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Edwin Richards Quarry – Soil Treatment Centre

Odour Management Plan

Waste Recycling Group (Central) Limited

Report No. K0182-BLA-R-ENV-00006
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Contents

1 Introduction

1.1 Site Description

This Odour Management Plan (OMP) supports an application by Waste Recycling Group (Central) Limited (WRG) to vary the current permit referenced EPR/HP3632RP to:

- Allow additional 30,000 tonnes per annum to be accepted at the facility and increase overall throughput to 180,000 tonnes per annum inclusive of either hazardous and/or non-hazardous waste.
- Remove the split of hazardous / non-hazardous waste treated at the facility from 89,998 tpa for hazardous waste and 60,002 tpa for non-hazardous waste to 180,000 tonnes per annum inclusive of either hazardous and/or non- hazardous waste. The amended ratio relates to the list of wastes in Table S2.2 and S2.3 of the permit (physical treatment of wastes and wastes for treatment in the bioremediation process respectively). This will impact the following listed activities:
    - AR1 S5.3A(1)(a)(ii) Physical treatment of hazardous waste
    - AR2 S5.3A(1)(a)(ii) Asbestos removal from soils
    - AR3 S5.4A(1)(a)(ii) Physical treatment of non-hazardous waste
    - AR4 S5.3 A(1)(a)(i) Bioremediation of hazardous waste for disposal
    - AR5 S5.3 A(1)(a)(i) Bioremediation of hazardous waste for recovery
    - AR6 S5.4A(1)(a)(i) Bioremediation of non-hazardous waste for disposal
    - AR7 S5.4A(1)(b)(i) Bioremediation of non-hazardous waste for recovery
- Addition of new soil treatment pad for biological treatment and soil washing.
- Addition of a point source emission to air to Table S3.1 to account for the biofilter from the new soil treatment area.
- Addition of soil washing activity for the soil washing of soils contaminated with heavy metals comprising the following listed activities and waste operations to be subject to the 180,000 tonnes per annum inclusive of either hazardous and/or non-hazardous waste.
    - S5.3 A(1)(a)(ii) – recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment via soil washing
    - S5.3 A(1)(a)(ii) – disposal of hazardous waste with a capacity exceeding 10 tonnes per day involving physico-chemical treatment via soil washing

  Associated waste operations will be:
    - Treatment of non-hazardous waste soils by soil washing for recovery.
- Amendment to Table S1.1 Activity AR8 regarding the temporary external storage of hazardous soils to increase amount to 20,000 tonnes to include soils contaminated with heavy metals (10,000 tonnes) and activities associated soil washing activity references in the limits of specified activity and waste types.
- Allow the use of a mechanical screener for the pre-screening of soils containing asbestos.

- Remove pre-operational condition 1 as listed in Table S1.3 of the Permit.
- Undertake mechanical screening of non-hazardous soils in the area currently used for storage of non-hazardous soils. It is proposed to use this area for storage and screening of non-hazardous soils. Screening is already regulated under activity reference AR3 physical treatment of non-hazardous waste.
- Amend drawing reference in Table S3.3 of the Permit to remove reference to plan 100993 – Asbestos DWG1 dated January 2018 and replace with Monitoring Emissions Point Plan (MEPP).

The proposed changes to the Permit at the Soil Treatment Centre (STC) better reflect current market conditions and reflect the activities permitted by the extant planning permission.

This OMP will also discharge Condition 3.a) of Planning Permission DC/21/66058 which approves the new soil treatment area. Condition 3.a) is reproduced below for reference.

Soil treatment works should not begin on this part of the site until information is submitted to and approved in writing by the local planning authority confirming the mitigation measures that will be employed to contain fugitive emissions of dust and odour from this activity. This information could be either a specific dust management plan or details of the conditions in the Environmental Permit issued by the Environment Agency which adequately demonstrates the measures in place to ensure that there will be no adverse impact on local amenity from dust.

