Alberni-Clayoquot Regional District

WEST COAST COMMITTEE MEETING
TUESDAY, AUGUST 24, 2021, 1:30 PM

Due to COVID-19, the meeting will be held via Zoom Video Conferencing and will be livestreamed on the ACRD website at https://www.acrd.bc.ca/events/24-8-2021/

Public Attendance: the public are welcome to attend the meeting via Zoom Webinar by registering at: https://portalberni.zoom.us/webinar/register/WN_q5xLuvj8SyO-PGLkhsRIRw

Click here to view the 2021 – 2024 ACRD Strategic Plan

AGENDA

PAGE #

1. CALL TO ORDER

Recognition of Territories.

Notice to attendees and delegates that this meeting is being recorded and livestreamed to YouTube on the Regional District Website.

2. APPROVAL OF AGENDA
(motion to approve, including late items requires 2/3 majority vote)

3. MINUTES

a. **West Coast Committee Meeting – June 2, 2021** **3-6**

THAT the minutes of the West Coast Committee meeting held on June 2, 2021 be received.

4. PETITIONS, DELEGATIONS & PRESENTATIONS (10 minute maximum)

a. **Tawney Lem, Executive Director, West Coast Aquatic regarding an overview of the Coastal Strategy update and local government's role in the Blue Economy Strategy.**

b. **Tim Weaver, Founder, Weaver Technical and Tony Sperling, President, Sperling Hansen Associated Inc. regarding the planned upgrades to the West Coast Landfill Leachate System.**

5. CORRESPONDENCE FOR INFORMATION

a. **Tofino Ratepayers Association Newsletter – August 4, 2021** **7-18**
b. **Use of Airport lands for the purpose of growing Christmas Trees** **19**

6. REQUEST FOR DECISIONS & BYLAWS

a. **REQUEST FOR DECISION**
West Coast Transit Service – Removal of Salmon Beach Impacts **20-57**

THAT the West Coast Committee receive the report and resolve that no amendments be considered to Bylaw E1062, West Coast Transit Service Area Establishment, 2019 to change the service area boundaries.

b. **REQUEST FOR DECISION**
Potential Use of Long Beach Airport for Campground for West Coast Workers **58-62**

THAT the West Coast Committee recommend that the Board of Directors proceed with the development of a long-term strategy for dispersed camping issues on the West Coast as outlined in the August 25, 2021 Board of Directors Request for Decision 'Dispersed Camping Task Force – Next Steps' including the investigation of the development of a campground at the Long Beach Airport for West Coast workers.

7. REPORTS

a. Discovery of Asbestos on Airport Lands – verbal report, Airport Manager M. Fortune
b. West Coast Landfill Leachate Preliminary Design Report **63-110**

THAT the West Coast Committee receive reports a-b for information.

8. LATE BUSINESS

9. QUESTION PERIOD

Questions/Comments from the public participating in the Zoom meeting.

Questions/Comments from the Public, respecting an agenda item, can be emailed to the ACRD at responses@acrd.bc.ca and will be read out by the Corporate Officer at the meeting.

10. ADJOURN

Alberni-Clayoquot Regional District

MINUTES OF THE WEST COAST COMMITTEE MEETING
HELD ON WEDNESDAY, JUNE 2, 2021, 10:00 AM

Due to COVID-19 pandemic, meeting conducted via Zoom video/phone conferencing

MEMBERS PRESENT:
Kel Roberts, Director, Electoral Areal "C" (Long Beach), Chair
Tom Stere, Councillor, District of Tofino
Rachelle Cole, Councillor, District of Ucluelet
Alan McCarthy, Member of Legislature, Yuułuʔiłʔatḥ Government
Kirsten Johnsen, Member of Council, Toquaht Nation

STAFF PRESENT:
Douglas Holmes, Chief Administrative Officer
Jenny Brunn, General Manager of Community Services
Teri Fong, Chief Financial Officer
Wendy Thomson, General Manager of Administrative Services
Heather Zenner, Protective Services Manager
Eddie Kunderman, Operations Manager
Janice Hill, Executive Assistant

The meeting can be viewed on the Alberni-Clayoquot Regional District website at https://www.acrd.bc.ca/events/2-6-2021/

1. CALL TO ORDER

The Chairperson called the meeting to order at 10:00 am.

The Chairperson recognized the meeting this morning is being held throughout the Nuu-chah-nulth territories.

The Chairperson acknowledged this is a time for mourning and implementation of truth and reconciliation and a disclosure of the government and church records relating to the death of children while in the care of residential schools, in particular the recent discovery and location of the mass burial site containing the remains of 215 children on the property of the former residential school in Kamloops.

The Chairperson reported this meeting is being recorded and livestreamed to YouTube on the Regional District website.

2. APPROVAL OF AGENDA

MOVED: *Director Cole*
SECONDED: *Director McCarthy*

THAT the agenda be approved as circulated.

CARRIED

3. MINUTES

a. **West Coast Committee Meeting Minutes – March 3, 2021**

MOVED: Director Cole
SECONDED: Director McCarthy

THAT the minutes of the West Coast Committee meeting held on March 3, 2021 be received.

CARRIED

4. PETITIONS, DELEGATIONS & PRESENTATIONS

a. Samantha Hackett, West Coast Multiplex Society regarding West Coast Multiplex Society status update.

Ms. Hackett provided an update on the proposed multiplex facility on the West Coast including continued support for the project and efforts to raise revenues. Focus over the last year is on capital funding.

b. Ben Bolton regarding Marine Plastic Debris Re-use Project.

Mr. Bolton provided an overview of the Marine & Consumer Plastic Debris Re-use Program at the Tofino Airport. He spoke to their upcoming fundraising campaign.

5. CORRESPONDENCE

6. REQUESTS FOR DECISIONS

7. REPORTS

a. WC Multiplex
b. RATI Grant
c. 2020 West Coast Landfill Annual Reports
d. West Coast Curbside Three-Stream Waste Services Update
e. West Coast Transit Service Update
f. Long Beach Emergency Program – Agreement between ACRD & District of Ucluelet

MOVED: Director Johnsen
SECONDED: Director Cole

THAT the West Coast Committee receive reports a-f.

CARRIED

8. LATE BUSINESS

9. QUESTION PERIOD

Questions/Comments from the public. The Corporate Officer advised there were no questions or comments from the public respecting an agenda topic from Zoom webinar attendees or submissions received by email at responses@acrd.bc.ca.

The meeting recessed at 11:26 am.
The meeting re-convened at 11:30 am

10. IN-CAMERA

MOVED: Director Stere
SECONDED: Director Cole

THAT the meeting be closed to the public as per the Community Charter, section(s):

i. *90 (1) (j) information that is prohibited, or information that if it were presented in a document would be prohibited, from disclosure under section 21 of the Freedom of Information and Protection of Privacy Act;*
ii. *21 (1) (c) (i) of FOIPPA: the disclosure of which could reasonably be expected to harm significantly the competitive position or interfere significantly with the negotiating position of the third party.*

CARRIED

The meeting was closed to the public at 11:31 am.

The meeting was re-opened to the public at 11:37 am.

11. REPORT OUT – RECOMMENDATIONS FROM IN-CAMERA

12. ADJOURN

MOVED: Director Cole
SECONDED: Director Stere

THAT this meeting be adjourned 11:37 am.

CARRIED

Certified Correct:

Kel Roberts,
Chairperson

Wendy Thomson,
General Manager of Administrative Services

August 4, 2021

Tofino Ratepayers Association Newsletter

I am pleased to be able to report on the most recent meeting of the directors of the Tofino RPA. In attendance Directors: Kevin Midgely, Steven Thicke, Harold Sadler, Tammy Shymko and Jack Gillie.

Subjects for discussion:

ITEM ONE Regional Bus Service

Later in August, the Regional District of Alberni Clayoquot, will entertain a motion to exclude Salmon Beach from the areas subject to taxation in support of the bus initiative. A 2/3 vote of the directors is required. You may recall we opposed this initiative at the time of approval for the borrowing bylaw. This new motion is troubling on many levels.

The motion, if passed, would put increased burden on others still required to pay the tax, your taxes would likely go up. Tofino taxpayers will share more of the burden as the rate of taxation is set against assessment. So, one of the initial problems for Tofino taxpayers, an unfair distribution of the burdens of taxation. will be exacerbated. Taxation that is based not on use or ability to pay but a system of assessment that is widely disparate from one community to another. Tofino assessments generally running double the regional.

It also opens the door for other parts of Area C that do not have direct access to the bus, to ask to be excluded as well. For example, property on Vargas Island, Catface and Cypre River areas, Recreational properties at Hesquiat, and in Barkley Sound, to name a few. This could turn into a disaster for those left holding the bag. Even those supporting the busing scheme should have second thoughts

This new motion calls into question the legitimacy of the original process where we were required to participate on the basis of a system of sharing that will no longer exist and a petition process that will end up based on false premises.

We continue to oppose and will oppose the bus proposal because 1) the projected needs and use were not adequately substantiated, 2) costs were disproportionately distributed, 3) local business providing service at no cost to the taxpayer would inevitably be eliminated 4) Local residents subject to the tax were not given adequate say in developing the proposal or approving the funding bylaw.

WE encourage the Regional Board to take this opportunity for a fresh start and a redraw of this entire proposal.

ITEM TWO The Scale of Local Government

It has been a couple of years since we first presented a set of graphs and charts (still available on the Tofino RPA website) that tried to capture the tax situation, past present and future, that the community of Tofino is facing. No doubt we got some attention and inevitably ruffled a few feathers.

It is time to add more current information to this effort. To update our information. Have our forecasts come about? You intuitively know the answer, but we need to substantiate it with facts about the growth/cost of local government, spending increases and taxes. And the implications. It seems a wise thing to understand the past to help predict the future.

ITEM THREE Progress on the MRDT?

During the last election, it was clear to us that the broader community was behind the idea of getting a share of the MRDT (money directly from the tourists) to help shoulder the burden of the costs of Tofino's infrastructure needs. It seemed fair to most that a town of 2000 could not and should not have to support infrastructure for more than a million visitors. (I don't know what the current number of visitors is, who can keep up?) The looming costs of sewage treatment made this point abundantly clear.

Council will be trying to negotiate a new deal on the MRDT. They need our support and encouragement to not shy away from getting the best result possible for us. There is an expectation that 1/3 of the current 3% tax would come to Tofino for infrastructure (sewer water). This is not only possible, it is necessary.

WE don't know where the process is at. We would like to be more informed, but regardless I would say to our elected representatives "you have the hammer, don't sign a deal that is unacceptable to the residents of Tofino".

Contact your Councillors and Mayor, let them know the public has their back. We want them to negotiate hard for Tofino. Don't get whittled down. C'mon Mayor and councillors, get it done.

As an aside to this discussion, we would add.

Currently Tofino Council has allocated an additional $450,000 of your municipal dollars for redesigns and a search for cost savings on the sewage treatment proposal. If cost savings can be found that is good for the Taxpayers of Tofino. But it becomes apparent that it will also be good for the Senior levels of government who will be asked to contribute mightily to the project. Why can they not contribute to engineering and analysis that reduces costs for everyone?

ITEM FOUR Tofino Housing Corp.

Concerns persist around the Tofino Housing Corp and "affordable housing".

Some of our members would like to see a full accounting of what this has cost the community. Those who have information that could contribute to assembling this file please send it to us. Help us do the research. We note that the DOT has taken to advertising for necessary rental accommodations, after selling off it's stock of housing, gifted to Tofino as "amenity contributions". The monies used to help fund the "Affordable Housing" project. Confusing isn't it.

Some folks may have been for or against this project, but I have yet to encounter a resident who doesn't think the granting of tax-free status, that is, complete relief from annual property taxes, is a bridge too far. After all it is not social housing for the needy. Many of the future residents in these facilities will be making reasonable wages and contributing nothing to the town's coffers by way of property tax.

ITEM FIVE The "Inflection Point" and a Point of View.

In geometry the inflection point is where a curve on a graph takes off in a different slope or direction. In accounts of human events, it refers to a change in historic and social events. Where things dramatically change for better or worse, where a different paradigm takes over.

In the 90's Tofino was engaged with the Sustainable Development of Clayoquot Sound. As part of the effort a working group of locals lead by L. J. Maclean was tasked with doing a "community values survey". Their report entitled "Some Implications of Community Values for Community Planning"

I know that this report was well researched. Ms. Mclean personally interviewed over 95% of the resident Tofino population. This was no projection based on a small sample. It makes for a good read. It contains some humorous local issues of the day but also an amazing amount of foresight about the problems about to descend on Tofino. Unfortunately, within a few years it was forgotten, left to the dustbin of history. We have pulled it out of the dustbin and attached it to this email and also posted it on the Ratepayers website -- tofinorpa.ca

One fact I want to share is that at the time of the survey, 68.5% of the residents of Tofino owned their own homes. The balance being tenants. That was the character of the community. Today, nationally, the numbers are about the same ranging from 65% to as high as 70% for most Canadian municipalities. That has been the underpinning of our property tax system. Residential Use taxes contribute by far the most taxes as a tax class to local government across Canada. This burden is shared by most Canadians

By the 2016 census Tofino was down to 58% of the residents in an ownership position, slipping well below national averages.

This comes as no surprise. My only question is, "Are they adequately accounting for all the staff housing, parked campers, temporary use zones that are around?" Does it account for young folks who are fortunate to get into ownership but have to rent a room or two to friends to make it work? In any event, the driving forces in this equation have continued unabated for another five years since the 2016 figures.

It is very likely to probable that home ownership has slipped into the low 50% range in the last 5-6 years.

Now we come to the Tofino Affordable Housing Projects, which between Sharp Road and DL114, have by my count just over 100 units planned. That is over 10% of the housing stock identified in the 2016 census. These numbers, regardless of any other happenings, all other existing trends continuing, will put Tofino into the mid 40% range for home ownership. We are falling off the map in regards to home ownership. I have seen no evidence that any other municipality in the Country has approached these levels. I beg to be informed.

If councillors are ever asked what makes Tofino different or unique, these facts need to be part of the answer.

We need to ask, "What impacts does this have on the town, socially, politically, economically, when most residents don't directly pay tax?" Is anyone on council thinking about this? As municipal spending continues to climb, renters' rents are restricted to 2% annual increases or as prescribed by provincial law. The landlord foots the bill. Part of the reason some people choose VR use over long term rental for their extra suite. There is no restriction on the amount of tax that a homeowner can pay. It is more than ironic that the more homeownership declines and spending increases, the more homeowners are required to pay in tax. Also putting additional impediments in the way of those who would like to own.

This is not a criticism of renters. That would be plain stupid. Almost everyone has rented, either out of necessity or choice. Everyone has the right to vote, get the services and facilities they want and contribute to the community in various ways. And many do.

But there is a social contract underpinning our tax system and government process. What happens when the majority is not required to contribute directly to the funding of local government through property tax? We are approaching an inflection point in Tofino. Where does it take us? I don't think anyone has thought much about it.

That is why lately, we have put effort into the exploration of alternate ways of raising funds for the District's expenditures. The future survival of the community as we have known it may depend upon it.

We encourage members and others to share their views with their elected officials.

We encourage you to share this newsletter with friends and neighbours.

We also welcome your feedback. Anyone who is interested in becoming a member, who wants to contribute, who wants to work on developing and researching these issues, please contact us. We want to hear what you have to say and welcome you. We need your help.

Cheers Jack Gillie

SOME IMPLICATIONS

OF

COMMUNITY VALUES

FOR

COMMUNITY PLANNING

Submitted to:

Mr. Gerard LeBlanc
District of Tofino Council
Tofino Steering Committee for
Sustainable Development for Clayoquot Sound

Prepared by:

L. J. MacLean
Community Values Working Group

June 2, 1991

INTRODUCTION

This submission is an attempt to briefly examine some of the findings from the Community Values Survey, public workshops, and the Community Values Working Group as they apply to community planning.

Initially in the public workshops, a series of statements was generated to summarize major points of discussion. These statements will be used to provide a framework for this submission and will be supplemented with data from the workshops, working group and the survey.

The community places great value on a safe, healthy, sustainable and accessible environment, the integrity of which is strongly protected. The sense of "space" should be maintained.

- Where land use conflicts are unresolvable, preservation of the natural environmental shall take precedence.
- No polluting industry shall be licensed to operate in Clayoquot Sound.
- The potential impact of rising sea levels needs to be considered.
- Ecologically sensitive sites require identification and protection.
- Heritage sites require identification and protection.
- Development must not exceed infrastructure carrying capacity.
- Sewage treatment is required, perhaps in combination with the technology for nutrient retrieval (eg. fertilizer). Space needs to be allocated for this purpose.
- Public waterfront access needs to be protected and enhanced. (Current access along the inlet shoreline is being blocked by commercial and residential development. Guidelines need to be established to govern changes to the foreshore.)
- Adequate green belt, parkland and "buffer zones" are required. Guidelines should be determined for "greenery" requirements for commercial and residential developments. Guidelines for removal of natural vegetation on private property should be established.
- Municipally owned waterfront should be retained for public use/access with commercial and residential development on the non-waterfront properties.
- Viewscape protection bylaws should be established to guide present and future development.

- Recommendations from Fish and Wildlife about inlet protection must be included in future planning.

- Beach protection bylaws may be required (ie. re beach fires, driftwood removal).

- Toxic waste disposal needs to be addressed. An environmental hazard reporting mechanism needs to be established.

- Community residents wish to retain the quiet, rural atmosphere of the area.

- Maintaining the sense of "space" will require considerable care re the inclusion of higher density commercial or residential development, but need not exclude such options (eg. a fourplex on one acre of land would provide accommodation equivalent to four residences on one quarter each but may not appear as "dense" if carefully planned.

- Consider additional access road to core area.

- Determine a maximum number of whale watching and sport fishing operations which can be licensed and implement regulations to control operations.

- Several safety issues have been discussed and the following recommendations are included for your consideration.

  - The First Street planter in front of the Post Office should be cut back so that pedestrians (especially children) can be seen before they enter the traffic lane.

  - The first parking space on First Street next to the planter should be converted to bicycle stands so cars are not backing into the crosswalk.

  - Review traffic patterns and parking. Restrict parking of large recreational vehicles to the municipal lot; restrict parking near intersections and crosswalks; ensure adequate set-back of buildings at intersections; install traffic warning signs at playground, school, preschool and "limited vision" signs near laundromat complex.

  - Require access for the disabled on all public buildings.

  - Curb at the Post Office should be level to the planter.

  - Provide light on sidewalk at rear entry to library and replace the door handle to allow the door to be opened from the outside.

- Level the sidewalk in front of the library where the grating is placed.

- Reduce speed limit on the highway curve south of the south entrance to Chestermans Beach.

Assuming basic needs for food and shelter can be met, no economic development should compromise the quality of life in the area.

Sustainable community planning strives to balance the interaction of ecologic, human and economic factors in the environment to ensure the basic characteristics of the community are not eroded.

- 68.4% of residents surveyed own their home; 21.9% rent accommodation; 5.7% share accommodation; 0.5% live in room and board situations; 3.5% have a variety of other accommodation.

- Of the 253 residents who own their own homes:

  10.3% have a disposable annual income under $6,000.00
  17.4% have a disposable annual income between $7 and $13,000.00
  20.6% have a disposable annual income between $14 and $20,000.00
  19.4% have a disposable annual income between $21 and $27,000.00
  8.7% have a disposable annual income between $28 and $34,000.00
  6.7% have a disposable annual income between $35 and $41,000.00
  8.8% have a disposable annual income over $42,000.00

- Careful consideration needs to be given to the impact of future community development on adjacent properties vis-a-vis the effect that development might have on property evaluations and taxes. Escalations could put a significant percentage of home owners in financial difficulty.

- Concerns re affordable land and housing continue. Innovative, long-term solutions must be sought. Some threats to resident home ownership or the availability of basic shelter have been identified as:

  - Limited land base
  - Rising land, house and property tax costs
  - Speculative land purchases.
  - Non-resident/summer home ownership
  - Decreasing economic diversity
  - Seasonal wage scales
  - 56.8% of surveyed residents have a disposable annual income of less than $20,000.

