

# Organic Waste System Review

Regional District of Okanagan-Similkameen Board Presentation

# Project Background

- AECOM was initially engaged by the RDOS to conduct a peer review on the work undertaken by another engineering consultant for the proposed solutions to the management of organic waste within the Regional District
- Organic Waste
  - Kitchen waste
  - Yard waste
  - Compostable paper
  - *Wastewater treatment solids*
- Review determined that cost estimates may have been overly conservative
  - Cost to deliver services considered to be too high
- Agricultural Land Commission January 2023 decision
- AECOM subsequently requested to develop concepts and cost estimates that will fit within available land at the 1313 Greyback Road Site

# Site Context



# Suggested Waste Management Options

- Composting Processes Only
  - Sustainable Generations (Gore) System – OPTION 1
  - Enclosed Aerated Windrow System – OPTION 2
  - Enclosed Aerated Bunker System
    - Organic waste only – OPTION 3
    - Organic waste & wastewater solids – OPTION 3a

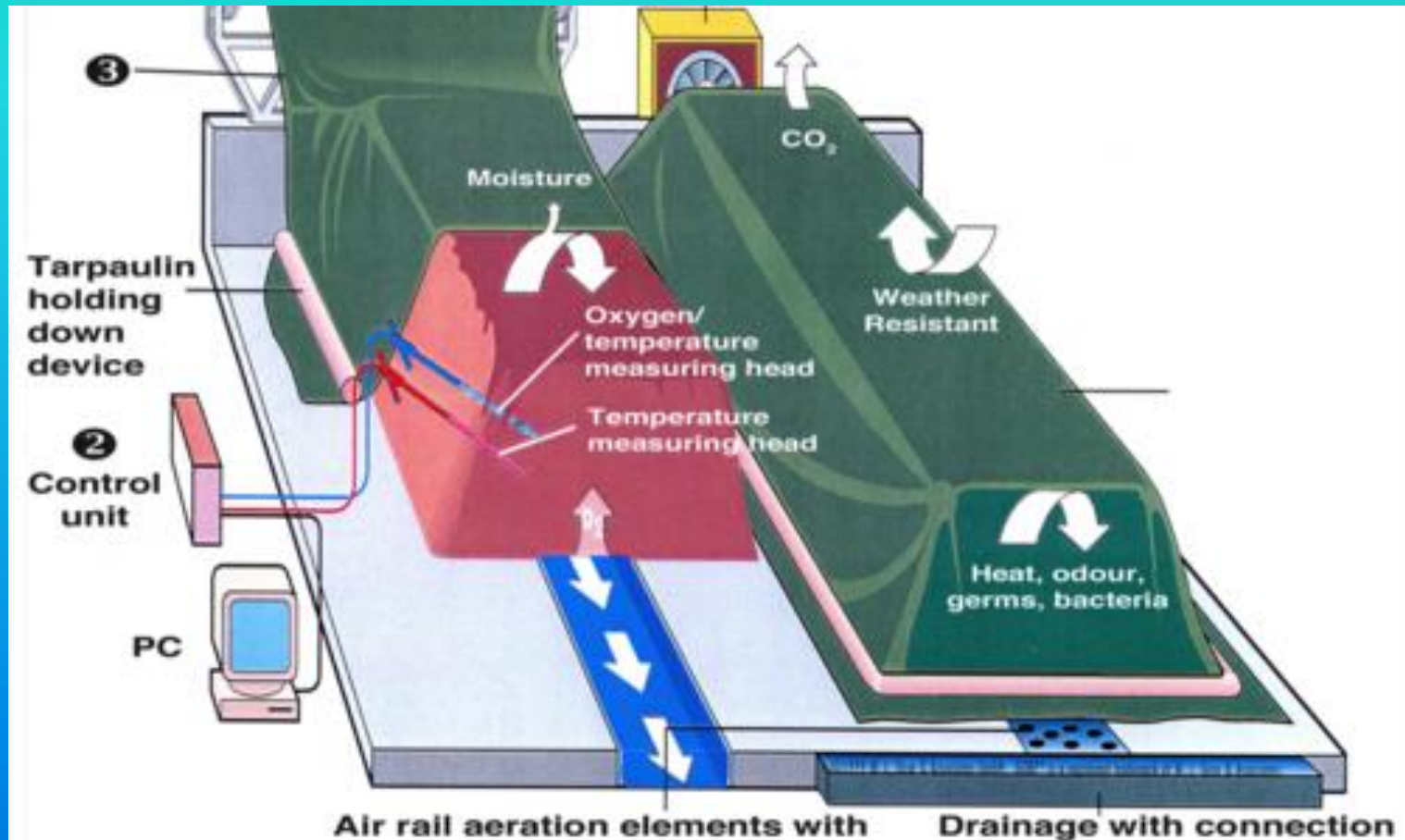
# Quantity of Organic Waste\*

**Table I-1: Total Organics Feedstocks at CMLF**

Organic Material	2018		2040	
	Average Annual	Peak Month	Average Annual	Peak Month
Green Waste	10,200	1,273	11,900	1,485
Biosolids	5,900	885	6,900	1,038
Bulking Agent Amendment	2,950 – 4,800	443 – 525	3,450 – 5600	569 – 617
Food Waste & Compostable Paper	7,400 – 9,100	742 – 913	8,600 – 10,600	865 – 1,065
<b>Total Feedstocks</b>	<b>26,450 – 30,000</b>	<b>3,343 – 3,596</b>	<b>30,850 – 35,000</b>	<b>3,957 – 4,205</b>

