Test Report

On

Ambient Air Quality Assessment

Prepared

For

Vertex RMG Division

Vertex Wear Limited, Dress World Limited, Neo Fashion Limited

Varari, Rajfulbaria, Tetuljhora, Hemayetpur, Savar, Dhaka, Bangladesh

Report No. XSAAQ_3RECL-2017-1224

Prepared by

3R ENVIRONMENTAL CONSULTING

sustainable solutions through innovation

Ambient Air Quality Assessment

At
Vertex RMG Division

Vertex Wear Limited, Dress World Limited, Neo Fashion Limited

Varari, Rajfulbaria, Tetuljhora, Hemayetpur, Savar, Dhaka, Bangladesh

Report No.	XSAAQ_3RECL-2017-1224
Sampling Date	November 26, 2017
Sampling Time	02:00 p.m. - 05:00 p.m.
Reporting Date	November 27, 2017

Environmental Conditions	
Temperature	28.1°C
Humidity	52% RH
Visibility	Winter & Sunny Atmosphere

Method of Sampling

Analysis of the ambient air emission was done using direct reading instruments. So, there was no separate sampling for this analysis. During the analysis, a standard work instruction stated in the SWI-04, SWI-05 and SWI-06 was followed.

Description of Instrument

Eight calibrated direct reading instruments designed to measure the Carbon Monoxide (CO), Carbon Dioxide (CO_2), Sulfur Dioxide (SO_2), Oxides of Nitrogen (NO_x), Suspended Particulate Matter (SPM), Particulate Matter (PM_{10} and $PM_{2.5}$) was used to assess the Ambient air quality.

Methods of Analysis

The following methods were used to analyze the ambient air quality parameters.

Parameters	Methods
CO (Carbon Monoxide)	Electrochemical
CO_2 (Carbon Dioxide)	NDIR(Non Dispersive Infrared)
SO_2 (Sulfur Dioxide)	Electrochemical
NO_x (Oxides of Nitrogen)	Electrochemical
SPM(Suspended Particular Matter)	Laser
PM_{10} (Particulate Matter)	Laser
$PM_{2.5}$ (Particulate Matter)	Laser

Measurement Uncertainties

The following measurement uncertainties were assigned to the respected parameters.

CO (Carbon Monoxide)	±0.2 ppm
CO_2 (Carbon Dioxide)	2% of Rdg. ± 10 ppm
SO_2 (Sulfur Dioxide)	±0.5 ppm of Rdg
NO_x (Oxide of Nitrogen)	±0.5 ppm of Rdg
SPM(Suspended Particular Matter)	±0.4%
PM_{10} (Particulate Matter)	±0.4%
$PM_{2.5}$ (Particulate Matter)	±1.1%

Team

All the experiments and reporting have been done under the supervision of

Mohammad Kabir Hossain (MSc in Environment & Sustainable Technology, Manchester, UK).

Team members involved in field experiments and reporting

- **Md. Sarwar Kabir** (BSc in Electrical and Electronics Engineering)
  Chief Technical officer, 3R Environmental Consulting Limited

- **Mohammad Faridul Islam** (BSc & MSc in Environment Science)
  Lab Analyst, 3R Environmental Consulting Limited

- **Mohammad Mosarof Hossain**
  Assistant Technical officer, 3R Environmental Consulting Limited

Results of Analysis

The findings are expressed in the table below:

Location	Section	Parameters							
		SPM	$PM_{2.5}$	PM_{10}	SO_2	CO	CO_2	NO_x	O_2
		$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	ppm	ppm	$\mu g/m^3$	%
Outside Of Factory	East Zone	**162**	**22**	**69**	**0**	**0**	**462**	**0**	**21.0**
Outside Of Factory	South Zone	**184**	**33**	**94**	**0**	**0**	**551**	**0**	**21.0**
Outside Of Factory	North Zone	**176**	**32**	**93**	**0**	**0**	**518**	**0**	**21.0**
Outside Of Factory	West Zone	**177**	**23**	**83**	**0**	**0**	**524**	**0**	**21.0**

Standard Parameters for Ambient Air Quality as following

Parameters	SPM	$PM_{2.5}$	PM_{10}	SO_2	CO	CO_2	NO_X
Units	**$\mu g/m^3$**	**$\mu g/m^3$**	**$\mu g/m^3$**	**$\mu g/m^3$**	**ppm**	**ppm**	**$\mu g/m^3$**
DoE Standard (National)	**200**	**65**	**150**	**365**	**9**	**NYS**	**100**
WHO Standard	**NYS**	**25**	**50**	**20**	**10**	**NYS**	**200**
OSHA standard	**NYS**	**NYS**	**NYS**	**NYS**	**50**	**5000**	**NYS**
ASHRAE	**NYS**	**NYS**	**NYS**	**NYS**	**9**	**1000**	**NYS**
NAAQS	**500**	**65**	**150**	**120**	**9**	**NYS**	**120**

***NYS=** Not Yet Set

PPM= Parts per million

$\mu g/m^3$= Micrograms per cubic meter

DoE= Department of Environment Standard (Bangladesh)

OSHA= Occupational Safety and Health Administration (USA)

ASHRAE= American Society of Heating, Refrigerating and Air Conditioning Engineers

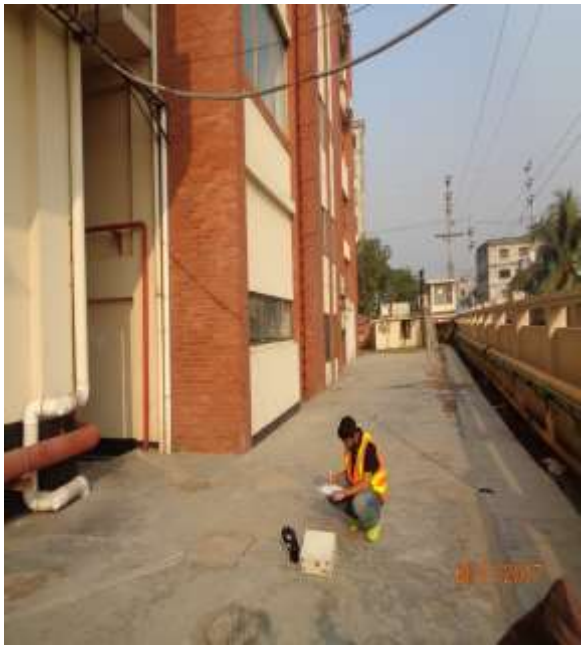
WHO= World Health Organization

NAAQS=The National Ambient Air Quality Standard (USA)

Remarks

According to the result of analysis, it has been observed that the Ambient air quality of the factory is broadly under the standard limit of national or international guidelines. All of the areas count of SO_2, CO, CO_2 and NO_X is within the standard limit both nationally and internationally. Particulate matter count (PM_{10} and $PM_{2.5}$) and Suspended Particulate Matter (SPM) is also within the standard limit of DoE (national) and NAAQS (international) organization. It is also recommended that plenty of trees should be planted in surrounding area to minimize the effect of emission.

Prepared by	**Checked by**	**Approved by**
_____	_____	_____

Ambient Air Quality Testing Picture	Ambient Air Quality Testing Picture
	
Ambient Air Quality Testing Picture	**Ambient Air Quality Testing Picture**