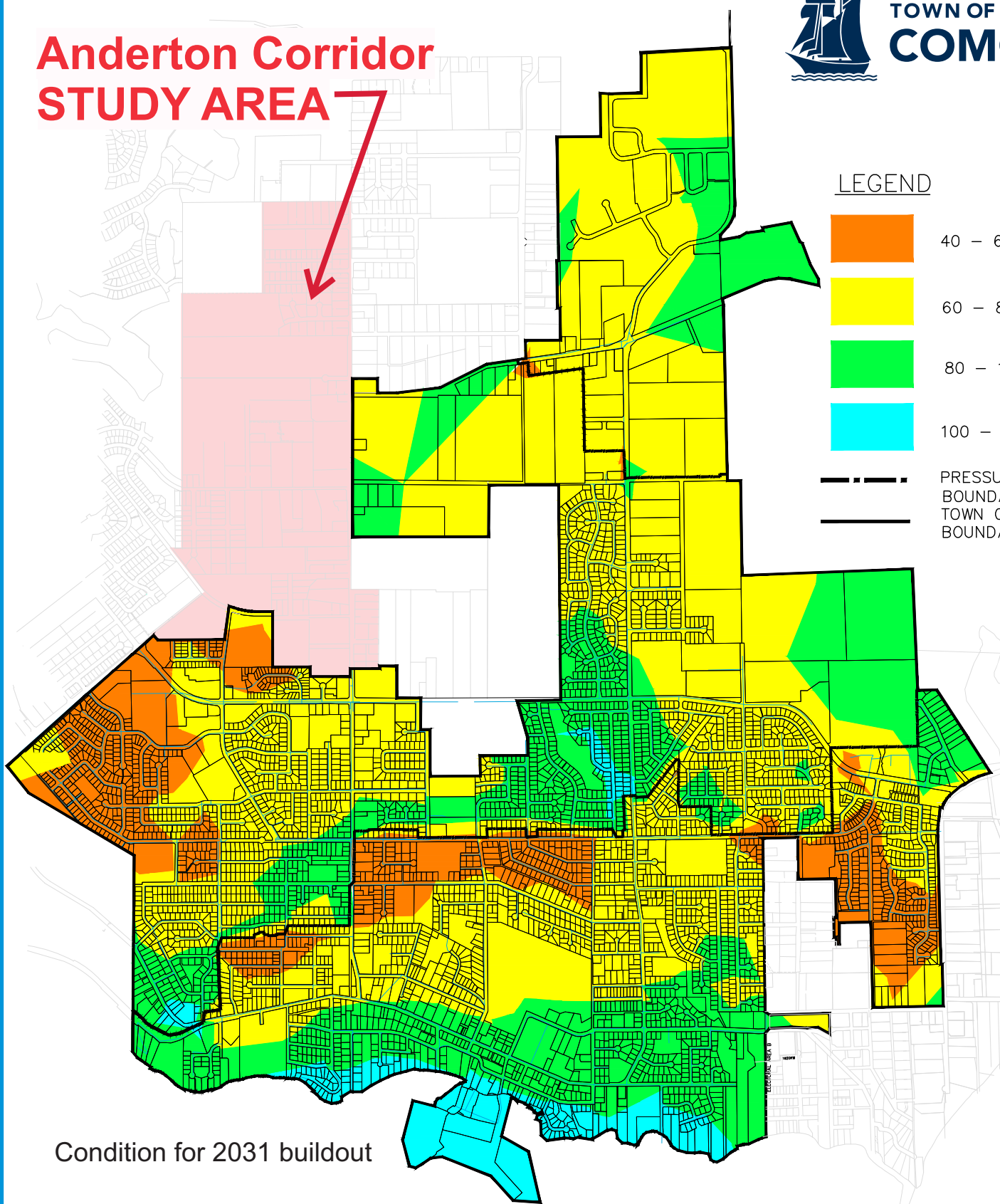
TOWN OF  
**COMOX**

# Anderton Corridor STUDY AREA



## LEGEND

-  40 – 60 psi
-  60 – 80 psi
-  80 – 100 psi
-  100 – 120 psi
-  PRESSURE ZONE BOUNDARY
-  TOWN OF COMOX BOUNDARY



Condition for 2031 buildout

Base Plan: Town of Comox Water System Study,  
September 2013, Koers & Associates  
Engineering Ltd.