\* Values provided are measured in tonnes

# Sustainable Generations (GORE) System



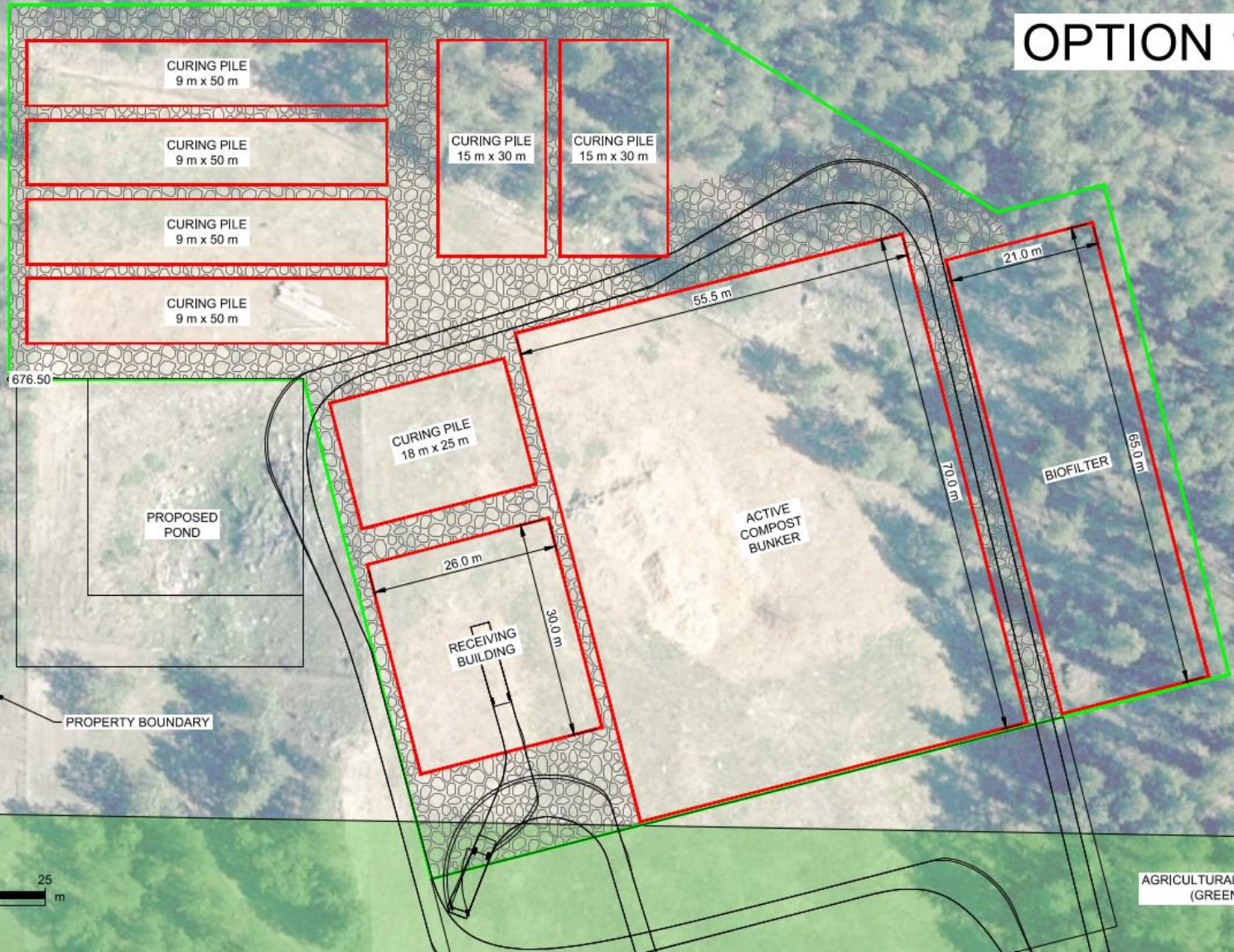
# Sustainable Generations (GORE) System

- Odours retained under the cover (70-90%)
- Moisture and heat retention
- Proprietary
- Examples in BC
  - Grand Forks (outdoors)
  - Oliver (outdoors)
  - City of Abbotsford (indoors)
  - GFL – Chemainus (indoors)
  - RD of Kitimat-Stikine (indoors)





# OPTION 1





# Enclosed Aerated Windrow System



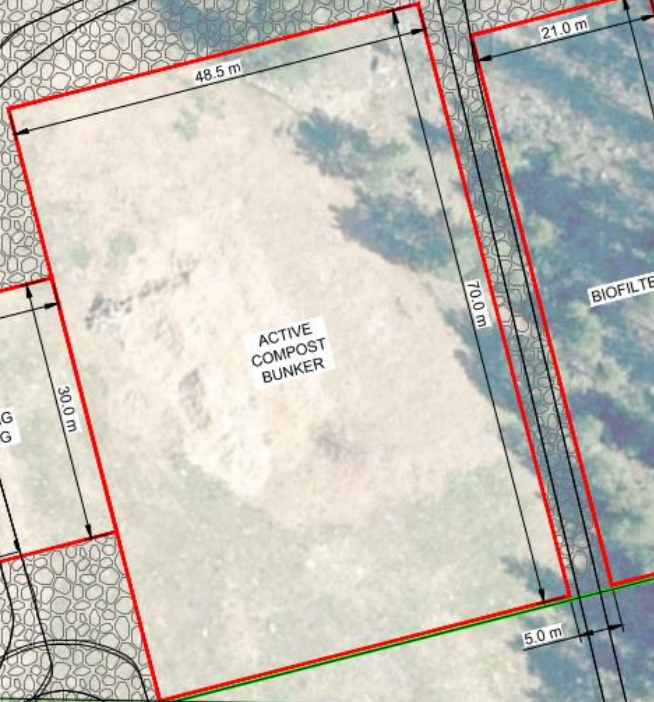
# Enclosed Aerated Windrow System

- Open area windrows
- Covered with a biocover (finished compost) (80-90% odour retention)
- Windrows can be aerated as they are being built (further odour risk reduction)
- Lower cost than Sustainable Generations (no interior bunker walls or proprietary covers)
- Examples in BC
  - Farm to Garden Organics – Victoria (indoors)
  - Creston (outdoors)
  - West Coast Landfill (outdoors)

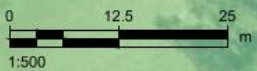




# OPTION 2



PROPERTY BOUNDARY



AGRICULTURAL LAND RESERVE (GREEN HATCH)

