Strathcona
REGIONAL DISTRICT

STAFF REPORT

DATE: April 19, 2023 **FILE**: 0550-04 Board

TO: Chair and Directors
Regional Board

FROM: Dave Leitch
Chief Administrative Officer

RE: KYUQUOT WATER SYSTEM REQUIREMENTS

PURPOSE/PROBLEM

To consider the status of the water system currently serving the Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations community of Houpsitas, as well as Walters Island, Okime Island and the Kyuquot School within Electoral Area A.

EXECUTIVE SUMMARY

The attached report was considered at the April 12, 2023 meeting of the Electoral Areas Services Committee and concerns the issues to be dealt with in bringing the existing water distribution system up to the standards required by Provincial legislation. As noted in the report, the fact that the water system provides service to properties located within the boundaries of the community of Houpsitas on Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations treaty lands as well as properties located within Electoral Area A presents special challenges.

Although attempts to engage with the KCFN have so far been unsuccessful, staff will continue to seek opportunities for dialogue in the hope that additional clarity regarding resolution of outstanding issues can be obtained.

RECOMMENDATION

THAT the report from the Chief Administrative Officer be received.

Respectfully:

Dave Leitch
Chief Administrative Officer

Prepared by: *T. Yates, Corporate Services Manager*

Attachment: April 3, 2023 report to Electoral Areas Services Committee

Strathcona
REGIONAL DISTRICT

STAFF REPORT

DATE: April 3, 2023 **FILE**: EASC

TO: Chair and Directors
Electoral Areas Services Committee

FROM: David Leitch
Chief Administrative Officer

RE: **HOUPSITAS WATER SYSTEM SERVICING REQUIREMENTS FOR KYUQUOT SCHOOL, WALTERS ISLAND AND OKIME ISLAND**

PURPOSE/PROBLEM

To consider the request from the Ministry of Forests that the Strathcona Regional District take over the operation and distribution of the water service to Kyuquot School, Walters Island and the Okime Island health centre.

EXECUTIVE SUMMARY

Under the Water Sustainability Act, the Province of BC required all groundwater users to apply for a groundwater license by March 1, 2022. The Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations (KCFN) applied for a groundwater license for its water system. In addition to providing water to KCFN Treaty Lands, the water system has served the Kyuquot School and teacher's residence, Walters Island properties and the Okime Island health center since 1998. To continue providing water outside its Treaty Lands, the KCFN would need to apply for a Certificate of Public Necessity and Convenience (CPNC). The KCFN is not obliged to continue supplying water or maintaining the distribution system to service areas outside its Treaty Lands, nor does KCFN wish to undertake the arduous process of obtaining a CPNC.

The Ministry of Forests and KCFN representatives met with Regional District staff in July 2022 to introduce the issue and followed up with the attached letter in September. Improvements to the water treatment plant are required, and it is expected to take two years for KCFN to bring its system up to the current standard. The Ministry will permit KCFN to supply water off Treaty Lands until then, but those external entities that are dependent on the service will need to find an alternate solution. At the July 2022 meeting, the KCFN representative expressed willingness to sell bulk water to the Regional District should we assume responsibility for the service.

There is limited information available on the distribution system off treaty lands, but as described by locals, it would not meet current standards and there is likely no license in place for the portion of the pipe that crosses the inlet. If correct, significant upgrades may be needed to bring it into compliance with current standards. Staff will continue to work with the KCFN to assess the status of system upgrades and explore efficiencies through collaboration.

RECOMMENDATION

THAT the report from the Chief Administrative Officer be received.

Respectfully:

David Leitch
Chief Administrative Officer

Prepared by *Sheena Fisher, Engineering Services Coordinator*

Attachments: August 29, 2022 Memo from the Ministry of Forests
Houpsitas Water Supply Map
2001 Walters Cove and Area Community Water System Study

BRITISH COLUMBIA

Ministry of Forests West Coast Region

MEMORANDUM

FILE: 20022001
DATE: August 29, 2022
PREPARED FOR: Strathcona Regional District
PREPARED BY: Leanne Robinson, Water Authorizations Specialist

RE: Houpsitas Water System

BACKGROUND

Ka:'yu:'k't'h'/Che:k'tles7et'h' First Nations (KCFN) submitted an Existing Use Groundwater application on April 22, 2020, for the water service area that includes Houpsitas Village on Treaty Lands, Kyuquot School, Walters Island users, and Okime Island health centre. Groundwater is diverted from two wells located on Provincial land approximately 3km north of Houpsitas. KCFN has supplied water to all the area's users since 1998.

The application was made in accordance with the *Water Sustainability Act* (WSA) as transitioning users under Section 140. Under the WSA, anyone who diverts and uses groundwater for anything other than household use is required to obtain a water licence. KCFN requested 300 m3/day for Waterworks – Others purpose.

KCFN holds a Permit to Operate from Island Health ("Houpsitas Village Water System"). KCFN is currently working with Island Health to replace or repair the storage tanks, supply line, and distribution lines. The upgrades are expected to take another 2-3 years to complete.

The distribution system on Walters Island is maintained as needed by Kyuquot Community Association but is known to need upgrades.

It should also be noted that there is currently no provincial authorization for the portion of pipe that runs along the bed of Walters Cove to Walters Island and Okime Island.

PREFERRED LICENSING OPTION

Under Section 9 of the WSA, KCFN may apply for a water licence as owners of the Treaty Lands. Section 8.1.4 of the Maa-nulth First Nations Final Agreement further states that the *Water Utility Act* does not apply to Maa-nulth First Nations that are providing water services on Maa-nulth First Nation Lands, therefore KCFN does not require a Certificate of Public Convenience and Necessity (CPCN) nor does KCFN need to become a utility for supply of water on Treaty Lands. However, KCFN does not meet the requirements of Section 9 for supplying water off-Treaty Lands as they are not owners of those parcels and do not have a CPCN.

KCFN is not obliged to continue supplying water and maintaining the distribution system off-Treaty Lands and have expressed that they do not wish to gain the authority to continue doing so. The procurement of a CPCN is onerous, and KCFN does not wish to undertake the CPCN process, nor is it practical for a small system such as this. KCFN has advised that they will not consider bulk purchase of water from the SRD. As such, KCFN plans to proceed with applying for a water authorization for waterworks purpose on Treaty Lands only.

The Province suggests that Strathcona Regional District (SRD) take over the portion of the application that is appurtenant to the lands off Treaty Lands, specifically, to Kyuquot School and teachers' residences, to Walters Island and the VIHA facility on Okime Island. The Province encourages regional districts to become the primary water service providers in rural areas. This option appears to be the fastest, most direct route to licensing.

<u>JOINT WORKS AGREEMENT</u>

KCFN and the SRD could collaborate to establish a Joint Works Agreement (JWA) to access, use and maintain the water system infrastructure. FrontCounter BC provides the following information regarding possible joint works arrangements: Joint Works Agreement.

If any other licensing options are considered (e.g., licence applications from each party on the water system), a JWA will still be necessary regardless of how any future licences are divided.