The new soil treatment area will be within the boundary of the existing waste management facility, to treat up to 30,000 tonnes at any one time of soil contaminated with hydrocarbons or heavy metals through the process of bioremediation or soil washing dependent on the contract. The bioremediation of soils has been undertaken at the Site since 2016.

The purpose of this OMP is to address the current and proposed activities at the waste management facility which have the potential to cause emissions of odour and how these emissions will be minimised and managed.

Separate management plans have been submitted for fugitive emissions of dust (Report Ref: K0182-BLA-R-ENV-00005) and noise (Report Ref: K0182-BLA-R-ENV-00007).

1.2 Maintenance and review of the OMP

The Site Manager is responsible for the OMP and ensuring staff are suitability trained in the content of the OMP. A copy of this OMP will be included in the Site Management System held at the Site Office and all members of staff will have access to this document.

1.3 Relevant sector guidance

Reference has been made to the following guidance documents:

- H4 Odour Management: How to comply with your environmental permit (Environment Agency, March 2011);

- Sector Guidance Note IPPC S5.06: Guidance for the Recovery and disposal of hazardous and non-hazardous waste. Issue 5. May 2013.
- Environment Agency: Chemical waste: appropriate measures for permitted facilities. 18 November 2020
- Best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council. 10 August 2018.

2 Receptors

2.1 Receptor List

When choosing the receptors, the closest or the most sensitive (if different from the closest) have been considered in each direction from the STC. The most sensitive receptors are within 500 m radius of the STC making the assessment conservative for other potential receptors located further away. Receptors are considered sensitive where people have the potential to be adversely affected by the odour emissions. The nearest sensitive receptors to the Site are identified in drawing referenced Sensitive Receptor Plan

The probability of exposure is determined by the distance of the receptor to the Site and the likelihood of the hazard reaching the receptor (e.g. frequency of prevailing wind in that direction). This stage of the assessment assumes that exposure has resulted from an uncontrolled emission i.e. without mitigation.

The distance of these receptors to the Site boundary, their direction relative to the Site and the frequency the wind blows in the direction of the receptor is detailed in Table 1 below. The sensitivity to odour of the individual receptor types identified in the third column of Table 1 is further detailed in Table 2.

Table 1 – Potential Sensitive Receptors

No.	Receptor Description	Receptor Type	Direction from Site	Approximate distance from site boundary	Frequency downwind of site	Sensitivity to odour
1	Tower Road off Portway Hill	Residential properties	NNE	360 m	6.3 %	High
2	Dudley Golf Club House	Recreational facility	NNW	125 m	22.1 %	Medium
3	Portway Hill	Residential and Commercial Properties	NE	10 m	7.4 %	Medium / High
4	Old Portway House and Barn	Residential / Listed building	NE	10 m	7.4 %	High
5	Portway Road	Residential and Commercial Properties	E to S	10 m	5.5 % to 2.1 %	High
6	Warren Hall Country Park	Local Nature Reserve	W	610 m	0.7 %	Low
7	Bumble Hole	Local Nature Reserve	W	990m	0.7 %	Low
8	Rowley Hills	Local Wildlife Site	NE	225 m	7.4 %	Low
9	Dudley Golf Course	Recreational	W to NW	40 m	0.7 % to 8.6 %	Low
10	Rowley Regis Golf Course	Recreational	SE to S	120 m	3.6 % to 2.1 %	Low
11	Rowley Hall Primary School	School	SE	360 m	3.6 %	High
12	Grace Mary Primary School	School	NNE	420 m	6.3 %	High
13	Dudley Road	Residential and Commercial Properties	SW	440 m	4.2 %	Medium / High

Table 2 – Types of Receptors Sensitive to Odour

Receptor Type	Sensitivity to Odour
Residential	High
Recreational	High
Commercial	High
Highway	Low
Habitat	Low
School	High

2.1.1 Residential, recreational, industrial, commercial, and educational premises

The potential emissions from the STC are likely to have a similar impact on persons occupying residential, recreations, industrial, commercial or educational premises. Exposure of emissions to persons in industrial or commercial premises may be lower as they are more likely to be inside during the working day or they may be transient visitors to the premises. Certain industrial activities may generate similar emissions to the Site and the employees may be desensitised as a result.

