From: Braedon Bigham <[redacted]>
Sent: Friday, November 29, 2024 6:59 AM
To: David Maude; Aaron Campbell; Deb Morrison; SouthInfo; Brad Smith
Cc: Peter Luckham; Robert Kojima
Subject: 3334 Port Washington Road - Letter to LTC
Attachments: Island Truss Correspondence - PDF.pdf; Circular Economy Opportunity Assessment_Big Dig Em.pdf

Good Morning,

Please see our attached letter regarding our rezoning application addressing some of the concerns brought forward.

I have also included our Circular Economy report.

Please reach out if you have any questions.

Thanks, Braedon

BIG DIGEM EXCAVATING LTD

[redacted]

Pender Island, BC [redacted]

[redacted]

Email [redacted]

North Pender
Islands Trust

28th November 2024

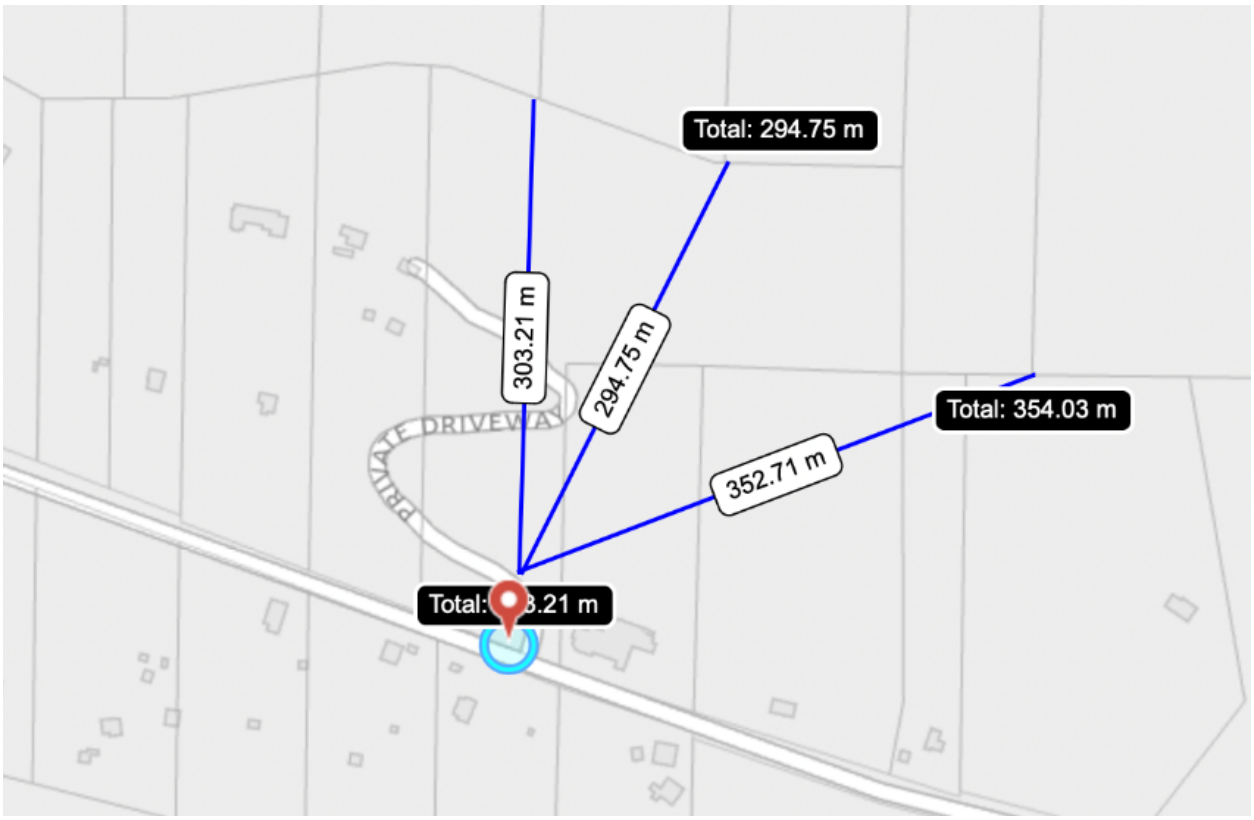
Dear North Pender Trustees, Maude, Campbell and Morrison

I'm writing this letter to provide some clarifications / clarity around correspondence that has been received regarding our rezoning application.

1. **Other industrial zoned sites** - While it's easy to suggest that our operation should move. It's important to note for the record there is no other available zoned land for my business operation.

2. **With regards to the covenant land listed** on the northern boundaries of our property. The Pender Islands Conservancy letter could be misleading. Their " Port Washington conservation land use concept" map shows our property in red. While this is true, it does not demonstrate accurately where the property will be rezoned. The adjacent nature reserves from west to east are a significant distance away and on the back side of the ridge in most locations. The Lisa Baile Nature Reserve 300 plus meters away from our operation. The Forest Wetland Nature Reserve 295

meters away and the Vulture Ridge Nature Reserve is 350 meters plus away.



3. It is important to understand the rezoning is only for a small portion of the land adjacent to Port Washington Road. The Portion of land to be rezoned is .56 of a hectare with the other 5.51 hectare remaining rural.

See mapping / Screen shot


OCP Designations
R
5.51 ha
.56 ha
I
C
AG

4. **Potential ecological impacts** -

Further items involving potential environmental impacts. We are seeking direction from the LTC on how to proceed with this, I am prepared to engage with a QEP to review any of these potential impacts to the environment.

Issues around water usage – Our business water uses will be minimum. The shop building will have a small bathroom with a sink and toilet for staff use. Water required for washing equipment can be captured through a rainwater catchment system from the roof on the shop building Since we will be recapturing water on a wash pad, and we will be re using multiple times.

Ground Water - The Pender Island Conservancy provided some mapping around Ground Water sustainably and recharge areas. The mapping provided shows our property in a moderate to high recharge area. We don't believe there to be any issues around quantities of water to support our business and residential uses. A professional hydrologist could speak to these matters in detail if the LTC requests such reports.

5. Storm Water Management - We are happy to engage with a civil engineer around our storm water management requirements.

6. **Geotechnical** - Further Geotechnical assessments can be completed during the review and issuance of the building permit.

7. Site Area - The Pender Island Conservancy noted in their letter dated November 27, the proximity of 2 new potential Raptor / Eagle nests having an impact on the rezoning. The proposed rezoning falls outside of the 200-meter breeding season buffer. Draft information provided in North Pender Islands Trust agenda package page #185

8. **Parking** - Proposed off road parking requirements are laid out in the North Pender OCP on Page 78/79. The requirements listed under Industrial use are 1 parking space per 35 m3 of floor area.

   Our proposed shop building would be appropriately 148 square meters, suggesting 4 parking spots could be required. During the initial TUP application, the LTC required there to be roadside parking. This is why the fence line and screening are offset from the property line to provide roadside parking. Currently we have space for 6 roadside parking spaces.

