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NYMNPA

31/07/2023

Date: 31 July 2023

Our ref: 50303/04/HS/ROd/26749230v1

Dear Rob

North York Moors: Ladycross Plantation - Application to Partially Discharge Conditions 4, 18, 34, 42, 52, 57, 59, 60, 65, 68, 70, 71, 76, 80, 88, 89, 90, 91, 92, 93, 94 and 95 of Planning Permission NYM/2017/0505/MEIA

On behalf of our client, Anglo American Woodsmith Limited, we are pleased to submit this application for limited and partial approval of Planning Conditions 4, 18, 34, 42, 52, 55, 57, 59, 60, 65, 68, 70, 71, 76, 80, 88, 89, 90, 91, 92, 93, 94 and 95 of Planning Permission NYM/2017/0505/MEIA.

The Project will be delivered in a series of Phases within each discrete part of the overall consented area. This application relates solely to Phase 7 works at Ladycross Plantation.

Background

On 19 October 2015, the NYMNPA granted planning permission for the “*Winning and working of polyhalite by underground methods including the construction of a minehead at Dove's Nest Farm involving access, maintenance and ventilation shafts, the landforming of associated spoil, the construction of buildings, access roads, car parking and helicopter landing site, attenuation ponds, landscaping, restoration and aftercare and associated works. In addition, the construction of an underground tunnel between Doves Nest Farm and land at Wilton that links to the mine below ground, comprising 1 no. shaft at Doves Nest Farm, 3 no. intermediate access shaft sites, each with associated landforming of associated spoil, the construction of buildings, access roads and car parking, landscaping, restoration and aftercare, and the construction of a tunnel portal at Wilton comprising buildings, landforming of spoil and associated works*” (Council Reference NYM/2014/0676/MEIA).

NYM/2014/0676/MEIA was approved subject to 95 planning conditions and a Section 106 Agreement.

On 6 February 2017, the NYMNPA granted planning permission for the “*Variation of Condition 5 of planning permission NYM/2014/0676/MEIA to allow minor material amendments relating to that part of the development at the Woodsmith Mine site (formerly known as Doves Nest Farm and Haxby*



Plantation), including; re-design of foreshafts and shaft construction methodology, changes to building layout and shaft access arrangements, revisions to construction and operational shaft platform levels, revisions to location and layout of surface water attenuation ponds, revisions to groundwater management arrangements and amendments to internal access arrangements” (Council Reference NYM/2017/0505/MEIA).

The amended scheme (NYM/2017/0505/MEIA) was approved subject to 98 planning conditions and a deed of variation to the originally approved Section 106 Agreement.

Phase 7 Works

Phase 7 comprises the following works:

- Soft landscaping of lagoon and other areas
- Installation of double-stacked containers for acoustic and visual screening
- Creation of temporary top spoil and sub soil screening stockpiles
- Replacement welfare facilities and associated parking
- Installation of hardstanding areas
- Erection of lattice communication mast

Partial Discharge

Anglo American acknowledges that limited and partial approval of Planning Conditions 4, 18, 34, 42, 52, 57, 59, 60, 65, 68, 70, 71, 76, 80, 88, 89, 90, 91, 92, 93, 94 and 95 when given, does not constitute permission to undertake works other than those described, and that such works remain subject to the approval of other conditions.

This approach has been discussed and agreed with your Planning Team and is consistent with the approach taken at the Woodsmith Mine site.

Application Submission

The application was submitted via the planning portal on 31 July 2023 (reference PP-12346294) and comprises the following documentation:

- Completed application form;
- Application drawings – Please see Appendix 1;
- Supporting Documents – Please see Appendix 1.

The requisite planning application fee of £116 has been paid online by credit card.

Conclusion

We trust that this application provides you with the necessary information to be able to partially discharge the above conditions to cover Phase 7 site works at Ladycross Plantation. However, should you require any further information, please do not hesitate to contact me.



Yours sincerely

James Cox
Associate Director
BA (Hons) MA MRTPI

Annex 1: Supporting Documents

Table 1 Supporting Documents

Condition No	Description	Document Name / Number	Further Details
N/A	N/A	Listed Plans	<p>40-STC-LC-2100-PA-22-20122– Ladycross Plantation Phase 7 General Arrangement</p> <p>40-STC-LC-2100-PA-22-20120– Ladycross Plantation Phase 7 Phasing Plan</p> <p>40-STC-LC-2100-PA-22-20123– Ladycross Plantation Phase 7 Drainage Layout</p>
4	Phasing Plan	40-STC-LC-2100-PA-22-20120– Ladycross Plantation Phase 7 Phasing Plan	N/A
18	Noise & Vibration	Phase 7 Ladycross Plantation Noise and Vibration Management Plan - 40-STC-LC-2100-EN-PL-00034	N/A
34	Construction Traffic Management Plan	Phase 3 Ladycross Plantation Construction Traffic Management Plan - 40-STC-LC-2100-LG-PL-00001	<p>To manage the potential impacts of construction traffic associated with the Phase 3 works at Ladycross Plantation, a Construction Traffic Management Plan (CTMP; Reference 40-STC-LC-2100-LG-PL-00001) was submitted to North York Moors National Park Authority and North Yorkshire County Council (local highway authority).</p> <p>The Contractors have confirmed that the total numbers of employees working out of Ladycross Plantation during the proposed Phase 7 works would not exceed those peak levels currently permitted by the Phase 3 CTMP. Whilst the Phase 7 works will require HGV deliveries, the Contractors have confirmed that the demand for deliveries can be accommodated within the daily targets set out in the Phase 3 CTMP.</p> <p>The Phase 7 works are expected to require approximately 10 abnormal indivisible load (AIL) deliveries. The</p>

Condition No	Description	Document Name / Number	Further Details
			<p>routing and timing of these AIL deliveries will be subject to separate agreement with the local highway authorities and police through the established Electronic Service Delivery for Abnormal Loads system (ESDAL) process.</p> <p>It is considered that the targets, measures and monitoring processes contained within the Phase 3 CTMP would be appropriate to manage the additional construction activities proposed as part of Phase 7.</p>
42	Access	Refer to CEMP (Condition 93)	Access arrangements will remain as per earlier phases. Further details regarding the proposed parking, manoeuvring and turning areas that will be utilised in this phase are also set out in the Construction Method Statement and Listed Plans.
52	Protected Species Management Plan	<p>Ladycross Plantation Phase 3 Protected Species Management Plan – Bats – 40-STS-LC-2100-EN-PL-00001</p> <p>Ladycross Plantation Phase 3 Protected Species Management Plan – Breeding Birds – 40-STS-LC-2100-EN-PL-00002</p> <p>Ladycross Plantation Phase 3 Protected Species Management Plan – Reptiles – 40-STS-LC-2100-EN-PL-00003</p> <p>Ladycross Plantation Phase 3 Protected Species Management Plan – Badgers – 40-STS-LC-2100-EN-PL-00004</p> <p>Ladycross Plantation Phase 3 Protected Species Management Plan – Water Voles – 40-STS-LC-2100-EN-PL-00005</p>	Please also refer to the Phase 7 CEMP (Condition 93).

Condition No	Description	Document Name / Number	Further Details
57	Landscape & Ecological Management Plan	Ladycross Plantation – Phase 3 Works – NYMNPA 57 Landscape & Ecological Management Plan– 40-STS-LC-2100-EN-PL-00014	The Phase 3 LEMP will remain applicable for the Phase 7 works.
59	External Lighting	Refer to CEMP (Condition 93)	N/A
60	Surface Water Drainage	40-STS-LC-2100-PA-22-20123– Ladycross Plantation Phase 7 Drainage Layout Ladycross Plantation – Phase 3 Works – NYMNPA 60 and 80 Surface Water Drainage Scheme – 40-STS-LC-2100-PA-PL-20102	<p>Whilst the Phase 3 Surface Water Drainage Scheme will remain applicable for the Phase 7 works, additional drainage infrastructure will be constructed around the new welfare facilities and extended parking area. This newly constructed drainage will be tied into the existing surface water drainage infrastructure and will remain under controls of the sites oil interceptor unit and final discharges through the site’s attenuation pond and package treatment plant.</p> <p>Landscaping across the wider and eastern proportion of site will include natural attenuation created by topsoiling and grassing of the landscaped zone. Site levels will, as is practicable, revert to original slope. Any runoff from the landscaped areas will drain to newly constructed swales which will tie into the existing swale to the south. For the main, drainage will revert to pre-construction conditions. The external perimeter drainage swale will remain in place and provide effective site isolation.</p>
65	Temporary Fencing	Refer to Construction Method Statement (Condition 94)	Please also refer to CEMP (Condition 93).
68	Temporary Structures	Refer to Construction Method Statement (Condition 94)	Please also refer to CEMP (Condition 93).
70	Arboricultural Method Statement	Ladycross Plantation Phase 3 Arboricultural Method Statement – 40-STS-LC-2100-CN-MS-00003	Please also refer to CEMP (Condition 93).
71	Hard & Soft Landscaping	40-STS-LC-2100-PA-22-20121– Ladycross Plantation Phase 7 Hard and Soft Landscaping Plan	N/A
76	Soil Management Plan	Ladycross Plantation – Phase 3 Works – NYMNPA 76 Soil	The Phase 3 Soil Management Plan will remain applicable for the Phase 7 works.

Condition No	Description	Document Name / Number	Further Details
		Management Plan – 40-STS-LC-2100-EN-PL-00007	
80	Surface Water Drainage	40-STS-LC-2100-PA-22-20123– Ladycross Plantation Phase 7 Drainage Layout Ladycross Plantation – Phase 3 Works – NYMNPAs 60 and 80 Surface Water Drainage Scheme – 40-STS-LC-2100-PA-PL-20102	See Condition 60 above
88	Hydrogeological Risk Assessment	Ladycross Plantation – Phase 5 Works – NYMNPAs 88 & 90 Hydrogeological Risk Assessment – 40-STS-LC-2100-EN- RA-00004	The Phase 5 HRA will remain applicable to the Phase 7 works. Please also refer to CEMP (Condition 93).
88	Ground Water & Surface Water Monitoring Scheme	Ladycross Plantation – Phase 7 Works – NYMNPAs 88 Construction & Operation Groundwater & Surface Water Monitoring Scheme – 40-STS-LC- 2100-EN-PL-00033	
89	Remedial Action Plan	Ladycross Plantation – Phase 4 Works – NYMNPAs 89 Remedial Action Plan – 40-STS-LC-2100-EN- PL-00017	<p>No update to the Remedial Action Plan is required for Phase 7, and the works will be undertaken in accordance with the Remedial Action Plan for the Phase 4 works. The Phase 7 Groundwater and Surface Water Monitoring Scheme removed the external Spring Water Quality Monitoring Probe monitoring, following the completion and verification of total aquifer (hydraulic barrier) seal created by the Environmental Curtain during Phase 4 works. As such this element within the Phase 4 Remedial Action Plan is no longer relevant.</p> <p>As in Phase 4, recorded breaches of any trigger values will be evaluated by the Environmental Engineer or nominated competent person(s) with the Project Manager to determine the cause of any breach and appropriate remedial actions that will be undertaken.</p>

Condition No	Description	Document Name / Number	Further Details
			All exceedances of Control and Compliance Trigger Values and remedial actions that are implemented will be reported
90	Groundwater Management Scheme	Ladycross Plantation – Phase 5 Works – NYMNP Condition 88 & 90 Hydrogeological Risk Assessment – 40-STSLC-2100-EN-RA-00004	The Phase 5 HRA will remain applicable to the Phase 7 works. Please also refer to CEMP (Condition 93).
91	Emissions	Phase 7 Ladycross Plantation Emissions to Atmosphere - 40-STSLC-2100-EN-PL-00035	N/A
92	CVPMP	Phase 7 Ladycross Plantation Construction Vehicle & Plant Management Plan - 40-STSLC-2100-LG-PL-00009	N/A
93	CEMP	Phase 7 Ladycross Plantation Construction Environmental Management Plan – 40-STSLC-2100-EN-PL-00032	N/A
94	Construction Method Statement	Phase 7 Ladycross Plantation Construction Method Statement – 40-STSLC-2100-CN-MS-00008	Listed plans.
95	Written Scheme of Investigation	Refer to CEMP (Condition 93)	40-COT-LC-8324-EN-PL-00002 – Ladycross Plantation - Written Scheme of Investigation for an Archaeological Watching Brief – Phase 2

NYMNP

31/07/2023



Project Title / Facility Name:

Woodsmith Project

Document Title:

CONSTRUCTION METHOD STATEMENT - PHASE 7 - LADYCROSS

Document Review Status

- 1. Reviewed – Accepted – Work May Proceed By: Angela Samuels
- 2. Reviewed – Accepted As Noted, Work May Proceed, Revise & Resubmit On: 31 Jul 2023 11:55
- 3. Reviewed – Work May Not Proceed, Revise & Resubmit
- 4. For information only
- 5. On Hold – Pending Project Restart & Ramp Up

D	26-Jul-2023	Planning	PLA			
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B	26-Jun-2023	Planning	PLA			
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This document has been electronically verified and accepted in accordance with Project Information Management System (Pims) prior to issue. An audit trail of verification and acceptance is available within Pims. As such signatures are not required. Only the latest accepted revision of the digital version is considered valid for use. Any print out shall be regarded as a non-controlled copy.



**WOODSMITH PROJECT
(788.5030)**

**CONSTRUCTION METHOD
STATEMENT – PHASE 7 –
LADYCROSS PLANTATION /
40-STS-LC-2100-CN-MS-00008**

Revision	Date of issue	Prepared by	Checked by	Approved by	Changes
A (PLA)	01/06/2023	F Keiter	P Gill	C Fryer	First issue
B (PLA)	26/06/2023	F Keiter	P Gill	C Fryer	Revision in accordance with rev A comments
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1. INTRODUCTION

1.1. OVERVIEW

This document has been prepared on behalf of Anglo American and details the Construction Method Statement for the Phase 7 construction activity at Ladycross Intermediate Shaft Site

Anglo American are constructing a Mineral Transport System (MTS) tunnel, as part of the wider Woodsmith Project. The tunnel will be used to transport polyhalite from the Woodsmith Mine site to the Material Handling Facility (MHF) at Wilton, Teesside. Safe and efficient construction and operation of the tunnel requires the construction of an intermediate shaft at Ladycross to provide access to the tunnel.

This document builds on the previous Construction Method Statements (CMS) for the previous phases of works.

This report only details the construction works required for the Phase 7 works at Ladycross.

The CMS provides an overview of the resource requirements, the plant and materials that are anticipated to be used during the Phase 7 construction works at Ladycross. It includes the measures to be taken to ensure that the works are carried out in accordance with the requirements of both the planning permission and of Anglo American and, above all, are carried out safely and in compliance with all statutory obligations.

In addition, while not submitted to the Planning Authority, all site works are controlled by a Risk Assessment and Method Statement (RAMS) process, which identify the resources, plant, materials and specific controls required for all scopes of work.

The Phase 7 scope of works, comprises:

- Soft landscaping of lagoon and other areas;
- Installation of double-stacked containers for acoustic and visual screening;
- Creation of temporary top spoil and sub soil screening stockpiles;
- Replacement welfare facilities and associated parking; and
- Installation of hardstanding areas.
- Erection of lattice communication mast.

A site plan is provided separately.

Table 1 - 1 Condition NYMNPA-94: Construction Method Statement

NYMNPA 94 Compliance	Compliance
<p>Prior to the commencement of each phase of the development at Dove’s Nest Farm or Ladycross Plantation in accordance with the approved Phasing Plan, a Construction Method Statement shall be submitted for that phase, and approved in writing by the MPA, in consultation with the appropriate Highway Authority. Each approved Statement shall be adhered to throughout the construction period. The Statements shall provide for:</p>	<p>This Phase 7 Construction Method Statement</p>
<p>(i) The parking of vehicles of site operatives and visitors clear of the highway;</p>	<p>Section 2.3 Phase 7 Construction Traffic Management Plan</p>
<p>(ii) Loading and unloading of plant and materials;</p>	<p>Section 2.5 Phase 7 Construction Traffic Management Plan</p>
<p>(iii) Storage of plant and materials used in constructing the development;</p>	<p>Section 2.6</p>
<p>(iv) Erection and maintenance of security fencing;</p>	<p>Section 2.2</p>
<p>(v) Wheel washing facilities;</p>	<p>Section 2.9</p>
<p>(vi) An outline construction method for sub-surface works including adherence to the ‘rack and pillar’ method of mining described in the SEI (14th February 2015) and the SRK Subsidence Memorandum (15th May 2013);</p>	<p>This type of work is not required in Phase 7</p>
<p>(vii) Buildings and structures associated with the mine and tunnel shafts;</p>	<p>Section 3</p>
<p>(viii) Welfare/office building and security gatehouse;</p>	<p>Section 2.2</p>

NYMNP 94 Compliance	Compliance
(ix) Screening bunds;	Phase 7 Noise Vibration Management Plan
(x) Hardstandings;	Section 3
(xi) Shuttle Bus terminal;	Phase 7 Construction Traffic Management Plan
(xii) Park-and-Ride layby;	This type of work is not required in Phase 7
(xiii) Emergency helipad;	This type of work is not required in Phase 7
(xiv) Lighting columns;	Section 2.8 Phase 7 Construction Environment Management Plan
(xv) Internal access and haul roads;	Section 2.7
(xvi) Domestic wastewater (foul sewage) treatment plant;	Section 2.10
(xvii) Non-domestic wastewater treatment plant and settlement tanks;	Section 2.10
(xviii) Surface water attenuation ponds, settlement ponds, swales and wetland areas;	Phase 3 Surface Water Management Plan and Phase 3 Surface Water Drainage Scheme
(xix) Temporary spoil and Polyhalite storage areas;	This type of work is not required in Phase 7
(xx) Removal of any temporary structures; and	Section 3.5
(xxi) Formation of spoil mounds and the establishment of vegetation on them.	Section 3.3 and CEMP

NYMNPA 94 Compliance	Compliance
The CMS shall contain a construction timetable and order of works noting any construction dependencies, refer to any inherent mitigation measures required to address adverse impacts identified in the EIA and cross refer to the CEMP in relation to any additional avoidance or mitigation measures	Phase 7 Construction Environment Management Plan

The CMS is a live document and updates to this CMS plan will be prepared for subsequent construction phases and following any design or method change. The NYMNPA has confirmed that it supports this approach.

2. DESCRIPTION OF WORKS

2.1. PHASE 7 WORKS

The Phase 7 works comprise:

- Soft landscaping of lagoon and other areas;
- Installation of double-stacked containers for acoustic and visual screening;
- Creation of temporary top spoil and sub soil screening stockpiles;
- Replacement welfare facilities and associated parking;
- Installation of hardstanding areas; and
- Erection of lattice communication mast.

2.2. OFFICES AND COMPOUNDS

The current double stacked office and welfare block will be decommissioned with the new welfare facilities comprising a single storey.

2.2.1. LAYDOWN AREAS

The laydown area and workshops constructed during Phase 3 works will be utilised for general laydown of materials and day to day small mechanical tasks. The immediate area surrounding the Phase 7 working areas will be demarcated using pedestrian barriers and classified as a 'restricted access area' where only authorised personnel involved in the operation can gain unescorted access.

2.3. CAR PARKING

All site personnel will continue to use the car parking facilities established during the Phase 3 works. As soon as the new car park is finalised, the facility will be used. Parking will only be permitted within designated car parking areas. No access to the site by foot is permitted. A peak of up to 45 employees are expected on site during the Phase 7 works. As stated in Section 2.5.5, mass transport such as car sharing, and mini-bus services will be utilised to ensure parking is limited to the spaces set out in the Phase 7 Construction Traffic Management Plan (CTMP). During the Phase 7 works the number of car parking spaces will be increased to 64 at the welfare car park. After the completion of the Phase 7 car park the usage of shared transport will still be encouraged. The increased parking spaces are sufficient to accommodate for the increased parking demand during the shift changes of the future tunnelling operations.

2.4. MOBILISATION

All equipment, plant and materials will be delivered to site using the approved traffic routes as per the Phase 7 CTMP.

All HGV's and abnormal loads will drive directly to site and will not stop / wait on the public highway.

Approximately 10 Abnormal loads (AILs) are expected during the Phase 7 works to facilitate delivery of the Containers, equipment and topsoil restoration works. Deliveries will be staggered throughout the duration of the Phase 7 works to reduce the number of AIL operating on the A171 and C82 between Lockwood Beck Site and Ladycross.

2.5. TRAFFIC AND PEOPLE

2.5.1. TRAFFIC MANAGEMENT

Condition 34 requires that a Construction Traffic Management Plan (CTMP) is to be prepared and submitted to NYMNPA prior to each phase of construction, for detailed traffic information please see the Phase 7 CTMP. Additional information for Traffic Management is also detailed in the Phase 7 Construction Environment Management Plan (CEMP).

2.5.2. PUBLIC PEDESTRIAN MANAGEMENT

Pedestrian management is to be controlled via both site security fencing and site access gate security; this is to be situated at the entrance to the main site haul road. Perimeter fencing along the site boundary was installed as part of Phase 2 works with improved site security facilities installed as part of Phase 5 works.

2.5.3. ACCESS

All construction traffic will use the existing main internal road to access the site. The access road is appropriately sized to allow for three HGVs to queue. In addition to the physical measures proposed, to prevent traffic having to wait on the highway or the potential for multiple to meet at the site access, the contractor will be required to provide a banksman and schedule deliveries and shift times.

Security will be stationed at the site access gates and all drivers will be required to have completed the appropriate driver induction before entering site. Access will only be authorised for deliveries / vehicles booked in for the day and with the appropriate access documentation. All deliveries will follow the onsite one-way traffic controls. Where required a banksman will be provided by the contractor if reversing or manoeuvring of vehicles is required.

In addition to assisting the contractor to manage the total numbers of daily HGV movements, the requirement for planning and scheduling deliveries will also assist the contractor in ensuring that deliveries can be spread throughout the working day.

The contractor will also be required to schedule shift times to try and avoid employees arriving and departing at the same time and to schedule deliveries outside of these hours.

2.5.4. LOADING AND UNLOADING

Loading and unloading of deliveries and materials on site will take place in designated areas dependent on works.

2.5.5. TRANSPORT HUB AND MASS TRANSPORT

If practical, car parks outside of the North York Moors National Park will be encouraged as a transport hub for shift workers travelling to Ladycross. Other potential locations will be explored to reduce parking at the Ladycross Site where practicable.

Car sharing and minibuses will be promoted by subcontractors to limit the numbers of people driving / parking at Ladycross to remain within the committed numbers stated in the Phase 7 CTMP.

2.6. STORAGE OF PLANT AND MATERIALS

Materials will be stored in demarcated zones dependant on material use. According to the site layout plan, the laydown area will be reduced. The remaining laydown area established during Phase 3 will be utilised for storage of bulk materials and material deliveries will be managed to reduce overall site storage requirements. Materials will also be stored in designated area as close to the works as possible.

All storage areas will be located on hardstanding appropriate to the plant and materials away from sensitive receptors. All COSHH and fuel will be stored in line with requirements and practices outlined in the Phase 7 CEMP.

2.7. INTERNAL ACCESS ROUTES

Haul roads and internal access routes within the Phase 7 works scope will be demarcated and separated from pedestrian areas as per previous phases. All HGV and delivery vehicles will follow the internal one-way system route. Speed limits will be enforced as per the site limits.

2.8. LIGHTING COLUMNS

As part of the Phase 7 works additional temporary lighting columns / fixed lighting will be installed on new structures for emergency use and safe access / egress in the area. Where additional temporary lighting is required to provide a safe working area and access and egress, it will be installed in line with the procedures detailed in the Phase 7 CEMP, where possible aiming to limit upward light spill, and utilising warm spectrum LED's.

2.9. WHEEL WASH

Vehicles entering site will stay on hardstanding already installed during Phase 3 works. No plant will travel off site other than specialised plant moving transport. All HGV's and plant exiting site will use the approved wheel washing facilities described in the approved Phase 3 CMS.

2.10. WATER MANAGEMENT

2.10.1. SURFACE WATER MANAGEMENT

The Water Treatment Plant (WTP) along with finalised attenuation pond and drainage network set up as part of the Phase 3 works will be utilised to manage site surface water as indicated in the Phase 3 Surface Water Management Plan (40-ST5-LC-2100-PA-PL-20102). Some modifications may be carried out to the surrounding drainage around the lagoon footprint to facilitate the remediation works where appropriate. The drainage will be extended to the new parking facilities as shown in the Phase 7 Surface Water Drainage Scheme (40-ST5-LC-2100-PA-22-20123).

2.10.2. PROCESS WATER MANAGEMENT

All controls and mitigation for process water will be carried out in accordance with the controls outlined in the Phase 7 CEMP.

2.10.3. FOUL WATER MANAGEMENT

The foul sewerage from the welfare, offices and security cabin will be stored in appropriate cesspit installed during the Phase 3 works. During the Phase 7 works a new cesspit will be installed to accommodate additional welfare facilities. Foul sewerage will be removed by a licensed contractor to a permitted waste facility.

2.11. HOURS OF OPERATION

All Phase 7 operations will be limited to daytime.

3. CONSTRUCTION METHOD STATEMENTS

3.1. WORKING PLATFORM

The working platform constructed during Phase 3 works was designed to withstand the loadings of all plant and equipment associated with the Phase 7 works.

3.2. POWER REQUIREMENTS

All electrical installations to required areas will be installed by STRABAG electrical team in accordance with the Phase 7 CEMP.

An emergency back-up generator will need to be installed onsite to facilitate emergency operations in the event mains supply would cut-off. The emergency generator would supply power to key site operations such as shaft lighting, emergency winches, ventilation systems and the site tally hut and communications cabin. A 250kVA generator will be situated on pre-constructed concrete bases to accommodate this back-up power requirement.

3.3. SOFT LANDSCAPING OF LAGOON AND OTHER AREAS

The CEMP (40-STC-LC-2100-EN-PL-00032), and the Phase 3 Soil Management Plan (SMP) set out the detailed requirements in relation to soil handling and storage for the site in order to protect the soil quality and the surrounding environment.

The Phase 7 Works includes the establishment of welfare, car parking, spreading of topsoil and additional SUDs drainage installation.

Earthworks are dependent on weather and site conditions at the time of working. As such a phased approach will be carried out to ensure best practice and reduce exposure during the topsoil strip and re-topsoiling. Topsoil and subsoils will not be stripped unless conditions at that time comply with both the site SMP and Construction Code of Practice for the Sustainable Use of Soils on Construction Sites 2009 published by the Department of Environment, Food and Rural Affairs (Department for Environment, Food and Rural Affairs, 2009) and the Good Practice Guide for Handling Soils (Ministry of Agriculture, Fisheries and Food, 2000). All areas that do require stripping will undergo circa 200mm topsoil strip followed by a 250mm – 300mm subsoil strip and where ground conditions allow. All areas will be dressed with imported virgin material to protect the underlying subsoils.

In coordination with the Parks Authority, it was determined that no further action needs to be taken on archaeological matters.

Areas that require further soil stripping are shown in the Phase 7 Hard and Soft Landscaping Plan (40-STC-LC-2100-PA-22-20121) and the Phase 7 Phasing Plan (40-STC-LC-2100-PA-22-20120).

The Environmental Statement which supported the original planning application concluded that if appropriate mitigation and enhancement activities were undertaken, the impacts on protected species would not be considered significant.

This CMS should be read in conjunction with the Phase 7 Construction Environmental Management Plan, CEMP (40-STS-LC-2100-EN-PL-00032) and Protected Species Management Plans.

3.3.1. STRIPPING STONE HAUL ROAD

To avoid contamination of the topsoil, the stone haul road that got constructed during the phase 3 works will be stripped to the clean subsoil. The gravel will be excavated by a tracked excavator and loaded onto a dump truck. To reduce the imported material, the excavated gravel will be stored on site and reused as a base layer for the shipping containers, should they be required and the new welfare base.

3.3.2. RE-TOPSOIL OF LAGOON AND STOCKPILE AREA, INCLUDING STONE HAUL ROAD

Following that, the stored topsoil will be distributed in the lagoon area that got backfilled in the phase 6 works and the soil storage area. Topsoil will be in a dry and friable condition prior to placement. The topsoil will then be spread to achieve varied topsoil depths utilising earthmoving plant to maximum depth of 260 mm, feathering out edges to adjoining areas of subsoil. Any left over topsoil will be stored in the designated area, as portrayed in the Phase 7 layout drawing. All Topsoil placement operations will follow the phase 3 soil management plan (40-STS-LC-2100-EN-PL-00007)

3.3.3. SEEDING OF LAGOON AND STOCKPILE AREA, INCLUDING THE STONE HAUL ROAD

To avoid erosion the topsoil is seeded with a seed mixture as stated in the Phase 7 Construction Environmental Management Plan. The seed will be distributed by a tractor trailer with a sowing rate of 25 g/m².

3.4. INSTALLATION OF SHIPPING CONTAINERS TO SUPPLY SITE SCREENING

3.4.1. PLACING SHIPPING CONTAINERS IN TARGETED AREAS, DOUBLE HEIGHT

In order to provide acoustic and visual screening, double height shipping containers will be placed in targeted areas. The containers will be installed in the north-eastern part of site, as stated in the phase 7 layout drawing (40-STS-LC-2100-PA-22-20122). The Containers will not exceed 7m in height and will be lifted into place by a site mobile crane.

The units will be painted RAL6008 (brown/green) or equivalent prior to arrival on site

The container dimensions will be approximately 6m by 2.5m.



Image 2 A similar container (painted either Brown Green (RAL 6008) or Juniper Green (RAL 160 20 10)) will be used at Ladycross Plantation.

3.5. DECOMMISSIONING OLD WELFARE AND INSTALLATION OF NEW WELFARE

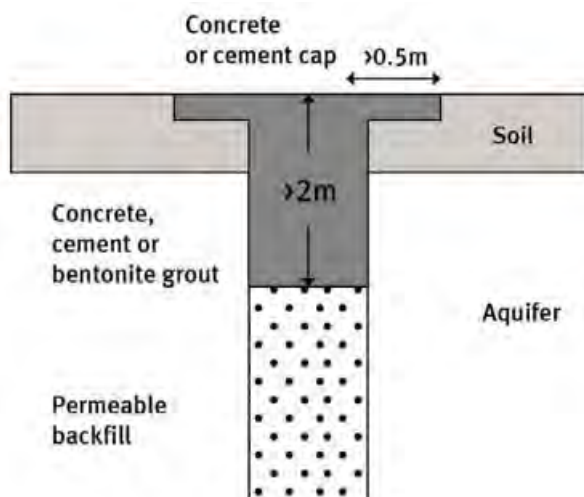
3.5.1. INSTALLATION OF NEW WELFARE

In Phase 7, new welfare facilities will be installed in the north western part of site, as detailed within the Phase 7 layout drawing (40-STS-LC-2100-PA-22-20122). The area will be stripped in accordance with the Phase 3 Soil Management Plan.

During the Phase 7 works, boreholes 03 and 06 require decommissioning, since they fall in the footprint of the welfare area. The decommissioning of the boreholes will be undertaken in accordance with current guidance and best practice (Environment Agency, 2012) and will adopt one of the three decommissioning options detailed in **Table 3-1**. On completion of the decommissioning, a report of works undertaken will be prepared.

Table 3-1 Summary of options for the removal and replacement of monitoring wells.

Option	Condition	Methodology
Option 1	In boreholes where there is more than 1m or less of plain pipework	Grout up standpipe from the base to 1.5m below ground level (bgl). Remove headworks and plain pipe from 0-1mbgl. Remove the gravel pack and slotted pipework from 1.0-1.5mbgl and replace with a bentonite/grout plug. Replace upper section 0-1.0mbgl with appropriate topsoil/arising mix.
Option 2	In boreholes where there is greater than 1m of plain pipework	Grout up standpipe from the base to 1m below ground level. Remove headworks and plain pipe from 0-1mbgl and replace with appropriate topsoil mix.
Option 3	In boreholes located on land that may be ploughed	Where boreholes are located on land that may be ploughed then guidance recommends that installations are removed to a minimum of 2.0 mbgl. Grout up standpipe from base to 2 mbgl. Remove headworks and plain pipe from 0-2mbgl. Remove the gravel pack and slotted pipework from 2.0-2.5m and replace with a bentonite/grout plug. Replace upper section 0-2.0mbgl with appropriate topsoil/arising mix.



