

**Town and Country Planning Act 1990  
Section 106 Agreement**

**ENVIRONMENTAL MONITORING**

**1. INTRODUCTION**

1.1 On 25<sup>th</sup> January 2008 INEOS and Halton Borough Council ('HBC') entered into an agreement pursuant to section 106 Town and Country Planning Act 1990 ('the S.106 Agreement') in respect of the Runcorn Energy from Waste Facility on land at Weston Point, Runcorn, Cheshire ('the EfW facility').

1.2 The S.106 Agreement, Schedule 3, Paragraph 4 states:

*"The Owner agrees not to commence operation of the Development until it has submitted to the Council a scheme detailing the location (which may extend to land within the Owner's control and outside of the Application Site) and frequency of monitoring of air quality and noise emissions during plant operation and the Council has approved in writing the said scheme and thereafter to provide the Council with a written report every quarter (or such shorter or longer period as may be agreed in writing with the Council) detailing the results of the monitoring."*

1.3 This document summarises the scheme for monitoring of air quality that INEOS will propose to discharge the Environmental Monitoring planning obligation created by the S.106 Agreement, Schedule 3, Paragraph 4.

**2. AIR QUALITY**

Continuous monitoring

**Methodology**

2.1 The air quality monitoring methodology shall comply with the following standards:

- BS.EN.ISO.9001:2001 for quality procedures
- TickIT for software development procedures
- British Safety Council (5 stars) for health, safety and environment
- Certification to ISO 14001 for environmental management
- Certification to OHSAS 18001 for occupational health and safety

2.2 The air quality monitoring technique shall be as follows:

<b>Monitoring Technique</b>	<b>Measurement Frequency</b>
1 x continuous chemiluminescent analyser	Continuous Reported every 15 minutes with hourly averages
2 x MetOne BAM analysers	Continuous Reported hourly
Partisol 2000 & laboratory analysis	Continuous sampled for each month

2.3 The air quality monitoring shall be of:

- Oxides of nitrogen
- Particulate matter (PM10 and PM2.5)

- Dioxins

#### **Location**

- 2.4 The monitoring equipment shall be located on the grounds of Westfield Primary School, Clayton Crescent, Runcorn, WA7 4TR; as shown for identification purposes only on Figure 1.

#### **Passive monitoring**

##### **Methodology**

- 2.5 Diffusion tubes monitoring oxides of nitrogen will be located at suitable sites in the area between the continuous monitoring equipment to be provided under this agreement, and that provided in relation to planning condition 62.
- 2.6 Suitable sites will be determined by reference to Figure A.1 of the Halton Stack Assessment, and must be at least 10m from heavily used roads.
- 2.7 Between three and six sites dependent upon availability of suitable sites, with tubes also being co-located with each of the two continuous monitors.

