



Control Number: 38578



Item Number: 3

Addendum StartPage: 0

*Public Utility Commission of Texas*

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**Memorandum**

**TO:** Central Records

**FROM:** Theresa Gross, Competitive Markets – Energy Efficiency *tg*

**DATE:** May 27, 2011

**RE:** Project No. 38578, Energy Efficiency Implementation Project  
Under SUBST.R.25.181 (q)

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Please file the attached ARL Research Lab and Eco-Aqua ad submitted by Green Lantern for the June 2, 2011 EEIP meeting.

11 MAY 27 PM 1:44  
FILING CLERK

11 MAY 27 PM 1:44

11 MAY 27

# Eco-Aqua™

Eco-Aqua™ is a "green product" that conserves energy & preserves our precious water supply. Eco-Aqua™ takes the **WASTED ENERGY** from A/C's or **UTILIZES FREE** solar energy with **NO** pump and **NO** electrical requirement to produce hot water.

**100% MANUFACTURED IN THE USA!**

**HIGHLY PROFITABLE**

Average installation **NETS** \$400.00

**AFFORDABLE**

Average end-user cost is \$1,200.00, less local & federal rebates

**EASY TO INSTALL**

Takes 2 workers 4-5 hours

**INSTALLATION**

Installation can only be done by a certified/licensed air conditioning specialist who has taken Green Lantern, LLC's Eco-Aqua™ 4 hour course in Alachua, Florida. Classes will begin in February 2011.

**TERRITORIES**

We are establishing **Exclusive USA & International Territories** and **Joint-ventures** with individuals who need financing.

**CONTACT US:**

<http://www.greenlanternllc.com>

Email: [info@greenlanternllc.com](mailto:info@greenlanternllc.com) Call: 352-871-9955

APPLIED



RESEARCH LABORATORIES

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## PERFORMANCE REPORT

L/N 50081

**Green Lantern, LLC  
13101 Rachael Blvd.  
Alachua, FL 32615**

**Heat Recovery System  
Model: Eco-Aqua TM**

L/N 50081

Green Lantern, LLC

Issued 03/30/11

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**Lab Number:** 50081

**Client:** Green Lantern, LLC  
 13101 Rachael Blvd.  
 Alachua, FL 32615

**Test Method:** Client Specified Protocol

**Product:** Heat Recovery System

**Model:** Eco-Aqua TM

### REPORT OF TEST

#### 1 INTRODUCTION

- 1.1 Green Lantern, LLC, of Alachua, FL, retained Applied Research Laboratories (ARL) to conduct temperature measurements according to a client specified protocol on a heat recovery system, Model Eco-Aqua TM.
- 1.2 Temperature measurements were taken by ARL Project Engineer E. John Lanager on Tuesday, March 29, 2011.
- 1.3 The measurement program was authorized by an ARL Work Authorization Form (Form WAF-00) signed by Mr. Glenn Blumberg, Vice-President of Green Lantern, LLC, on Thursday, March 24, 2011.

#### 2 TEST SYSTEM DESCRIPTION

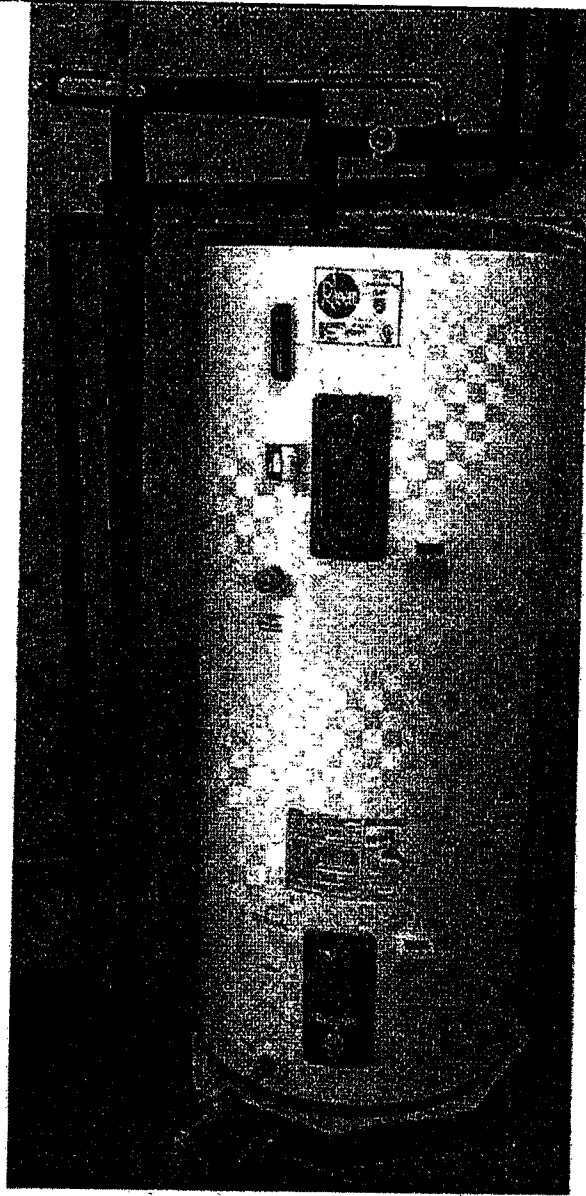
- 2.1 The test system on which temperature measurements were taken was installed at Metalloy Industries, Inc, 13101 Rachael Blvd, Alachua, FL, 32615
- 2.2 The test system was attached, via seamless copper tubing of various trade sizes, to the condensing unit of a 3-ton Carrier Heat Pump and a Rheem Solaride Water Heater. Apollo tempering and flush valves were also used
- 2.3 The outlet of the heat pump's compressor (discharge) was rerouted and connected to the refrigerant inlet of the Eco-Aqua TM. The refrigerant outlet of the Eco-Aqua TM was then routed back to the heat pump and connected to the inlet of the condensing coil.



