

# **INDEPENDENT TESTING SERVICES LIMITED**

*Testing & Inspection Services to the Civil Engineering Industry*

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## **TEST REPORT No. RN3300**

**Dust Monitoring using the  
Bergerhoff Method**

**Site: Primary Care Centre,  
Grangegorman Upper, Dublin 7**

**Monitoring Period: 7<sup>th</sup> December 2015 to 4<sup>th</sup> January 2016**

I.T.S. Job No. JN2312

Prepared for: L & M Keating Ltd.

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### LABORATORY ANALYSIS CERTIFICATE

*S. Dixon*

Simon Dixon

Director

**For and on behalf of Independent Testing Services Limited.**

## 1 INTRODUCTION

Independent Testing Services Limited were instructed by L & M Keating Ltd to carry out dust monitoring at their site at Grangegorman Upper, Dublin 7.

The purpose of monitoring was to determine the average monthly dust deposition at two locations on the site boundary using the Bergerhoff Method.

This report presents the results of the dust monitoring for the period from 7<sup>th</sup> December 2015 to 4<sup>th</sup> January 2016.

## 2 SITE DETAILS

The site at Grangegorman is currently undergoing redevelopment, including the refurbishment of existing buildings and the construction of new buildings. Of particular relevance to the generation of air-borne dust is the heaping of soils into a number of piles for future use or disposal.

## 3 PRINCIPLE OF THE BERGERHOFF METHOD

The Bergerhoff Method is described in the standards BS1747 Part 1: *Methods for the measurement of air pollution. Deposit gauges*, and VDI 4320 Part 2 *Measurement of atmospheric depositions - Determination of the dust deposition according to the Bergerhoff method* (the latter published by the German Engineering Institute).

With reference to BS6069 Part 2, dust is characterised as encompassing solid Particulate Matter (PM) with a particle size of between 1 and 75 microns (1 - 75  $\mu\text{m}$ ). Dust can become suspended in the atmosphere from many sources, both natural (pollen/spores, sea salt, soil volcanic ash, fires, etc.) and anthropogenic (construction/demolition, minerals extraction, agriculture, industry, transport, leisure activities, etc.). Construction activities are likely to generate some dust emissions, depending on the dust mitigation measures adhered to on the particular site.

Dust deposition typically occurs in close proximity to the source, and potential dust impacts may occur within 500 meters of the dust generating activity as dust particles fall out of suspension in the air. Larger particles deposit closer to the generating source and deposition rates will decrease with distance from the source.

Health effects are associated with fine particles smaller than 10 µm in size (PM<sub>10</sub>). “Nuisance dust” (when deposited to ground, buildings, or other materials) is generally associated with the coarse fraction particulates, greater than 20 µm in size.

The Bergerhoff Method uses dust deposition gauges to measure the total particulate matter that is deposited into a collecting vessel by its own weight, or by the assistance of rainfall.

The total amount of dust deposited in the collection vessel during the monitoring period is determined by laboratory analysis, *i.e.* the weight of the total insoluble residue on evaporation. The average monthly deposition is expressed as the weight of dust that has been collected per unit area per day.

## **4 METHODOLOGY**

The dust deposition was sampled at 2 no. monitoring stations within the Grangegorman site, using Bergerhoff Dust Deposition Gauges which were installed at locations specified by L & M Keating Ltd.

The location references for the dust monitoring stations are as follows:

- Monitoring Station 1: Left side of gate looking out onto Grangegorman Upper.
- Monitoring Station 2: Right side of gate looking out onto Grangegorman Upper.

The period of monitoring was from 7<sup>th</sup> December 2015 to 4<sup>th</sup> January 2016, *i.e.* 28 days.

When the dust sample jars were collected on 4<sup>th</sup> January 2016, the sample at Monitoring Station 1 was found to have been destroyed. The exact date that this occurred and the reason for it happening is not certain, however it was probably caused by either extreme weather conditions or vandalism during the period when the site was closed for the Christmas/New Year holiday.

The remaining dust sample was laboratory analysed by BHP Laboratories, using gravimetric weight analysis, to determine the amount of dust deposition.

## **5 RESULTS OF DUST MONITORING**

The laboratory analysis certificate is included in the Appendix of this Report. Only the results for Monitoring Station 2 are presented since the sample at Monitoring Station 1 was destroyed during the monitoring period.

The results of the dust monitoring at Monitoring Station 2 at the Grangegorman site can be summarised as follows:

**Monitoring Station 2**

Monitoring period:	7 <sup>th</sup> December 2015 to 4 <sup>th</sup> January 2016
Number of days:	28
Collecting surface area:	$4.778 \times 10^{-3} \text{ m}^2$
Total dust deposition:	12.3 mg
<b>Average Dust Deposition:</b>	<b>91.9 mg/m<sup>2</sup>/day</b>

**APPENDIX**

**LABORATORY ANALYSIS CERTIFICATE**

# TEST REPORT NO.: 120109 Issue 2

Analysing  
Testing  
Consulting  
Calibrating



**Client:** Independent Testing Services Ltd  
5 Main Street  
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Co. Laois

**BHP Ref. No.:** 16/01/062-063  
**Order No.:**  
**Date Received:** 05/01/16  
**Date Completed:** 07/01/16  
**Test Specification:** Nil  
**Item :** See below

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**FTAO:** Mr Simon Dixon

TEST	Client Reference	Units	Results	Test Method
Residue Dust Deposition	Monitoring Station 1 07/12/15 to 04/01/16*	mg mg/m <sup>2</sup> /day	N/A** N/A**	BHP AC 017 BHP AC 017
Residue Dust Deposition	Monitoring Station 2 07/12/15 to 04/01/16*	mg mg/m <sup>2</sup> /day	12.3 91.9	BHP AC 017 BHP AC 017

**Additional Information:** All Sample locations are inside the EPA Limit of 350 mg/m<sup>2</sup>/day.  
\*Monitoring period provided by Independent Testing Services Ltd  
\*\*Sample at location 1 was destroyed on site.

**For and on behalf of BHP laboratories :**

*Colette Hannan*

**Colette Hannan**  
**Issue Date : 26/01/16**

Supplementary to BHP Test Report 120109

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