<u>INFRASTRUCTURE GRANTS</u>

The SRD inquired about potential infrastructure grants to assist with infrastructure assessments and upgrades. Information on Infrastructure Planning Grants and/or Capital Grants may be found at Local Government Drinking Water Infrastructure - Province of British Columbia.

TIMELINE

Given that water system upgrades are in progress, KCFN has suggested that water licensing discussions should be paused until construction is complete. This would allow for as-builts to be shared with SRD. The Province agrees that this a pragmatic approach.

In closing, the Province is making these recommendations to the SRD for consideration until further discussion resumes in 2-3 years. In the meantime, please do not hesitate to contact Leanne Robinson if you have questions.

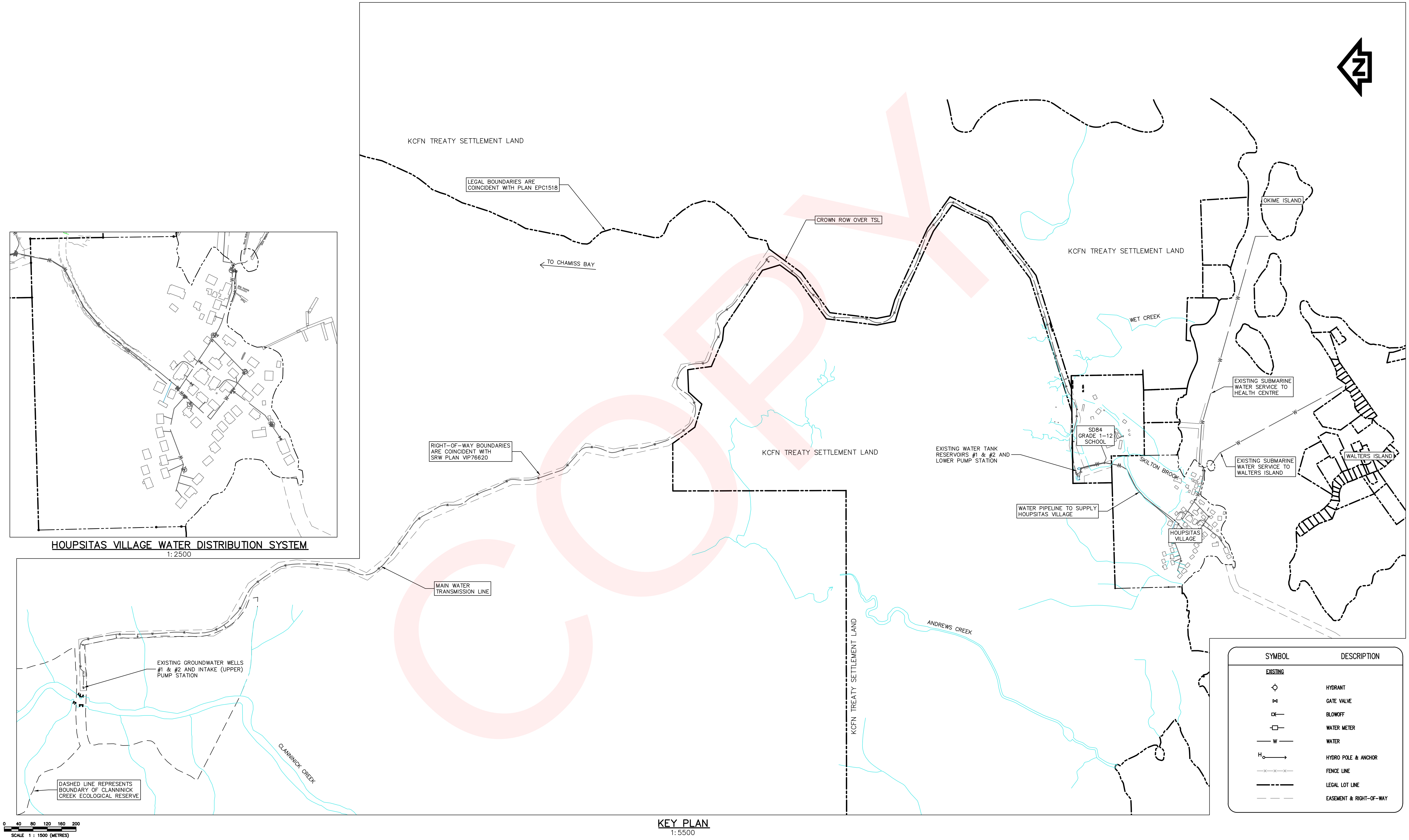
Respectfully submitted,

Prepared by:

Leanne Robinson
Water Authorizations Specialist
Ministry of Forests
2100 Labieux Road, Nanaimo
Phone: 250-739-8307
leanne.robinson@gov.bc.ca

Reviewed by:

Cali Melnechenko, M.Sc. P.Ag.
Water Authorizations Section Head



KEY PLAN
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BM/ TBM:								