Industrial Use Warehouses Wholesale and Storage Buildings Servicing and Repair - Industrial zones Recycling Facilities Printing and Publishing	1 per 35 m^2 of *floor area*

Recently I had the opportunity to be involved in a circular economy project regarding my business, the project aligns perfectly with the principles of sustainability and resource efficiency. The project focuses on minimizing waste, maximizing the reuse of materials, and fostering a closed loop system where resources are continually repurposed. By participating in this program, it helped identify areas that I can reduce my environmental impact, helping to support my local community and reducing my environmental impact. This initiative not only represents a meaningful step towards a more sustainable future but also highlights the importance of collaboration and forwards thinking to address these challenges. The report also highlights the limited availability of properly zoned industrial lands on North Pender. I'm happy to share and discuss this report with anybody.

Braedon Bigham

Owner

[redacted]

BIG DIG 'EM

CIRCULARITY ASSESSMENT

August 19th, 2024
Attn: Braedon Bingham
Big Dig 'Em
3334 Port Washington Rd.
Pender Island, BC V0N 2M1

Circular Advisor:

Maddy Best,
Synergy Foundation

PROJECT ZERO ACCELERATOR

SYNERGY FOUNDATION

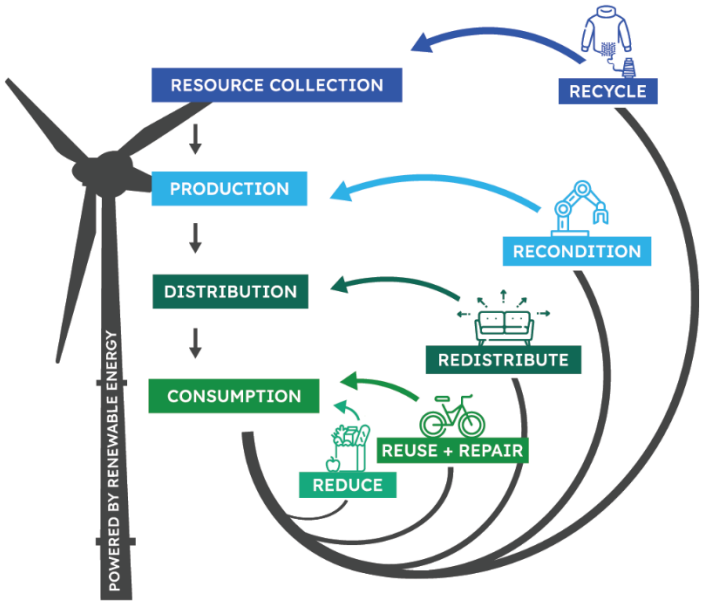
TABLE OF CONTENTS

ASSESSING CIRCULARITY

The circular economy is an economic system that eliminates pollution and waste by retaining resources and manufactured goods within the system through innovation, reuse and repair, redistribution, recondition, and recycling processes, all of which are powered by renewable energy. These principles have been integral to traditional ways of life for Indigenous Peoples since time immemorial and align with natural processes.

Transitioning from the current "take-make-waste" linear model to a circular economy eliminates high emissions, waste, and virgin resource demand while enabling affordable lifestyles and green job creation, and can provide a 4.5 trillion dollar value worldwide by 2030.

The Circular Economy Accelerator program was designed to provide hands-on support to businesses seeking to adopt circular economy principles, reduce waste and emissions, and develop innovative business practices. As part of this program, each business' current level of circularity will be evaluated using the Circular Assessment Tool developed by Synergy Foundation.



The Circular Assessment Tool collects baseline data for waste, waster, energy, and fuel usage, and assesses the business' performance in seven areas of circularity:

- **ELIMINATE & REDUCE**
- **REUSE**
- **PROCUREMENT**
- **DIVERSION**
- **LEADERSHIP & TRAINING**
- **REDESIGN & INNOVATION**
- **ENERGY, WATER & FUEL**

Using the data gathered during the site assessment, the tool generates a circularity score in each area based on the current actions the business is taking.

ABOUT THIS REPORT

This report outlines 46 opportunities for Big Dig 'Em to increase circularity.

We encourage users to use this report as a planning tool on a quarterly or annual basis.

The cost legend denotes each opportunity's cost range and can be used to support budgeting and capital planning. The timeline can be used to prioritize which opportunities to tackle first.

COST LEGEND	
Cost Savings/Free	$
≤ $1,499	$
$1,500 – $9,999	$$
$10,000 – $49,000	$$$
≥ $50,000	$$$$

TIMELINE	
Immediate	No additional resources required
Short-term	≤1 year
Medium	1 – 3 years
Long-term	≥ 3 years
Unknown	More info needed/technology still developing

EXECUTIVE SUMMARY

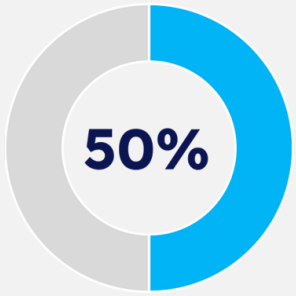
Big Dig 'Em is an excavation and trucking company based on Pender Island. Offering a variety of site development, hauling services, and aggregate sales, the company supports customers across the Southern Gulf Islands and Vancouver Island.

The company's North Pender site serves as a gravel yard, as well as storage for its fleet and equipment. Big Dig 'Em operates a fleet five dump trucks, four crew cabs, and eleven industrial loaders, excavators, and tractors. In addition, it owns a range of specialty equipment such as mowers, compactors, rock crushers, screening plants, pressure washers, and more. The majority of fleet and equipment are diesel operated, with a small percentage requiring gasoline. Water is sourced from local wells and ponds for dust suppression, compaction, and vehicle/equipment washing. Landfill waste collected onsite is trucked monthly to DL's Bins in Saanichton.

Although the company has the equipment to process surplus fill and landscaping waste into value-added products, it is limited by space and zoning constraints. Pender Island's minimal industrial waste management infrastructure causes challenges for Big Dig 'Em, which processes large volumes of construction, demolition, and landscaping waste. An additional barrier to Big Dig 'Em is a lack of local suppliers for aggregate. As a result, the fleet frequently travels from Pender to VI with empty loads, reducing cost efficiency.

Big Dig 'Em is founded by a lifelong resident of Pender and aims to be a responsible steward for the local community. The company is heavily engaged in the community, offering pro-bono or reduced rates to local organizations, lending equipment, and participating in FireSmarting efforts to reduce summer wildfire risk.

CIRCULARITY SCORE



Before implementing the recommendations in this report, Big Dig 'Em has already achieved a 50% circularity score. Congratulations!

HIGHEST SCORING AREAS:

- ✓ Section 1: Eliminate & Reduce
- ✓ Section 2: Reuse

AREAS FOR OPPORTUNITY:

- ✓ Section 5: Leadership & Training
- ✓ Section 6: Redesign & Innovation

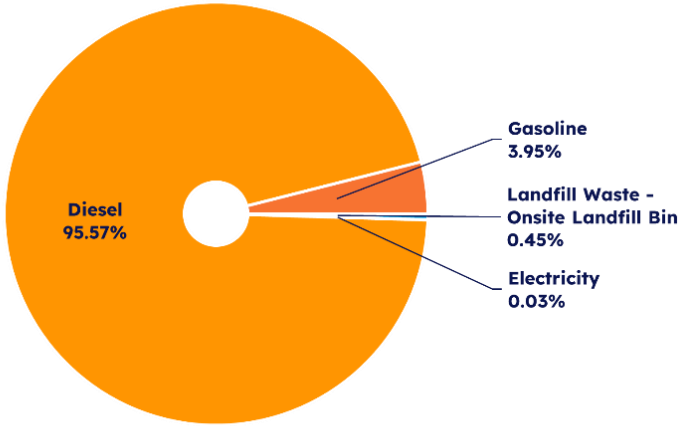
EMISSIONS SUMMARY

The calculated GHG emissions from major sources were an estimated **202.41 tCO_2e**. Over 95% of Big Dig 'Em's calculated emissions are attributed to diesel usage.

