



Misson Training Area SSSI

Air Quality Monitoring Scheme

IGas Energy

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Quality information

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1. Introduction

1.1 Overview

This document relates to the proposed exploratory drilling at land off Springs Road, Misson, DN10 6ET.

Planning Permission ref. 1/15/01498/CDM was granted by Nottinghamshire County Council (NCC), as the appropriate Mineral Planning Authority (MPA), on 24 May 2017 to develop a hydrocarbon wellsite and drill up to two exploratory hydrocarbon wells.

This document sets out the monitoring of air quality to be carried out within the nearby Misson Training Area Site of Special Scientific Interest (SSSI) during the three year period encompassing the site preparation, drilling and decommissioning phases as required by Condition 25 of Planning Permission 1/15/01498/CDM.

Planning Condition 25 attached to the planning permission states:

25. No development shall take place until a scheme for the monitoring and management of air quality in Misson Training Area SSSI has been submitted to and approved in writing by the MPA. The approved scheme and reporting shall thereafter be carried out for the life of the development.

Reason: Details are required prior to the commencement of development to record air quality changes to the Mission Training Area SSSI in line with Policy M3.19 of the MLP.

This air quality monitoring scheme sets out the approach which should be taken to monitor the air quality conditions within the Misson Training Area SSSI near to the project site. The survey will use passive sampling methods to establish concentrations of oxides of nitrogen (NO_x), nitrogen dioxide (NO₂) and sulphur dioxide (SO₂). The survey will be carried out in such a way as to provide a body of data that is suitable for comparison with data collected during the baseline survey period, so that it is possible to assess the impact of emissions to air during project activities on the SSSI.

This scheme document sets out the following information:

- the substances to be measured;
- monitoring locations;
- the measurement methods to be employed;
- the methodologies and techniques to be employed in the field during the implementation of the survey;
- sample handling and analysis; and
- the schedule for the reporting of results.

1.2 Scope of the Survey

The scope of the survey and the approach to be adopted is determined by the requirement to measure the impact of the development during its preparation, operation and decommissioning phases. Previous baseline studies and potential impacts identified from earlier assessment work, have informed the scope of this survey.

The survey deliverables will be to report:

- monthly mean concentrations of oxides of nitrogen, as μg/m³ of total nitrogen oxides (NO_x) at locations that are representative of background conditions within the SSSI;
- monthly mean concentrations of oxides of nitrogen, as μg/m³ of nitrogen dioxide NO₂, at locations that are representative of background conditions within the SSSI; and
- monthly mean concentrations of oxides of sulphur, as μg/m³ of sulphur dioxide SO₂, at locations that are representative of background conditions within the SSSI.

The monthly mean values should be used to calculate long term mean concentration values, such as annual mean concentration values, that can be compared against relevant air quality standards for the protection of ecosystems. These standards are listed in Appendix A to this scheme.

2. Monitoring Methodology

2.1 Staff and Materials

The survey should be undertaken by suitably qualified staff. As a minimum, the survey should be undertaken by staff that have received training from an appropriately experienced air quality professional in the tasks they are required to perform. The training should include the quality control procedures associated with the task, in addition to the survey skills. An air quality professional should be responsible for reviewing any reports produced from the survey results.

There is no internationally recognised standard for the use of passive diffusion tubes (Palmes tubes) to sample oxides of nitrogen, nitrogen dioxide and sulphur dioxide. However, the method is widely used, especially in UK and European countries, as a means of informing decision making for the development control process.

The passive diffusion tubes should be prepared to a recognised method, by a laboratory that can demonstrate competence in the task. For example, in the UK the Government department responsible for air quality sponsors an inter-laboratory comparison study for commercial laboratories preparing and analysing passive diffusion tubes for nitrogen dioxide.

Verifiable information should be provided for the analytical method used and for the organisation undertaking the analysis.

2.2 Survey Permissions

The survey uses passive methods to measure the concentrations of gases within the SSSI, and as such there is no need to carry out any works which could potentially affect the environment within the site. As a statutory site of ecological importance, however; the site is managed as a Nature Reserve by the Nottinghamshire Wildlife Trust (Misson Carr SSSI Nature Reserve), and a permit to work must therefore be obtained prior to carrying out any works within the site.

Before issuing a permit to work, the Trust will need to be provided with a map of the proposed locations of the tubes, timetable for installation and removal and the types of fixing to be used. The Trust will issue a permit once they have verified the proposals would not affect the SSSI.

The permit would need to remain valid for the duration of the works. If the Trust requires that permits are reviewed on a regular basis, further communication should take place to ensure that the permit remains in force for the duration of the survey.

2.3 Monitoring Locations

The survey should include a minimum of three sampling positions that are representative of background air pollutant concentrations within the SSSI. These locations should be remote from any potentially significant local sources of the pollutants being sampled. For example, a location that is remote from combustion activities, which are the principal local sources of oxides of nitrogen and oxides of sulphur in the study area.