- A committee to investigate the feasibility of starting a community land trust in Tofino could address the issue of affordable housing at the same time as considering the potential for a continuing source of revenue for the District if some of

the municipally owned land were included in the trust. If municipally owned land could not be included in a land trust, consideration should be given to the feasibility of leasing rather than selling the land, and to establishing a residency requirement for lease or sale of municipally owned land.

One solution to alleviate the housing shortage was to allow secondary houses on half acre lots currently zoned for single family residences. In one Alberni neighbourhood this approach was tried but resulted in escalating land evaluations and taxes as the properties were considered to be revenue producing. Properties in the same neighbourhood which remained single residence only were apparently also taxed at the higher rate as they had the potential to become revenue producing. Given this were to result, it would be likely that rents on these secondary houses would also rise, possibly beyond the reach of local residents requiring housing. In that event, secondary houses would most likely be rented out to tourists which would defeat the original intent of the proposal. Furthermore, an increase in property evaluations and taxes for owners not choosing to erect a second residence may force some current home owners to sell. In all likelihood, such half acre properties would be purchased primarily by non-residents, thus compounding the housing problem for local residents. It is of interest to note that a second neighbourhood approached by the Alberni District to consider the same rezoning rejected the proposal, apparently because of the problems created in the area where such rezoning had been implemented.

- Once zoning is determined, consistent enforcement of that zoning is required; violations, if they exist, would have to be phased out.

- Size restrictions on residential and commercial developments are desired. A two-storey limit has been suggested with square footage to be compatible with neighbouring structures. Concern has been expressed regarding the "monster house syndrome" which has destroyed communities in Vancouver because of the impact on property evaluations and taxes.

- A majority of residents surveyed have indicated a preference for small (low density), low impact, environment-oriented and locally initiated tourism developments. Beach concession stands are rejected. Additional large resort complexes, hotels, restaurants, pubs and marinas, etc. are incompatible with values expressed in the community survey.

- A location for a future community centre needs to be identified.

- Specific areas within the District of Tofino boundaries which were identified as having "special importance" to residents are: Tonquin Park, Chestermans Beach, Tofino Inlet, Frank Island, Mackenzie Beach and Cox Bay. Mackenzie Beach and Cox Bay

already have some tourism development in place as does some of Tofino Inlet. Sixty-five point four percent of all residents surveyed indicated there should be specific areas in Clayoquot Sound not advertised for tourist use. The Tofino community plan could protect the non-commercially developed areas above by zoning them primarily as local resident use areas.

- Marketing of the area needs to be addressed to attract tourists with values and expectations complementary to those of area residents.

- Bed and breakfast operations require regulation. (Should there be a differential rate for water and sewer? A business license?)

- Future commercial developments should be required to provide parking and when appropriate on-site staff accommodation.

- "Resident Parking Only" signs are required in congested areas (eg. in front of main street residents.)

- Tofino has to determine the limits it must set for commercial and residential development without destroying the existing character of the community. The community cannot possibly absorb every tourist or potential investor. Some hard decisions need to be made about the extent to which the community can meet the demands being made on it. (Good communication with Port Alberni and Ucluelet regarding available tourist accommodation may help alleviate some pressure on the area. Hotel/motel advertising should include "reservations required" or "recommended".

The cultural and economic diversity in the community is highly valued. Diversity of occupation should be encouraged as should individuality and self-sufficiency. The respect accorded people, whatever their heritage, income or occupation must be retained or enhanced. The community should continue to encompass a wide range of age groups.

- Care must be taken that the emphasis on tourism does not result in decreased economic diversity.

- Land use plans, building permits and business licenses should be monitored to ensure continued diversification. (Refer to Question 20 in survey for current occupational breakdown.)

- Consider land use needs to enhance self-sufficiency of community, especially re food production. (eg. community garden, greenhouse, compost (possibly community garden/greenhouse complex could operate in conjunction) with the CO-OP to supply produce?)

- Determine interest from Nuu-chah-Nulths re land requirements for a native cultural centre (possibly in combination with a community centre?)

- Consider needs of differing age groups when planning land use. (eg. pre-school, teen areas, long-term care, hospital outreach programs, etc.)

- Community centre could be a multi-use building, possibly combined with other functions to help cover costs. (eg. nature centre, medical clinics, mental health, substance abuse centre, women's resource centre, clinics (physio, dentistry, veterinary), swap shop, theatre, meeting rooms, volunteer bureau, preschool, day care, seniors groups, etc.)

- Consider need for future North Island College space (possibly in community centre) (Has NIC considered offering courses in native language/culture? Would their space be adequate?)

- Consider land use needs if more "value added" industries related to fishing, wood lots, etc. were developed.

- All planning should contribute to the stability of the existing community.

- Native land issues need to be addressed.

Methods of exercising responsibility for a sustainable community must be determined.

"Sustainable community development consists of human activity which guarantees the future of the community." (Bailey: *Planning Sustainable Communities*. November 1988)

The community plan will be a major factor contributing to the quality of life in Tofino, and should be carefully reviewed by residents. Every effort should be made to reach a consensus on the plan; at the least, the plan should be approved by a majority of residents prior to its adoption by Council.

Further review of the Community Values Survey may provide additional indicators for land use planning.

Of particular relevance to community planning is the high level of commitment residents have for Tofino. Sixty-four point four percent of residents indicated they would prefer to stay and work at an unrelated job rather than move elsewhere in the event they lost their source of employment. Maintaining and/or enhancing the quality of life residents experience will be a major challenge as the community develops. Concern has been expressed about the possible loss of the "small town ambience".

This submission is an attempt to provide a brief overview of data relevant to community planning which has been gathered from the survey and from community meetings. The opportunity for input to the process of community planning is greatly appreciated.

BARKLEY COMMUNITY FOREST CORPORATION

July 16, 2021

Alberni-Clayoquot Regional District
3008 5th Ave
Port Alberni, BC
V9Y 2E3

Re: Use of Airport lands for the purpose of growing Christmas Trees

Dear Mark Fortune,

Thank you for considering our application to explore growing Christmas Trees on Airport land.
There had been a shortage of Christmas trees in previous years and it was decided that this would be a good project for the Community Forest to pursue.
There was a great suggestion that the Airport lands could be a good fit for both the ACRD and the BCFC and I appreciate you initially showing me two areas that could be considered.
I reported my findings to the BCFC board and you subsequently took the General Manager and four board members on a tour of the site closest to the highway.
It is a good site and we discussed this fully at a board meeting but have decided that the access may be a problem and costs to bring this project to fruition will be more than the Community Forest is willing to commit and we will now look at ways to grow trees within the Community Forest areas.

The board appreciates the time and effort you have put in to help us explore this avenue.

Sincerely,

T. D. Smith

Terry Smith
Chair, Barkley Community Forest Corporation

PHONE: (250) 726 7669
EMAIL: barkleyforest@telus.net
www.barkleyforest.ca

PO Box 707
1971 Peninsula Road
Ucluelet, BC V0R 3A0

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

REQUEST FOR DECISION

To: West Coast Committee

From: Eddie Kunderman, Operations Manager
Wendy Thomson, General Manager of Administrative Services

Meeting Date: August 24, 2021

Subject: **West Coast Transit Service – Removal of Salmon Beach Impacts**

Recommendation:

THAT the West Coast Committee receive the report and resolve that no amendments be considered to Bylaw E1062, West Coast Transit Service Area Establishment, 2019 to change the service area boundaries.

Desired Outcome:
To provide information on the financial implications of removing a portion of area "C" (Long Beach) from the West Coast Transit Service area.

Summary:
At the February 17, 2021 Committee of the Whole (COW) meeting a resolution was passed instructing staff to investigate options for portions of Area "C" (Long Beach) withdrawing from the West Coast Transit Service which was established by Bylaw E1062 in 2019. As directed by the COW, staff provided the attached information report to the West Coast Committee on March 3rd with background information on the service and the process to remove an area from the establishing bylaw. This report was received by the Committee.

At the March 10, 2021 Board of Directors meeting, Directors considered a report from Director Roberts respecting options to withdraw Salmon Beach from the West Coast Transit service and the following resolution was passed:

> *THAT the ACRD Board of Directors instruct staff to investigate the financial impacts of removing the Salmon Beach portion of Electoral Area 'C' from the West Coast Transit Service.*

This report is provided as directed by the Board on March 10th.

Background:

Population Statistic - As part of the March 3rd report staff indicated they would reach out to Statistics Canada to determine if the population statistic, provided as part of the census, could be broken down by neighborhood for Area 'C'. Staff have confirmed that Statistics Canada is unable to provide this level of detail. This is relevant because 50% of the apportionment of the service is based on population and therefore the Salmon Beach portion of the population is unable to be removed from the apportionment calculation. However, the Salmon Beach portion of the population statistic for Area 'C' could be fairly low as it's a seasonal recreational community that limits use to less than 180 days in a calendar year.

Maximum Requisition Clarification - In the March 3rd report to the West Coast Committee it was identified that the Ministry had advised that the maximum requisition amount would require adjustment if the service area boundary was amended. Staff have had further discussions with Ministry staff and the Ministry has now retracted that initial statement and therefore no amendment to the maximum requisition section of the establishing bylaw is required.

Financial Impacts - Salmon Beach represents 28% of total assessed values of Electoral Area 'C' Long Beach and 3% of the total assessed values of the West Coast Transit Service Area. Due to the fact that the Salmon Beach percentage of the total assessed value is relatively low the financial impact to the other areas is minimal. The financial impacts by area for both the 2021 requisition of $110,658 as well as the maximum requisition of $550,000 have been included as attachments to this report.

Public Correspondence - Over the last month, the ACRD has received correspondence from the property owners within the service area respecting the removal of Salmon Beach from the service area (attached). The majority of correspondence is from property owners in Salmon Beach requesting to be removed from the service. There is also correspondence from property owners in the service area opposed to the removal of Salmon Beach.

Recommendation - Staff recommend that no amendments be made to the service area establishment bylaw to remove Salmon Beach from the West Coast Transit Service.

The West Coast Transit service will benefit all residents of the area, whether individuals will be directly using the service or not. Public Transit will improve mobility and provide other benefits to all members of the Region. The improved mobility for non-drivers will potentially expand the pool of available workers, as it increases the ability to live in one community and work in another. This option will also provide public health benefits to members of the Region, who will have access to healthcare they may not have had before. Non-drivers can currently resort to unsafe modes of transportation, such as hitchhiking, which decreases safety for all members of the Region.

The overall transportation network within the Region will also improve and will allow residents the ability to utilize the multi-modal travel network within the West Coast. Travelling to a destination could consist of driving, walking, cycling and utilizing the public transportation network – all within one trip, which has many benefits to all.
Support for Public Transit should not be limited only to current users. Residents of an area, or Community, should support Transit as a means to improve mobility for others, reduce traffic on the roadways (thus reducing environmental impacts), and providing the base of a transportation network that they may one day use within their own transportation plans. The addition of this safe and affordable option will connect the residents of the Region to many essential services such as employment, healthcare and various recreational activities – this benefits all of those who live within the Region.

Staff are concerned that if the Salmon Beach area is removed on the basis they do not have easy access to utilize the service, it is quite possible that other areas within the service will also make requests for removal on the same principles.

Regional District staff have received input from several property owners within the service area expressing concerns that the removal of Salmon Beach from the service area changes the intent of the Alternative Approval Process which was used to gain consent of the electorate to establish the service in 2019.

Next Steps - BC Transit will provide an update to the West Coast Committee in October 2021 on next steps in implementing the West Coast Transit service.

Time Requirements – Staff & Elected Officials:

Staff time has been required to investigate the process to remove a portion of the service area as well as the financial implications to the other areas of making such an amendment.

Financial:
Staff time to investigate these options allocated through the West Coast transit service.

Strategic Plan Implications:
Not applicable.

Policy or Legislation:
ACRD's West Coast Transit Service Establishing Bylaw E1062 and the *Local Government Act* apply.

Options Considered:
If the West Coast Committee would like to proceed with the removal of Salmon Beach from the West Coast Transit service, then the following motion could be considered:

> *That the West Coast Committee direct staff to draft an amendment to Bylaw E1062, West Coast Transit Service Area Establishment, 2019 to remove Salmon Beach from the service area and present to the Board of Directors for consideration.*

In order for this bylaw to be adopted, consent of 2/3's of the participants of the service area will be required as well as approval by the Inspector of Municipalities.

Submitted by: _____
Eddie Kunderman, Operations Manager

Submitted by: _____
Wendy Thomson, General Manager of Administrative Services

Approved by: _____
Teri Fong, CPA, CGA, Acting Chief Administrative Officer

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

INFORMATION REPORT

To: West Coast Committee

From: Wendy Thomson, General Manager of Administrative Services
Teri Fong, CPA, CGA, Chief Financial Officer

Meeting Date: March 3, 2021

Subject: West Coast Transit Service – Portions of Area "C" Withdraw Options

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Summary:

At the February 17, 2021 Committee of the Whole Meeting, Regional District staff were instructed to bring back information to the West Coast Committee on options for portions of area "C" (Long Beach) to withdraw from the West Coast Transit Service . This report outlines the steps involved in amending the service area. Attached to this report is the West Coast Transit section of the Draft 2021-2025 Financial Plan for information.

Background:

Bylaw E1062, West Coast Transit Service Area Establishment was adopted by the ACRD Board of Directors in December 2019 following a successful alternative approval process held in October 2019 (bylaw attached).

The participants of the West Coast Transit Service Area are:

- Electoral Area "C" (Long Beach)
- District of Tofino
- District of Ucluelet
- Toquaht Nation
- Yuułuʔiłʔatḥ Tribe Government

Maximum Requisition & Apportionment Method

The maximum amount that may be requisitioned annually for the cost of the service is $550,000 or $0.294 per $1,000 of taxable value of land and improvements, whichever is greater. The net annual costs of providing the service are apportioned among the participants as follows:

- 50% on the basis of population as determined by Statistics Canada's most recent census data;
- 50% on the basis of converted land and improvements.

Required Steps to Amend the Boundaries of the Service Area

Amendments to the boundaries of service area establishment bylaws are governed by the *Local Government Act Section 349 and 350.*

The following are the required steps:

- At the direction of the ACRD Board of Directors, Regional District staff would draft an amendment to Bylaw E1062, amending Section 3 of the Bylaw – **Boundaries** to reduce the boundaries of the service area to remove sections of area "C" from the service area;
- The ACRD Board of Directors can consider 3 readings to the amending bylaw at a regular board of directors meeting
- Prior to adoption of the amending bylaw by the ACRD Board of Directors, the following is required:
    - Written consent of at least 2/3's of the participants of the service area
    - approval by the Inspector of Municipalities

Implications to the Service Area from the Boundary Reduction

Reducing the service area size will increase the tax rate and cost for the remaining service area participants each year. The apportionment method of this service includes an allocation based on population. Staff do not believe that this type of statistical breakdown of information exists for only part of an electoral area which will make this portion of the allocation challenging. If directed to proceed with this review, staff will inquire with Statistics Canada as to whether more detailed statistical information within an electoral area is available.

Time Requirements – Staff & Elected Officials:

Significant staff time would be required to undertake this amendment including:

- working with the mapping technician to determine the proposed revision to the service area boundaries
- drafting of the bylaw amendment
- Gaining written consent from the Electoral Area Directors, Municipal and First Nation Council's
- if approved, staff will then need to request that BC Assessment create the new service area code for the defined area in Long Beach

Due to the fact that this amendment would require the creation of a new service area code for BC Assessment it is not possible to complete the steps in time for the 2021-2025 Financial Plan.

Financial:

Staff are unable to determine the financial impact to the other areas until we can clearly define the portion of the service area that is requesting removal. It is important to note that the Ministry has advised that the maximum tax rate per $1,000 would need to be reduced to maintain equivalence based on the revised service area. Depending on the portion of the service area that is requested to be removed, this may make operating the service within the requisition limits challenging. Until the proposed service area is defined staff cannot comment on the whether the limit will be sufficient to support the service.

Strategic Plan Implications:

Not applicable.

Options Considered:

If the Directors would like to proceed with this project in 2021 then the following motion would be suggested:

That the West Coast Committee recommend to the ACRD Board of Directors that staff investigate the financial impacts of removing a portion of Electoral Area 'C' Long Beach from the West Coast Transit Service based on the areas to be removed being provided by Director Roberts.

Submitted by: _____
Wendy Thomson, General Manager of Administrative Services

Submitted by: _____
Teri Fong, CPA, CGA, Chief Financial Officer

Approved by: _____
Douglas Holmes, BBA, CPA, CA, Chief Administrative Officer

ALBERNI-CLAYOQUOT REGIONAL DISTIRCT

BYLAW NO. E1062

A bylaw to establish and operate a service for public transportation on the West Coast

WHEREAS under the *Local Government Act* a regional district may, by bylaw, establish and operate any service the Board considers necessary or desirable for all or part of the regional district;

AND WHEREAS the Alberni-Clayoquot Regional District Board of Directors wishes to establish and operate a public transportation service within the District of Ucluelet, District of Tofino, Toquaht Nation, Yuułuʔiłʔatḥ Tribe Government and Long Beach Electoral Area.

AND WHEREAS the approval of the electors in the participating areas has been obtained by an alternative approval process in accordance with the *Local Government Act*;

AND WHEREAS the approval of the Inspector of Municipalities has been obtained in accordance with the *Local Government Act.*

NOW THEREFORE the Board of Directors of the Alberni-Clayoquot Regional District in open meeting assembled, enact as follows:

1. **Citation**

   This Bylaw may be cited as "Bylaw No. E1062, *West Coast Transit Service Area Establishment, 2019."*

2. **Service**

   The service established by this Bylaw is for the purpose of establishing and operating a public transportation system on the west coast.

3. **Boundaries**

   The boundaries of the service area are as shown on Schedule "A" attached to and forming part of this bylaw.

4. **Participating Areas**

   The participants of the service established under this bylaw are:
   Electoral Area "C" (Long Beach)
   District of Tofino
   District of Ucluelet

Toquaht Nation
Yuułuʔiłʔatḥ Tribe Government

5. Cost Recovery

In accordance with section 378 of the *Local Government Act*, the annual cost of providing the service may be recovered by one or more of the following:

a. Property values taxes imposed in accordance with Division 3 of Part 11 of the *Local Government Act*;
b. Parcel taxes imposed in accordance with Division 3 of Part 11 of the *Local Government Act*;
c. Fees and charges imposed under section 397 of the *Local Government Act*;
d. Revenues raised by other means authorized under the *Local Government Act* or another act;
e. Revenues received by way of agreement, enterprises, gift, grant or otherwise.

6. Maximum Requisition

In accordance with the *Local Government Act*, the maximum amount that may be requisitioned annually for the cost of the service is $550,000.00 or $0.294 per $1,000 of taxable value of land and improvements, whichever is greater.

7. Apportionment

The net annual costs of providing the service shall be apportioned among the participants in the following manner:

a. 50% on the basis of population as determined by Statistics Canada's most recent census data;
b. 50% on the basis of converted land and improvements.

Read a first time this 11th day of September , 2019.

Read a second time this 11th day of September , 2019.

Read a third time this 11th day of September , 2019.

I hereby certify this document to be
a true copy of Bylaw E1062, *West Coast Transit Service Area Establishment, 2019*
as read a third time on September 11, 2019.

Dated this 11th day of September,2019.

Wendy Thomson

_____

Wendy Thomson,
Manager of Administrative Services

Approved by the Inspector of Municipalities this 3rd day of October , 2019.

Assented to by the Electors this 3rd day of December , 2019.

Adopted this 11th day of December , 2019.