# Enclosed Aerated Bunker System



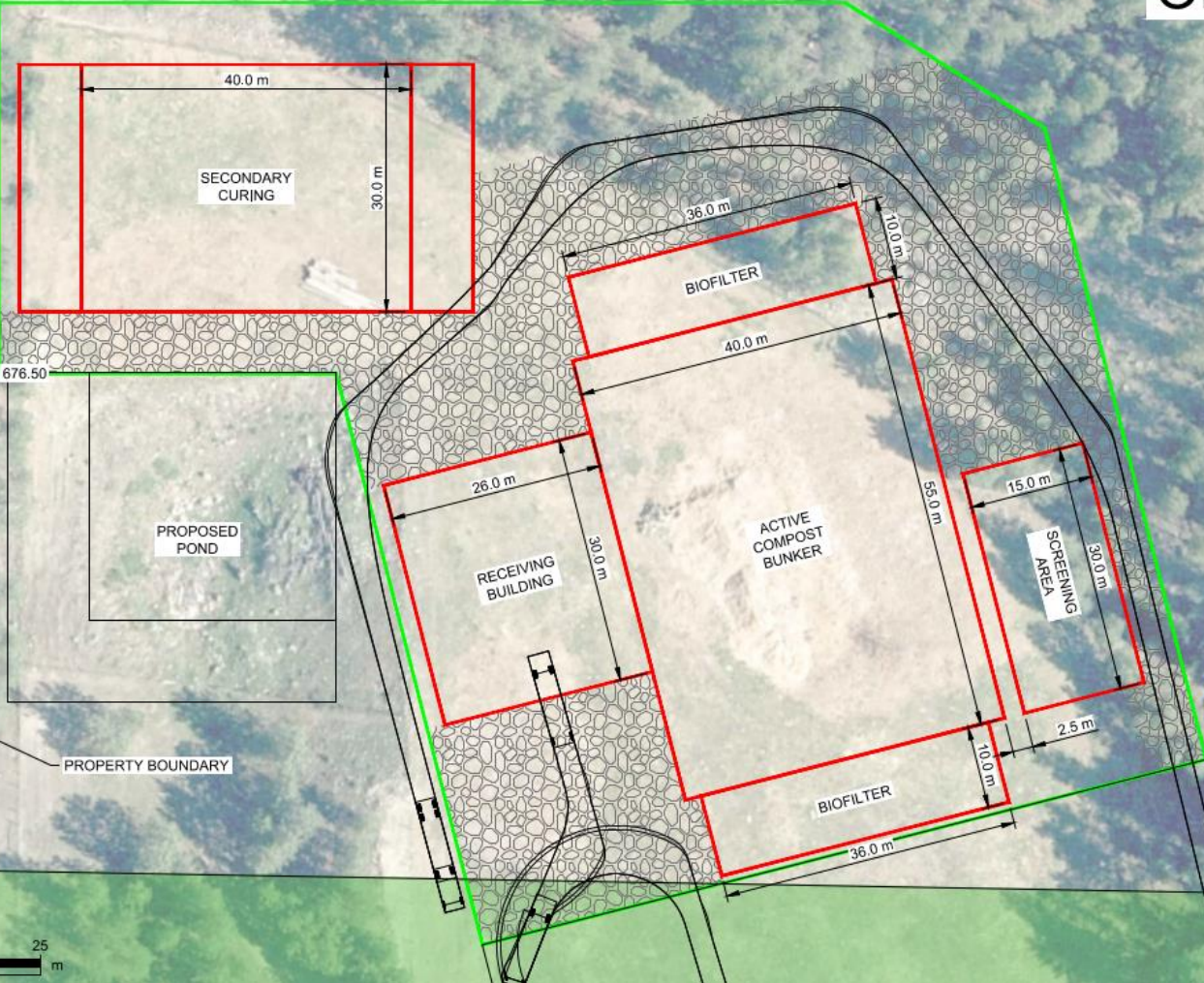


# Enclosed Aerated Bunker System

- Process allows higher piles to be developed, which in turn reduces the required building footprint
  - Lower capital cost
  - Smaller odour control process
- Process is amenable to both organic waste and wastewater solids
- Examples in BC
  - Comox Valley (wastewater solids)
  - Nanaimo (food and yard waste)
  - Surrey Biofuels (food and yard waste - residual post digestion)
  - Various mushroom compost facilities in the Lower Mainland



# OPTION 3



AGRICULTURAL LAND RESERVE  
(GREEN HATCH)