EMISSIONS SOURCE	ANNUAL EMISSIONS (tCO_2e)	EST. EMISSIONS REDUCTIONS (tCO_2e) *(for measurable actions)*
Landfill Waste - Onsite Landfill Bin	0.91	0.38
Electricity	0.06	0.00
Diesel	193.32	62.68
Gasoline	7.99	0.00
TOTAL EMISSIONS	**202.41**	**63.06**

The emissions summary is an estimate based on fuel for vehicles & equipment (Scope 1), electricity (Scope 2), and landfill waste (Scope 3). Emissions related to disposal of stumps & shrubs, concrete, and mixed demolition waste are not included in this estimate.

CALCULATED EMISSIONS (tCO_2e)

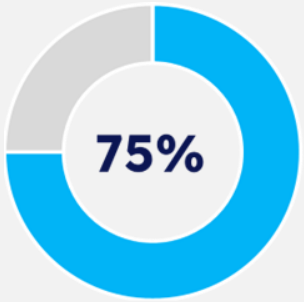


IMPACT SUMMARY

IMPACT AREA	UNIT	EST. ANNUAL USAGE	EST. ANNUAL COST*	EST. ANNUAL tCO_2e	EST. USAGE SAVINGS *(for measurable actions)*	EST. COST SAVINGS *(for measurable actions)*	EST. EMISSIONS REDUCTIONS *(tCO_2e)*	
Disposal - Onsite Landfill Bin	**kg**	1,588.80		0.91	794		0.38	*Implementing recycling practices*
Disposal - DL's Bins, Gulf Excavating, Journey's End Farm, PI Waste Management			$72,210.27					
Water - Well & Pond	**m^3**	757.08	$0.00	0.00				
Electricity	**kWh**	4,075.00	$515.50	0.06				
Diesel	**L**	70,835.81	$134,534.77	193.32	6,094	$11,395.78	16.63	*Vehicle idling policy*
						-$940.35	11.25	*Biodiesel blend for diesel dump trucks*
					21,251	$0.00	34.80	*Hydrogen injection for diesel dump trucks*
Gasoline	**L**	3,352.92	$6,399.21	7.99				
			$213,659.75	**202.27**		**$10,455.43**	**63.06**	

**Cost estimates based on the following: Disposal, electricity, diesel, and gasoline summaries provided by business; Biodiesel, $1.916/L (August 2024 price at Cowichan Biodiesel Co-Op, B20).*

SECTION 1: ELIMINATE & REDUCE



The most resource-efficient way to contribute to a circular economy is to eliminate and reduce waste before it is generated. Big Dig Em' reduces fuel and water usage through efficient consumption practices like dust suppressants and backhauling. We have identified three additional opportunities to reduce waste and emissions from operations.

POTENTIAL SAVINGS

6,094 L diesel | $11,396 fuel costs | 16.63 tCO_2e

ACHIEVEMENTS

- ✓ Dust suppressant used in summer to minimize water usage
- ✓ When possible, trucks backhaul deliveries and supply pick-ups to reduce overall fuel consumption

ACTION	DETAILS	COST	TIMELINE	STATUS
For office operations, set printers to automatically print double sided & implement paperless systems	Printing double sided is an easy way to cut down on paper usage. Double sided printing can offer immediate cost savings of between 30-50%. Transition to paperless invoices, memos, paystubs, purchase orders, etc. Digitizing these processes will help to save time, reduce error, and enhance workflow.	$	Immediate	
Reduce empty loads to Vancouver Island by advertising backhauling services	Approximately 85-90% of loads to Vancouver Island are for supply runs, while only 10-15% are to drop off demolition loads. To reduce the percentage of empty loads, consider the following additional opportunities:	$	Immediate	

ACTION	DETAILS	COST	TIMELINE	STATUS
	• Build partnerships with local contractors or landscapers that drive worksite waste off-island • Reach network of local businesses through the Chamber of Commerce to advertise backhaul services • Advertise to individual households via local bulletin boards and news publications			
Implement a policy to reduce vehicle idling	According to the US Department of Energy, a heavy-duty diesel vehicle can consume between 0.44-1.5 gallons of fuel per hour, depending on vehicle type and load weight. According to McClung -Logan Equipment Company, excavators burn an average of 4 gallons per hour, and wheel loaders an average of 5 gallons per hour. A vehicle idling policy could result in significant annual savings: • If each of the four diesel dump trucks reduced idling by 30 minutes per day, they could save an annual **1,836 litres of diesel, $3,433, and 5.01 tCO_2e*** • If one excavator and one wheel loader reduced their running time by 30 minutes per day, this could save an annual **4,258 litres of diesel, $7,962, and 11.62 tCO_2e*** *Assumptions: Average of 0.97 gal/hr for dump trucks, 4 gal/hr for excavator, 5 gal/hr for wheel loader. 250 workdays per year. Average price of diesel $1.87/L (Stats Canada, Monthly average retail prices for diesel between June 2023 – May 2024, Victoria, BC).	$	Immediate	

SECTION 2: REUSE

There is untapped value in the materials that similar companies consider waste, including shrubs and stumps, large rocks, and mixed soils. Big Dig 'Em has strong reuse practices, capturing the value of these waste streams and reducing need for virgin materials. We have identified three additional opportunities for reuse.

ACHIEVEMENTS

- ✓ Excavation "waste" is transformed into new materials:
  - Mixed soil waste is processed into screened topsoil, drain rocks, and 6" clear cobble
  - Shrubs and stumps are processed into hog fuel or mulch
  - Rocks up to 18" are processed into 3" rock using crusher
- ✓ Special or temporary equipment is rented/ borrowed rather than purchased (ex. loader borrowed from farmer in exchange for property work)
- ✓ Buckets are reused to catch spills
- ✓ Tires (when not recycled) are reused to hold down tarps
- ✓ Hand tools repaired before being disposed

ACTION	DETAILS	COST	TIMELINE	STATUS
Donate unused tools or hardware to the Pender Island Recycling Freestore/Reshop	The Freestore/Reshop accepts donations of clean items in working order. Freestore items can be picked up for free. Higher value items (ex. appliances, electronics) are sold at the Reshop, all proceeds go to the non-profit.	$	Immediate	

ACTION	DETAILS	COST	TIMELINE	STATUS
	To make sure that the type of item that you'd like to donate is accepted, call ahead (250 629 6962) or send a photo to penderislandrecycling@gmail.com.			
Additional uses for processed stumps and brush	There are a variety of uses for chipped fibres. Although they can be used as hog fuel or mulch for landscaping, consider these additional opportunities to capture the material's value: • Animal bedding chips • Compost additive (smaller chips, easier to break down) • Soil conditioner (very small chips) • Dust suppressant for small scale See this guide for more details on uses for wood waste. Potential avenues for distribution: • Pender farms may be interested in a 100% locally sourced product to support their agricultural operations. See list of local farms here. • Advertise to individual households via local bulletin boards and news publications.	$	Immediate	
Donate stumps to a local artist	Consider donating larger stumps to local artisans, which can reduce transport emissions, extend the useful life of "waste" wood, and boost Pender's local economy. We recommend reaching out to the following artists to see if they're interested in a partnership: • Thuja Wood Art carves pieces from reclaimed and recycled wood • Dara Wood Works sources wood from storm damage, pruning, development, and local arborists	$	Immediate	

BIG DIG 'EM

CIRCULARITY ASSESSMENT

Arbutus Burl Bowl 16: diameter with pewa patches, finished with 2 coats Tung Oil

Arbutus Burl Nested Bowls, turned from a salvaged dead stump.

