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Eco Decomposition System

EXCERPTS FROM THE
SOURCE EMISSION
TEST REPORTS
AND
ASH & SLUDGE
COMPLIANCE

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Company Registration No. & GST: 201323826G

SOURCE EMISSION TEST OF
SMOKE, PARTICULATES, OXIDES OF NITROGEN, CARBON MONOXIDE,
SULPHUR DIOXIDE, HYDROGEN FLUORIDE, HYDROGEN CHLORIDE,
ANTIMONY, ARSENIC, CADMIUM, COPPER, LEAD, MERCURY,
NICKEL, ZINC, PHOSPHORUS PENTOXIDE, HYDROGEN SULFIDE,
DIOXINS & FURANS

FOR INTERNATIONAL GREEN AIR ENGINEERING INC. (IGAE)
13333, MARRYWOOD COURT,
MILTON, GEORGIA 30004,
UNITED STATES OF AMERICA (USA)

Date of Survey : 1 – 2 October 2019
Reported : December 5 2019
Report No. : ASL-E348-19

Reported by:-



TAM YUN HONG
Senior Environmental Engineer
Environmental Services



CHANG HEE KUAN
Principal Consultant
Environmental Services

1.0 SUBJECT

Source Emission Monitoring was conducted by Environmental Services of Astar Laboratory Pte Ltd on 1 – 2 October 2019 at New San Jose Builders, Quezon Road, Purok 4 Propio, Barangay San Pablo, San Simon, Pampanga for International Green Air Engineering Inc. (IGAE), 13333, Marrywood Court, Milton, Georgia 30004, United States of America (USA).

Astar Laboratory Pte Ltd, Singapore which is an approved laboratory registered to SAC-SINGLAS ISO/IEC 17025 Quality Management System (the ISO system for laboratories), was requested by International Green Air Engineering Inc. (IGAE) to carry out testing of emission gases for Eco Waste Management System (EWMS) as per below analytes :

- a) Smoke (Ringelmann Chart)
- b) Particulates (EPA 5)
- c) Oxides of Nitrogen (EPA 7E)
- d) Carbon Monoxide (EPA 3A/10)
- e) Sulphur Dioxide (EPA 6C)
- f) Hydrogen Fluoride (EPA 13B)
- g) Hydrogen Chloride (EPA 26)
- h) Antimony (EPA 29)
- i) Arsenic (EPA 29)
- j) Cadmium (EPA 29)
- k) Copper (EPA 29)
- l) Lead (EPA 29)
- m) Mercury (EPA 29)
- n) Nickel except Nickel Carbonyl (EPA 29)
- o) Zinc (EPA 29)
- p) Phosphorus Pentoxide (EPA 29)
- q) Hydrogen Sulfide (EPA 11)
- r) Dioxins and Furans (EPA 23)

The above analytes were proposed by Astar Laboratory Pte Ltd, Singapore whilst approved and witnessed by the Environmental Technology Verification (ETV) Group of the Department of Science and Technology – Industrial Technology Development Institute (DOST-ITDI) to sample and analyse for three (3) operating conditions ie. three (3) ETV test protocols as presented in this report.

Three (3) batches of domestic composite wastes were loaded into the Eco Waste Management System (EWMS) during the course of this ETV Test Protocol :

- 1) Test #1 - Municipal wastes at 500 degree Celcius
- 2) Test #2 - Municipal wastes at 700 degree Celcius
- 3) Test #3 - Municipal & Tires wastes at 900 degree Celcius

Their respective Test #1, Test #2 and Test #3 timing are as shown in the report.

5.0 TEST RESULTS

5.1 Test #1 - Municipal wastes at 500 degree Celcius

Toxicity Equivalents Report (Test #1)

Date & Time	Analytes	Determined Value (ng TEQ/Nm ³)	@ Corrected Value to STP, 11% O ₂ Dry (ng TEQ/Nm ³)	Special Emission Standard for Waste Incinerators (ng TEQ/Nm ³)
October 1 2019 1715 – 1925 hrs	Dioxins & Furans	0.0338	0.178	0.5

Eco Waste Management System (EWMS) (Test #1)

Timing	Analytes	Determined Value (mg/Nm ³)	#Corrected Value to STP, 11% O ₂ dry (mg/Nm ³)	Republic Act 8749 Philippines Clean Air Act 1999 (mg/Nm ³)	Singapore NEA Special Emission Standard for Waste Incinerators (mg/Nm ³)
October 1 2019 1715 – 1815 hrs	Smoke	1	1	Not Available	0 (Ringelmann chart)
	Particulates	0.8	4.2	200	50
	NOx	58	305	500	400
	CO	13	68	500	100
	SO ₂	14	74	200 (as SO ₃)	200
	HF	<0.1	<0.1	50	5
	HCl	<0.1	<0.1	Not Available	60
	H ₂ S	<0.01	<0.01	Not Available	7.6
	Antimony	<0.1	<0.1	10	0.5
	Arsenic	<0.01	<0.01	10	0.5
	Cadmium	<0.01	<0.01	10	0.05
	Copper	<0.01	<0.01	100	0.5
	Lead	<0.01	<0.01	10	0.5
	Mercury	<0.01	<0.01	5	0.05
	Nickel	<0.01	<0.01	20 (except Nickel Carbonyl)	0.5
	Zinc	<0.01	<0.01	100	0.5
	Phosphorus Pentoxide	<0.01	<0.01	200	Not Available

Remarks:

Results corrected to STP, dry gas and 11% O₂ correction factor for boilers.
O₂ content =19.1 %



5.2 Test #2 - Municipal wastes at 700 degree Celcius

Eco Waste Management System (EWMS) (Test #2)