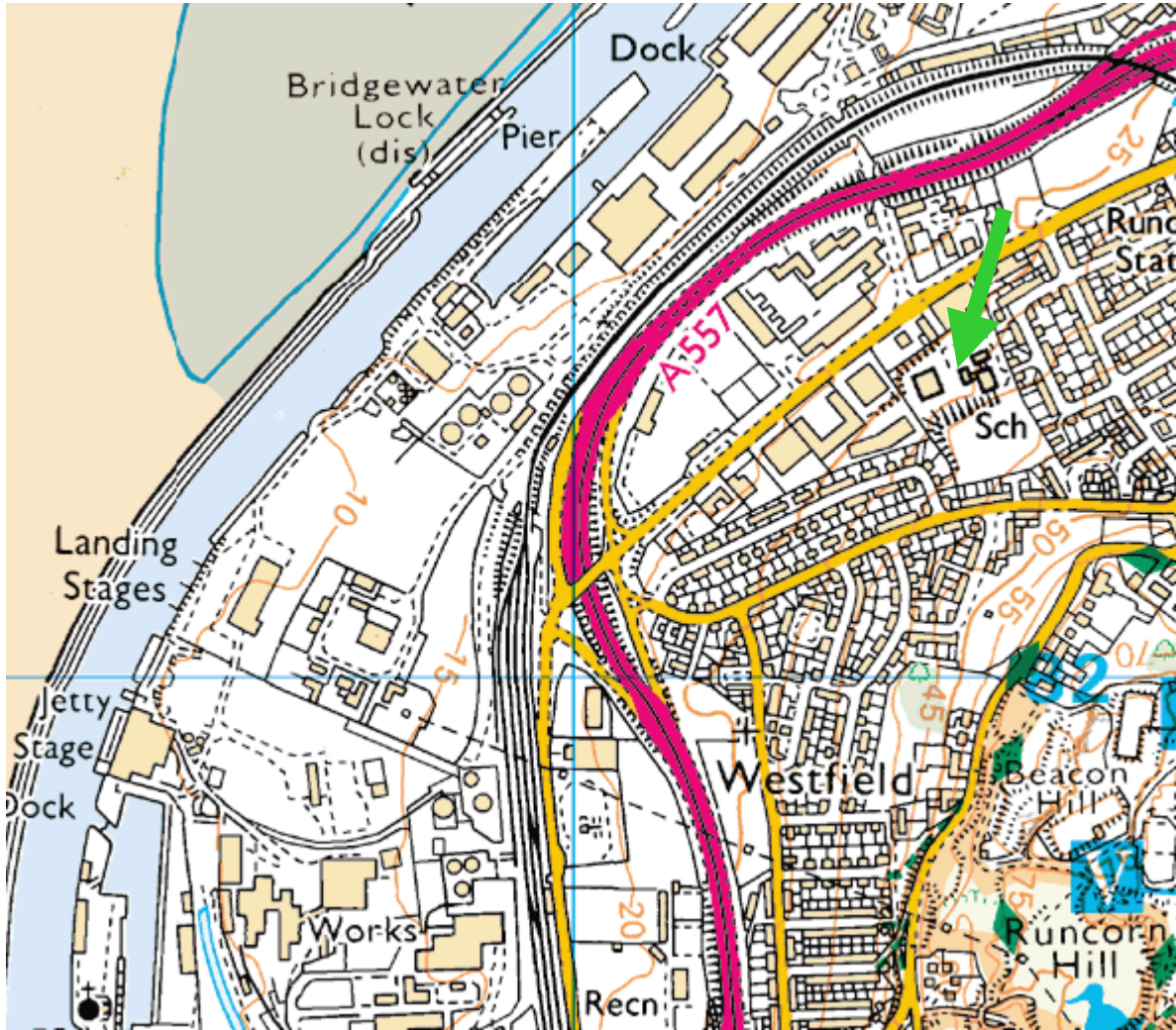
##### **Period and Frequency**

- 2.8 It is noted that the s.106 Agreement does not require monitoring to commence until the facility is operating.
- 2.9 Notwithstanding 2.9 above, monitoring will commence by the end of March 2013. Monitoring under the s.106 Agreement will continue for the same period as the continuous monitoring in relation to planning condition 62.