PROJ. MGR.	ARG
DESIGN/DRAWN	MXV
PEER REVIEWED	-
HORIZ. SCALE	AS SHOWN
VERT. SCALE	-

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KA:'YU:'K'T'H'/CHE:K:TLES7ET'H' FIRST NATIONS
-
KYUQUOT, BC

HOUPSITAS WATER SUPPLY MAP

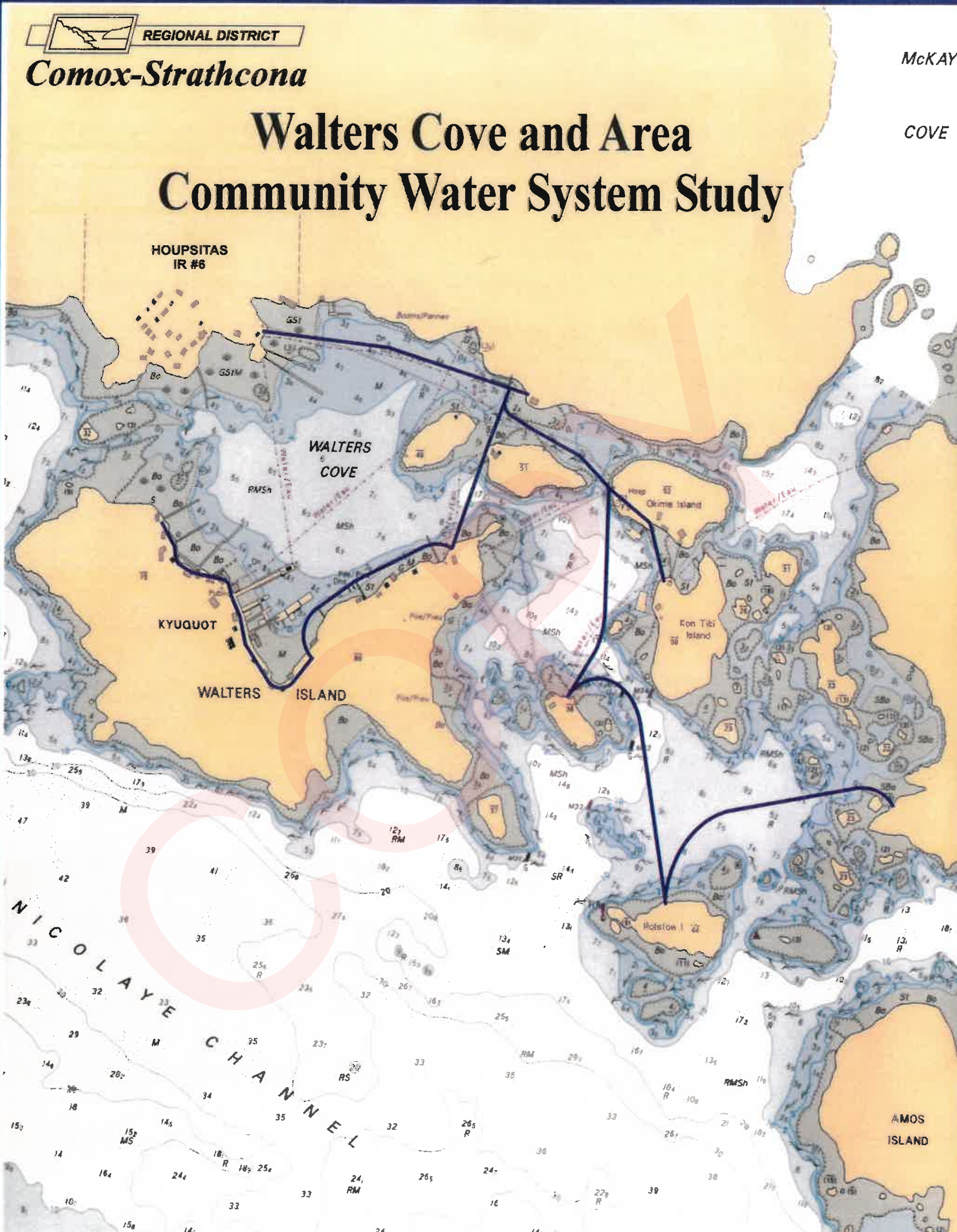
DRAWING NO.	OF -
V20-0428/A-01	
LOCAL GOVERNMENT FILE	-FILE-
PHASE	REVISION A

PROGRESS PRINT - NOT FOR CONSTRUCTION

REGIONAL DISTRICT

Comox-Strathcona

Walters Cove and Area Community Water System Study



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Consulting Engineers

January 2001

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January 31, 2001
M0044-01

Regional District of Comox-Strathcona
RR #4, 4795 Headquarters Road
Courtenay, B.C.
V9N 7J3

Attention: **Mr. Graeme Faris,**
Director of Environmental Services

Dear Sirs:

Re: **Walters Cove and Area Community Water System, Conceptual Design Report**

We are pleased to submit four copies of our conceptual design report for a community water system for Walters Cove and small outlining islands in Kyuquot, B.C.

The report contains details of information gathered, pre-design assumptions, conceptual layout for the proposed water system, cost estimates, conclusions, and recommendations for proceeding to implementation.

We have enjoyed working on this important study. We would be pleased to meet with you and the area director at a mutually convenient time to discuss the report in detail, if this would be beneficial. We look forward to assisting the Regional District in the further development of a community water system for Walters Cove and Area.

Yours truly,

KOERS & ASSOCIATES ENGINEERING LTD.

PROFESSIONAL PROVINCE OF D. A. KOERS BRITISH COLUMBIA ENGINEER

D.A.Koers, P.Eng.
Project Manager

Chris Holmes

PROFESSIONAL PROVINCE OF C. M. D. HOLMES BRITISH COLUMBIA ENGINEER

Chris Holmes, P.Eng.
Project Engineer

REGIONAL DISTRICT OF COMOX-STRATHCONA

WALTERS COVE and AREA

COMMUNITY WATER DISTRIBUTION SYSTEM

TABLE OF CONTENTS

TABLES

FIGURES

TABLE OF CONTENTS cont'd

1 INTRODUCTION

1.1 AUTHORIZATION

Koers and Associates Engineering Ltd. (KAEL) were retained by the Regional District of Comox-Strathcona (RDC-S) for the study and conceptual design preparation for a community water system for the coastal community in Walters Cove and several small outlining islands in Kyuquot B.C. by connecting to the Houpsitas I.R. #6 water system. We understand the funding for this study has been provided by the Community Economic Adjustment Initiative (CEAI) and that the Kyuquot Community Associates (KCA) is proposing to apply to CEAI for construction funding.

1.2 SCOPE OF WORK

In order to carry out the conceptual design of the water system the following work plan was adopted:

1. Obtain all existing available information on the area to be served, including residences, accommodations, and other water-use needs; population levels including seasonal variations and projection to year 2017; area charts and topographic maps; Houpsitas I.R. #6 water system and metered connection location; details of existing line to Red Cross hospital; and any other pertinent information. Meet at RDC-S offices to discuss study.

2. Study information and community water system requirements. Determine flow requirement and pipe size. Review charts, choose routing, consider tide and ocean swell currents and weighting needs for pipe.

3. Prepare a schematic drawing of the proposed pipe routing, properties to be served, and service connection locations.

4. Carry out a site visit, to view the physical conditions to be encountered during construction, assist in cost estimate preparation, and refine routing shown on the schematic drawing.

5. Items 2 and 4 require the assistance of a marine engineering specialist to review oceanographic conditions for pipe design and construction cost estimates. The services of Mr. Ivo Van Bastelaere, P.Eng. of Komex International of Victoria were used for this work.

6. As the project involves crossing of tidal waters, the study will include preliminary discussions regarding approvals through the Government of Canada Navigable Waters Protection Act, as well as the Department of Fisheries and Oceans. The B.C. Ministry of Health will also be advised of the project, to assist in future approval under the Health Act.

7. Prepare Class C construction cost estimate based on proposed pipe routing. This will include allowances for engineering detailed design and construction services, construction costs, a suitable contingency allowance for the unknown risk associated with this project, net GST, and any applicable fees or administration charges. The completed estimate will allow finalization of funding application and approval for the project to proceed to implementation.

8. Preparation of a summary report, containing details of information gathered, pre-design assumptions and layout, cost estimates, conclusions, and recommendations for proceeding to implementation.

1.3 ACKNOWLEGEMENTS

Koers & Associates Engineering Ltd. acknowledge with thanks the assistance provided by Kyuquot residents Sue and Mike Bostrom, and Sam Kayra, Regional District of Comox-Strathcona Area G Director Mr. Tom Pater, RDC-S Director of Environmental Services, Mr. Graeme Faris and Houpsitas Band Chief Mr. Richard Leo.

2 EXISTING WATER SYSTEM

Kyuquot is a small coastal community with a population of approximately 300 located north of Zeballos on the West Coast of Vancouver Island, as shown on Figure 1. Access to the area is by boat from Fair Harbour or float plane from Gold River. Electrical power is generated locally by individually owned diesel generators. Telephone communication is by a digital radio signal to Walters Island and then via landlines, and submarine cables. Approximately 65 – 75% of the local population is comprised of the Ka:'yu:'k'c'h' /Che:k:tles7et'h' Nation (KCN) people who have their main Village at Houpsitas I.R. #6, on Vancouver Island.