Timing	Analytes	Determined Value (mg/Nm ³)	#Corrected Value to STP, 11% O ₂ dry (mg/Nm ³)	Republic Act 8749 Philippines Clean Air Act 1999 (mg/Nm ³)	Singapore NEA Special Emission Standard for Waste Incinerators (mg/Nm ³)
October 1 2019 1715 – 1925 hrs	Smoke	1	1	Not Available	0 (Ringelmann chart)
	Particulates	3.9	15.6	200	50
	NOx	74	296	500	400
	CO	20	80	500	100
	SO ₂	16	64	200 (as SO ₃)	200
	HF	<0.1	<0.1	50	5
	HCl	<0.1	<0.1	Not Available	60
	H ₂ S	<0.01	<0.01	Not Available	7.6
	Antimony	<0.01	<0.01	10	0.5
	Arsenic	<0.01	<0.01	10	0.5
	Cadmium	<0.01	<0.01	10	0.05
	Copper	<0.01	<0.01	100	0.5
	Lead	<0.01	<0.01	10	0.5
	Mercury	<0.01	<0.01	5	0.05
	Nickel	<0.01	<0.01	20 (except Nickel Carbonyl)	0.5
	Zinc	<0.01	<0.01	100	0.5
Phosphorus Pentoxide	<0.01	<0.01	200	Not Available	

Remarks:

Results corrected to STP, dry gas and 11% O₂ correction factor for boilers.
O₂ content =18.5 %



5.3 Test #3 - Municipal & Tires wastes at 900 degree Celcius

Toxicity Equivalents Report (Test #3)

Date & Time	Analytes	Determined Value (ng TEQ/Nm ³)	@ Corrected Value to STP, 11% O ₂ Dry (ng TEQ/Nm ³)	Special Emission Standard for Waste Incinerators (ng TEQ/Nm ³)
October 2 2019 1600 – 1810 hrs	Dioxins & Furans	0.0999	0.213	0.5

Eco Waste Management System (EWMS) (Test #3)

Timing	Analytes	Determined Value (mg/Nm ³)	#Corrected Value to STP, 11% O ₂ dry (mg/Nm ³)	Republic Act 8749 Philippines Clean Air Act 1999 (mg/Nm ³)	Singapore NEA Special Emission Standard for Waste Incinerators (mg/Nm ³)
October 2 2019 1600 – 1700 hrs	Smoke	1	1	Not Available	0 (Ringelmann chart)
	Particulates	3.1	6.6	200	50
	NOx	173	368	500	400
	CO	30	64	500	100
	SO ₂	*51	*108	200 (as SO ₃)	200
	HF	<0.1	<0.1	50	5
	HCl	<0.1	<0.1	Not Available	60
	H ₂ S	<0.01	<0.01	Not Available	7.6
	Antimony	<0.1	<0.1	10	0.5
	Arsenic	<0.1	<0.1	10	0.5
	Cadmium	<0.1	<0.1	10	0.05
	Copper	<0.1	<0.1	100	0.5
	Lead	<0.1	<0.1	10	0.5
	Mercury	<0.1	<0.1	5	0.05
	Nickel	<0.1	<0.1	20 (except Nickel Carbonyl)	0.5
Zinc	<0.1	<0.1	100	0.5	
Phosphorus Pentoxide	<0.01	<0.01	200	Not Available	

Remarks:

Results corrected to STP, dry gas and 11% O₂ correction factor for boilers.

O₂ content =16.3 %

*SO₂ value was higher due to tires loading for Test #3, but was well within 200 mg/Nm³



6.0 CONCLUSIONS

In summary, based on the findings of this ETV test, all the results for the three (3) test conditions were well within their respective emission standards of Republic Act 8749, Philippines Clean Air Act 1999, and the Singapore NEA Environmental Protection and Management Act 2008, Environmental Protection and Management (Air Impurities) (Amendment) Regulations 2015.

International Green Air Engineering Inc. (IGAE) is committed to ensure full compliance with all the required international emission standards by adding pollution control devices such as Catalytic Converter cum with 3-stage Scrubber System ie. 1st stage alkaline scrubber, 2nd stage acid scrubber and 3rd stage activated carbon system for removal of any expected and/or suspected organics, inorganics, volatiles and semi-volatiles pollutants, where necessary.

In conclusion, the overall ETV tests for Eco Waste Management System (EWMS) at New San Jose Builders, Quezon Road, Purok 4 Propio, Barangay San Pablo, San Simon, Pampanga for International Green Air Engineering Inc. (IGAE), 13333, Marrywood Court, Milton, Georgia 30004, USA can be regarded as **successful and satisfactory** based on the reported values as presented in this study, the detection limits of the test methods used and the established instrumentation detection limits within the scope of the required test parameters.

It should be noted that this study is based upon the limited information gathered during the execution of this project and reflects our findings at the date/time and place inspected. This ETV test was carried to the best of our knowledge and professional capability as well as responsibility towards the code of practice in the performance and reliability of our Environmental Testing business within Astar Laboratory Pte Ltd, Singapore.

7.0 REFERENCES

NEA, Environmental Protection and Management Act 2008, Environmental Protection and Management (Air Impurities) (Amendment) Regulations 2015.

Republic of the Philippines, Republic Act 8749; Philippine Clean Air Act, 1999.