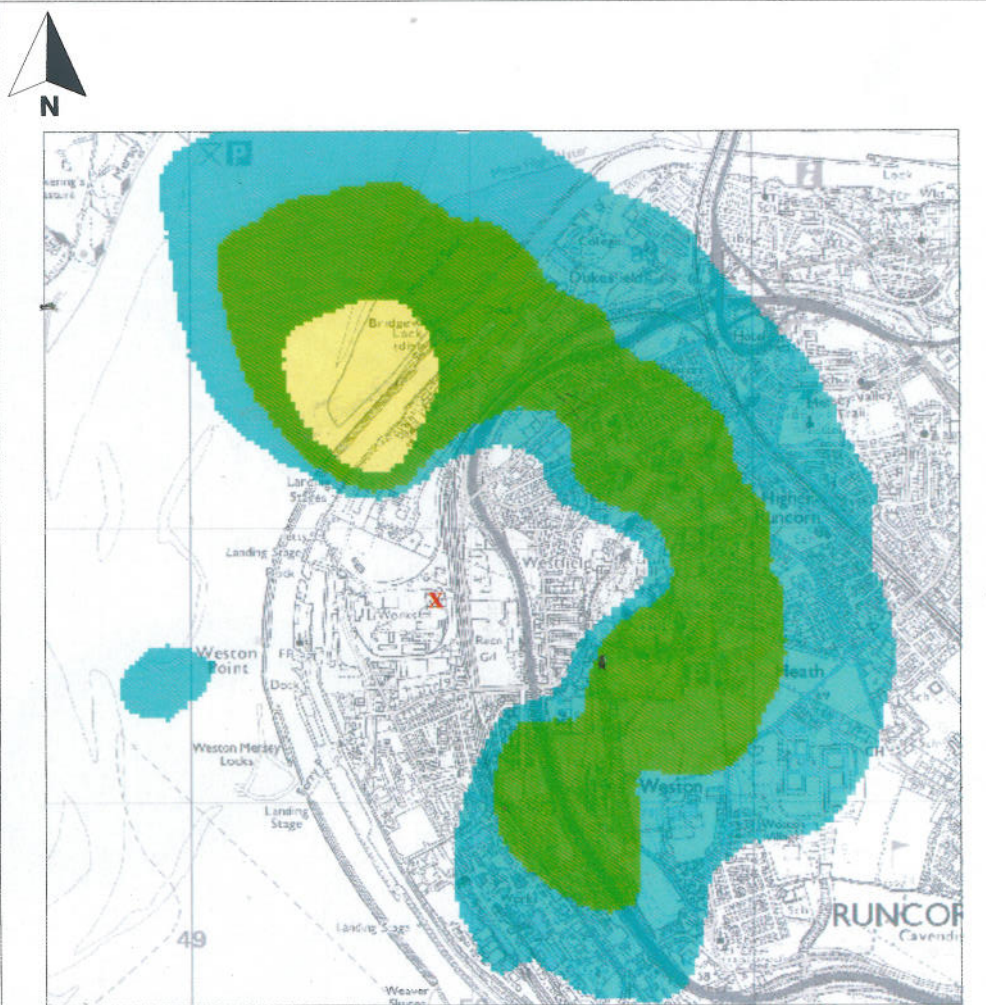
##### **Reporting**

- 2.10 A written report detailing the results of the air quality monitoring shall be lodged with HBC every quarter (or such shorter or longer period as may be agreed in writing with HBC).

Figure 1 Air Quality Monitoring Location

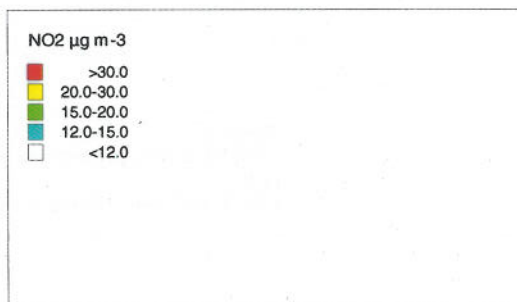


**Figure A.1 of Halton Stack Assessment**



Key:

Scale 1:36.44 @ A4



Halton Stack Assessment

**Figure A.2**  
Short Term NO<sub>2</sub> Concentration  
 $\mu\text{g m}^{-3}$   
NO<sub>x</sub> to NO<sub>2</sub> conversion at 35%

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**SLR Consulting Letter dated 12 December 2012**  
**Air Quality – Ambient Monitoring Recommendations**

12th December 2012

Mr Julian Watts  
INEOS ChlorVinyls Limited  
Runcorn Site HQ  
South Parade  
PO Box 9.  
Runcorn  
Cheshire  
WA7 4JE

Our Ref: 403.00778.00019  
Your Ref:

Dear Julian

**RE: AIR QUALITY: AMBIENT MONITORING RECCOMENDATIONS**

I have undertaken a review of Planning Condition 62 of the Permission and provision 4 (Environmental Monitoring) of the section 106 agreement with a view to considering what air quality monitoring would be appropriate to meet the requirements of such monitoring against any air quality risks posed by the development. The views of SLR Consulting on this issue are outlined below.

Halton Borough Council already monitor at the brine reservoir ('Runcorn 1') and this equipment was commissioned in relation to planning condition 62. The aim of this letter is therefore to consider the technical merits of additional monitoring. Specifically, I consider:

- Whether any additional monitoring would be of value in scientific terms; if so
- Which pollutants would it be of value to monitor given the risk of significant ground level impact; and
- How many additional monitoring locations would be necessary / useful.

**Qualifications and Experience**

I am a Technical Director of SLR Consulting Limited (SLR) and head the SLR UK air quality team. I hold a Bachelor of Science Degree with Honours in Agriculture and Environmental Science from the University of Newcastle upon Tyne. I also hold a Master of Science Degree from the University of Newcastle Upon Tyne in Environmental Resource Assessment. I am a Fellow of the Institute of Air Quality Management (IAQM), a Member of the Institute of Environmental Science (IES) and a Chartered Environmentalist. I have been a practising air quality specialist for 14 years. During this time I have provided air quality advice and services to a range of industry sectors and clients, including the waste and minerals industry. I have also worked on behalf of local authority and government agencies advising on air quality issues and have been involved in preparation of UK air quality guidance.

I am therefore qualified to present a considered expert view on this issue.