John Jack

_____

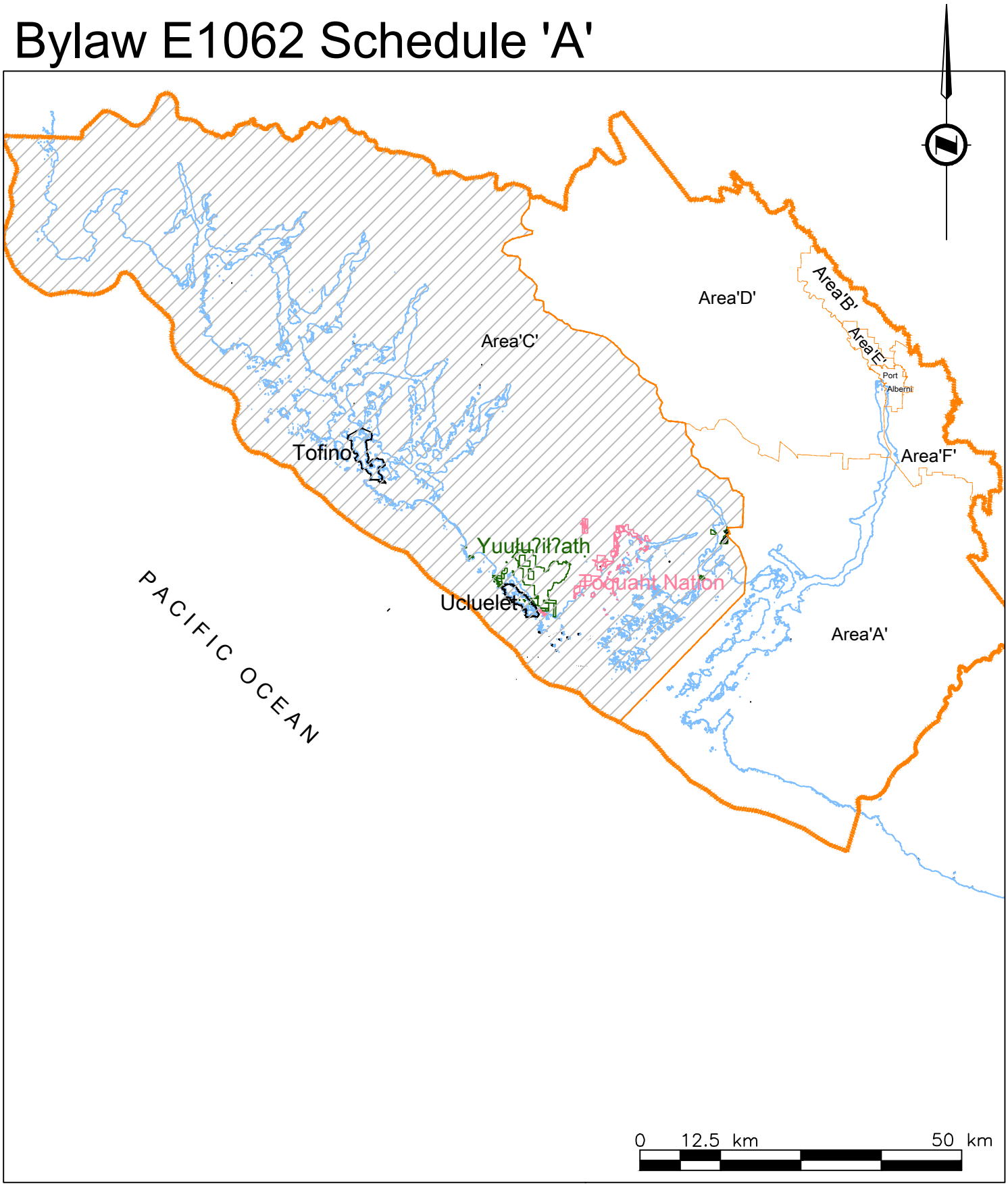
John Jack,
Chairperson

Wendy Thomson

_____

Wendy Thomson,
General Manager of Administrative Services

Bylaw E1062 Schedule 'A'



West Coast Public Transportaion Service Area - Electoral Area 'C', District of Tofino, District of Ucluelet ,Toquaht Nation and Yuułu?ił?atḥ Tribe Government.

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

West Coast Transit

Budget Highlights

This new transit service on the West Coast was planned to be implemented in 2021 and has been delayed to an estimated start of late spring or summer 2022. Key steps will be completed in 2021 to determine the size of buses to be used in the service, establishment of a local operator for the service, routes and schedules as well as develop the infrastructure plan including bus stops, benches and/or shelters. There was a significant surplus in this service in 2020, as a result of the pandemic, nevertheless staff recommend the development of a 'Rate Stabilization' or 'Operating' reserve instead of reducing the requisition in 2021 that would be followed by a sharp tax increase in 2022.

Financial Summary

2020 Requisition	2021 Requisition	Change $	Change %
$111,000	$111,000	$0	0.00%

The requisition limit for this service is $0.294 per $1,000 of assessed value. The estimated requisition maximum for 2021 is $621,297.

Overview

This is a newly established fixed route transit service that will serve communities between Ucluelet and Tofino, including the community of Hitacu. The service is scheduled to start operation in 2021/22.

Legislation

This service was established with Bylaw No. E1062 on December 11, 2019.

Participants

District of Tofino, District of Ucluelet, Yuułuʔiłʔatḥ, Toquaht, and Electoral Area C

Service	Account Type	GLCategory	2020 Actual	2020 Budget	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget
136 - West Coast Transit	Revenues	103 - Conditional Grant	$2,211			$267,000	$457,000	$461,570	$466,186
		124 - Fees & Charges				$93,000	$161,000	$162,610	$164,236
		126 - Surplus (Deficit) from Prior Years			$106,461				
		127 - Tax Requisition	$110,772	$111,000	$111,000	$319,039	$499,416	$504,724	$510,092
		130 - Unconditional Grant	$354						
		135 - Transfer from Stabilization Reserve				$84,761			
		Total	$113,337	$111,000	$217,461	$763,800	$1,117,416	$1,128,904	$1,140,514
	Expenses	247 - Labour & Benefits	$6,000	$6,000	$28,300	$30,800	$31,416	$32,044	$32,685
		257 - Operating Costs	$876	$5,000	$5,000	$633,000	$1,086,000	$1,096,860	$1,107,829
		269 - Operational Planning		$100,000	$100,000	$100,000			
		290 - Contribution to Stabilization Reserve			$84,161				
		Total	$6,876	$111,000	$217,461	$763,800	$1,117,416	$1,128,904	$1,140,514

WEST COAST TRANSIT	2020 Actual	2020 Budget	2021 Budget	2022 Budget	2023 Budget	2024 Budget	2025 Budget
STABILIZATION RESERVE							
Balance, beginning of year	$ -	$ -	$ -	$ 84,461	$ -	$ -	$ -
Contribution from operating budget	-	-	84,161	-	-	-	-
Interest earnings	-	-	300	300	-	-	-
Transfer to operating budget	-	-	-	84,761	-	-	-
BALANCE, END OF YEAR	**$ -**	**$ -**	**$ 84,461**	**$ -**	**$ -**	**$ -**	**$ -**

WEST COAST TRANSIT - Analysis of removing Salmon Beach from Service Area

BASED ON 2021 REQUISITION: $ 110,658

BASIS OF APPORTIONMENT: 50% POPULATION & 50% LAND AND IMPROVEMENTS
CONVERTED HOSPITAL VALUES

CURRENT PARTICIPANTS: TOFINO, UCLUELET, YUUŁU?IŁ?ATH, TOQUAHT AND ELECTORAL AREA C

PARTICIPANT	2021 CONVERTED VALUES	% SHARE	50% REQUISITION BASED ON CONVERTED	POPULATION BASED ON 2016 CENSUS	% SHARE	50% REQUISITION BASED ON POPULATION	NET REQUISITION
TOFINO	$ 165,241,421	57.40%	$ 31,756	1,932	41.83%	$ 23,143	$ 54,899
UCLUELET	$ 88,100,347	30.60%	$ 16,931	1,717	37.17%	$ 20,567	$ 37,498
AREA C	$ 34,392,028	11.95%	$ 6,610	677	14.66%	$ 8,109	$ 14,719
YUUŁU?IŁ?ATH	$165,240	0.06%	$ 32	274	5.93%	$ 3,282	$ 3,314
TOQUAHT	$ 0	0.00%	$ 0	19	0.41%	$ 228	$ 228
	$ 287,899,036	100.00%	$ 55,329	4,619	100.00%	$ 55,329	$ 110,658

REVISED REQUISITION CALCULATION BASED ON REMOVAL OF SALMON BEACH

PROPOSED PARTICIPANTS: TOFINO, UCLUELET, YUUŁU?IŁ?ATH, TOQUAHT AND
ELECTORAL AREA C WITH EXCEPTION OF SALMON BEACH

PARTICIPANT	2021 CONVERTED VALUES	% SHARE	50% REQUISITION BASED ON CONVERTED	POPULATION BASED ON 2016 CENSUS	% SHARE	50% REQUISITION BASED ON POPULATION	NET REQUISITION
TOFINO	$ 165,241,421	58.80%	$ 32,534	1,932	41.83%	$ 23,143	$ 55,677
UCLUELET	$ 88,100,347	31.35%	$ 17,346	1,717	37.17%	$ 20,567	$ 37,913
AREA C	$ 27,511,703	9.79%	$ 5,417	677	14.66%	$ 8,109	$ 13,526
YUUŁU?IŁ?ATH	$165,240	0.06%	$ 33	274	5.93%	$ 3,282	$ 3,315
TOQUAHT	$ 0	0.00%	$ 0	19	0.41%	$ 228	$ 228
	$ 281,018,711	100.00%	$ 55,329	4,619	100.00%	$ 55,329	$ 110,658

IMPACT OF REMOVING SALMON BEACH FROM SERVICE AREA

PARTICIPANT	REQUISITION BASED ON CURRENT MODEL	REQUISITION BASED ON REVISED MODEL	IMPACT
TOFINO	$ 54,899	$ 55,677	$ 778
UCLUELET	$ 37,498	$ 37,913	$ 415
AREA C	$ 14,719	$ 13,526	-$ 1,193
YUUŁU?IŁ?ATH	$ 3,314	$ 3,315	$ 1
TOQUAHT	$ 228	$ 228	$ 0
	$ 110,658	$ 110,658	$ 0

WEST COAST TRANSIT - Analysis of removing Salmon Beach from Service Area

BASED ON MAXIMUM REQUISITION: $ 550,000

BASIS OF APPORTIONMENT: 50% POPULATION & 50% LAND AND IMPROVEMENTS
CONVERTED HOSPITAL VALUES

CURRENT PARTICIPANTS: TOFINO, UCLUELET, YUUŁU?IŁ?ATH, TOQUAHT AND ELECTORAL AREA C

PARTICIPANT	2021 CONVERTED VALUES	% SHARE	50% REQUISITION BASED ON CONVERTED	POPULATION BASED ON 2016 CENSUS	% SHARE	50% REQUISITION BASED ON POPULATION	NET REQUISITION
TOFINO	$ 165,241,421	57.40%	$ 157,838	1,932	41.83%	$ 115,025	$ 272,863
UCLUELET	$ 88,100,347	30.60%	$ 84,153	1,717	37.17%	$ 102,225	$ 186,378
AREA C	$ 34,392,028	11.95%	$ 32,851	677	14.66%	$ 40,306	$ 73,157
YUUŁU?IŁ?ATH	$165,240	0.06%	$ 158	274	5.93%	$ 16,313	$ 16,471
TOQUAHT	$ 0	0.00%	$ 0	19	0.41%	$ 1,131	$ 1,131
	$ 287,899,036	100.00%	$ 275,000	4,619	100.00%	$ 275,000	$ 550,000

REVISED REQUISITION CALCULATION BASED ON REMOVAL OF SALMON BEACH

PROPOSED PARTICIPANTS: TOFINO, UCLUELET, YUUŁU?IŁ?ATH, TOQUAHT AND
ELECTORAL AREA C WITH EXCEPTION OF SALMON BEACH

PARTICIPANT	2021 CONVERTED VALUES	% SHARE	50% REQUISITION BASED ON CONVERTED	POPULATION BASED ON 2016 CENSUS	% SHARE	50% REQUISITION BASED ON POPULATION	NET REQUISITION
TOFINO	$ 165,241,421	58.80%	$ 161,702	1,932	41.83%	$ 115,025	$ 276,727
UCLUELET	$ 88,100,347	31.35%	$ 86,213	1,717	37.17%	$ 102,225	$ 188,438
AREA C	$ 27,511,703	9.79%	$ 26,922	677	14.66%	$ 40,306	$ 67,229
YUUŁU?IŁ?ATH	$165,240	0.06%	$ 162	274	5.93%	$ 16,313	$ 16,475
TOQUAHT	$ 0	0.00%	$ 0	19	0.41%	$ 1,131	$ 1,131
	$ 281,018,711	100.00%	$ 275,000	4,619	100.00%	$ 275,000	$ 550,000

IMPACT OF REMOVING SALMON BEACH FROM SERVICE AREA

PARTICIPANT	REQUISITION BASED ON CURRENT MODEL	REQUISITION BASED ON REVISED MODEL	IMPACT
TOFINO	$ 272,863	$ 276,727	$ 3,864
UCLUELET	$ 186,378	$ 188,438	$ 2,060
AREA C	$ 73,157	$ 67,229	-$ 5,929
YUUŁU?IŁ?ATH	$ 16,471	$ 16,475	$ 4
TOQUAHT	$ 1,131	$ 1,131	$ 0
	$ 550,000	$ 550,000	$ 0

-----Original Message-----
From: Bea Jacobs
Sent: July 10, 2021 9:00 AM
To: Teri Fong <tfong@acrd.bc.ca>; Wendy Thomson <wthomson@acrd.bc.ca>
Subject: No on transit tax for Salmon Beach

Hello,
We love salmon Beach and spend as much time there as we can , mostly summers. We do Not think that it is fair or equitable to include Salmon Beach in the transit tax as we will never use the service.
Respectful,
Beatrice and Donald Jacobs
1137 th Ave

www.photosbybeatrice.com
Sent from my iPad

From: Cade and Char
Sent: July 19, 2021 2:35 PM
To: Wendy Thomson
Subject: Salmon Beach

Good After noon Wendy,

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.

Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
Thank you,

Charlene Morris ,
1039 View Rd, Salmon Beach.

-----Original Message-----
From: dale Conley
Sent: July 8, 2021 6:24 AM
To: Wendy Thomson <wthomson@acrd.bc.ca>
Subject: Salmon Beach Transit Tax

Wendy Thomson

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.

Thank You
Dale Conley
1036 - 6 Ave
Salmon Beach

From: Dean Bieber
Sent: July 10, 2021 11:10 AM
To: Kel Roberts <kroberts@acrd.bc.ca>
Cc: Planning Shared <planning@acrd.bc.ca>; Mayco Noël <mnoel@ucluelet.ca>
Subject: Removal of Area C From Transit

Hello Kal,

I wanted to extend my gratitude to you for your proposal to remove Salmon Beach taxpayers from the transit plan on the West Coast.

I am in full support of removing this burden to Salmon Beach taxpayers for the following reasons:

- This is another tourist service that should NOT be funded by local taxpayers in any area
- Salmon Beach tax funds can be better used to improve infrastructure within the community
- Salmon Beach taxpayers already contribute to ACRD services that are not available to the area (which I am in support of)
- The adoption of including Salmon Beach in the transit service was not fairly presented to owners in the area

As I have not seen an actual presentation of the proposed route this transit service would take, I can only assume the busses will only travel between Tofino and Ucluelet. Please advise if this is incorrect.

I feel it is time for responsible management of the West Coast, and primary focus on tourist services should no longer take precedent. There are important infrastructure improvements needed on the West Coast, Tofino, and Ucluelet that have taken a back seat to tourist services for too long, and the area is now paying the price for this neglect.

This being said, I believe the removal of Salmon Beach from the transit tax will be a step in the right direction, and the board should source other tourism-based monies to support this program.

Please feel free to contact me if I can provide further support to remove Salmon Beach from the transit plan.

Sincerely,

Dean Bieber

From: Dawn Sanders
Sent: July 7, 2021 5:51 PM
To: Wendy Thomson
Subject: West Coast Transit Services

To Wendy Thompson - General Manager of Administrative Services

We would like to register our opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location. It is also my understanding that this service has never been commenced and is unlikely to be a viable service to the residents.

Thank you,

Dean and Dawn Sanders
1073 Seventh Ave.
Salmon Beach, B.C.

-----Original Message-----
From: Lyle Johnson
Sent: July 9, 2021 10:03 AM
To: Wendy Thomson <wthomson@acrd.bc.ca>
Subject: Re: In support of Salmon Beach Transit Tax

Good morning Wendy,
Sure you may include my email in the meeting agenda. Many that live(yes there's probably about a dozen or more that live there year round, in violation of the bylaw) and vacation in Salmon Beach need to realize they are not an self sustaining island unto themselves and they rely heavily on the surrounding communities and should contribute as well.
Eboni Johnson

Sent from my iPhone

> On Jul 8, 2021, at 8:09 AM, Wendy Thomson <wthomson@acrd.bc.ca> wrote:
>
> Good morning Lyle,
>
> Thank you for forwarding your support for the West Coast Transit Service. Regional District staff have been instructed to investigate options for the Salmon Beach area to withdraw from this service. A report on this issue will be going to the West Coast Committee this fall.
>
> Would you like your correspondence included on this meeting agenda? I should note that this is a public meeting and your email would be posted publicly on our website.
>
> I can advise you when this issue will be considered by the West Coast Committee.
>
> Sincerely,
>
>
> Wendy Thomson
> General Manager of Administrative Services
>
> A 3008 Fifth Avenue, Port Alberni, BC V9Y 2E3
> O 250.720.2700 M 250.720.2706 W acrd.bc.ca
>
>
>
>
>
>

> -----Original Message-----
> From: Lyle Johnson
> Sent: July 7, 2021 5:36 PM
> To: Wendy Thomson <wthomson@acrd.bc.ca>

> Subject: In support of Salmon Beach Transit Tax

Hello,
> I am writing in support of the proposed Salmon Beach transit tax. I am a property owner at Salmon Beach. I know you are probably receiving many emails in opposition to this tax as they claim they will not be able to use the service. However I think these ones are a bunch of self entitled people that need to realize the surrounding communities of Tofino and Ucluelets' working population will greatly benefit from services supported by these taxes. These are the working people that work at the grocery stores, gas stations, and restaurants and other businesses those at Salmon Beach rely on. So in this way They do benefit from the services this tax will support.
> Salmon Beachers need to stop being so entitled and learn to contribute to these communities in a meaningful way.
> Thank you

> Eboni Johnson

Sent from my iPhone

From: Rhonda Butler
Sent: July 11, 2021 11:23 PM
To: Teri Fong
Subject: West Coast Transit Tax

To Teri Fong – Chief Financial Officer

We would like to register our opposition to the inclusion of Salmon Beach in the By Law E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon beach tax payers should not have to pay this transit tax as we will never be able to use this service due to our remote location.

Thank you
John & Rhonda Butler
1029 Seventh Ave.
Ucluelet B.C.

Sent from Mail for Windows 10

From: José lommen
Sent: July 10, 2021 9:55 PM
To: Wendy Thomson
Subject: Transit Tax

Wendy Thomson - General Manager of Administrative Services,

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
Thank you,

Josephina Lommen
1034 7th Ave
Salmon Beach

-----Original Message-----
From: dale Conley
Sent: July 8, 2021 6:14 AM
To: Wendy Thomson <wthomson@acrd.bc.ca>
Subject: Salmon Beach Transit Tax

Wendy Thomson

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
Thank You
Karen Conley
1036 - 6 Abe
Salmon Beach

From: Ken M
Sent: July 8, 2021 7:30 AM
To: Wendy Thomson
Subject: Bylaw E1062

To Wendy Thompson - General Manager of Administrative Services

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.

Thanks fpr your time,

Ken Mutch owner of 1145-7th Ave Salmon Beach

From: lawrence conley
Sent: July 8, 2021 11:52 AM
To: Wendy Thomson
Cc: Teri Fong
Subject: : Transit Tax

DEAR Wendy Thomson and Teri Fong

As a property owner at Salmon Beach I will not support the transit tax that the ACRD wants to burden Salmon Beach owners with.
We are in a remote location and this bus service would never extend to our community.
We are limited to 182 days of usage of our property's per year.
We already pay taxes on so many things we can never benifit from or use like people in Ucluelet and Tofino.
This is not a fair or reasonable tax to expect the Salmon Beach community to absorb.
We pay for our own sewage, garbage, road maintenance etc, we have no fire protection.
Enough putting hands into our back pockets to support another useless service for us.