The closest residential areas to the STC are properties on Portway Hill, Portway Road and Dudley Road. Two primary schools are also within the 500 m radius of the STC. It is likely that the combination of waste types and operational controls, physical barriers (building, treeline and fences), and distance to the receptor prevent most potential emissions from reaching receptors.

2.1.2 Highways and footpaths

The transitory nature of highways means receptors using those locations will be exposed to potential emissions from the Site for shorter (albeit variable) periods of time than residences or businesses. Pedestrians will have longer and more direct exposure to emissions compared to vehicle users.

The highways and footpaths are close to the STC, and this places a more immediate need for the operational effectiveness of Site controls. WRG has confirmed that no odour complaints have been received at the STC. The roads and footpaths to the north east are upwind of the Site for the majority of the time.

2.1.3 Public Amenity

Persons using the Golf Courses and Rowley Hills (Local Wildlife Site) may be exposed to potential odour emissions from the STC. The potential emissions and their effects are the same as human receptors at fixed locations or pedestrians on nearby highways and paths.

2.2 Meteorological Conditions

The principle mechanism for the transit of odorous emissions from site operations to adjacent sensitive receptors is via ambient air. The distance and direction that these emissions will be carried is determined by the following factors:

- Source Related Pathways
- Meteorological Conditions; and
- Topography

2.2.1 Wind Direction

The prevailing wind direction will determine which receptors will be affected and at what frequency. The main controlling factor in determining the pathway of odour is the ambient meteorological conditions. This is fundamental to the transportation of odour to sensitive receptors.

2.2.2 Wind Velocity

Wind velocity will affect the distance an odour emission will travel. Conversely, increased wind speed could also beneficially improve dispersal. Those receptors closest to the installation are still at the highest risk of a potential negative impact however.

Meteorological data from Rowley Regis[1] which is located approximately 400 m to the south of the Site and is expected to provide representative meteorological data for the area. The windrose reproduced as Figure 1 indicates a wind direction from the prevailing south-south-east.

[1] Rowley Regis Wind Forecast, West Midlands B65 9 - WillyWeather

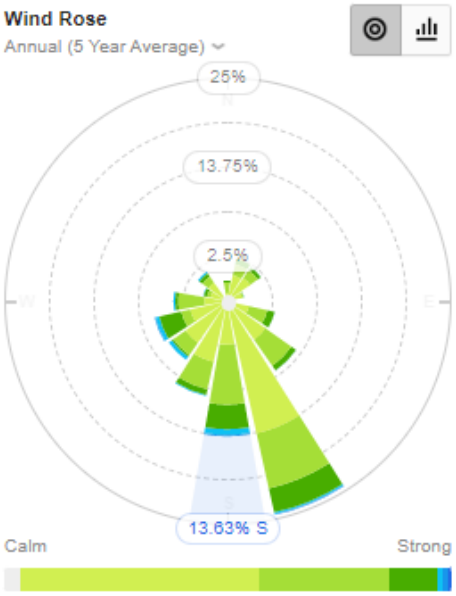


Figure 1 – Windrose, Rowley Regis

2.2.3 Air Temperature

Warm air may carry odours upwards by convection for their dispersal away from the site. However, warm weather will encourage the onset of biodegradation of exposed or temporarily stored wastes and therefore increase odour potential.

2.2.4 Adverse Weather Conditions

Unusual weather conditions may increase the risk of odour emissions from the site. Site staff will be vigilant to unusual trends in the meteorological data or forecasts which may indicate strong winds or extremes of temperature which may cause a potential problem. The types of weather conditions that may impact on odour generation and emissions and appropriate contingency actions are detailed in section 6 below.