## Monitoring Scheme Requirements

Planning Condition 62 of the Permission states the following:

### Air Pollution Monitoring

- (62) The commissioning of the Development shall not take place until there has been submitted to and approved in writing by the Council, in consultation with the Environment Agency, a scheme for the monitoring of air pollution in their area. The scheme shall include the measurement location or locations within the relevant area from which air pollution will be monitored, the equipment and methods to be used and the frequency of measurement. The scheme shall provide for the first measurement to be taken not less than 12 months prior to the Commissioning of the Development and for the final measurement to be taken not more than 24 months after commissioning of the Development. The Company shall supply full details of the measurements obtained in accordance with the scheme to the Council as soon as possible after they become available.

INEOS ChlorVinyls have sought to discharge this Condition with Halton Borough Council ('HBC') and monitoring currently takes place at the Runcorn brine lagoons (the monitoring location is known as 'Runcorn 1').

Provision 4 (Environmental Monitoring) of the section 106 agreement states the following:

#### **4. Environmental Monitoring**

The Owner agrees not to commence operation of the Development until it has submitted to the Council a scheme detailing the location (which may extend to land within the Owner's control and outside of the Application Site) and frequency of monitoring of air quality and noise emissions during plant operation and the Council has approved in writing the said scheme and thereafter to provide the Council with a written report every quarter (or such shorter or longer period as may be agreed in writing with the Council) detailing the results of the monitoring.

## Significance

When considering the potential for ground level impacts of multiple pollutants it is important to prioritise these impacts and disregard any pollutants which fall below a threshold where they have the potential to lead to an environmental risk.

A detailed account of how process contributions should be assessed is provided in Environmental Permitting Regulations (EPR) Horizontal Guidance Note H1, Annex F. This guidance states that Process Contributions (PC's) can be considered insignificant if:

*the long term process contribution is <1% of the long term environmental standard;*

and

*the short term process contribution is <10% of the short term environmental standard*



Where PC's fall below this value they are regarded by the Environment Agency as below a level which would have the potential to cause environmental harm either alone or in contribution with existing background levels.

### Predicted Pollutant Impacts

HAGATI are seeking the monitoring programme to include monitoring for:

- Nitrogen dioxide (NO<sub>2</sub>);
- Particulate Matter (PM<sub>10</sub>); and
- Dioxins

Epidemiological testing on each of these pollutants (or pollutants groups in the case of dioxins) has been demonstrated as having the potential to be harmful and limits are set for each of them (nationally and internationally). However, the actual risk of harm will be based upon the exposure and whether this leads to receptors being exposed to levels at (or above) these limits.

The process contribution (PC) and Predicted Environmental Concentration (PEC) was predicted in the air quality assessment work undertaken by RPS at the planning and permitting stages. The approach to these predictions and the results were accepted by consultees and an Environmental Permit has been issued for the site.

The results of the modelling indicate that:

- The PC of PM<sub>10</sub> from the stack is 'insignificant'; and
- The PC of NO<sub>2</sub> from the stack cannot be regarded as insignificant (see below).

The EPR Decision Document ('DD') provides further clarification in relation to pollutants which cannot be regarded as 'insignificant':

It is important to understand that an exceedence of these H1 thresholds does not mean an emission will have a **significant** impact, but only that it cannot be screened out as **insignificant**.

In relation to dioxins, the main pathway for which is through the food chain, a different assessment method is required. This is discussed in some depth in the EPR Decision Document, which states that impacts of Dioxins are also predicted to be insignificant:

It is not the intention to reduce the ELV for dioxins in this permit on the basis of the performance demonstrated by other incinerators. Plant process conditions fluctuate naturally and continuously and emission levels fluctuate as a consequence. The ELV has been set at a level to ensure that there is no harm to the environment and it allows for a certain amount of process variation without causing the limit to be breached. As the predicted impact of releases at the ELV is regarded as insignificant, any further reduction of the ELV would still be insignificant. In any event we will keep ELVs under review.

## In-stack monitoring

It must be noted that there is already a requirement to monitor emissions of Nitrogen dioxide (NO<sub>2</sub>), Particulate Matter (PM<sub>10</sub>) and Dioxins through the Permit. This monitoring will ensure that levels of pollutants remain below ELV's (set at WID limits).

Freely available evidence from other EfW facilities indicates that levels of these pollutants are likely to be significantly below the regulatory limits.

## Local Concern

As an air quality scientist my role is to consider whether monitoring is scientifically justified.