Regards Laurence Conley
1045 View Road
Salmon Beach.

Sent from my Galaxy

From: Skip Triplett
Sent: July 7, 2021 4:17 PM
To: Teri Fong
Subject: SAlmon Beach Transit Tax

I am a 30 year Salmon Beach owner and I I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
Thank you,

Leslie Triplett
1066 Fifth Avenue
Salmon Beach

Leslie "Skip" Triplett
Colwood, BC, Canada

From: Malcolm Collingwood
Sent: July 12, 2021 10:50 AM
To: Wendy Thomson ; Teri Fong
Subject: West Coast Transit Tax

To Wendy Thomson - General Manager of Administrative Services

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.

Thank you,

Malcolm and Jane Collingwood
1186 Front Street
Salmon Beach

From:
Sent: July 8, 2021 11:42 AM
To: Wendy Thomson ; Teri Fong
Subject: Transit Tax

Dear Wendy Thomson
Teri Fong

As a property owner at Salmon Beach I will not support the transit tax that the ACRD wants to burden Salmon Beach owners with.
We are in a remote location and this bus service would never extend to our community.
We are limited to 182 days of usage of our property's per year.
We already pay taxes on so many things we can never benifit from or use like people in Ucluelet and Tofino.
This is not a fair or reasonable tax to expect the Salmon Beach community to absorb.
We pay for our own sewage, garbage, road maintenance etc, we have no fire protection.
Enough putting hands into our back pockets to support another useless service for us.
Thank you for reviewing this.

Regards Patience Conley.
1045 View Road
Salmon Beach.

Sent from my Galaxy

-----Original Message-----
From: Rick Pedersen
Sent: July 8, 2021 9:19 AM
To: Wendy Thomson <wthomson@acrd.bc.ca>
Subject: Transit Tax

> To Wendy Thompson - General Manager of Administrative Services I
> would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
> Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
>>
> Thank you,

> Rick Pedersen
> Salmon Beach
> 1045 Sixth Avenue
> Ucluelet, BC

-----Original Message-----
From: Sandra Pedersen
Sent: July 8, 2021 8:51 AM
To: Wendy Thomson <wthomson@acrd.bc.ca>
Cc: Teri Fong <tfong@acrd.bc.ca>
Subject: Re: Transit Tax

Good morning Wendy,

Thank you for your reply.

I would also like to mention that this service has not been commenced and are now questioning whether the service would be viable for us, the residents. Being in a remote area, there is no way for us to access this service.

I have no problem having my email be published.

Thank you for your attention to this matter.

Regards,

Sandra Pedersen

-----Original Message-----

> From: Sandra Pedersen
> Sent: July 7, 2021 8:35 PM
> To: Wendy Thomson <wthomson@acrd.bc.ca>

> Subject: Transit Tax

To Wendy Thompson - General Manager of Administrative Services

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.

> Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.

Thank you,

Sandra Pedersen

> Salmon Beach
> 1045 Sixth Avenue

Ucluelet, BC

my beach address

Sent from my iPhone

From: scott kehl
Sent: July 12, 2021 11:26 AM
To: Wendy Thomson
Subject: West Coast Transit Tax

To Ms. Thomson

We would like to register our opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
Thank you,

Scott and Simone
1192 5th Ave.
Salmon Beach

Sent from Mail for Windows 10

From: TG
Sent: July 7, 2021 10:45 PM
To: Wendy Thomson
Subject: No Transit Tax for Salmon Beach

To Wendy Thompson - General Manager of Administrative Services

I would like to register my opposition to the inclusion of Salmon Beach in the Bylaw E1062 - The West Coast Transit Service Area Establishment 2019.
Salmon Beach taxpayers should not have to pay this transit tax as we will never be able to use this service due to our remote location.
Thank you,
Terry and Merle Graff
1124 Front. St.
Salmon Beach, BC

August 4, 2021

Tofino Ratepayers Association Newsletter

I am pleased to be able to report on the most recent meeting of the directors of the Tofino RPA. In attendance Directors: Kevin Midgely, Steven Thicke, Harold Sadler, Tammy Shymko and Jack Gillie.

Subjects for discussion:

ITEM ONE Regional Bus Service

Later in August, the Regional District of Alberni Clayoquot, will entertain a motion to exclude Salmon Beach from the areas subject to taxation in support of the bus initiative. A 2/3 vote of the directors is required. You may recall we opposed this initiative at the time of approval for the borrowing bylaw. This new motion is troubling on many levels.

The motion, if passed, would put increased burden on others still required to pay the tax, your taxes would likely go up. Tofino taxpayers will share more of the burden as the rate of taxation is set against assessment. So, one of the initial problems for Tofino taxpayers, an unfair distribution of the burdens of taxation. will be exacerbated. Taxation that is based not on use or ability to pay but a system of assessment that is widely disparate from one community to another. Tofino assessments generally running double the regional.

It also opens the door for other parts of Area C that do not have direct access to the bus, to ask to be excluded as well. For example, property on Vargas Island, Catface and Cypre River areas, Recreational properties at Hesquiat, and in Barkley Sound, to name a few. This could turn into a disaster for those left holding the bag. Even those supporting the busing scheme should have second thoughts

This new motion calls into question the legitimacy of the original process where we were required to participate on the basis of a system of sharing that will no longer exist and a petition process that will end up based on false premises.

We continue to oppose and will oppose the bus proposal because 1) the projected needs and use were not adequately substantiated, 2) costs were disproportionately distributed, 3) local business providing service at no cost to the taxpayer would inevitably be eliminated 4) Local residents subject to the tax were not given adequate say in developing the proposal or approving the funding bylaw.

WE encourage the Regional Board to take this opportunity for a fresh start and a redraw of this entire proposal.

To the West Coast Committee and the Board of Directors

A recent motion by Director Roberts Area C requesting Staff to report the impact of withdrawing Salmon Beach from the recently adopted West Coast Transit Bylaw is very concerning. The Director's stated intent is to withdraw SB from the newly created service. The WC Committee and Board has been put in a very tough position by this motion. On one hand there is a legitimate concern being raised by the folks at Salmon Beach. The issue is one of having access to a service that they are being asked to pay for. I believe that this is a valid concern, that being said, there are dozens upon dozens of other properties in both Clayoquot and Barkley Sounds. From Hot Spring Cove through Catface, Wickaninnish Island and Barkley that have exactly the same concern. Many of these other properties have even greater issues accessing the service than SB does.

The establishment of a bylaw should not be taken lightly. The Board decided to use the Alternate Approval Process to adopt this very significant Servicing Bylaw. It will have a huge impact on the Coast both in future costs and expectations. The information to the voters as presented had gone through months of public consultation and in fact the Alternate Approval Process was legitimized by this public consultation and the report that followed. Ultimately it was Director Robert's decision to include all of Area C within the assessment area for the financial obligations within the bylaw. That is the choice of the Director. Unfortunately now just months after the Bylaw has been adopted and received the Province's blessing the Committee and Board are being asked to make radical amendments that will substantially change the original Bylaw as presented to the public. The removal of 420 properties or more from the already small assessment area will have significant financial impact to the remaining participants.

It would seem to me that the Committee and Board have a couple of options before them. If the Board rejects the motion and the removal of Salmon Beach from the Newly created Service then the status quo remains. If the Board accepts the intent of the motion and allows Salmon Beach to withdraw then the Board must consider the many other Properties in Area C that have the exact same issue as SB. The Board must also consider the substantial change to the Bylaw as originally presented and the damage done to the confidence of the elector when these types of actions are undertaken just months after the approval of the Bylaw. I would suggest that if this is the case that the process reverts back and Electors have a chance to vote on the dramatically changed Bylaw. Further I cannot stress the incredible waste of Staff resources and time that is being spent on this issue having already gone through the process it did. I also include my original email on the issue of WC Transit and the use of the alternate approval Process

Sincerely

Tony Bennett

Port Albion

Forwarded Conversation

Subject: Re: West Coast Directors meeting July 17/2019

From:
Date: Mon, Jul 15, 2019 at 12:52 PM
To: Wendy Thomson <wthomson@acrd.bc.ca>
Cc: Tracy Bond <tbond@acrd.bc.ca>, Douglas Holmes <dholmes@acrd.bc.ca>

To the West Coast Directors Alberni Clayoquot Regional District

On today's agenda (July 17/2019) you have a recommendation to approve an Alternate Approval Process to provide Transit Service on the West Coast. This is based on an overwhelming approval of the proposal through public outreach through open houses and online and phone surveys. Based on the ACRD report these numbers are 75 attendees at open houses, 128 phone surveys and 212 online surveys for a total of 415 respondents. With a 2016 Census population of 5534 that includes Ucl., Tof, Area C, Toquaht and UFN I do not believe that a total of 415 respondents can be considered overwhelming. It can not be ruled out that some of the 415 responses could all so have been some folks answering all three surveys that being said 415 responses are far less than the requirement of 10% or 554 peoples to write and submit to the ACRD their disagreement to disqualify the Alternate Approval Process. The survey quotes agreement to pay through taxes of up to $190 for Tofino and $135 for Ucluelet. The bylaw as proposed allows for far greater tax to be collected at $1.47 per $1000 of assessed value. For a very modest $300k home the tax for the service will be a maximum of just over $442 per year. It has been my experience that when a maximum tax requisition is set then that is what is collected if not right away then within a few years. I recognize that on page 37 of your agenda quotes of between 0.162 and 0.281 per $1000 value as being the cost of providing the service but that is not what the bylaw as presented is allowing.
The Transit Service maybe be a valuable asset for the WC but I urge you to reconsider the use of the Alternative Approval Process to legitimize the Service. We complain about the lack of involvement of our citizens in the political arena but when we have an obligation and opportunity for that engagement the choice is being made to take the easy way and not allow a referendum. This is a completely new service, there are no immediate reasons to approve the alternate approval process. I urge you to also consider the fallout that has occured because of the AAP being used to approve the Alberni Valley Airport tax requisition, decisions at the airport are met with a cloud of distrust. Please reconsider the recommendation of using AAP and allow your citizens a vote through referendum on the creation of a WC Transit Service.

Sincerely
Tony Bennett
1407 Port Albion Road

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT
3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

REQUEST FOR DECISION

To: West Coast Committee

From: Director Rachelle Cole, District of Ucluelet
Teri Fong, CPA, CGA, Acting Chief Administrative Officer

Meeting Date: August 24, 2021

Subject: **Potential Use of Long Beach Airport for Campground for West Coast Workers**

Recommendation:

That the West Coast Committee recommend that the Board of Directors proceed with the development of a long-term strategy for dispersed camping issues on the West Coast as outlined in the August 25, 2021 Board of Directors Request for Decision 'Dispersed Camping Task Force – Next Steps' including the investigation of the development of a campground at the Long Beach Airport for West Coast workers.

Desired Outcome:

To explore creative opportunities to address the dispersed camping issues on the West Coast.

Summary:

The Tla-o-qui-aht First Nation recently brought together a group of stakeholders on the West Coast to explore options to address the lack of housing for workers on the West Coast and issues with dispersed camping in the area. One possible option identified was the development of a campground at the Long Beach Airport.

District of Ucluelet representative, Director Cole, requested the concept of creating a campground at the Long Beach Airport for West Coast workers be brought forward for consideration by the West Coast Committee.

Background:

One possible site identified at the Long Beach Airport is a lot currently leased to Hazelwood Construction Services which is setup with crew accommodations with 18 trailer stalls. The current lease with Hazelwood does not expire until December 31, 2022, so this option would not be feasible for the 2022 busy season. Although this this lot is somewhat set up to service a campground, further investigation and considerations would be required including servicing, campground management and monitoring. This concept requires a fulsome investigation and significant staff time to gather the relevant information to enable the West Coast Committee and ACRD Board of Directors to make an informed decision.

The topic of issues related to dispersed camping on the West Coast is at a crisis level. The ACRD has been leading a stakeholder group using COVID-19 Restart Funding to coordinate a discussion regarding this topic during 2021. A report titled 'Dispersed Camping Task Force – Next Steps' will be considered by the Board of Directors on August 25, 2021. A copy of this Request for Decision has been attached to this report for your reference. This concept of creating a campground at the Long Beach Airport could be investigated as a component of the overall dispersed camping strategy. As such, staff have provided this recommendation at the beginning of this report.

It is also important to note that the West Coast Housing Needs Report is currently being drafted and will be completed later this fall providing the West Coast Committee and the Board with valuable information regarding the housing situation on the coast.

Time Requirements – Staff & Elected Officials:

Significant staff time would be required to investigate this concept. If the West Coast Committee would like to proceed with a fulsome investigation, staff recommend consultant funding be considered during the 2022-2026 Financial Plan discussions to assist with this process. Preliminary investigation work would be conducted by staff to determine the scope of the project prior to making a consultant recommendation.

Financial:

There is no funding available in the current 2021-2025 Financial Plan for this initiative. The overall costs related to the dispersed camping strategy are discussed in the attached report.

Strategic Plan Implications:

This project aligns with strategic priority 5.1 Engagement with Community Partners.

Policy or Legislation:
n/a

Approved by: Fong
Teri Fong, CPA, CA, Acting Chief Administrative Officer

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

REQUEST FOR DECISION

To: Board of Directors

From: Teri Fong, CPA, CGA, Acting Chief Administrative Officer

Meeting Date: August 25, 2021

Subject: Dispersed Camping Task Force – Next Steps

Recommendation:

That the Alberni-Clayoquot Regional District Board of Directors support in principle engaging with the Whistler Center for Sustainability to develop a more robust and longer-term strategy for the dispersed camping issues on the West Coast to a maximum cost of $25,000 and direct staff to reach out to the other regional stakeholders for financial contributions to the project and report back to the Board of Directors at the September 22, 2021 meeting.

Desired Outcome:

To mitigate the dispersed camping issues that are occurring on the West Coast.

Summary:

In June 2021 the ACRD engaged the Whistler Center for Sustainability Engagement and Planning (WCS) to lead a task force of stakeholders related to the dispersed camping issues on the West Coast. A summary of the work done to date by WCS has been attached for your information. As noted in the report, WCS is proposing that the task force be reconvened in the fall and a more robust strategy is developed. Participation in this task force has diminished over the summer however staff believe that this is not from a lack of interest in the topic but from resource challenges from the stakeholders over the busy summer months. This proposal would see the development of a strategy and action items over the quieter winter months in anticipation of next year's busy summer camping season.

Over the summer further action and meetings have also occurred and been led by other stakeholders as the issues emerge. As an example, please find attached the press release dated August 8, 2021 from Tla-o-qui-aht First Nation regarding Kennedy Back Country Road Pollution.

Background:

Unauthorized camping is at crisis levels. Problems being experienced include the interruption of industry by campers blocking industrial roads, campers themselves creating unhealthy living conditions for themselves, access to homes being blocked by campers both in remote communities and in small urban centres, pollution through garbage and human waste, and increasing points of conflict between campers and those whose lives, perceived security and livelihoods are affected by the unauthorized camping.

Much of this is occurring on Crown lands including near first nations treaty lands and reserve lands. Multiple tools will need to be developed and resources will need to be contemplated to contend with this escalating situation. This can

only be addressed through a partnership that starts with multiple provincial and federal ministries and agencies, RCMP, first nations, and local governments.

Time Requirements – Staff & Elected Officials:

To date significant staff time has been spent coordinating stakeholders, finding a consultant and analyzing this complex issue. If this recommendation is to proceed, further staff time will be required to support the consultant and participate in the task force.

Elected officials have also spent a significant amount of time to date not only participating on the task force but also dealing with the issues in their area that have arose from the dispersed campers. This task force is not an official committee of the Regional District and therefore no remuneration has been received by the Directors for their participation in these meetings with the exception of March 3, 2021 meeting that was a Committee of the Whole.

Financial:

The 2021-2025 Financial Plan includes $10,000 of COVID-19 Restart Funds in the Regional Planning service for costs related to addressing dispersed camping issues. To date the consultant work has cost $3,200.

If the Board is to proceed with the remaining portion of the proposal, then an additional $15,000 will be required. Staff recommend reaching out to the other stakeholders such as the West Coast Municipalities, First Nations and other participants on the task force looking for financial contribution to this initiative. Another option would be to allocate some of the remaining COVID-19 Restart Funding to this project however there are competing demands within the ACRD for this remaining funding which will be discussed at the September 9, 2021 Board of Directors meeting.

Strategic Plan Implications:

This project aligns with strategic priority 5.1 Engagement with Community Partners.

Policy or Legislation:

The ACRD has not adopted a statutorily constituted service to undertake broad bylaw enforcement or coordination of enforcements and therefore the actions that can be assumed by the ACRD are very limited. Depending on the actions recommended by the strategies developed by the task force, as lead by WCS, the establishment of a new service may be required.

Options Considered:

If the Board wants further action on this topic but do not support the WCS approach, then Board direction is requested.

If a more formal approach to this topic is desired, then a Select Committee of the ACRD could be formed including the development of a terms of reference. The ACRD participants on this committee would then be eligible for remuneration for meeting attendance. This more formal approach would require additional resources to set up and support. The following motion would be appropriate if the Directors support this concept:

That the Alberni-Clayoquot Regional District Board of Directors direct staff to draft a Terms of Reference for a West Coast Dispersed Camping Mitigation Committee for consideration by the Board of Directors.

Submitted by: _____

Teri Fong, CPA, CA, Acting Chief Administrative Officer

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

3008 Fifth Avenue, Port Alberni, B.C. CANADA V9Y 2E3 Telephone (250) 720-2700 FAX: (250) 723-1327

INFORMATION REPORT

To: West Coast Committee

From: Jenny Brunn, General Manager of Community Services

Meeting Date: August 24, 2021

Subject: West Coast Landfill Leachate Preliminary Design Report

Background:

In 2019, the ACRD completed a review of the West Coast Landfill that highlighted the need for improved leachate collection, storage and treatment system. In early 2020, Sperling Hansen completed an assessment determining that it was more economically and environmentally beneficial to upgrade the leachate system than to close the landfill and operate a transfer station. The Board approved that staff proceed with preliminary design to upgrade the leachate system.

Summary:

The attached preliminary design report, completed by Weaver Technical in consultation with Sperling Hansen, proposes a combination of biological treatment processes that will occur via a series of lagoons and engineered wetlands which will be constructed on the site to create an enhanced leachate treatment system. This system will be designed to meet current and future flow projections, incorporating potential impacts from climate change. The technology has been selected to ensure the effluent will meet the requirements of our operational certificate, current regulations, and best practices.

Any changes to current landfill operations require an amendment to the landfill operating certificate which is approved by the Ministry of Environment (MoE). Staff have had a pre-application meeting with Ministry staff to present this proposed change to the leachate treatment system. Ministry staff are supportive of the ACRD's intent to improve the treatment system and will be providing the ACRD with an application instruction document with specific information requirements for us to submit our amendment application. The process for review and approval can be quite lengthy (upwards of a year) and may require additional consultation requirements.

On January 28, 2021, staff presented the proposed upgrades to the west coast solid waste working group which includes staff from the key organization on the west coast. Staff also presented the preliminary design, along with the proposed organics facility upgrades to a Pacific Rim Parks management meeting on February 3, 2021. The design was well received and supported by both groups.

The next key steps in this process will be to work with MoE staff on the application for the amendment, and prepare a Request for Proposal (RFP) to complete the detailed engineering design. This RFP will include the provision of supervision and contract oversight for the construction phase, as well as tender document creation. Staff will also need to prepare a Loan Authorization Bylaw that will need to be approved by the Ministry of Municipal Affairs and Housing.

Financial:

The 2021-2025 Financial Plan for the West Coast Landfill included this proposed project in 2022 with a budget of $2.6 million which was to be funded by a combination of $1.4 million in borrowing and the remainder from the capital reserve. This budget will be revisited during the 2022-2026 Financial Plan process and updated to reflect anticipated capital reserves remaining after completion of the organics facility construction and landfill tipping area upgrades.