Prior to 1998, the Houpsitas Reserve water source was Andrew's Creek, located approximately 750 m west of the Reserve. The water was chlorinated but not filtered and had taste, odour and colour problems as well as high coliform counts. In 1998, the surface water source was abandoned in favour of a ground water source from two wells adjacent to Clanninick Creek, approximately 5.5 kms from the Village. It is our understanding that the quality of the water from the wells is good and chlorination is not required. The Houpsitas water system also services the Red Cross Hospital on Okime Island and the fish packaging plant on Walters Island. The water system is operated and maintained by Archie Vincent, who lives on the Reserve.

The remaining 100 or so non native residents are located outside the reserve on Walters Island, Homesite Island, Okime Island, Rolston Island, Vancouver Island and other small islands in the area. These residents do not have access to the Reserve's water system and therefore depend on a variety of makeshift systems that have been in place for a number of years. This includes a patchwork of submarine pipelines from several creeks on Vancouver Island as well as individual wells. The KCA reports that the water from these creeks and individual shallow wells often have organic contamination that makes the water unfit for drinking. The existing piping systems are shown on the attached Figure 2.

As part of the upgrading of the Houpsitas water system, the pumping capabilities and the storage capacity of the water reservoirs were increased to allow for the ability to service the Kyuquot community outside of the reserve. An agreement is in place between KCA and Ka:'yu:'k'c'h' /Che:k:tles7et'h' Nation (KCN) for the supply of water for domestic-use and other accommodation use purposes. A copy of the agreement is located in Appendix A.

3 DESIGN CRITERIA

3.1 POPULATION ESTIMATES

The following population estimates were used for this study;

Table1 – Population Estimates

Description	Current Year (2000)		
	Permanent	**Seasonal**	**Total**
Vancouver Island (east of Houpsitas I.R. #6)		6	6
Walters Island - Residents - Tourism	15	20 40	35 40
"Esko's" & Homesite Islands	8	5	13
Okime (Hospital) Island	3	2	5
Kon Tiki Island		5	5
Kyuquot Sound Lodge		14	14
Rolston Island	5	2	7
DL 427		10	10
Year 2000 Total	**31**	**104**	**135**

The population estimates in Table 1 are slightly higher than reported in the 1997 Chatwin Report, which were based on an average occupancy rate of 50% during the summer months for the tourist and sports fishing lodge. The above estimate assume a 100% occupancy rate, includes the fishing lodge presently being constructed on DL 427, and accounts for the drop in the number of permanent residents on Walters Island.

By year 2020 the population is projected to increase to 230 based on a growth rate of 2.7% per annum as reported in the 1997 Chatwin Report. This rate of growth is the same as estimated for the Native population but is based on the assumption that tourism would increase with the high attraction of sports fishing and eco-tourism.

3.2 WATER DEMANDS

The following water demands have been projected for the next 20 years for the sizing of the water system;

Table 2 – Domestic Water Demands

Year	Peak Day Summertime Population Est..	Ave. Day Demand (l/s)	Max. Day Demand (l/s)	Peak Hour Demand (l/s)
2000	135	0.44	1.32	1.98
2010	176	0.57	1.71	2.57
2020	230	0.75	2.25	3.38

The domestic demands are based on the following design criteria which was adopted from the 1997 Water supply System – Houpsitas I.R. #6 Phase 1 – Preliminary Design Report, by Chatwin Engineering Ltd. for native and non-native demand projections:

- Average Day per Capita Demand: 280 lpcd
- Maximum Day/Average Day: 3.0
- Peak Hour/Average Day 4.5

The per capita domestic demand of 280 lpcd is recommended by Public Works & Service Canada (PWGSC) and is higher than the 230 lpcd recommended in the Design Guidelines for Rural Residential Community Water Systems, by the Ministry of Environment, Lands and Parks, 1999 Edition. The average day demand per capita is for indoor household use only. Allowances for lawn and garden watering demands are not included, as per the water supply agreement between KCN and KCA. It is assumed that water leakage from the proposed system will be insignificant.

Under the water supply agreement dated January 31, 2000, the KCN will provide water to the KCA at a rate not to exceed 2.19 l/s averaged over a 24-hour period or measured as a maximum day demand.

3.3 FIRE FLOWS

The ability of the distribution system to provide fire flows was excluded from the Terms of Reference for this study. The agreement between KCA and KCN refer to domestic flow only. At present, the residences rely on salt water pumps for fire fighting purposes and propose to continue to do so for the foreseeable future.

4 PROPOSED WATER SYSTEM

4.1 DISTRIBUTION SYSTEM

The conceptual design of the proposed distribution system is presented in Figure 3. The routing is based on the findings of a site investigation on January 4, 2001, a review of the local sea floor contour map, and discussions with local residences and the Band Chief Richard Leo regarding tidal currents, storm waves and boat-mooring areas.

The connection to the Reserve water system would occur at the existing metering chamber and the submarine line would be laid along the floor of the sea bottom to the various islands. The line would be weighed and installed as much as possible in areas of mud and sands along the sea floor. In these areas the line would jetted-in to the seabed as necessary to protect the pipe from anchor damage. To protect the water line on the rocky foreshore approaches, it would be installed in small shallow trenches blasted in the bedrock.

The submarine line would be brought on to the foreshore for the tees to Walters Island and Okime Island as well as for the service connections for Kyuquot Sound Lodge, Rolston Island and the DL 427 fishing lodge. This will minimize underwater tees and connections. Line valves would be located above the high tide level where they could be easily serviced if necessary, and will be clearly marked in the event that shutting off a portion or all of the system is needed.

For the lots along the northwest portion of Walters Island, it is proposed that the water line be installed in the ground between the boardwalk and the homes as much as possible to protect and insulate the line from periodic freezing temperatures. Where above ground installation is required, insulated pipe will be necessary.

The northeast portion of Walters Island has a few developed lots, a few abandoned buildings and several undeveloped lots. The foreshore is very rocky and the terrain across the lots is very steep. A foot path and the above ground telephone line cuts across the middle of the lots. It would be difficult to install a water line along this path and ensure the stability of the bank. It is anticipated that the water line for these lots could be installed below the low tide level in the mud and sands, with service connections to the lots.

4.2 PRESSURE REDUCING VALVES AND WATER METERS

The reservoirs located on the Reserve have a top water level of 60.1 m which generates a static pressure of approximately 85 psi at sea level and an estimated 105 psi at the lowest spot along the submarine pipeline route. It is recommended that each service connection be provided with a pressure reducing valve (PRV) so that each property owner can adjust the incoming pressure to their own choosing.

It is recommended that each property owner be provided with a water meter. This will ensure each property owner is charged according to their own usage. It will also assist in assessing if illegal connections or leak in the submarine pipeline has occurred.

4.3 APPROVALS

The water line will cross over several foreshore leases, Telus submarine cables and rights-of-way and onto private property on Walters Island and for each island connection. Approval from each of the various landowners will be required.