8.0 ABBREVIATION GUIDE

DOST	Department of Science and Technology, Philippines
ITDI	Industrial Technology Development Institute, Philippines
ETV	Environmental Technology Verification
NEA	National Environment Agency, Singapore
mg/Nm ³	Milligram per normalized cubic metre, corrected to STP, dry gas
STP	Standard temperature 273K and pressure 101.3 kPa, dry gas

 **STAR LABORATORY PTE LTD**
ENVIRONMENTAL CONSULTANTS & TESTING



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**SOURCE EMISSION TEST OF
SMOKE, PARTICULATES, SULPHUR DIOXIDE,
OXIDES OF NITROGEN AND CARBON MONOXIDE**

**FOR LEGACY ECO SOLUTIONS INC. (LES)
230 BUENMAR AVE., A. BONIFACIO AVENUE,
GREELAND VILLAGE PHASE 2 BARANGAY SAN JUAN,
CAINTA, RIZAL, 1900 PHILIPPINES**

Date of Survey : 10 - 11 February 2020
Reported : February 20 2020
Report No. : ASL-EXXX-20

Reported by:

PHILIP GERARD
Environmental Engineer
Environmental Services

CHANG HEE KUAN
Principal Consultant
Environmental Services

1.0 SUBJECT

Source Emission Monitoring was conducted by Astar Laboratory Pte Ltd from 10 to February 11 2020 at New San Jose Builders, Quezon Road, Purok 4 Propio, Barangay San Pablo, San Simon, Pampanga for Legacy Eco Solutions Inc. (LES), 230 Buenmar Ave, A. Bonifacio Avenue, Greenland Village Phase 2 Barangay San Juan, Cainta, Rizal, 1900 Philippines.

Astar Laboratory Pte Ltd, Singapore which is an approved laboratory registered to SAC-SINGLAS ISO/IEC 17025 Quality Management System (the ISO system for laboratories), was requested by Legacy Eco Solutions Inc. (LES) to carry out testing of emission gases for Eco Waste Management System (EWMS) as per below analytes:

- a) Smoke (Ringelmann Chart)
- b) Particulates (EPA 5)
- c) Sulphur Dioxide (EPA 6C)
- d) Oxides of Nitrogen (EPA 7E)
- e) Carbon Monoxide (EPA 3A/10)

The above analytes were proposed by Astar Laboratory Pte Ltd, Singapore whilst approved and witnessed by the Environmental Technology Verification (ETV) Group of the Department of Science and Technology – Industrial Technology Development Institute (DOST-ITDI) to sample and analyse for three (3) operating conditions ie. three (3) ETV test protocols as presented in this report.

Three (3) batches of domestic composite wastes were loaded into the Eco Waste Management System (EWMS) during the course of this ETV Test Protocol :

- 1) Test #1 - Municipal wastes at 1,100 degree Celcius
- 2) Test #2 - Municipal wastes + Papers + Plastic Bags at 1,100 degree Celcius
- 3) Test #3 – Municipal wastes + Papers + Plastic Bags + Tyres at 1,100 degree Celcius

Their respective Test #1, Test #2 and Test #3 timing are as shown in the report.