Policy or Legislation:

The *Environmental Management Act* requires that landfills meet their issued Operating Permits and the *2016 Landfill Criteria* has provided updated standards for landfill operations which necessitates much higher standards of monitoring, operation and planning. The ACRD's 2007 Solid Waste Management Plan identified the need to address leachate quality and committed to upgrade the leachate collection and treatment system to meet or exceed Ministry requirements and guidelines.

Submitted by: _____
Jenny Brunn, General Manager of Community Services

Approved by: _____
Teri Fong, CPA, CGA, Acting Chief Administrative Officer

Preliminary Design Report

Westcoast Landfill Leachate Treatment System

Prepared for Alberni-Clayoquot Regional District

Prepared by,
Bita Nazyab, EIT, M.A.Sc.,
& Tim Weaver, R.P.Bio, EP

Sperling Hansen Associates

Weaver Technical
Science - Construction - Engineering

Date: August 19, 2021

Table of Contents

1 Introduction

Weaver Technical Corp. (WeaverTech) and Sperling Hansen Associates Inc. (SHA), have provided this preliminary design concept for upgrading the leachate retention and wetland discharge system at West Coast Landfill (WCL). The landfill is owned by Alberni-Clayoquot Regional District (ACRD) and operated by a contractor. The landfill is subject to requirements stipulated under the Landfill Criteria for Municipal Solid Waste and the site-specific Operational Certificate Number MR-05634, issued April 12, 2005. The facility accepts municipal solid waste from the surrounding region, including Ucluelet and Tofino.

The background information and baseline condition provided here is based on a site reconnaissance conducted in fall 2020, a review of historical monitoring reports for West Coast Landfill, by Piteau Associates Engineering Ltd., and West Coast Landfill Leachate Collection and Treatment Assessment, by McGill & Associates Engineering Ltd., and other mapping information provided by ACRD staff.

The WCL is located 1 km north of the Pacific-Rim Highway, approximately 9 km northwest of the Tofino-Ucluelet junction, and 7 km southeast from the Tofino Airport. The site is located at elevations of approximately 40 to 50 m ASL and it occupies approximately 28.4 hectares (including both developed and undeveloped areas).

This report describes the engineering and ecological rationale of upgrades, system components and considerations for successful operation of a combined passive and active leachate treatment system. The treatment system incorporates aspects of conventional biological treatment methods. The upgrade includes retrofit of a retention pond and installation of a second lagoon to commission two aerobic lagoons totalling 16,000m^3 which exceeds the 1:100 year storm requirement, in combination with phytoremediation methods utilizing periphyton (attached growth algae/bacterial films) and an engineered wetland. These types of systems can have comparable capital costs to conventional treatment technologies (such as chemical or membrane treatment technologies) but carry a much lower operating cost.

1.1 Baseline Condition

The current leachate infrastructure includes a ~7,000m^3 retention lagoon located at the southwest corner of the landfill and an upgradient irrigation system with associated pumping infrastructure that distributes leachate to a vegetated attenuation area. The attenuation area is in the north west quadrant of the site and drainage leads to Sandhill Creek approximately 100m to the West. The Operational Certificate requires that any leachate discharges maintain compliance with parameters listed in the B.C. Water Quality Guidelines (WQG). Historically, discharges of treated leachate have at times exceeded these standards for certain contaminants

such as aluminum, copper, iron, and magnesium (See Appendix A). In addition, exceedances of ammonia have also occurred. Since ammonia is known to have potential to cause eutrophication of water courses or otherwise cause toxicity to fish, depletion of dissolved oxygen (DO) within surface waters and toxicity to aquatic life are concerns with respect to nearby aquatic environments. It is important that design criteria ensure that ammonia and its metabolites (e.g. nitrates and nitrites) are not released in quantities that could cause degradation of the receiving environment.

Furthermore, the design criteria must ensure that the treatment system is able to accommodate storm events to prevent the discharge of untreated runoff into the environment.

1.2 Treatment Objectives

ACRD intends to upgrade their leachate treatment system to meet the requirements set out in their Operational certificate and comply with the Fisheries Act requirements on all permitted effluents discharged to fish bearing waters. The operational certificate requires to meet BC Water Quality Guidelines at point of discharge.

Environment Canada (EC) and the BC Ministry of Environment and Climate Change are requiring demonstration that discharges are acutely non-toxic to fish, typically confirmed through standard acute toxicity testing on rainbow trout. The previous approach included dilution modelling in the receiving environment to predict whether toxicity could occur, and this is still common with pollutants where there might be numerical exceedances above guidelines at end of pipe. However, more recently, *end of pipe* enforcement of acute toxicity guidelines has become more general practice. Based on historical ammonia concentrations observed at WCL, releases may have occurred or continue to occur that could be toxic to fish. For instance, concentrations of ammonia exceeding 30mg/L with an alkaline pH can be acutely toxic to rainbow trout. Furthermore, demonstrating non-toxicity of landfill leachates may become a point of interest to regulators. As such, toxicity along with the constituents currently in exceedance is included in treatment objectives.

It is expected that over time as the landfill is capped, the volume of leachate generation will decrease and subsequently the retention time in the treatment system increases, which typically has no negative consequence since the total mass loading of contaminants in generally will decrease.

The specific objectives of the WCL redesign are as follows:

I. Meet compliance requirements with regards to standards outlined in the Operational Certificate (MR-05634).
II. Produce an effluent that is non-toxic, demonstrated by the LT50 acute lethality test.

III. Accommodate 1 in 10 year return, 24 hour storm event runoff in minimum.
IV. Achieve the above treatment system objectives while implementing a system which is economically effective and requires the least amount of maintenance.
V. Meet Operational Certificate Requirements by preventing discharges to surface water receiving environments where the BC Water Quality Guidelines could apply.

1.3 Proposed System Upgrades

To meet the Operational Certificate requirements, leachate treatment needs to focus on the biological degradation of contaminants such as ammonia, combined with physical/oxidative removal of suspended and dissolved metals such as those observed [aluminum, copper, iron, and magnesium]. The new proposed design is a biological treatment system, similar to activated sludge that includes a combination of the aerobic activated microbial recycle process, anoxic treatment, and attached periphyton growth. The proposed system is designed to provide favorable year-round conditions for microbial communities that undertake the degradation of contaminants through both oxidation and assimilation/deposition processes. During summer months heterotrophs, microalgae and nitrifiers play important symbiotic roles in the metabolic processes and that role is changed in winter when photosynthesis is no longer available.

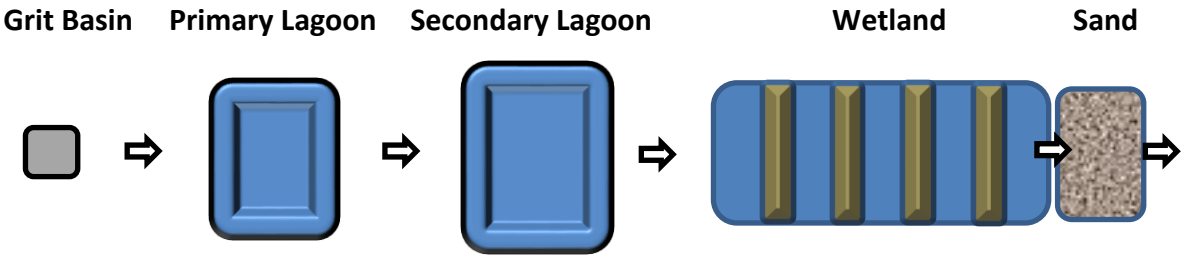
Biological treatment systems have advantages over other treatment methods because they typically have low energy requirements and can effectively reduce COD, BOD, ammonia nitrogen, and trace metals for a low operating cost. The low energy requirement and low operating cost are due to the fact that there is typically little to no chemical addition or moving parts aside from aeration and pumping. Supporting literature and examples throughout the world substantiate that landfill leachate can be treated through staged aerobic and anoxic treatment system that can enhance ammonia removal through nitrification (aerobic) and denitrification (anaerobic) processes (Yang and Zhou 2008). Other secondary pollutants and toxicity contributors in landfill leachate such as heavy metals require a vegetated soil-based treatment. Examples including bioswales or engineered wetland can reduce secondary pollutants through adsorption/absorption and through diverse microbial processes. The climate of the Tofino area [with winter temperatures daily averages of 5°C or higher] is supportive of required biological processes such as nitrification which slows considerably at lower temperatures.

The proposed design takes advantage of a dual lagoon configuration to achieve aerobic treatment coupled with additional anoxic stages to enhance contaminant removal processes. The proposed treatment system will also incorporate an engineered wetland containing submerged media galleries for discharge to further enhance anoxic nitrogen removal and to reduce concentrations of metals that are often not degraded in aerobic/anoxic processes (Grisey et al. 2012; Yang and Zhou 2008). Metals will be adsorbed to the aggregates and soils prescribed for the wetland. It will also provide a sand drain field discharge environment for final effluent polishing.

Overall, this re-design of the leachate treatment system will involve the following six installations:

1. A grit basin to remove large solids and grit that can interfere with treatment process or cause undue mechanical wear and increased maintenance on wastewater treatment equipment (The grit basin will be located on the inlet side of the primary lagoon. Not shown on design drawings).
2. A primary aeration lagoon for Biochemical Oxygen Demand (BOD) reduction, organic nitrogen utilization and primary nitrification.
3. A secondary lagoon with aeration and anoxic chambers to further reduce BOD, de-nitrification and solids settling.
4. Sludge recycling system to return biomass from the secondary lagoon anoxic chamber to the primary lagoon
5. Engineered wetland with submerged media galleries for anoxic nitrogen and metals removal.
6. Sand field discharge area for metals adsorption, solids and coliform attenuation

The following schematic below outlines the general layout and flow of the system:



Detailed descriptions of the treatment system are provided in the next section.

2 Detailed Description of the Treatment System

The treatment system consists of a grit basin, a primary lagoon (aerobic lagoon), a secondary lagoon (staged aerobic/anoxic lagoon), followed by an engineered wetland and a sand field for final discharge. The system would continue to passively receive water through leachate ditching and maintain full static water levels and flow via gravity to a secondary lagoon. The effluent from the lagoons will be pumped to the wetland from the final anoxic chamber in the secondary lagoon through an upgraded lift station. Water from settlement chamber of the second lagoon will be recirculated to re-introduce biomass to influent.

The system components are described below. A detailed design drawing is provided in Appendix B.

2.1 Primary Lagoon (7,000 m^3)

The existing pond will be upgraded to a capacity of ~7,000 m^3 and will serve as primary treatment pond. Leachate will enter the existing pond through re-configured local ditching and a new settlement basin. This pond will contain an aeration system to create an environment that promotes the biodegradation of organic contaminants by microorganisms with a focus on optimizing conditions for heterotrophs. During commissioning, the primary lagoon can be seeded with "activated sludge" provided from either the Tofino plant or another regional wastewater facility to establish appropriate microorganisms that will initiate the biodegradation processes. Aerobic conditions will be maintained with the use of forced air to provide an oxygenated environment (targeting a minimum of 2 mg/L), thereby stimulating both oxidative processes and the growth of microorganisms that consume organic material. The goal during both lagoon processes is BOD reduction and some nitrification. A floating aeration system with stainless steel nozzles at depth is recommended to provide the oxygen supply. This aeration system has a simple and flexible hose assembly that can be pulled in and out of the lagoon by hand. The nozzles themselves are twist nozzles that can adjust back pressure and are not prone to frequent clogging.

Four mixers (~1HP power consumption each) will be installed at the bottom of the primary lagoon to provide vertical mixing. Vertical mixing reduces the need for deep water air delivery and extra costs on aeration power and more expensive blowers. This creates a partially mixed lagoon that can enhance microbial contact and keep some sludge in suspension. Circulation enhances the oxygen transfer and microbial contact with contaminants by keeping light organic solids/biomass in suspension and preventing anerobic ammonia formation in sludges below.

A floating baffle curtain would be installed to create a second chamber and reduce short circuiting.

2.2 Secondary Lagoon (~9,200 m^3)

In the secondary lagoon, water will undergo additional aeration followed by anoxic settlement to enhance the removal of NOx (Nitrates and Nitrites) species that form during the initial nitrification processes in the primary lagoon. The aerobic and anoxic sections will be separated by curtain baffles. The aerobic and anoxic chambers will contain a volume of ~4,600 m^3 each. Two mixers of ~1HP power consumption each will be installed; one at the bottom of each aerobic and anoxic section (one mixer each) to provide vertical mixing.

Slower, anoxic processes promote colonies of sulphate reducing bacteria and denitrifiers, as well as providing optimal conditions for algae growth near the surface due to increased CO_2 concentrations. Algal photosynthesis requires the presence of dissolved carbon dioxide and is best undertaken in a shallow anoxic environment. However, the benefit they provide is seasonal.

Some ammonia will remain after the lagoon processes that will need to be removed. However, BOD and biologically available nutrients will be significantly spent except for organic carbon generated from algae before it is either discharged to the next phase or pumped back to the primary lagoon. Nutrient and BOD reduction in the lagoons is important to protect nitrifiers that will establish in the media of the primary side of the wetland. BOD and nutrients (apart from Phosphorus which may need to be supplemented) need to be reduced in the lagoons to protect denitrification organisms in the next phase as they are easily outcompeted by heterotrophs that prefer nutrient rich environments. Replenished carbon supply (i.e. from algal biomass or nitrifiers) can be recycled back to the primary lagoon to complete the symbiosis of the system.

A biomass recycling pump will return the microbial biomass from the anoxic settlement area to the primary lagoon adjacent the raw influent inlet. This will likely be undertaken using a small 75-gpm submersible pump (~1 HP) that operates continuously and recirculates back to the primary lagoon. This will allow direct contact of microbial biomass with influent entering the primary lagoon, effectively seeding incoming raw leachate with starved microbial biomass and carbon recycling. A two percent floor slope is proposed to encourage water flow and diversion of biosolids to a sludge return pump for redirection to the influent area and microbial contact with untreated influent.

The effluent from the outfall of the secondary lagoon is then to be pumped through a new HDPE force main up to the wetland using a 400-gpm floating pump (~5 HP).

2.3 Engineered Wetland Discharge Area

The engineered wetland will filter the water through a series of deeper pools that will be separated by aggregate berms of various types of gravels (media galleries) and pumice. The berms serve as substrate for nitrifiers and other periphyton and the wetland will provide further reduction of contaminant concentrations through natural adsorption/attenuation processes. In addition, there should be tangible benefit from phytoremediation[1] processes (Grisey et al. 2012). This wetland is anticipated to contain standing water all year round due to natural clay that will act as a liner with areas of pooling water a maximum of 1m deep but consideration for varying depth profiles will be preserved for final design to promote diversity of aquatic macrophytes (for example some species prefer shallow water). The final design may not include uniform 1m depth. It will be hand-planted during commissioning with local plant species selected for longest growing seasons and nitrogen and metals attenuation contribution. The water entering the wetland is required to meet the BC Water Quality Guidelines for the Protection of Wildlife, as there may be

1 Phytoremediation is a bioremediation process that uses various types of plants to remove, transfer, stabilize, and/or destroy contaminants in the soil and water.

some incidental use by amphibians and birds. Subsequent to studies determining the potential for wildlife guidelines being exceeded for a particular configuration in the wetland, additional upstream treatment measures might need to be considered. Depending upon results of studies to support detailed design, it may be recommended to conduct nitrification in a controlled tank (such as a concrete basin filled with media) since they require high oxygen concentrations that might not be maintained in a wetland during summer (should be >4mg/L dissolved oxygen).

Native wetland species will be planted throughout the wetland, particularly in shallow planting zones as well as along the edges of the pond and on the surface of the eight gravel / pumice berms. This will increase the holding time and improve treatment efficacy. The presence of vegetation such as cattails and sedges is important to trap and remove heavy metals found in the leachate (Grisey et al. 2012). During winter months there will be more reliance upon microbial processes without vegetation. The wetland sediments can be monitored annually for accumulation of metals, but the initial lifespan before an excavation and reinstatement is required is anticipated to be a number of decades.

ACRD intends to consult elders within local first nations communities about appropriate evergreen or winter active species for the engineered wetland and work with local stakeholder groups to assist with planting and maintaining of the wetland.

2.4 Sand Drain Field

Final discharge from the wetland will be to a sand field. The field will promote the removal of biological organisms and colloidal solids that may persist through the system. It will also buffer pulses of nutrients that may break through during flash rain events so as not to cause pulse loading on the local creek. Close monitoring of the lagoon and wetland performance during the first year of operation will be required to understand specifically nutrient needs to minimize these kinds of risks, albeit at this time they are anticipated to be low risks.

2.5 Retention Time

Considering the overall capacity of the treatment system to be a combined volume of ~21,000 m^3 (treatment lagoons combined 16,200 m^3, wetland excluding the berms ~4,500 m^3) and given the calculated average wet season inflow to the lagoons 824 m^3/d (see calculation details in Appendix C), the minimum hydraulic retention time (HRT) in the lagoons and wetland is anticipated to be ~25-days. Overall the combined retention time in the lagoons and the wetland meets and exceeds required HRT required by comfortable margin as supported in literature and utilized in other similar treatment systems (typically in the order of hours/days, <10 days) (Peng et al. 2008).

2.6 Additional Nitrification Tank (In-case further nitrification capacity is required)

As discussed above, an additional nitrification tank may be required for nitrogen/ammonia removal. The media galleries within will serve as growth media for nitrifying bacteria and will be installed at a downstream point of the secondary lagoon to isolate nitrifiers and prevent competitive heterotroph periphyton establishment on the media.

Further leachate analytical testing is required to determine whether the addition of an external nitrification tank is necessary. Design calculations for the nitrification tank will be conducted upon further investigation of influent quality to support whether it is necessary in the design and what design characteristics need to be met.

2.7 Clean Runoff Retention Pond

The clean runoff from the inactive portions of the landfill site will be stored in a 7,000 m^3 retention pond in accordance with provincial landfill design criteria. This water will also be used for maintaining the wetland (e.g. flushing the wetland in certain times of the year as needed or keeping the wetland "wet" during dry months). Adding the clean runoff water to the wetland will also provide benefits such as micronutrients and additional alkalinity that is consumed in the nitrification process.

The clean runoff retention pond is sized to contain 24 hour, 100 year return storm events over currently active landfill cells (~31,000 m^2) after those cells are capped and closed. See calculation details in Appendix C.

3 Oxygen Requirement and Aeration System Modeling

Oxygen required in the aeration stage was calculated using standard engineering practice methods. Calculation details are provided in Appendix D.

Required oxygen for average wet season influent flowrate of 824 m^3/d (calculated based on rational method, see Appendix C) was calculated to be 12.3 kg O_2/hr. Providing the required amount of oxygen could be accomplished by 75 HP of regenerative blowers to produce at least 2733 cfm aeration overall. A much smaller additional blower (~5HP) may be needed for a nitrification chamber if this chamber is deemed necessary. The aeration system is simple in configuration and can be expanded with additional modules if oxygen demand increases with future landfill expansions.

This provides some excess oxygen that accounts for additional BOD which will be introduced to the system by nutrient addition (e.g. phosphorus, and possibly external sources of carbon if needed) or by stormwater runoff produced by landfill expansions or by a future composting facility that is planned for the site. While composting should reduce the nitrogen content of future

deposits in the landfill and subsequent nitrogen in leachate, the storage and maturation process of composting is most often exposed to some amount of precipitation and will produce its own nitrogen rich runoff. Overall, leachate from the landfill may contain lower concentration of nitrogen on an annual basis due to the diversion of organics from landfill disposal and into compost. However, pulses of nitrogen may become more apparent during precipitation contacting compost being prepared on site, although with the retention and mixing in the lagoons, this should ensure pulse loads are buffered.

4 Biological Process Enhancements/optimization

The organic material breakdown in biological wastewater treatment is undertaken by a variety of bacterial groups that have unique growth requirements and nutrient needs. Bacteria require a balance of nutrients to process water effectively. Lack of nutrients in the system can be a limiting factor for bacterial growth. The two main bacterial groups present in the proposed treatment system are aerobic and facultative[2] bacteria.

