A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

6 January 2009

Inciner8 (Sylvis)
2935 Fred Street
Armstrong, B.C.
Canada, V0E 1B1

ATTENTION: Ms. Ruth McDougall

Dear Ruth:

REFERENCE: Analysis of Rodear Incinerator Stack Emissions

Subsequent to the emission testing of the Inciner8 waste incinerator in December 2008, it was suggested by our firm, that trace metal analysis of some samples may shed some light on the nature and/or origin of the particulate matter in the emissions

Following is a discussion of the findings of the sample analysis.

Discussion

Particulate matter emitted from "super hot" stacks usually are contributed as uncombusted carbonaceous material, trace metals, or materials of construction

Uncombusted carbonaceous material (organics) was not of interest in this aspect of the study, as it was obvious, by the black or grey nature of the emissions, that some level of uncombusted material was emitted at various times of the burn cycle.

Our concern was, that materials of construction used in the refractory lining or the metal stack were contributing an unusual amount to the particulate matter "count" in the overall particulate emissions. The most common refractory used in these types of incinerators, are aluminium, calcium, silica, or magnesium based. There are many other refractory materials. Stacks are usually made of mild steel or stainless steel. In this case, the stack was mild steel, of which iron would be the predominant metal.

The refractory sample provided by Rodear was analysed to contain calcium (6.4%), aluminium (5.0%) and Iron (2.1%); with about 0.2% of potassium, sodium and titanium.

Analysis was also conducted on some of the "catch" of the emission tests, with the predominant metal determined to be potassium, with sodium at about one-half the potassium content. Sulphur was also found to be present in amounts slightly greater than sodium.

The relative absence of calcium and aluminium in the stack samples was compelling and conclusively showed that the refractory type material used to insulate this incinerator were not significantly present in the particulate matter emitted from the stack. In addition there were very low levels of iron in the stack samples, suggesting rust or steel was not part of the particulate emissions.

While we are not familiar with the chemical composition of the slaughterhouse waste, a brief review of cattle diet determined that cattle have high potassium dietary needs and potassium is the predominant metal in red blood cells

It is probable that the metal content of the slaughterhouse waste is not incinerable, and would be a large part of the particulate matter discharged. If we summed the oxide or a salt form of the potassium and sodium, plus the sulphur; we determine these three elements would constitute an emission of about 15 to 25 mg/Sm^3. This was true, to a lesser extent, for the diesel only tests Because these metals were also found during the diesel only tests, we theorize that there was residual matter in the combustion chamber or an unknown source of potassium/sodium/sulphur was associated with the diesel only test.

Following is a table of the findings

	Refractory Material (ppt)	Diesel Test (mg)	400 kg Load 1 (mg)	400 kg Load 2 (mg)	400 kg Load 3 (mg)
Al	50	0.01 to 0.1	0.02	0.05	0.02
Ca	64	0.04 to 0.13	0.08	0.21	0.05
Fe	21	0.04 to 0.12	0.06	0.09	0.07
K	2.4	5.4 to 6.5	7.7	8.3	4.3
Na	2.0	1.6 to 1.7	3.6	3.8	1.6
Ti	2.0	0.001	0.001	0.001	< 0.001
S	0.9	2.8 to 2.9	5.3	4.4	2.6

The Blank (blind) sample did not show any significant amount of any trace metal, showing no sample contamination from extraneous sources

In conclusion, we find that potassium, sodium and sulphur (probably a sulphate form) are the predominant compounds emitted during the "clean burn" period near the end of each burn cycle. Since these elements are not predominant in the refractory or steel, we conclude these elements originated in the materials combusted, or possibly (unlikely) the fuel

If you have any questions please contact our office at any time.