FIGURE 1 - CONTINUOUS MONITORING GRAPHS FOR TEST #1
ON 10 FEBRUARY 2020

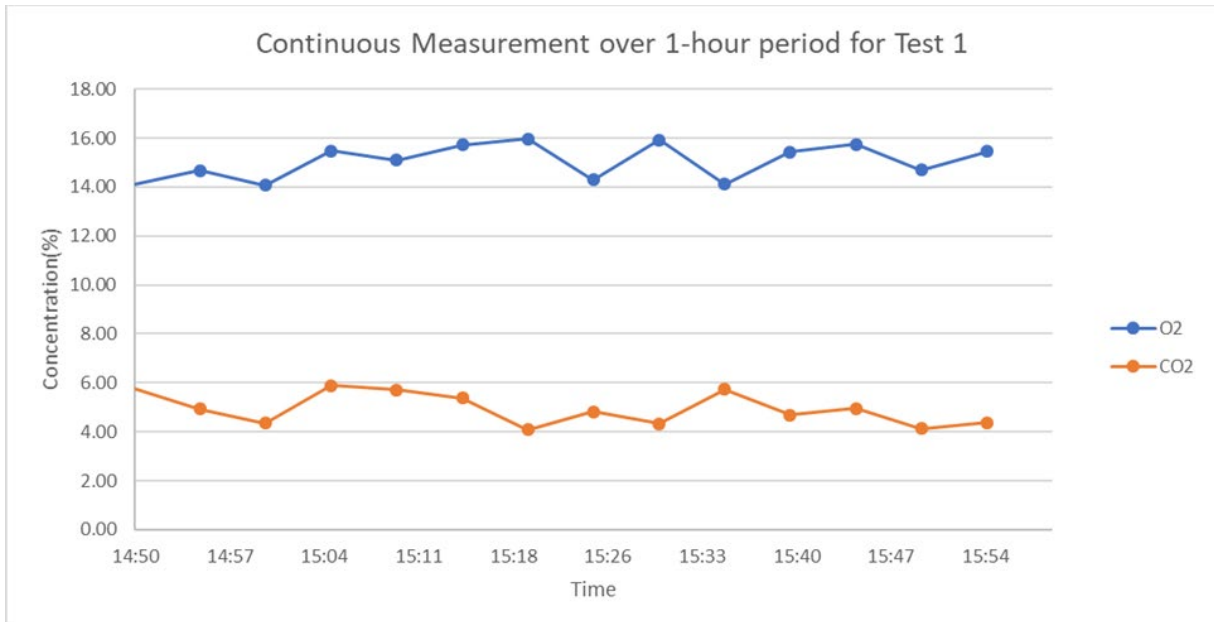
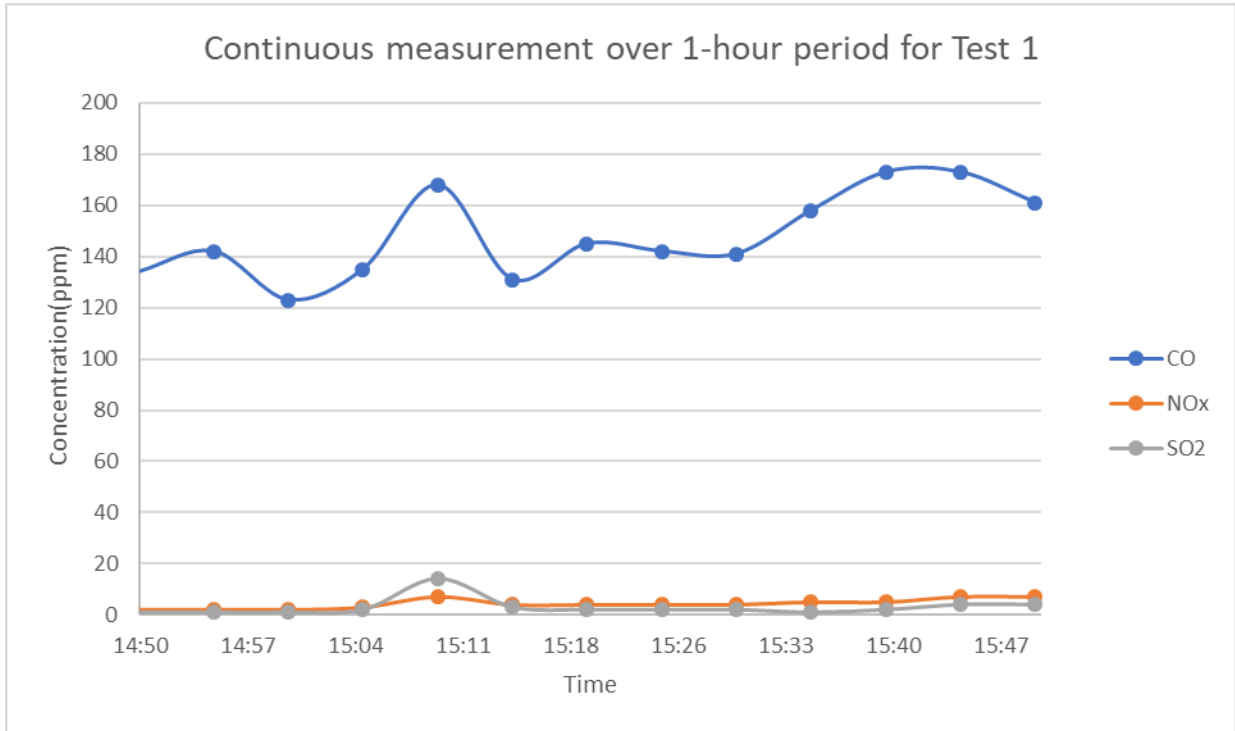


FIGURE 2 - CONTINUOUS MONITORING GRAPHS FOR TEST #2
ON 11 FEBRUARY 2020

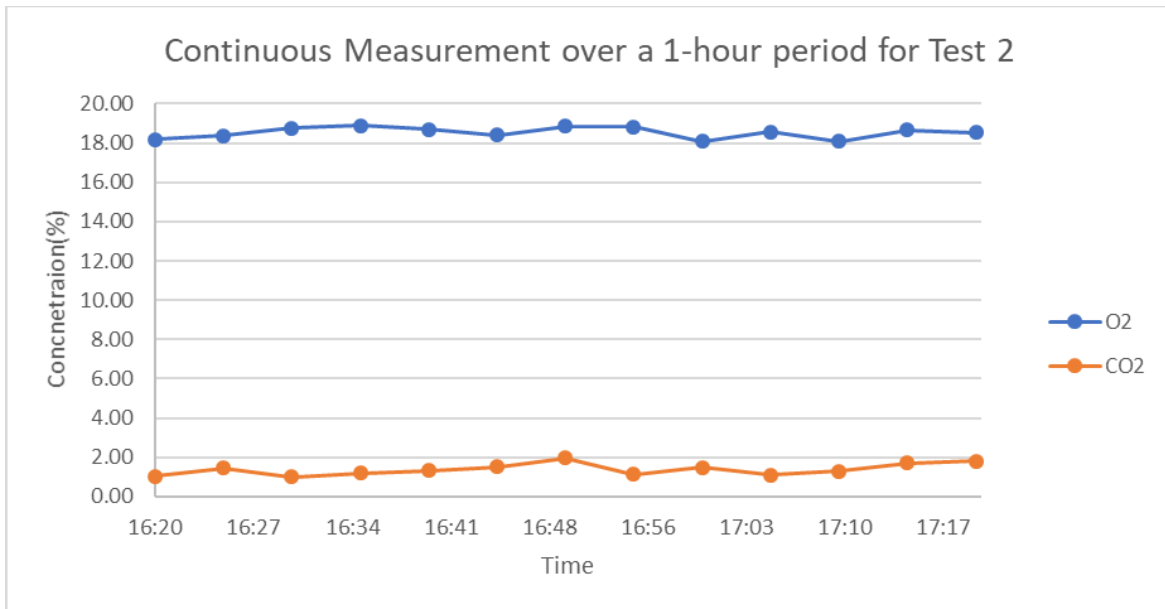
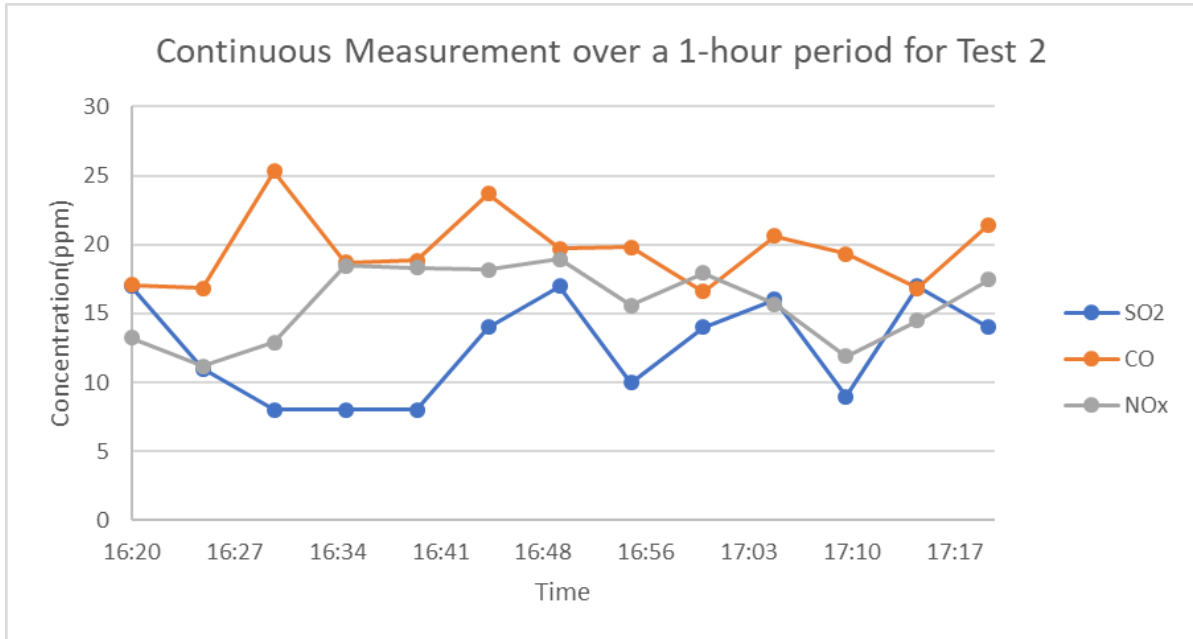