4.1 Bulk Nutrient Addition

Phosphorus

A review of the historical monitoring data provided showed that the phosphorus supply is limited. Operating the treatment system at maximum efficiency requires favorable nutrient ratios in the system. To maintain healthy biological activity, nutrient addition might be required periodically. The recommended nutrients ratio for aerobic treatment of landfill leachate is total nitrogen to total phosphorus (N:P) of 16:1-7:1 (See Appendix F for more information provided by Larratt Aquatics).

We recommend starting phosphorus supplementation based on a fraction of the lowest end of the recommended range (16:1 N:P) to avoid overdosing phosphorus until its consumption rates in this system can be measured and understood - every system is unique. Initial required phosphorus dosage was determined based on the most recent leachate data (from August 2020) considering ammonia concentration as N (see Appendix C). It should be noted that the N:P ratio was calculated with ammonia nitrogen. This is because total nitrogen concentrations were not measured and ammonia removal is the main objective of this treatment system. However, the remaining fraction of nitrogen (organic nitrogen) might pose a risk to the phosphorus supplementation as it might be more immediately bioavailable and utilize the phosphorus

[2] Facultative bacteria use either free dissolved oxygen or bond oxygen obtained from sulfate or nitrate ions.

supplement first. We recommend monitoring and adjusting the phosphorus dosage after determining the removal of target for ammonia and other contaminants. This can be achieved by analyzing the water chemistry 7 and 14 days after the initial phosphorus addition and adjusting a dosing regimen based on the proportional consumption.

Monopotassium phosphate is a commercial source that is ~23% phosphorus by weight. Monopotassium phosphate is available in bulk quantities as agricultural supplements at rates of approximately $3.3/kg, but, it may be available from international suppliers for much less. Monthly phosphorus dosage as monopotassium phosphate was calculated based on the most recent leachate analytical data (from August 2020). Calculation results are provided in Appendix C. These calculations must be adjusted once more analytical data is available. Other sources of phosphorus can also be considered depending upon cost and availability for long term operation.

Carbon

For efficient denitrification, readily biodegradable carbon compounds must be present. In C:N ratios of below 2.5 (i.e., 100:40), the efficiency of the denitrification process can become impaired, resulting in higher nitrate values in the outflow. As mentioned above, the algae that grow in anoxic chambers produce algal biomass that serves as a carbon supply and is recycled to the aeration chamber. Algae also help with removing excess nutrients and toxic metals through biosorption and bioaccumulation.

Based on the recommended ratio above, carbon addition may be required if algal populations cannot provide sufficient carbon year-round. If that is the case, the addition of an external source of readily degradable carbon should be considered. In anticipation of this, we will suggest retaining all wood wastes encountered during the wetland and lagoon construction. Stumps, logs etc. will be placed in the wetland to provide a carbon source for these organisms that will form in the media of the wetland.

5 Effluent Discharge Quality

5.1 Proposed Discharge Criteria

This section provides the proposed discharge criteria applicable to water discharges from the site. The proposed criteria is based on the applicable guidelines [i.e. BC Water Quality Guidelines (WQG) and BC Municipal Wastewater Regulation (MWR)] and appropriate receptors in the receiving environment. The Wildlife Protection guidelines may also apply at the end of pipe discharge into the head of the wetland (for animals incidentally utilizing the wetland from time to time). The Aquatic life and Recreational guidelines apply at point of discharge to the creek where there is potential for exposure to fish or to people (recreationally coming into contact with creek water).

The tables below summarise the proposed discharge criteria for potential key contaminants known in landfill leachate that have established criteria in the BC WQG and BC MWR. Chronic standards are proposed assuming that the discharge will be continuous (24 hours/day, 7 days/week) and at volumes that may fluctuate based on precipitation.

The guidelines proposed for point of discharge to the creek are defined conservatively as the creek flow will provide some dilution to the discharge (~2:1 dilution in winter).

Table 1. Proposed discharge criteria for wetland discharge to the creek

	Unit	Concentration in discharge
		MWR
BOD	mg/L	45
TSS	mg/L	45
		WQG[1]
Ammonia-N	mg/L	1.78
Nitrate	mg/L	3
Nitrite	mg/L	0.2[2]
Chloride	mg/L	150
Total Iron	mg/L	1[3]
Total Zinc	mg/L	7.5
Total Cadmium	mg/L	Variable[4]
pH	pH unit	6.5-9
Total phosphorus		Not defined

Notes:

[1]Most stringent of aquatic life and recreational guidelines applied.

[2]Assuming that chloride concentration is >10 mg/L.

[3]Short-term acute guideline is proposed since no chronic guideline was defined.

[4]Depends on water hardness.

Table 2. Proposed discharge criteria for end of pipe discharge to the wetland

	Unit	Concentration in discharge
		WQG[1]
Ammonia-N	mg/L	Not defined
Nitrate	mg/L	100[2]
Nitrite	mg/L	10[2]
Chloride	mg/L	600
Total Iron	mg/L	Not defined
Total Zinc	mg/L	Not defined
Total Cadmium	mg/L	Not defined
pH	pH unit	6.5-9
Total phosphorus		Not defined

Notes:

[1]Wildlife Protection guidelines applied.

[2]Short-term acute guideline is proposed since no chronic guideline was defined.

Since the receiving environment is an ephemeral stream, during winter wet months there is significant dilution potential in the receiving environment that may be available to compensate for lower microbial activity that will occur in the treatment system. Based on the available historical creek flows from 2016 to 2020, during the months of October to January, a natural dilution multiple of 2X the above stated guidelines would be available in the form of creek flow assuming that a discharge diffuser pipe (details will be provided in the detail design phase) from the wetland is placed in a location that would provide optimal for mixing upon stream entry. A field location can be confirmed by a QP during the detailed design phase and dilution modeling conducted if determined necessary by the QP. The exact window for 2X dilution in the creek can be confirmed during detailed design. During summer months, growth is enhanced and so is microbial degradation of ammonia and other contaminants. It is not anticipated that there will be exceedances of guidelines in effluent, but contingencies will be explored during detailed design.

6 Other Considerations

6.1 pH and Alkalinity Adjustment

The addition of alkalinity might be required in the aeration basin to buffer the acidity generated during the nitrification process and ensure adequate carbonate is available for the nitrifying processes. A pH value in the range of 7.5-8.0 is optimum for biological nitrification. Nitrification rates decrease significantly in extreme acidic conditions (i.e., pH<5.5). If sufficient alkalinity is not

present in the leachate, the nitrification reaction will be self-inhibitory as the pH values decrease with the release of hydrogen ions (SEPA IPPC 2007).

In theory, for each one kilogram of ammoniacal nitrogen that is nitrified, 7.14 kg of alkalinity, as $CaCO_3$, is consumed (SEPA IPPC 2007). The chemistry of leachate in the aeration chambers must be monitored periodically to determine if addition of alkalinity is necessary.

Potential sources for the addition of alkalinity include waste shells from a shellfish processing plant and limestone. The required dosage of alkalinity addition can be calculated based on the chemistry of leachate, if necessary.

6.2 Future Compost Facility Leachate

It is our understanding that ACRD is planning to construct a composting plant on site to receive curbside organic waste and some commercial (e.g., restaurant food wastes). Under the BC Organic Matter Recycling Regulation composting leachate must not be discharged to the environment without authorization by the Ministry. However, it will be an option to treat this water in the same system as the landfill leachate and can be proposed during the permitting process. Based on our experience from similar composting facilities that we have designed, we expect this composting leachate will have a similar character to the landfill leachate but with lower metals concentrations. We expect that the additional leachate coming from the composting facility can be readily accommodated in the treatment system since treatment lagoons are sized to exceed the required 1 in 10 year storm event as required under the BC Organic Matter Recycling Regulation, and considering the additional capacity that can be accomplished by modular expansion of the air supply system.

6.3 Mechanical Components

Based on the preliminary calculations conducted for this report, the treatment system would likely require approximately 87 HP of power for aeration and pumping systems and mixers. The estimated power consumption for each of the mechanical equipment is as follows:

- Regenerative blowers, ~75 HP overall
- One floating pump (for pumping the secondary lagoon effluent to the wetland), ~5 HP
- One submersible pump (for recirculating water from secondary lagoon to primary lagoon), ~1 HP
- Six mixers (four in primary lagoon and two in secondary lagoon), ~1 HP power consumption each for a total of 6HP.

As discussed in our pre-design meetings, power requirements are of concern since there is currently only single-phase power available at the existing lagoon kiosk. An electrical engineer

will need to be retained during the detailed design phase to determine power availability and confirm costs for servicing.

6.4 Sludge Removal from Lagoons

Based on our experience with similar landfill leachate treatment facilities, sludge generation in the treatment lagoons is expected to be less than 100 tonnes per year. In order to remove the sludge when required (anticipated to be every 5-10 years), one of the treatment lagoons will be drained into the wetland during dry season (summer months) while the other lagoon is in operation. The drained pond will then be suction dredged and the sludge conveyed to a temporary excavation in the landfill for dewatering. Once dewatered, it can be composted as long as the sludge does not contain heavy metals exceeding Class A compost criteria and as long as the lagoon sludge is included in the operations plan for the compost facility or BC Organic Matter Recycling Facility permit as an approved feedstock since it will not be a listed compostable material as defined in that regulation specifically.

7 Cost Analysis

A cost analysis of the proposed upgrades is provided in Appendix E. This cost analysis is based on:

- Local contractor submission on labour, equipment, and material rates required in the upgrade
- Site visit during periods of heavy rain
- Topographic information supplied by CVRD

General Site Conditions

The following was observed during the site visit:

- A noticeable brown sediment plume was entering the existing pond. This likely due to poor surface gradients and quality of capping of access roads within the collection footprint. This fine silt, during heavy rains would place burden on the lagoons and may remain in suspension until the wetland, affecting percolation ability.
- Runoff captured from the area outside of the landfill collection area can enter the treatment system. Ditches that separate collection on the east and northern sides require regrading and adjustment.
- The overall runoff capture collection and discharge methodology requires upgrade and repair.

Proposed Upgrades

- Control all flows that enter the treatment area by relocation, berms or regrading.

- Install settlement chambers at the existing retention pond intake and adjust the culvert's elevation.
- Establish a new lagoon utilizing the existing clay with an approx. lagoon capacity of 9,000-10,000 m^3
- Upgrade the existing pond floor by removing silt settlement on the floor.
- Install aeration systems in the existing and secondary lagoon.
- Install new discharge lines from lagoon 1 to 2, complete with spillway.
- Install new precast lift chamber within lagoon 2
- Construct the wetland, utilizing low-ground impact equipment. The actual design of the wetland will be affected by old-growth stumps that will be encountered and should remain in place. To control runoff, the wetland should be constructed from the downstream end. The overall capacity of the wetland will be approx. 5,000 m^3, with a gentle gradient between 0.5 and 1% fall.
- Install lava berms or gabions in the wetland.
- Granular access paths will be installed, paralleling the force main, to the head of the wetland and running on the top bank of the wetland. This will assist in monitoring, fine grading and the planting of grasses and vegetation.
- A sand drain field of coarse sand and cobbles is proposed at the end of the wetland that will allow native soil absorption.
- A small kiosk will house the blowers, lift station controls, electrical panelling, and gauges.

The mechanical portion of the upgrade will be based on the electrical engineering review and recommendations. Blowers and pump sizing are dependent on these findings. This portion of the refit has the greatest range of cost, i.e. $50k to $200k or perhaps more if the future composting facility power requirements utilize all onsite servicing available and a power upgrade to 3 phase service is required. After preliminary electrical engineering review, the range can be re-estimated to within 20%.

Contingencies

- The blower lift station electrical upgrade.
- The ability to purchase 80% of the material (gravel etc.) locally favorable in terms of rates.
- Local contractors have shown they have the equipment, expertise, and bonding to complete the works.
- It would assist to accurately measure volumes of import or export with periodic use of the landfill weigh scale.
- The living out allowances for finishing and monitoring crews within the area are well above the provincial standards and should be considered.

- Weather: The most time-consuming activity in this upgrade is the stripping, excavation, and shaping of the marine clay. This portion of the work will require approximately 100 days and should be scheduled between April and September of a calendar year. Trying to carry out this work outside of the recommended window may increase costs by up to 30%.
- Test pits should be conducted in all planned improvement areas as a part of detailed design to prove clay integrity to ensure a natural liner will provide adequate protection.

8 Closure

We are pleased to submit this preliminary design report to Alberni-Clayoquot Reginal District in support of the technical design of the leachate treatment system provided by WeaverTech. A recommended monitoring and maintenance plan for the leachate treatment system will be provided separately in an operation manual. For any questions regarding the content of this report please contact the undersigned.

Regards,

Weaver Technical Corp.

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Appendices

Appendix A

Historical Leachate Analytical Data as Compared to Water Quality Guidelines

Parameter	Units	WQG - FW Aquatic Life[a]	Raw Leachate (SW-2)[b]	Leachate Storage Lagoon (SW-3)[b]
Physical and Chemical Parameters				
Conductivity	uS/cm		1282	820
Hardness (CaCO3)	mg/L		404	264
pH	pH	6.6-7.7[c]		
Toxicity (96h LC-50)	%			
Total Dissolved Solids (TDS)	mg/L		682	451
Total Suspended Solids (TSS)	mg/L			
Oxygen Demand (COD)	mg/L		70	86
Ammonia (total as N)	mg/L	1.8-2.2[d]	29.1	13.6
Chloride (Cl)	mg/L	150	57	81
Nitrate (as N)	mg/L	3	5.4	0.8
Sulphate (SO4)	mg/L	430	9.4	17.6
Metals				
Aluminum (Al)-Total	mg/L	0.05	0.1	0.4
Chromium (Cr)-Total	mg/L	0.037		0.0025
Copper (Cu)-Total	mg/L	0.0024[e]		0.003
Iron (Fe)-Total	mg/L	1	2.8	3.8
Magnesium (Mg)-Total	mg/L	0.83	1.9	1
Mercury (Hg) - Total	mg/L	0.00002		
Phosphorus (P) - Dissolved	mg/L	15	0.03	0.18

Notes:

Yellow highlight indicates exceedance from WQG, aquatic life standards.

[a]WQG, FW: Water Quality Guidelines, Fresh Water

[b]Values from Piteau Associates 2019 report, Table II: Summary of Leachate Impacts Based on Mean 2019 Concentrations

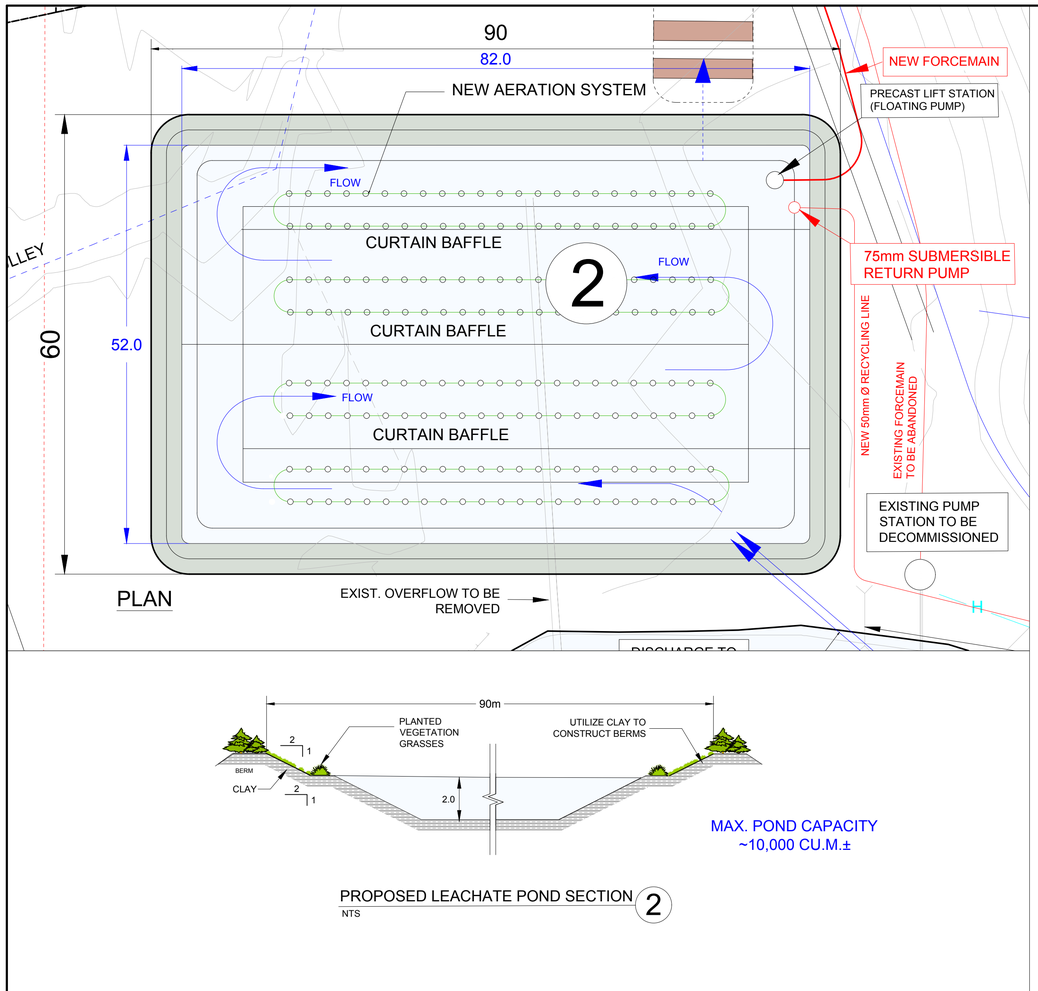
[c]Natural range for Vancouver Island mountains

[d]Calculated pH >6.5, range for temperature 1-15, where lower temp increases limit.

[e]Calcutate at pH 7, DOC 10, and Hardness 243. As each value increases, so does the limit.