The welfare will be modular units, single stacked, double row, with a planned footprint area of approx. 480m². The modular units will incorporate site welfare, office and toilet spaces. The units will not exceed 3,5m height and will be lifted into place by a site mobile crane or HIAB. The units

will be painted RAL6008 (brown/green) or equivalent prior to arrival on site. Discreet, sensor-controlled perimeter downlighting will be fitted to provide safe access and egress. All windows will be fitted with shutters.

Electrical ducting will be installed to power the wheel wash and to allow for heated storage of COSHH Material in the fuel station. Moreover, a shed will be installed at the refuelling station to reduce visual impact.

The potable water and electric supply will be extended from existing phase 3 supplies. To supply water for showering in the new welfare facilities an additional water tank will be installed. The installation will be according to the Phase 7 layout drawing (40-STS-LC-2100-PA-22-20122) and might include excavation. To store septic waste a larger septic tank will be installed next to the new welfare facilities. The disposal of the septic waste will be according to the Phase 3 procedure.

A concrete footpath will be constructed in front of the new welfare area, to allow safe access to the facilities.

3.5.2. DECOMMISSIONING OF OLD WELFARE

As soon as the new welfare facilities are operational, the old welfare facilities will be decommissioned.

The existing potable water and electric supply, as previously installed under Phase 3, will be cut. The septic tank will be emptied before being removed. Afterwards the septic tank will be dug up and disposed of. The remaining pit will be filled with subsoil. The container units will be decommissioned and transported off site.

Due to the decreased need for fuel storage, the fuel storage area will be deconstructed and replaced by a fuel storage container.

3.6. HARDSTANDING AREA

3.6.1. BLACKTOP INSTALLATION

To meet the need for increased parking space during shift changeovers, the parking at the welfare car park will be increased to 64 parking slots. Black top is to be added between phase 3 parking facilities and the new Welfare.

To minimise the emission of dust and to provide safe working conditions, a further section around the grout plant will be cover with blacktop too.

3.7. ERECTION OF LATTICE COMMUNICATION MAST

Due to the decommission of the current welfare facilities and the installation of the proposed welfare facilities, a temporary 15m high (maximum height) lattice communication mast (wind up) will be erected in the Northwest area of the proposed welfare. The colour of the mast will be RAL 6008.

The installation of the lattice communication mast will require the construction of a concrete slab with the following dimensions, length 3m and width 3m. Foundations will be constructed up to 1m deep.

The above slab dimensions are indicative and are subject to change based upon final design requirements.

4. PLANT & EQUIPMENT

All proposed plant and equipment to be used during the Phase 7 works are detailed in **Table 4-1** and **Table 4-2**. Details of each main scope activity plant has been provided with proposed plant models where the information is available. The Models of plant may change closer to the time of the works based upon supply and final design requirements.

Table 4-1 Plant use for the Phase 7 works

Description	Model	Loading when operational
General Site use		
12T Excavator	Hitachi ZX135US-7	25.00%
20T Dumper	Bell B20E	25.00%
Roller Vibrator	HAMMM BW120	10.00%
Telehandler	Manitou MT1840	50.00%
Road Sweeper	DAF or similar	50.00%
45ft MEWP	Artic Boom SJ63AJ	10.00%
Flat bed	Ford transit dropside single cab	50.00%
Soft landscaping of Lagoon and other areas		
Tracked Excavator 30T	Hitachi_ZX350LC-6	80.00%
Tracked Excavator 30T	Hitachi_ZX350LC-6	80.00%
Tractor & Trailer (seeding of topsoil)		20.00%
Dumper Truck 20T	Bell B20E	50.00%
Dumper Truck 20T	Bell B20E	50.00%
Dozer	CAT D6	25.00%
Installation of shipping containers to supply site screening		
Tracked Excavator 20T	Hitachi ZX225USRLC	80.00%

Roller Vibrator	HAMMM BW120	10.00%
Dumper Truck 20T	Bell B20E	50.00%
Telehandler 5T	Manitou MT1840	50.00%
100T Mobile Crane	Liebherr-LTM-100T	20.00%
500 kVA emergency generator	JCB BCRV 500-50/60 E3A	10.00%
Installation of new welfare facilities and decommissioning of existing welfare facilities		
Tracked Excavator 30T	Hitachi_ZX350LC-6	80.00%
Roller Vibrator	HAMMM BW120	10.00%
Dumper Truck 20T	Bell B20E	50.00%
Telehandler 5T	Manitou MT1840	50.00%
100T Mobile Crane	Liebherr-LTM-100T	20.00%
Concrete Pump	M36 - Mobile concrete pump	20.00%
Plate Bearing Test Equipment	TERRATEST 6000 BLE or similar	5.00%
2" vibrating pokers		5.00%
Compressor	30 kW - ACS Variable XP model 30	50.00%
Formwork		10.00%
500 kVA emergency generator	JCB BCRV 500-50/60 E3A	10.00%
Installation of hardstanding areas		
Dozer	CAT D6	25.00%
Roller	HAMMM BW120	10.00%
Asphalt Paver	CAT AP300	50.00%
Asphalt Roller	BW 120 AD-5	50.00%

Skid Steer	Bobcat M3 Series	25.00%
Tracked Excavator 20T	Hitachi ZX225USRLC	80.00%

5. HAZARDOUS MATERIALS AND SUBSTANCES

The following hazardous materials are foreseen to be used during construction of site works activities listed within this document. This list may not be exhaustive, individual Risk Assessment and Method Statements will identify the hazardous materials and a specific COSHH Assessment will be included within the Safe System of Work (SSOW) documentation.

- Concrete / Cement
- Grout
- Diesel
- Petrol
- Oils and Greases (Plant Maintenance)
- Spray Paint (Setting out)
- Mould oil / release agents
- Bentonite (rout mix)
- MAPEI CBS System 1 (Retarder for grout mix)
- Blacktop

6. RELATED DOCUMENTS AND REFERENCES

GENERAL ARRANGEMENT - PHASE 7 – LADYCROSS - 40-STS-LC-2100-PA-22-20122

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN - PHASE 7 - CONDITION 93 –
LADYCROSS - 40-STS-LC-2100-EN-PL-00032

NOISE & VIBRATION MANAGEMENT PLAN - PHASE 7 - NYMNPA CONDITION 18 (ROYAL
HASKONINGDHV) - LADYCROSS - 40-STS-LC-2100-EN-PL-00034

VEHICLE & PLANT MANAGEMENT PLAN - PHASE 7 - NYMNPA CONDITION 92 -
LADYCROSS - 40-STS-LC-2100-LG-PL-00008

7. DEFINITIONS AND ABBREVIATIONS

CMS – Construction Method Statement

RAMS – Risk Assessment and Method Statement

MPA – Mineral Planning Authority

EIA – Environment Impact Assessment

NYMNPA – North York Moors National Park Authority

AIL – Abnormal Indivisible Load

CTMP – Construction Traffic Management Plan

HGV – Heavy Goods Vehicle

COSHH – Control of Substances Hazardous to Health

WTP – Water Treatment Plant

CEMP – Construction Environment Management Plan



NYMNPA

31/07/2023

Project Title / Facility Name:

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Document Title:

**CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN - PHASE 7 -
CONDITION 93 - LADYCROSS**

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**WOODSMITH PROJECT
(788.5030)**

**CONSTRUCTION
ENVIRONMENTAL
MANAGEMENT PLAN – PHASE 7
– CONDITION 93 – LADYCROSS
PLANTATION /
40-STS-LC-2100-EN-PL-00032**

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1. INTRODUCTION

1.1. PURPOSE OF THE DOCUMENT

In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to the North York Moors National Park Authority (NYMNP) for permission to develop a polyhalite mine and underground Mineral Transport System (MTS). Planning permission was subsequently granted in 2015 subject to conditions, as varied in February 2018 by NYM/2017/0505/MEIA.

Anglo American is constructing a Mineral Transport System (MTS) tunnel, as part of the wider Woodsmith Project. The tunnel will be used to transport polyhalite from the Woodsmith Mine site to the Material Handling Facility (MHF) at Wilton, Teesside. Safe and efficient construction and operation of the tunnel requires the construction of a shaft at Ladycross Intermediate Shaft Site (Ladycross) to provide access to the tunnel.

This Construction Environmental Management Plan (CEMP) has been prepared on behalf of Anglo American for the Phase 7 Works at Ladycross (as described in **Section 1.2** below).

This CEMP has been prepared to discharge condition 93. Subsequent CEMPs will be prepared for future phases of works. This CEMP covers work carried out in Phase 7.

Table 1 - 1 Condition NYMNP-93: Construction Environment Management Plan

NYMNP-93 Description	Compliance with Condition NYMNP 93
<p>Prior to the commencement of each Phase of Construction in accordance with the approved Phasing plan at either Doves Nest Farm or Lady Cross Plantation, an updated CEMP shall be based on the approved Construction Method Statement (CMS) and should be submitted and approved in writing by the MPA in consultation with the Environment Agency in respect of the area concerned.</p>	<p>This version of the CEMP is for Phase 7 as defined in Section 1.2 below.</p> <p>Earlier versions of the CEMP were produced for preceding works.</p>
<p>The size, location and design of any site compounds, including how any potentially polluting materials will be stored to minimise the risk of pollution</p>	<p>Section 3 and Section 11</p> <p>Phase 7 Construction Method Statement</p>
<p>An incident Response Plan to deal with any pollution that may occur during the course of construction;</p>	<p>Section 12</p>

NYMNP-93 Description	Compliance with Condition NYMNP 93
A protocol to deal with contaminated ground, should this be encountered, to ensure protection of water resources;	Section 10
Details of how surface water run-off shall be passed through a settlement facility of settlement facilities prior to being discharged into any watercourse or soakaway;	Section 9.1
Plant and wheel washing including that it shall only be carried out in a designated area of hard standing at least 10 metres from any watercourse or surface water drain and that washings shall be collected in a sump, with settled solids removed regularly and water recycled and reused where possible;	Section 3.10
A scheme for the recycling/disposing of waste resulting from demolition and construction works;	Section 11
Storage of waste not covered by the Mine Waste Directive;	Section 11
Measures to control glare from in-site lighting;	Section 3.6
Measures to manage deliveries by HGV including routing and timing for deliveries and details of the penalty system for breaches of the agreed control;	Section 4
Temporary Traffic Management	Section 4
The provision of a Dust Management Plan relating to Phase 1 of the construction period (earthworks and bund formation) and Polyhalite handling and stockpiling to include dust generation modelling so as to identify	Section 6 Phase 6 Emissions to Atmosphere Construction Phase Dust Management Plan

NYMNP-93 Description	Compliance with Condition NYMNP 93
<p>sensitive receptors; likely dust generation and its disposition during the construction Phases and operation over time and under different weather conditions; the avoidance and mitigation measures required to ensure dust deposition levels at the sensitive receptors are maintained at the residual levels identified in the approved EIA, and monitoring arrangements. The Dust Management Plan must comply with the criteria set out in the 'Dust and Air Emission Mitigation Measures' best practice guidance for control of dust on construction sites from the Institute of Air Quality Management 2012. The monitoring arrangements will include dust deposition or dust flux or real-time PM₁₀ continuous monitoring locations; baseline dust monitoring at least three months before construction commences; daily on-site and off-site inspections at monitoring locations with results recorded in a log to be made available to the MPA on request, and more frequent monitoring during periods of high dust generation;</p>	
<p>In the event that there is insufficient clay with the Lady Cross Plantation site to form 1m deep basal layer beneath the spoil storage area, a contingency plan to address the importation of clay, including the source, quantity and quality of such material, and how adverse effects on the water environmental would be avoided;</p>	<p>Phase 7 Construction Environment Management Plan</p>
<p>How the requirements of the approved CEMP will be disseminated to all relevant</p>	<p>Section 2.2</p>

NYMNP-93 Description	Compliance with Condition NYMNP 93
staff/contractors throughout the construction period;	
The location of the site notice board;	Section 2
A scheme for parking, loading, unloading during construction;	Section 4 Phase 7 Construction Traffic Management Plan
A scheme for security and lighting during construction;	Section 3.1 and 3.6
A protocol for the replenishment of tanks and containers, including that all refuelling of vehicles, generators, plant and equipment shall be supervised and shall take place within a suitable bunded, impervious hardstanding;	Section 3.8
Contingency proposals for if fuel cannot be delivered for the generators, e.g. due to adverse weather;	Section 3.8
Proposals / contingency plans for waste not managed as part of the Mine Waste Permit comprising the storage and management of temporary mining waste stored on-site for less than three years (e.g. Pyritic Mudstone); non-inert and non-hazardous materials stored for less than one year, and unexpected hazardous waste stored for less than six months, including measures to prevent the dispersal of dust, leachate and surface water run-off;	Section 11
Precautionary Method of Working for Site Clearance (PMWSP) which shall be submitted to and agreed in writing by the MPA prior to commencement of Preparatory Works and	Section 7 Attachment C – Precautionary Method of Working

NYMNP-93 Description	Compliance with Condition NYMNP 93
shall be adhered to thereafter. The PMWSP shall set out proposals for tree clearance and the demolition of structures and shall include that between March and September each year surveys of areas to be cleared should occur no less than 48 hours before clearance occurs so that occupied wild bird nests can be identified and prevented from being destroyed;	
Alarms fitted to mobile plant and vehicles for the purposes of warning pedestrians of their movements;	Section 5

Additional conditions addressed in this CEMP are detailed in **Table 1 - 2**.

Table 1 – 2 Additional relevant conditions

Condition	Topic	Compliance with Condition
NYMNP-18	Noise and Vibration Management	Section 5 Phase 7 Noise and Vibration Management Plan
NYMNP-34	Construction Traffic Management	Section 4 Phase 7 Construction Traffic Management Plan
NYMNP-42	Access Arrangements	Section 3 Previous Phase 2 Construction Environment Management Plan and Phase 7 Construction Method Statement
NYMNP-52	Protected Species	Section 7.1 Phase 3 Protected Species Management Plan
NYMNP-57	Landscape and Ecological Management	Section 7.3 Phase 3 Landscape and Ecological Management Plan

Condition	Topic	Compliance with Condition
NYMNPA-59	External Lighting	Section 3.6
NYMNPA-65	Temporary boundary treatments	Section 3
NYMNPA-68	Temporary Structures	Section 3 Phase 7 Construction Method Statement
NYMNPA-70	Vegetation retained & clearance	Section 7.2 Construction Phase Arboricultural Method Statement
NYMNPA-76	Soil Management Plan	Section 10 Phase 3 Soil Management Plan
NYMNPA-88	Hydrogeological Risk Assessment	Section 9 Phase 5 Hydrogeological Risk Assessment
NYMNPA-90	Groundwater Management	Section 9
NYMNPA-92	Plant and Vehicle Management	Section 4 Phase 6 Construction Vehicle and Plant Management Plan
NYMNPA-95	Written scheme of Archaeological Investigation	Section 8 Phase 2 Written Scheme of Investigation for an Archaeological Watching Brief

This document details only the additional activities required for Phase 7 at Ladycross associated with the Anglo American Woodsmith Project. Updates to this plan will be prepared for subsequent phases and following any design or method changes. The NYMNPA, as well as the Environment Agency and Natural England agreed that they support this approach in meetings held in April 2016.

1.2. SCOPE OF WORKS

The Phase 7 scope of works, comprises:

- Soft landscaping of lagoon and other areas;
- Installation of double-stacked containers for acoustic and visual screening;
- Creation of temporary top spoil and sub soil screening stockpiles;
- Replacement welfare facilities and associated parking;
- Installation of hardstanding areas; and
- Erection of lattice communication mast.

A site plan is provided separately.

1.3. SCOPE OF THIS DOCUMENT

This CEMP details how the Phase 7 works will be planned, monitored and managed in an environmentally responsible manner. The document outlines the management framework for the environmental requirements, commitments, and performance targets associated with the planning and implementation of Phase 7 of the project.

The CEMP refers to several management plans, which have been prepared to discharge a number of planning conditions. Collectively these plans incorporate all mitigation measures relevant to Phase 7.

The Phase 7 CEMP should also be read together with the documentation listed below.

Information in these documents is summarised in this CEMP where appropriate:

- Phase 7 Construction Traffic Management Plan (40-STS-LC-2100-LG-PL-00008)
- Phase 7 Noise & Vibration Management Plan (40-STS-LC-2100-EN-PL-00034)
- Phase 3 Landscape and Ecological Management Plan (40-STS-LC-2100-EN-PL-00014)
- Phase 3 Surface Water Management Plan (40-STS-LC-2100-PA-PL-20102)
- Phase 7 Construction Method Statement (40-STS-LC-2100-CN-MS-00008)
- Phase 2 Archaeological Watching Brief Written Scheme of Investigation (40-COT-LC-8324-EN-PL-00002)
- Phase 3 Soil Management Plan (40-STS-LC-2100-EN-PL-00007)
- Phase 5 Hydrogeological Risk Assessment (40-STS-LC-2100-EN-RA-00004)

-
- Phase 7 Surface Water Drainage Scheme (40-STS-LC-2100-PA-22-20123)
 - Construction Phase Dust Management Plan (40-STS-LC-2100-EN-PL-00015)
 - Construction Phase Arboricultural Method Statement (40-STS-LC-21-CN-MS-00003)
 - Phase 7 Construction and Operation Groundwater and Surface Water Monitoring Scheme (40-STS-LC-2100-EN-PL-00033)
 - Phase 7 Hard and Soft Landscaping Plan (40-STS-LC-2100-PA-22-20121)
 - Phase 7 Phasing Plan (40-STS-LC-2100-PA-22-20120)
 - Phase 7 General Arrangement (40-STS-LC-2100-PA-22-20122)

This CEMP will remain a live document, being reviewed and updated in consultation with the appointed contractor(s) or sub-contractor(s) as required. Each of these updated CEMPs will be submitted to NYMNPA for approval prior to the start of each phase of works.

2. ENVIRONMENTAL MANAGEMENT FRAMEWORK

2.1. STRUCTURE OF RESPONSIBILITIES

This CEMP addresses those environmental matters within the accountability of Anglo American and the Contractors engaged on its behalf to deliver the Phase 7 construction works. While overall responsibility for compliance with environmental requirements will remain with Anglo American, the Contractors working on site are responsible for undertaking the works in line with the requirements of this CEMP as well as all legal and other requirements imposed via permits and licenses.

2.2. TRAINING, AWARENESS AND COMPETENCE

2.2.1. INTERNAL COMMUNICATION

All staff and sub-contractors working on site will be required to attend a site induction prior to commencing work. This will cover the key environmental aspects relating to the project and the roles and responsibilities of individuals.

Toolbox talks will be undertaken by the Environmental Manager or other nominated personnel throughout the project. The aim will be to communicate information to all staff and serve to educate, prompt and remind them of their responsibility to protect the environment during works.

Monthly progress meetings will be used to disseminate the results of monitoring and audit reports. At these meetings, a review of the environmental performance throughout the site to date will be undertaken, and any improvements required during the Phase 7 works will be identified. Details of where sustainable approaches to works activities have been implemented or developed as the work proceeds will also be discussed and recorded. Their suitability for implementation at other areas of the site will be considered and applied where appropriate. Decisions about amendments required to the processes and procedures will also be agreed.

2.2.2. EXTERNAL COMMUNICATIONS

Anglo American will lead communication with members of the public, including adjacent landowners, local residents and businesses in line with the Community Stakeholder and Engagement Framework (CSEF) see **Attachment A**.

The CSEF includes provision for a quarterly Liaison Group Forum meeting, which are open to members of the public to attend.

2.3. MONITORING OF COMPLIANCE

All Phase 7 construction works will be supervised by the Contractor's managerial staff with the support of members of their teams on a daily basis. The Contractor's managerial staff will receive a briefing from the Contractor's Environmental Manager to ensure that they are aware of the environmental requirements. The briefing will also ensure that they are able to assess whether the environmental requirements are being implemented properly.

Procedures relating to environmental management and monitoring of environmental performance identified within the CEMP will be subject to inspections by the Contractor at least once every week, with oversight and audit by the Anglo American Environmental Team. Records of inspections, audits and overall environmental performance will be submitted to Anglo American.

2.4. COMPLAINTS PROCEDURE

The implementation of the systems and procedures to protect the environment will effectively reduce or remove the risk of an environmental incident and/or exceedance of established thresholds. However, complaints may still be received and in this event the Complaints Procedure will be implemented, as detailed in **Attachment B**.

3. DESCRIPTION OF SITE

The following section seeks to address the requirements of planning conditions 65 and 68, providing details for the site's temporary boundary treatments, temporary compounds and structures that will be used as part of Phase 7 works. Most of the site set-up will have been completed as part of the previous phases of works. Changes to welfare compound layout, car park and haul road will be made during Phase 7 works as detailed in the below sections.

3.1. FENCING AND SECURITY OF THE SITE

Perimeter fencing will be installed around the shaft works area as a demarcation zone. Site access and controls established in previous phases will be utilised for site access and security during the Phase 7 works. Further controls for site access are detailed in the Phase 7 CMS.

3.2. SITE LAYOUT AND COMPOUNDS

The site layout and compounds are detailed in the Phase 7 Ladycross Plantation General Arrangement Plan and the Phase 7 Construction Method Statement (CMS).

The working platform constructed during Phase 3 works was designed and constructed to withstand the loadings of all plant and equipment associated with the Phase 7 works.

The welfare compound constructed during Phase 3 will be deconstructed and decommissioned. A new welfare compound will be installed to accommodate personnel for tunnelling operations. The new welfare will be modular units, single stacked, double row, with a planned footprint area of approx. 480m².

The refuelling area constructed during Phase 3 works will be operational during Phase 7 works and will be modified to accommodate storage of COSHH needed for future phases of work. Details of modifications are provided in the Phase 7 Construction Method Statement (CMS).

3.3. AREAS OF HARDSTANDING

3.3.1. CONCRETE/SLABS

To facilitate the install of temporary units for the Phase 7 works, additional reinforced concrete slabs will be required dependent on load capacities. Existing concrete pads / slabs will be utilised where practicable, the below provides details of maximum concrete slabs required during the Phase 7 works:

- A concrete footpath will be constructed in front of the new welfare area, to allow safe access to the facilities. Total surface area 100 m², length 50m and width 2m.

- Mechanical equipment storage - Adjacent area East of Workshop. Total surface area 30m², length 10m and width 3m.
- A concrete slab will be constructed to place a lattice communication mast - Adjacent area Northwest of new proposed welfare. Total surface area 9m², length 3m and width 3m.

The above dimensions are indicative sizes and are subject to change based upon final design requirements.

3.3.2. *STONE / AGGREGATE HARDSTANDING*

The stone Northern haul road that was constructed during the phase 3 works will be stripped to the clean subsoil level. The Glensanda surface cover layer will be excavated by a 30t tracked excavator and loaded onto a 20t dump truck. To reduce the imported material, the excavated Glensanda stone will be stored on site and reused as a base layer for shipping containers which are to be used for noise attenuation and screening purposes as detailed in **Section 3.4**.

3.3.3. *BLACKTOP INSTALLATION*

To meet the need for increased parking space during shift changeovers during tunnel operations, the parking facilities will be increased to 64 parking slots. Black top (tarmac) is to be added in addition to the phase 3 parking facilities adjacent to the Welfare.

To minimise the emission of dust and to provide safe working conditions, a further section of black top is to be installed around the grout plant.

3.4. EXTERNAL TEMPORARY STRUCTURES

As part of the Phase 7 scope of works additional external structures will be installed to minimise noise and visual impact. For further details of each structure refer to the Phase 7 Construction Method Statement (CMS) and Phase 7 General Arrangement Drawing. Overall sizes and dimensions will be as detailed below, minor changes to structure may be implemented as part of final design.

3.4.1. *PLACING SHIPPING CONTAINERS IN TARGETED AREAS, DOUBLE HEIGHT*

To reduce the visual impact of the construction site, double height shipping containers will be placed in targeted areas to screen the site as shown in **Image 1**. The containers will be installed in the north-eastern part of site, as stated in the Phase 7 General Arrangement Plan (40-STS-LC-2100-PA-22-20122). The containers will not exceed 7m in height and will be lifted into place by a site mobile crane.

The units will be painted RAL6008 (brown/green) or equivalent prior to arrival on site.

The container dimensions will be approximately 6m by 2.5m.

Image 1 – Similar shipping containers will be installed as part of Phase 7 works.



3.4.2. *ERECTION OF LATTICE COMMUNICATION MAST*

Due to the decommissioning of the current welfare facilities and the installation of the proposed welfare facilities, a temporary 15m high lattice communication mast (wind up) will be erected in the Northwest area of the proposed welfare.

3.5. UTILITIES

3.5.1. *WATER SUPPLY*

Raw water to facilitate site operations will be serviced by a 4" Yorkshire Water potable water supply. The potable water will provide services to both welfare facilities and for site process use.

Bottled water dispensers will be provided for site staff. Where required, dust suppression bowsers will also periodically be topped up via the water supply. Temporary tanks may be utilised for storage of water for site specific operations.

To supply water for showering in the new welfare facilities an additional water tank will be installed. The installation will be according to the Phase 7 General Arrangement Plan (40-STS-LC-2100-PA-22-20122) and might include excavation.

3.5.2. ELECTRICAL SUPPLY

A three-phased 415V electrical supply was installed during Phase 4 to power site operations. Where practical the main supply will power the Phase 7 activities.

Additional generators will be installed in Phase 7 to provide power where it is not practical to use the existing mains supply. Details of the additional generators are described in the Phase 7 CMS.

Where standalone generators are required, these will be super silent and installed in a manner to reduce noise impacts on local receptors. Practices to reduce noise impacts will include but not be limited to:

- Procurement of super silent generators with reduced noise impact,
- Positioning of generators during installation, and
- Noise attenuation fencing/panels installed around generators, where required.

3.6. WELFARE FACILITIES

The welfare compound constructed during Phase 3 will be deconstructed and decommissioned. A new welfare compound will be installed to accommodate personnel for tunnelling operations. As soon as the new welfare facilities are operational, the old welfare facilities will be decommissioned.

In Phase 7, new welfare facilities will be installed in the north-western part of site, as detailed within the Phase 7 General Arrangement Plan (40-STS-LC-2100-PA-22-20122).

The new welfare will be modular units, single stacked, double row, with a planned footprint area of approx. 480m². The modular units will incorporate site welfare, office and toilet spaces. The units will not exceed 3,5m height and will be lifted into place by a site mobile crane or HIAB. The units will be painted RAL6008 (brown/green) or equivalent prior to arrival on site. Discreet, sensor-controlled perimeter downlighting will be fitted to provide safe access and egress. All windows will be fitted with shutters. A stores cabin will be retrofitted to the proposed welfare footprint and external stairs positioned to face into site.

3.7. LIGHTING

The Phase 7 works will be illuminated, when necessary, through temporary, task-specific directional lighting. The additional cabins for the new welfare area will be fitted with motion sensor controlled, discreet perimeter lighting for safe access and egress. Shutters on welfare buildings will be shut after nightfall to reduce light spill. Phase 7 works will be daytime working only.

On-site exterior lighting will apply the following principles which will ensure that impacts on wildlife are minimised in accordance with 'Artificial Lighting and Wildlife' guidance¹:

- Task lighting will be used where appropriate,
- Lighting will be directed downwards (0 to 20 degrees where possible), with all beam angles below 70°,
- Lighting will be kept as low as is safe and practicable for the works taking place and kept at a maximum height of 4m,
- Lights will be switched off when not in use or will be motion sensor controlled,
- Where safe and practicable, British Standards and guidance from the Institute of Lighting Professionals in the document 'Bats and Artificial Lighting in the UK' (September 2018) (<https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>) will be followed where relevant, and
- All lighting will be directed to avoid light spill on to the perimeter woodland.

Where additional temporary lighting is required to provide a safe working area and access and egress, it will be installed in line with the above procedures, where possible aiming to limit upward light spill, and utilising warm spectrum LED's.

3.8. MATERIAL STORAGE

The type of material stored on site will determine the storage methodology adopted. Fuel and chemical storage areas will be located as far from all open drains and watercourses as practicable, with at least 10m from these locations. In addition, the storage areas will not be located near any open excavation of natural ground. Additional storage requirements will be implemented based upon the associated manufacturers Material Safety Data Sheet (MSDS).

The areas in which hazardous substances are stored will be clearly demarcated and within appropriate containerised units with integrated secondary containment.

All fuel will be stored within the onsite fuel tank installed during Phase 3 works. Specific areas onsite will be designated for materials storage.

All non-polluting materials will be stored in designated areas, with surface water run-off draining to adjacent filter drains, surface swales and surface water drainage as detailed in **Section 9**. Penstocks and hydraulic brakes have been installed within the surface water drainage network, which will be closed in the event of a spill or detection of other contaminants. Details of site drainage and penstock locations are detailed in the Phase 3 Surface Water Management Plan and Phase 7 Surface Water Drainage Scheme.

Table 3 - 1 Material storage for Phase 7 works

Material	How it will be stored
Concrete (Wagon / truck loads)	Bulk concrete will be delivered and used straight from the concrete wagon.
Cement (small bags 25kg)	Small bags of cement will be stored on pallets with appropriate weatherproofing in a designated area away from high trafficked zones.
Diesel / Petrol (Bulk storage)	Bulk storage of diesel/petrol will be stored in a designated refuelling area. A towable bowser with secondary containment will be utilised for refuelling of large plant. The bowser will be stored in an appropriate demarcated location.
Oils and greases (Plant maintenance and site operations)	Oils and greases will be stored in appropriate containers in segregated areas of site (COSHH container and workshops). COSHH assessment and MSDS will be assessed for further storage requirements.
Bentonite (small bags 25kg)	Small bags of bentonite will be stored on pallets with appropriate weatherproofing in a designated area away from high trafficked zones.
MAPEI CBS System 1 (Retarder for grout mix) (Liquid 25kg drums)	Retarder for grout mix will be stored in appropriate containers in segregated areas of site (refuelling station).

Material	How it will be stored
Spray Paint (750ml pressurised cylindrical can)	Spray paint will be stored in appropriate containers in segregated areas of site (COSHH container).
Asphalt	Bulk asphalt will be delivered and used straight from the asphalt wagon.
Chemicals	Chemicals will be stored within appropriate container within the on-site COSHH containers.

3.9. FUEL OIL STORAGE AND REFUELLING ON SITE

3.9.1. STORAGE

Fuel will be stored within/on the designated refuelling area, it will be stored in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001, as follows:

Secondary containment will be provided for all surface oil and diesel tanks:

- For a single tank, the secondary containment will be at least 110% of the maximum storage capacity; and
- For two or more tanks in one secondary containment system, the secondary containment will be at least 110% of the biggest tank's maximum storage capacity or 25% of the total maximum storage capacity of all the tanks, whichever is the greater.

Storage must be more than 10m away from any watercourse or the surface drainage system.

Static fuel tanks (such as those linked to generators) will be sited on sealed, level ground adjacent to the generators. All fuel bowsers will have tanks with integrated secondary containment that holds a minimum of 110% of the volume of the inner tank.

Spill kits will be stored adjacent to the storage areas and relevant staff will be trained in the use of such equipment in the event of a spillage.

3.9.2. REFUELLING

All replenishment of tanks and containers and all re-fuelling of vehicles, plant and equipment shall take place within bunded, impervious hardstanding where practical. The refuelling area built during Phase 3 works will be utilised to refuel all site mobile plant. A double bunded tank will be used for the storage of diesel and a further bunded IBC unit will be used to contain AdBlue.

Toolbox talks regarding refuelling processes will be briefed to all relevant personnel.