FIGURE 3 - CONTINUOUS MONITORING GRAPHS FOR TEST #3
ON 11 FEBRUARY 2020

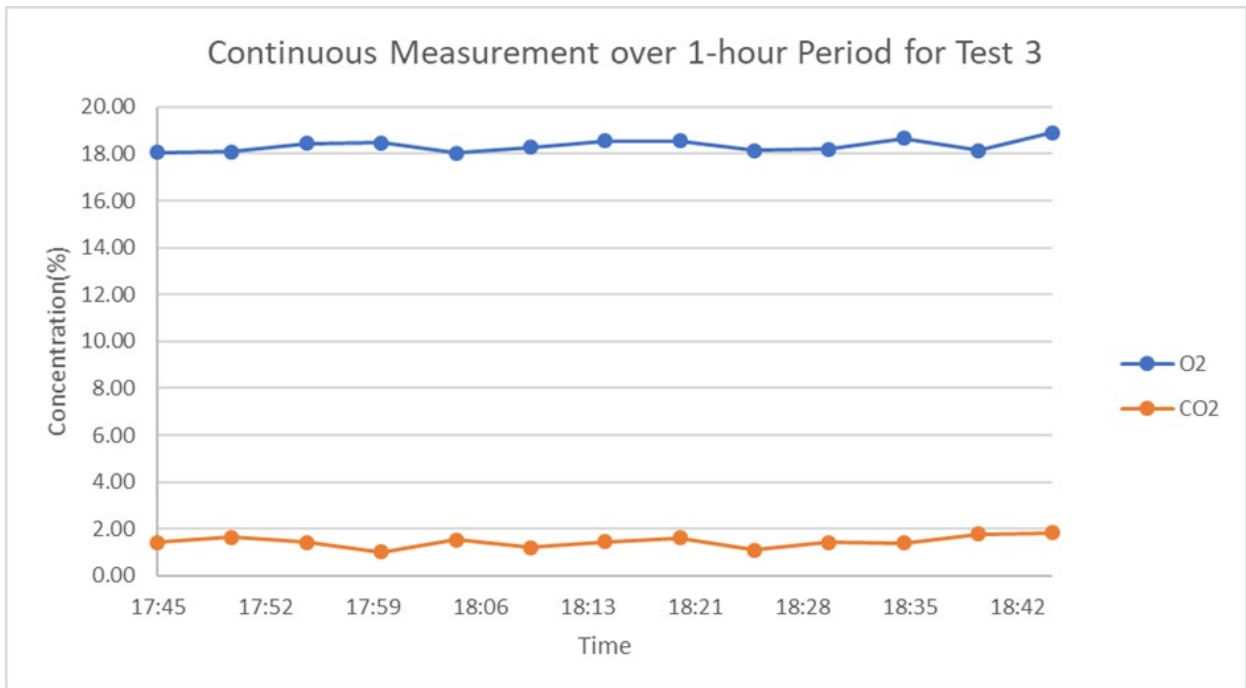
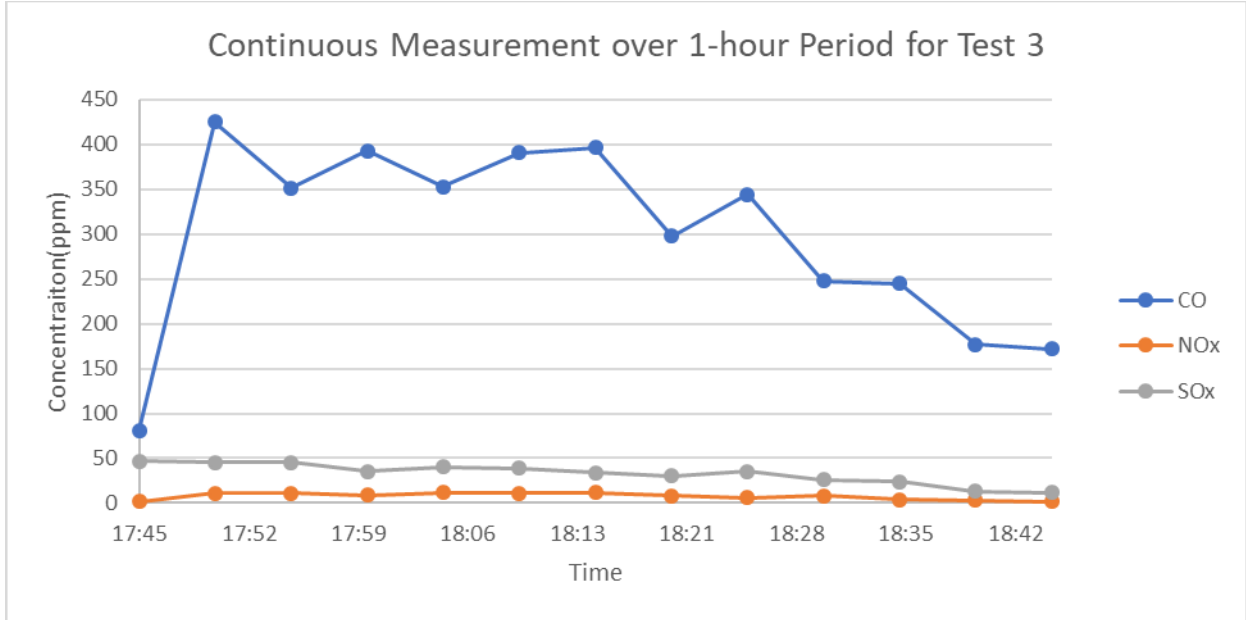