Charlotte Sholl (EA Officer) corresponded with HBC on 7<sup>th</sup> March 2011, 2 months before the Permit was issued (on 17<sup>th</sup> May 2011) and confirmed that the Environment Agency did not consider that the level of pollution was 'sufficiently high' to require off-site monitoring. In fact, based on the conclusions of the EPR DD, even this appears to have overstated the potential impacts as the PC of both dioxins and PM<sub>10</sub> were confirmed by the Environment Agency as 'insignificant'.

Ms Sholl identified the 'considerable concern' expressed by the local residents. Similar concern is common at other EfW development sites despite the very clear Government Position on this issue<sup>1,2,3</sup>. It has been well documented that this concern 'has been courted'<sup>4</sup> by local action groups and that this is contrary to the Government position on the issue<sup>5,6,7</sup>.

It is my view that, whether or not there is pressure from local groups to regulate and / or monitor a facility beyond a level which is considered appropriate by the Regulator, all monitoring should only be considered where there is a scientific reason to do so. Where there is a reason, the monitoring regime should be designed for a specific purpose and in the full knowledge of the real-life constraints on the sampling locations, accuracy of the method and statistical error associated with the results.

In summary, a monitoring regime can be a valuable tool where a risk is identified and measurement will allow verification of predictions. Real-time monitoring, when focussed and appropriate to the source being measured, is a useful and sometimes *essential*<sup>8</sup> tool in environmental assessment. It is my view that the local concern referred to by Ms Sholl is not a justified reason for installation of a PM<sub>10</sub> and / or dioxin monitoring network such as HAGATI propose as it would not be capable of providing a level of accuracy that would be required to allow model 'verification' and any risk would already have been prevented through the CEMS monitoring and the obligations of Viridor under the terms of their Environmental Permit.

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<sup>1</sup> Paragraph 30 of PPS10

<sup>2</sup> EN-3 paragraph 2.5.43

<sup>3</sup> Waste Strategy 2007

<sup>4</sup> Newhurst Inspectors Report. APP/M2460/A/11/2150748, para 7.122

<sup>5</sup> Eastcroft EFW Inspectors Report. APP/Q3060/S/2036129/NWF

<sup>6</sup> Ince Marshes EFW Inspectors Report. APP/20645/A/07/205609

<sup>7</sup> Avonmouth EFW Inspectors Report. APP/Z0116/A/10/2132394. Para 104

<sup>8</sup> DEFRA LAQM TG (09) p6-2 para 6.11.

### Summary: Pollutants to be measured

In relation to PM<sub>10</sub> and dioxins, I consider that there can be no sensible, reasoned scientific argument as to why pollutants which are predicted to be released in such low levels that their impacts are predicted to be insignificant (even based on the most precautionary of assessments) would require monitoring at remote locations within the Runcorn area as proposed by HAGATI.

My view is in line with that of the Environment Agency in the Permit DD that the stack monitoring prescribed by the Environmental Permit will be sufficient to identify risks to health from emissions of these pollutants from the stack.

However, predicted Process Contributions of NO<sub>2</sub> cannot be regarded as insignificant and there is therefore a stronger scientific argument for proposing that the concentration of this pollutant is monitored (as indeed it is at the Runcorn 1 monitor).

### Runcorn Hill

HAGATI is concerned about levels of NO<sub>x</sub> (including NO<sub>2</sub>) at the Runcorn Hill Local Nature Reserve (LNR). For ecological sites, where there is an indication that significant pollution is being caused, monitoring should be aimed at providing a result for comparison against annual average EALs rather than short-term impacts. This is achievable using passive techniques, such as diffusion tubes.

However, the EPR Decision Document states the following in relation to this site:

Protection criteria for non-stat conservation sites, such as Local Nature Reserves, are not the same as for Habitats or SSSI in that we are required to ensure there is no significant pollution (described in section 5.4 of the DD). The evidence for NO<sub>x</sub> ambient level indicates that we cannot rule out the background being already above the ecological air quality critical load of 30 µg/m<sup>3</sup>. The predicted PC is 0.82 µg/m<sup>3</sup> which is 2.7% of the CL. This is considered to be insignificant for non-statutory conservation sites, being less than 100% of the critical level [as agreed with Natural England]. We therefore consider that further assessment is not required

Runcorn Hill is a Local Nature Reserve, not a SSSI. Having considered the condition of the site, after discussions with the local authority, we are satisfied that the potential additional impact of the INEOS incinerator, including present background levels of acid and nitrogen deposition will not cause damage to the site (see sec.5.4 of the DD).