For larger or stationary plant such as cranes and generators refuelling will be carried out in-situ on site. The following control measures will be implemented during refuelling processes:

- Supervision of all fuel deliveries;
- Checks carried out on delivery of fuels to ensure correct fuel is delivered;
- Ensure all valves on a bunded tank or secondary containment is closed when not in use;
- Any static fuel bowsers are fitted with automatic cut-off or trigger nozzles; and
- Never leave vehicle or plant unattended during refuelling.

Heavy plant undergoing in-situ refuelling will be located on the working pad area. As part of the Phase 3 works an impermeable Geosynthetic Clay Liner (GCL) was installed to minimise impact from any pollution incidents.

3.10. SITE HOUSEKEEPING

The implementation of a good site housekeeping policy is key to reducing the likelihood of accidents and environmental pollution incidents. Good housekeeping measures that will be implemented on site include:

- Keeping the site tidy;
- Segregating waste and removing it from site regularly;
- Maintaining all site facilities, including welfare facilities;
- Maintaining site roads, ensuring internal roads and those surrounding the site are kept clean;
- Ensuring plant and vehicles on site are well maintained;
- Ensuring all materials are stored appropriately;
- Undertaking regular inspections of all areas of the site to ensure housekeeping requirements are being fully implemented; and
- Ensuring that detailed records of these inspections, their findings and any mitigation required are kept.

The Site Supervisor will monitor the cleanliness of the road daily to ensure that it is free of dirt and debris. Road sweepers will be deployed to clean the roads as necessary, under instruction of the Site Supervisor.

3.11. WHEEL WASHING FACILITIES

The wheel washing facilities constructed as part of Phase 3 works will be utilised for wheel cleaning of all HGVs and plant exiting site onto the public highways. Traffic will be routed one way to ensure all vehicles required use the wheel washing facilities.

Regular maintenance of the wheel washing facility will be carried out in accordance with the manufacturers servicing specification. The washings shall be collected in a sump, with settled solids removed regularly and water recycled and reused where possible.

4. TRAFFIC

4.1. CONSTRUCTION TRAFFIC MANAGEMENT PLAN

The Phase 7 Construction Traffic Management Plan (CTMP) (40-STC-LC-2100-LG-PL-00008) outlines control measures implemented for the Phase 7 works. This contains a range of general measures for the management of transport including:

- High occupancy travel for employees, including car-sharing, minibus pick up and utilising a parking area outside of the NYMNPA as a transport hub, and
- All vehicles travelling to site using the designated routes only.

The CTMP also contains a Highway Communication Plan, which outlines how communication with the public, the planning and local authorities, and any other stakeholders will be undertaken.

The CTMP also specifies prohibited routes for construction vehicles. To support this, Prohibitive and Directional Signage will be shared with all delivery drivers. This signage was installed prior to the commencement of Phase 2 of the project as part of the Phase 1 Highway works and will be maintained throughout the construction period for Phase 7

4.2. PARKING, LOADING AND UNLOADING

4.2.1. *PARKING AND LOADING*

4.2.1.1 **PARKING**

Parking will only be permitted within designated car parking areas and drivers will be required to display permits while parking on site. No access to the site by foot is permitted. A peak of up to 45 employees per day/shift will be on site during Phase 7.

4.2.1.2 **LOADING AND UNLOADING**

Loading and unloading of deliveries and materials on site will take place in designated areas dependent on works.

Approximately 10 Abnormal Indivisible Loads (AIL) are expected during the Phase 7 works. Deliveries will be staggered throughout the duration of the Phase 7 works to reduce the number of AIL operating on the A171 and the C82 between Lockwood Beck Site and Ladycross.

4.2.2. *ACCESS*

All construction traffic will use the existing main access road to access site. The access road is appropriately sized to allow for three HGVs to queue. In addition to the physical measures

proposed, to prevent traffic having to wait on the highway or the potential for multiple to meet at the site access, the contractor will be required to provide a banksman and schedule deliveries and shift times.

Security will be stationed at the site access gates and all drivers will be required to have completed the appropriate driver induction before entering site. Access will only be authorised for deliveries / vehicles booked in for the day and with the appropriate access documentation. All deliveries will follow the onsite one-way traffic controls. Where required a banksman will be provided by the contractor if reversing or manoeuvring of vehicles is required.

In addition to assisting the contractor to manage the total numbers of daily HGV movements, the requirement for planning and scheduling deliveries will also assist the contractor in ensuring that deliveries can be spread throughout the working day.

The contractor will also be required to schedule shift times to try and avoid employees arriving and departing at the same time and to schedule deliveries outside of these hours.

5. NOISE AND VIBRATION

5.1. NOISE AND VIBRATION MANAGEMENT PLAN

The imposed noise limits for the Ladycross Plantation are 55dB LAeq¹hr during the day and 42dB LAeq¹hr in the evening (07:00-19:00 and 19:00-07:00 respectively). The Phase 7 works will comply with these limits. Noise monitoring will be carried out for the full duration of the Phase 7 works. A Phase 7 Noise and Vibration Management Plan (NVMP) (40-STS-LC-2100-EN-PL-00034) has been produced and provides further details regarding the mitigation, monitoring and controls to be implemented during the Phase 7 works.

6. AIR QUALITY AND DUST MANAGEMENT PLAN

During the Phase 7 works dust suppression measures will include:

- Damping down of road surfaces, road sweeping and potentially vehicle wheel washing will be utilised across the works area, as appropriate,
- Site fencing, barriers and other areas of dust accumulation will be kept clean using water spraying where there is the risk of dust accumulation. Any run-off will be filtered via the site surface water drainage system,
- Materials that have the potential to create dust problems will be removed unless they are to be re-used on site. Where possible these will be covered or contained in a fenced area,
- Seeding of all topsoil and landscaping areas,
- Burning of waste materials will be prohibited, and
- Plant and vehicles used on site will be well maintained to minimise pollutant emissions.

6.1. DUST MANAGEMENT PLAN

Dust emissions can arise during Phase 7. Measures and controls to minimise dust emissions from Phase 7 are provided in the Construction Phase Dust Management Plan (DMP) submitted as part of Phase 3 to partially discharge condition 93. Daily inspections and monitoring will be undertaken by the contractors, in accordance with this procedure. Some of the dust management mitigation identified in the DMP is detailed in **Table 6-1** below. The Phase 7 Emissions to Atmosphere and Phase 3 CTMP provides further detail regarding the air quality and dust mitigation to be adopted during the Phase 7 works.

Table 6 – 1 Dust Mitigation

Source / Activity	Mitigation Measures
Construction Traffic	<ul style="list-style-type: none"> • Implement speed limit on internal roads • Dust suppression used on roads when dust emissions noted • Provide wheel washes to reduce dust on public highways • Sheeting of vehicles carrying dust generating materials • Regular maintenance of vehicles and plant

Source / Activity	Mitigation Measures
Compound Areas	<ul style="list-style-type: none">• Ensure areas used for welfare facilities and vehicle management (loading and unloading) are constructed of hardstanding• Sweeping / dampening down areas of hardstanding when required
Storage Areas	<ul style="list-style-type: none">• Grass seeding temporary earth bunds until re-use• Profiling stockpiles of dust generating materials• Covering dust generating materials, if practical• Dampening down facilities for stockpiles
Earthworks and restoration of large areas	<ul style="list-style-type: none">• Monitor earth moving works, especially in dry and windy conditions• Dust suppression in areas of noted emissions• Additional dust mitigation controls installed where required• Background dust monitoring to assess impacts

7. NATURE CONSERVATION

7.1. PROTECTED SPECIES AND PRECAUTIONARY METHOD OF WORKING FOR SITE CLEARANCE

Protected Species Management Plans (PSMPs) were produced for reptiles, birds, bats, badgers and water voles to partially discharge condition NYMNPA-52 for Phase 3. These remain applicable for the Phase 7 works, and the accompanying Precautionary Methods of Working will be applied. The measures detailed in these PSMPs will be implemented in Phase 7.

7.2. VEGETATION CLEARANCE

An assessment by competent persons and consultation with the Project Ecologist will determine if any works impact on the peripheral tree line. Appropriate measures will be followed as outlined in the Arboricultural Method Statement (AMS) prior to any works commencing.

In the event trees require removal, pre-commencement checks for protected species will be carried out 48 hours prior to felling works. Further checks will be undertaken at three-day intervals while works are ongoing to ensure nesting birds have not returned.

As per the Phase 3 Soil Management Plan prior to stockpiles movement, weeds in the stockpiles will be undertaken either by spraying to kill them or by mowing or strimming

7.3. LANDSCAPING AND ECOLOGICAL MANAGEMENT

A Landscape and Ecological Management Plan (LEMP) was produced during Phase 3 works to partially discharge condition NYMNPA-70. The temporary soft landscaping that will be undertaken within the Phase 7 works requires no variation to the Phase 3 LEMP. The soil stockpiles and soft areas developed by the Phase 7 works will be seeded with Seed Mix 1 as shown in **Table 7-1** below.

Table 7 – 2 Stockpiles Seed Mix

Topsoil and subsoil storage mounds sowing mix (sowing rate 25gms/m²)		
30%	Crystal	Hard Fescue
25%	Disco	Perennial Ryegrass
20%	Franklin	Strong Creeping Red Fescue
10%	Panduro	Smooth Stalked Meadow Grass
10%	Highland	Browntop Bent
5%	Huia	White Clover

8. ARCHAEOLOGY

Earthworks required for utilities installation will be carried out on previously extensively surveyed areas of site. Therefore, the potential for interaction with archaeology is low. The principles set out in the Phase 2 Written Scheme of Investigation (WSI) will be applied to archaeology encountered during the Phase 7 works.

9. HYDROGEOLOGY, WATER QUALITY AND DRAINAGE

9.1. SURFACE WATER MANAGEMENT

As part of the Phase 7 works the full site surface water drainage network installed during the Phase 3 works will be adopted for surface water management on site. The scope of works for Phase 7 has been reviewed and it was concluded that no review is required to the existing Phase 3 Surface Water Management Plan (SWMP) which provides further detail regarding the control measures and mitigation which will be adopted during the Phase 7 works.

Some modifications may be carried out to the surrounding drainage around the lagoon footprint to facilitate the remediation works where appropriate. The drainage will be extended to the new parking facilities. The drainage will tie into the existing Phase 3 drainage network and will be installed to design requirements. The Phase 7 Surface Water Drainage Scheme (40-ST5-LC-2100-PA-22-20123) shows the modifications implemented during Phase 7 works.

9.2. GROUNDWATER MANAGEMENT

The following section seeks to address the requirements of planning conditions 88 and 90, providing details for managing shallow groundwater during the Phase 7 works. The scope of works for Phase 7 has been reviewed and it was concluded that no review is required to the existing Phase 5 Hydrogeological Risk Assessment (HRA).

Groundwater will be monitored and managed in accordance with the Phase 5 (HRA) and Phase 7 Construction and Operation Groundwater and Surface Water Monitoring Scheme.

During excavation works any short term ingress water from either shallow groundwater or surface water sources will be managed by pumping, if required, prior to placement and compaction of superficial deposits and subsoils. Water will be pumped into the site drainage network and managed in accordance with the Water Abstraction and Impounding (Exemptions) Regulations 2017 and the Phase 7 Surface Water Drainage Scheme.

During the Phase 7 works, boreholes 34BH03 and 34BH06 will require decommissioning since they fall within the footprint of the new welfare area. The decommissioning of the boreholes will be undertaken in accordance with current guidance and best practice (Environment Agency, 2012) and will adopt one of the decommissioning options detailed in the Phase 7 Construction Method Statement (40-ST5-LC-2100-CN-MS-00008) On completion of the decommissioning, a report of works undertaken will be prepared. Details about changes to GW monitoring schemes are provided in the Phase 7 Construction and Operation Groundwater and Surface Water Monitoring Scheme (40-ST5-LC-2100-EN-PL-00033).

9.3. SILT AND POLLUTANT MANAGEMENT

Silt and pollutant management remain as per the Phase 3 CEMP and SWMP.

10. SOILS AND CONTAMINATED LAND

As part of the Phase 7 works, there is a requirement to strip topsoil as part of the new welfare facilities to be installed as detailed in section 3.6. The area will be stripped in accordance with the Phase 3 Soil Management Plan (SMP). Areas that require further soil stripping are shown in the Phase 7 Hard and Soft Landscaping Plan (40-STS-LC-2100-PA-22-20121) and the Phase 7 Phasing Plan (40-STS-LC-2100-PA-22-20120).

The earthworks are dependent on weather and site conditions at the time of working. As such a phased approach will be carried out to ensure best practice and reduce exposure during the topsoil strip and re-topsoiling. Topsoil and subsoil will not be stripped unless conditions at that time comply with both the site SMP and Construction Code of Practice for the Sustainable Use of Soils on Construction Sites 2009 published by the Department of Environment, Food and Rural Affairs (Department for Environment, Food and Rural Affairs, 2009) and the Good Practice Guide for Handling Soils (Ministry of Agriculture, Fisheries and Food, 2000). All areas that do require stripping will undergo circa 200mm topsoil strip followed by a 250mm – 300mm subsoil strip where ground conditions allow. All areas will be dressed with imported virgin material to protect the underlying subsoils.

The stored topsoil will be placed in the lagoon area that was previously backfilled during Phase 6 works and the soil storage area. Topsoil will be in a dry and friable condition prior to placement. The topsoil will then be spread to achieve varied topsoil depths utilising earthmoving plant to maximum depth of 260 mm, feathering out edges to adjoining areas of subsoil. Any topsoil surplus will be stored in the designated area, as portrayed in the Phase 7 General Arrangement Plan. All topsoil placement operations will follow the Phase 3 Soil Management Plan (40-STS-LC-2100-EN-PL-00007).

To avoid erosion the topsoil will be seeded with a seed mixture as stated in Section 7.3.

The control measures to be implemented for interaction with unidentified contamination is described within the Phase 3 CEMP, which remains applicable for Phase 7.

Image 2 – Phase 7 Landscaping areas



11. MATERIALS AND WASTE

A range of materials and waste materials will be stored on site, and these will be stored in a designated area on site. The areas used for storage of material have been planned to avoid excessive handling of material and to facilitate loading and unloading. Details of the measures taken to reduce potential pollution are detailed in **Sections 11.1 – 11.4**.

11.1. Waste Minimisation

Waste management practices will ensure that the waste Duty of Care requirements of the Environmental Protection Act 1990 Part II: (Duty of Care); The Waste (England & Wales) Regulations 2011: and the Environmental Permitting (England & Wales) Regulations 2016 are met.

The national hierarchy for waste will be used as reference for management of all wastes produced on site:

Reduce: we will seek to minimise waste through design

Re-use: Wherever possible we will utilise waste exemptions to enable waste to be re-used both on and off-site.

Recycle: We will recycle material wherever technically, environmentally and economically practicable.

Recover: We will look to recover energy and material from waste (digestion, incineration, gasification etc.)

Dispose: We will look to avoid the disposal of waste to landfill and only use disposal as a last resort. Wastes will be minimised through adoption of the following procedures:

- Appropriate procurement of materials (volumes, and options to use recycled materials);
- Use of 'Just in Time' delivery of raw materials to ensure that raw materials (aggregate etc.) are not wasted or lost to the environment;
- Operation of a take-back scheme for excess materials when possible; and
- Adoption of energy management practices minimising use of plant and fuels.

11.2. MATERIALS AND WASTE STORAGE

Additional storage measures for materials used in Phase 7 not covered by previous CEMPs are detailed in **Section 3.8**.

11.3. LIQUID WASTE MATERIAL

11.3.1. WATER TREATMENT PLANT SLUDGES

Waste sludges will be produced during the operation of the onsite Water Treatment Plant (WTP). The sludges will be pumped to a sludge tank for holding. A licensed waste contractor will carry out collection and disposal of sludges where required.

11.3.2. OIL INTERCEPTOR OILS AND WATER

The oil interceptor will undergo regular maintenance and servicing based upon the specification outlined in the supplier guidelines and manuals. The silt removed from the silt trap will be collected and disposed of by a licensed waste contractor. The oil will be collected and disposed of by a licensed waste contractor.

11.3.3. CESSPIT FOUL SLUDGES

During the Phase 7 works a new cesspit will be installed to accommodate additional welfare facilities for a maximum of 50 employees during tunnel operations. The new cesspit and the one installed as part of previous phases at the gatehouse will undergo regular maintenance and servicing based upon the specification outlined in the supplier guidelines and manuals.

The foul sludge will be emptied from the tanks on a routine basis based upon site footfall and supplier recommendations. The tanks are fitted with high level alarms as an additional layer of safety. Foul sewerage will be removed by a licensed contractor to a permitted waste facility.

12. INCIDENT AND EMERGENCY PLANNING

Potential environmental issues and emergencies are considered as part of the project planning, and the appropriate prevention and control measures put into place. These measures are communicated to all people working on the project including subcontractors through the site induction and toolbox talks.

The emergency contacts list and drainage plan/ site plan (including the location of spill kits) will be posted on notice boards. Spill kits will be located within the stores in the site compound, at strategic points around the site and within all working vehicles. Vehicles will carry enough spill kit to clean up the amount of diesel/ oils they are carrying.

All employees will be instructed to bring any environmental incidents they identify to the immediate attention of Site Management, after first taking any possible steps to contain/ remediate the incident (without putting the health and safety of themselves or others at risk).

Environmental Emergency Preparedness Plans (EEPP) have been prepared specifying the actions to be undertaken in the event of an environmental emergency or a breach of the measures set out in the EIA. The EEPP will be displayed on all site notice boards. In accordance with the EEPP, the Contractor's Environmental Manager will be notified of environmental incidents.

13. RELATED DOCUMENTS AND REFERENCES

- Phase 7 Construction Method Statement (40-STS-LC-2100-CN-MS-00008)
- Phase 7 Construction Traffic Management Plan (40-STS-LC-2100-LG-PL-00008)
- Phase 7 Noise & Vibration Management Plan (40-STS-LC-2100-EN-PL-00034)
- Phase 7 Surface Water Drainage Scheme (40-STS-LC-2100-PA-22-20123)
- Phase 7 Construction and Operation Groundwater and Surface Water Monitoring Scheme (40-STS-LC-2100-EN-PL-00033)
- Phase 7 Hard and Soft Landscaping Plan (40-STS-LC-2100-PA-22-20121)
- Phase 7 Phasing Plan (40-STS-LC-2100-PA-22-20120)
- Phase 3 Landscape and Ecological Management Plan (40-STS-LC-2100-EN-PL-00014)
- Phase 2 Archaeological Watching Brief Written Scheme of Investigation (40-COT-LC-8324-EN-PL-00002)
- Phase 3 Soil Management Plan (40-STS-LC-2100-EN-PL-00007)
- Phase 5 Hydrogeological Risk Assessment (40-STS-LC-2100-EN-RA-00004)
- Construction Phase Dust Management Plan (40-STS-LC-2100-EN-PL-00015)
- Construction Phase Arboricultural Method Statement (40-STS-LC-21-CN-MS-00003)

14. DEFINITIONS AND ABBREVIATIONS

NYMNPA – North York Moors National Park Authority

MTS – Mineral Transport System

CEMP – Construction Environmental Management Plan

HGV – Heavy Goods Vehicle

EIA – Environmental Impacts Assessment

PMWSP – Precautionary Method of Working Standard Procedures

CSEF – Community Stakeholder Engagement Framework

ANPR – Automatic Number Plate Recognition

AMS – Arboricultural Method Statement

MSDS – Material Safety Data Sheet

COSHH – Control of Substances Hazardous to Health

IBC – Intermediate Bulk Container

PSMP – Protected Species Management Plan

RPZ – Root Protection Zone

WSI – Written Scheme of Investigation

WTP – Water Treatment Plant

EEPP – Environmental Emergency Preparedness Plan

AIL – Abnormal Indivisible Loads

15. ATTACHMENTS

ATTACHMENT A – Community Stakeholder Engagement Framework

ATTACHMENT B – Complaints Procedure

ATTACHMENT C – Precautionary Method of Working

ATTACHMENT A - COMMUNITY STAKEHOLDER ENGAGEMENT FRAMEWORK



Community and Stakeholder Engagement Framework

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Community and Stakeholder Engagement Framework

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Community and Stakeholder Engagement Framework

1 Purpose and Scope

1.1 Background

The Company takes its responsibility to the local area very seriously and is committed to taking an active and positive role in the local community. This means minimising the potential adverse impacts on people living and working in the area, making a meaningful contribution to the social and economic well-being of the area, keeping the community informed as the project develops and responding quickly to questions and concerns.

There is widespread interest in the Company's Woodsmith Project (the Project) at local, regional and national levels. This is demonstrated by the ongoing media and stakeholder enquiries, as well as the levels of participation during the planning consultations and at Company events.

Anglo American (the Company) successfully engaged the community and other key stakeholders during the planning period and has continued to do so beyond, gaining widespread support for the Project. This has helped to provide the Company with a social license to operate. Maintaining this throughout the construction period is important to the successful delivery of the Project and is a key objective of the Company's board and management team.

1.2 Purpose

This Community and Stakeholder Engagement Framework (CSEF or the Framework) aims to set out a clear communications approach during the construction period which, when implemented correctly, can help to maintain the Project's social license to operate.

1.3 Scope

The Framework sets out an approach to community and stakeholder communications during the construction period. It outlines the overall strategy, identifies the main stakeholder groups and details the engagement objectives and activities. Stakeholders have been identified as those groups in the local area who have the potential to be impacted by construction, and as such does not include wider corporate stakeholders such as investors or customers.

The Framework sets out the roles and responsibilities of the Company and the principle construction contractors for implementing and managing its delivery.

1.4 Standards and compliance

The Framework is in compliance with planning obligations relating to community and stakeholder engagement including: producing a communications plan; the establishment of the Liaison Group Forum and Traffic Management Liaison Group; notification to neighbours of construction activities, particularly in relation to noise; dealing with complaints and initiatives to promote local benefits.

It is not within the scope of this plan to include engagement with the planning authorities and other statutory bodies in relation to the compliance with planning obligations and further environmental requirements, other than those specifically regarding community engagement.

1.5 Document review

The Company is committed to regularly reviewing its approach. This is the fifth time this document has been updated since the off-site highways improvement works were undertaken on the main transport route and construction started at Woodsmith, Ladycross Plantation, Lockwood Beck and Wilton. The principles of the Framework therefore remain unchanged, with the addition of the good practice learnt over the last five years.

The Framework will be reviewed on annual basis by the General Manager External Affairs and Corporate Relations Director, in consultation with the land, environment and planning team, and updated as necessary. It will be distributed to the list shown in section 1.6. Lessons learnt will be adopted into the working practices of the social performance team under the direction of the Corporate Relations Director.

1.6 Distribution list

- North York Moors National Park Authority
- North Yorkshire County Council
- Principle contractors

2 Engagement Strategy

2.1 Rationale

The strategy is based on the principle that the local community and key stakeholders should be kept informed of developments and in advance of them occurring. The failure to communicate often leads to a communications vacuum and this in turn leads to misinformation and rumours which is unhelpful for all stakeholders.

Similarly, providing channels for feedback to the Company in the first instance, including direct contact with the community relations team, allows local people or spokespeople to be engaged in matters that might affect them. Since construction started on the off-site highways works over five years ago, the vast majority of questions or concerns about the Project have come directly to the Company. This demonstrates the importance of developing and maintaining relationships 'on the ground'.

Keeping people informed is not just about notification of physical activities during the construction period, but is also about allowing a channel for feedback that might raise an issue or local knowledge that the Company or its contractor teams were not aware of. It also enables a channel to promote the benefits of the Project as well as engaging in other positive public relations activities.

Any materials that are prepared for public consumption to explain parts of the construction work are designed and drafted in a manner that promotes the understanding of works or issues in as clear and straightforward manner as possible.

2.2 Approach

1. Conduct pre-briefings for key events or activities

Providing clear information before each phase of works commences at the Project sites detailing what construction will involve, when it will take place and the measures to limit impacts. Since

construction started this has included newsletters, mailouts, direct face-to-face meetings, drop-in events, public meetings, press releases and notices in the local media.

2. Have effective ongoing management of local communications

Providing ongoing updates about construction progress and establish mechanisms that enable concerns to be raised and acted upon. This includes participation in the various liaison groups and clear processes to manage incoming queries or complaints. These have worked well since construction started. The Company also operates a 24-hour community helpline.

3. Community benefit initiatives

Undertaking and promoting regular initiatives that deliver community benefits such as education schemes and employment and business opportunity information sessions. These have been ongoing since construction started and have been well received by the community.

Further details on the methodology for pre-briefings, ongoing management and community benefits initiatives are available in sections 4.2 – 4.4.

3 Stakeholder Identification

Stakeholder groups have been identified and engaged as the Project has developed and can be broadly categorised as follows:

1. Site neighbours

Residential neighbours and/or landowners, businesses and organisations close to the individual construction sites. This also includes those directly affected in other areas such as those living close to key transport corridors or junctions. Approximately 70 households have been identified as 'site neighbours' to the Woodsmith, Ladycross Plantation and Lockwood sites and regular contact has been maintained since construction commenced. In addition, links with the neighbourhood of Dormanstown have been established since construction commenced at the Wilton site.

2. Community representatives

This group includes elected representatives of the community including parish and town councils, local authority officers and councillors, and local MPs.

3. Interest groups

Business networks, environmental bodies, other local clubs and groups.

4. Education Institutions

This includes local schools, colleges, universities and other training providers.

5. Media

A wide range of online, print and broadcast outlets and journalists are considered key stakeholders.

6. General public

The wider public as accessed through media channels, the website, social media or site signage etc.

A register has been developed for each Project site for of these broad groups, which is reviewed and updated. Stakeholder engagement takes into account the needs of vulnerable and disadvantaged groups, making sure that information about the Project is accessible and people are able to contact the

Company and receive a prompt response. This is ensured by utilising a broad range of engagement channels, as set out in section 4, and holding public events in accessible venues.

4 Engagement Methodology

This section sets out how community and stakeholder communications will be handled.

4.1 Identify stakeholders

The broad stakeholder groups have been identified, together with specific stakeholders relevant to each of the construction sites that are most likely to be impacted by the works. This includes landowners and local residents in close proximity to the sites.

4.2 Pre-briefings for key events

Before each phase of construction starts, or before a specific construction activity that has the potential to impact stakeholders, it is important to provide information to the local community. For the purpose of this Framework these stages are defined as “construction events” (these are listed in Appendix 1). Each construction event triggers the requirement for pre-briefing activities. The level of pre-briefing activity will vary, taking into account the extent of the local impact anticipated.

The pre-briefing information will include details about what construction will involve and how people can contact the Company if they have questions or concerns. Reassurance will be given that measures will be taken to limit adverse impacts to an acceptable level and that planning conditions and other requirements are in place to ensure that this happens. As a minimum, the pre-briefing activities will include:

- Letters – Letters and or emails should be sent to those that are likely to be immediately affected. This might include neighbouring residents or households and businesses on access routes. As a courtesy, the same information will be sent to the local Parish Council, borough and county councillors covering those areas.
- Visits and phone calls – In addition to letters, affected households and businesses will be visited, or at the very least receive a telephone call.

For construction activities that are more significant, in terms of their potential for stakeholders to be affected, the Company will use the following pre-briefing methods. The precise details and extent of pre-briefing will be a matter of judgement and as a result of discussions between the contractor and the Company and, where appropriate, the planning authorities. Activities may include:

- Newsletter / Leaflet – A short summary newsletter or leaflet about the works will be made distributed, including local noticeboards and community facilities.
- Exhibitions / Open days – In the case of certain key events, such as the main shaft sinking, it will be appropriate to inform local residents and the wider general public through open days prior to works starting. This includes further information on exhibition boards and will be attended by key personnel from the Company and contractors, who are be able to respond to queries and provide reassurance on potential concerns. Ten of these sessions have taken place since construction started.

- **Press release** – If appropriate (often where a wider audience is potentially affected or interested in the works planned) then a press release will be prepared detailing the key facts. Any press release needs to be signed off by the Company in a timeframe that makes sure newspaper deadlines are met. Where possible, coverage should always appear in the week prior to the proposed activities beginning. The local media has been particularly useful in instances where the community beyond the immediate site neighbours could be affected, such as public highways disruption.
- **Website updates** – Details of key events are uploaded to the Company website. Some works may also require more detailed information and documents to be uploaded.
- **Social media updates** – The Company will control its social media accounts. As above, the contractor will be expected to provide the relevant details to the Company in a timely fashion so the relevant information can be released through its social media channels.
- **Stakeholder briefings** – In some circumstances specific stakeholders will be individually briefed to inform them of key events. This may include elected representatives, local authority officers or interest groups. The Company will take the lead on such matters and will involve contractors where appropriate.

4.3 Ongoing management

Local residents and stakeholders will continue to be engaged throughout construction (i.e. general updates in addition to those covered under ‘key events’ in appendix 1). This will enable the Company to provide regular updates of the Project’s progress, and that it is being delivered in accordance with planning consents and any other Company commitments. Alternatively, if the Project is not progressing as expected it is important that stakeholders are provided with an explanation and reassurance that corrective measures will be implemented.

In addition, on-going engagement will include a range of communication channels that enable stakeholders to raise issues and ask questions and for the Company to respond to these.

4.3.1 Liaison Group Forum

The Liaison Group Forum (LGF) was established prior to the commencement of construction and has met quarterly. It is chaired by the Company and its membership includes representatives from the National Park Authority, parish and town councils and wider community stakeholder representation as appropriate. The meetings take place in community venues, such as village halls, close to the Woodsmith site and are open to the general public to attend and to ask questions.

The purpose of the group is to facilitate liaison between local stakeholders about construction, providing updates about progress, and to enable issues and concerns to be raised and resolved.

4.3.2 Industrial Business Group

The Industrial Business Group (IBG) was established to facilitate liaison between the businesses based at Wilton International and residents from the neighbourhoods in close proximity of the site.

Meetings are held bi-monthly and attended by the major businesses on the site, local councillors and residents. The Company joined the group once construction started on the Wilton site.

4.3.3 Traffic Management Liaison Group

The purpose of this group is to facilitate liaison between local authorities and other interested stakeholders in regard to construction traffic. The group, which meets quarterly, oversees the management and monitoring of the Construction Traffic Management Plan (CTMP) and is chaired by the Company. The meetings take place after the LGF meetings, on the same day and venue, with traffic issues raised by the LGF addressed by the group.

There is representation from the National Park Authority, highways authorities, local authorities, the police and other stakeholders as invited.

4.3.4 24-hour community helpline

To ensure that there are accessible points of contact for the local community and wider stakeholders a 24-hour community helpline has been established, which is delivered by a specialist contractor. In addition there is a community email address, which is managed by the Company.

4.3.5 Regular briefings and updates

Key individuals and organisations are regularly briefed and updated. Similarly to pre-briefings for key events, updates are communicated through the following channels:

- Public meetings and presentations – Parish council and town council meetings are regularly attended, together with presentations to local interest groups.
- Site visits and meetings – visits to the Project sites for key stakeholders have been an effective way to communicate site activity and progress. In addition, drone footage of the project sites is regularly used to show progress and is used in Project presentations and on the Company's website.
- Press releases – the print and broadcast media are utilised extensively to communicate with the wider community and at a regional and national level.
- Newsletters, website and social media – regular updates produced throughout construction via the website, leaflets, newsletters, social media and publications relating to specific issues, such as careers. Videos, including footage of the sites and interviews with key Project personnel have also been an effective tool.

4.4 Community benefit initiatives

The Company has made a number of commitments to benefit the local area during construction such as providing employment and supply chain opportunities, training schemes, school outreach programmes and funding community projects. It is important that these are implemented and widely promoted so that the community and stakeholders are aware that the Company's commitments are being delivered. The activities and initiatives, some of which are planning obligations in the S106 agreements, are outlined below:

- Funding to Scarborough Borough Council and Redcar and Cleveland Council to identify and prepare local people for employment opportunities.
- Funding to raise awareness of science, technology, engineering and maths (STEM) related careers in schools in North Yorkshire and Redcar and Cleveland.