TABLE 4 - SUMMARY OF TEST RESULTS ON 10 – 11 FEBRUARY 2020

Analytes	Test #1			Test #2			Test #3			The Philippines Clean Air Act 1999 Republic Act 8749 (mg/Nm ³)	Singapore NEA Special Emission Standard for Waste Incinerators (m g/ N m ³)
	Determined values		Corrected values #	Determined values		Corrected values #	Determined values		Corrected values #		
	ppm	mg/Nm ³	mg/Nm ³	ppm	mg/Nm ³	mg/Nm ³	ppm	mg/Nm ³	mg/Nm ³		
Smoke	1			1			1			-	0
Particulates	13.9	16.2	54.1	3.35	4.2	14.0	3.15	3.7	12.2	200	50
CO	149	55.9	186	19.6	7.4	24.5	298	111.4	371	500	100
NO _x	4.5	2.8	9.2	15.7	9.7	32.2	7.6	4.7	15.6	500	400
SO ₂	3	2.6	8.6	12.5	10.8	35.8	32.7	28,1	93.6	200 (as SO ₃)	200
CO ₂	4.94 %			1.39 %			1.46 %			-	-
O ₂	15.06 %			18.53 %			18.35 %			-	-

Remark: # Results corrected to STP, dry gas and 11% O₂ correction factor for incinerators.

6.0 CONCLUSIONS

We refer to earlier Test Report No. ASL-E348-19 dated December 5 2019 (Date of Survey on 1 – 2 October 2019).

This is a follow up re-assessment of final ETV test for Carbon Monoxide (ie. all 3 test conditions) and Sulphur Dioxide (ie. tyres disposal) for operating temperature of over 1,000 degree Celcius, upon installed the new Catalytic Converter to the existing Eco Waste Management System (EWMS).

In summary, based on the findings of this re-verification and re-validation of ETV test, all the results for the three (3) test conditions were well within their respective emission standards of Republic Act 8749, The Philippines Clean Air Act 1999, and the Singapore NEA Environmental Protection and Management Act 2008, Environmental Protection and Management (Air Impurities) (Amendment) Regulations 2015.

Legacy Eco Solutions Inc. (LES) complies with all the required international emission standards by having added pollution control devices such as Catalytic Converter cum with 3-stage Scrubber System ie. 1st stage alkaline scrubber, 2nd stage acid scrubber and 3rd stage activated carbon system for removal of any expected and/or suspected organics, inorganics, volatiles and semi- volatiles pollutants, where necessary.

In conclusion, the overall ETV tests for **Eco Waste Management System (EWMS)** at New San Jose Builders, Quezon Road, Purok 4 Propio, Barangay San Pablo, San Simon, Pampanga for **Legacy Eco Solutions Inc. (LES)**, 230 Buenmar Ave, A. Bonifacio Avenue, Greenland Village Phase 2 Barangay San Juan, Cainta, Rizal, 1900 Philippines can be regarded as **successful and satisfactory** based on the reported values as presented in this study, the detection limits of the test methods used and the established instrumentation detection limits within the scope of the required test parameters.

It should be noted that this study is based upon the limited information gathered during the execution of this project and reflects our findings at the date/time and place inspected. This ETV test was carried to the best of our knowledge and professional capability as well as responsibility towards the code of practice in the performance and reliability of our Environmental Testing business within Astar Laboratory Pte Ltd, Singapore.

7.0 REFERENCES

NEA, Environmental Protection and Management Act 2008,
Environmental Protection and Management (Air Impurities) (Amendment)
Regulations 2015.