# Wastewater Solids Composting

- Wastewater solids composting could be part of the overall organic waste composting facility, however, should be segregated from the main process and may require an application to the ALC to obtain additional lands (phased approach)
- Wastewater solids cannot be included in the composting process if compost that is approved for organic use is one of the objectives with the organic waste composting, therefore additional end user(s) required
- Concerns regarding PFAS compounds may limit the distribution of the wastewater solids compost
- Other Considerations
  - Only Aerated Bunker Option is feasible based on footprint
  - Availability of bulking agent (clean wood waste)
  - Grant funding is specific to organic waste only
  - Third party solution (Arrow Transportation) is available as a short to medium term solution
    - 2020 service cost - \$125/tonne
    - 2018 study - \$8.0M City of Penticton facility (~\$140 to \$150/tonne)

# Capital Cost Estimates

ITEM	OPTION 1	OPTION 2	OPTION 3	OPTION 3a
General Requirements	\$80,000	\$80,000	\$80,000	\$80,000
Site Civil	\$5,527,657	\$4,056,585	\$2,923,764	\$3,085,217
Structural	\$4,435,920	\$2,796,000	\$2,988,336	\$3,817,704
Buildings	\$2,332,500	\$2,087,500	\$1,765,000	\$2,067,500
Process Mechanical	\$6,212,525	\$3,169,125	\$2,582,550	\$2,758,725
Mobile Equipment	\$1,440,000	\$2,190,000	\$2,190,000	\$2,190,000
Electrical / Instrumentation	\$657,253	\$669,825	\$552,510	\$591,745
Direct Construction Cost	\$20,685,855	\$15,049,035	\$13,082,160	\$14,590,891
Contingency (30%)	\$6,205,756	\$4,514,711	\$3,924,648	\$4,377,267
<b>Total Capital Cost</b>	<b>\$26,900,000</b>	<b>\$19,600,000</b>	<b>\$17,100,000</b>	<b>\$19,000,000</b>



# Operating and Maintenance Cost Estimates

ITEM	OPTION 1	OPTION 2	OPTION 3	OPTION 3a
Electricity	\$65,910	\$65,910	\$72,270	\$81,906
Fuel for Mobile Equipment	\$144,000	\$144,000	\$115,200	\$172,800
Labour	\$374,400	\$374,400	\$374,400	\$374,400
Maintenance and Replacement	\$620,576	\$451,471	\$392,465	\$437,727
Direct Operating Cost	\$1,204,886	\$1,035,781	\$954,335	\$1,066,833
Contingency (30%)	\$361,466	\$310,734	\$286,300	\$320,050
<b>Total Operating Cost</b>	<b>\$1,566,352</b>	<b>\$1,346,516</b>	<b>\$1,240,635</b>	<b>\$1,386,883</b>

# Annualized Costs

ITEM	OPTION 1	OPTION 2	OPTION 3	OPTION 3a
Annualized Capital Cost <sup>2</sup> (including grant funding)	\$1,386,234	\$749,787	\$531,826	\$697,476
Operating Cost	\$1,566,352	\$1,346,516	\$1,240,635	\$1,386,883
Total Annualized Cost	\$2,952,586	\$2,096,303	\$1,772,461	\$2,084,359
<b>Cost Per Tonne Processed</b>	<b>\$109</b>	<b>\$78</b>	<b>\$66</b>	<b>\$50</b>

# Recommendations

- Based on the design options, the restrictions associated with land available for this facility, and the financial estimates, it is recommended that OPTION 3 be carried forward by the RDOS as a basis of design.
- OPTION 3 can also be readily expanded in the future should some of the adjacent ALR land become available, which could allow for the accommodation of the City of Penticton's wastewater solids into the composting operation.
- This option provides a more compact footprint and one that will allow for more efficient foul air collection and treatment.
- It's proximity to the landfill may also accommodate shared resources and provide an area for the use of the compost as landfill cover.

# Project Delivery Timelines

- Design Procurement – 2 months
- Rezoning – 3 months
- Preliminary Design – 2 months
- Value Analysis (procurement and workshop) – 2 months
- Detailed Design – 3 months
- Tender Period (document preparation and tender period) – 2 months
- Award and Approvals – 2 months
- Construction – 10 months
- Commissioning and Start-up – 2 months
- June 2023 to March 2025



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