- Targets specified in the S106 agreement - take on 50 apprentices, recruit 15 local students on the Company's Undergraduate Programme and train 300 adults.
- Quarterly employment opportunity sessions to promote job opportunities to local people and meet the buyer events for local businesses.
- Education outreach initiatives, careers events and presentations.
- Funding community projects through the Woodsmith Foundation.

4.5 Dealing with complaints

The Company aims to respond promptly to complaints and concerns, ensuring that issues are investigated and resolved as quickly as possible. The Company's approach is detailed in its Complaints Procedure – see Appendix C.

5 Roles and Responsibilities

This section provides a framework that identifies responsibilities for the delivery and management of community and stakeholder engagement, focusing on roles of the Company and the principle construction contractors. The Company will be responsible for all community and stakeholder engagement during construction, supported by each construction contractor as required.

5.1 Anglo American

The Company will be responsible for:

- Identifying key stakeholders likely to be impacted by the works.
- Undertaking pre-briefing activities before construction starts such as:
 - Open Days / exhibitions as appropriate.
 - Producing information outlining what is involved, impacts and mitigation, contact information, etc.
 - Direct correspondence with neighbours and landowners about construction events
- Liaison with the planning authorities and community representatives, including chairing the Liaison Group Forum and Traffic Management Liaison Group.
- Media relations.
- Manage the complaints procedure.
- Producing project newsletters, social media and updating the website.
- Direct engagement and briefings with key stakeholders including local residents, community representatives and interest groups.

5.1.1 Social performance team

The Company's social performance team is responsible for implementing the Framework in liaison with others in the Company as appropriate.

The Company's Corporate Relations Director has overall responsibility for all company communications and external relations. The Corporate Relations Director chairs the Liaison Group Forum.

The General Manager External Affairs, reporting to the Corporate Relations Director, manages the implementation of the approach detailed in the Framework. The Local Liaison Officer, Social Programmes Manager and Education Programme Manager report to the GM External Affairs, and are further supported by the EA to the Corporate Relations Director.

The social performance team work closely with other departments in the Company in the implementation of the Framework, particularly the land, environment and planning team as well as the project development team. They assist in providing relevant information, investigating and resolving complaints, and attending Company events and public meetings as required. The Company's Logistics Manager chairs the Traffic Management Liaison Group.

5.2 Construction Contractors

Having developed and maintained positive relationships with key local stakeholders since the Project was launched in 2011, Anglo American takes the lead role in all community and stakeholder engagement. Each of the construction contractors will be required to support the Company's stakeholder engagement approach as follows:

- Provide expected durations of phases or work, their potential impact on the local community and mitigation measures where required.
- Provide details of any expected public transport diversions, delays, planned road closures, impacts on highways, interrupted access for residents/ businesses, or other expected community disruption.
- Participate in employment opportunity sessions, meet the buyer events, and education outreach events as required.
- Cooperate with Anglo American in media events and provide information to the Company for publications, the website, newsletters, etc.
- Adherence to Anglo American's communications protocols and guidelines.
- Attend the liaison groups, parish/town council meetings and assisting Anglo American as required.
- Ensure that all sub-contractors comply with stakeholder and community relations requirements.

Appendix A – Construction Events

The following provides a list of construction events which trigger the requirement for pre-briefing activities, as outlined in section 4.2. The list is not exhaustive and there may be other events or activities not listed here that could be classified as construction events as a result of discussions between the Company and its contractors.

The construction events for the purposes of this Framework are:

- Any significant geotechnical investigation or drilling works
- Main Woodsmith Mine shaft sink
- Main Lockwood Beck shaft sinking
- Main Ladycross Plantation shaft sinking
- MHF construction
- Harbour construction
- Other construction activities with the potential to affect stakeholders including site neighbours or road users in regard to noise, light, disruption to the public highway, etc. Examples include an abnormal load arriving to site or a short period of piling.

Appendix B – Engagement Activities Summary

The table below provides an ‘at a glance’ overview of the main community and stakeholder engagement activities, together with the respective roles of Anglo American and contractors.

	Pre-briefing activities	Ongoing management	Community benefit initiatives
Anglo American	<ul style="list-style-type: none"> Establish Liaison Group Forum and Traffic Management Liaison Group Project update newsletter Media, website update, social media Briefings with site neighbours, landowners, community representatives and other key stakeholders as identified Produce leaflet detailing upcoming construction activities Send letters to stakeholders likely to be immediately affected Hold public open days / exhibitions 	<ul style="list-style-type: none"> Chair Liaison Group Forum and Traffic Management Liaison Group Attend the Industrial Business Group Manage 24-hour community helpline and cropnutrients.info@angloamerica.com Attend parish and town council meetings quarterly Regular updates to site neighbours, landowners, community representatives and interest groups Site visits Media, website update, social media Manage complaints procedure 	<ul style="list-style-type: none"> Training targets and promotion of initiatives funded by the S106 Promote activities of the Sirius Minerals Foundation Organise meet the buyer events Organise regular employment opportunity sessions Deliver education outreach programmes
Construction Contractor	<ul style="list-style-type: none"> Provide information to Anglo American to be used in leaflets, letters, web content, etc., as required Attend public open days/exhibitions and meetings with stakeholders as required 	<ul style="list-style-type: none"> Attend liaison groups, parish council and other meetings as required Provide information to support ongoing community and stakeholder relations Participate in media events as required Adherence to complaints procedure, media protocol and crisis response procedure 	<ul style="list-style-type: none"> Involvement in community benefit initiatives as required

Community engagement is tracked across these three elements. Activities and complaints are reported in the Company’s annual Responsible Business Report. Minutes of the Liaison Group Forum, which includes community engagement as a standing agenda item, are published on the Company’s website.

By being proactive in building and maintaining relationships in the community, the Company is always receiving feedback about its performance. This helps to inform the Company on what it could be doing better, enables it to respond quickly to concerns and pre-empt them in the future and is an important part of annual review of the Framework.

Appendix C – Complaints Procedure

This procedure outlines the Company's standards in handling complaints and the process of managing complaints from receipt through to resolution. The procedure has been updated to take into account the lessons learnt during the first two years of construction.

1 Standards for Handling Complaints

- All complaints will be treated seriously, fairly and with courtesy;
- Complaints will be responded to quickly – we will acknowledge a receipt of a complaint straight away wherever possible;
- We will investigate and aim to resolve complaints within a maximum of three days, making sure that initial feedback is provided within one day; and
- We publish information about complaints, with the identity of the complainant kept confidential, to the Liaison Group Forum and in the Company's annual Responsible Business Report.

2 Stages of the Complaints Procedure

2.1 Receipt of complaint

The vast majority of complaints are received directly by the Anglo American community relations team through a variety of channels, e.g. directly to a team member, via the general cropnutrients.info@angloamerican.com email, social media, parish council meetings or the 24-hour community helpline. Relationships with the regulatory authorities are well established and complaints received by them are forwarded to the Company's community relations team to investigate.

The team aim to acknowledge a complaint straight away and ascertain the relevant details as soon as possible.

Occasionally a complaint is made directly to a Project site. In this instance the community relations team will be informed and further communication with the complainant managed by them.

2.2 Investigation

In all cases the community relations team will notify the Anglo American site manager, the environment team and the logistics team (where complaints are related to traffic). The site manager will lead the investigation, delegating where appropriate and liaise with the relevant contractor. All relevant personnel will be kept updated.

If remedial action is required this will be implemented as quickly as possible in consultation with the environment and planning team, community relations team and others as appropriate.

2.3 Feedback

The community relations team will feedback to the complainant within a maximum of three days, with initial feedback given within one day. Further details will be sought from the complainant if required.

The complainant will be given the details of any remedial action taken and have the opportunity to discuss the outcome of the investigation with the community relations team, who will involve others as appropriate. If further relevant information comes to light, the complaint will be investigated again.

2.4 Log and Review

Complaints are logged and reported to the next Liaison Group Forum (LGF) meeting. The minutes of LGF meetings are published on the Company's website.

Complaints are reviewed to establish whether action can be taken to reduce the likelihood of similar complaints in the future, and whether the way in which the complaint was dealt with could be improved.

ATTACHMENT B – COMPLAINTS PROCEDURE

Complaints Procedure

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Complaints Procedure

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Complaints Procedure

This procedure outlines the Company's standards in handling complaints and the process of managing complaints from receipt through to resolution. The procedure has been updated to take into account the lessons learnt during the first three and half years of construction.

1 Standards for Handling Complaints

- All complaints will be treated seriously, fairly and with courtesy;
- Complaints will be responded to quickly – we will acknowledge a receipt of a complaint straight away wherever possible;
- We will investigate and aim to resolve complaints within a maximum of three days, making sure that initial feedback is provided within one day; and
- We publish information about complaints, with the identity of the complainant kept confidential, to the Liaison Group Forum.

2 Stages of the Complaints Procedure

2.1 Receipt of complaint

The vast majority of complaints are received directly by the Woodsmith community relations team through a variety of channels, e.g. directly to a team member, via the general Crop Nutrients email, social media, parish council meetings or the 24-hour community helpline. Relationships with the regulatory authorities are well established and complaints received by them are forwarded to the Company's community relations team to investigate.

The team aim to acknowledge a complaint straight away and ascertain the relevant details as soon as possible.

Occasionally a complaint is made directly to a Project site. In this instance the community relations team will be informed and further communication with the complainant managed by them.

2.2 Investigation

In all cases the community relations team will notify the Woodsmith site manager, the environment team and the logistics team (where complaints are related to traffic). The site manager will lead the investigation, delegating where appropriate and liaise with the relevant contractor. All relevant personnel will be kept updated.

If remedial action is required this will be implemented as quickly as possible in consultation with the environment and planning team, community relations team and others as appropriate.

2.3 Feedback

The community relations team will feedback to the complainant within a maximum of three days, with initial feedback given within one day. Further details will be sought from the complainant if required.

The complainant will be given the details of any remedial action taken and have the opportunity to discuss the outcome of the investigation with the community relations team, who will involve others as appropriate. If further relevant information comes to light, the complaint will be investigated again.

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Complaints are logged and reported to the next Liaison Group Forum (LGF) meeting. The minutes of LGF meetings are published on the Company's website.

Complaints are reviewed to establish whether action can be taken to reduce the likelihood of similar complaints in the future, and whether the way in which the complaint was dealt with could be improved.

ATTACHMENT C – PRECAUTIONARY METHOD OF WORKING

Precautionary Method of Working (PMoW) for Site Clearance (Ecology)

The Precautionary Method of Working (PMoW) for site clearance predominantly relates to the protection of reptiles and nesting birds which may be present within the development site although requirements for otters and badgers have also been included for completeness.

General overview

The construction site manager will ensure that anyone undertaking construction works on the site (including sub-contractors) is made aware of the potential for the site to support nesting birds, common reptile species and other protected species, where to expect them, their protected status and the procedure (see below) to follow in the unlikely event that nesting birds or common reptiles are discovered during works. Where applicable this advice will be given through site inductions, ecological tool box talks or similar.

Should any nesting birds, reptiles or other species be discovered during construction, which are likely to be effected by the development, works will cease immediately. The construction site manager will then seek the advice of a suitably qualified and experienced ecologist and works will only proceed in accordance with the advice they provide.

Reptiles

Within the development's construction zone the following methods of working will be adopted:

- All clearance works will be undertaken when reptiles are likely to be fully active i.e. during the period March/April to September/October inclusive, but this is weather and temperature dependent;
- Where clearance works cannot be undertaken within this period, additional surveys and/or mitigation measures may be required to confirm the absence of reptiles prior to clearance works, and a suitably qualified ecologist (the project ecologist) should be on site during the works to inspect areas immediately prior to clearance;
- Clearance of dry stone walls, logs, brash, stones, rocks, or piles of similar debris will be undertaken carefully and by hand and supervised by a suitably qualified ecologist;
- Clearance of tall vegetation (any vegetation over 150mm) should be undertaken using a hand held strimmer or brush cutter with all cuttings raked and removed the same day. Cutting will only be undertaken in a phased way which may either include:
 - Cutting vegetation to a height of no less than 30mm, clearing no more than one third of the site in anyone day or;
 - Cutting vegetation over three consecutive days to a height of no less than 150mm at the first cut, 75mm at the second cut and 30mm at the third cut;
- Following removal of tall vegetation using the methods outlined in above remaining vegetation will be maintained at a height of 30mm through regular mowing or strimming to discourage common reptiles from returning;

- Ground clearance of any remaining low vegetation (if required) and any ground works will only be undertaken following the works as above;
- Any trenches left overnight will be covered or provided with ramps to prevent reptiles from becoming trapped and enable escape; and
- Any building materials such as bricks, stone etc. will be stored on pallets to discourage reptiles from using them as shelter. Any demolition materials will be stored in skips or small containers rather than in piles on the ground.

Nesting Birds

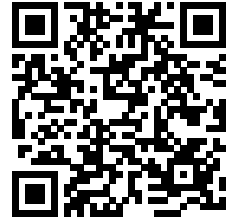
Within the development's construction zone the following methods of working will be adopted:

- Vegetation clearance that is required will be undertaken outside of the breeding bird season (i.e. the works will be undertaken between September and February);
- Any demolition work that is required will be undertaken outside of the breeding bird season (i.e. between the works will be undertaken September and February);
- Where clearance works or demolition works cannot be undertaken out with this period, additional surveys may be required to verify absence of breeding birds prior to clearance works and an ecologist should be on site during the works to inspect areas immediately prior to clearance, or at least no less than 24 – 48 hours before the works commence. The area of inspection should extend for at least 500m from the area of works;
- Where felling outside the breeding season is not possible a sensitive felling methodology will be implemented, involving the identification of specific areas to be felled, followed by surveys for occupied nests (or nests being built) being carried out by a suitably qualified ecologist (the project ecologist) undertaken a maximum of 24 - 48 hours prior to the commencement of works) and extending over an area of at least 500m from the area of works;
- If active birds' nests are found within the following distances from site, the area should be roped off and no works should be undertaken in these exclusion areas until the birds have fledged and the nests are empty:
 - Common crossbill - 150m;
 - Nightjar - 500m;
 - Goshawk - 150m; and
 - All other species - 10m.
- Alternatively, liaison with Natural England may be undertaken to agree the approach to working within the exclusion zones of the nest sites specified above.

Other Protected Species

Within the development's construction zone the following methods of working will be adopted:

- Dust minimisation methodologies will be implemented and adhered to at all times;
- Construction lighting will be directed away from areas of retained habitat wherever possible;
- Pollution prevention controls will be implemented and adhered to at all times; and
- All excavations will be covered every night to reduce the risk of otters, badgers or any other species falling into the excavations and becoming stranded or if this is not possible then a means of enabling their escape will be provided.



NYMNPA

31/07/2023

Project Title / Facility Name:

Woodsmith Project

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CONSTRUCTION & OPERATION GROUNDWATER & SURFACE WATER MONITORING SCHEME - PHASE 7 - CONDITION 88 - LADYCROSS

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**WOODSMITH PROJECT
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**CONSTRUCTION AND
OPERATION GROUNDWATER
AND SURFACE WATER
MONITORING SCHEME –
PHASE 7 – CONDITION 88 /
40-STS-LC-2100-EN-PL-00033**

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1. INTRODUCTION

1.1. GENERAL BACKGROUND

In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to the North York Moors National Park Authority (NYMNPAA) for permission to develop a Polyhalite mine and underground Mineral Transport System (MTS). Planning permission was subsequently granted in 2015 subject to conditions, as varied in February 2018 by NYM/2017/0505/MEIA.

This document details the hydrological, hydrogeological and ecological monitoring to be undertaken from commencement of the Phase 7 works at the Ladycross Plantation Site, as defined in **Section 1.2** below.

1.2. PHASE 7 SCOPE OF WORKS

The proposed works will comprise:

- Soft landscaping of lagoon and other areas
- Installation of double-stacked containers for acoustic and visual screening
- Creation of temporary top spoil and sub soil screening stockpiles
- Replacement of welfare facilities and associated parking
- Installation of hardstanding areas
- Erection of lattice communication mast

1.3. COMPLIANCE WITH CONDITIONS

This document is required to partially discharge condition NYMNPA-88 as stated in the planning permission Ref. no NYM/2017/0505/MEIA. **Table 1-1** details where the relevant information has been provided within this report.

Table 1-1 – Summary of planning condition 88 and where the relevant details are provided in the report.

NYMNPA Condition 88 Description	Compliance with Condition NYMNPA 88
The scheme shall include:	
Groundwater quality and level triggers	Section 3.3.4 and Section 3.4.5
Surface water quality triggers, including those necessary to protect the health of the River Esk Pearl Mussel beds	Section 3.6.5
Details of the number, type and location of monitoring points	Section 3.3.2, Section 3.4.2 and Section 3.6.2
A protocol for the removal and replacement of any existing monitoring points	Section 4
Details of the frequency with which monitoring points will be monitored during construction and operation	Section 3.3.3, Section 3.4.3 and Section 3.6.3
A list of the ground and surface water determinants to be tested for	Section 3.4.4 and Section 3.6.4
Monitoring of groundwater levels and spring flows	Section 3.3, Section 3.4 and Section 3.5
Monitoring of groundwater quality against ground water triggers	Section 3.4.5
A scheme of periodic review and refinement of the monitoring regime to take account of any approved changes to site layout/design, construction methods and monitoring data	Section 5
A protocol for notifying the MPA of any breach of the trigger levels, including the timing of any such notification	Section 5
Details of the method and frequency with which monitoring results will be shared with the MPA and the Environment Agency	Section 5

This document should be read together with the following documents:

- Phase 4 Remedial Action Plan (40-STC-LC-2100-EN-PL-00017)
- Phase 5 Revised Hydrogeological Risk Assessment (40-STC-LC-2100-EN-RA-00002)
- Phase 3 Surface Water Management Plan (40-STC-LC-2100-PA-PL-20102)
- Phase 3 Surface Water Drainage Scheme (40-STC-LC-2100-PA-22-20107)

2. SITE DETAILS

The site details remain the same as previous phases. For information with regards to site geology, receptors and historic information refer to previous Groundwater and Surface Water Monitoring Schemes (GWSWMSs) along with the historic Hydrogeological Baseline Report (FWS, September 2014).

3. MONITORING

3.1. GENERAL

In the following sections, the requirements for undertaking ground and surface water monitoring are presented in terms of the monitoring locations, frequency of monitoring, determinants to be analysed for, trigger values and reporting procedures. This document amends the previous monitoring scheme presented for the Phase 4 GWSWMS (40-ST5-LC-2100-EN-PL-00020), to incorporate revised baseline conditions.

The monitoring requirements have been determined specifically to enable monitoring of Phase 7 activities. The following sections present details of the scope, data requirements, frequency and trigger values (where appropriate) to be adopted for monitoring the following elements:

- Meteorology,
- Groundwater,
- Springs, and
- Surface Water.

Ground and surface water trigger levels, comprising 'Control' and 'Compliance' values, have been set to enable evaluation of whether the works have an adverse impact on water resources, in accordance with Environment Agency guidance:

- The Control Trigger values are an early warning system designed to draw attention to the development of adverse trends in the monitoring data that may suggest the mitigation measures incorporated into the Phase 7 Works are not working as anticipated. These values have been derived from the baseline data, and where the baseline data is less than the detection limit, the Control Trigger value has been set at the detection limit.
- The Compliance Trigger values are defined as the levels at which significant adverse environmental effects have occurred, i.e. if compliance value for a specific receptor has been breached there is pollution occurring. These values have been derived from current Statutory Instruments, where available. Where the detection limit is greater than the Statutory Instrument value, the Compliance Trigger value have been set at the detection limit.

3.2. CHANGES TO EXTERNAL OFFSITE MONITORING (TRACER UNITS)

There is no longer a requirement to monitor groundwater levels associated with leaching of grout into the aquifers associated with shaft sinking activities. Monitoring was undertaken throughout grouting activities (27 May 2023) and for a sustained period after completion of grouting activities. It has been shown that no leaching of grout was experienced in the aquifers as a result of grouting activities, due to the two external grout rings (that were installed as an environmental curtain). Monitoring of BH01 (and associated vibrating wire piezometers) will continue to be

undertaken in order to monitor groundwater levels associated with the immediate proximities of the shaft installation.

Details of changes to the GWSWMS are shown in **Table 3-1**.

Table 3-1 Changes made to the monitoring requirements for Phase 7 works,

Section	Changes
3.2 Meteorology	No changes, monitoring remains the same as detailed in the Phase 4 GWSWMS.
3.3 Groundwater Levels	<p>Due to the extension of the welfare/office facilities and car park, BH03 and BH06 are to be decommissioned. All other infrastructure and associated monitoring installed in Phase 4 remains unchanged.</p> <p>Amendments have been made to the trigger level values based on extended baseline monitoring.</p> <p>Amendments have been made to the monitoring frequency based upon reduced risk from Phase 7 operations</p>
3.4 Groundwater Quality	<p>All offsite GW quality monitoring locations to be decommissioned due to the completion of shaft excavation and grouting activities. All other infrastructure and associated monitoring installed in Phase 4 remains unchanged.</p> <p>Amendments have been made to the trigger level values based on extended baseline monitoring.</p> <p>Amendments have been made to the monitoring frequency based upon reduced risk from Phase 7 operations</p>
3.6 Surface Water Quality	<p>The infrastructure and associated monitoring installed in Phase 4 remains unchanged.</p> <p>Amendments have been made to the trigger level values based on extended baseline monitoring.</p> <p>Amendments have been made to the monitoring frequency based upon reduced risk from Phase 7 operations</p>

3.3. METEOROLOGY

3.3.1. OBJECTIVES

To provide rainfall and evapotranspiration information to confirm water balance inputs and outputs.

3.3.2. SCOPE OF MONITORING

Meteorological monitoring will be undertaken of the following parameters from the automated permanent weather station located at Ladycross Plantation.

3.3.3. METEOROLOGICAL DATA

Meteorological monitoring will consist of:

- Rainfall (mm),
- Evapotranspiration (mm),
- Temperature (°C),
- Wind Speed (km/hr) and Direction, and
- Barometric Pressure (m/bar).

3.3.4. MONITORING FREQUENCY

The monitoring frequency will be set for 15 minute intervals for all parameters and will be continually uploaded to the web portal via a data logger.

3.3.5. ASSESSMENT AND COMPLIANCE LEVELS

Not required, information obtained will confirm water balances and influences on shallow groundwater activity.

3.4. GROUNDWATER LEVEL MONITORING

3.4.1. OBJECTIVES

The objectives of this water level monitoring are to:

1. Demonstrate that construction activities, in the vicinity of the working platform, and bored shaft cause no adverse long-term impacts on water levels within the Superficial Deposits, Scalby Formations, Scarborough Formations, Cloughton / Saltwick Formations

2. Provide continual data to aid with tunnelling works. Off-site boreholes are monitored to demonstrate that the TBM causes no adverse long-term impacts on groundwater levels along the whole length of the tunnel drive.

3.4.2. MONITORING LOCATIONS

From the design layout of the Phase 7 works, monitoring of construction stage boreholes with response zones within the Superficial Deposits, Scalby, Scarborough, Cloughton / Saltwick aquifers will be undertaken as summarised below, for which the monitoring well positions are shown in **Attachment A**

- Groundwater levels will be monitored within the superficial deposits (non-aquifer) using the series of monitoring wells detailed in **Table 3-2**. The wells are orientated to monitor water levels both up and down hydraulic gradient of the working site area. To compare soil moisture conditions in comparison with baseline conditions.
- Groundwater levels will be monitored within the Scalby Formation, the Long Nab and Moor Grit (Secondary A Aquifer) using the series of monitoring wells detailed in **Table 3-2**. The wells are orientated to monitor water levels both up and down hydraulic gradient of the working site area.
- Groundwater levels will be monitored within the Scarborough Formation (Secondary A Aquifer) using the series of monitoring wells detailed in **Table 3-2**. The wells are orientated to monitor water levels both up and down hydraulic gradient of the working site area.
- Groundwater levels will be monitored within the Cloughton / Saltwick Formation (Secondary A Aquifer) using the series of monitoring wells detailed in **Table 3-2**. The wells are orientated to monitor water levels both up and down hydraulic gradient of the working site area.

During the Phase 1 access works, BH401 was decommissioned due to the location of the access road.

During the Phase 3 construction works, BH413A, BH413B and BH413C were commissioned to allow for the construction of the working platform. Boreholes 34_BH04, 34_BH06 and 34_BH07 were installed as replacement monitoring boreholes.

As part of the Phase 7 construction works, 34_BH03 and 34_BH06 are to be decommissioned to allow for the extension of the welfare, office and parking facilities. No replacement boreholes are required as these boreholes are no longer required for the purposes of groundwater quality and groundwater level monitoring.

Table 3-2 Groundwater Monitoring Boreholes ID, location, and geological description

Monitoring Well ID	NGR Coordinates	Geology and description
BH402 BH403 BH405 BH406 BH407 BH408	481737, 507534 481807, 507620 481218, 507701 481452, 507744 481590, 507886 481423, 507919	Monitor potential changes in the groundwater levels within the superficial deposits.
BH401A BH402A BH405A BH406A BH407A BH408A	481571, 507474 481738, 507552 481221, 507693 481442, 507743 481583, 507881 481414, 507916	Monitor potential changes in the groundwater levels within the Scalby Formation (Long Nab and/or Moor Grit Member).
BH401B BH402B 34_BH07 ¹	481572, 507470 481736, 507547 481673, 507627	Monitor potential changes in the groundwater levels within the Scarborough Formation.
BH401C BH402C 34_BH04 ¹	481576, 507473 481730, 507540 481635, 507638	Monitor potential changes in the groundwater levels within the Cloughton Formation.

Note¹ Additional monitoring boreholes installed during the 2022 GI works and will replace the BH413 series. 34_BH04 installed into the Cloughton / Saltwick Formation.

3.4.3. MONITORING FREQUENCY

The Phase 7 works will not constitute any further excavation works, with all operations limited to shaft fit out and surface infrastructure install. Therefore, a reduced risk on the groundwater environment has been evaluated based upon the associated activities within the Phase 7 scope.

A continuation of the groundwater level monitoring approach will be carried out using a dip meter from all boreholes listed in **Table 3-2**. Monthly monitoring of groundwater levels will be conducted during Phase 7. Monitoring will continue to be monthly during this period if no continual impacts are observed as a result of shaft sinking operations.

Periodic reviews will be carried out during the Phase 7 works and will determine any changes required to frequency and type of monitoring. Any details of changes to the monitoring scheme will be communicated to the Mineral Planning Authority (MPA).

3.4.4. GROUNDWATER LEVEL CONTROL AND COMPLIANCE TRIGGER VALUES

The GWL (Groundwater Levels) Control Trigger Values determined for the Superficial Deposits, Scalby, Scarborough and Cloughton / Saltwick formation in the area of the Site have been derived using the following methodology:

Control Trigger Values = mean baseline value – 2 × standard deviation of baseline data¹

Note¹ The monitoring undertaken during the Ground Investigation works showed potential for suppressed groundwater levels within the Scarborough and Cloughton Formations during drilling activities. Following on from the completion of the pre-grout works, recovery towards baseline levels is observed. No long-term impacts on groundwater levels have been noted.

The GWL Compliance Trigger Values determined for the Superficial Deposits, Scalby, Scarborough and Cloughton formation in the area of the Site have been derived using the following methodology:

Compliance Trigger Values = mean baseline value – 3 × standard deviation of baseline data¹

Note¹ The monitoring undertaken during the Ground Investigation works showed potential for suppressed groundwater levels within the Scarborough and Cloughton Formations during drilling activities. Following on from the completion of the pre-grout works, recovery towards baseline levels is observed. No long-term impacts on groundwater levels have been noted.

The above methodology was adopted for the monitoring wells where a comprehensive baseline was available. It was noted from the baseline during the summer months and periods of dry weather large fluctuations in GWL were observed in the superficial deposits and Scalby Formations. Further baseline data has been collected and captures further fluctuations with seasonal trends.

The Phase 5 and preceding HRA's identified that the works will have a negligible impact on strata used for abstractions below the Cloughton Formation, the Saltwick was identified as low sensitivity with no active abstractions within this geology. The Ground Investigation works along with baseline monitoring has advised on appropriate exceedance values for the newly installed boreholes.

Table 3-3 VWP installations in 34_BH01

VWP ID	Depth of install (mbgl)	Geology
34_BH01_1	12	Scarborough Formation
34_BH01_2	37	Cloughton Formation
34_BH01_3	53	Cloughton Formation
34_BH01_4	76	Cloughton / Saltwick Formation

VWP ID	Depth of install (mbgl)	Geology
34_BH01_5	111.5	Saltwick Formation
34_BH01_6	118.5	Saltwick Formation

3.4.4.1 Superficial Deposits

Table 3-4 - Control and compliance trigger levels for monitoring wells in the Superficial Deposits based on baseline data from 2020-2022.

MONTH	CONTROL (mAOD)						COMPLIANCE (mAOD)					
	BH402	BH403	BH405	BH406	BH407	BH408	BH402	BH403	BH405	BH406	BH407	BH408
Jan	195.98	201.47	205.01	204.80	207.98	209.25	195.51	200.74	204.75	203.68	207.01	208.44
Feb	195.13	201.56	205.01	206.64	207.70	209.13	194.34	200.88	204.75	206.27	206.87	208.13
Mar	194.36	202.79	205.01	206.95	208.98	209.36	193.60	202.72	204.75	206.73	208.86	208.88
Apr	193.55	202.14	204.75	206.44	208.42	209.44	192.44	201.98	204.69	206.13	208.09	208.62
May	193.73	202.01	204.82	207.00	208.60	210.37	192.82	201.55	204.51	206.86	208.50	210.17
Jun	193.95	201.87	204.62	205.95	208.14	210.16	193.57	201.52	204.40	205.52	207.75	209.90
Jul	193.48	201.93	204.33	205.63	208.13	209.76	192.67	201.66	203.98	205.23	207.85	209.28
Aug	193.63	202.02	204.17	204.74	207.94	209.66	192.94	201.89	204.01	204.13	207.68	209.15
Sep	193.63	201.64	204.01	205.67	208.04	209.32	192.93	201.35	203.93	205.50	207.79	208.72
Oct	194.45	201.82	205.37	205.03	207.91	209.26	193.73	201.42	205.27	204.37	207.63	208.62
Nov	195.78	201.82	205.37	205.93	208.09	209.08	195.43	201.42	205.27	205.42	207.64	207.76
Dec	196.39	202.72	205.01	207.25	208.59	209.09	196.19	202.65	204.75	207.16	207.96	208.04

3.4.4.2 Scalby Formation

Table 3-5 - Control and compliance trigger levels for monitoring wells in the Scalby Formation based on baseline data from 2020-2022

MONTH	CONTROL (mAOD)						COMPLIANCE (mAOD)					
	BH401A	BH402A	BH405A	BH406A	BH407A	BH408A	BH401A	BH402A	BH405A	BH406A	BH407A	BH408A
Jan	187.74	194.18	204.70	205.58	207.58	196.42	185.59	193.35	204.62	205.31	206.93	192.70
Feb	188.10	194.15	204.41	205.39	207.05	196.45	186.06	193.23	204.21	205.05	206.04	192.73
Mar	189.26	194.27	204.58	205.70	207.43	196.59	187.65	193.18	204.46	205.52	206.61	192.67
Apr	189.99	195.15	204.09	205.62	208.20	197.03	188.66	194.62	203.81	205.49	207.84	193.81
May	191.33	194.97	204.12	205.57	208.74	195.46	191.23	194.32	203.71	205.39	208.40	192.37
Jun	188.04	193.30	203.96	204.82	207.07	195.27	186.07	192.13	203.66	204.38	206.40	192.07

MONTH	CONTROL (mAOD)						COMPLIANCE (mAOD)					
	BH401A	BH402A	BH405A	BH406A	BH407A	BH408A	BH401A	BH402A	BH405A	BH406A	BH407A	BH408A
Jul	187.76	193.20	203.49	204.30	206.95	196.93	186.03	192.51	203.14	203.83	206.49	193.55
Aug	188.81	194.01	203.32	204.39	206.79	196.87	187.25	193.84	202.99	203.99	206.44	193.41
Sep	189.25	192.83	203.19	204.20	206.90	196.17	187.87	192.31	202.95	203.87	206.65	192.86
Oct	188.72	192.60	202.69	203.86	206.86	199.09	187.07	191.60	202.10	203.34	206.60	196.16
Nov	188.49	193.60	203.14	203.95	206.58	202.03	186.89	192.83	202.61	203.28	206.04	199.90
Dec	188.55	195.18	204.81	205.65	207.74	196.14	186.93	194.87	204.76	205.45	207.26	192.28

3.4.4.3 Scarborough Formation

Table 3-6 - Control and compliance trigger levels for monitoring wells in the Scarborough Formation based on baseline data from 2020-2022

MONTH	CONTROL (mAOD)			COMPLIANCE (mAOD)		
	BH401B	BH402B	34_BH07	BH401B	BH402B	34_BH07
Jan	184.33	183.54	183.542	184.10	183.49	183.49
Feb	185.02	183.21	177.23	184.94	182.88	176.77
Mar	185.02	183.87	183.872	184.91	183.74	183.74
Apr	185.11	183.96	183.962	185.05	183.89	183.89
May	184.56 ¹	183.90	183.902	184.38 ¹	183.80	183.8
Jun	184.56	183.85	183.852	184.38	183.81	183.81
Jul	185.05	183.71	183.712	185.01	183.62	183.62
Aug	184.64	183.43	183.432	184.53	183.30	183.3
Sep	184.54	183.31	183.312	184.47	183.23	183.23
Oct	184.35	183.08	183.082	184.24	182.91	182.91
Nov	184.05	183.08	183.082	183.82	182.91	182.91
Dec	184.05	183.79	183.792	183.82	182.91	182.91

¹ Limited or no baseline data available, values based upon neighbouring months.