3 Odour Source Term Characterisation

3.1 Odour Sources and materials

The current and proposed activities associated with the Soil Treatment Centre (STC) that have the potential to produce odorous emissions are:

- Delivery of waste to site and initial pre-acceptance assessment.
- Transfer of soils to appropriate storage area (biopiles).
- Storage of hazardous soils awaiting treatment.
- Bioremediation of hydrocarbon contaminated soils including initial placement, aeration and turning.
- Pre-screening of soils containing asbestos fragments which may be (albeit unlikely) contaminated with hydrocarbons.
- Storage and transfer of residual material removed from screen.
- Handpicking of asbestos fragments soil with potential hydrocarbon contamination and subsequent storage prior to further treatment in biopiles; and
- Removal of contaminated residues from treatment process.

The contaminated soils accepted on site may contain odorous organic substances due to the presence of hydrocarbons compounds. Odour may present a nuisance to surrounding human receptors or cause an adverse impact to the environment.

The waste types to be accepted at Site are set out in Schedule 2 of the permit. No changes are proposed as part of this variation.

WRG propose to remove the tonnage split between non-hazardous waste and hazardous waste to and increase the annual throughput by 30,000 tonnes to allow 180,000 tonnes per annum to be accepted. WRG also propose to add a new soil treatment area with a 30,000 tonnes treatment capacity. The bioremediation area has adequate controls for odour that are based on full occupation of the bioremediation area.

Soils accepted for biological treatment contain the following contaminants:

- Range of petroleum hydrocarbons (petrol, heating fuel, diesel, used oils, crude oil etc.);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Creosote;
- Phenols; and

- Chlorinated Solvents and other Volatile Organic Compounds (VOCs).

Absence of oxygen during the bioremediation process may lead to anaerobic conditions developing in the soils and potential generation of odorous compounds. Optimum conditions are maintained to avoid anaerobic decomposition. The current bioremediation procedures maintains optimum aerobic conditions in waste by extracting air through the soil continuously with regular monitoring to ensure optimal oxygen levels are present at all times. The Air Extraction System has been designed and installed to account for full occupation of the bioremediation area.

Extracted air is passed through a biofilter to remove odorous contaminants. The biofilter is maintained on a regular basis to ensure conditions for removal of odours / VOCs are optimal. The performance of the biofilter is monitored as previously agreed in the existing permit and remedial action can be implemented based on analysis of the monitoring information. Strict controls including maintaining ideal moisture and temperature conditions, nutrient concentrations, pH and matrix particle size for the biofilter are in place.

The new soil treatment area will adopt the same bioremediation procedures. In addition, a point source emission to air will be added to Table S3.1 to account for the biofilter at the new soil treatment area.

4 Odour Risk Assessment

4.1 Site Odour Emissions

The risk potential to each receptor from odour generated at the STC is presented in Table 3 below. This table evaluates the nuisance to sensitive receptors from odour emissions and the control measures to be implemented at the STC in order to minimise this risk, producing a revised residual risk to receptors.