Best regards;

A. Lanfranco and Associates Inc

A. Lanfranco, A.Sc.T.
Principal

Bodycote TESTING GROUP

Analytical Report

Bill To:	A Lanfranco & Associates	Project:		Lot ID:	**661553**
Report To:	A Lanfranco & Associates	ID:		Control Number:	A043800
	#101, 9488 - 189 Street	Name:	Rodear/Sylvis	Date Received:	Dec 19 2008
	Surrey, BC, Canada	Location:		Date Reported:	Dec 24, 2008
	V4N 4W7	LSD:		Report Number:	1184957
Attn:	Al LanFranco	P O.:			
Sampled By:		Acct code:			
Company:					

Reference Number	661553-1
Sample Date	
Sample Time	
Sample Location	
Sample Description	Refractory Particles
Matrix	Solids

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Metals					
Aluminum	ug/g	49900			1
Antimony	ug/g	<1 0			0 5
Arsenic	ug/g	<0 4			0 2
Barium	ug/g	33 3			0 03
Beryllium	ug/g	1 05			0 02
Bismuth	ug/g	<1 0			0 5
Cadmium	ug/g	<0 1			0 05
Calcium	ug/g	64200			2
Chromium	ug/g	116			0 04
Cobalt	ug/g	3 1			0 05
Copper	ug/g	11 3			0 05
Iron	ug/g	21400			1
Lead	ug/g	<0 50			0 3
Lithium	ug/g	57 0			0 1
Magnesium	ug/g	760			10
Manganese	ug/g	55 8			0 3
Molybdenum	ug/g	1 9			0 05
Nickel	ug/g	36 9			0 1
Phosphorus	ug/g	589			0 5
Potassium	ug/g	2400			5
Selenium	ug/g	<0 5			0 3
Silver	ug/g	0 8			0 2
Sodium	ug/g	2050			1
Strontium	ug/g	68 4			0 02
Sulfur	ug/g	892			1
Thallium	ug/g	<0 5			0 3
Tin	ug/g	<0 4			0 4
Titanium	ug/g	2030			0 05
Vanadium	ug/g	81 5			0 2
Zinc	ug/g	16 5			0 1
Zirconium	ug/g	63 1			0 05

Approved by: Marie England

Marie England
Consulting Scientist

Bodycote TESTING GROUP

Analytical Report

Bill To: A Lanfranco & Associates
Report To: A Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC Canada
V4N 4W7
Attn: Al LanFranco
Sampled By:
Company:

Project:
ID:
Name: Rodear/Sylvis
Location:
LSD:
P O :
Acct code:

Lot ID: **661553**
Control Number: A043800
Date Received: Dec 19 2008
Date Reported: Dec 24, 2008
Report Number: 1184808

	Reference Number	661553-2	661553-3	661553-4	
	Sample Date				
	Sample Time				
	Sample Location				
	Sample Description	Beaker P9 (Blk)	PM Hastalloy	Z3 Quartz	
	Matrix	Stack Samples	Stack Samples	Stack Samples	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Air Quality Metals						
Aluminum	Strong Acid Extractable	ug	54	114	11	1
Antimony	Strong Acid Extractable	ug	0 5	<0 5	0 7	0 5
Arsenic	Strong Acid Extractable	ug	0 3	0 3	3 3	0 2
Barium	Strong Acid Extractable	ug	0 7	1 3	0 7	0 3
Beryllium	Strong Acid Extractable	ug	<0 02	<0 02	<0 02	0 01
Cadmium	Strong Acid Extractable	ug	0 2	0 59	0 56	0 05
Calcium	Strong Acid Extractable	ug	45	127	41	2
Chromium	Strong Acid Extractable	ug	8 70	54 2	70 0	0 04
Cobalt	Strong Acid Extractable	ug	0 08	26 9	0 06	0 05
Copper	Strong Acid Extractable	ug	2 7	8 04	1 8	0 05
Iron	Strong Acid Extractable	ug	73	117	41	1
Lead	Strong Acid Extractable	ug	3 3	12 9	13 8	0 3
Magnesium	Strong Acid Extractable	ug	12	<1	4	1
Manganese	Strong Acid Extractable	ug	2 0	46 2	0 96	0 05
Molybdenum	Strong Acid Extractable	ug	2 1	1310	4 7	0 05
Nickel	Strong Acid Extractable	ug	5 0	656	1 0	0 1
Phosphorus	Strong Acid Extractable	ug	4 6	13 9	14 3	0 5
Potassium	Strong Acid Extractable	ug	20	5440	6500	5
Selenium	Strong Acid Extractable	ug	0 3	1 0	<0 2	0 3
Silicon	Strong Acid Extractable	ug	23	80	12	1
Silver	Strong Acid Extractable	ug	0 2	0 2	<0 2	0 2
Sodium	Strong Acid Extractable	ug	27	1620	1650	1
Sulfur	Strong Acid Extractable	ug	11	2930	2750	1
Tellurium	Strong Acid Extractable	ug	<0 4	0 5	<0 4	0 4
Thallium	Strong Acid Extractable	ug	<0 2	<0 2	<0 2	0 3
Tin	Strong Acid Extractable	ug	0 7	0 3	1 0	0 2
Titanium	Strong Acid Extractable	ug	1 4	0 66	0 3	0 05
Vanadium	Strong Acid Extractable	ug	<0 2	<0 2	<0 2	0 1
Zinc	Strong Acid Extractable	ug	16 8	38 7	51 4	0 1
Zirconium	Strong Acid Extractable	ug	1 3	1 2	0 2	0 05