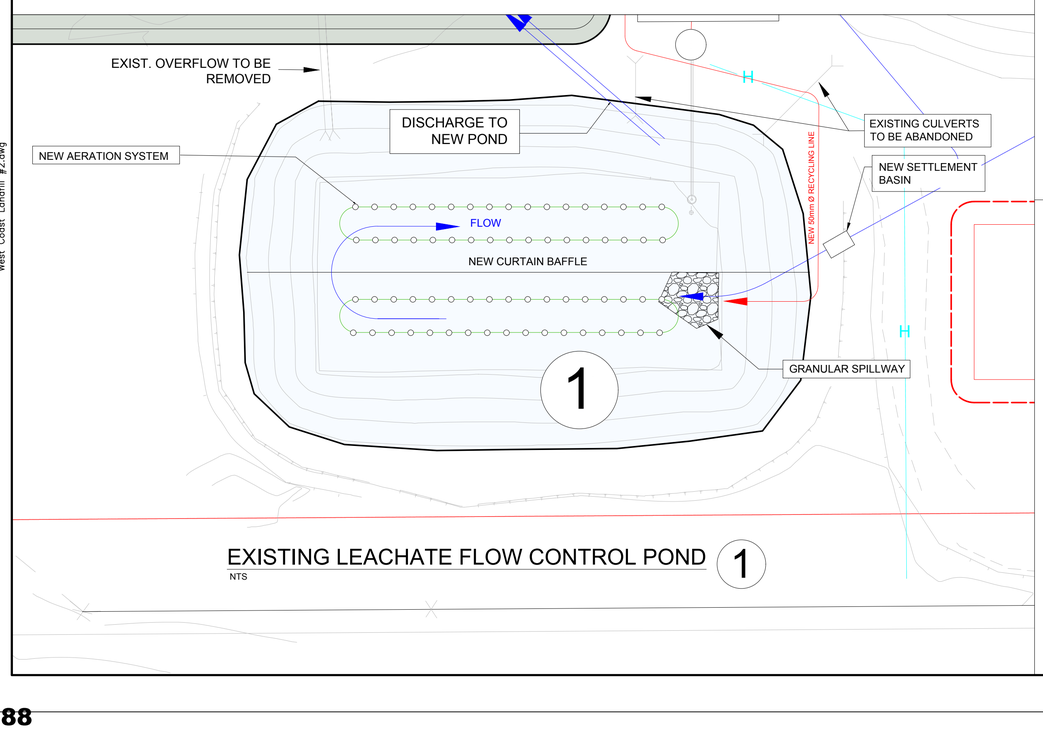
Appendix B

Preliminary Design Drawing

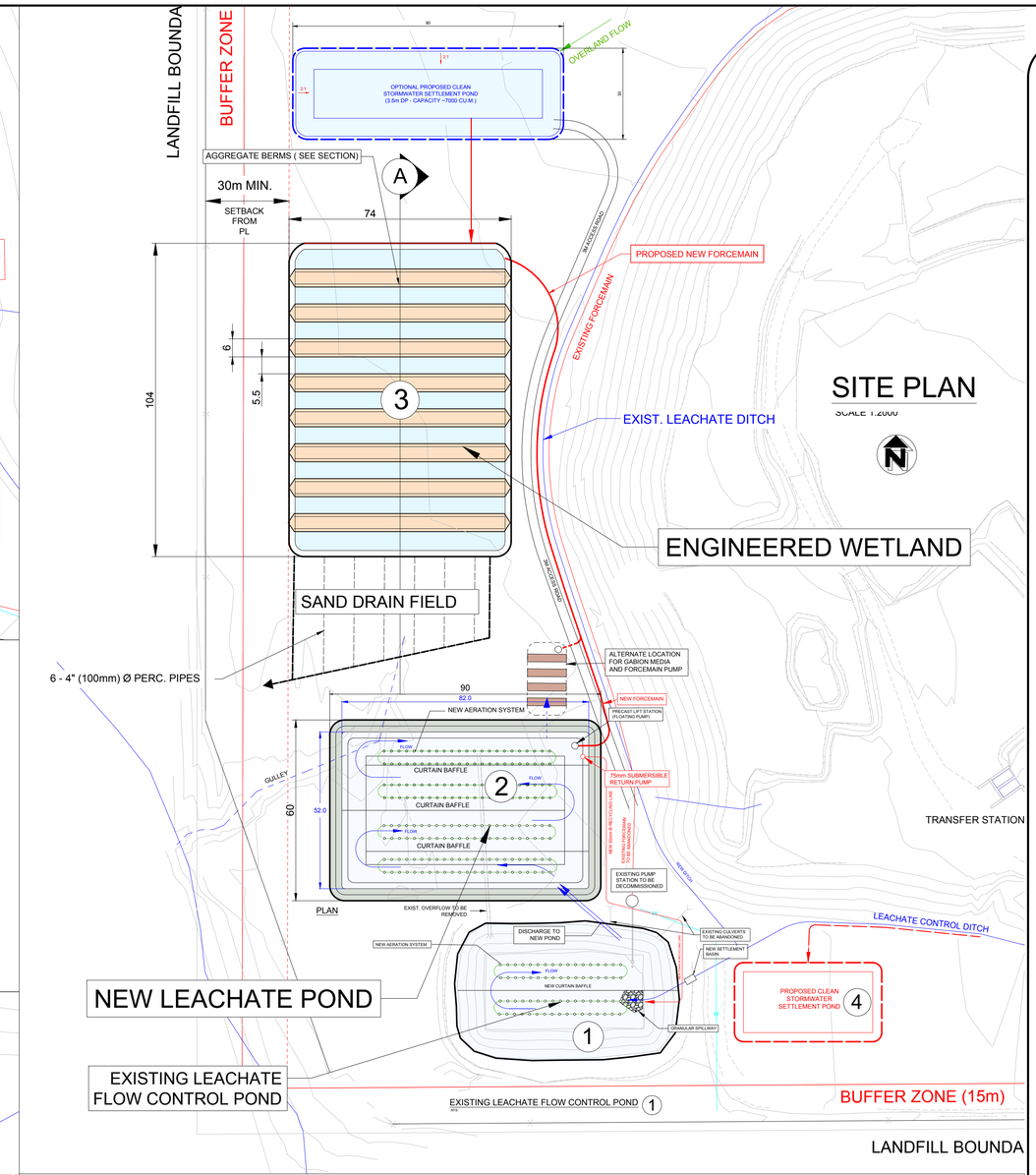


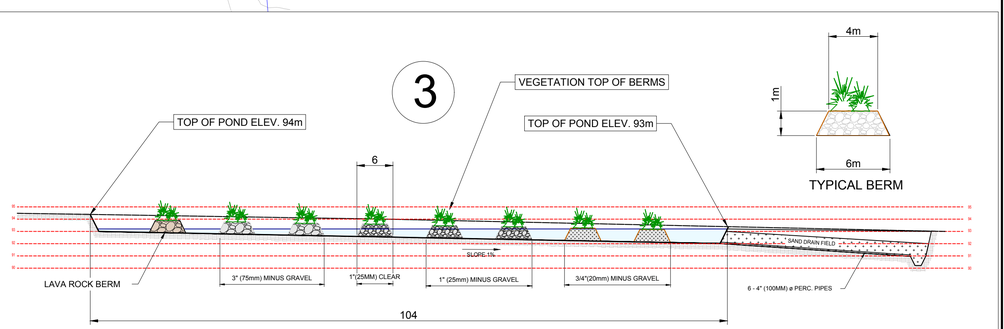
MAX. POND CAPACITY
~10,000 CU.M.±

PROPOSED LEACHATE POND SECTION 2
NTS



EXISTING LEACHATE FLOW CONTROL POND 1
NTS





A ENGINEERED WETLAND SECTION
SCALE HORIZ. 1:500 & VERT. 1:250

WETLAND CAPACITY
~7000 CU.M. ±

General Notes

NOT FOR CONSTRUCTION

No.	Revision/Issue	Date

Prepared by:
Weaver Tech
Science - Construction - Engineering
Sperling Hansen Associates

Project Name and Address

ALBERNI-CLAYOQUOT
REGIONAL DISTRICT
WEST COAST LANDFILL
UCLUELET, BC

Project

CONCEPTUAL DESIGN
LEACHATE COLLECTION SYSTEM

Date	Feb 4.2021	Design	TW
Scale	AS SHOWN	Drwn	GMK

West Coast Landfill #2.dwg

Appendix C

Runoff Volume and Phosphorus Dosage Calculations

Table 1. Average climate data (1981-2010)*

	January	February	March	April	May	June	July	August	September	October	November	December	Average
Avg. Temperature (°C)	5.3	5.4	6.5	8	10.5	12.9	14.7	15	13.4	10	6.8	5	9.458
Precipitation, average monthly (m/month)	0.487	0.336	0.330	0.270	0.153	0.130	0.071	0.088	0.133	0.342	0.492	0.440	0.273
Precipitation, average daily (m/d)	0.016	0.011	0.011	0.009	0.005	0.004	0.002	0.003	0.004	0.011	0.016	0.015	0.009

*Source of climate data: Canadian Climate Normals 1981-2010 Station Data, TOFINO A

Table 2. Average runoff volume based on rational method

	Catchment area*			Jan	Feb	Mar	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual average	Wet season average (Nov-Jan)
		Area (m^2)	Runoff coef. (%)														
Catchment areas daily runoff (m^3/d)	Area A	20,000	0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Area B	11,000	40%	71.4	49.3	48.4	39.6	22.4	19.0	10.4	12.9	19.5	50.1	72.2	64.5		
	Area C	20,000	60%	194.6	134.4	131.9	108.0	61.2	51.9	28.4	35.2	53.1	136.8	196.8	176.0		
	Area D	14,000	60%	136.2	94.1	92.3	75.6	42.8	36.3	19.9	24.7	37.2	95.7	137.8	123.2		
	Area E	23,000	100%	373.1	257.7	252.8	206.9	117.3	99.4	54.4	67.5	101.8	262.1	377.3	337.3		
	Leachate treatment pond	4,500	100%	73.0	50.4	49.5	40.5	23.0	19.5	10.7	13.2	19.9	51.3	73.8	66.0		
Average total daily runoff (m^3/d)				848.3	585.9	575.0	470.5	266.7	226.1	123.8	153.6	231.5	596.0	857.9	767.1	475.2	824.4

*Catchment area and runoff coefficients were adapted from Piteau 2004 Water Balance Report (See Figure 1 attached).

Table 3. Ten-year return storm event runoff over total catchment area (including future expansion)

Parameter	Quantity
1:10 year, 24 hour precipitation (mm/h)	7.3
Total catchment area (m^2)	92,500
Runoff coefficient*	100%
Storm runoff volume (m^3)	**16,206**

*Runoff coefficient is assumed 100% for the whole catchment area as an additional factor of safety.

Table 4. Hundred-year return storm event runoff over currently active landfill cells

Parameter	Quantity
1:100 year, 24 hour precipitation (mm/h)	9.5
Active catchment area (catchment areas A and B), (m^2)	31,000
Runoff coefficient*	100%
Storm runoff volume (m^3)	**7,068**

*Runoff coefficient is assumed 100% for the active cells area as an additional factor of safety.

Table 5. Phosphorus deficiency based on leachate characteristics from August 2020 sampling

Parameter	Quantity
Ammonia (mg/L)	4.91
Total phosphorus (mg/L)	0.085
Phosphorus deficiency based on N:P = 16:1 ratio (mg/L)	**0.22**

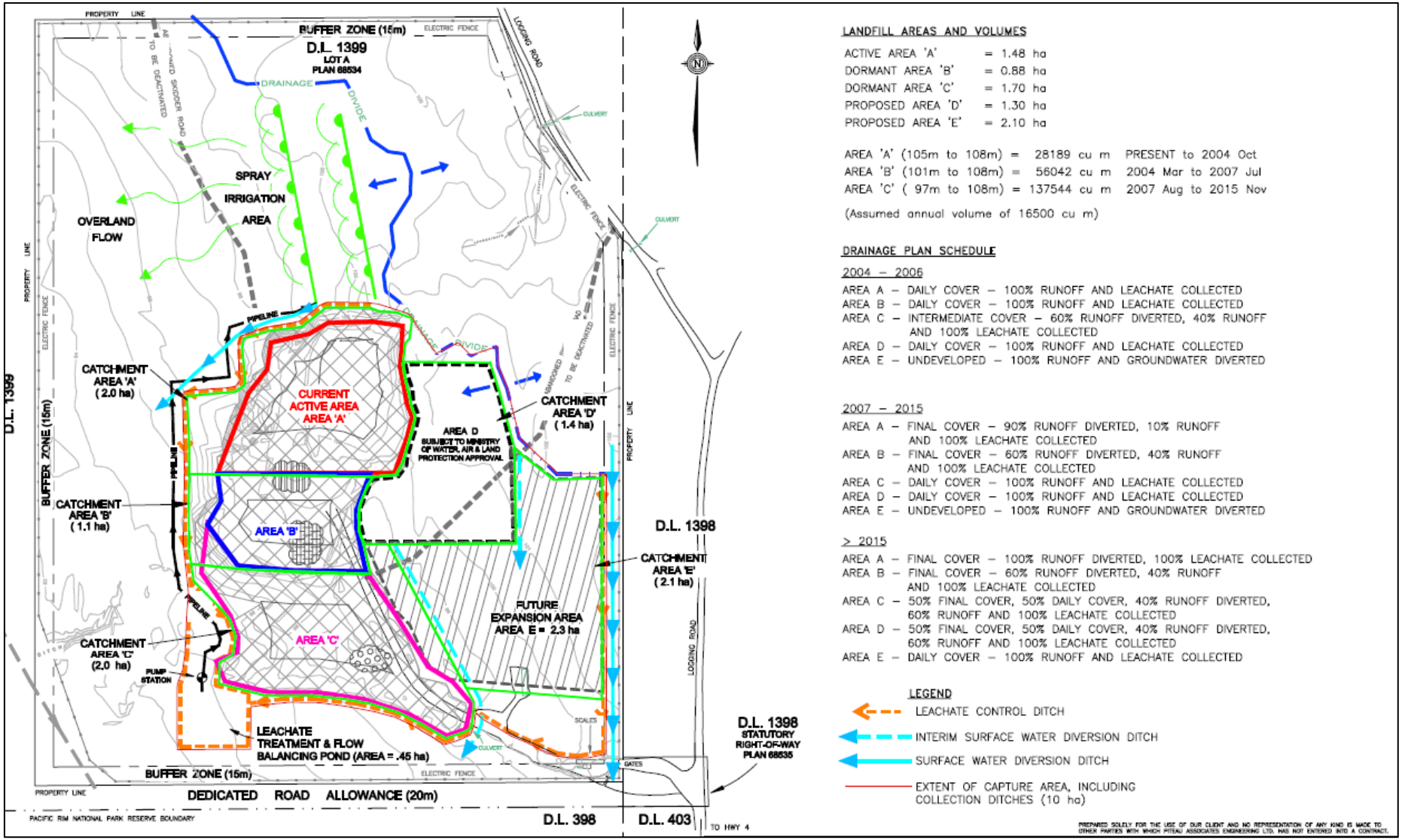
Table 6. Phosphorus and monopotassium phosphate dosage required

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	5.3	5.4	6.5	8	10.5	12.9	14.7	15	13.4	10	6.8	5
Precipitation / Rainfall (mm)	486.6	336.1	329.8	269.9	153	129.7	71	88.1	132.8	341.9	492.1	440
Average monthly runoff (m3/month)	25449	17578	17249	14116	8002	6783	3713	4608	6945	17881	25737	23012
Mass of P required (kg)	46	31	31	25	14	12	7	8	12	32	46	41
Mass of KH2PO4 req. (kg)	200	138	135	111	63	53	29	36	55	140	202	181

Notes:

1. Phosphorus dosage required was calculated based on N:P ratio of 16:1, N being the concentration of ammonia in the raw leachate.
2. Phosphorus dosage must be calculated in proportion to the phosphorous content in the chosen nutrient supplement since most of the compounds are comprised of other elements (like oxygen, in phosphoric acid) by mass.

Figure 1. Catchment area layout (Adapted from Piteau 2004 Water Balance Report)



LANDFILL AREAS AND VOLUMES

ACTIVE AREA 'A'	= 1.48 ha	
DORMANT AREA 'B'	= 0.88 ha	
DORMANT AREA 'C'	= 1.70 ha	
PROPOSED AREA 'D'	= 1.30 ha	
PROPOSED AREA 'E'	= 2.10 ha	
AREA 'A' (105m to 108m)	= 28189 cu m	PRESENT to 2004 Oct
AREA 'B' (101m to 108m)	= 56042 cu m	2004 Mar to 2007 Jul
AREA 'C' (97m to 108m)	= 137544 cu m	2007 Aug to 2015 Nov

(Assumed annual volume of 16500 cu m)

DRAINAGE PLAN SCHEDULE

2004 – 2006

AREA A – DAILY COVER – 100% RUNOFF AND LEACHATE COLLECTED
AREA B – DAILY COVER – 100% RUNOFF AND LEACHATE COLLECTED
AREA C – INTERMEDIATE COVER – 60% RUNOFF DIVERTED, 40% RUNOFF AND 100% LEACHATE COLLECTED
AREA D – DAILY COVER – 100% RUNOFF AND LEACHATE COLLECTED
AREA E – UNDEVELOPED – 100% RUNOFF AND GROUNDWATER DIVERTED

2007 – 2015

AREA A – FINAL COVER – 90% RUNOFF DIVERTED, 10% RUNOFF AND 100% LEACHATE COLLECTED
AREA B – FINAL COVER – 60% RUNOFF DIVERTED, 40% RUNOFF AND 100% LEACHATE COLLECTED
AREA C – DAILY COVER – 100% RUNOFF AND LEACHATE COLLECTED
AREA D – DAILY COVER – 100% RUNOFF AND LEACHATE COLLECTED
AREA E – UNDEVELOPED – 100% RUNOFF AND GROUNDWATER DIVERTED

> 2015

AREA A – FINAL COVER – 100% RUNOFF DIVERTED, 100% LEACHATE COLLECTED
AREA B – FINAL COVER – 60% RUNOFF DIVERTED, 40% RUNOFF AND 100% LEACHATE COLLECTED
AREA C – 50% FINAL COVER, 50% DAILY COVER, 40% RUNOFF DIVERTED, 60% RUNOFF AND 100% LEACHATE COLLECTED
AREA D – 50% FINAL COVER, 50% DAILY COVER, 40% RUNOFF DIVERTED, 60% RUNOFF AND 100% LEACHATE COLLECTED
AREA E – DAILY COVER – 100% RUNOFF AND LEACHATE COLLECTED

LEGEND

- LEACHATE CONTROL DITCH
- INTERIM SURFACE WATER DIVERSION DITCH
- SURFACE WATER DIVERSION DITCH
- EXTENT OF CAPTURE AREA, INCLUDING COLLECTION DITCHES (10 ha)

Appendix D

Design Calculations for Complete Mix Activated Sludge Process for BOD Removal with Nitrification

Design conditions and assumptions:

Table 1. Design parameters and assumptions

	Unit	Quantity
Clean water O_2 transfer efficiency for coarse bubble diffusers	%	10
Oxygen transfer efficiency (OTE), coarse bubble aeration system	% (per foot of diffuser submergence)[1]	0.75
Depth of diffuser submergence	ft	6.5
Target oxygen concentration in aeration basin	g/m^3	2
Average wet season inflow rate (Q)[2]	m^3/d	824
Site elevation	m	46
Atmospheric pressure at site elevation	Pa	100774
α (for BOD removal and nitrification)	No unit	0.65
β (for BOD removal and nitrification)	No unit	0.95
F (diffuser fouling factor)	No unit	0.9
Peak to average TKN loading ratio	No unit	1.28
typical AOR/SOR[3] ratio, coarse bubble aeration system	No unit	0.5

Notes:

1. i.e., 10 ft submergence equals 7.5% oxygen transfer efficiency in clear water.
2. See calculation details for average wet season inflow rate in Appendix C.
3. Actual oxygen requirement to standard oxygen requirement ratio.

Table 2. Kinetic coefficients at 20°C (Metcalf & Eddy, fifth edition, Table 8-14)

Parameter	Unit	Quantity
$\mu_{max, AOB}$	g/g.d	0.9
b_{AOB}	g/g.d	0.17
K_{NH4}	g/m^3	0.5
$K_{0, AOB}$	g/m3	0.5
θ (Temperature correction factor)		

Table 3. Influent and effluent characteristics

	Unit	Quantity
Influent characteristics[1]		
BOD	mg/L	80
NH4-N	mg/L	80
TKN	mg/L	80
Effluent characteristic[2]		
NH4-N	mg/L	2

Notes:

1. Due to insufficient raw leachate data available, the influent characteristics are assumed the above values based on the data available from similar landfill leachates.
2. Target concentration to comply with BC Water Quality Guidelines.