Approval from the Ministry Health to construct the water distribution system will be required. Preliminary discussions with the local Environmental Health Officer, Mr. Alan DeRosario indicated no objection to a proposed community water distribution system.

Approval from the Federal Department of Fisheries and Oceans (DFO) and the Provincial Ministry of Environment, Lands and Parks will be required to ensure there is not net loss of fish habitat and that construction occurs during appropriate fisheries window.

Approval from the Canadian Coast Guard, under the Navigable Water Protection Act will be required. Preliminary discussions indicate that for this project, the work assessment process would most likely be applied as opposed to the more detailed formal approval process.

An environmental screening in accordance with the federal Canadian Environmental Assessment Act (CEAA) will be required. Based on other similar projects, it is believed that a preliminary screening will be required and not a detailed assessment of foreshore, sea bottom and aquatic life along the proposed routes.

5 COST ESTIMATES

The cost for the engineering design and construction of the water distribution system is estimated at $288,915 + GST in year 2001 dollars. This includes a cost of approximately $38,000 + GST to provide water service to the new lodge under construction on DL 427 which is outside of the local water service area. A detailed breakdown of the cost estimate is presented in detail in Table 3.

The estimate includes the cost for the supply and installation of the distribution system including a water meter and pressure reducing valve for each property, and the decommissioning and removal of the existing underground water lines. An allowance for engineering and contingencies is shown.

The following costs are not included in the estimates: land acquisition, administration, legal, or financing costs, and costs for each property owner to install a water line from the water meter to house. The engineering fees allows for a preliminary CEAA screening, as noted in section 4.3. If a detailed assessment is required, additional funds will need to be budgeted to carry out this extra work.

Table 3 - Construction Cost Estimate

Material					
Description	Amount	Units	Unit Cost	Total	Ext.
100 mm dia. HDPE	530	m	$3.43	$ 1,818	
75 mm dia HDPE	1440	m	$2.07	$ 2,981	
50 mm dia. HDPE	1500	m	$1.28	$ 1,920	
37.5 mm dia. HDPE	270	m	$0.72	$ 194	
100 mm Flanges and stub ends	2	ea.	$56.62	$ 113	
75 mm Flanges and stub ends	8	ea.	$45.79	$ 366	
50 mm Flanges and stub ends	6	ea.	$42.11	$ 253	
37.5 mm Flanges and stub ends	4	ea.	$41.01	$ 164	
100 mm valves	2	ea.	$672.67	$ 1,345	
75 mm valves	6	ea.	$596.96	$ 3,582	
50 mm valves	6	ea.	$265.97	$ 1,596	
Valve Vaults	6	ea.	$237.21	$ 1,423	
Air Valves and chambers, 25 mm dia.	8	ea.	$663.61	$ 5,309	
Master Water Meter 37.5mm dia.	1	ea.	$445.00	$ 445	
Individual Water Meter 15 mm dia.	36	ea.	$69.50	$ 2,502	
Individual Pressure Reducing Valves, 19 mm	36	ea.	$40.00	$ 1,440	
Water Meter and PRV chamber	36	ea.	$71.23	$ 2,564	
Steel wire weighting	1	LS	$12,000.00	$ 12,000	
Cord and powder	1	LS	$2,000.00	$ 2,000	
Freight costs				$ 3,000	
TOTAL ESTIMATED MATERIALS					$ 45,016

Equipment Rentals					
Description	Amount	Units	Unit Cost	Total	Ext.
Mobilization - shipping	1	LS	$1,500	$ 1,500	
Welding machine	1	month	$1,500	$ 1,500	
Generator	1	month	$400	$ 400	
Seatruck	30	days	$500	$ 15,000	
Miniexcavator	30	days	$500	$ 15,000	
Compressor / hose / jack hammer	30	days	$125	$ 3,750	
De-mobilization - shipping	1	LS	$1,500	$ 1,500	
TOTAL ESTIMATED EQUIPMENT					$ 38,650

Labour					
Description	Amount	Units	Unit Cost	Total	Ext.
Mobilization	1	LS	$1,200	$ 1,200	
Underwater Pipe Assembly and Placement					
1.1 530 m of100 mm - Flowmeter to DL 1609					
Join and place	1.5	land day	$1,700	$ 2,550	
Jet in - d= 2-6m	3	u/w day	$2,800	$ 8,400	
1.2 290 m of 75 mm - DL 1609 to Blk A					
Join and place	0.5	land day	$1,700	$ 850	
Jet in - d= 5-9 m	1.5	u/w day	$2,800	$ 4,200	
1.3 360 m of 75 mm - Blk A to DL 2126					
Join and place	1	land day	$1,700	$ 1,700	
Jet in d=3-7m	2	u/w day	$2,800	$ 5,600	
2.1 260 m of 75 mm - DL 1609 to Okime Island					
Join and place	0.5	land day	$1,700	$ 850	
Jet in d=1-3m	1.5	u/w day	$2,800	$ 4,200	
2.2 100 m of 37.5 mm - Crossing to Kon Tiki					
Jet in d=0-4m	1.5	u/w day	$2,800	$ 4,200	
3. 380 m of 50 mm - Okime Island to DL 1298					
Join and place	1	land day	$1,700	$ 1,700	
Jet in d=9-13 m	2	u/w day	$2,800	$ 5,600	
4. 500m of 50 mm - DL 1298 to Rolston					
Join and place	1	land day	$1,700	$ 1,700	
Jet in d=5-9m	2	u/w day	$2,800	$ 5,600	
5. 620 m of 50 mm - Rolston to DL 427					
Join and place	1	land day	$1,700	$ 1,700	
Jet in d=4-8m	3	u/w day	$2,800	$ 8,400	
Service Connections	2	u/w day	$2,800	$ 5,600	
Blaster	5	days	$600	$ 3,000	
Weather days	3	days	$1,700	$ 5,100	
On-Land Pipe Assembly and Placement					
Across Okime Island	1.5	days	$1,700	$ 2,550	
East shoreline of Walters Island	5	days	$1,700	$ 8,500	
TOTAL ESTIMATED LABOUR					$ 83,200

SUBTOTAL BASE PRICE					$ 166,866
Additionals					
7% PST on materials				$ 3,151	
10% mark-up on materials				$ 4,502	
R&B (30 days, 3 men, 5 days 1man)	95	mandays	125	$ 11,875	
R&B (Land Crew, 7 days 3 men)	21	mandays	125	$ 2,625	
Air charters (blaster and one extra)	2		1000	$ 2,000	
Estimated Additionals					$ 24,153
Subtotal					$ 191,018
Insurance	1	%			$ 1,910
Contractors OH+P	20	%			$ 38,204
Estimated Contractors Bid Price					$ 231,132
15 % Engineering & 10 % Contingency	25	%			57,783.06
Total Estimated Cost					$ 288,915
					(excludes GST)

6 CONCLUSIONS & RECOMMENDATIONS

6.1 CONCLUSIONS

The following are the principal findings of the study:

1. In 1998 the surface water source for the Houpsitas Reserve which has taste, odour and colour problems was replaced with a ground water source. The quality of the ground water is reported to be good and chlorination is not required.