Garry Oak Bowl Fumed and Fluted finished with 6 coats Tung Oil and buffing.

Arbutus Burl Live Edge Bowl

Arbutus Burl Bowl with pewa patches. Turned green to about 1/4" thickness and allowed to morph as it dried...

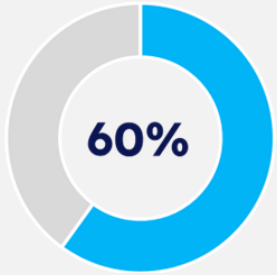
A large 18" Arbutus Bowl finished with Mineral Oil and pyrography

Arbutus Burl Live Edge Bowl

Arbutus 3 Footed Winged Bowl finished with home made Blackberry Stain and Lacquer Spray.

Picture Credit: Dara Wood Works – storm damaged wood and finished products

SECTION 3: PROCUREMENT



Circular procurement practices can help businesses make the most resource-efficient purchases. We have identified eight opportunities to incorporate more circularity in your procurement strategy.

ACHIEVEMENTS

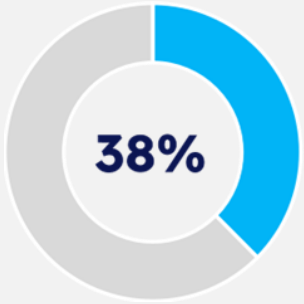
- ✓ When purchasing vehicles and equipment, preference is given for serviceability and durability
- ✓ Approximately half of vehicles and equipment are purchased used
- ✓ Carrying Recycled Asphalt Product (RAP), reducing demand for virgin materials
- ✓ Supply pick-ups frequently batched with visits to Vancouver Island, delivery transport emissions

ACTION	DETAILS	COST	TIMELINE	STATUS
Develop a sustainable purchasing policy	Create a sustainable purchasing policy that gives preference to: • Vehicles with a high fuel efficiency or zero/low emissions • Durable, repairable, second hand, and refurbished goods • Material inputs with high reusability and recyclability • Energy efficient equipment and appliances (e.g. ENERGY STAR appliances, electric tools, LED lighting, etc.) • Eco-friendly maintenance fluids, de-icers, and dust suppressants	$	Immediate	

ACTION	DETAILS	COST	TIMELINE	STATUS
Switch to reusable hearing protection	To reduce waste from single-use hearing protection, consider reusable options. See examples at Uline.	$	Ongoing, as needed	
Eco-friendly options for vehicle maintenance fluids	Renewable Lubricants (Ohio) offers a range of high performance, environmentally friendly lubricants, greases, and cleaners, used by organizations including NASA, Kellog's, US Air Force, and more. They may offer alternatives to: • Phillips 66® Megaplex XD3 • Shearforce Equipment Hammer Lube • Lucas Motor Oil SA 15W-40 To review potential product offerings, view their industrial lubricant guide and automotive & diesel page. Their distributors page notes one Calgary-based distributor, and several based in Washington. **Verify the manufacturer's terms on warranty prior to implementing new maintenance fluids.*	$	Ongoing, as needed	
Eco-friendly options for marking paint	BioStripe is a water-based alkyd traffic paint derived from soybean oil. It reports high durability, low VOCs (volatile organic compounds that release in the air as paint is applied and dries), and a range of colors. View their distributors page here. Another option is Eco Stripe Utility Marking Paint, which can be used for construction zones, excavation sites, and traffic uses.	$	Ongoing, as needed	
Eco-friendly options for de-icer	According to Pennsylvania State University, common de-icers can be harmful to the local environment due to chloride and cyanide ingredients. Common de-icers listed in order of least environmental impact: 1. **CMA (calcium magnesium acetate)** – lowest impact (does not contain chloride)	$	Ongoing, as needed	

ACTION	DETAILS	COST	TIMELINE	STATUS
	2. **Magnesium chloride** – lower chloride levels 3. **Calcium chloride** – higher chloride levels 4. **Sodium chloride (rock salt)** – highest chloride levels and contains cyanide as an anti-caking agent Keep an eye out for de-icers that primarily contain CMA or magnesium chloride. Some examples include: Xynyth eco-friendly ice melt products (warehouses across Canada).			
Eco-friendly options for dust suppressant	Magnesium chloride dust suppressants are effective temporarily but lose efficacy in high-traffic areas, with rain/wind, and can cause corrosion to equipment. Additionally, when chlorides leach into the water, they pose a risk to local vegetation and wildlife. Some potential products to explore: • Midwest Industries (Ohio) range of dust control products • EnviRoad (Oregon) range of dust control products • Eco Solutions (Ontario) – Fusion Dust Control • Cypher Environmental (Manitoba) – DUST/BLOKR	$	Ongoing, as needed	
Source 100% waste-to-resource products from GRT Regenerock	GRT, based in Nanaimo, processes and sorts waste soils into their sub materials in a closed-loop system. Their regenerated aggregate products are structurally suitable to be reused in new construction and green infrastructure projects, significantly reducing their carbon footprint. They offer a range of products that suit your needs: • Washed Sand (C33) • Clear (1/4"-1", 1"-3", 3"-6") See their product page and product sheet.	$- $$	Short-term	

SECTION 4: DIVERSION



Waste is a significant contributor to climate change and can be expensive to deal with. Reducing and diverting waste is not only a positive way to reduce your impact, but also your bottom line. We have identified 3 opportunities to further divert Big Dig 'Em's waste from landfill.

POTENTIAL SAVINGS

794 kg waste sent to landfill | 0.38 tCO_2e

ACHIEVEMENTS

- ✓ Tires recycled in Sidney

ACTION	DETAILS	COST	TIMELINE	STATUS
Use the CRD online tool to find local recycling options	The CRD's myrecyclopedia is a good resource to narrow down the closest recycling depots or determine where to bring a hard-to-recycle item.	$	Immediate	
Create a waste diversion station with clear signage and right-sized bins	A significant amount of the items in the waste bin can be recycled for free on Pender Island. By making some adjustments to the setup, Big Dig 'Em can reduce waste related emissions and hauling costs. Currently, approximately 75% of items in the on-site bin are recyclable. By reducing that number to 25% Big Dig 'Em could reduce annual emissions by **0.38 tCO_2e** and volume of waste sent to landfill by **794 kg.** We recommend setting up collection bins for the following waste streams, all of which can be dropped off at Pender Island Recycling	$	Short-term	