Calculated parameters:

a. $\mu_{max,AOB,\ 10\ C} = (0.9\ g/g.d)(1.072)^{10-20} = 0.449\ g/g.d$

b. $b_{AOB,\ 10\ C} = (0.17\ g/g.d)(1.029)^{10-20} = 0.128\ g/g.d$

c. $\mu_{AOB} = 0.159\ g/g.d$

$$\mu_{AOB} = \mu_{max,AOB}\left(\frac{SNH4}{SNH4+KNH4}\right)\left(\frac{So}{So+Ko,AOB}\right) - b_{AOB}$$

- μ_{AOB} = specific growth rate for ammonia oxidizing bacteria, g VSS/g VSS.d
- $\mu_{max,AOB}$ = maximum specific growth rate for ammonia oxidizing bacteria, g VSS/g VSS.d
- S_{NH4} = NH_4-N concentration = target NH_4-N 2 mg/L
- K_{NH4} = half-velocity coefficient for NH_4-N, mg/L
- S_O = DO concentration (target DO) = 2 mg/L
- $K_{O,\ AOB}$ = half-velocity coefficient for DO for AOB, mg/L
- b_{AOB} = specific endogenous decay rate of ammonia oxidizing bacteria, g VSS lost/gVSS.d

d. Theoretical SRT = $1/\mu_{AOB} = 6.27$

e. Design SRT = ~8 d

Design SRT = (SF)(theoretical SRT)

- SF = peak to average TKN load = 1.28

f. Biomass production ($P_{X,bio,VSS}$) = 35.2 kg VSS/d

$$P_{X,bio,VSS} = \frac{QYH(S0-S)}{1+bH(SRT)} + \frac{(fd)(bH)QYH(S0-S)SRT}{1+bH(SRT)} + \frac{QYn(NOx)}{1+bAOB(SRT)}$$

$$S = \frac{Ks[1+bH(SRT)]}{[SRT(\mu m-bH)-1]} = 0.579\ g\ bCOD/m^3$$

NO_x = 0.8 x TKN = 64 mg/L

- Q = 824 m^3/d
- Y_H = 0.45 g VSS/g bCOD
- S_0 = bCOD = 1.6 (BOD) = 128 mg/L
- $b_{H,20}$ = 0.12 g/g.d
- $b_{H,10} = (0.12)(1.04)^{10-20}$ = 0.081 g/g.d
- f_d = 0.15
- Yn = 0.15 g VSS/g NOx
- K_s = 8 mg/L
- $\mu_{m,10} = (6)(1.07)^{10-20}$ = 3.05 g/g.d
- TKN = influent TKN concentration = 80 mg/L
- $P_{x,bio}$ = 3.26 kg VSS/d

g. Oxygen demand (Ro) = 294.6 kg O_2/d = 12.3 kg O_2/hr

$$Ro = Q (S_0\text{-}S) – 1.42\ P_{x,bio} + 4.57\ (Q)\ NO_X$$

- Q = 824 m^3/d
- S_0 = bCOD = 1.6 (BOD) = 128 mg/L
- S = 0.579 g bCOD/m^3
- $P_{x,bio}$ = 35.2 kg VSS/d
- NOx = 64 mg/L

h. Standard oxygen transfer rate (SOTR) = 30.5 kg/h

$$SOTR = \left(\frac{OTRf}{\alpha F}\right)\left(\frac{C\infty 20}{\frac{\beta CstPbC\infty 20}{Cs20Pa} - C}\right)$$

- OTR_f = actual oxygen transfer rate at site, kg/h = Ro

- C^*_{st} = dissolved oxygen surface saturation concentration at operating temperature, mg/L (Appendix E, Metcalf & Eddy)
- C^*_{s20} = dissolved oxygen surface saturation concentration at standard temperature (20°C), mg/L
- $C^*_{\infty 20}$ = saturated DO value at sea level and standard temperature (20°C) for diffused aeration, mg/L.
- P_b = biometric pressure at test site
- F = diffuser fouling factor

i. Air flow = 1367 cfm

$$\text{Air flowrate} = \frac{SOTR}{(OTE)\left(0.27\ kg\frac{O2}{m3}air\right)}$$

- OTE for coarse bubble diffuser at 6.5’ depth = 0.75% x 6.5 = 4.87%

Appendix E

Cost Analysis

Table 1. Cost analysis of the proposed upgrades

Item	Description	Rate	Total cost ($)
Mobilization	Skidders, fallers, chippers, excavators, 6-wheel drive rock trucks	N/A	50,000
Health and Safety	Health and Safety		25,000
Site accommodation (5 months)	Temporary office, COVID-19-compliant lavatory, temporary shop seacan power supply	N/A	20,000
Testing	Existing force mains, pumps, controls		15,000
Environmental safeguards	Silt fencing, temporary holding sediment basins		14,000
Access roads	Staging areas, capping, grading scale road		144,000
Clear grub	Secondary pond, engineered wetland, sand drain field. Includes felling, partial chipping, loading, and hauling.		110,000
Stripping	Overburden within the secondary pond, engineered wetland, 50% of sand drain field. Loading, hauling, stockpiling for landfill cover. Anticipated volume: 8,500m³	8,500m³ @ $12.00/m³	102,000
Mass excavation - secondary pond	Anticipated volume 10,000 m³. Average depth 3m. Surface area average 4000 m². Side walls 3:1. Total excavation and regrading 12,000 m³. 10,000 m³ excavate, load, haul to landfill and stockpile. Equipment: 3 excavators, 4 rock truckers (6-wheel drive). Equipment foreman, laser grade man.	12,000m³ @ $15.87/m³	190,440
Mass excavation - Wetland	Anticipated volume 9,600 m³. Average depth 1.25 m. Side walls 3:1. Total excavation and regrading 9,600 m³. 4,800m³ removed, hauled and stockpiled @ the landfill. 4,800 m³ will form and shape side walls.	9,600m³ $15.87	$152,352
Equipment (for wetland)	1x 350-class excavator. 1x 250-class excavator. 4x30-ton articulated 6-wheel drive. 1x 5-ton sheepsfoot roller. 1x skid steer track mounted. 1x equipment foreman. 1x labourer.	9,600m³ @ $18.50/m³	177,600
Trimming	Includes fine grading of the sidewalls, creating the base of access corridors. 1 Class 100 excavator, skid-steer articulated 6-wheel drive rock truck, 2 labourers, 1 equipment foreman.	6,000m² @ $7/m²	42,000
Engineered wetland	Finishing materials including gravels, cobbles and sand. Total volume imported material: 3,300m³	3,300m³ @ $38/m³	125,400
Engineered wetland	Finishing labour and equipment. Includes skid-steer, 100-class excavator, 5-ton articulator, 6-wheel drive rock truck, 3 labourers, surveyor, equipment foreman.	6,000m² @ $8/m²	48,000
Engineered wetland	Planting and seeding under the direction of the biologist.	Lump Sum	58,000
Sand Drain Field	Perc pipe and sand. Average depth approx. 0.75m, length overall 480 lin m, unit rate: $80/lin m	480 lin m @ $80/ lin m	38,400
Ponds	Upgrades - Includes the adjustment of the intake discharge at the existing pond, the installation of new discharge from Pond 1 to Pond 2, and the insulation of a precast pump chamber within Pond 2.		25,000
Ponds Treatments	Includes 1 Aeration system for pond 1, and 2 for pond 2: 3x$15,000 ($45,000). Internal baffles (360m² @ $10/m² = $3,600), and rip rap spillway from Pond 1 to Pond 2 ($3,500)		52,100

Item	Description	Rate	Total cost ($)
Ponds - Mechanical	Subject to power restraints. New submersible pump that acts as an assist to the existing ($30,000), 3 blowers to the aeration systems ($30,000), a kiosk building to house the blowers and upgraded electrical ($15,000)		75,000
Existing Swales and Ditches	This would include the cleaning, regrading (where required to control flows), and stabilizing sidewalls equipment: Gradall, tandem, granular materials where required. Overall length 1,500 lin m.	1,500 lin m @ $60/m	90,000
Force main	A twinning of the existing force main may be required subject to inspection and pressure testing. The 6" HDPE pipe would be installed from the lift station to the headwater of the bioswale.	600m @ $400/m	240,000
Excess borrow material	If the volume of the overburden schedule to be removed is not desirable for use as cover, or the significant volume restricts the landfall operation, the local supplier has a permitted fill site for material that has a presence of woody debris. (Subject to verifications of its condition) Trucking and tipping fee costs are $16/tonne.	15,000 tonne @ $16/tonne	240,000
Existing Power Source - Upgrade	Subject to review, as specified in memo, can range between $50,000 - $200,000.		200,000
Engineering - Electrical	Electrical preliminary review and engineering design upgrades		30,000
Engineering - Civil	Topographic survey showing existing elevations, inverts, ditches, general gradients		25,000
Engineering - Geotechnical	Drilling and sampling soil and characteristics of marine clay		15,000
Engineering - Mechanical	Review conditions of pumps and intakes, pressure testing of force mains		30,000
Design	Detailed design and construction drawings for tendering showing pond development, bioswales and treatment methods		80,000
Survey and layout	Supplying the contractor for a GPS control and creating as-builts		35,000
Project Management	Periodic supervision, tender preparation, execution, and cost analysis.	5% of total	114,847
		TOTAL	2,296,940

Note: See weather contingency costs as specified in Section 7.

Appendix F

Phycoremediation Aspects of Landfill Leachate Treatment

PHYCOREMEDIATION ASPECTS OF LANDFILL LEACHATE TREATMENT – for WEAVER TECHNICAL

CONCEPT

Algae can grow in adverse climatic and ecological conditions while removing nutrients and toxic metals through biosorption and bioaccumulation (Nawaz et al. 2020). The benefits of phyco-remediation compared to other remediation concepts is provided in a table at the end of this document (Edmundsen 2012).

Algae indigenous to landfill sites can have inherent adaptations to the chemical conditions (high concentrations of salts, heavy metals, xenobiotic organics, and ammonia nitrogen), and physical conditions (light levels, water temperatures, rainfall, and seasonal changes) at these sites (Nawaz et al. 2020). The most notable potential inhibitors of algae in landfill leachate are total ammoniacal nitrogen, sodium, and chloride (Edmundsen 2012).

The benefits of phyco-remediation using algae include nutrient and metal removal, and daytime oxygen generation. They also represent organic carbon with the correct nutrient ratios to support bacterial processes. Interestingly, bench tests have repeatedly failed to accurately forecast full-scale phyco-remediation results (Sniffen et al. 2017; 2018; Nawaz et al. 2020; Torretta et al 2016). For this reason, bench testing of phyco-remediation is not recommended, however, sampling to understand the taxa and their densities is advised.

TOFINO LANDFILL LEACHATE

Like most landfill leachates, West Coast Landfill (WCL) leachate sampling indicates elevated ammonia, sodium/chloride, and metals. Of the metals detected in the WCL leachate, aluminum, copper, iron, and manganese can exceed recommended BC aquatic life guidelines, and of these, copper can be directly phyto-toxic (leachate data obtained from West Coast Landfill 2019 Monitoring Report by Piteau Associates).

ALGAE TAXA

Cultivating native algae that have volunteered in adjacent landfill leachate sites through bioprospecting, is repeatedly recommended for algae culture sourcing to commence phyco-remediation (Edmundsen 2012; Costa et al. 2014; Nordin et al. 2017; Paskuliakova et al. 2016; 2016b). From there, sampling to understand the dominant taxa growing in the leachate pond(s), their densities and seasonality is recommended. Common taxa found in and used to treat landfill leachate are provided in Table 1, and optimal growth rates are provided in Table 2.

PHYTO-REMEDIATION IMPORTANT REACTIONS / ALGAE CULTURE REQUIREMENTS

1. pH REQUIREMENTS

Algal blooms in natural surface waters are often associated with dramatic diurnal pH fluctuations (7 – 10) due to carbonic acid scavenging via algal photosynthesis. Many landfill leachate studies showed that pH should be maintained in the circum-neutral range to favor algal growth, as unregulated pH allows the leachate to become alkaline which subsequently favors free NH_3 production, causing algal toxicity (Nawaz et al. 2020; Edmundsen 2012; Naveen 2017; Yang and Zhou 2008; Lin 2007). The pH reported for the lagoon sampling by Piteau Associates (West Coast Landfill 2019 Monitoring Report) ranged from 6.06 – 8.29 (monthly average, field pH) which is suitable for algae culture, however, this pH will rise with photosynthesis and pH control may become necessary. If needed, pH can be lowered by the addition of carbon dioxide that will dissociate in water to form carbonic acid (H_2CO_3). If pH regulation is applied, algae growth is possible in undiluted landfill leachate of 100% concentration - a value not often reported in the current literature (Edmundsen 2012).

Ammonia has a pKa of ~9.26, at which unionized and ionized species are in equilibrium in solution. Under pH conditions lower than 9.26 the ammonium ion (NH^{4+}) is the major form, which is soluble within the liquid phase. At pH conditions higher than 9.26, the unionized ammonia is increasingly the major form. Because of these molecular properties, a common landfill leachate treatment practice to remove volatile ammonia gas is to raise the pH and drive air through the liquid medium causing the escape of the volatile ammonia gas into the atmosphere.

Landfill leachate also has a high concentration of dissolved inorganic carbon. When the leachate leaves the landfill, dissolved carbonic acid concentrations are greater than the atmospheric carbon dioxide concentration and equilibration by carbonic acid leaving solution occurs. As carbon dioxide escapes, it shifts the carbonate equilibrium, removing carbonic acid and raising the leachate pH. As the pH of the landfill leachate rises due to carbon dioxide escape, a greater percentage of unionized ammonia is present and it is phytotoxic as explained above.

2. CO_2 REQUIREMENTS

The algal treatment of leachate requires adequate light penetration and CO_2 absorption into the pond. Landfill leachate is often dark brown in color which restricts light penetration and thus challenges algal growth rate. Shallow ponds (0.6–1.5 m deep) are used for treating landfill leachate with microalgae (Nawaz et al. 2020; Toretta et al. 2016). To maintain this shallow water depth and given the rate of leachate generated, large surface areas would be needed. Long residence times could lead to depletion of CO_2 which is also critical for algal growth as their carbon source, as well as for pH adjustment. To overcome this possibility, sequentially mixing raw and treated leachate could be explored which would replenish the nutrient supply and CO_2 concentrations, or addition of carbon dioxide could be considered.

3. PHOSPHATE REQUREMENTS

Landfill leachate usually requires phosphate supplements to achieve a molecular ratio of 7:1 to >16:1 N:P in the final volume (Table below). Different algal taxa will show variable growth in a variety of leachate composition depending on nutrient availability, ammonia, and heavy metals concentrations.

The desired taxa for leachate treatment are in the green microalgae group and they have high phosphorus requirements. When nitrogen is already high as in leachate, these ratios do not need to be strictly met.

Phosphorus additions required to meet bacterial requirements may also be close to meeting algal requirements. Recycling of P through bacterial decomposition of algal biomass may lower P requirements (Table 3).

4. TEMPERATURE REQUIREMENTS

Like most aquatic organisms, algae growth rates will slow with low water temperature, however, some of the taxa collected from leachate ponds are capable of growth in very cold water, even under ice. Most algae are impeded below 8°C, and optimal growth usually occurs between 20°C and 30°C (Table 4) (Torretta et al. 2017).

Review prepared by:

Heather Larratt: H. BSc. R.P.Bio.
Aquatic Biologist

Please refer to attached Excel file for more information:

Table 1: Research on inhibitions, requirements and treatment offered by algae used to treat landfill leachate

		Inhibitions			Requirements		Treatment (removal) offered				Comments
	Microalgae taxa	unionized ammonia	salinity	metals	pH	phosphate	ammonia + nitrate	ortho-P	metals	COD BOD DO	
Green	Ankistrodesmus convolutus	✓					✓	✓	✓	✓	tolerant of 100% leachate
	Chlyamydomonas mexicana	✓					✓	✓	✓	✓	some salt tolerance
	Chlamydomonas reinhardii	✓				supplement	✓	✓	✓	✓	
	Chlamydomonas snowiae	✓				supplement	✓	✓	✓	✓	
	Chlorococcum oviforme	✓	✓	✓	did not grow		X	X	X	X	not suitable
	Chlorella ellipsoidea	✓	✓		5 - 7.5		✓	✓		✓	
	Chlorella pyrenoidosa	✓	✓				✓				tolerant of 100% leachate
	Chlorella vulgaris	✓	✓			50 mg/L	✓	✓	✓	✓	tolerant of 100% leachate
	Chlamydomonas sp.										cold - tolerant
	Euglena sp.		✓				✓	✓	✓	✓	tolerates low light
	Scenedesmus acuminatus	✓	✓								tolerant of darkness
	Scenedesmus quadricauda	✓	✓				✓	✓	✓	✓	tolerant of 100% leachate, salinity, winter
	Scenedesmus rubescens	✓	✓				✓				tolerant of 100% leachate, salinity, winter
	Selenastrum sp.	✓					✓				
cyanobacter	Anacystis sp.		✓								
	Microcystis sp.		✓								tolerant to 10oC blooms at 12oC
	Oscillatoria sp.						✓				fast growing
	Lyngbya sp.										very tolerant
Marine	Chaetoceros mulerii	✓		✓	did not grow		X	X	X	X	not suitable
	Nanochloropsis gaditana	✓		✓	did not grow		X	X	X	X	not suitable
	Pavlova lutheri	✓		✓	did not grow		X	X	X	X	not suitable
	Tetraselmis chuii										some growth

References: All listed references were used in this table

Table 2: Algae growth rates by group

Type	Doubling, cell division/ per day under optimal conditions
sm diatom	max avg 0.90 max range (0.4 - 1.9)
lrg diatom	max avg 0.35 max range (0.2 - 0.5)
single cell green	max avg 1.37 max range (0.93 - 2.3)
filamentous green	typical estimate 0.28
cyanobacteria	avg 0.99 max range (0.65 - 1.4)

Table 3: Nutrient ratios using different N and P forms

	ratio descriptions (Ptacnik et al. 2010)			ratio descriptions (McDowell et al. 200		
	N-limited	N+P limited	P limited	N-limited	N+P limited	P limited
TN : TP	<35 : 1	35 - 60	>60 : 1			
DIN : PO_4	< 16 : 1	>16 : 1	>50 : 1	< 7 : 1	7 - <15	> 15 : 1
DIN : TP	<2 : 1	2 - 5	>5 : 1			

Table 4: Temperature effects on algae reproduction

Temperature coefficient (Q10) for common species					
		23.5/13.5 ºC	27/16ºC	33/23.5 ºC	38/27 ºC
Low temperature diatoms	Navicula lanceolata	21.48	-15.82	0	0
	Surirella minuta	-0.95	0	0	n/a
	Nitzschia acicularis	4.98	0.63	0	0
	Fragilaria crotonensis	-3.09	-0.83	0	-2.7
Intermediate temperature diatoms	Nitzschia palea	1.37	1.23	1.04	-0.28
	Synedra ulna	1.33	0.8	0.6	-2.39
	Nitzschia capitellata	1.14	0.27	-0.94	-11.1
	Cyclotella meneghiniana	1.74	1.89	-1.37	-4.13
	Melosira varians	1.35	4.47	-3.15	0
	Nitzschia dissipata	0.91	0.98	1.11	-0.11
Green coccoids	Chlorella sp.	2.02	1.54	-1.32	-0.03
	Chlorococcum sp.	3.04	2.75	-1.22	-1.12
Cyanobacteria	Leptolyngbya sp.	-7.33	0	0.74	n/a

Table 1-2. Summary of Advantages and Disadvantages of Landfill Leachate Management Options

Treatment Method	Advantages	Disadvantages
Leachate Transfer		
Off-site transfer (municipal sewage treatment facility via truck or sewer)	▪ High populations of nitrifying bacteria present at sewage treatment facilities ▪ Effective removal of BOD and ammonia nitrogen	▪ High cost of transporting liquids ▪ Corrosion issues in sewers ▪ Biological upset of treatment plant ▪ Contaminates sludge ▪ Sludge returns to landfill
Leachate Recirculation	▪ Low short-term cost ▪ Can increase methane production ▪ Improves leachate stability	▪ Perpetual operation and maintenance costs
Chemical Treatment		
Coagulation/Flocculation Precipitation Adsorption Chemical oxidation Radiation	▪ Effective removal of COD, BOD, ammonia nitrogen ▪ Rapid ▪ Improve biodegradation	▪ High cost of reagents ▪ Do not meet discharge requirements as stand alone systems ▪ Some by-products can be toxic ▪ Often need pH extremes to be effective
Physical Treatment		
Filtration Reverse Osmosis Air Stripping	▪ Effective removal of COD, BOD, ammonia nitrogen ▪ Can meet and exceed discharge requirements	▪ High cost of operation and maintenance ▪ Membrane fouling ▪ Residual concentrate ▪ Transfer of pollutant
Biological Treatment		
Microbe-based: Aerated Lagoons Activated Sludge Sequential Batch Reactors Attached Bio-films	▪ Can have low energy consumption ▪ Use natural consortia to treat wastes ▪ Effectively reduce COD, BOD, ammonia nitrogen	▪ Often do not meet discharge requirements as stand alone systems ▪ Highly variable ▪ Temperature dependent
Plant-based: Constructed wetlands Irrigation Fields	▪ Low energy consumption ▪ Use natural consortia to treat wastes ▪ Plants can sequester heavy metals	▪ Large land areas required ▪ Soil contamination
Algae-Based: Open ponds Photobioreactors	▪ Use natural consortia to treat wastes ▪ Bio-resource production	▪ Experimental ▪ Unproven

From Edmundson 2012

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