Republic of the Philippines, Republic Act 8749; Philippine Clean Air Act, 1999.

8.0 ABBREVIATION GUIDE

DOST	Department of Science and Technology, Philippines
ITDI	Industrial Technology Development Institute, Philippines
ETV	Environmental Technology Verification
NEA	National Environment Agency, Singapore
mg/Nm ³	Milligram per normalized cubic metre, corrected to STP, dry gas
STP	Standard temperature 273K and pressure 101.3 kPa, dry gas



27, Gul Avenue, Singapore 629667 Tel: 63396136 Fax: 63396138 Email: sales@astarlab.com.sg
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Our Ref : ASL/L/E042-1/20

January 12, 2021

International Green Air Engineering Inc. (IGAE)
13333, Marrywood Court,
Milton, Georgia 30004,
United States of America.

Dear Mr Joe Jawahar Kachwalla,

CLARIFICATION ON THE EUROPEAN UNION (EU) COMMISSION IMPLEMENTING DECISION 2019/2010 OF NOVEMBER 12 2019 ON INDUSTRIAL EMISSION OF BEST AVAILABLE TECHNIQUES (BAT) FOR WASTEGONE ECO DECOMPOSITION SYSTEM (ALSO KNOWN AS ECO WASTE MANAGEMENT SYSTEM).

Our sincere apology for this late reply.

We refer to the Test Reports No. ASL-E348-19 in October 2019 and ASL-E042-20 in February 2020.

Following your feedbacks on the EU Directive 2010/75/EU regarding the new emission standards enforced in November 2019 and the tabulated compliance tables for EU, Philippines, Singapore and USEPA emission standards, we would like to clarify that the non-compliance is closely related to the 11% reference oxygen level used to correct for the BAT-AELs (best available technique-associated emission levels).

During the course of the February 2020 survey we measured all the emission pollutants after the Catalytic Converter cum with 3-stage Scrubber System ie. 1st stage alkaline scrubber, 2nd stage acid scrubber and 3rd stage activated carbon system (this in contrast to the October 2019 test where only 1 single standard scrubber was applied), thus, the oxygen levels were near to ambient 21% Oxygen (ie. 16% to 19% O₂). Due to the absence of emission standards for this innovative technology our initial objective was to compare the measured emission values with current emissions standards regarding conventional incineration plants. This resulted in the applied oxygen correction factor as below, being 3.33 times the measured values:

$$Er = \frac{21-11}{21-18} \times Em = \text{factor of } 3.33$$

whereby,

Er = corrected emission concentration at 11% O₂

Em = measured/determined emission concentration

However, on further consideration the applied technology does not require any input energy source like fuel or electricity to decompose the waste. There does not exist a combustion process in the magnetic ionization chamber, thus, in our professional opinion, the initial correction for oxygen level should not have been applied.

If based on that consideration we would have measured the oxygen level in the magnetic ionization chamber (ie. impossible during the site measurement, no testing point available), we expect the oxygen level in the chamber to be <3% O₂. In this manner, the correction factor should be:

$$E_r = \frac{21-11}{0.55} \times E_m = \text{factor of } 21-3$$

When applying this factor to the actual measured emission values, the corrected values are considerably lower and are complying with the EU standards with minor concerns to particulates and CO. Please find enclosed a tabulated summary of the actual measured and corrected emission values compared to the respective national and international standards.

We appreciate your valuable feedback as Astarlab is committed to Quality and providing services of the highest standard and we hope we will continue to provide you with a top level of service in the future.

On behalf of Astar Laboratory Pte Ltd, we thank you for the opportunity to be of service to IGAE. We look forward to your continuous support and further working relationship in other testing projects.

Please feel free to contact the undersigned, HP: +65 9630 2838 should you need further clarifications on this matter.

Yours sincerely,
for Astar Laboratory Pte Ltd



CHANG HEE KUAN
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Director

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STAR LABORATORY PTE LTD
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Analytes	USEPA Standards	Determined values WASTEGONE/EWMS October 2019			Corrected values with O2 factor 0.55 WASTEGONE/EWMS October 2019		
		Municipal Waste	Municipal Waste	Municipal Waste + Tyres	Municipal Waste	Municipal Waste	Municipal Waste + Tyres
		Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C	Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C
Particulates	25 mg/Nm ³	0.8 mg/Nm ³	3.9 mg/Nm ³	3.1 mg/Nm ³	0.4 mg/Nm ³	2.1 mg/Nm ³	1.7 mg/Nm ³
NOX	200 mg/Nm ³	58.0 mg/Nm ³	74.0 mg/Nm ³	173.0 mg/Nm ³	31.9 mg/Nm ³	40.7 mg/Nm ³	95.1 mg/Nm ³
CO	80 mg/Nm ³	13.0 mg/Nm ³	20.0 mg/Nm ³	30.0 mg/Nm ³	7.2 mg/Nm ³	11.0 mg/Nm ³	16.5 mg/Nm ³
SO2	100 mg/Nm ³	14.0 mg/Nm ³	16.0 mg/Nm ³	51.0 mg/Nm ³	7.7 mg/Nm ³	8.8 mg/Nm ³	28.0 mg/Nm ³