2. Non native Kyuquot residents located outside the reserve on Walters Island and surrounding area do not have access to the Reserve's water system depending on a variety of makeshift systems from creeks and shallow wells that are prone to leaks, breaks and running dry in the summer months. The water from these sources has taste, odour and colour problems.

3. A water supply agreement is in place between the Kyuquot Community Association and the Ka:'yu:'k'c'h' /Che:k:tles7et'h' Nation for the supply of fresh water for domestic and other accommodation use purposes.

4. The Kyuquot Community Association unanimously passed a referendum to pay for the cost of increasing the capacity of the Houpsitas water storage reservoir and the well pumping rates so that they could have access to the Reserve's clean water. The capacity of the reservoir and the pumping rates has been increased.

5. Kyuquot experiences an estimated threefold increase in population during the summer months with the high attraction of sports fishing and eco-tourism, who stay at lodges and bed and breakfasts in the area. A new 10 bed lodge is currently under construction, confirming that the summer time population will continue to increase as will the demand for water.

6. The peak hour water demands for the years 2001 and 2020 have been estimated by others at 1.98 l/s and 3.38 l/s, respectively (26 igpm and 44.6 igpm).

7. The local residences rely on individual salt water pumps for fire fighting purposes and propose to continue to do so for the foreseeable future. The ability of the proposed water system to provide fire flows was not included in the Terms of Reference for this study.

8. The static pressure for the water system will be approximately 85 psi at sea level.

9. Approvals will be required from provincial agencies including the Ministry of Health, and Ministry of Environment, Lands and Parks, the federal agencies of Department of Fisheries and Oceans, and Canadian Coast Guard. Approvals from foreshore lease holders and permission from Telus to cross over their underwater telephone cables will be required.

10. An environmental screening in accordance with the Canadian Environmental Assessment Act (CEAA) will be required.

11. The cost including engineering design and construction of the proposed community water system is estimated at $288,915 + GST. This does not include land acquisition, administration, legal, financing costs, and costs for each property owner to install a service connection from the water meter to the house.

6.2 RECOMMENDATIONS

Based on the conclusions reached in this study, the following actions are recommended:

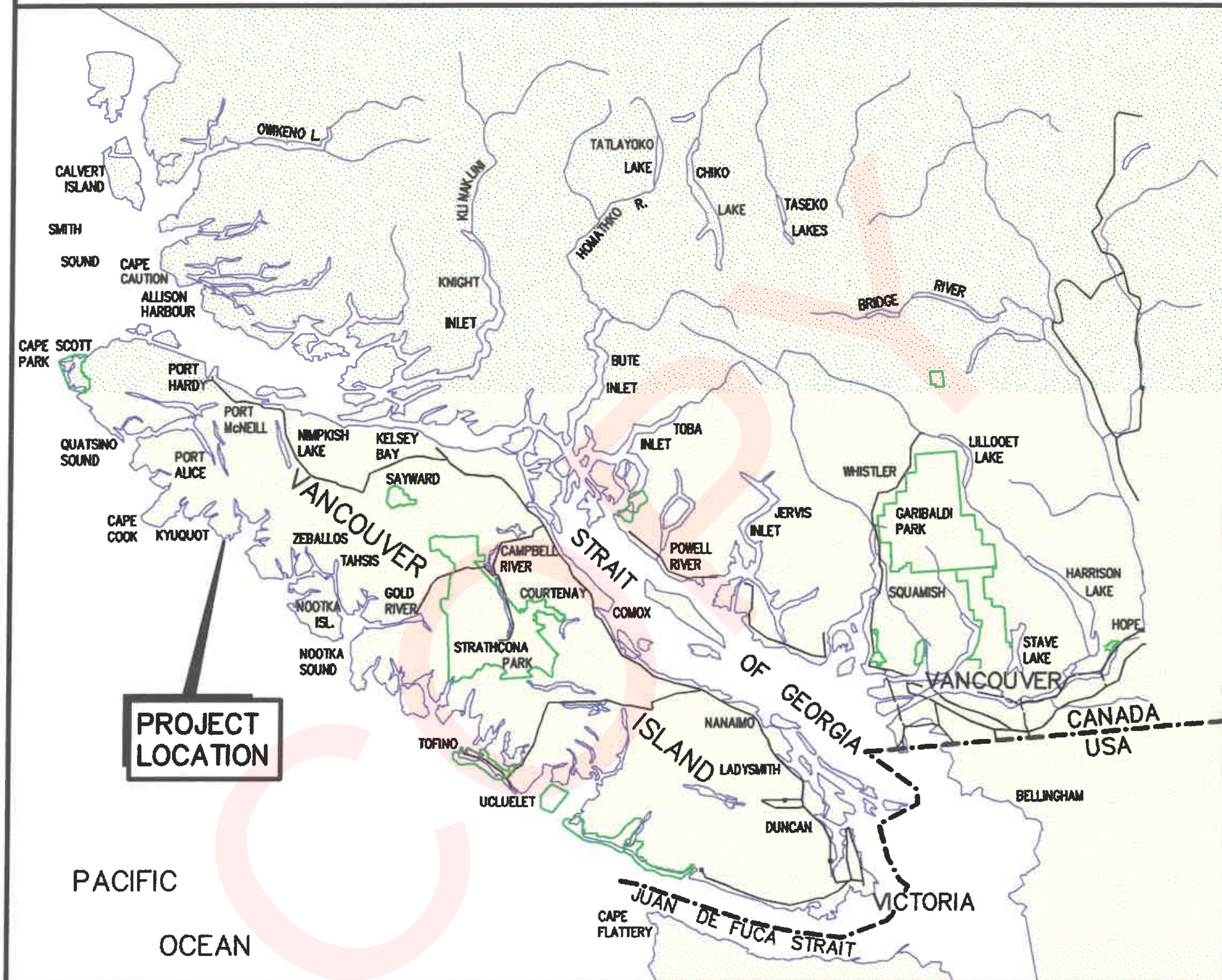
1. The Kyuquot Community Association (KCA) continue to proceed with the design and construction of a community water system as shown conceptually on Figure 3.

2. The KCA apply for funding under the Community Economic Adjustment Initiative program.

3. The project schedule account for construction to occur during the period July – September to take advantage of the low tide levels during daylight hours and avoid the winter storm period.

4. The water distribution system be designed to handle estimated peak hour demands for the year 2020.

5. Individual water meters and pressure reducing valves to be installed at each service connection. This allow for the billing based on individual consumption, create the greatest available pressure at each connection and allow residences to adjust the incoming pressure to suit their needs.