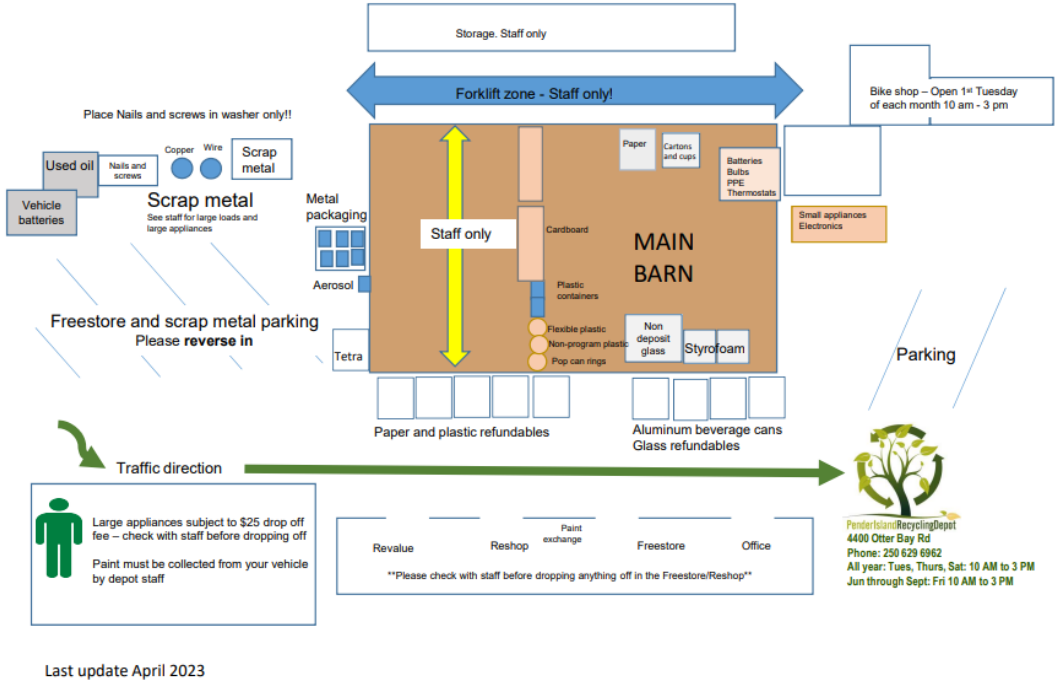
ACTION	DETAILS	COST	TIMELINE	STATUS

	free of charge. Learn what happens to materials collected at this depot (4400 Otter Bay Rd).
	• **Mixed containers** – non-hazardous
	  ○ Ex. beverage cups, hard plastics, glass
	• **Cardboard/paper**
	• **Soft plastics**
	  ○ Ex. plastic bags, bubble wrap, foil lined plastics, etc.
	• **Electronics, tools, appliances**
	  ○ Ex. small appliances, electronics, power tools, batteries, light bulbs
	• **Motor oil/oil filters, antifreeze, oil and antifreeze containers**
	  ○ Contact staff before dropping off
	• **Paint containers**
	Ensure that each bin is the right size to accommodate the average volume of waste. This will ensure bins are user-friendly and ensure that bins are not under or over-filled on pickup/drop off days.
	See pictures below of sample waste diversion stations from Sea to Sky Removal. Additional resources can be found in the Sea to Sky Recycling Toolkit. There is an opportunity to combine this project with the construction of the new 40x40 shop.			

Dispose of surplus fill at GRT in Nanaimo	GRT's Nanaimo plant accepts waste soils which are processed into new products for construction and landscaping. GRT charges a set tipping fee and requires a waste approval application to confirm material acceptance. Acceptance of materials is subject to facility capacity at time of the project. There may be potential to combine a soil disposal with an aggregate pick-up, eliminating an empty load trip. See more information here.	$		

ACTION	DETAILS	COST	TIMELINE	STATUS
Conduct a bi-annual waste audit, set waste reduction and diversion targets, and monitor progress	This will allow you to assess bin contamination and identify opportunities to reduce or divert waste, using these free waste-audit tools. After completing a waste audit, set a meaningful waste reduction and diversion target. For example, diverting 80% of waste from landfill by volume in the next two years, and 90% after 5 years. Communicate these targets to your entire team, and the actions they can do to help reach these targets.	$	Short-term	

Pender Island Recycling Depot, Facility Map (Source)



Waste Diversion Station Examples (Source)

Setting Up Your Waste Diversion Station

PLAN

- Identify materials generated onsite and estimate their quantity.
- Based on your findings, determine what materials you will collect and how much space it will require.
- Determine where you will set up your recycling station. Consider ease of access for waste haulers or for self hauling. The current area is good but requires proper bins and signage.

BUILD

- Set up your waste diversion station including right-sized recycling bins and containers.
- Create clear signage for each bin detailing accepted and not accepted materials. You can download signage here, samples are below.

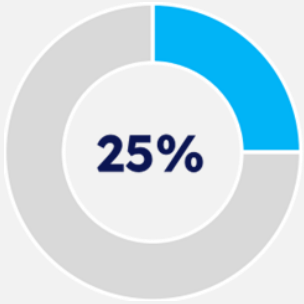
ENGAGE

- Communicate the new system to your crew and provide training on best practices.
- Ensure to notify all sub-contractors of your new waste diversion practices and mission to zero-waste to get them engaged!

MONITOR

- Check in on your bin contamination regularly.
- Communicate to the crew where they can improve to reduce contamination.
- Track changes in waste management expenses.

SECTION 5: LEADERSHIP



People are seeking values-aligned organizations. Companies that step outside the "business as usual" model can attract and retain staff and customers that care about their environmental impact. We have identified 8 opportunities to implement circularity on a leadership level.

ACHIEVEMENTS

- ✓ Significant involvement in the community:
  - Donating services to improve local baseball field
  - Lending out water trailer for local sailing group to clean boats
  - Engaging in community beach clean ups
- ✓ Supporting wildfire prevention practices across Pender Island
- ✓ Strong values of preserving and supporting Pender Island's local environment and community

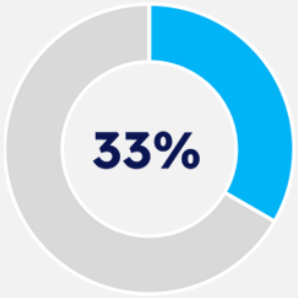
ACTION	DETAILS	COST	TIMELINE	STATUS
Publicly share commitment to sustainability & environmental impact	This will help position Big Dig 'Em as a local sustainable business leader and help raise awareness for environmental initiatives. Potential information to share: • Your environmental values • Circular practices: ○ Non-virgin aggregates and their benefits (ex. RAP, 3" rock processed onsite)	$	Short-term	

ACTION	DETAILS	COST	TIMELINE	STATUS
	○ Locally produced mulch or hog fuel ○ FireSmarting practices ○ Backhauling loads to reduce empty ferry trips and transport emissions ○ Environmentally friendly technology at new facility (ex. water recapture system) ○ If swapping over, eco-friendly options used for traditional maintenance fluids, de-icer, etc. Ways to share: • Add a sustainability page to your website. • Add a sustainability highlight to your social feeds.			
Track & share total volume of processed or reused surplus fill and stumps/shrubs	Big Dig 'Em already tracks volumes of incoming, outgoing, and processed surplus fill and stumps/shrubs. Consider tracking the annual volume of waste streams re-generated into new materials. This can provide metrics to: • Share on social platforms, website and advertising. Highlight the environmental & economic benefit of reusing local materials within the Pender community. • Advocate to local government for support for processing capacity and zoning changes. • Set a baseline metric and set goals to increase % yearly.	$	Short-term	
Micro-certificates or individual courses with targeted learning outcomes	The following micro-certificates (all scheduled for fall 2024) may align with your current goals/obstacles surrounding waste management, material streams, and local economic and waste infrastructure development. We recommend looking into the detailed course offerings to see if any of them may provide value.	$	Short-term	