3.4.4.4 Cloughton / Saltwick Formation

Table 3-7 - Control and compliance trigger levels for monitoring wells in the Cloughton Formation based on baseline data from 2020-2022

MONTH	CONTROL (mAOD)			COMPLIANCE (mAOD)		
	BH401C	BH402C	34_BH04	BH401C	BH402C	34_BH04
Jan	183.47	183.05	143.84	183.39	182.79	142.81
Feb	183.70	183.70	143.91	183.62	183.62	142.44
Mar	183.67	183.71	147.29	183.50	183.60	147.21
Apr	183.81	183.79	147.29	183.74	183.72	147.14
May	183.36	181.88	147.29	183.16	180.90	147.07
Jun	183.36	183.69	147.29 ¹	183.16	183.65	147.07 ¹
Jul	183.42	183.54	148.93	183.22	183.44	148.73
Aug	183.13	182.66	148.98	182.93	182.06	148.85

MONTH	CONTROL (mAOD)			COMPLIANCE (mAOD)		
	BH401C	BH402C	34_BH04	BH401C	BH402C	34_BH04
Sep	183.02	182.87	148.17	182.80	182.67	147.99
Oct	183.04	181.66	147.91	182.92	180.55	147.75
Nov	183.04	181.66	147.36	182.92	180.55	147.13
Dec	184.30	183.09	147.36 ¹	184.27	183.02	147.13 ¹

¹ Limited or no baseline data available, values based upon neighbouring months.

3.5. GROUNDWATER QUALITY MONITORING

3.5.1. OBJECTIVES

From the results of the Hydrogeological Risk Assessment, the objectives of the quality monitoring are:

- Determine whether the previously completed phases of works and proposed Phase 7 works have an adverse chemical impact on the groundwater quality in the superficial deposits, Scalby, Scarborough, Cloughton / Saltwick aquifers.
- Determine if adverse chemical impact on groundwater quality of shallow aquifers is due to onsite pollution of surface water run-off from the Phase 7 works.

3.5.2. MONITORING LOCATIONS

Groundwater quality sampling will be undertaken at locations up hydraulic gradient and down hydraulic of the potentially polluting activities associated with the Phase 7 works.

As such, groundwater quality will be monitored in the superficial deposits, Scalby, Scarborough, Cloughton / Saltwick aquifers using a series of monitoring wells both up and down gradient of the development areas detailed in **Table 3-2**.

3.5.3. MONITORING FREQUENCY

All construction activities will be managed in accordance with the Phase 7 Construction Environmental Management Plan (CEMP). Monthly monitoring will continue throughout the Phase 6 lagoon restoration works and for three months post the completion of these works. Monitoring frequency will change to quarterly after this period if no long-term exceedances are observed from the monthly monitoring schedule.

Monitoring of groundwater quality will continue for a minimum period of six months following completion of the Phase 6 works and until it has been demonstrated that no significant variance

from the Control Trigger Values or exceedance above the Compliance Limits detailed below has been detected.

In the event significant exceedances are identified during Phase 7 works, additional rounds of monitoring at an increased frequency will be undertaken to help define extent, where appropriate.

3.5.4. GROUNDWATER QUALITY DATA

The baseline suite of analysis will include both onsite water analysis and laboratory testing, as detailed below. The suite of determinants will be carried out in accordance with the suite identified during baseline and is a continuation of previous phases of work.

Presented below are details of the onsite monitoring and of the sampling and laboratory testing that will be undertaken to obtain the groundwater quality data for the Phase 7 works. All chemical analysis will be undertaken by an MCERTS accredited laboratory.

3.5.4.1 Onsite Water Analysis

On site monitoring, using appropriately calibrated field equipment, will be undertaken for the following determinants:

- pH,
- Temperature,
- Electrical Conductivity, and
- Total Dissolved Solids.

3.5.4.2 Sampling

Prior to sampling of the up and down gradient boreholes, each well will be developed by pumping and either purged to three well volumes or the establishment of stable pH and conductivity readings (typically three consecutive field measurements of +/- 0.1 pH units and +/-250 µS/cm) to ensure the groundwaters sampled are representative of the surrounding groundwater quality.

Unfiltered samples will be collected in two 1-litre coloured glass jars, and one 100 ml vial and as required by the laboratory, to complete the specified testing suites.

3.5.4.3 Laboratory Analysis

The laboratory chemical analysis will be undertaken for the following suite of determinants:

- pH,

- Conductivity,
- Metals (including Aluminium, Boron, Cadmium, Calcium, Chromium III, Chromium VI, Copper, Iron (total and dissolved), Lead, Magnesium, Manganese, Nickel, Potassium, Sodium and Zinc)
- Chloride,
- Sulphate,
- BTEX (Benzene, Toluene, Ethylbenzene and Xylene),
- Speciated Polycyclic Aromatic Hydrocarbons, and
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG) (Aliphatic/Aromatic split).

3.5.5. GROUNDWATER QUALITY CONTROL AND COMPLIANCE TRIGGER VALUES

Groundwater Quality (GWQ) Control Trigger Values have been set for all monitoring well locations (as detailed in **Table 3-2**, above) for the determinants to be analysed by consideration of the baseline groundwater quality level range and typical variation. The Control Trigger value has been set at a value equivalent to the mean baseline value plus 2 x the Standard Deviation for that dataset. The GWQ Compliance Trigger Value has been set at the equivalent Drinking Water Standard (DWS), Environmental Quality Standard (EQS) or the baseline value determined where the current baseline value exceeds the EQS value.

Where the analytical detection limit (MRV) has been adopted as the Compliance Trigger Value, then no Control Trigger Value is included, as presented below.

3.5.5.1 Superficial Deposits

Table 3-8 Control and compliance trigger quality levels for monitoring wells in the Superficial Deposits based on baseline data from 2020-2022

Determinants	LOD	Units	Control	Compliance	Source
Aliphatic C10-C12	1	µg/l ⁻¹	-	300	DWS
Aliphatic C12-C16	1	µg/l ⁻¹	-	300	DWS
Aliphatic C16-C21	1	µg/l ⁻¹	-	1	LOD
Aliphatic C21-C35	1	µg/l ⁻¹	-	1	LOD
Aliphatic C5-C35	10	µg/l ⁻¹	-	300	Combined DWS
Aliphatic C5-C6	0.1	µg/l ⁻¹	-	15000	DWS
Aliphatic C6-C8	0.1	µg/l ⁻¹	-	15000	DWS
Aliphatic C8-C10	0.1	µg/l ⁻¹	-	300	DWS
Aluminium, Dissolved	10	µg/l ⁻¹	1550	2100	Max Baseline
Anthracene	0.01	µg/l ⁻¹	0.34	0.47	LOD / EQS
Aromatic C10-C12	1	µg/l ⁻¹	-	90	DWS
Aromatic C12-C16	1	µg/l ⁻¹	-	90	DWS
Aromatic C16-C21	1	µg/l ⁻¹	-	90	DWS
Aromatic C21-C35	1	µg/l ⁻¹	-	90	DWS
Aromatic C5-C35	10	µg/l ⁻¹	-	300	Combined WHO
Aromatic C5-C7	0.1	µg/l ⁻¹	-	10	DWS

Determinants	LOD	Units	Control	Compliance	Source
Aromatic C7-C8	0.1	µg/l ⁻¹	-	700	DWS
Aromatic C8-C10	0.1	µg/l ⁻¹	-	300	DWS
Benzene	1	µg/l ⁻¹	-	10	EQS
Benzo(a)pyrene	0.01	µg/l ⁻¹	0.11	0.15	EQS
Benzo(b)fluoranthene	0.01	µg/l ⁻¹	1	2	Max Baseline
Boron, Dissolved	12	µg/l ⁻¹	105	150	Max Baseline
Cadmium, Dissolved	0.03	µg/l ⁻¹	1.3	1.8	Max Baseline
Calcium, Dissolved	0.09	mg/l ⁻¹	365	485	Max Baseline
Chloride	0.1	mg/l ⁻¹	-	250	DWS
Chromium III, Dissolved	1	µg/l ⁻¹	5.7	7.9	Max Baseline
Chromium VI, Dissolved	7	µg/l ⁻¹	-	7	LOD
Conductivity	1	µS/cm	570	625	Max Baseline
Copper, Dissolved	0.4	µg/l ⁻¹	12	15	Max Baseline
Ethylbenzene	1	µg/l ⁻¹	-	300	WHO
Fluoranthene	0.01	µg/l ⁻¹	1.1	1.6	Max Baseline
Iron, Dissolved	5.5	µg/l ⁻¹	2965	3910	Max Baseline
Iron, Total	5.5	µg/l ⁻¹	268000	346000	Max Baseline
Lead, Dissolved	0.09	µg/l ⁻¹	8.5	11.5	Max Baseline
Magnesium, Dissolved	0.02	µg/l ⁻¹	13	15	Max Baseline
Manganese, Dissolved	0.22	µg/l ⁻¹	3850	5200	Max Baseline
Nickel, Dissolved	0.5	µg/l ⁻¹	16	21	Max Baseline
PAH Total	0.2	µg/l ⁻¹	13	18	Max Baseline
pH			-	6 to 9	EQS
Potassium, Dissolved	0.08	mg/l ⁻¹	16.5	18.5	Max Baseline
Sodium, Dissolved	0.07	mg/l ⁻¹	25	34	Max Baseline
Sulphate as SO4	0.1	mg/l ⁻¹	40	250	Max Baseline / DWS
Toluene	1	µg/l ⁻¹	-	74	EQS
TPH Ali/Aro Total	10	µg/l ⁻¹	128	173	Max Baseline
Xylene	1	µg/l ⁻¹	-	30	DWS
Zinc, Dissolved	1.3	µg/l ⁻¹	133	181	Max Baseline

3.5.5.2 Scalby Formation

Table 3-9 - Control and compliance trigger quality levels for monitoring wells in the Scalby Formation based on baseline data from 2020-2022

Determinants	LOD	Units	Control	Compliance	Source
Aliphatic C10-C12	1	µg/l ⁻¹	-	300	DWS
Aliphatic C12-C16	1	µg/l ⁻¹	-	300	DWS
Aliphatic C16-C21	1	µg/l ⁻¹	45	62	Max Baseline
Aliphatic C21-C35	1	µg/l ⁻¹	71	99	Max Baseline
Aliphatic C5-C35	10	µg/l ⁻¹	147	300	Max Baseline / Combined DWS
Aliphatic C5-C6	0.1	µg/l ⁻¹	-	15000	DWS
Aliphatic C6-C8	0.1	µg/l ⁻¹	-	15000	DWS
Aliphatic C8-C10	0.1	µg/l ⁻¹	-	300	DWS
Aluminium, Dissolved	10	µg/l ⁻¹	1230	1650	Max Baseline
Anthracene	0.01	µg/l ⁻¹	-	0.11	EQS
Aromatic C10-C12	1	µg/l ⁻¹	-	90	DWS
Aromatic C12-C16	1	µg/l ⁻¹	-	90	DWS
Aromatic C16-C21	1	µg/l ⁻¹	-	90	DWS
Aromatic C21-C35	1	µg/l ⁻¹	-	90	DWS
Aromatic C5-C35	10	µg/l ⁻¹	-	300	Combined DWS
Aromatic C5-C7	0.1	µg/l ⁻¹	-	10	DWS
Aromatic C7-C8	0.1	µg/l ⁻¹	-	700	DWS
Aromatic C8-C10	0.1	µg/l ⁻¹	-	300	DWS
Benzene	1	µg/l ⁻¹	-	10	EQS
Benzo(a)pyrene	0.01	µg/l ⁻¹	0.11	0.15	Max Baseline

Determinants	LOD	Units	Control	Compliance	Source
Benzo(b)fluoranthene	0.01	µg l ⁻¹	0.08	0.11	Max Baseline
Boron, Dissolved	12	µg l ⁻¹	75	90	Max Baseline
Cadmium, Dissolved	0.03	µg l ⁻¹	1.5	1.8	Max Baseline
Calcium, Dissolved	0.09	mg l ⁻¹	365	485	Max Baseline
Chloride	0.1	mg l ⁻¹	60	250	Max Baseline
Chromium III, Dissolved	1	µg l ⁻¹	3.5	5	Max Baseline
Chromium VI, Dissolved	7	µg l ⁻¹	-	7	LOD
Conductivity	1	µS/cm	670	830	Max Baseline
Copper, Dissolved	0.4	µg l ⁻¹	32	45	Max Baseline
Ethylbenzene	1	µg l ⁻¹	-	300	DWS
Fluoranthene	0.01	µg l ⁻¹	-	0.11	Max Baseline
Iron, Dissolved	5.5	µg l ⁻¹	9400	12100	Max Baseline
Iron, Total	5.5	µg l ⁻¹	865400	1100000	Max Baseline
Lead, Dissolved	0.09	µg l ⁻¹	2.8	3.7	Max Baseline
Magnesium, Dissolved	0.02	µg l ⁻¹	50	75	Max Baseline
Manganese, Dissolved	0.22	µg l ⁻¹	3700	4800	Max Baseline
Nickel, Dissolved	0.5	µg l ⁻¹	150	210	Max Baseline
PAH Total	0.2	µg l ⁻¹	1.6	2.5	Max Baseline
pH			-	6 to 9	EQS
Potassium, Dissolved	0.08	mg l ⁻¹	30	45	Max Baseline
Sodium, Dissolved	0.07	mg l ⁻¹	75	90	Max Baseline
Sulphate as SO ₄	0.1	mg l ⁻¹	120	250	Max Baseline / DWS
Toluene	1	µg l ⁻¹	-	74	EQS
TPH Ali/Aro Total	10	µg l ⁻¹	175	250	Max Baseline
Xylene	1	µg l ⁻¹	-	30	DWS
Zinc, Dissolved	1.3	µg l ⁻¹	210	280	Max Baseline

3.5.5.3 Scarborough Formation

Table 3-10 - Control and compliance trigger quality levels for monitoring wells in the Scarborough Formation based on baseline data from 2020-2022

Determinants	LOD	Units	Control	Compliance	Source
Aliphatic C10-C12	1	µg l ⁻¹	-	300	DWS
Aliphatic C12-C16	1	µg l ⁻¹	-	300	DWS
Aliphatic C16-C21	1	µg l ⁻¹	-	300	DWS
Aliphatic C21-C35	1	µg l ⁻¹	-	1	LOD
Aliphatic C5-C35	10	µg l ⁻¹	32	300	Max Baseline / Combined DWS
Aliphatic C5-C6	0.1	µg l ⁻¹	-	15000	DWS
Aliphatic C6-C8	0.1	µg l ⁻¹	-	15000	DWS
Aliphatic C8-C10	0.1	µg l ⁻¹	-	300	DWS
Aluminium, Dissolved	10	µg l ⁻¹	330	440	Max Baseline
Anthracene	0.01	µg l ⁻¹	-	0.1	EQS
Aromatic C10-C12	1	µg l ⁻¹	-	90	DWS
Aromatic C12-C16	1	µg l ⁻¹	-	90	DWS
Aromatic C16-C21	1	µg l ⁻¹	-	90	DWS
Aromatic C21-C35	1	µg l ⁻¹	-	90	DWS
Aromatic C5-C35	10	µg l ⁻¹	-	300	Combined DWS
Aromatic C5-C7	0.1	µg l ⁻¹	-	10	DWS
Aromatic C7-C8	0.1	µg l ⁻¹	-	700	DWS
Aromatic C8-C10	0.1	µg l ⁻¹	-	300	DWS
Benzene	1	µg l ⁻¹	-	10	EQS

Determinants	LOD	Units	Control	Compliance	Source
Benzo(a)pyrene	0.01	µg/l	-	0.01	EQS
Benzo(b)fluoranthene	0.01	µg/l	-	0.01	EQS
Boron, Dissolved	12	µg/l	25	32	Max Baseline
Cadmium, Dissolved	0.03	µg/l	0.28	0.36	Max Baseline
Calcium, Dissolved	0.09	mg/l	110	130	Max Baseline
Chloride	0.1	mg/l	90	250	Max Baseline
Chromium III, Dissolved	1	µg/l	1.4	1.9	Max Baseline
Chromium VI, Dissolved	7	µg/l	-	7	LOD
Conductivity	1	µS/cm	690	850	Max Baseline
Copper, Dissolved	0.4	µg/l	6.7	9.3	Max Baseline
Ethylbenzene	1	µg/l	-	300	DWS
Fluoranthene	0.01	µg/l	-	0.01	LOD
Iron, Dissolved	5.5	µg/l	5650	7400	Max Baseline
Iron, Total	5.5	µg/l	1500000	2000000	Max Baseline
Lead, Dissolved	0.09	µg/l	0.4	1.3	Max Baseline / EQS
Magnesium, Dissolved	0.02	µg/l	12	15	Max Baseline
Manganese, Dissolved	0.22	µg/l	510	600	Max Baseline
Nickel, Dissolved	0.5	µg/l	17	20	Max Baseline
PAH Total	0.2	µg/l	-	0.2	LOD
pH			-	6 to 9	EQS
Potassium, Dissolved	0.08	mg/l	2.3	2.8	Max Baseline
Sodium, Dissolved	0.07	mg/l	19	22	Max Baseline
Sulphate as SO4	0.1	mg/l	15	250	Max Baseline / DWS
Toluene	1	µg/l	-	74	EQS
TPH Ali/Aro Total	10	µg/l	24	33	Max Baseline
Xylene	1	µg/l	-	30	DWS
Zinc, Dissolved	1.3	µg/l	20	25	Max Baseline

3.5.5.4 Cloughton / Saltwick Formation

Table 3-11 - Control and compliance trigger quality levels for monitoring wells in the Cloughton Formation based on baseline data from 2020-2022

Determinants	LOD	Units	Control	Compliance	Source
Aliphatic C10-C12	1	µg/l	-	300	DWS
Aliphatic C12-C16	1	µg/l	-	300	DWS
Aliphatic C16-C21	1	µg/l	18	25	Max Baseline
Aliphatic C21-C35	1	µg/l	5	7.5	Max Baseline
Aliphatic C5-C35	10	µg/l	75	300	Max Baseline / Combined DWS
Aliphatic C5-C6	0.1	µg/l	-	15000	DWS
Aliphatic C6-C8	0.1	µg/l	-	15000	DWS
Aliphatic C8-C10	0.1	µg/l	-	300	DWS
Aluminium, Dissolved	10	µg/l	610	820	Max Baseline
Anthracene	0.01	µg/l	-	0.1	EQS
Aromatic C10-C12	1	µg/l	-	90	DWS
Aromatic C12-C16	1	µg/l	-	90	DWS
Aromatic C16-C21	1	µg/l	-	90	DWS
Aromatic C21-C35	1	µg/l	-	90	DWS
Aromatic C5-C35	10	µg/l	-	300	Combined DWS
Aromatic C5-C7	0.1	µg/l	-	10	DWS
Aromatic C7-C8	0.1	µg/l	-	700	DWS

Determinants	LOD	Units	Control	Compliance	Source
Aromatic C8-C10	0.1	µg/l ⁻¹	-	300	DWS
Benzene	1	µg/l ⁻¹	-	10	EQS
Benzo(a)pyrene	0.01	µg/l ⁻¹	-	0.01	EQS
Benzo(b)fluoranthene	0.01	µg/l ⁻¹	-	0.01	EQS
Boron, Dissolved	12	µg/l ⁻¹	53	75	Max Baseline
Cadmium, Dissolved	0.03	µg/l ⁻¹	1.5	2	Max Baseline
Calcium, Dissolved	0.09	mg/l ⁻¹	300	400	Max Baseline
Chloride	0.1	mg/l ⁻¹	50	250	Max Baseline
Chromium III, Dissolved	1	µg/l ⁻¹	2.5	3.5	Max Baseline
Chromium VI, Dissolved	7	µg/l ⁻¹	-	7	LOD
Conductivity	1	µS/cm	550	750	Max Baseline
Copper, Dissolved	0.4	µg/l ⁻¹	1.2	1.6	Max Baseline
Ethylbenzene	1	µg/l ⁻¹	-	300	DWS
Fluoranthene	0.01	µg/l ⁻¹	-	0.04	Max Baseline
Iron, Dissolved	5.5	µg/l ⁻¹	2900	3900	Max Baseline
Iron, Total	5.5	µg/l ⁻¹	150000	200000	Max Baseline
Lead, Dissolved	0.09	µg/l ⁻¹	3.2	4.4	Max Baseline / EQS
Magnesium, Dissolved	0.02	µg/l ⁻¹	15	20	Max Baseline
Manganese, Dissolved	0.22	µg/l ⁻¹	860	1150	Max Baseline
Nickel, Dissolved	0.5	µg/l ⁻¹	10	15	Max Baseline
PAH Total	0.2	µg/l ⁻¹	10	14	Max Baseline
pH			-	6 to 9	EQS
Potassium, Dissolved	0.08	mg/l ⁻¹	125	200	Max Baseline
Sodium, Dissolved	0.07	mg/l ⁻¹	110	150	Max Baseline
Sulphate as SO ₄	0.1	mg/l ⁻¹	12	250	Max Baseline / DWS
Toluene	1	µg/l ⁻¹	-	74	EQS
TPH Ali/Aro Total	10	µg/l ⁻¹	55	75	Max Baseline
Xylene	1	µg/l ⁻¹	-	30	DWS
Zinc, Dissolved	1.3	µg/l ⁻¹	95	120	Max Baseline

3.6. SPRING LEVEL AND QUALITY MONITORING

The purpose of the spring water monitoring strategy is to detect chemical and physical impact on the 5 spring confluences in **Table 3-12** as a result of the works in previous Phases of construction, so that appropriate remedial measures could be adopted should potentially detrimental impacts arise. Spring level and Quality monitoring, upon completion of Phase 5, will not longer be required and therefore not take place during the Phase 7 works.

Table 3-12 Details of springs that have been previously monitored

Location	Description	X	Y
1	Newstead farm	481795	506909
2	Priory Farm	482403	505584
3	Grosmont Farm	483234	506267
4	Egton Bridge	480589	505441
5	Church Cliff	479787	506762

3.7. SURFACE WATER

3.7.1. OBJECTIVES

The purpose of the surface water monitoring strategy is to detect chemical and physical impacts on surface waters within Cat Scar Beck and Cold Keld Beck caused by the ongoing construction works, so that appropriate remedial measures can be adopted should potentially detrimental impacts arise.

From the results of the Revised Hydrogeological Risk Assessment and the Surface Water Drainage Scheme, potential impacts on Cat Scar Beck that could arise from the then completed and ongoing construction works, and therefore require evaluation by the surface water monitoring strategy include:

- Chemical pollution in the form of hydrocarbon (fuel, hydraulic oil, lubricant oil) spillage or leakage from construction plant and silt/particulate suspended solids entering surface water drainage via runoff and discharging into controlled waters.
- Chemical pollution in the form of cementitious materials from construction works entering the surface water drainage via runoff or pre-grouting works and discharging into controlled water.

- Physical impacts of the groundwater and surface water discharges to the surface water outfall system on Cat Scar Beck by causing siltation, scour or erosion of the stream bed.
- The outfall locations at Cold Keld Beck (LCSW3) will be monitored. However, as the outfalls do not lie within the catchment area of the Ladycross Site works, the impact of works is negligible, control and compliance trigger values will not be set for these monitoring locations.

3.7.2. MONITORING LOCATIONS

To meet the above objectives, the surface water monitoring locations have been designed to provide:

1. Further baseline data for Cat Scar Beck,
2. Early monitoring of surface water drainage within the onsite construction activities, and
3. Monitoring of surface water outfalls at downstream compliance points prior to discharge to Cat Scar Beck.

From the design layout of the Phase 7 Works, monitoring of the construction stage discharges up and down stream of the surface water drainage outfall points will be undertaken as summarised in **Table 3-13** and **Attachment A**.

Table 3-13 – Surface Water Monitoring Locations

ID	X	Y	Description
LCSW1	481868	507673	Upstream monitoring location of unnamed tributary A running along South-East boundary of site
LCSW2	481633	507421	Downstream monitoring location Highway drainage, outfall for site surface water
LCSW3	481344	507542	Discharge to Cold Keld Beck from drain culvert
LCSW4	481641	507460	Downstream monitoring location of unnamed tributary A running along South-East boundary of site.
LCSW5	481600	507440	Monitoring location upstream of LCSW2, outfall for site surface drainage

3.7.3. MONITORING FREQUENCY

Surface water quality samples will be undertaken on a monthly basis for laboratory analysis at monitoring location LCSW3. The other monitoring locations will continue to be sampled on a bi-weekly frequency or at frequencies detailed in site related discharge permits. Field measurements will be undertaken on a weekly basis for the parameters outlined in **Section 3.5.4.1**. Where no flow is observed at the monitoring location, this will be stated as part of the reporting procedure.

Monitoring of surface water quality shall continue for a minimum period of three months following completion of the Phase 6 Works and until it has been demonstrated that no significant variance from the Control Trigger Values has occurred and no exceedance above the Compliance Trigger Values detailed below has been detected.

3.7.4. SURFACE WATER DATA

To meet with the surface water monitoring objectives, the minimum baseline suite of analysis will include onsite analysis, sampling and laboratory testing.

The suite of determinants to be analysed to evaluate construction related pollution will include the specific Contaminants of Concern (CoC) associated with the Phase 7 Works.

3.7.4.1 Sampling

During the sampling visits, surface water sampling of the downstream monitoring points will be collected first, to minimise disturbed sediment impacting on the results. These samples are to be taken from sections of fast flowing water, where possible. In the event no flow is observed this will be stated.

Unfiltered samples will be collected in two litre coloured glass jars, and one 100 ml vial, or as required by the laboratory to complete the specified testing suites.

3.7.4.2 Onsite Monitoring

Visual inspection will be undertaken of the construction works surface water drainage systems to observe for evidence of high suspended solids, discolouration or hydrocarbon pollution.

On site monitoring using calibrated equipment will be undertaken for the following determinants: -

- Temperature,
- pH,
- Electrical Conductivity,
- Total Dissolved Solids, and

- Turbidity.

3.7.4.3 Laboratory Analysis

All chemical analysis will be undertaken by an MCERTS accredited laboratory. From the expected potentially polluting activities associated with Phase 7 Works the CoC that are to be analysed will include:

- pH,
- Conductivity,
- Suspended Solids,
- Biological Oxygen Demand,
- Free ammonia (NH₃),
- Chloride,
- Sodium,
- Sulphate,
- Aluminium,
- Cobalt,
- BTEX (Benzene, Toluene, Ethylbenzene and Xylene),
- Speciated Polycyclic Aromatic Hydrocarbons, and
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG) (Aliphatic/Aromatic split).

Flow rates will not be quantified; however, consideration will be made of climatic conditions, particularly after high runoff storm events.

3.7.5. SURFACE WATER QUALITY CONTROL AND COMPLIANCE TRIGGER VALUES

Surface Water Quality (SWQ) Control Trigger Values have been set for all of the determinants to be analysed for by consideration of the baseline surface water quality testing undertaken to date from Cat Scar Beck. The SWQ Control Trigger Value have been derived using the following methodology:

Control Trigger Values = mean baseline value + 2 × standard deviation of baseline data¹

Note¹ The monitoring undertaken thus far during pre-commencements and early site establishment and construction works has demonstrated that 2 standard deviations is most appropriate considering the natural variation observed in the monitoring baseline data.

The Compliance Value has been set at the appropriate Environmental Quality Standard (EQS), DWS or the baseline value where this exceeds the EQS value using the below methodology:

Compliance Trigger Values = mean baseline value + 3 × standard deviation of baseline data¹

Note¹ The monitoring undertaken thus far pre-commencements and early site establishment and construction works has demonstrated that 3 standard deviations is most appropriate considering the natural variation observed in the monitoring baseline data.

Where the analytical detection limit (MRV), EQS or DWS has been adopted as the Compliance Trigger Value, then no Control Trigger Value is included, as presented below in **Table 3-12**.