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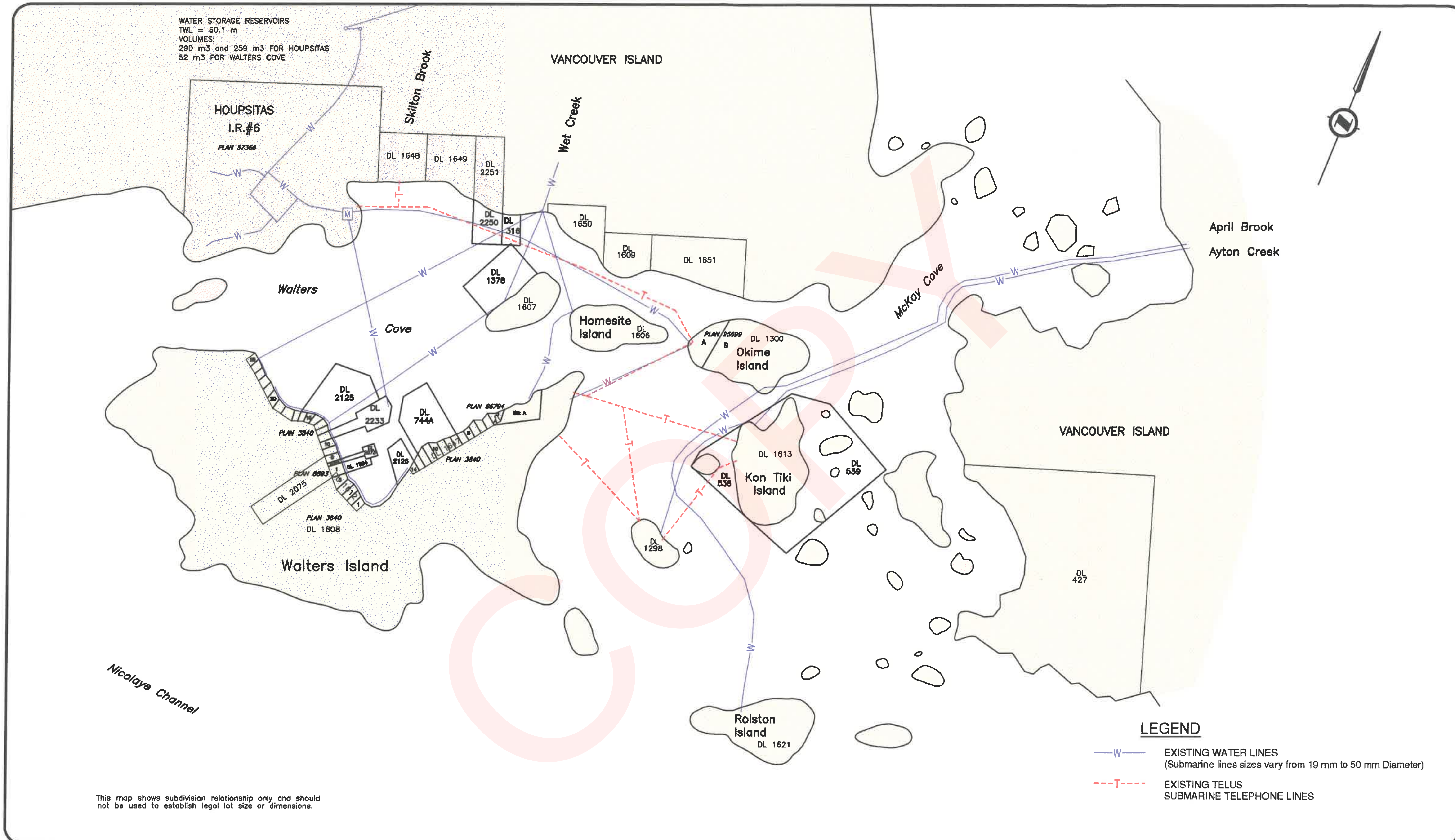
CLIENT	REGIONAL DISTRICT OF COMOX – STRATHCONA	TITLE	SITE LOCATION PLAN
PROJECT	WALTERS COVE & AREA COMMUNITY WATER SYSTEM STUDY	APPROVED	SCALE: NOT TO SCALE
		DATE: JANUARY 10, 2001	
		JOB No. M0044	DWG No. FIGURE 1



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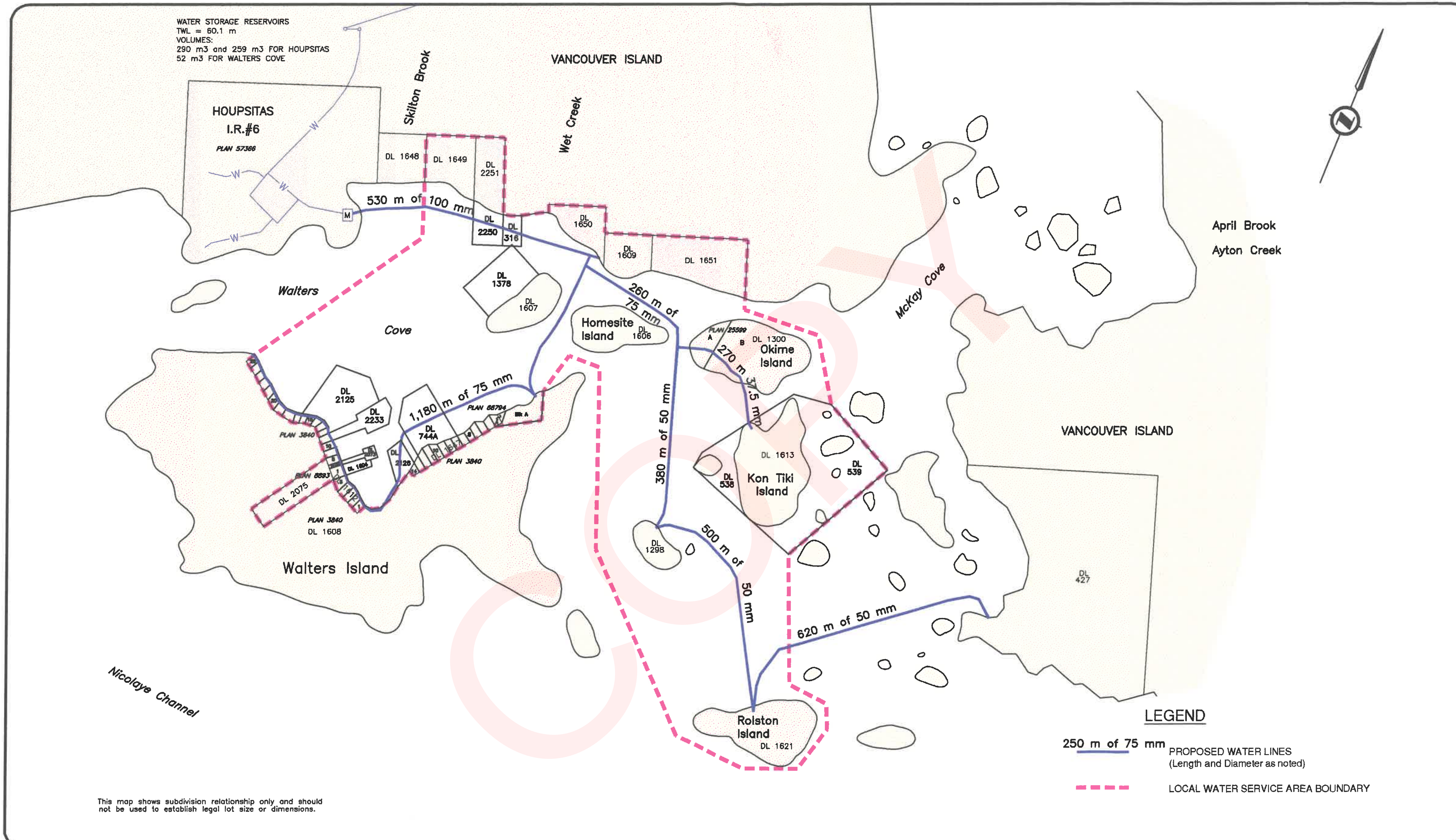
Consulting Engineers