In terms of human receptors, there are no residences within the LNR and thus in terms of human impact only the short term (1-hour) EAL would be relevant at this location<sup>9</sup>.

<sup>9</sup> Refer to DEFRA LAQM.TG(09) Box 1.4.

The Environment Agency is in agreement with this conclusion:

The impact of NO<sub>x</sub> on residents on Runcorn Hill is below the EAL for humans (40 µg/m<sup>3</sup>); see tables 5.2.1 and 5.2.2 in the DD and is not considered to be harmful.

## Conclusions

We are in agreement with the Environment Agency in that operation of the facility in accordance with WID and continuous monitoring using the CEMS system will be adequate to ensure that the emitted levels of pollutants remain below those used for the predictive modelling and a small fraction of those which would be likely to cause harm.

Offsite monitoring currently takes place at the Runcorn brine lagoons ('Runcorn 1') and this monitoring was commissioned by Halton Borough Council as a result of INEOS ChlorVinyls seeking to discharge the planning Condition 62.

If any additional monitoring is proposed it should focus on pollutants of significance in relation to this facility and be proportionate to the risk. Any monitoring program should be designed in a way which allows a greater level of certainty in relation to results (i.e. identifying a statistically significant effect given the complex interactions between other existing sources of the same pollutants which are shown to dominate the background).

It is my view that the existing monitoring programme is proportionate to the risk of environmental impact. The key monitoring will be that undertaken using the CEMS system installed in the facility stack. Anything additional would be of no obvious scientific benefit based on the results of the predictive assessments undertaken during the planning and permitting processes by the Applicant and the Environment Agency (i.e. 'check' modelling).

Please contact me if you wish to discuss any of the issues discussed in this letter.

Yours sincerely  
**SLR Consulting Limited**



**Matt Stoling**  
Technical Director

**SLR Consulting Letter dated 17 December 2012**  
**Evaluation of Options for Additional Air Quality Monitor**

17th December 2012

Mr Julian Watts  
Energy Projects Manager  
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Our Ref: 403.00778.00019

Dear Julian,

**RE: RUNCORN EFW FACILITY – SECTION 106 AGREEMENT ENVIRONMENTAL MANAGEMENT SCHEME – EVALUATION OF LOCATIONS FOR ADDITIONAL CONTINUOUS AIR QUALITY MONITOR**

Further to a recent site survey and reconnaissance of the Runcorn area, please find below a site appraisal of proposed locations for the relocation of the existing 'Runcorn 2' continuous air quality monitoring location.

## Background

Air quality monitoring is currently being undertaken by INEOS ChlorVinyls (INEOS) at a location adjacent to the brine reservoir on Runcorn Hill (location known as 'Runcorn 1'). This existing monitoring is undertaken in accordance with planning condition 62 for the Energy from Waste (EfW) facility. INEOS are seeking to locate an additional air quality monitor in relation to the S.106 agreement.

To assist in the site selection of the new monitoring location, SLR were requested by INEOS to provide a review and appraisal of potential monitoring locations in the Runcorn area, from a scientific air quality and dispersion point of view.

An initial desk top review of potential monitoring locations was undertaken through consultation with aerial photography of the Runcorn area. Sites were initially identified from consideration of contour plots produced as part of the Halton Stack Assessment to identify locations within Runcorn corresponding to the predicted locations of maximum plume ground-level process contributions from the operation of the Runcorn EfW facility. In this respect, monitoring undertaken in these locations would identify any deviation from baseline subsequent to the commissioning and operational phases of the EfW facility.

## Locations

From this initial desktop review, 3 sites were selected for the potential siting of the air quality monitor based upon a prevailing downwind location from the EfW stack, stack dispersion characteristics and site-suitability requirements (including ease of access, power supply, security, etc.) for TRL, the 3<sup>rd</sup> party company subcontracted to undertake the monitoring. Reference should be made to Figure 1 for an illustration of these site locations relative to the surrounding area and the INEOS Runcorn EfW facility. Within this document these sites are referred to as:

- option A: The United Utilities reservoir on Runcorn Hill;
- option B: The Westfield Primary School; and
- option C: The Riverside College, Dukesfield.