- 2.4 Cold, city water was supplied to the top of the water heater where it was routed, via tubing, to the bottom of the tank. The cold water exited the bottom of the tank and was connected to the water inlet of the Eco-Aqua TM. The water outlet of the Eco-Aqua TM was routed back to the top of the tank via a heat riser. Hot water was then piped to two (2) sink faucets (Right and Left) located at a distance of approximately sixty (60) feet from the tank.
- 2.5 The hot water source of the Right Sink Faucet was connected to the Eco-Aqua TM.
- 2.6 The hot water source of the Left Sink Faucet was not connected to the Eco-Aqua TM. It was connected to a separate electric hot water heater without any modifications.



Photograph 1  
Eco-Aqua TM



**Photograph 2**  
**Installed Test System**



**Photograph 3**  
**Condensing Unit of 3-ton Carrier Heat Pump**





**3 EQUIPMENT USED**

3.1 The following equipment was used for temperature measurements:

Equipment	ASST ID	Calibration Date	Calibration Due Date
Psychrometer with Type-K Thermocouple	2014	12/4/10	12/4/11
Psychrometer with Type-K Thermocouple	2015	1/20/11	1/20/12
Psychrometer with Type-K Thermocouple	2016	1/20/11	1/20/12

3.2 All psychrometers used were manufactured by Extech Instruments, Model HD500, and include temperature, humidity and Type-K thermocouple Specifications are as follows:

Measurement	Range	Accuracy
Type-K Thermocouple	-148 to 2501°F	± 1%
Air Temperature	14 to 140°F	± 2%
Relative Humidity	0 to 100% RH	± 2%



#### 4 TEST METHOD

- 4.1 Before any temperature measurements were taken it was verified that all power to the water heater connected to the Eco-Aqua TM was disconnected. At no time, while temperatures were being recorded, did the water heater receive power
- 4.2 Temperatures of copper tubing were measured by holding the welded end of the thermocouple to the location at which the temperature was being measured. Water temperatures were taken by holding the welded end of the thermocouple in the stream of water
- 4.3 Temperature measurements were taken at the following locations:
  - a) End of Heat Riser
  - b) City Water Supply
  - c) Right Sink Faucet
  - d) Left Sink Faucet
  - e) Refrigerant Inlet to Eco-Aqua TM
  - f) Refrigerant Outlet from Eco-Aqua TM
  - g) Outside Ambient Conditions
  - h) Inside Ambient Conditions

**5 DATA**

5.1 The following data was collected:

Location	S1	S2	S3	S4	S5	S6	S7
End of Heat Rise	77.5	103.9	113.0	112.1	116.3	116.4	115.8
City Water Supply	76.9	76.0	75.8	78.4	78.8	79.2	78.5
Right Sink Faucet (Cold / Hot)	75.0 / -	71.6 / 87.1	72.3 / 93.2	73.4 / 98.3	73.4 / 105.7	73.5 / 106.2	74.1 / 109.0
Left Sink Faucet (Cold / Hot)	70.8 / -	- / -	- / -	- / -	- / -	- / -	73.2 / 110.4
Refrigerant Heat to Eco Aqua TV	73.3	124.4	133.4	140.8	135.8	135.3	134.3
Refrigerant Heat to Eco Aqua TV	76.0	105.5	108.7	110.2	111.0	110.9	113.0
Outside Ambient (Temp / Humidity)	75.0 / 63.4	74.1 / 63.1	67.2 / 73.0	66.5 / 73.2	77.3 / 64.6	67.0 / 67.6	65.1 / 72.3
Inside Ambient (Temp / Humidity)	75.5 / 63.9	70.6 / 63.1	74.2 / 64.6	75.7 / 61.3	72.2 / 59.2	73.1 / 69.6	73.3 / 69.1

- All temperature data shown above is in degrees Fahrenheit (°F).
- All humidity data shown above is in percent relative humidity (% RH).

5.2 At 4.0 hours of continuous device operation the elapsed time of the temperature rise from cold to hot at the outlet of the sink faucets was recorded. Time measurements were taken using a typical stopwatch

5.2.1 Left Sink Faucet – It took 2 minutes, 47 seconds for the water to rise from 73.2°F to 110.4°F.

5.2.2 Right Sink Faucet – It took 16 seconds for the water to rise from 74.1°F to 98.0°F It took an additional 2 minutes, 31 seconds to rise from 98.0°F to 109.0°F.

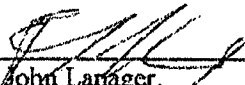
**6 CONCLUSION**

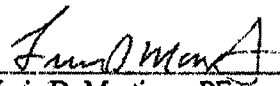
- 6.1 No conclusions or recommendations were made.
- 6.2 The data shown in this report pertain only to the test system on which temperature measurements were made and may not be representative of ongoing production and/or other configurations or variations
- 6.3 The test system was not field certified or field labelled
- 6.4 The test system is not considered to be listed and is not eligible for ARL's Listing, Labelling and Follow-up Service Program.

**END OF REPORT**

Report by:

Reviewed by:

  
E. John Larager,  
Project Engineer

  
Luis D. Martinez, PE  
Director of Engineering

Date: 3/30/11

Date: 3-30-11

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