Table 3-14 – Surface Water Monitoring Control and Compliance Trigger Levels

Determinants	LOD	Units	Control	Compliance	Source
Aliphatic C10-C12	1	µg l ⁻¹	-	300	Max Baseline / WHO DWQ
Aliphatic C12-C16	1	µg l ⁻¹	-	300	Max Baseline / WHO DWQ
Aliphatic C16-C21	1	µg l ⁻¹	-	300	Max Baseline
Aliphatic C21-C35	1	µg l ⁻¹	250	350	Max Baseline
Aliphatic C5-C35	1	µg l ⁻¹	250	350	Max Baseline
Aliphatic C5-C6	0.1	µg l ⁻¹	-	15000	WHO DWQ
Aliphatic C6-C8	0.1	µg l ⁻¹	-	15000	WHO DWQ
Aliphatic C8-C10	0.1	µg l ⁻¹	-	300	WHO DWQ
Alkalinity as CaCO ₃ (Automated)	10	mg l ⁻¹	150	300	Max Baseline
Aluminium, Dissolved	10	µg l ⁻¹	2780	3500	Max Baseline
Ammoniacal Nitrogen as N	0.015	mg l ⁻¹	2.1	2.9	Max Baseline
Anthracene	0.01	µg l ⁻¹	-	0.1	EQS
Aromatic C10-C12	1	µg l ⁻¹	-	90	WHO DWQ
Aromatic C12-C16	1	µg l ⁻¹	-	90	WHO DWQ
Aromatic C16-C21	1	µg l ⁻¹	20	90	Max Baseline / WHO DWQ
Aromatic C21-C35	1	µg l ⁻¹	10	90	Max Baseline / WHO DWQ
Aromatic C5-C35	10	µg l ⁻¹	25	300	Max Baseline / WHO DWQ
Aromatic C5-C7	0.1	µg l ⁻¹	-	10	WHO DWQ
Aromatic C7-C8	0.1	µg l ⁻¹	-	700	WHO DWQ
Aromatic C8-C10	0.1	µg l ⁻¹	-	300	WHO DWQ
Benzene	1	µg l ⁻¹	-	10	EQS
Benzo(a)pyrene	0.01	µg l ⁻¹	-	0.05	Max Baseline
Benzo(b)fluoranthene	0.01	µg l ⁻¹	-	0.05	Max Baseline
Boron, Dissolved	12	µg l ⁻¹	75	100	Max Baseline
Cadmium, Dissolved	0.03	µg l ⁻¹	0.33	3	Max Baseline / WHO DWQ
Calcium, Dissolved	0.09	mg l ⁻¹	80	90	Max Baseline

Determinants	LOD	Units	Control	Compliance	Source
Chloride	0.1	mg ^l ⁻¹	60	250	Max Baseline / EQS
Chromium III, Dissolved	1	µg ^l ⁻¹	5	50	Max Baseline / DWD
Chromium VI, Dissolved	7	µg ^l ⁻¹	-	7	LOD
Conductivity	1	µS/cm	650	800	Max Baseline
Copper, Dissolved	0.4	µg ^l ⁻¹	4.65	5.6	Max Baseline
Ethylbenzene	1	µg ^l ⁻¹	-	300	WHO
Fluoranthene	0.01	µg ^l ⁻¹	0.06	0.08	LOD
Iron, Dissolved	5.5	µg ^l ⁻¹	1900	2400	Max Baseline
Iron, Total	5.5	µg ^l ⁻¹	7500	10000	Max Baseline
Lead, Dissolved	0.09	µg ^l ⁻¹	10.6	14.9	Max Baseline
Magnesium, Dissolved	0.02	µg ^l ⁻¹	14.5	18	Max Baseline
Manganese, Dissolved	0.22	µg ^l ⁻¹	120	150	Max Baseline
Nickel, Dissolved	0.05	µg ^l ⁻¹	13.7	15.4	Max Baseline
Nitrate as NO ₃	5	mg ^l ⁻¹	15	50	Max Baseline / WHO DWQ
PAH Total	0.2	µg ^l ⁻¹	0.6	0.9	Max Baseline
pH			-	6 to 9	EQS
Potassium, Dissolved	0.08	mg ^l ⁻¹	55	80	Max Baseline
Sodium, Dissolved	0.07	mg ^l ⁻¹	110	150	Max Baseline
Sulphate as SO ₄	0.1	mg ^l ⁻¹	225	300	Max Baseline / DWS
Suspended Solids	5	mg ^l ⁻¹	90	120	Max Baseline
Toluene	1	µg ^l ⁻¹	-	74	EQS
TPH Ali/Aro Total	10	µg ^l ⁻¹	153	220	Max Baseline
Xylene	1	µg ^l ⁻¹	-	30	DWS
Zinc, Dissolved	1.3	µg ^l ⁻¹	120	180	Max Baseline

4. DECOMISSION AND REPLACEMENT OF EXISTING MONITORING POINTS

Two boreholes are designated for decommissioning during Phase 7. The boreholes to be decommissioned are 34_BH03 and 34_BH06. This will be undertaken in accordance with current guidance and best practice (Environment Agency, 2012) and will adopt one of the three decommissioning options detailed in **Table 4-1**.

Table 4-1 Summary of options for the removal and replacement of monitoring wells

Option	Condition	Methodology
Option 1	In boreholes where there is more than 1m or less of plain pipework	Grout up standpipe from the base to 1.5m below ground level (bgl). Remove headworks and plain pipe from 0-1mbgl. Remove the gravel pack and slotted pipework from 1.0-1.5mbgl and replace with a bentonite/grout plug. Replace upper section 0-1.0mbgl with appropriate topsoil/arising mix.
Option 2	In boreholes where there is greater than 1m of plain pipework	Grout up standpipe from the base to 1m below ground level. Remove headworks and plain pipe from 0-1mbgl and replace with appropriate topsoil mix.
Option 3	In boreholes located on land that may be ploughed	Where boreholes are located on land that may be ploughed then guidance recommends that installations are removed to a minimum of 2.0 mbgl. Grout up standpipe from base to 2 mbgl. Remove headworks and plain pipe from 0-2mbgl. Remove the gravel pack and slotted pipework from 2.0-2.5m and replace with a bentonite/grout plug. Replace upper section 0-2.0mbgl with appropriate topsoil/arising mix.

On completion of the decommissioning, a report of work undertaken will be prepared.

5. REPORTING REQUIREMENTS

All exceedances of Control and Compliance Trigger Values and remedial actions that are implemented will be reported to Anglo American. A quarterly water report will detail the exceedance that occurred, the construction activities and antecedent meteorological conditions, the results of the site inspection, the established cause of the exceedance in Trigger Values and the remedial action specified together with the timescale for it to be implemented.

Where exceedances to Trigger Values are identified, associated with the site works a record of the data and site observations will be issued on receipt of results of the event. Where visual evidence of a significant change in stream flows, cloudy discharge or elevated turbidity or pH readings are identified associated with the works, the inspection report and remedial action specified will be issued to those identified in **Section 3.1** within 48 hours of that exceedance.

On completion of the remedial action, a record of the measures implemented, and their effectiveness will be reported to the relevant parties. The Anglo-American Construction Manager or Environment and Permitting Manager will provide a copy of the report.

Remedial actions will remain in accordance with the Phase 4 Remedial Action Plan (RAP).

6. REFERENCES

DEFRA. (2014). *Water Framework Directive implementation in England and Wales: new and updated standards to protect the water environment*. GOV.UK.

Environment Agency. (2012). *Good practice for decommissioning redundant boreholes and wells*. Environment Agency.

FWS. (September 2014). *Hydrogeological Baseline Report of the Lady Cross Plantation, North Yorkshire*. FWS Consultants LTD.

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7. DEFINITIONS AND ABBREVIATIONS

DWS – Drinking Water Standards

EQS – Environmental Quality Standards

HRA – Hydrogeological Risk Assessment

GWSWMS – Groundwater and Surface Water Monitoring Scheme

CoC – Contaminants of Concern

LOD – Limit of Detection

GWL – Groundwater Level

CEMP – Construction Environment Management Plan

GWQ – Groundwater Quality

SWG – Surface Water Quality

8. ATTACHMENTS

ATTACHMENT A – MONITORING LOCATIONS

ATTACHMENT B – SPRING MONITORING LOCATIONS

ATTACHMENT C – SPRING AND ABSTRACTION LOCATIONS



ATTACHMENT A – MONITORING LOCATIONS

Legend

- Site Boundary
- ◆ SW monitoring Location
- ▲ GW monitoring boreholes 2022





ATTACHMENT B – SPRING MONITORING LOCATIONS



North York Moors National Park

North York Moors National Park

Location 6_BH401C_onsite borehole

Location 1_Newstead farm

Location 5_Church Cliff

Egton Cemetery

Egton Lane

High Street

North York Moors

North York Moors

Location 3_Grosmont Farm

North York Moors

Location 2_Priory Farm

Location 4_Egton Bridge

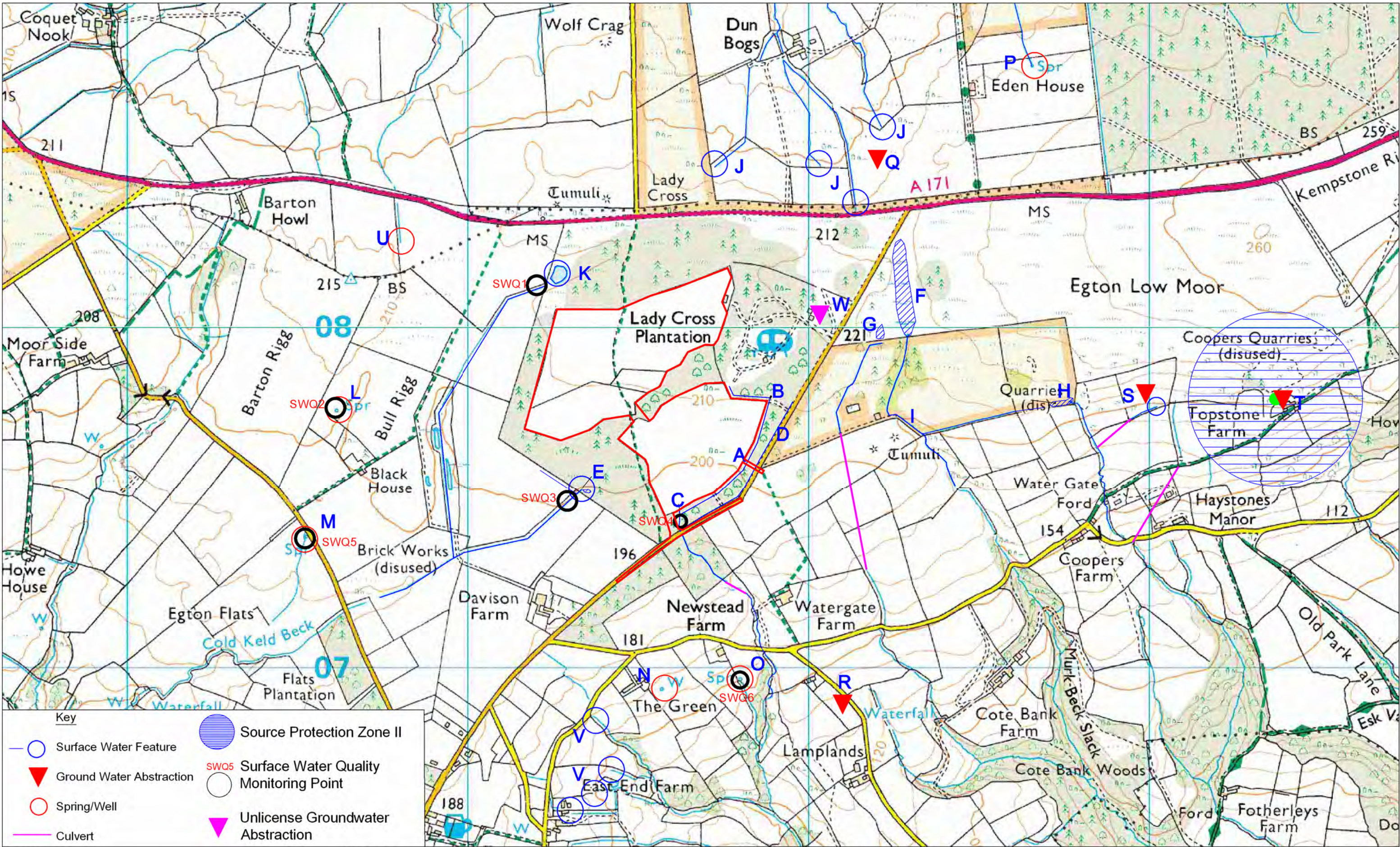
River Esk

Barnardis Road

Eskdaleside

River Esk

ATTACHMENT C – SPRING AND ABSTRACTION LOCATIONS



Key	
	Surface Water Feature
	Ground Water Abstraction
	Spring/Well
	Culvert
	Source Protection Zone II
	Surface Water Quality Monitoring Point
	Unlicense Groundwater Abstraction

DRAWING NUMBER 1433AmtsOD27Rev1
DRAWING TITLE HYDROLOGICAL AND HYDROGEOLOGICAL FEATURES - LADY CROSS PLANTATION

JOB TITLE YORK POTASH - MINERAL TRANSPORT SYSTEM
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CLIENT York Potash Ltd
SCALE 1:10,000 @A3
DRAWN BY KW

DATE July 2014

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NYMNPA
31/07/2023

Project Title / Facility Name:
Woodsmith Project

Document Title:
**NOISE & VIBRATION MANAGEMENT PLAN - PHASE 7 - NYMNPA CONDITION 18
(ROYAL HASKONINGDHV) - LADYCROSS**

Document Review Status

- 1. Reviewed – Accepted – Work May Proceed By: Angela Samuels
- 2. Reviewed – Accepted As Noted, Work May Proceed, Revise & Resubmit On: 31 Jul 2023 12:18
- 3. Reviewed – Work May Not Proceed, Revise & Resubmit
- 4. For information only
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A	19-Jul-2023	Planning	PLA			
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**WOODMITH PROJECT
(788.5030)**

**NOISE AND VIBRATION
MANAGEMENT PLAN - PHASE
7 - NYMNP A CONDITION 18 -
LADYCROSS PLANTATION
/
40-STS-LC-2100-EN-PL-00034**

(Royal HaskoningDHV)

Revision	Date of issue	Prepared by	Checked by	Approved by	Changes
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REPORT

Phase 7 - Ladycross Plantation Noise and Vibration Management Plan

Ladycross Phase 7 - NVMP

Client: STRABAG AG

Reference: 40-STS-LC-2100-EN-PL-00034 Rev B

Status: 00/Final

Date: 18 July 2023

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Document title: Phase 7 - Ladycross Plantation Noise and Vibration Management Plan

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Classification

Project related

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1 INTRODUCTION

1.1 Purpose of this Report

- 1.1.1 In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to North York Moors National Park Authority (NYMNP) for permission to develop a polyhalite mine and underground Mineral Transport System (MTS). Planning permission was subsequently granted in 2015 subject to conditions, as varied in February 2018 by NYM/2017/0505/MEIA.
- 1.1.2 This document has been prepared on behalf of STRABAG AG, who are the contractor delivering part of the works on behalf of Anglo American Ltd (Anglo American); and details the requirements with respect to noise and vibration management for the Phase 7 Works (see Paragraph 1.1.4 below) at the Ladycross Plantation site.
- 1.1.3 This document is required to partially satisfy the requirements of Condition 18 of the NYMNP planning permission. The details of this planning condition, and how the relevant requirements have been addressed, are set out in Table 1-1.

Table 1-1: Condition NYMNP 18 Noise and Vibration Management Plan

NYMNP 18	Compliance with Condition NYMNP-18
Prior to the commencement of each Phase of Construction at Dove's Nest Farm or Lady Cross Plantation, a Noise and Vibration Management Plan (NVMP) for the control, mitigation and monitoring of noise and vibration for both construction and operational phases at the two sites shall be submitted to and approved in writing by the MPA in consultation with the SBC EHO. The scheme shall set out the following:	This document addresses Phase 7 Works at Ladycross Plantation. Works at Woodsmith Mine are addressed in a site specific NVMP and are therefore not addressed in this Plan.
Noise-sensitive receptors for which predictions shall be made and at which the noise and vibration limits shall apply and which shall include recreational receptors.	Section 3.1
Predicted noise levels at the noise-sensitive receptors from noise and vibration generated at the DNF and LCP sites for the key construction phases during the forthcoming year including any periods in which the higher daytime limit of 70 dB L _{Aeq} shall apply (permitted 56 days for temporary works to create noise-reducing bunds and/or barriers as per Conditions 20 and 22).	Section 3, and Appendix A
The best practicable means which will be used to control noise and vibration levels on site including such measures proposed in the Environmental Statement (September 2014 as updated by the Supplementary Environmental Statement dated February 2015) and the Supplementary Environmental Statement dated July 2017 (updated by further information dated October and November 2017) as relevant. Such measures shall include, but are not limited to: the use of the quietest available plant, equipment and techniques; the regular maintenance and inspection of such plant and equipment; the use of cladding, attenuators and barriers to reduce noise levels from noisy plant and operations; the specification of appropriate reversing alarms to minimise annoyance; and, measures to reduce vibration and air overpressure during blasting.	Section 5

NYMNP A 18	Compliance with Condition NYMNP A-18
<p>Details of the noise and vibration monitoring system to be installed around the DNF and LCP sites to continuously log noise levels during construction and operation. The system shall include at least six noise monitors installed around the boundary of the Dove's Nest site and at least four monitors at key residential receptors near the Dove's Nest site and at least four noise monitors around the Lady Cross Plantation Site and at least three monitors at key residential receptors near the Lady Cross Plantation site.</p>	Section 4
<p>The precise number and location of noise monitors shall be set out in the NVMP. The developer shall use reasonable endeavours to obtain access to the residential receptor properties for the installation of noise monitors and only if access cannot be obtained the number or location of noise monitors may be reduced. The MPA and the SBC EHO and/or their advisers shall be granted access to inspect the noise and vibration data whenever required, records of the data should be kept for a reasonable period and these records should be accessible by the public.</p>	Section 3, Section 4 and Figure B.1
<p>Details of the procedure to be followed in the event that the noise predictions detailed in the NVMP or the noise limits detailed in conditions 20 to 23 are exceeded. Such procedures shall require the investigation of the reasons for the breach of the limits and the cessation of the activity causing the breach until such a time as additional mitigation can be provided.</p>	Section 5
<p>Details of how the residents will be informed and consulted about the site operations and progress, particularly in regard to blasting and especially noisy operations including details of complaints logging and management procedures and a 24-hour telephone incident hotline. Details of the procedure for investigating complaints and informing complainants of the results of such investigations and of any actions resulting from them.</p>	Section 5
<p>The NVMP shall be adhered to at all times unless agreed previously in writing by the MPA.</p>	
<p>The NVMP shall be updated and agreed whenever appropriate to reflect changes in the programme during construction and operation and at intervals not less than 6 months after the initial start on site and thereafter annually.</p>	Section 1

1.1.4 This NVMP relates to the Phase 7 Works at Ladycross Plantation only. These works comprise the following:

- Soft landscaping of lagoon and other areas;
- Installation of double-stacked containers for acoustic and visual screening;
- Creation of temporary top spoil and sub soil screening stockpiles;
- Replacement welfare facilities and associated parking;
- Installation of hardstanding areas; and
- Erection of a lattice communication mast

1.1.5 According to received information/the Construction Method Statement (CMS; reference 40-STSLC-2100-CN-MS-00008), all phase 7 Works will be undertaken during daytime hours only (07:00 – 19:00).

1.1.6 Contractors responsible for implementing the Phase 7 Works have advised that some works associated with Phase 6 (as detailed the previous report) will continue throughout the Phase 7 period; these are detailed in Appendix A.

Planning Conditions

- 1.1.7 In addition to Condition NYMNPA 18, two further conditions NYMNPA 22 and NYMNPA 23 establish noise limits relating to the Ladycross Plantation site (see **Section 2.2**). Planning condition detail is provided in Table 1-2 and Table 1-3.

Table 1-2: Condition NYMNPA 22 Noise and Vibration Management Plan

NYMNPA 22	Compliance with Condition NYMNPA-22
Day-time (07.00 hrs to 19.00 hrs) noise levels $L_{Aeq,1hr}$ from mine construction at the Lady Cross Plantation site, excluding blasting operations, shall not exceed 55 dB $L_{Aeq,1hr}$ and for short-term, construction activities solely relating to the demolition of existing buildings and erection of new structures excluding earth mound and bunds shall not exceed 65dB $L_{Aeq,1hr}$. An upper limit of 70 dB $L_{Aeq,1hr}$ for the purposes of temporary noisy operations to provide noise-reducing earth bunds and / or barriers may be permitted for up to 56 days in any calendar year provided such temporary operations are specified and agreed in the NVMP described in Condition 18. Each calendar day when the higher temporary noise level is exceeded shall be counted as one day. Noise levels shall be measured in accordance with BS 4142:2014 and shall apply at the curtilage boundary of residential properties and at the following recreational receptors: on the open access land to the north and east of the site at OS Grid Reference locations 810684 and 819077.	Section 3, and Appendix A

Table 1-3: Condition NYMNPA 23 Noise and Vibration Management Plan

NYMNPA 23	Compliance with Condition NYMNPA-23
Evening (19.00 hrs to 22.00 hrs) and night-time (22.00 to 07.00 hrs) noise levels $L_{Aeq,1hr}$ from mine construction at the Lady Cross Plantation site, excluding blasting operations, shall not exceed 42 dB $L_{Aeq,1hr}$. Noise levels shall be measured in accordance with BS 4142:2014 and the limits apply at the curtilage boundary of residential properties.	Section 3, and Appendix A

- 1.1.8 Condition NYMNPA 26 relates to vibration arising from construction activities other than blasting, details are provided in Table 1-4.

Table 1-4: Condition NYMNPA 26 Noise and Vibration Management Plan

NYMNPA 26	Compliance with Condition NYMNPA-26
Vibration from construction work on site and during operation (but excluding blasting) shall not exceed 0.3mm/s (PPV) at any residential property at any time.	Section 3.3

- 1.1.9 In this document, the term “*construction*” includes all physical and related engineering and construction activities associated with the Phase 7 Works, as described above. Updates to this plan will be prepared and submitted to the NYMNPA for approval in advance of subsequent construction phases and following any material design or method change.

2 GUIDANCE

2.1 Legislation and British Standards

2.1.1 Wherever practicable, construction will be carried out in accordance with:

- Planning Practice Guidance for Minerals (PPGM), 2014¹
- BS 5228:2009+A1:2014 *Code of Practice for noise and vibration control on construction and open sites*².

2.2 Construction Limits

2.2.1 The PPGM includes noise limits which align with the established noise limits detailed in NYMNPA Condition 22 and NYMNPA Condition 23.

2.2.2 The established noise limits detailed in NYMNPA Condition 22 and NYMNPA Condition 23 (as measured at the identified receptors) remain as:

- 55 dB L_{Aeq,1hr} for daytime (07:00 – 19:00);
- 65 dB L_{Aeq,1hr} for the demolition of buildings and erection of new structures;
- Up to 70 dB L_{Aeq,1hr} for temporary noisy operations to provide noise-reducing earth bunds and / or barriers; and
- 42 dB L_{Aeq,1hr} for evening and night-time (19:00 – 07:00).

2.2.3 Established vibration limits for construction works (other than blasting) shall not exceed 0.3 mm/s. Vibration limits for blasting activities are outlined in Conditions 27 and 28, however blasting works are not anticipated at the Ladycross Plantation Site and are therefore not considered in the NVMP.

2.3 Construction Method

2.3.1 Contractors responsible for implementing these Phase 7 Works have provided details of the construction plan, number and type of plant items to be used and location/duration of construction activities within the site. Further detail is provided in the Phase 7 Construction Method Statement (CMS) (reference 40-STC-LC-2100-CN-MS-00008).

2.3.2 **Appendix A** details the plant items included within the noise model, their sound power level and location on site. Predictions of noise levels based upon these details are assessed within this NVMP.

¹ *Planning Practice Guidance for Minerals (PPGM), 2014 Department for Levelling Up, Housing and Communities (/government/organisation/department-for-levelling-up-housing-and-communities) and Ministry of Housing, Communities & Local Government (/government/organisations/ministry-of-housing-communities-and-local-government. (URL:https://www.gov.uk/guidance/minerals, accessed 03 February 2022)*

² *British Standards Institute (2014). BS 5228:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites*

3 PREDICTED CONSTRUCTION NOISE AND VIBRATION LEVELS

3.1 Baseline Receptor Locations

3.1.1 The Environmental Statement (ES) which accompanied the planning application included (Part 2, Chapter 8, Noise and Vibration) an assessment of construction noise at the following nearby residential locations:

- Ladycross Caravan Park Owner's Property, approximately 320m from the nearest site boundary;
- Davidson Farm, approximately 425m from the nearest site boundary; and
- Watergate Farm, approximately 365m from the nearest site boundary.

3.1.2 For the purposes of this NVMP the receptors detailed above are the residential receptors at which the noise limits in Conditions 22 and 23 apply, and for which predictions of construction noise were undertaken.

3.1.3 The following recreational receptors, detailed within Condition 22, were included within the construction noise calculations:

- Open access land to the north of the site (OS Grid Reference 816084), OSGB36 co-ordinates (m) X:481600, Y:508400; approximately 310m from the nearest site boundary; and
- Open access land to the east of the site (OS Grid Reference 819077), OSGB36 co-ordinates (m) X:481900, Y:507700, approximately 60m from the nearest site boundary.

3.2 Predicted Noise Levels

3.2.1 3-D noise modelling was undertaken using computational noise modelling software SoundPLAN (v8.2) to predict construction noise levels associated with the Phase 7 Works. **Table A.1** and **Table A.2** in **Appendix A** show the predicted construction noise levels for the Phase 7 Works (including ongoing Phase 6 works).

3.2.2 Predicted noise levels from the Phase 7 Works do not exceed the agreed construction noise limits at any of the identified noise-sensitive receptors during the day or night-time when the activity timing and physical mitigation measures described in **Section 0** are adopted. Despite predicted noise levels reaching limit value at recreational receptor 819077 (see **Table A.1**), it should be noted that the noise model setup and inputs are considered to be conservative and that exceedances of the noise limits during normal operations are therefore not anticipated.

3.3 Vibration

3.3.1 Ground-borne vibration assessments can be drawn from the empirical methods detailed in BS 5228-2:2009+A1:2014; in the Transport and Road Research Laboratory Research Report (TRRL) 246: Traffic induced vibrations in buildings 2; and within the Transport Research Laboratory (TRL) Report 429 (2000): Ground-borne vibration caused by mechanical construction works.

3.3.2 A series of calculations, in accordance with the empirical methods referred to above, were carried out based on typical construction activities, applying reasonable worst-case assumptions, in order to determine set-back distances at which critical vibration levels may occur. These were presented in the ES and are reproduced in **Appendix A, Table A.4**.

- 3.3.3 During Phase 7, no significant sources of vibration are to be present. Additionally, the minimum distance between the plant and any of the surrounding residential receptors is over 350m. At this distance, ground-borne vibration levels will be significantly lower than 0.3mm/s at all nearby sensitive receptors, i.e. significantly below levels which are considered to be *“just about perceptible in residential environments”*³.

³ British Standards Institution (2014). BS5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'

4 NOISE AND VIBRATION MONITORING PROGRAMME

4.1 Vibration Monitoring

- 4.1.1 As detailed within Section 3.3 of this NVMP, construction activities during Phase 7 will not give rise to significant levels of vibration at nearby residential receptors.
- 4.1.2 The construction methodology for the Ladycross Plantation site is similar to works that are being undertaken at Lockwood Beck. There have been no complaints or incidents from vibration at the Lockwood Beck site
- 4.1.3 Given the experience and knowledge gained from the Lockwood Beck site and the distance between the Ladycross Phase 7 Works and the residential receptors, vibration impacts are not anticipated. Vibration monitoring is therefore not proposed.

4.2 Noise Monitoring

- 4.2.1 Condition NYMNPA 18 specifies that continuous noise monitoring is undertaken during construction and operation at three key residential receptor locations near the Ladycross Plantation Site. Residential receptor locations are outlined in **Section 3.1.1**.
- 4.2.2 Monitoring is currently being undertaken both on and off site at the following monitoring locations:
- LC-NM1 – Ladycross Caravan Park Owner’s Property;
 - LC-NM2 – Centre of the site;
 - LC-NM3 – Davidson Farm; and
 - LC-NM4 – Barn Cottages (a temporary relocation from the North-east boundary of the site).
- 4.2.3 Noise monitoring locations are presented in **Appendix B, Figure B1**. The redline boundary shown on **Figure B1** is the land ownership boundary.
- 4.2.4 Although Watergate Farm is closer to the site boundary than Davidson Farm, similar construction noise is anticipated at these receptors due to the distance to the works and the intervening ground between the works and the receptors. This is confirmed by the noise predictions presented in **Appendix A**.
- 4.2.5 The noise measurements are conducted in accordance with the guidance contained in BS 7445 parts 1⁴ and 2⁵.

⁴ British Standard Institution (2003) BS 7445-1:2013 Description and measurement of environmental noise – Guide to quantities and procedures

⁵ British Standard Institution (1991) BS 7445-2:1991 Description and measurement of environmental noise – Guide to acquisition of data pertinent to land use

- 4.2.6 The sound level meters are fully calibrated, traceable to United Kingdom Accreditation Service (UKAS) standards and satisfy the requirements of BS EN 61672-1:2013⁶ for a 'Class 1' Sound Level Meter (SLM).
- 4.2.7 The SLMs record L_{Aeq} , L_{Amax} , L_{A90} , and L_{A10} data with a 'fast' time constant and A-weighting. **Appendix C** presents descriptions of these terms.
- 4.2.8 The noise measurements are being conducted in accordance with BS 7445 with the SLM microphone mounted on a tripod or secured mounting pole at 1.5m above ground level and 3.5m away from any reflecting surface other than the ground. The instruments will be calibrated at monthly intervals during the monitoring period, and before and after any battery change using a portable field calibrator. Any deviations in the calibration level will be noted and reported within the summary reports.
- 4.2.9 The SLMs operate using a system of real time alerting which allows remote monitoring of noise levels and indication of noise levels approaching and/or breaching the limits. Alerts are managed by the Contractors who, following an investigation as to the cause of any alert (assisted by live audio observations provided by the monitoring equipment located at the boundary), will report the alert to Scarborough Borough Council (SBC) and the NYMNPA as necessary.
- 4.2.10 The SLMs are inspected during each field calibration and maintenance visit and any faults will be identified and rectified during the visits. Should faults require off-site repair a replacement SLM will be installed during the repair period.
- 4.2.11 Monitoring of weather conditions including wind speed and direction, rainfall, temperature and humidity is being carried out simultaneously at the Ladycross Plantation Site.
- 4.2.12 Reports will be provided monthly to SBC and NYMNPA. The report will contain details of the type and system of sound level meters used and a summary of the measured noise data at each location with corresponding weather data and survey notes.

⁶ British Standard Institution (2013) BS EN 61672-1:2013 Electroacoustics. Sound level meters - Specifications

5 MITIGATION AND PROCEDURES

5.1 Purpose of the Section

5.1.1 This section outlines measures to be taken by the Contractors to limit, and manage the impact of, noise. This section also outlines the Best Practicable Means and specific mitigation actions to be adopted.

5.2 Best Practicable Means

5.2.1 The Control of Pollution Act 1974 and BS 5228 define a set of Best Practice working methods and mitigation measures, referred to as Best Practicable Means (BPM). The following measures will be adopted:

- Weekly construction meetings will take place to discuss the minimisation of noise emanating from the site, the potential for noise reduction for any upcoming activities and to identify any potential concurrent activities which may lead to noise levels requiring the upper limit of 70 dB $L_{Aeq,1hr}$. Occasions requiring these upper limits will be reported to the NYMNPA and SBC prior to the activities occurring and will be included within the regular communication to residents detailed within **Section 5.4**;
- Locating temporary plant so that it is screened from receptors by on-site structures, such as site cabins;
- Where practicable, not undertaking noisy activities concurrently close to residential receptors;
- Using modern, quiet equipment and ensuring such equipment is properly maintained (see **Section 5.2.8** below) and operated by trained staff (see **Section 5.2.10** below);
- Applying enclosures to particularly noisy equipment where possible;
- Ensuring that mobile plant is well maintained such that loose body fittings or exhausts do not rattle or vibrate;
- Ensuring plant machinery is turned off when not in use;
- Undertaking daily, pre-start inspections of plant and machinery;
- Providing local residents with 24-hour contact details for a site representative in the event that disturbance due to noise from the construction works is perceived (see **Section 5.4.1**); and
- Informing local residents about the construction works, including the timing and duration of any particularly noisy elements (see **Section 5.4.3**).

Management Structure and Responsibilities

5.2.2 Anglo American are accountable for compliance with environmental and approvals requirements. Contractors on site are responsible for undertaking construction activities in accordance with the requirements of this NVMP.

5.2.3 The CEMP provides details of the lines of responsibility for environmental management during the Phase 7 Works.

5.2.4 The Environmental Manager/Project Manager (or deputy) for each Contractor will be on site during working hours and will be responsible for robust implementation of noise management and mitigation measures.

5.2.5 The Operations Director/Project Manager (or deputy) for each Contractor is responsible for implementation of the appropriate Environmental Policy and the CEMP through:

- Compliance with contractual requirements regarding environmental matters;

- Adherence to the NVMP and associated control measures;
- Designated responsibility for environmental control during the works;
- Regular meetings with project team members to review environmental matters;
- Regular reporting to the employer on environmental matters;
- Ensuring adequate resources are made available;
- Managing and advising on environmental matters affecting the Project with the assistance of the Employer's Environment Manager, the Contractor's Environmental Manager and Environmental Inspector;
- Reporting to the Employer's Environment Manager on implementation of the NVMP;
- Carrying out regular internal audits and procedure review on environmental matters;
- Reviewing and mitigating all environmental impacts identified in submitted method statements;
- Recording and maintaining all environmental matters/incidents in accordance with reporting procedures; and
- Ensuring all team members work in accordance with the NVMP.

5.2.6 The Operations Director/Environmental Manager/Project Manager for the contractors and their appointed subcontractors engaged for the Phase 7 Works will, with the Employer's Environment Manager acting as coordinator, liaise to ensure regular review of environmental matters and appropriate assignment of responsibilities for Contractors' specific site activities.