A site visit was undertaken on 22<sup>nd</sup> November 2012 by Graeme Blacklock. Graeme is an Associate of SLR Consulting Limited (SLR) working within the SLR UK air quality team. Graeme holds a Bachelor of Science Degree with Honours in Environmental Science from the Manchester Metropolitan University. Graeme also holds a Master of Science Degree from the University of Manchester in Pollution and Environmental Control, and is a Member of the Institute of Air Quality Management (MIAQM). Graeme has been a practising air quality specialist for over 9-years as a consulting scientist. During this time Graeme has provided air quality services (including as an expert witness) to a range of industry sectors and clients, including public and private sector. This work has included undertaking and managing long-term air quality monitoring studies to determine and appraise baseline ambient air pollutant concentrations as part of planning submissions.

During the site visit, any additional locations of merit were considered for the siting of the monitor, which may not have previously been identified from the desktop review of aerial photography.

## Appraisal

Options A, B and C have been appraised based upon the following criteria:

- Access;
- Security;
- Power supply;
- Location 1 (representation to plume grounding) and
- Location 2 (proximity to any surrounding influences).

The scoring applied to each of the above criteria, for the purposes of appraising the potential site locations, are rated in accordance with the ratings illustrated in Table 1.

Appraisal criterion 'location 1' and 'location 2' have been given majority weighting in the site appraisal scoring, given that these criteria are the most important in selecting an appropriate monitoring location.

**Table 1**  
**Air Quality Monitoring Site Location Appraisal – Scoring Criteria**

Category	Scoring Range
Access	1 (poor) – 3 (ideal)
Security	1 (poor) – 3 (ideal)
Power Supply	1 (poor) – 3 (ideal)

Location 1	1 (poor) – 5 (ideal)
Location 2	1 (poor) – 5 (ideal)

A summary of the site appraisals is provided in the following sub-sections.

### **Option A**

Potential monitoring location Option A is representative of the location of annual mean plume grounding as identified from Figure A.1 of the Halton Stack Assessment and therefore likely to be representative of maximum ground level concentrations from Process Contributions.

This location is approximately 180m from surrounding roads (other than roads of a 'suburban' nature with low traffic flows and low corresponding emission contributions) and therefore is not likely to be affected by traffic movements, in accordance with the Design Manual for Roads and Bridges<sup>1</sup> (DMRB).

This monitoring location is not representative of annual mean exposure (i.e. a location of long-term human exposure, such as a school or residential dwelling) and therefore concentrations monitored are not relevant for comparison to the long-term annual mean Air Quality Objectives (AQO). SLR note that the Runcorn 1 monitor is currently in a similar monitoring location, and consider that siting an additional monitor at the Option A location is unlikely to provide any useful source of monitoring data.

The reservoir would provide a secure compound location in order to site the air quality monitor, in addition to an existing mains / 220V electrical supply to power the monitor. The reservoir and surrounding land is owned by United Utilities – contact has been made to request access for long-term placement of the monitor, however, no response has yet been received. Experience with United Utilities suggests that these negotiations could become lengthy and protracted prior to any successful resolution.

In accordance with Figure A.1 of the Halton Stack Assessment, the location of Option A is broadly downwind of the EfW stack location. However, there is an existing structure on site of approximately 3-4m in height – any placement of the monitor on the lea side of this building in a downwind location is potentially in a 'cavity region' which may impact upon monitored concentrations.

In summary, from an air quality monitoring site perspective, SLR consider Option A to be advantageous from providing a location representative of that maximum long-term plume grounding and high security and readily available source of power, albeit the monitoring location is not representative of long-term exposure. However, access is potentially restricted due to 3<sup>rd</sup> party land ownership and relatively remote location in terms of mobilisation and delivery of the monitor. Additionally, surrounding buildings may potentially influence dispersion and flow which may affect and limit appropriate placement of the monitor and any data capture.

### **Option B**

Potential monitoring location Option B is approximately 1000m from the EfW stack location and not representative of annual mean plume grounding as identified from Figure A.1 of the Halton Stack Assessment. The Option B location is, however, representative of short-term

<sup>1</sup> Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA 207/07 - Air Quality, Highways Agency, 2007.



(1-hour mean) process concentrations as identified from Figure A.2 of the Halton Stack Assessment.

This location is approximately 120m from Picow Farm Road, the closest road with a potentially significant traffic flow which has the potential to result in a monitored emission contribution. Other roads in the immediate vicinity are of a more 'suburban' nature and therefore it is considered that potential corresponding emission contributions would be low. The A557 Western Point Expressway is greater than 200m from this monitoring location and thus will not be affected by traffic movements from this source, in accordance with the DMRB.