CLIENT	REGIONAL DISTRICT OF COMOX – STRATHCONA
PROJECT	WALTERS COVE & AREA COMMUNITY WATER SYSTEM STUDY

TITLE	EXISTING WATER SYSTEMS		
APPROVED		SCALE	1: 7,500
DATE	JANUARY 10, 2001		
JOB No.	M0044	DWG No.	FIGURE 2



KOERS & ASSOCIATES ENGINEERING LTD.
Consulting Engineers

CLIENT	REGIONAL DISTRICT OF COMOX – STRATHCONA
PROJECT	WALTERS COVE LOCAL WATER SERVICE

TITLE	PROPOSED WATER SYSTEM – CONCEPTUAL DESIGN		
APPROVED		SCALE	1: 7,500
DATE	JANUARY 10, 2001		
JOB No.	M0044	DWG No.	FIGURE 3

APPENDIX A

KCA and KCN WATER AGREEMENT

WATER AGREEMENT

BETWEEN: Ka:'yu:'k't'h'/Che:k:tles7et'h' Nation (KCN)

AND: Kyuquot Community Association (KCA)

* KCN will provide water to the Kyuquot Community Association at a flow rate not exceeding 2.19 litres per second averaged over a 24-hour period or measured as a maximum day demand, as measured at the water meter chamber at Houpsitas, at a cost of $0.50 per 1000 litres.

* KCA will install an approved backflow preventer adjacent to the water meter chamber.

* KCN is not responsible for the construction, repair, operation, or maintenance of any works or use beyond the water meter chamber, or any cost associated therewith, and shall not be liable for any loss, damage, or liability ensuing from the inability of KCN to supply water to the water meter chamber.

* KCN will bill KCA for water on a quarterly basis, the amount billed due within thirty days of receipt. Should KCA fail to submit payment within thirty days, KCN may inform KCA of their intention to disconnect the water supply with ten days notice. If payment is not submitted within the ten-day notice period, then KCN may disconnect the water supply to the water meter chamber.

* This agreement between KCN and KCA is for one year, and may be reviewed, extended, or revised, on an annual basis.

DATED: 31 January 2000

For KCN:

Beverly Hansen, Administrator

For KCA:

D. Zand

Dirk Zand, President

(FOR YEAR 2017 -
AVERAGE DAY DEMAND IS 0.65 l/sec,
OR 56,280 l/day
AS PER CHATWIN ENGINEERING ESTIMATES.)

APPENDIX B

SECTION 10 of CHATWIN REPORT

(Tom Chatwin's
Design Report

10.0 Supplemental Section - Servicing Walter's Island

10.1 Introduction

Public Works & Government Services has requested that a separate section of this study be developed to include the impact of servicing the existing and future water demands of the non-First Nation people in the Kyuquot area. The criteria for this review is to determine what additional costs would be required to do over and above what would be normally recommended to provide the 20 year demand for Houpsitas I.R. #6.

Domestic demand will only be considered in this review. If fire flow is required, the non-First Nation residents could develop their own reservoir and pump system to provide fire flow.

The areas included are as follows:

- Walter's Island
- Homesite Island
- Vancouver Island

10.2 Population Projections

Information regarding population in the non-First Nation areas of Kyuquot was provided in a letter dated April 9, 1997 from Bruce Williams, Administrator for the Regional District of Comox-Strathcona. This letter is attached as Appendix No. 13. Table No. 11 shows the existing population for these areas.

TABLE NO. 11

Existing Population - Non-First Nation - Kyuquot			
Location	Permanent	Seasonal	Total
Walter's Island Residents	31	20	51
Homesite and Vancouver Island	12	7	19
Walter's Island Tourism		20	20
Outer Cove East of Walter's Island	14	14	28
Total	57	61	118

Notes:

1. Walter's Island Tourism has approximately 40 beds which are estimated to be 50% occupied.
2. Walter's Island Residents, Homesite and Vancouver Island, and Walter's Island Tourism are presently on a surface source water system.

Table No. 12 - "Population Projections" shows the population projections for the non-First Nation population at Kyuquot.

TABLE NO. 12

Population Projections - Non-First Nation - Kyuquot	
Year	Projected Population
1997	118
2007	154
2017	201

Notes:

1. A population growth rate of 2.7% was used as it is assumed that tourism will increase with the high attraction of sports fishing and eco-tourism.

10.3 Domestic Water Demand

The following Table No. 13 - "Domestic Water Demand" outlines the domestic demand projections for the non-First Nation lands at Kyuquot.

TABLE NO. 13

Domestic Water Demand				
Year	**Population**	**Avg. Day Demand (ℓ/s)**	**Max. Day Demand (ℓ/s)**	**Peak Hour Demand (ℓ/s)**
1997	118	0.38	1.14	1.71
2007	154	0.49	1.47	2.21
2017	201	0.65	1.95	2.93

Notes:

1. 280ℓpcpd was used as the average day flow derived for this system.
2. The following peaking factors were used:
   - Maximum day/average day = 3.0
   - Peak hour/average day = 4.5
3. Demands do not include:
   - Fish plants
   - Two residents of fish plant line
   - Hospital Island
   - Skilton's Residence

   as they are presently calculated in the Kyuquot system.

10.4 System Improvements

A review of the system improvements has determined that the supply pipeline and distribution system are adequate to provide the domestic demand for the non-First Nation areas of Kyuquot.

The capacity of the water storage reservoir would have to be increased for the 20 year peak hour demands if the non-First Nation flows were added. The required increase in capacity would be approximately $52m^3$. ~~litres)~~

The pump capability would have to be increased to accommodate the higher domestic demands for the non-First Nation flows at Kyuquot. These design points are outlined as follows:

- 10 year demands 5.3ℓ/s @ 75m
- 20 year demands 6.8ℓ/s @ 78m

These demands represent total flow required for non-First Nation and Houpsitas I.R. #6. See Appendix No. 14 - "Computer Models of Supply Line With Non-First Nation Flows at Kyuquot Included".

Our estimate of costs for these additional improvements are outlined as follows:

- Reservoir size increase $15,000.00
- Well pumps 3,000.00

Total $18,000.00

It should be noted that a water meter chamber is included in the main cost of construction for Houpsitas I.R. #6 water system improvements as it is important to meter the existing connection that goes to Walter's Island and Hospital Island.