Sirius Minerals Plc

Woodsmith Mine - Phase 7 Works

NYMNPA 81 Non-Domestic Wastewater Management Scheme

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1 Introduction

1.1 Overview

This document has been prepared on behalf of Sirius Minerals PLC and details the Non-Domestic Wastewater Management scheme for the Phase 7 construction activity at Woodsmith Mine (Phase 7 Works). This is required to discharge condition 81 of the North York Moors National Park Authority (NYMNPA) planning permission NYM/2014/0676/MEIA, as subsequently varied by NYM/2017/0505/MEIA [1].

This report only details the works required at the Woodsmith Mine site.

The Phase 7 Works comprise:

- Completion of Service Shaft headgear chamber;
- Completion of Service Shaft to 83.17m AOD via Vertical Shaft-Sinking Machine (VSM) Method;
- Excavation of Production Shaft headgear chamber;
- Excavation from the base of the Production Shaft headgear chamber to 83.66m AoD;
- Surface Water Run-Off Silt Treatment Facility Building;
- Erection of temporary facilities to enable mobilisation of deep shaft sinking contractor;
- Earthworks and drainage;
- Contingency grouting of the MTS shaft.

2 Non-domestic Wastewater Treatment Strategy

The activities giving rise to the generation of Non-Domestic Wastewater during the Phase 7 works, and the management of the wastewater is described in the following sub-sections.

2.1 Completion of excavation of the Service Shaft headgear chamber

This element of works provides a continuation of the excavation of the chamber from a level of 168.7m AOD (as included within the Phase 5 submission) to the formation level of the floor slab at approximately 157mAOD (precise level is subject to detailed design of the slab). This forms a continuation of the scope

described and approved in Phase 5, therefore the same quantity and methodology for treating Non-Domestic Wastewater is proposed as previously approved

Any water entering the excavation will be pumped from a sump to a settlement facility. This will include the use of settlement tanks and/or portable 'Silt Buster' type equipment, similar to that already used on site for treatment of surface water, if necessary. In the unlikely event it is necessary, the discharge will be pH balanced, before being passed through an oil/water interceptor and discharged to the surface water drainage system. Water will be pumped from the excavation at a rate not exceeding 50m^3 per day, for a duration of less than six months in total. A water meter will be installed to monitor rate of pumping.

2.2 Completion of the Service Shaft to 83.17m AOD via VSM Method

This element of works will be undertaken using the same methodology for the construction of the MTS shaft to -120m as approved under the Phase 4a works.

Water pumped from the VSM excavation as outlined within the Construction Method Statement (CMS) (Document reference: 40-SMP-WS-7100-PA-MS-00003) will be discharged to the site wide surface water drainage system, following treatment. This water will be a mixture of potable water added to assist operation of the VSM and groundwater entering predominantly from the Saltwick Formation. The water within the lined shaft will be pumped from a sump to a settlement facility. Treatment will include the use of settlement tanks and/or portable 'Silt Buster' type equipment, similar to that already used on site for treatment of surface water, if necessary. In the unlikely event it is necessary, the discharge will be pH balanced, before being passed through an oil/water interceptor and discharged to the surface water drainage system, then attenuated within the drainage attenuation ponds to ensure that the overall discharge from site does not exceed the permissible discharge rate.

2.3 Excavation of Production Shaft headgear chamber to approximately 157mAOD

As with the Services Shaft headgear chamber, water pumped from the Production Shaft chamber excavations as outlined within the CMS (Document reference: 40-SMP-WS-7100-PA-MS-00003) will consist of groundwater from the Scarborough and Cloughton formations, isolated from the surrounding aquifer by the diaphragm walls.

Based on the current programme it is estimated that a maximum flow rate of 50m^3/day will be required for a maximum duration of six months. On this basis there is no requirement for an abstraction licence. Water will be pumped from the excavation at a rate not exceeding 50m^3 per day, for a duration of less than six months in total. A water meter will be installed to monitor rate of pumping.

The same Non-Domestic Waste Water treatment strategy and disposal route is proposed as for the excavation of the Service Shaft headgear chamber described in Section 2.1 above.

2.4 Excavation from the base of the Production Shaft headgear chamber to 83.66m AOD (the pre-sink)

Water pumped from the pre-sink as outlined within the CMS (document reference: 40-SMP-WS-7100-PA-MS-00003) will consist of groundwater from the Saltwick Formation, isolated from the surrounding aquifer by the diaphragm walls. This will be discharged to the site wide surface water drainage system, following treatment if required.

Hydrological modelling has been carried out to determine the flow rate required to dewater the shaft during excavation. Based on the current programme and an effective porosity of 8.5% (refer to FWS 'Hydrogeological Baseline Report for the Dove's Nest Minesite', document reference 19750R01Rev 1, dated May 2016), it is estimated that a maximum flow rate of $3m^3$/day will be required. On this basis there is no requirement for an abstraction licence.

Abstracted water will be treated prior to discharge to the sitewide surface water drainage system. Treatment will include the use of settlement tanks and/or portable 'Silt Buster' type equipment, similar to that already used on site for treatment of surface water, if necessary. In the unlikely event it is necessary, the discharge will be pH balanced, before being passed through an oil/water interceptor and discharged to the surface water drainage system, then attenuated within the drainage attenuation ponds to ensure that the overall discharge from site does not exceed the permissible discharge rate.

3 Monitoring

As noted in the sections above, pumping rates from the headgear chambers and pre-sink will be monitored using flowmeters.

All water discharged from the site will be monitored in accordance with the 'Surface and Ground Water Monitoring Scheme' submitted to discharge Condition 46 (Document reference: 40-FWS-WS-70-WM-PL-0008). Qualitative triggers for the discharge are included within this scheme.

References

[1] North York Moors National Park Authority planning permission NYM/2014/0676/MEIA and as subsequently varied by NYM/2017/0505/MEIA.