Maintenance

5.2.7 Maintenance of plant will be carried out routinely and in accordance with the manufacturers' guidance.

5.2.8 A daily safety inspection of all plant and equipment will be undertaken to ensure that, as a minimum:

- all plant is in a good state of repair and fully functional;
- any plant found to be requiring interim maintenance has been identified and taken out of use;
- acoustic enclosures fitted to plant are in a good state of repair;
- doors and covers remain closed during operation (self-closing doors/covers are recommended); and
- any repairs are undertaken by a fully qualified maintenance engineer.

Training

5.2.9 The site induction programme and site rules will include good working practice instructions for site staff, managers, visitors and contractors to help minimise noise whilst working on the site.

5.2.10 The good working practice guidelines/instructions will include, but not be limited to, the following points:

- avoid unnecessary revving of engines;
- plant used intermittently will be shut-down between operational periods, where possible;
- avoid reversing wherever possible;
- contractors to be advised that reversing alarms on mobile equipment must be specified as low/white noise where safety requirements allow;
- report any defective equipment/plant as soon as possible so that corrective maintenance can be undertaken; and
- handle material in a manner that minimises noise.

5.3 Specific Mitigation

Bunds and barriers

- 5.3.1 Temporary storage bunds north of the Works, constructed during Phase 6, were included in the noise model, providing screening between the proposed construction works and the residential receptors. Creation of temporary top soil and sub soil screening stockpiles activities proposed as part of the Phase 7 works will involve modifications to these bunds. Additionally, as part of the Phase 7 works, further acoustic and visual screening will be provided through the installation of double-stacked containers. Modelling scenarios were created of the Phase 7 activities with and without these modifications and the worst-case impacts were considered and the maximum potential impacts have been reported in this NVMP.

5.4 Communications

- 5.4.1 If monitoring indicates that the noise limits are being exceeded as a result of the works, or a complaint is received from a local resident, an investigation will be instigated in accordance with the Complaints Procedure provided in Appendix B to the Phase 3 CEMP.
- 5.4.2 Good relations with local residents in nearby noise-sensitive receptors will be maintained.
- 5.4.3 A Community and Stakeholder Engagement Plan is provided in Appendix A to the Phase 7 CEMP which details actions to be taken by Anglo American and the Contractors.

Appendix A Predicted Construction Noise Levels

The predicted noise levels detailed within the tables below are considered to represent the most conservative, worst-case, scenario. The modelled results for Phase 7 daytime construction works are detailed in **Table A.1**.

Table A.1 Calculated noise levels during Phase 7 – Daytime

Receptor location	Daytime (07:00–19:00)	
	Limit $L_{Aeq,1hr}$ dB	Maximum predicted $L_{Aeq,1hr}$ dB
Ladycross Caravan Park Owners Property	55	45
Davison Farm	55	47
Watergate Farm	55	45
Recreational Receptor OS Grid 816084	55	36
Recreational Receptor OS Grid 819077	55	55

The modelled results for Phase 7 evening and night-time construction works are detailed in **Table A.2**.

Table A.2 Calculated noise levels during Phase 7 – evening and night-time

Receptor location	Night time (19:00–07:00)	
	Limit $L_{Aeq,1hr}$ dB	Maximum predicted $L_{Aeq,1hr}$ dB
Ladycross Caravan Park Owners Property	42	33
Davison Farm	42	35
Watergate Farm	42	35
Recreational Receptor OS Grid 816084	N/A	27
Recreational Receptor OS Grid 819077	N/A	44

Modelling Assumptions

The works at the site are considered to comprise mineral extraction and the conditioned noise limits are in accordance with the Planning Practice Guidance for Minerals (PPGM). The PPGM does not specify the method to be used to predict noise propagation; therefore, in line with acoustics industry best practice, noise propagation from the site was calculated using the ISO 9613-2 methodology.

The contractor responsible for the works provided a schedule of construction activities. This has been used to identify the following weeks of the schedule which potentially result in the worst-case impacts:

- Week 2:
 - Restoration of large areas of site (Part 1)
 - General site activities; and
 - Installation of shipping containers to supply site screening
- Week 3:
 - Restoration of large areas of site (Part 2)
 - General site activities; and
 - Installation of shipping containers to supply site screening.
- Week 5:
 - Restoration of large areas of site (Part 2)
 - Creation of temporary top soil and sub soil screening stockpiles
 - Decommissioning of old welfare and installation of new welfare
 - Hardstanding areas
 - General site activities.

Separate modelling was undertaken for each potentially worst-case week, including the simultaneous operation of all the identified activities and changes to the ground levels due to the ongoing works. The maximum of the predicted noise levels from each modelled scenario at each receptor are provided in Tables A.1 and A.2.

Overall, the model setup and assumptions made on the number of plant and their location within the site were conservative, and therefore the predicted impacts are considered to be worst-case.

Acoustic modelling input data

Data sources used for this modelling are shown in **Table A.3**.

Table A.3 Data sources

Data	Source file	Origin
Nearby building locations	OS Buildings.geo	Ordnance Survey Vectormap
Site topography	CAD drawing entitled '221013 - LDX TIN_2.dwg'	Anglo American
Wider area topography	NZ80NW _DTM_2m.tif	Defra LiDAR survey data (available at Defra Survey Data Download)
Site layout	Ladycross Plantation Phase 7 Phasing Plan, drawing number 40-ST5-LC-2100-PA-22-20120	STRABAG

Acoustic model settings

Acoustic modelling was undertaken using the following model settings:

- Maximum search radius of 5000m.
- Maximum number of reflections: 3
- Noise predictions carried out at each floor level of sensitive receptors, ground floor level is 1.5m above ground, each storey is 2.5m high.
- Side diffraction enabled.
- Ground absorption was set as:
Areas within site red line boundary and roads/haul routes within site set to G=0;
Ground outside of site red line boundary set to G=1 (representing soft ground).

Plant details

Ongoing works from Phase 6 are included in the model for all scenarios. These include the following:

- Alimak base sections and lower landing level steelwork;
- Alimak mast installation;
- Alimak surface support steelwork;
- Mechanical Bracket / Pipe install;
- Electrical Unistrut Install;
- Alimak Cable / Guides installation;
- Headhouse Phase 1;
- Rescue Winch Bases;
- Alimak lift car and enclosures installation;
- Headhouse Phase 2;
- Alimak top landing levels and rescue winch; and
- Grout Plant Civils.
- Use of shaft Infrastructure including tally hut and ventilation fan, use of generators, use of Alimak and general site activities (24 hours per day).

The erection of a lattice communication mast will involve the construction of a 3m x 3m concrete slab and the installation of the mast will occur simultaneously with the replacement of welfare facilities and associated parking facilities.

The following Phase 7 equipment, associated sound power levels and conservative assumptions regarding plant 'on-times' were used within the SoundPLAN noise model:

General site activities

1 x 12T Excavator, 10% 24 hours per day, 103dB LwA
 1 x 20T Dump Truck, 10% on-time 24 hours per day, 102dB LwA
 1 x Ride on Roller, 5% on-time 24 hours per day, 103dB LwA
 1 x Telehandler, 25% on-time 24 hours per day, 99dB LwA
 1 x Road Sweeper, 25% on time 24 hours per day, travelling at 5 km/h, 104dB LwA
 45 ft MEWP, 10% on-time 24 hours per day, 95dB LwA

General Site Activities Equipment

1 x 250kVa Generator (Welfare), 100% on-time 24 hours per day, 95dB LwA
 1 x 60kVa Generator (Workshop), 100% on-time 24 hours per day, 96dB LwA
 1 x 60kVa Generator (Siltbuster), 25% on-time 24 hours per day, 96dB LwA
 1 x 60kVa Generator (Wheelwash), 25% on-time Daytime only, 96dB LwA
 6 x Supersilent Pumps, 25% on-time 24 hours per day, 87dB LwA
 1 x Static Fuel Bowser, 50% on-time 24 hours per day, 101dB LwA
 12 x Lighting Towers, 50% on-time 24 hours per day, 85dB LwA
 1 x Vibrating Poker, 25% on-time Daytime only, 99dB LwA
 1 x Towable Jet wash, 25% on-time Daytime only, 91dB LwA
 1 x Towable Water Bowser 7000L, 25% on-time Daytime only, 109dB LwA
 1 x 6m Ecowash Wheelwash, 25% on-time Daytime only, 91dB LwA
 1 x Siltbuster, 25% on-time 24 hours per day, 93dB LwA

Installation of shipping containers to supply site screening

1 x 20T excavator, 50% on-time daytime only, 101dB LwA
 1 x Vibratory Roller, 25% on-time daytime only, 103dB LwA
 1 x 20T Dumper, 60% on-time daytime only, 102dB LwA
 1 x Telehandler 5T, 50% on-time daytime only, 105dB LwA
 1 x 100T mobile Crane, 50% on-time Daytime only, 105dB LwA

Decommissioning of old welfare and installation of new welfare

1 x 30T excavator, 100% on-time daytime only, 103dB LwA
 1 x 20T Dumper, 60% on-time daytime only, 102dB LwA
 1 x Telehandler 5T, 50% on-time daytime only, 105dB LwA
 1 x Vibratory Roller, 25% on-time daytime only, 103dB LwA
 1 x Concrete Pump, 75% on-time daytime only, 109dB LwA
 2 x Vibratory poker, 25% on-time daytime only, 106 LwA
 1 x 500kVa Emergency Generator 10% on-time 24 hours per day, 95dB LwA
 1 x 130T mobile Crane, 50% on-time Daytime only, 105dB LwA
 1x Compressor, 100% on-time daytime only, 107dB LwA

Installation & use of Alimak and associated infrastructure

1 x 130T mobile Crane, 50% on-time Daytime only, 105dB LwA
 1 x 250T Mobile Crane, 50% on-time Daytime only, 107dB LwA
 1 x Alimak, 15% on-time 24 hours per day, 94dB LwA

Restoration of large areas of site

1 x 30T excavator, 100% on-time daytime only, 103dB LwA
 1 x 30T excavator, 100% on-time daytime only, 103dB LwA
 1 x Tractor & Trailer, 25% on-time daytime only, 102dB LwA
 2 x 20T Dumper, 60% on-time daytime only, 102dB LwA
 1 x Dozer, 75% on-time daytime only, 105dB LwA

Installation and use of temporary shaft head house and associated services

1 x 130T mobile Crane, 50% on-time Daytime only, 105dB LwA
 1 x 250T Mobile Crane, 50% on-time Daytime only, 107dB LwA
 1 x MEWP, 75% on-time Daytime only, 95dB LwA
 1 x Alimak, 15% on-time 24 hours per day, 94dB LwA

Installation of grout plant and associated services

1 x 20T excavator, 50% on-time daytime only, 101dB LwA
 1 x 20T Dumper, 10% on-time daytime only, 102dB LwA
 1 x 130T mobile Crane, 50% on-time Daytime only, 105dB LwA
 1 x Mobile Welding Unit, 20% on-time Daytime only, 101dB LwA
 1 x MEWP, 20% on-time Daytime only, 95dB LwA
 1 x Roller vibrator, 25% on-time Daytime only, 103 LwA

Installation of emergency back-up generators

1 x 500kVa Emergency Generator, 10% on-time 24 hours per day, 100dB LwA
 1 x 1000kVa Generator (Shaft fit-out), 100% on-time 24 hours per day, 99dB LwA
 1 x 250kVa Generator, 50% on-time 24 hours per day, 95dB LwA

Hardstanding Areas

1 x Dozer, 75% on-time daytime only, 105dB LwA
 1 x Vibratory Roller, 50% on-time daytime only, 103dB LwA
 1 x Asphalt Paver, 50% on-time daytime only, 112dB LwA
 1 x 20T excavator, 10% on-time daytime only, 101dB LwA
 1 x Asphalt Roller, 50% on-time daytime only, 108dB LwA
 1 x Skid Steer, 50% on-time daytime only, 112 LwA

Creation of temporary top soil and sub soil screening stockpiles

2x 30t Tracked Excavator, 100% on-time daytime only, 103 LwA
 2x 20t Dumper, 60% on-time daytime only, 102 LwA
 1x Dozer, 75% on-time daytime only, 105 LwA

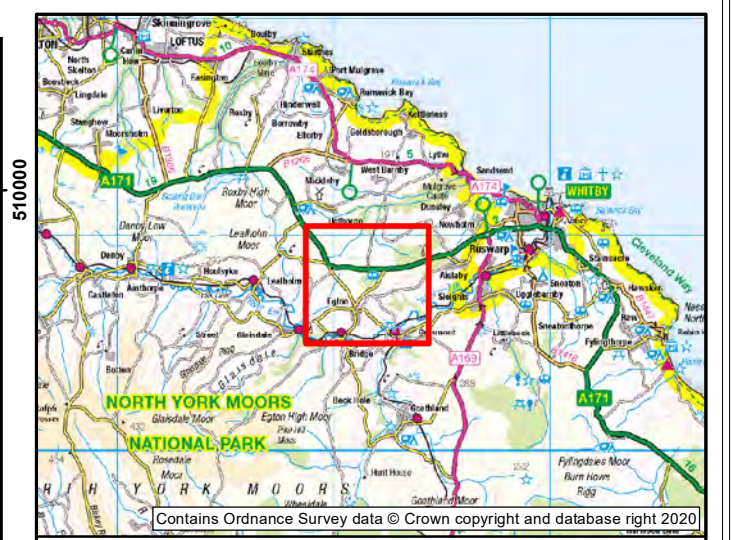
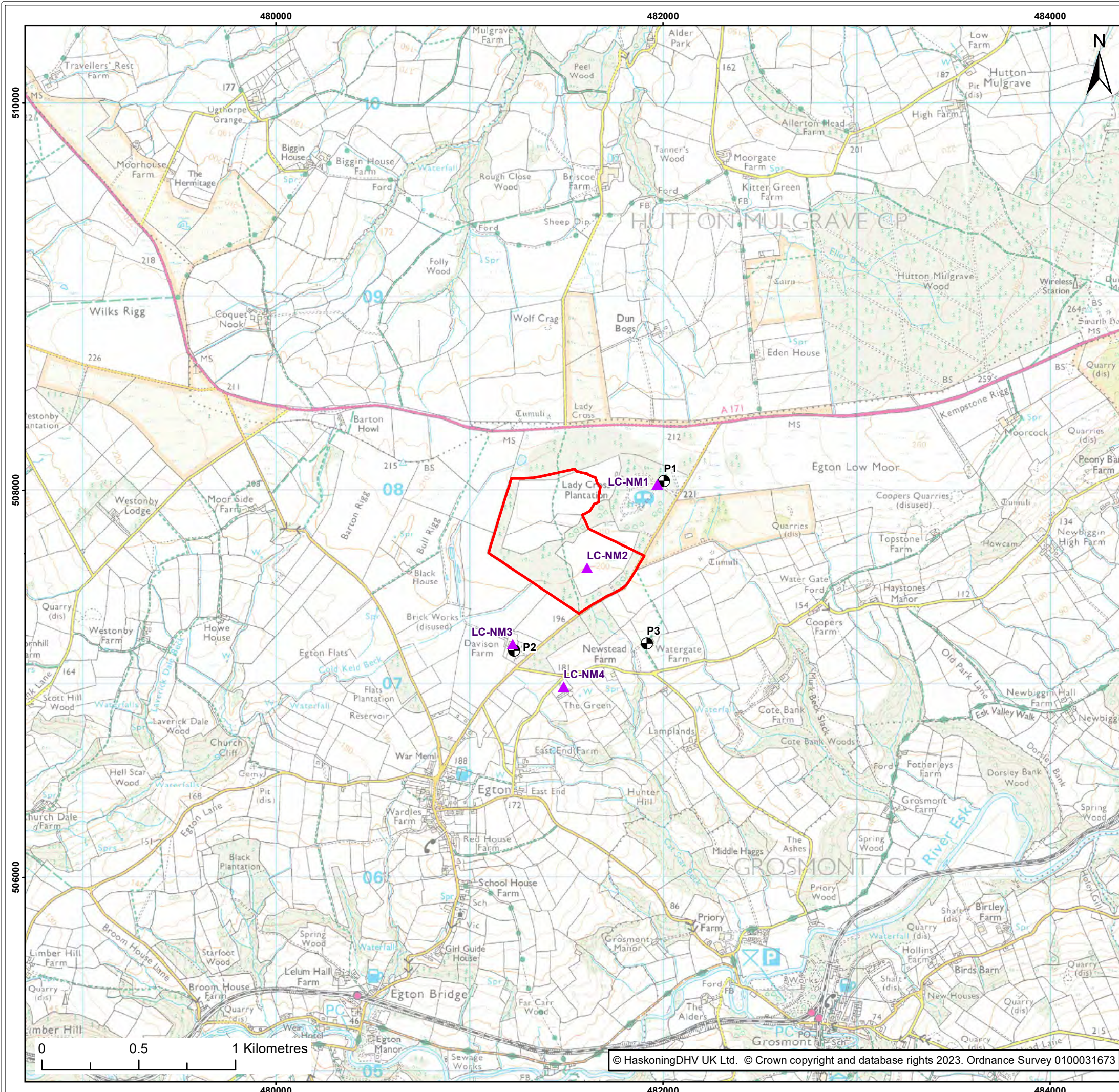
Noise propagation was calculated using the ISO 9613-2:1996 methodology.

Table A.4 Predicted Distances at which Specific Vibration Levels Occur

Activity	Set-back distance at which vibration level (PPV) occurs			
	0.3 mm/s	1.0 mm/s	10 mm/s	15 mm/s
Vibratory compaction (start-up)	116m*	65m	9m	6m
Vibratory compaction (steady state)	102m	44m	8m	6m
Vibratory piling (start-up)	154m*	56m	8m	6m
Vibratory piling (steady state)	75m	32m	6m	5m
Tunnelling	137*	54m	9m*	7m*
HGV movements on uneven haul route (assuming Alluvium surface)	277m	60m	3m	2m

Note These predicted distances are outside the limitations of the calculations and are therefore provided for information only.*

Appendix B Figures



- Legend:
- Ladycross Freehold Boundary
 - ▲ Monitoring locations
 - Receptor Location

Client: Anglo American	Project: The Woodsmith Project
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Title:
Residential Receptor Locations and Monitoring Locations for Ladycross Plantation Site

Figure: B1	Drawing No: PB1110-RHD-00-XX-DR-Z-0001				
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Appendix C Acoustic Terminology

Term	Definition
Noise sensitive receptors	People, property or designated sites for nature conservation that may be at risk from exposure to noise and vibration that could potentially arise as a result of the proposed development/project
Noise and Vibration study area	The area assessed for noise and vibration impacts during this assessment
Baseline scenario	Scenarios with the proposed development/project not in operation
Decibel (dB)	A unit of noise level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μ Pa, the threshold of normal hearing is 0dB, and 140dB is the threshold of pain. A change of 1dB is only perceptible under controlled conditions. Under normal conditions a change in noise level of 3dB(A) is the smallest perceptible change.
dB(A)	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
$L_{Aeq,T}$	The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.
$L_{A10,T}$	The A weighted noise level exceeded for 10% of the specified measurement period (T). L_{A10} is the index generally adopted to assess traffic noise
$L_{A90,T}$	The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142:2014 it is used to define the 'background' noise level.
L_{Amax}	The maximum A-weighted sound pressure level recorded during a measurement.
PPV	Instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
'A' weighting	A frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Fast time constant	Sound level meters have two conventional time weightings, F = Fast and S = Slow with time constants of 125ms and 1000ms respectively. Fast time constant relates to the response time of the meter which allows rapid variations in noise level to be registered.



NYMNPA

31/07/2023

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Woodsmith Project

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EMISSIONS TO ATMOSPHERE - PHASE 7 - NYMNPA CONDITION 91 (ROYAL HASKONINGDHV) - LADYCROSS

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**WOODSMITH PROJECT
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**EMISSIONS TO ATMOSPHERE
- PHASE 7 - NYMNPA
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REPORT

NYMNPA-91 Emissions to Atmosphere

Ladycross Plantation Phase 7

Client: STRABAG AG

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1 Introduction

1.1.1 In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to North York Moors National Park Authority (NYMNPA) for permission to develop a polyhalite mine and underground Mineral Transport System (MTS). Planning consent was subsequently granted in 2015, subject to conditions, as varied in February 2018 by NYM/2017/0505/MEIA.

1.1.2 This document has been prepared on behalf of STRABAG AG, the contractor delivering the Phase 7 Works on behalf of Anglo American, and details the requirements with respect to emissions to atmosphere for the Phase 7 Works of the development at Ladycross Plantation (see paragraph 1.1.6 below). This document is required to partially discharge Condition 91 of the NYMNPA planning permission NYM/2017/0505/MEIA and has been prepared in accordance with current good practice. The planning condition states that:

“The final specification and configuration of generators to be employed at Doves Nest Farm and Ladycross Plantation, such to be fitted with Selective Catalytic Reduction (SCR), or other such emissions control measures as are necessary, will be submitted to the MPA for approval prior to commencement of their use. Results of air dispersion modelling will be submitted at the same time to verify that the identified configuration will lead to nutrient nitrogen and acid deposition at levels no greater than those that were demonstrated in the York Potash Environmental Statement (September 2014 as updated by the Supplementary Environmental Statement dated February 2015) as not leading to a significant effect on the integrity of the North York Moors SAC, SPA and SSSI.”

1.1.3 The specific requirements of Condition NYMNPA-91 are detailed in Table 1-1.

Table 1.1 Condition NYMNPA-91 Emissions to Atmosphere

Condition NYMNPA-91	Compliance with Condition NYMNPA-91
The specification and configuration of generators and Selective Catalytic Reduction (SCR) / emission control measures.	Section 2
Confirmation that Phase 7 nutrient nitrogen and acid deposition rates are below those presented in the York Potash Environmental Statement (ES) and Supplementary Environmental Information Report (SEI).	Section 3

1.1.4 This assessment considers only the Phase 7 Works at Ladycross Plantation. Updates to this assessment will be prepared for subsequent construction phases and following any design review or method change. The approach adopted in this document was agreed with Natural England and NYMNPA for previous Phases at Woodsmith Mine.

1.1.5 The scope of Phase 7 described by this document is as follows:

- Soft landscaping of lagoon and other areas;
- Installation of double-stacked containers for acoustic and visual screening;
- Creation of temporary top spoil and sub soil screening stockpiles;
- Replacement welfare facilities and associated parking;
- Installation of hardstanding areas; and
- Erection of a lattice communication mast.

2 Assessment

- 2.1.1 This assessment considers the impact of nutrient nitrogen and acid deposition from emissions arising from the Phase 7 Works. During Phase 7, an electrical grid supply will be in use on the site, which will be supplemented with additional diesel generation to ensure there is sufficient power for the proposed activities. As a proportion of the power requirement will be provided by electrical means, it was not considered that detailed dispersion modelling was necessary to undertake the assessment for this Phase of works. This document therefore presents a comparison of the power demand required during Phase 7, hours of working and duration, with the power demand and working hours presented within the York Potash Environmental Statement (ES) and Supplementary Environmental Information report (SEI) (Royal HaskoningDHV, 2014 and 2015), upon which the consented nutrient nitrogen and acid deposition values were based. The expected impact upon designated ecological sites was then evaluated.
- 2.1.2 A comparison of the atmospheric emission sources operating during Phase 7 with those considered in the York Potash ES and SEI (Royal HaskoningDHV, 2014 and 2015) is shown in **Table 2.1**.

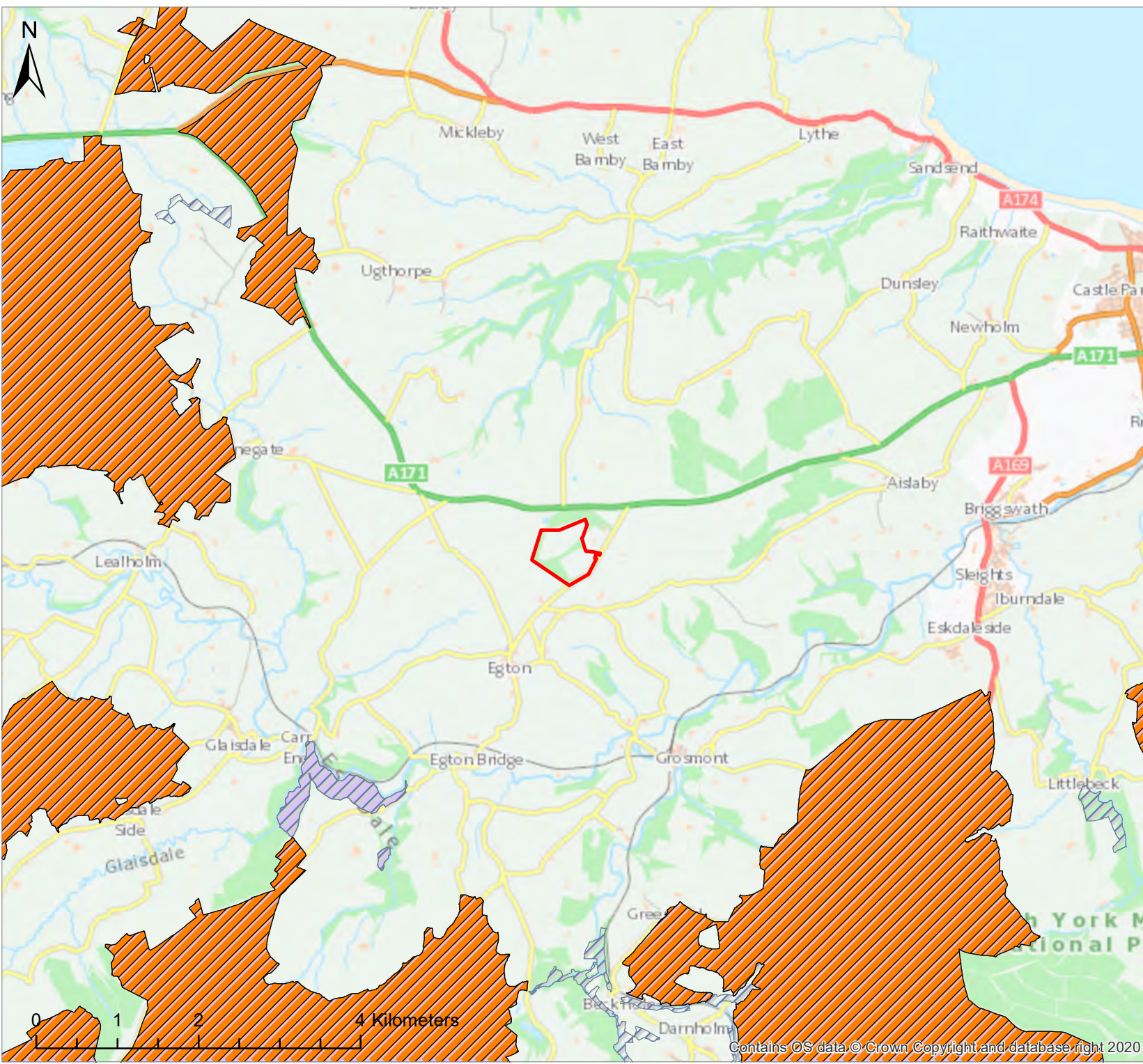
Table 2.1 Comparison of Emission Sources between Phase 7 and the York Potash ES and SEI

Parameter	Phase 7	ES and SEI
Number of generators and capacity	1 x 250 kVA generator 3 x 60 kVA generators 430 kVA total	7 x 1,290 kVA generators with SCR at 88% efficiency 9,030 kVA total
Stack height	Approx. 2.5 m	30 m
Other emission sources	Road traffic Plant emissions	Road traffic Plant emissions Blasting emissions
Working hours	Some activities 7am to 7pm Other activities 24 hours a day	24 hours a day
Duration	15 weeks	26 weeks

- 2.1.3 As shown in **Table 2.1**, there is significantly less power generation capacity required during the Phase 7 Works in comparison to the level of generation assessed in the York Potash ES and SEI (5%). In the ES and SEI, the generator emissions were assumed to be abated using Selective Catalytic Reduction (SCR) technology; given the lower power demand during Phase 7 in comparison to the ES and SEI assessment scenario, SCR or other emissions abatement technology is not considered to be required to mitigate impacts at designated ecological sites. In addition, the assessment presented in the ES and SEI included emissions from blasting which would not occur during Phase 7. The 250 kVA generator would be used for the welfare (main) works and would be operated at 10% load for up to 24 hours per day as a worst-case scenario. The 60 kVA generator will also be operated at 10% load for up to 24 hours per day as a worst-case scenario to power the workshop. In addition, the remaining 60 kVA generators will be used to power the siltbuster and wheelwash and will therefore be used only intermittently when these items of plant are in use, at a low load (10%). As such, emissions from the onsite generators will be relatively low.
- 2.1.4 Whilst higher stack heights typically reduce off site effects by allowing greater dilution and dispersion of emissions before reaching receptors at ground level, they also carry pollutants across greater distances from the source. The lower stack heights utilised during Phase 7 will prevent emissions from dispersing further from the site towards designated habitats. As shown in **Figure 1**, the Ladycross Plantation site is situated at a distance from the North York Moors SAC and SSSI boundaries (3.5 km at its closest point). Whilst the total duration of diesel power usage at Ladycross Plantation has exceeded the six-month duration assessed in the ES and SEI, it is considered highly unlikely that emissions from the relatively small onsite generators would give rise to effects on designated sites given that emissions would be well dispersed and diluted across a 3.5 km distance. As such, emissions from plant and generators operating as part of the Phase 7 works would not lead to nutrient nitrogen and acid deposition of a greater magnitude than that presented in the ES and SEI at designated ecological sites.
- 2.1.5 If required, additional assessments will be carried out for future Phases of construction as the power demand at Ladycross Plantation increases.

3 Conclusions/Condition Discharge

- 3.1.1 This emissions to atmosphere assessment shows that emissions from the Phase 7 Works will result in no greater nutrient nitrogen and acid deposition at ecological receptors than those values presented in the ES and SEI. Additional mitigation controls are therefore not required for Phase 7.
- 3.1.2 The assessment thereby demonstrates that the requirements of Condition NYMNPA-91 are met.



Key:

- Lady Cross Plantation
- Special Protection Area
- Site of Special Scientific Interest
- Special Area of Conservation

Title
Location of Lady Cross Plantation in Relation to Designated Ecological Sites

Project
PB1110 Woodsmith Project

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Scale
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Figure
Figure 1

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**CONSTRUCTION VEHICLE &
PLANT MANAGEMENT PLAN -
PHASE 7 - NYMNPA
CONDITION 92 - LADYCROSS
PLANTATION**

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NYMNPA-92 Construction Vehicle and Plant Management Plan

Ladycross Plantation Phase 7

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Classification

Project related

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- A3 Inputs and Outputs of the Emission Factor Toolkit**
- A4 Calculation of Emissions from NRMM**
- A5 Calculation of Emissions from Generators**

1 Introduction

1.1.1 In 2014 a planning application (reference NYM/2014/0676/MEIA) was submitted to North York Moors National Park Authority (NYMNP) for permission to develop a polyhalite mine and underground Mineral Transport System (MTS). Planning permission was subsequently granted in 2015, subject to conditions, as varied in February 2018 by NYM/2017/0505/MEIA.

1.1.2 This document has been prepared on behalf of STRABAG AG, the contractor delivering the Phase 7 Works on behalf of Anglo American, and details the requirements with respect to construction vehicles and plant for Phase 7 of the development at Ladycross Plantation (see paragraph 1.1.5 below). This document is required to partially discharge Condition 92 of the NYMNP planning permission NYM/2017/0505/MEIA and has been prepared in accordance with current good practice. The planning condition states that:

“Prior to the commencement of each Phase of Construction at either Dove’s Nest Farm or Ladycross Plantation, a Construction Vehicle and Plant Management Plan (CVPM) shall be submitted to and approved in writing by the MPA. The CVPM shall include details of monitoring locations and baseline particulate emissions; predicted traffic movements into/out of the sites including levels at the A171/Mayfield junction; predicted particulate emissions from plant and HGVs during the construction period; proposed particulate control levels; proposed avoidance or mitigation measures to comply with control levels, and arrangements for monitoring over the construction period. Development shall only occur in strict accordance with the measures set out in the CVMP [sic], unless otherwise agreed in writing with the MPA.”