Analytes	EU Standards	Determined values WASTEGONE/EWMS October 2019			Corrected values with O2 factor 0.55 WASTEGONE/EWMS October 2019		
		Municipal Waste	Municipal Waste	Municipal Waste + Tyres	Municipal Waste	Municipal Waste	Municipal Waste + Tyres
		Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C	Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C
Particulates	5 mg/Nm ³	0.8 mg/Nm ³	3.9 mg/Nm ³	3.1 mg/Nm ³	0.4 mg/Nm ³	2.1 mg/Nm ³	1.7 mg/Nm ³
NOX	120 mg/Nm ³	58.0 mg/Nm ³	74.0 mg/Nm ³	173.0 mg/Nm ³	31.9 mg/Nm ³	40.7 mg/Nm ³	95.1 mg/Nm ³
CO	50 mg/Nm ³	13.0 mg/Nm ³	20.0 mg/Nm ³	30.0 mg/Nm ³	7.2 mg/Nm ³	11.0 mg/Nm ³	16.5 mg/Nm ³
SO2	30 mg/Nm ³	14.0 mg/Nm ³	16.0 mg/Nm ³	51.0 mg/Nm ³	7.7 mg/Nm ³	8.8 mg/Nm ³	28.0 mg/Nm ³



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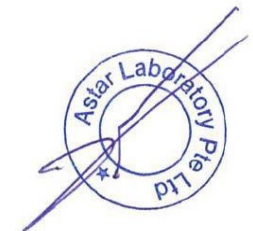


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 Company Registration No. & GST: 201323826G

Analytes	Philippines Act	Determined values WASTEGONE/EWMS October 2019			Corrected values with O2 factor 0.55 WASTEGONE/EWMS October 2019		
		Municipal Waste	Municipal Waste	Municipal Waste + Tyres	Municipal Waste	Municipal Waste	Municipal Waste + Tyres
		Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C	Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C
Particulates	200 mg/Nm ³	0.8 mg/Nm ³	3.9 mg/Nm ³	3.1 mg/Nm ³	0.4 mg/Nm ³	2.1 mg/Nm ³	1.7 mg/Nm ³
NOX	500 mg/Nm ³	58.0 mg/Nm ³	74.0 mg/Nm ³	173.0 mg/Nm ³	31.9 mg/Nm ³	40.7 mg/Nm ³	95.1 mg/Nm ³
CO	500 mg/Nm ³	13.0 mg/Nm ³	20.0 mg/Nm ³	30.0 mg/Nm ³	7.2 mg/Nm ³	11.0 mg/Nm ³	16.5 mg/Nm ³
SO2	200 mg/Nm ³	14.0 mg/Nm ³	16.0 mg/Nm ³	51.0 mg/Nm ³	7.7 mg/Nm ³	8.8 mg/Nm ³	28.0 mg/Nm ³

Analytes	Singapore Standards	Determined values WASTEGONE/EWMS October 2019			Corrected values with O2 factor 0.55 WASTEGONE/EWMS October 2019		
		Municipal Waste	Municipal Waste	Municipal Waste + Tyres	Municipal Waste	Municipal Waste	Municipal Waste + Tyres
		Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C	Test 1 at 500 deg C	Test 2 at 700 deg C	Test 3 at 900 deg C
Particulates	50 mg/Nm ³	0.8 mg/Nm ³	3.9 mg/Nm ³	3.1 mg/Nm ³	0.4 mg/Nm ³	2.1 mg/Nm ³	1.7 mg/Nm ³
NOX	400 mg/Nm ³	58.0 mg/Nm ³	74.0 mg/Nm ³	173.0 mg/Nm ³	31.9 mg/Nm ³	40.7 mg/Nm ³	95.1 mg/Nm ³
CO	100 mg/Nm ³	13.0 mg/Nm ³	20.0 mg/Nm ³	30.0 mg/Nm ³	7.2 mg/Nm ³	11.0 mg/Nm ³	16.5 mg/Nm ³
SO2	200 mg/Nm ³	14.0 mg/Nm ³	16.0 mg/Nm ³	51.0 mg/Nm ³	7.7 mg/Nm ³	8.8 mg/Nm ³	28.0 mg/Nm ³

Remark: filtering system existing of only 1 wet scrubber





ASH & SLUDGE COMPLIANCE

ASH 1 - DOMESTIC WASTE, SAMPLING DATE: OCTOBER 1 2019

ASH 2 - DOMESTIC WASTE W/TYRES, SAMPLING DATE: OCTOBER 2 2019 SLUDGE,

SAMPLING DATE: OCTOBER 3 2019

Test	Method	Result			Philippines Standard	Singapore Standard	USEPA Standard
		Ash 1	Ash 2	Sludge			
Arsenic (as Total As), mg/L	EPA 1311/ICP-OES	<0.10	<0.10	<0.10	5	5	5
Barium (as Total Ba), mg/L	EPA 1311/ICP-OES	0.41	1.12	<0.10	100	100	100
Cadmium (as Total Cd), mg/L	EPA 1311/ICP-OES	<0.01	<0.01	<0.01	5	1	1
Chromium (as Total Cr), mg/L	EPA 1311/ICP-OES	0.15	0.04	<0.01	5	5	5
Lead (as Total Pb), mg/L	EPA 1311/ICP-OES	<0.10	<0.10	<0.10	5	5	5
Mercury (as Total Hg), mg/L	EPA 1311/VGA-ICPOES	<0.01	<0.01	<0.01	0.2	0.2	0.2
Selenium (as Total Se), mg/L	EPA 1311/ICP-OES	<0.10	<0.10	<0.10	1	1	1
Silver (as Total Ag), mg/L	EPA 1311/ICP-OES	<0.10	<0.10	<0.10	-	5	5

- Remarks**
- 1.) The above results were tested based on sample submitted with reference to National Environmental Agency (NEA) Recommended Acceptance Criteria for Suitability of Industrial Wastes for Landfill Disposal as stipulated by Public Utilities Board (PUB) and DENR Standards for Wastes with Inorganic Chemicals under DAO 2004-36 Standards.
 - 2.) Singapore standards follow those of USEPA