ACTION	DETAILS	COST	TIMELINE	STATUS
	• UBC Circular Bioeconomy Business Development Micro-Certificate • UBC Climate Action and Community Engagement (CACE) Online Micro-Certificate • UBC Principles of Sustainability in Circular Economy All of these courses are covered by the Stronger BC Future Skills Grant, which pays for up to $3,500 for eligible courses. See entire list of Stronger BC eligible courses here.			
Incorporate circular economy training into employee orientation	When employees or contractors are onboarded, ensure that they are trained on your waste and emissions reduction initiatives. This may include idling policies, recycling, reuse & repair mechanisms in place, key action items to implement, company values and goals, etc.	$	Short-term	
Offer general circular economy training to all employees	edX offers a free, self-paced introductory course on the circular economy. **Content**: value creation through recycling and reuse, circular solution design, individual contributions to the circular economy.	$	Medium	
Engage with CESC	The Southern Gulf Islands Community Economic Sustainability Commission is an advisory commission of the Capital Regional District Board. Its mandate is to strengthen and attract local businesses, coordinate local economic sustainability initiatives, and support economic prosperity, social equity, and environmental quality. This commission may be a good starting place to advocate for additional infrastructure for high volume waste streams (currently sent off-island), zoning changes, and potential partnerships with local government or organizations to address high volume waste streams.	$	Medium	

ACTION	DETAILS	COST	TIMELINE	STATUS
Engage with CWMA	The Coast Waste Management Association hosts regular working groups to facilitate information sharing and collaboration in specific industries and locations. You might find alignment with the following groups: **Islands, Remote & Rural Community Working Group** • Includes ongoing updates, presentations, problem-solving discussions, and compilation of common information, successes and challenges for managing waste from BC Islands, rural, and remote areas. Meetings are quarterly. **Construction & Demolition Waste Working Group** • Meets on specific topics related to building, construction and demolition waste diversion, from policy to new innovations. Topics are determined by attendees and range depending on the group interest and needs. Meetings are every two months. **NEW!** *Side meeting for RURAL/REMOTE C&D waste will be set in 2024.*	$	Medium	
Become a certified BC Green Business	BC Green Business is a certification program that empowers businesses to raise the bar for what it means to be environmentally and socially responsible. They have a sector specific checklist for fleet operators and a member network of over 220 businesses. Annual certification for a business of your size is $275.	$	Medium	

SECTION 6: REDESIGN & INNOVATION



Innovating within your operations and waste management can significantly impact the circularity of your business, reduce your environmental impact, and set you apart from your competitors while creating a great story that customers resonate with. We have identified ten potential opportunities for innovation within Big Dig 'Em's operations.

POTENTIAL SAVINGS

34.8 tCO_2e | 21,251 L diesel

ACHIEVEMENTS

- ✓ "Waste" byproducts transformed into value added products for reuse:
  - Mixed soil waste is processed into screened topsoil, drain rocks, and 6" clear cobble
  - Shrubs and stumps are processed into hog fuel or mulch
  - Rocks up to 18" are processed into 3" rock using crusher

ACTION	DETAILS	COST	TIMELINE	STATUS
Create a net-zero strategy	A net-zero strategy outlines the necessary timelines and steps to transition your operations to net-zero GHG emissions. A decarbonization consulting firm can help you develop this strategy, using science-based targets to reduce emissions in Scopes 1, 2, and 3.	$$	Long-term	
YARD				
Maximize space efficiency on current site	By maximizing layout efficiency of your yard, there may be additional space to process and store waste streams like surplus fill and stumps/brush. **Best practices:**	$	Short-term	

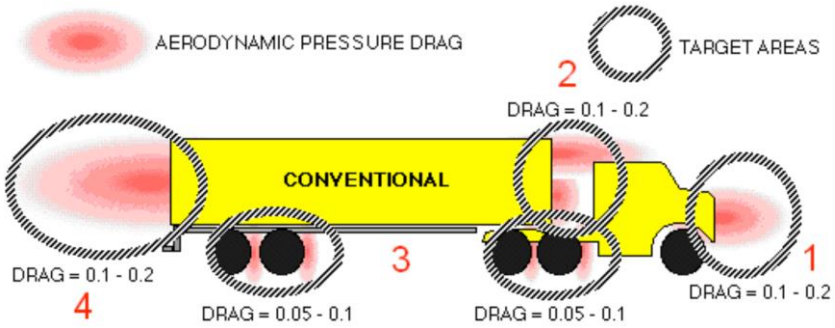
ACTION	DETAILS	COST	TIMELINE	STATUS

	- **Minimize storage footprint**, wherever possible. In other words, reduce the horizontal area occupied on the ground. This may include:
	  o Implementing well-organized vertical shelving for tools and supplies.
	  o Look into the potential for stacking storage containers, effectively doubling storage capacity within the same footprint.
	- **Utilize edges**. Push storage structures to the full extent of the property lines to free up valuable square footage.
	- **Integrate functions.** Create flexible and adaptable spaces that can change according to needs and performance. Place similar items together and use modular structures that can be expanded or reconfigured as needs evolve, maximizing adaptability.
	Recommendations for the property:
	- **Consolidate tools, equipment, and supplies**. With efficient organization and vertical storage, one of the containers/sheds can likely be eliminated, freeing up square footage. Organize contents by function.
	- **Determine if any containers can be stacked**, storing low usage equipment above.
	- **Rental storage** – see if these items can be shifted to a lower traffic area of the property or consolidated. Determine if any of the equipment stored outside can fit inside the rental container.
	See this guide for more details.			

STUMPS & BRUSH				
Advocate or build partnerships to	Although your location currently lacks the space to process stumps and brush, there may be organizations to build aligned partnerships with. In tandem with	$	Short-term	

ACTION	DETAILS	COST	TIMELINE	STATUS
support fibre processing capacity and infrastructure	Pender Island Fire Rescue, advocate for local government to support additional capacity or infrastructure for residual fibre processing. **Potential opportunities:** - **Local government** may identify land areas or companies that can support equipment for fibre processing & storage - **Partnership with local waste management facilities** (ex. Pender Island Recycling Society) for space to process fibre waste			
Utilize mobile chipping for stumps & brush	Raw stumps & brush take up significantly more space than their chipped counterpart. Rather than transporting unprocessed fibre waste back to your yard, process it onsite to significantly reduce space requirements. Processed fibers can be utilized by the site owner or transported back to Big Dig 'Em's yard at a significantly reduced volume.	$	Short-term	
Transform stumps and brush into biochar	Biochar is a charcoal produced from biomass feedstock, which is heated at a high temperature in the absence of oxygen (pyrolysis). Its volume and mass are smaller than the original feedstock, resulting in reduced transport emissions and costs. It is used as a soil amendment product, improving crop yields while sequestering carbon in the soil (source). **Equipment Options:** • **DIY, small scale equipment**: Individuals can make their own small-scale biochar pyrolysis kilns. See this manual for inspiration, or contact Brian Smallshaw on SSI (b@pixelmap.ca). • **Larger scale equipment**: professional pyrolysis units can produce biochar at a larger scale. See Takachar (UBC startup), Biogreen, WasteX, Beston, AirBurners, Huayin. This equipment would be a good fit for the BC Manufacturing Jobs Fund, which provides grant funding for capital	$- $$	Medium	