1.1.3 The specific requirements of the planning condition are detailed in **Table 1-1**.

Table 1-1 Condition NYMNP-92 Construction Vehicle and Plant Management Plan

Condition NYMNP-92	Compliance with Condition NYMNP-92
Details of monitoring locations and baseline particulate emissions	Section 2
Predicted traffic movements into/out of the sites including levels at the A171/Mayfield junction	Section 3
Predicted particulate emissions from plant and Heavy Goods Vehicles (HGVs) during the construction period	Section 4
Proposed avoidance or mitigation measures to comply with control levels	Section 5
Proposed particulate control levels	Section 5
Arrangements for monitoring over the construction period	Section 2

1.1.4 This management plan details only the Phase 7 Works at Ladycross Plantation. Updates to this plan will be prepared for subsequent construction phases (as required) and following any design review or method change. The NYMNP has confirmed that it supports this approach.

1.1.5 The activities required for the Phase 7 Works comprise the following:

- Soft landscaping of lagoon and other areas;
- Installation of double-stacked containers for acoustic and visual screening;

- Creation of temporary top spoil and sub soil screening stockpiles;
- Replacement welfare facilities and associated parking;
- Installation of hardstanding areas; and
- Erection of a lattice communication mast.

1.1.6 Meetings to discuss the scope and content of this document were held with the Environmental Health Officer (EHO) of Scarborough Borough Council (SBC) and NYMNPA on 17 March 2016 and 27 April 2016 respectively for earlier Phases of Works at Woodsmith Mine. The scope was re-confirmed with the EHO in a meeting on 1 December 2016. This document follows the agreed approach, and is in line with the CVPMPs previously submitted for Woodsmith Mine.

2 Baseline Conditions

2.1 Definitions of Dust and Fine Particulate Matter

2.1.1 Definitions of dust and fine particulate matter are provided in **Appendix A1**.

2.2 Site-Specific Dust Deposition Survey

2.2.1 Baseline dust deposition monitoring was not undertaken at Ladycross Plantation as part of the Environmental Statement (ES) which supported the planning application. As such, there are no historical baseline datasets at the site.

2.2.2 Dust deposition monitoring is now undertaken at four locations around the site, as shown in **Figure 1**, which will continue throughout the construction works.

2.2.3 Wind roses of hourly sequential meteorological data from the Fylingdales recording station were provided in the ES¹. The predominant wind direction is from the south-west, and locations downwind of particulate sources are likely to experience the greatest deposition.

2.2.4 Regulatory authorities conventionally consider a threshold of 200 mg/m²/day^{2,3} to be the dust deposition rate above which complaints are likely⁴. It is expected that, given the nature of the area and that the ground has a covering of vegetation, baseline dust deposition rates would be below 200 mg/m²/day. This would be expected in a rural and relatively undeveloped location.

2.3 Background Particulate Matter Concentrations

2.3.1 Background PM₁₀ and PM_{2.5} concentrations were sourced from pollutant maps provided by Defra⁵ for a 1 km x 1 km resolution of the UK. The relevant 2023 background pollutant concentrations at Ladycross Plantation were obtained for the grid squares covering the area, and are detailed in **Appendix A2**.

2.3.2 Background PM₁₀ and PM_{2.5} concentrations at Ladycross Plantation are well below the annual mean Air Quality Objectives (in England) of 40 µg.m⁻³ and 20 µg.m⁻³ respectively. The main contributor to PM₁₀ concentrations within the above grid squares is secondary PM₁₀ (aerosols formed in atmospheric condensation reactions), sea salt and calcium and iron rich dusts, reflecting the proximity of Ladycross Plantation to the coast.

¹ Royal HaskoningDHV (2014) York Potash Project Mine, MTS and MHF Environmental Statement: Part 2 Chapter 9 Air Quality

² Environment Agency (2013) Technical Guidance Note (Monitoring) M17 Monitoring Particulate Matter in Ambient Air around Waste Facilities

³ Institute of Air Quality Management (2016) Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites

⁴ Vallack & Shillito (1998) Suggested guidelines for deposited ambient dust, Atmospheric Environment **16** (32), 2737-2744

⁵ Defra (2020) 2018-based background maps <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

2.4 Additional Monitoring

- 2.4.1 Construction activities will be subject to a range of dust and vehicle management measures, as set out in the Construction Environmental Management Plan (CEMP), submitted to partially discharge planning condition NYMNPA-93. The measures detailed in the CEMP include regular visual site inspections to monitor compliance with dust control procedures set out within the document. The results of the inspections will be recorded within the site log book, and included in monthly reporting. Details around dust management are included within the Phase 5 CEMP, and within the Phase 3 Dust Management Plan which remains applicable for this Phase.
- 2.4.2 The programme of site inspections will assist with interpretation of the results of the ongoing dust deposition monitoring which will be undertaken throughout the construction works, and which will provide retrospective information about dust levels generated during construction to inform site management practices.

3 Predicted Traffic Movements Associated with Phase 7 Works

3.1 Construction Phase Road Traffic Movements

3.1.1 The anticipated traffic movements associated with Phase 7 align with the targets for vehicle movements presented in the Construction Traffic Management Plan (CTMP), submitted to partially discharge planning condition NYMNPA-34, and are based on the peak number of movements permitted at Ladycross Plantation. The Phase 7 Works will be undertaken over a 15 week period, totalling approximately 105 working days. It is expected that due to their scale, the Phase 7 Works would not generate the peak number of permitted vehicle movements; the assessment is therefore conservative.

3.1.2 The number of traffic movements generated during the Phase 7 Works is detailed in **Table 3-1**.

Table 3-1 Traffic Movements Generated During Phase 7 at Ladycross Plantation

Vehicle Type	Number of Vehicles During Phase 7 (Two-Way)*	Maximum Number of Vehicles per Day (Two-Way)
HGV	5,130	56
Light Goods Vehicles (LGVs)**	12,600	120
<p>*HGVs are restricted on Sundays and therefore the total number of HGVs during Phase 7 does not equate to the duration multiplied by the number of HGVs per day **Includes cars, minibuses and vans</p>		

3.1.3 As the primary source of construction materials within the area will be from Teesside, no HGVs would travel through the A171/Mayfield junction. It is expected that, based upon forecast employee distribution, there would be a negligible increase in traffic movements through the A171/Mayfield junction.

3.2 On-Site Plant

3.2.1 The number and types of plant that would be operating for the duration of Phase 7 at Ladycross Plantation are provided in **Table 3-2**. A number of generators will be on site in Phase 7 for emergency use. Whilst these generators will be routinely tested and maintained, as they will be used only in exceptional circumstances, emissions from emergency generators were not included in this assessment. In the table below, the generators for powering the siltbuster and wheelwash are noted as being in use for the full duration of Phase 7; however, these generators would be used periodically and only when required, and therefore the assessment is considered to be conservative.

Table 3-2 Plant Required During Phase 7

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Task*	Plant Type	Duration of Phase 7 That Plant Will Be Used**
General site use	12T Excavator	37.5%
	20T Dumper	37.5%
	Roller Vibrator	37.5%
	Telehandler	37.5%
	Road Sweeper	37.5%
	45ft Mobile Elevated Working Platform (MEWP)	12.5%
Soft landscaping of lagoon and other areas. Creation of temporary top spoil and sub soil screening stockpiles.	Tracked Excavator 30T	12.5%
	Tracked Excavator 30T	7.5%
	Tractor & Trailer (Seeding of topsoil)	12.5%
	Dumper Truck 20T	12.5%
	Dumper Truck 20T	7.5%
	Dozer	12.5%
Installation of double stacked containers for acoustic and visual screening	Tracked Excavator 20T	5%
	Roller Vibrator	5%
	Dumper Truck 20T	5%
	Telehandler 5T	5%
	100T mobile crane	5%
Replacement welfare facilities and associated parking	Tracked Excavator 30T	30%
	Roller Vibrator	30%
	Dumper Truck 20T	30%
	Telehandler 5T	25%
	100T mobile crane	25%
Installation of hardstanding areas	Dozer	20%
	Roller Vibrator	20%
	Asphalt Paver	20%
	Asphalt Roller	20%
	Skid Steer	20%
	Tracked Excavator 20T	20%
General equipment	4" Supersilent Pump x6	37.5%
	Towable Jet Wash	37.5%
	Towable Water Bowser 7000l	37.5%
	250kVA generator (Welfare) (Mains)	100%
	60kVA generator (Workshop)	100%

Task*	Plant Type	Duration of Phase 7 That Plant Will Be Used**
	60kVA generator (Back-up-Siltbuster) (Rain Dependant)	100%
	60kVA generator (Wheelwash)	100%
<p>*A lattice communication mast will also be constructed during Phase 7. The installation of the mast will require a 20T excavator (already included for other activities) to dig the foundations (up to 1 m) and a concrete wagon to build a 3 m x 3 m slab. Hand tools will be used to fix the unit to the slab and the mast will be wind-up (self-erecting). This activity will be completed over a very-short timescale; therefore it is considered that emissions from this activity would be negligible in comparison to other NRMM sources.</p> <p>**This takes into account the utilisation of the plant throughout the 15 week construction period and the expected on-time of the plant.</p>		

4 Predicted Particulate Emissions from Plant and HGVs during Phase 7

4.1 Methodology

4.1.1 Particulate matter will be generated by the combustion of fuel and brake and tyre wear associated with the following activities during Phase 7:

- Transportation of workforce to site;
- HGV deliveries and movements; and
- The operation of on-site plant (referred to as Non-Road Mobile Machinery (NRMM)) and generators.

4.1.2 Data on the above activities are provided where the required information is known. Where data were not available, information used in the assessments undertaken for the Environmental Statement are used, which included the average trip length and speeds. This is considered to be a reasonable worst-case scenario.

4.1.3 The quantification of emissions from road traffic was undertaken using the Defra Emission Factor Toolkit (version 11.0). The Emission Factor Toolkit is regularly updated to reflect the latest vehicle technologies and fleet compositions, and is the primary method of deriving emissions from road transport in the UK. The standard UK fleet composition for 2023, built into the Emission Factor Toolkit, was utilised.

4.1.4 The Emission Factor Toolkit does not provide specific emission factors for NRMM. As such, emissions of NRMM were calculated using the methodology detailed in European Environment Agency (EEA) Guidance⁶. This document details specific emission factors for NRMM, based on the power rating of the plant and the various emission stages, which correspond to the emission standards set out in relevant EU Directives.

⁶ EMEP/EEA (2019) *Emission Inventory Guidebook – Non-Road Mobile Sources and Machinery*

- 4.1.5 The guidance provides three tiers of emission factors; the appropriate tier for use is dependent on the level of information available on the types of plant. As specific information on the make and model of plant used at Ladycross Plantation were provided by STRABAG, Tier 3 emission factors were used.
- 4.1.6 Emissions associated with generators were derived using the Tier 1 approach in EEA Guidance⁷. Fuel consumption was derived using the electrical power of the plant, the electrical efficiency, the anticipated load and hours of use per day as provided by STRABAG. Emission factors were obtained from the EEA Guidance.

4.2 Assumptions

- 4.2.1 The following assumptions were made in the assessment of particulate emissions from NRMM and vehicle movements:
- NRMM was assumed to be in operation for 75% of the working day, with more specialist items of plant (the MEWP) assumed to be in operation for 25% of the working day;
 - Phase 7 will commence in 2023 – emission factors for 2023 were therefore used;
 - Some activities will be undertaken during a 12-hour working day, with others undertaken 24/7. This has been reflected within the calculations;
 - All generators were assumed to operate at 40% efficiency;
 - The duration of Phase 7 will be 15 weeks, with all Sundays worked; and
 - HGV deliveries are restricted to 10% of weekday volumes on Sundays (as per the CTMP). It was therefore assumed that, on Sundays, HGV deliveries would be 10% of weekday trips.
- 4.2.2 Data were provided by STRABAG on the expected loading for all items of plant during their use, and this information was applied in the assessment.
- 4.2.3 Average HGV speeds were obtained from GIS smartphone data on the road links that comprise the haul route, and average speeds of cars were obtained from route mapping and estimated distance over time.

4.3 Emissions from Construction Phase Road Traffic Movements

- 4.3.1 The quantification of particulate emissions generated by construction-phase traffic movements was undertaken using the following input data:
- Number of daily HGV and car movements;
 - Average trip lengths (km);
 - Average speed vehicles will be travelling; and
 - Emission factors for each vehicle type.
- 4.3.2 Input and output data from the Emission Factor Toolkit are detailed in **Appendix A3**.

⁷ EMEP/EEA (2019) *Emission Inventory Guidebook – Small Combustion*

4.4 Emissions from the Operation of On-Site NRMM and Generators

4.4.1 The input data used to calculate particulate (PM₁₀) emissions from NRMM and generators are detailed in **Appendix A4** and **Appendix A5**. The calculated particulate emissions from NRMM and generators are detailed in **Table 4-1**.

Table 4-1 Total PM₁₀ Emissions from NRMM during Phase 7

Task	Plant Type	Total PM ₁₀ Emission (tonnes)
General site use	12T Excavator	0.0004
	20T Dumper	0.0056
	Roller Vibrator	0.0013
	Telehandler	0.0104
	Road Sweeper	0.0030
	45ft MEWP	0.0007
Soft landscaping of lagoon and other areas. Creation of temporary top spoil and sub soil screening stockpiles	Tracked Excavator 30T	0.0049
	Tracked Excavator 30T	0.0029
	Tractor & Trailer (Seeding of topsoil)	0.0007
	Dumper Truck 20T	0.0037
	Dumper Truck 20T	0.0022
	Dozer	0.0007
Installation of double stacked containers for acoustic and visual screening	Tracked Excavator 20T	0.0033
	Roller Vibrator	0.0004
	Dumper Truck 20T	0.0018
	Telehandler 5T	0.0014
	100T mobile crane	0.0001
Replacement welfare facilities and associated parking	Tracked Excavator 30T	0.0140
	Roller Vibrator	0.0043
	Dumper Truck 20T	0.0045
	Telehandler 5T	0.0069
	100T mobile crane	0.0017
Installation of hardstanding areas	Dozer	0.0004
	Roller Vibrator	0.0014
	Asphalt Paver	0.0041
	Asphalt Roller	0.0036
	Skid Steer	0.0006
	Tracked Excavator 20T	0.0095
General equipment	4" Supersilent Pump x6	0.0134
	Towable Jet Wash	0.0003

Task	Plant Type	Total PM ₁₀ Emission (tonnes)
	Towable Water Bowser 7000l	0.0100
	250kVA generator (Welfare) (Mains)	0.0095
	60kVA generator (Workshop)	0.0023
	60kVA generator (Back-up-Siltbuster) (Rain Dependant)	0.0023
	60kVA generator (Wheelwash)	0.0023

4.5 Total Particulate Emissions Generated During Phase 7

4.5.1 The total particulate predicted to be generated during Phase 7 as a result of emissions from construction-phase traffic, NRMM and generators is detailed in **Table 4-2**.

Table 4-2 Total PM Emissions from Construction Traffic, NRMM and Generators

Source	Total PM Emission (tonnes)
Construction Traffic	0.047
NRMM and Generators	0.182
TOTAL	0.230

4.5.2 The total PM₁₀ emission within the SBC area was derived from National Atmospheric Emission Inventory (NAEI) mapping⁸, as detailed in **Figure 2**.

4.5.3 The total PM₁₀ emission within the whole SBC area of jurisdiction was 245.34 tonnes in 2021. Particulate emissions generated during Phase 7 will therefore contribute 0.09% of the total emissions within this local authority area.

⁸ National Atmospheric Emission Inventory (2021) Emission Maps for the UK http://naei.defra.gov.uk/data/map-uk-das?pollutant_id=24&emiss_maps_submit=naei-20160526090831

5 Mitigation Measures

5.1 Construction Dust and NRMM Mitigation Measures

5.1.1 Details of mitigation measures to minimise construction phase dust emissions are included in the CEMP.

5.1.2 All NRMM and plant will be well maintained. If any emissions of dark smoke occur then the relevant machinery will stop immediately and any problem rectified. In addition, the following controls will apply to NRMM:

- All NRMM should use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004);
- All NRMM will comply with the appropriate NRMM emission standards;
- All NRMM will be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting);
- The ongoing conformity of plant retrofitted with DPF, to a defined performance standard, will be ensured through a programme of onsite checks; and,
- Fuel conservation measures will be implemented, including instructions to:
 - throttle down or switch off idle construction equipment;
 - switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded; and,
 - ensure equipment is properly maintained to ensure efficient fuel consumption.

5.1.3 The vehicle fleet accessing Ladycross Plantation will be fitted with DPFs, which will control particle emissions⁹.


⁹ DPFs are commonly fitted to cars and commercial vehicles to reduce particulate emissions and ensure compliance with the latest Euro standards. It is an offence under the Road Vehicles (Construction and Use) Regulations (1986) to use a vehicle that has had the DPF removed.



Figures



Key:

 Location of Dust Monitor

Title
Ladycross Plantation Dust Monitoring Locations

Project
PB1110 Woodsmith Project

Client
STRABAG AG

Date
12/07/2022

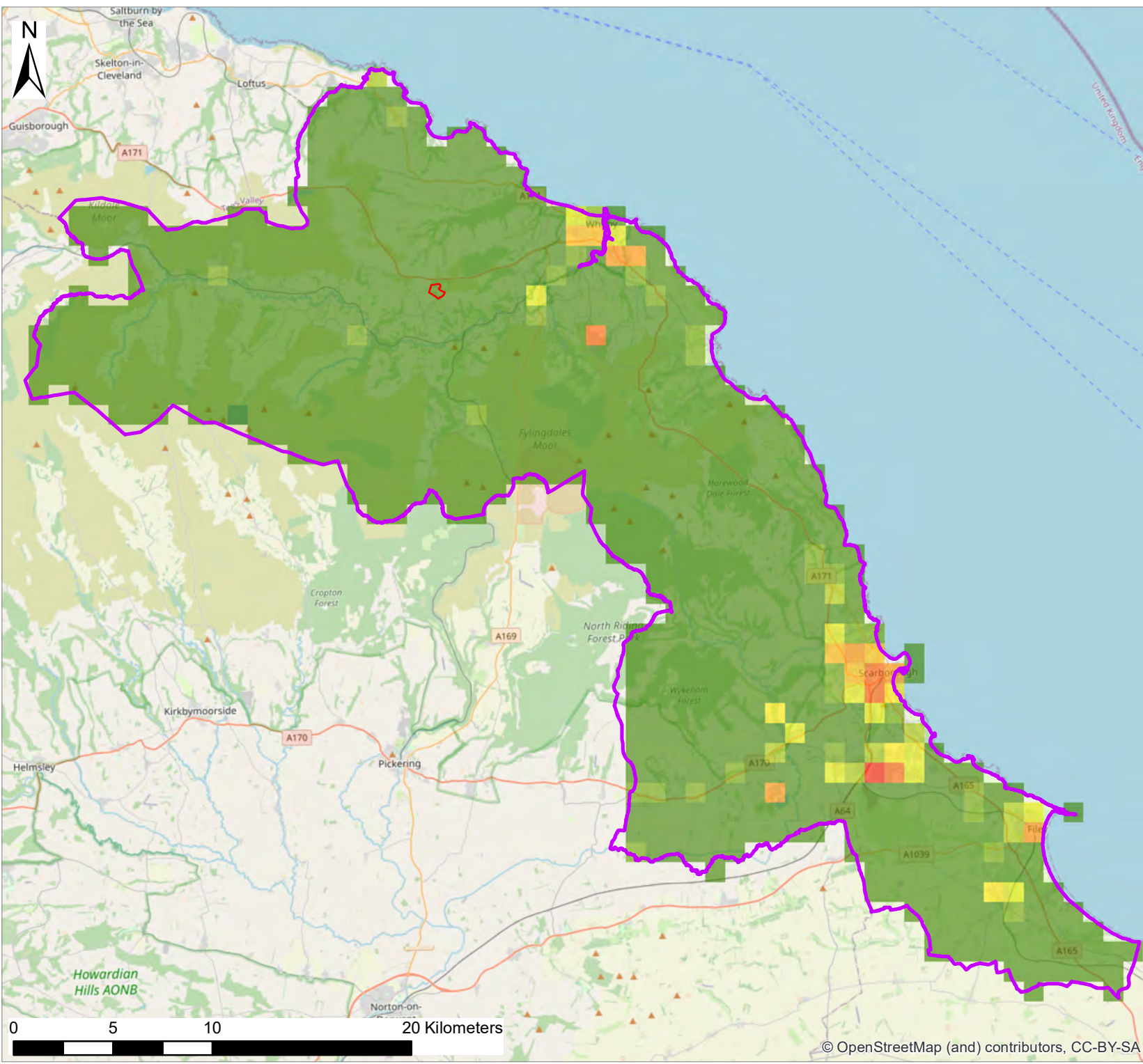
Scale
1:3300

Figure
Figure 1

Checked by
JD

Number
1





Key:

- Ladycross Plantation
- Scarborough Borough Council Area

Tonnes PM₁₀/km² (2021)

- <math><0.01</math>
- 0.01 - 0.58
- 0.59 - 1.35
- 1.36 - 1.93
- 1.94 - 2.9
- 2.91 - 3.67
- 3.68 - 4.25
- 4.26 - 6.19
- 6.2 - 18.56
- 18.57 - 49.31

Title
2021 NAEI PM₁₀ Emissions Mapping

Project
PB1110 Woodsmith Project

Client
STRABAG AG

Date
12/07/2023

Scale
1:265000

Figure
Figure 2

Checked by
JD

Number
1



Appendix A

A1 Definitions of Dust and Fine Particulate Matter

Atmospheric particles are generally categorised by size fraction and by their source, and are usually measured by mass concentration (although particle number and 'black carbon' techniques are available). The generic term of 'dust' and the two size fractions most commonly used to consider human health environmental effects are defined below.

'Dust' is considered to be the mass of solid particles that are suspended in air or have settled out onto a surface after having been suspended in air. In IAQM Guidance¹⁰ and within this document, the term 'dust' has been used to include the particles that give rise to soiling, and to potential human health and ecological effects. BS 6069:1993 provides a definition of dust as particles up to 75 µm in diameter.

The smaller size fractions considered in the UK Local Air Quality Management regime are defined in Regulations¹¹ as follows:

- "PM₁₀" means particulate matter which passes through a size-selective inlet as defined in the reference method for the sampling and measurement of PM₁₀, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter; and,
- "PM_{2.5}" means particulate matter which passes through a size-selective inlet as defined in the reference method for the sampling and measurement of PM_{2.5}, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter.

The term 'aerodynamic diameter' is a reference to the terminal velocity in air of a spherical particle of unit density, therefore this is a way of standardising the range of irregular airborne particle loading for measurement and standard-setting.

Particulate matter is generally described by source as being either 'primary' or 'secondary'. Primary particles such as carbon particles from fuel combustion, sea salt and mineral particles derived from construction activities are released directly into the air, whereas secondary particles are formed in the atmosphere by chemical reactions that lead to the formation of low volatility compounds that condense into particles.

The main sources of primary particulate are road transport (combustion emissions, brake and tyre wear and re-entrainment of dust from road surfaces); stationary combustion (such as domestic coal burning); and industrial processes (production of metals, cement, lime, coke and chemicals, bulk handling of dusty materials, construction, mining and quarrying).

Secondary particles are less easy to ascribe to their original sources. They are comprised mainly of ammonium sulphate and nitrate, originating from the oxidation of sulphur and nitrogen oxides in the atmosphere to acids, which are then neutralised by atmospheric ammonia derived mainly from agricultural sources. The chemical processes involved in their formation are relatively slow and their persistence in the atmosphere is prolonged. Thus, secondary particles are distributed more evenly

¹⁰ Institute of Air Quality Management (2016). Guidance on the assessment of dust from demolition and construction.

¹¹ The Air Quality Standards Regulations 2010 (SI 2010 No.1001)



throughout the air with fewer differences between urban and rural areas. They can also travel large distances, resulting in the transport of particles across national boundaries (AQEG, 2005)¹².

¹² Air Quality Expert Group (AQEG), (2005). Particulate Matter in the United Kingdom. Defra, London

A2 Background Particulate Matter Concentrations

Table A2 2023 Background Particulate Matter Concentrations

Grid Square	PM ₁₀ Background Concentration (µg.m ⁻³)	PM _{2.5} Background Concentration (µg.m ⁻³)
481500,507500	9.56	5.87
481500,508500	9.31	5.84

A3 Inputs and Outputs of the Emission Factor Toolkit

Table A3 Input Data into the Emission Factor Toolkit

Vehicle Type	Number of Vehicles During Phase 7	Number of Vehicles per Day (Averaged over Phase 7)	Speed (kph)	Trip Length (km)
HGV	5,130	49	69	46
Cars	12,600	120	62	45.5

Table A4 Output from the Emission Factor Toolkit

Vehicle Type	Emissions of PM ₁₀ over Phase 7 (kg)
HGV	29.3
Cars	18.0
Total	47.3

A4 Calculation of Emissions from NRMM

The European Monitoring and Evaluation Programme (EMEP)/European Environment Agency (EEA) Emission Inventory Guidebook 2019¹³ provides the following equation to calculate emissions from NRMM:

$$E = N \times \text{HRS} \times P \times (1 + \text{DFA}) \times \text{LFA} \times \text{EF}_{(\text{base})}$$

Where:

- E = mass of emissions generated
- N = source population
- HRS = hours of use over the period
- P = engine size (kW)
- DFA = deterioration factor adjustment
- LFA = load factor adjustment
- EF_(base) = base emission factor (g/kWh).

The average kilowatt (kW) power ratings for the proposed NRMM are provided in **Table A5**.

Table A5 Power Ratings of Required Plant During Phase 7 at Ladycross Plantation

Task	Plant Type	Power in kW
General site use	12T Excavator	74
	20T Dumper	160
	Roller Vibrator	24
	Telehandler	74.5
	Road Sweeper	172
	45ft Mobile Elevated Working Platform (MEWP)	36
	250T mobile crane	230
Restoration of large areas of site	Tracked Excavator 30T	210
	Tracked Excavator 30T	210
	Tractor & Trailer (Seeding of topsoil)	283
	Dumper Truck 20T	160
	Dumper Truck 20T	160
	Dozer	161
Installation of shipping containers to supply site screening	Tracked Excavator 20T	128.4
	Roller Vibrator	24
	Dumper Truck 20T	160
	Telehandler 5T	74.5
	100T mobile crane	149
Decommissioning of old welfare and installation of new welfare	Tracked Excavator 30T	210
	Roller Vibrator	24
	Dumper Truck 20T	160

¹³ EMEP/EEA (2019) *Emission Inventory Guidebook – Non-Road Mobile Sources and Machinery*

Task	Plant Type	Power in kW
	Telehandler 5T	74.5
	100T mobile crane	149
Hardstanding areas	Dozer	161
	Roller Vibrator	24
	Asphalt Paver	55
	Asphalt Roller	24.3
	Skid Steer	52.2
	Tracked Excavator 20T	128.4
General equipment	4" Supersilent Pump x6	16
	Towable Jet Wash	0.59
	Towable Water Bowser 7000l	18
	250kVA generator (Welfare) (Mains)	200
	60kVA generator (Workshop)	48
	60kVA generator (Siltbuster) (Rain Dependant)	48
	60kVA generator (Wheelwash)	48

The input data used to calculate emissions from NRMM are detailed in **Table A6**.

Table A6 Input Data Used to Calculate Particulate Emissions from NRMM

Plant	kW	Hours of Use During Phase 7	Deterioration Factor	Load Factor	Emission Factor Stage	Emission Factor (g/kWh)
12T Excavator	74	945	0.473	25%	Stage 5	0.015
20T Dumper	160	945	0.473	25%	Stage 3A	0.1
Roller Vibrator	24	945	0.473	10%	Stage 3A	0.4
Telehandler	74.5	945	0.473	50%	Stage 3A	0.2
Road Sweeper	172	315	0.473	10%	Stage 4	0.025
45ft MEWP	36	189	0.473	50%	Stage 3A	0.4
Tracked Excavator 30T	210	126	0.473	20%	Stage 3A	0.1
Tracked Excavator 30T	210	945	0.473	25%	Stage 3A	0.1
Tractor & Trailer	283	945	0.473	25%	Stage 3B/4	0.025
Dumper Truck 20T	160	945	0.473	10%	Stage 3A	0.1
Dumper Truck 20T	160	945	0.473	50%	Stage 3A	0.1
Dozer	161	945	0.473	50%	Stage 5	0.015
Tracked Excavator 20T	128.4	189	0.473	50%	Stage 3A	0.2
Roller Vibrator	24	315	0.473	20%	Stage 3A	0.4
Dumper Truck 20T	160	315	0.473	50%	Stage 3A	0.1
Telehandler 5T	74.5	189	0.473	50%	Stage 3A	0.2

Plant	kW	Hours of Use During Phase 7	Deterioration Factor	Load Factor	Emission Factor Stage	Emission Factor (g/kWh)
100T mobile crane	149	315	0.473	60%	Stage 4	0.025
Tracked Excavator 30T	210	756	0.473	60%	Stage 3A	0.1
Roller Vibrator	24	756	0.473	40%	Stage 3A	0.4
Dumper Truck 20T	160	756	0.473	25%	Stage 3A	0.1
Telehandler 5T	74.5	630	0.473	50%	Stage 3A	0.2
100T mobile crane	149	630	0.473	50%	Stage 4	0.025
Dozer	161	504	0.473	20%	Stage 5	0.015
Roller Vibrator	24	504	0.473	20%	Stage 3A	0.4
Asphalt Paver	55	504	0.473	50%	Stage 3A	0.2
Asphalt Roller	24.3	504	0.473	50%	Stage 3A	0.4
Skid Steer	52.2	504	0.473	60%	Stage 4	0.024
Tracked Excavator 20T	128.4	504	0.473	50%	Stage 3A	0.2
4" Supersilent Pump x6	16	945	0.473	25%	Stage 3A	10.4
Towable Jet Wash	0.59	945	0.473	25%	Stage 3A	1.6
Towable Water Bowser 7000l	18	945	0.473	25%	Stage 3A	1.6

A5 Calculation of Emissions from Generators

The EMEP/EEA Emission Inventory Guidebook 2019¹⁴ provides the following equation to calculate emissions from small combustion sources such as generators:

$$E_{\text{pollutant}} = AR_{\text{fuelconsumption}} \times EF_{\text{pollutant}}$$

Where:

$E_{\text{pollutant}}$ = the emission of the specified pollutant ($\text{g}\cdot\text{h}^{-1}$)

$AR_{\text{fuelconsumption}}$ = the activity rate for fuel consumption ($\text{GJ}\cdot\text{h}^{-1}$)

$EF_{\text{pollutant}}$ = the emission factor for the pollutant (g/GJ)

The fuel consumption (AR) of each generator was derived using the power rating of the generators, the load, the electrical efficiency and the utilisation percentage. The EF was taken from EMEP/EEA Guidance. The inputs are detailed in **Table A7**.

Table A7 Input Data Used to Calculate Particulate Emissions from Generators

Generator	Power (kVA)	Power (kW*)	Power Load (%)	Percentage of Phase 7 Used (%)	Efficiency (%)	AR Fuel Consumption (GJ.h ⁻¹)	EF (Emission Factor) PM ₁₀ (g/GJ)**
250kVA generator (Welfare)	250	200	10	100	40%	0.18	21
60kVA generator (Workshop)	60	48	10	100	40%	0.04	21
60kVA generator (Siltbuster)	60	48	10	100	40%	0.04	21
60kVA generator (Wheelwash)	60	48	10	100	40%	0.04	21
*Based on kVA to kW conversion of 0.8							
**The Emission Factor for liquid fuel was used							