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#101 9488 - 189 Street
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V4N 4W7
Attn: Al LanFranco
Sampled By:
Company:

Project ID:
Name: Rodear/Sylvis
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Control Number: A043800
Date Received: Dec 19 2008
Date Reported: Dec 24, 2008
Report Number: 1184808

	Reference Number	661553-5	661553-6	661553-7	
	Sample Date				
	Sample Time				
	Sample Location				
	Sample Description	80 PW 400-1	Q95 PW 400-2	P5 PW 400-3	
	Matrix	Stack Samples	Stack Samples	Stack Samples	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Air Quality Metals						
Aluminum	Strong Acid Extractable	ug	24	45	21	1
Antimony	Strong Acid Extractable	ug	0 5	<0 5	<0 5	0 5
Arsenic	Strong Acid Extractable	ug	1 4	1 8	0 9	0 2
Barium	Strong Acid Extractable	ug	1 3	1 1	0 5	0 3
Beryllium	Strong Acid Extractable	ug	<0 02	<0 02	<0 02	0 01
Cadmium	Strong Acid Extractable	ug	0 3	0 4	<0 05	0 05
Calcium	Strong Acid Extractable	ug	79	208	48	2
Chromium	Strong Acid Extractable	ug	61 7	74 6	49 7	0 04
Cobalt	Strong Acid Extractable	ug	0 2	0 2	0 06	0 05
Copper	Strong Acid Extractable	ug	3 1	6 50	3 5	0 05
Iron	Strong Acid Extractable	ug	64	92	74	1
Lead	Strong Acid Extractable	ug	5 1	4 1	3 5	0 3
Magnesium	Strong Acid Extractable	ug	11	21	8	1
Manganese	Strong Acid Extractable	ug	3 0	6 21	1 3	0 05
Molybdenum	Strong Acid Extractable	ug	3 6	2 1	2 2	0 05
Nickel	Strong Acid Extractable	ug	4 8	14 3	0 9	0 1
Phosphorus	Strong Acid Extractable	ug	79 4	85 2	59 4	0 5
Potassium	Strong Acid Extractable	ug	7680	8290	4300	5
Selenium	Strong Acid Extractable	ug	0 4	0 3	0 3	0 3
Silicon	Strong Acid Extractable	ug	10	10	9	1
Silver	Strong Acid Extractable	ug	<0 2	1 5	<0 2	0 2
Sodium	Strong Acid Extractable	ug	3610	3820	1620	1
Sulfur	Strong Acid Extractable	ug	5250	4360	2610	1
Tellurium	Strong Acid Extractable	ug	<0 4	<0 4	<0 4	0 4
Thallium	Strong Acid Extractable	ug	<0 2	0 3	<0 2	0 3
Tin	Strong Acid Extractable	ug	1 6	0 8	<0 2	0 2
Titanium	Strong Acid Extractable	ug	0 84	0 96	0 4	0 05
Vanadium	Strong Acid Extractable	ug	<0 2	0 4	0 2	0 1
Zinc	Strong Acid Extractable	ug	32 1	72 2	34 7	0 1
Zirconium	Strong Acid Extractable	ug	1 6	1 1	0 06	0 05

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