SLR note that the Option B location was not considered as a discrete receptor location within the original planning application and associated Air Quality Assessment. Monitoring data from the Option B location would provide concentrations representative of annual mean exposure. Option B is not located within the zone of annual mean plume grounding as identified from Figure A.1 of the Halton Stack Assessment. Option B is however located within the zone of short-term (1-hour mean) process concentrations as identified from Figure A.2 of the Halton Stack Assessment and is therefore predicted to be within the location of maximum short-term (1-hour mean) process contributions. Consequently, it is considered that monitoring data from Option B would be complimentary to that currently obtained from the Runcorn 1 monitor sited at the brine reservoir.

Topography of the surrounding land rises gradually from the location of the Runcorn EfW stack – the location of Option B is approximately the highest point of elevation in the direct path the EfW stack source. A number of buildings comprising The Westfield Primary School are present at the Option B site location. However, surrounding school grounds are extensive, ensuring that the location of the monitor could be sited in a location which would not be within a 'cavity region' which may potentially impact upon monitored concentrations.

In summary, from an air quality monitoring site perspective, SLR consider Option B to be advantageous from providing a good ease of access, security and power supply. An advantage of the relatively large land ownership of The Westfield Primary School, is that it ensures that the monitor could be sited in a location whereby not to be influenced by surrounding buildings. However, Option B is not representative of the location of maximum process contribution plume grounding (however it is in the zone of short-term 1-hour mean plume grounding). This location is representative of long-term exposure.

### ***Option C***

Potential monitoring location Option C is approximately 1400m from the EfW stack location and not representative of annual mean plume grounding as identified from Figure A.1 of the Halton Stack Assessment. The Option C location is, however, representative of short-term (1-hour mean) process concentrations as identified from Figure A.2 of the Halton Stack Assessment.

This location is greater than 200m from surrounding roads (other than roads of a 'suburban' nature with low traffic flows and low corresponding emission contributions) and therefore is not likely to be affected by traffic movements, in accordance with the DMRB. The Option C monitoring location is representative of annual mean exposure, however, it is not in the location of maximum predicted annual mean plume grounding.

Available land at the Option C site is dominated by a car-park for staff and students. However, due to the potential for an associated emission contribution to be monitored from this car-park source, TRL have suggested the potential for siting the monitor on the roof of the building. However, SLR noted from the site visit that the majority of the roof is not flat

(which would not provide a safe / suitable platform) and that area which is flat is a location of air condition vents, which may potentially affect monitored emissions. At ground level, due to the relatively built-up nature of surrounding commercial uses, placement of the monitor in the lea side surrounding buildings in a downwind location would potentially result in a 'cavity region' which may potentially impact upon monitored concentrations.

In summary, from an air quality monitoring site perspective, SLR consider Option C to be advantageous from providing a reasonable high level of security and access, with an assumed ready source of power. However, the location is not ideal in terms of placement due to the potential impact of surrounding sources (emissions from cars using the car-park and from the ventilation system on the roof) in addition to the proximity of surrounding buildings may potentially influence dispersion and flow which may affect and limit appropriate placement of the monitor and any data capture. Option C is not representative of the location of maximum process contribution plume grounding (however it is in the zone of short-term 1-hour mean plume grounding). This location is representative of long-term exposure.

### **Alternative Locations**

No other potential monitoring locations were identified during the site survey period, which would provide advantages or benefits over Options A, B or C considered above.

### **Scoring**

Results of the considered air quality monitoring site locations, and the scores applied to the options appraisal are presented within Table 2.

**Table 2**  
**Air Quality Monitoring Site Location Appraisal – Scoring Matrix**

<b>Appraisal Criteria</b>	<b>Option A</b>	<b>Option B</b>	<b>Option C</b>
Access	1	3	2
Security	3	3	2
Power Supply	3	3	3
Location 1	4	3	2
Location 2	1	5	1
<b>Total</b>	<b>12</b>	<b>17</b>	<b>10</b>

### **SLR Recommendation**

In summary, of the 3 considered monitoring locations SLR consider from an air quality perspective that Option B represents the most appropriate location in terms of advantages over Options A and C.

The options are ranked as follows in terms of their order of merit, on the basis of professional judgement, and practical availability:

- option B;
- option A; and
- option C.

## **Closure**

I trust the above provides you with sufficient information. However, please do not hesitate to contact me should you have any further queries.

Yours sincerely

**SLR Consulting Limited**

A handwritten signature in black ink, appearing to read 'G. Blacklock', with a horizontal line underneath.

**Graeme Blacklock**  
Associate – Air Quality

**Figure 1**  
**Air Quality Monitoring – Considered Site Locations**

