

APPENDIX V

WESTLAND ENVIRONMENTAL SERVICES



July 12, 2007

Mr. Philip Birett, B. Eng
Project Manager
GAIA Inc
500 4260 Still Creek Drive
Burnaby
BC V5C 6C6

Re: Response to Request for Information

Dear Philip Birett:

Attached please find the information as requested in your letter of July 4, 2007.

Based on our telephone conversation yesterday, we would like to provide the following comments.

- (1) To incinerate a large “whole-body” animal, such as a cow, a “pathological” incinerator or a “crematorium” is used. The operation is batch-wise, where the load is charged into a “cold” chamber, the combustion is then started and maintained until the whole load is completely incinerated. The incinerator is then left to cool down for ash removal and getting ready for the next load.

If the incinerator has a secondary chamber, it can be preheated to a desired temperature prior to charging the load into the primary chamber. This is a good practice to ensure complete combustion of combustible gases and soot generated in the primary chamber.

- (2) Therefore, a batch pathological incinerator is not suitable for incinerating SRM if the chamber is to be preheated to 850 C when the load is charged into it. To meet this requirement, an intermittently-charged incinerator is needed. The operation involves an initial pre-heating to the desired temperature, charging a “small” batch into the hot chamber, allowing the batch to be completely incinerated, and charging the next batch. This process is repeated for a pre-specified period of time, the “burn time”, or until the chamber is full of ash.

The annual capacity of such an incinerator depends on the hourly capacity, the burn time per day, and the number of days of operation in one year. The following Table shows the annual capacities of the systems offered by Westland for different burn times, and the specified 260 days of operation per year:



Capacity, kg/h	Annual Capacity, tonnes/y *		
	Burn Time, hours/day		
	6	10	14
50	78	130	182
100	156	260	364
150	234	390	546

Note that this mode of operation is strictly not continuous, where the load is *continuously* charged into the incinerator using a screw feeder or an auger.

- (3) A maximum particulate emission of 50 mg/m³ is specified, yet the use of an air pollution control device (APCD) is not stipulated. Based on our experience and literature information, an APCD is needed to meet that standard. See for example the following statement, which refers to a crematorium:

*"BACT for a new or modified incinerator is a maximum particulate emission rate of 0.12 gr/dscf corrected to 12% CO₂."*¹ [BACT = Best Available Control Technology; 0.12 grains/dscf = 275 mg/m³]

If you have questions or need clarification, please do not hesitate to contact me.

Looking forward to the results of your project,

Yours truly
Westland Environmental Services Inc

Anil Chhibber
General Manager

¹ <http://www.maine.gov/dep/air/licensing/Ch115Licenses/a949an.pdf>



Incinerator Information: Westland Environmental Services Inc

Model	Pathological	CY50	CY100	CY150
Description				
Configuration	Dual chamber	Dual chamber	Dual chamber	Dual chamber
Batch/Continuous Feed	Batch	Intermittent	Intermittent	Intermittent
Tested on SRM/Air emission	No	No	No	No
After burner/Secondary chamber	Yes	Yes	Yes	Yes
Foot Print (m x m)	6m x 8m	6m x 4 m	9m x 7 m	11m x 9m
Capacity (kg/h)	150	50	100	150
Auxiliary Fuel (to be specified)	Diesel, natural gas or propane	Diesel, natural gas or propane	Diesel, natural gas or propane	Diesel, natural gas or propane
Capital Cost (\$)	\$315,000.00	\$155,000.00	\$245,000.00	\$280,000.00
Typical installation Cost (\$)	\$31,500.00	\$15,500.00	\$24,500.00	\$28,000.00
Operation Costs				
Training (\$/session) Estimated 8 persons	\$12,000.00	\$12,000.00	\$12,000.00	\$12,000.00
Labour (\$/y)	\$60,000.00	\$60,000.00	\$60,000.00	\$60,000.00
Major Repair Contingency	\$30,000.00	18,000.00	\$22,000.00	\$30,000.00
Fuel (\$/y) *	\$52,000.00	\$18,000.00	\$36,000.00	\$52,000.00
Options				
Feed Ram (\$)	No	xxxx	xxxx	xxxx
Whole-body feeding system	Crane supplied by others	No	No	No
Scrubber (Basic)	\$210,000.00	\$130,000.00	\$245,000.00	\$260,000.00
Scrubber (Fine Polishing)	\$175,000.00	\$120,000.00	\$165,000.00	\$175,000.00

* Based on Secondary Chamber Temperature set at 1000 C, \$10/GJ and 2600 hours burn time/y