Anderton Corridor Servicing Study  
Volume 3 Water System Plan  
Peak Hour Pressure  
Figure A-3









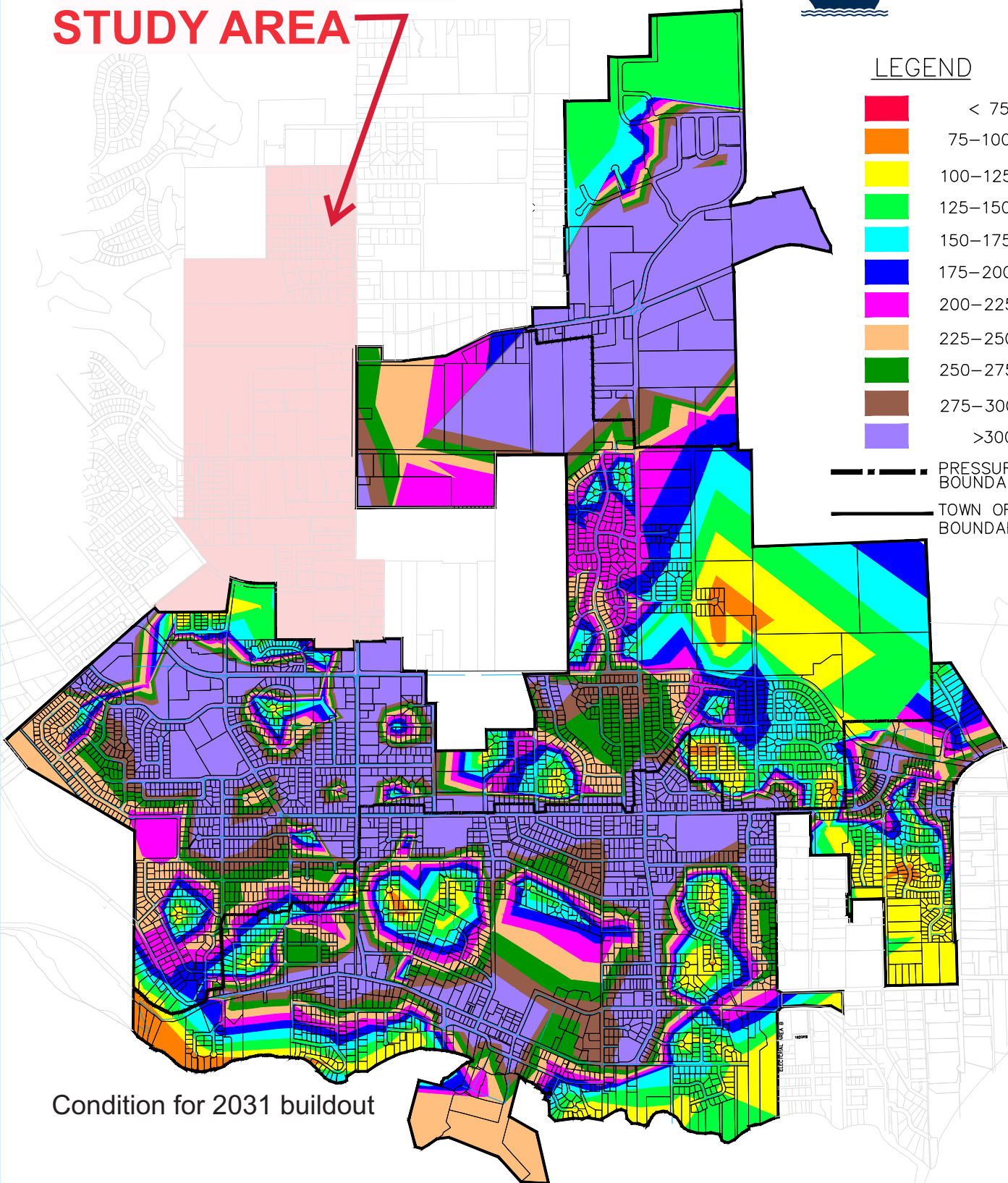
# Anderton Corridor STUDY AREA



## LEGEND

-  < 75 lps
-  75–100 lps
-  100–125 lps
-  125–150 lps
-  150–175 lps
-  175–200 lps
-  200–225 lps
-  225–250 lps
-  250–275 lps
-  275–300 lps
-  >300 lps

-  PRESSURE ZONE BOUNDARY
-  TOWN OF COMOX BOUNDARY



Condition for 2031 buildout