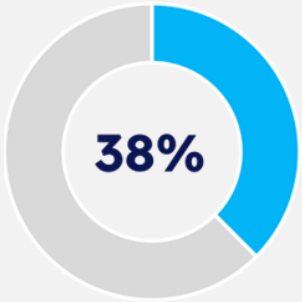
ACTION	DETAILS	COST	TIMELINE	STATUS
	Funding Opportunities: • **2025 FireSmart Community Funding & Supports** – funding to local governments to support FireSmart planning and activities that reduce the community's risk from wildfire. Pender Island Fire Rescue could work with municipal government to access this funding. • **FESBC 2025-27 Wildfire Risk Reduction Funding Program** – funding for wildfire risk reduction projects, can be accessed by Pender Island Fire Rescue. Eligible projects include the recovery and utilization of uneconomic residual fibre resulting from wildfire risk reduction treatments. **Helpful Resources:** • Review the Biochar Manual for Small Farms in BC. • The SSI biochar working group educates the community on the "how" and the "why" of local biochar production and use. We recommend connecting with them to learn about potential partnerships or best practices in the Gulf Islands.			
Partner with local mulch producers to sell or process stumps & brush	If processing on Pender Island isn't currently feasible, consider connecting with the following businesses to donate or sell fibre feedstock for their mulch products: • Highline Environmental (Ladysmith) • Vancouver Island Enterprises (Comox Valley) • Renuable Resources (Campbell River)	$	Medium	

ACTION	DETAILS	COST	TIMELINE	STATUS
FLEET				
Explore technology to reduce aerodynamic drag in dump truck fleet	For any dump trucks with frequent highway routes around Vancouver Island, consider looking into aerodynamic devices to reduce drag. According to a 2012 paper, up to 21% of fuel is lost to aerodynamic drag (combination truck, traveling on flat road at 65 mph). Drag is concentrated in the areas displayed below. Improvement in these areas offer potential for significant fuel savings of up to 15%, depending on devices used, truck load, and average speed.  **Figure 3. Drag contributions of areas on a conventional truck-trailer. [5]** Potential options: - Airodyne (USA) offers roof fairing models for the Kenworth T800 and Freightliner trucks - Airtabs (Ontario) sells small vortex generators that reduce drag at tractor-trailer gap and rear facing surfaces - See this report for additional recommended technologies	$- $$	Medium	

ACTION	DETAILS	COST	TIMELINE	STATUS
Consider tire pressure monitoring systems for dump trucks	Underinflated tires result in: - **Increased fuel cost** – every 10% reduction in pressure results in approx. 1% reduction in fuel efficiency. - **Increased and uneven wear** – underinflated tires increase wear-related costs by approximately 12%. This page offers a summery of types of tire pressure monitoring systems, including their pros and cons.	$- $$	Medium	
Create a low carbon fleet transition plan	To transition away from gasoline and diesel consumption, hire a consulting firm to develop a full fleet transition plan for the company's vehicles based on projected technology availability, feasibility, and costs. Below are some opportunities to explore: • **Biodiesel conversion** – biodiesel can be blended and used in many different concentrations. • **Electrification** - replace light duty vehicles and equipment with electric alternatives, as vehicles depreciate. • **Hydrogen injection** – heavy duty diesel trucks can be retrofitted to run partially on hydrogen. • **Full hydrogen conversion** – as fueling stations become more readily available on Vancouver Island, consider investing in hydrogen-run heavy duty vehicles.	$$	Medium to long-term	

ACTION	DETAILS	COST	TIMELINE	STATUS
Explore hydrogen injection as an option to reduce diesel consumption	Look into hydrogen injection technology as an interim option to reduce diesel consumption and associated emissions. Heavy-duty diesel trucks can be retrofitted to run partially on hydrogen, which offers the potential to reduce GHG emissions by up to 40% per vehicle. Hydra Energy offers free conversion for heavy-duty diesel vehicles and installs hydrogen refuelling stations on site at no cost. Hydrogen can be purchased at an equivalent price to diesel, pricing is based on a third-party diesel price forecast. Assuming the diesel dump trucks account for 30% of fuel use, if Big Dig 'Em swapped to hydrogen technology, this could reduce emissions by up to **34.8 tCO_2e** per year.	$$-$$$	Medium to long-term	
Consider hydrogen vehicle conversion as an option within your long-term fleet transition plan	There are plans to put at least 2 additional hydrogen fueling stations on Vancouver Island by 2026. As technology and funding increase, consider piloting a hydrogen conversion as part of your fleet transition plan. As this timeline comes into closer view, there may be significant funding opportunities to reduce the investment cost, such as the Clean BC Program.	$$-$$$	Long-term	

SECTION 7: ENERGY, WATER & FUEL



Fuel and energy can be a significant expense for businesses. While some usage is unavoidable, efficiencies can be made to reduce usage and operational costs. We have identified nine opportunities to improve efficiencies in these areas.

POTENTIAL SAVINGS

11.25 tCO_2e

ACHIEVEMENTS

- ✓ Vehicles frequently washed at cardlock when on Vancouver Island, reducing water usage

CATEGORY

ACTION	DETAILS	COST	TIMELINE	STATUS
FLEET & EQUIPMENT				
Prioritize washing vehicles at a commercial wash station, whenever possible	Washing a vehicle in the driveway uses up to 450 litres of water, while commercial car washes use approximately 150 litres (source). Additionally, commercial car washes are required to follow a set of practices, including treating wastewater and discharging it into the sanitary sewer system where it will receive further treatment. Until the water recapture system is installed with the new shop, prioritize washes at commercial stations when trucks are on Vancouver Island.	$	Immediate	

ACTION	DETAILS	COST	TIMELINE	STATUS
Use electric power tools on property	As needed, replace gas powered tools with electric equivalents. This can help to take advantage of the resort's renewable power generation, while reducing GHG emissions and costs.	$-$$	Ongoing, as needed	
Use a B20 biodiesel blend	Biodiesel is a clean-burning, renewable substitute for petroleum diesel. According to the US Department of Energy: • As of 2017, every OEM of diesel vehicles approved of blends of up to B5 in their vehicles, and almost 80% approved blends up to B20. Vehicles manufactured before 1994 should avoid higher blends of biodiesel due to potential wear on elastomers. • Engines operating on B20 exhibit similar fuel consumption, horsepower, and torque to engines running on traditional diesel. Biodiesel also shows improved combustion and lubrication to traditional diesel. • Biodiesel has a slightly lower energy content than traditional diesel, however the impact on fuel economy is insignificant. • Studies of B20 and lower-level blends in approved engines have not demonstrated long-term negative effects. See their Biodiesel Basics info sheet for a short summary. Biodiesel can be purchased from Cowichan Bio-Diesel Co-op at their Green-Go pump in Duncan. Assuming the diesel dump trucks accounts for 30% of fuel use, if Big Dig 'Em swapped to a B20 blend for all dump truck usage, this could reduce emissions by up **11.25 tCO_2e** per year at a **cost premium of $940.35**. **Verify the manufacturer's terms on warranty prior to implementing biodiesel – some OEM warranties have a limit on the concentration of biodiesel for vehicles.*	$-$$	Short-term to Medium	