Baseline sampling for NO_x, NO₂ and SO₂ was undertaken at three locations within the SSSI, during the period July 2016 to January 2017¹. The locations used in the baseline survey are shown in Figure B1 of Appendix B.

Much of the SSSI is densely wooded and at certain times of the year very wet, with steep sided banks adjacent to bodies of water. The locations chosen at the time of the baseline survey reflected the practicalities of gaining safe access to those parts of the site at all times of the year. Care should therefore be taken to select monitoring locations which are safely accessible and not close to water hazards.

In addition, there are six longhorn cattle in permanent residence within the SSSI. The cattle are moved around to different parts of the reserve on a planned rotation. Due to the risk of damage to the survey

¹ AECOM (2017), Springs Road Misson, Baseline Monitoring Report, Report Ref 60472297, July 2017.

equipment if it is sited within the same areas as the cattle, sampling locations shall be chosen which avoid the areas used by the cattle. This may introduce the need to relocate one or more sampling points during the survey, in consultation with the Wildlife Trust, if cattle are to be moved to one of the areas used for air quality measurements.

Coordinates of each sampling location will be recorded when the site is selected, and this will include a photograph of the sampling site.

2.4 Sampling Methodology

Pollutant specific passive diffusion tubes are commercially available that are suitable for the measurement of NO_x, NO₂ and SO₂. The concentration of nitric oxide can be calculated by subtracting the NO₂ result from a paired sample of NO_x. The alternative approach of using acid gases tubes to sample oxides of nitrogen typically results in lower concentrations of oxides of nitrogen being reported.

The tubes should be stored in a refrigerator when not in use and care should be taken during transfer to and from the sampling site to avoid exposure of the tubes to intense UV light or extreme temperatures.

The tubes should be exposed on site for a period that is consistent with the advice provided by the tube supplier. It would be usual for a diffusion tube to be exposed for a period of one calendar month and then re-sealed ready for analysis.

Additional tubes should be used as controls (travel blanks) during the survey. These tubes are not exposed to the air but should be analysed.

The tubes should be setup at a height above local ground level of around 1.5m. Ideally the height at which the gaseous pollutants are sampled should be the same at all sites. Samples should not be affixed to vegetation within the SSSI, but instead a small free-standing stake or pole shall be utilised. Appropriate fixings should be used which hold the tubes at a suitable distance away from obstructions and at the correct angle. An example of such a setup is shown in Figure 1.



Figure 1. Typical Sampling Setup

Details of any unusual onsite and/or offsite events (i.e. works, fires) or weather that may influence the concentration of the sampled pollutants should be recorded at the time that they occur and the records kept for future reference.

Following exposure the tubes will be sent to a laboratory for analysis. Appropriate measures should be implemented where possible to avoid the accidental transfer of invertebrates within the tubes.

Care should be taken to ensure that tubes are sent to the laboratory as soon as possible following exposure, and in every case, in time for the analysis to be completed before the viable life (shelf life) of the sampling media has been exceeded. If there is any delay in returning the exposed tubes to the laboratory, they should be appropriately stored in the meantime.

Samples analysed outside the suppliers recommended viable life for the tubes should be clearly identified and excluded from the calculation of long term average concentrations.

The baseline survey should operate continuously, with no gaps in the coverage in the survey, apart from those caused by acts that are beyond the control of the sampling team. Where for example survey equipment is damaged or taken from site it should be replaced as soon as practicable.

2.5 Sample Handling and Analysis

Sample record sheets should be completed and a copy saved with the associated laboratory analysis reports. These records should be kept for future reference.

A system should be adopted that allows the history of each sample to be tracked, based on a unique sample identifier. Most organisations that sell pre-prepared diffusion tubes issue the tubes labelled with unique codes, which can be linked to the identifier used in the survey.

2.6 Reporting of Results

A report should be prepared summarising the results of the survey at the end of each monthly monitoring period. The analysis of collected sample media takes up to three weeks following collection, so there will inevitably be a delay of up to one month between the collection of samples and the reporting of results.

Each monthly report will contain the results of the previous months sampling, along with a running survey mean for each pollutant and sampling location during the first twelve months of the survey, and a running annual mean thereafter. Copies of the laboratory analysis reports should be appended to each monthly survey report.

Appendix A Air Quality Standards for the Protection of Ecosystems

Table A1: Critical Level (CLe) Environmental Assessment Levels for Air (for the Protection of Designated Habitat Sites)

Pollutant	Source	Concentration (µg/m³)	Measured as	Notes
Sulphur dioxide	Environment Agency Environmental Permit Guidance	10	Annual mean	For sensitive lichen communities & bryophytes and ecosystems where lichens and bryophytes are an important part of the system's integrity
		20	Annual mean	For all higher plants (all other ecosystems)
		20	Winter mean (1 st October to 31 st March)	
Ovides of Nitrogen	Environment	30	Annual mean	-
(as nitrogen dioxide)	Agency Environmental Permit Guidance	75	Daily mean	-

Appendix B Approximate Sampling Locations



Prepared for: IGas plc Energy

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