ACTION	DETAILS	COST	TIMELINE	STATUS
	***Price assumptions: B20 $1.916/L at Cowichan Biodiesel Co-op in August 2024. Average price of diesel $1.87/L (Stats Canada, Monthly average retail prices for diesel between June 2023 – May 2024, Victoria, BC).*			
Consider zero-emission alternatives for your medium- and heavy-duty vehicles	This 2024 guide summarizes funding opportunities, availabilities, and specifications for zero-emissions commercial vehicles. Included in the guide are medium-duty trucks and heavy-duty trucks. Upfront purchase cost can be reduced by rebate programs such as iMHZEV – a vehicle incentive program that offers between $10,000-$200,000 for commercial MHDVs.	$$$	Long-term	
If investing in zero-emission vehicles, consider installing EV chargers onsite	To reduce upfront capital cost, BC Hydro offers rebates for eligible EV chargers of up to 50% of the cost, to a maximum of $2,000 per charger, and up to $14,000 per workplace.	$$	Long-term	
CONSIDERATIONS FOR NEW 40X40 SHOP				
If plumbing is installed, purchase low-flow fixtures	Ensure all sinks are fitted with low-flow aerators (< 6Lpm). You can either install low-flow faucets or purchase low-cost aerators to adapt inefficient faucets. Install low-flow toilets (< 6Lpf) to reduce water demand.	$	New Shop	
If shop will be heated, use efficient thermal regulation practices	Draft sealed doors are one of the most affordable ways to reduce heating costs and can save you up to 10% in heating in the winter months. Read more about it here. Single-paned windows lose 10 to 20 times more heat than a well-insulated wall. ENERGY STAR-certified double-paned windows can reduce heating costs by 22% on average.	$	New Shop	

ACTION	DETAILS	COST	TIMELINE	STATUS
Lighting considerations	Install motion sensors for lighting fixtures in less frequently used areas to reduce energy consumption by about 25% per fixture. As an alternative, place "lights out" signs next to switches. Install LED lighting instead of traditional incandescents or fluorescents. Review these BC Hydro fact sheets to compare energy usage between bulb types and tube lighting.	$	New Shop	
Ensure any new appliances are ENERGY STAR Certified	ENERGY STAR Certified products meet strict energy-efficiency standards and can help you save on energy costs in the long term.	$- $$	New Shop	

ADDITIONAL RESOURCES

REFERENCES & FURTHER READING

STUMPS & BRUSH

Jessica Dennis, UBC. Biochar Manual for Small Farms in BC.

Transition Salt Spring. Biochar Working Group.

BC Agricultural Research Development Corporation. Agricultural Waste Disposal: Best Practices Guide.

Forest Enhancement Society of BC. Wildfire Risk Reduction Funding.

Union of BC Municipalities. FireSmart Community Funding and Supports.

FLEET

Clean Energy Canada. Zero-Emission Medium and Heavy-Duty Vehicle: Canadian Model Availability Catalogue.

M.J. Bradley & Associates. Reducing Aerodynamic Drag & Rolling Resistance from Heavy-Duty Trucks.

U.S. Department of Energy. Biodiesel Benefits & Considerations.

U.S. Department of Energy. Biodiesel Basics.

WASTE DIVERSION

Capital Regional District. myrecyclopedia.

Project Zero. Waste Audit Tools.

Sea to Sky Removal. Construction Site Recycling Toolkit.

EDUCATIONAL PROGRAMS

The following programs can help you and your team advance your understanding of the circular economy and ways to adopt circular practices into your business. Look for funding through organizations like WorkBC to cover a portion of training costs.

PROGRAM	INSTITUTION	DESCRIPTION	LENGTH, COST
Circular Economy: An Introduction	edX, Professional Certificate Program	An online course introducing the circular economy. **Content:** value creation through recycling and reuse, circular solution design, individual contributions to the circular economy	Self-Paced, Free
Climate Action and Community Engagement	UBC, Professional Certificate Program	An online course to build skills and understanding for local climate champions. **Content:** Knowledge building on local aspects of climate change and climate solutions. Principles and tools for engaging communities in climate action. Training on climate change outreach and Climate Action Plans.	8 weeks, starting October 14, 2024 Tuition covered by StrongerBC Future Skills Grant
Principles of Sustainability in Circular Economy	UBC, Professional Certificate Program	An online course introducing the circular economy, intended for business applications. **Content:** Understand the fundamentals of the circular economy and associated business models. Understand and apply the basics of lifecycle assessments/lifecycle costing. Understand the positioning of relevant policies, regulations, motivations and reporting frameworks.	October 7-29, 2024 Tuition covered by StrongerBC Future Skills Grant
Circular Bioeconomy Business Development	UBC, Professional Certificate Program	An online course that provides professionals in forestry, agricultural and waste industry a thorough understanding of circular bioeconomy policies and technologies, and how to develop circular bioeconomy business through case studies and assessment strategies.	8 weeks, starting October 14, 2024 Tuition covered by StrongerBC Future Skills Grant

FUNDING DIRECTORIES

CleanBC Better Buildings Incentive Search Tool: A tool to filter eligible funding opportunities for capital upgrades, including equipment electrification and energy efficiency projects.

CleanBC Funding Finder Tool: This tool can be used to search for funding programs for climate action, filtered by project scope and recipient group.

National Resources Canada: Directory for energy efficiency and alternative energy programs in Canada.

FUNDING PROGRAMS

Check for available funding programs through your municipal government. In addition to municipal funding, we recommend looking into the following:

FUNDING PROGRAM	DESCRIPTION
BC Hydro rebates for EV chargers	BC Hydro offers rebates of up to 50% of the cost of eligible EV chargers, to a maximum of $2,000 per charger, and up to $14,000 per workplace site. Businesses can apply for a maximum of four workplace sites, resulting in a maximum project rebate of up to $56,000.
CleanBC Better Buildings	Clean BC provides funding and capital incentives to encourage energy efficient design, construction and renovation of commercial buildings. Use the Incentive Search Tool to find eligible programs.
CleanBC Go Electric	Clean BC offers rebates for vehicle (up to $8,000) and charging infrastructure (up to $25,000) purchases to help individuals and businesses transition to electric vehicles.
CleanBC Industry Fund	This fund supports the development, trial and deployment of projects that reduce GHG emissions from large industrial operations in British Columbia.
iZEV Program	The Government of Canada offers incentives for leased or purchased zero-emissions vehicles.

MEMBERSHIP ASSOCIATIONS

The following membership associations provide valuable connections, strategies, and industry trends for businesses seeking to further their circular initiatives.

Coast Waste Management Association: A membership association for professionals in BC's solid waste industry, making connections, facilitating networking, and providing current information and solutions for solid waste.

BC Green Business: A certification program that works one-on-one with small to medium-sized businesses to help reduce environmental impact and enhance social initiatives.