Table 3 – Odour Risk Assessment and Management Plan

Hazard / Pathway	Receptor				Probability of exposure	Unmitigated Consequence	Initial Risk / Reason	Risk Management	Mitigated Risk
	No.	Dist.	Direc.	Freq.					
Odour through the Air from: Waste storage. Bioremediation process.	1	360 m	NNE	6.3 %	Medium – proximity to site, occasionally downwind	High - Odour nuisance to residents	Medium – odour nuisance, proximity to site	Strict waste acceptance procedures are in place to ensure that no non-conforming materials are accepted which may contain malodorous waste. Bioremediation management controls are in place including an air extraction system, biopiles only being turned during appropriate meteorological conditions. Air drawn from the biopiles passed through carefully managed biofilter and malodorous compounds removed. Within the Soil Treatment Building operational controls utilised for the control of asbestos soils also control the potential release of odour such as preventing unnecessary agitation of the material. Regular olfactory monitoring will be conducted and will take account of meteorological conditions and potential impacts of odour (however unlikely) on receptors.	Low
	2	125 m	NNW	22.1 %	High - close to site, frequently downwind	High - Odour nuisance to users of golf course	High – odour nuisance		
	3	10 m	NE	7.4 %	High – close to site, infrequently downwind	High - Odour nuisance to residents	High – odour nuisance		
	4	10 m	NE	7.4 %	High – close to site, infrequently downwind	High - Odour nuisance to residents	High – odour nuisance		
	5	10 m	E to S	5.5 % to 2.1 %	High close to site, occasionally downwind	High - Odour nuisance to residents	High – odour nuisance		
	6	610 m	W	0.7 %	Low - distant from site, occasionally downwind	Low – not a nuisance to habitats	Low – not a nuisance to habitats		
	7	990m	W	0.7 %	Low - distant from site, occasionally downwind	Low – not a nuisance to habitats	Low – not a nuisance to habitats		
	8	225 m	NE	7.4 %	Medium - proximity to site, infrequently downwind	Low – not a nuisance to habitats	Low – not a nuisance to habitats		
	9	40 m	W to NW	0.7 % to 8.6 %	High - close to site, infrequently to occasionally downwind	High - Odour nuisance to users of open space	High – odour nuisance		
	10	120 m	SE to S	3.6 % to 2.1 %	High - close to site, occasionally downwind	High - Odour nuisance to users of open space	High – odour nuisance		
	11	360 m	SE	3.6 %	Low – distant from site, occasionally downwind	High - Odour nuisance to students	Medium – odour nuisance, distant from site		
	12	420 m	NNE	6.3 %	Low – distant from site, occasionally downwind	High - Odour nuisance to students	Medium – odour nuisance, distant from site		
	13	440 m	SW	4.2 %	Low – distant from site, occasionally downwind	High - Odour nuisance to residents	Medium – odour nuisance, distant from site		
	14	0-500m	NE, S & W	4.2 % to 0.7 %	High – close to site and occasionally downwind	Low – not a nuisance to habitats	Low – not a nuisance to habitats		

5 Control measures and process monitoring

5.1 Waste Pre-Acceptance and Acceptance

The Technical Standards Report (Document referenced: K0182-BLA-R-ENV-00004) details the waste acceptance procedure for the Site. Strict waste acceptance procedures are in place to ensure that no non-conforming materials are accepted which may contain malodorous waste not suited for treatment at the facility. Any potentially odorous soils identified will be subject to pre-determined handling requirements arranged as a consequence of the pre-acceptance assessment.

5.2 Bioremediation Process

Bioremediation of soils refers to the biological treatment of contaminated soils by creating optimal conditions for the biodegradation of organic contaminants. To enable biodegradation to occur the following parameters are monitored and manipulated:

- pH
- temperature,
- moisture content,
- oxygen level
- nutrient concentrations

Decomposition of the organic contaminants is carried out by microorganisms in the soil. This can be enhanced by addition of inorganic nutrients such as ammonium nitrate and organic material such as woodchip. Moisture is also essential for microbial activity; low moisture content will inhibit microbial growth but excessive moisture restricts airflow. The perforated aeration pipes located beneath the waste are able to extract air from the biopile. This allows effective control of the waste oxygen levels and moisture content in the waste to maintain aerobic conditions. This reduces the potential for anaerobic conditions to develop which can cause odorous emissions.

Biodegradation is optimised by maintaining a temperature in the biopiles 30°C and 40°C to ensure predominantly mesophilic microflora are stimulated.

The stages of the bioremediation process is detailed below:

i. **Initial Placement**: The soil is placed on the treatment pad by a dump truck where an excavator will form the biopile.

ii. **Addition of Nutrients**: Based on the contaminants present within the soil, nutrients are added to facilitate the biological degradation of the hydrocarbon compounds.

iii. **Chemical Analysis**: Approximately every 4 weeks the soil is tested to analyse the contaminant concentrations to determine whether the biological treatment of the soil is

adequately reducing the hazardous contaminants to non-hazardous concentrations. Additional nutrients and/or organic inputs may be added to expedite the process

iv. **Nutrients testing:** Every 2-4 weeks the soil is tested to analyse the levels of nutrients within the soil to ensure that there is sufficient inorganic and organic material to facilitate the biodegradation process. This is supported by the chemical analysis of the soil for contaminant concentrations. Soils are tested in accordance with Provectus procedure STC-F006-Soil Analysis.

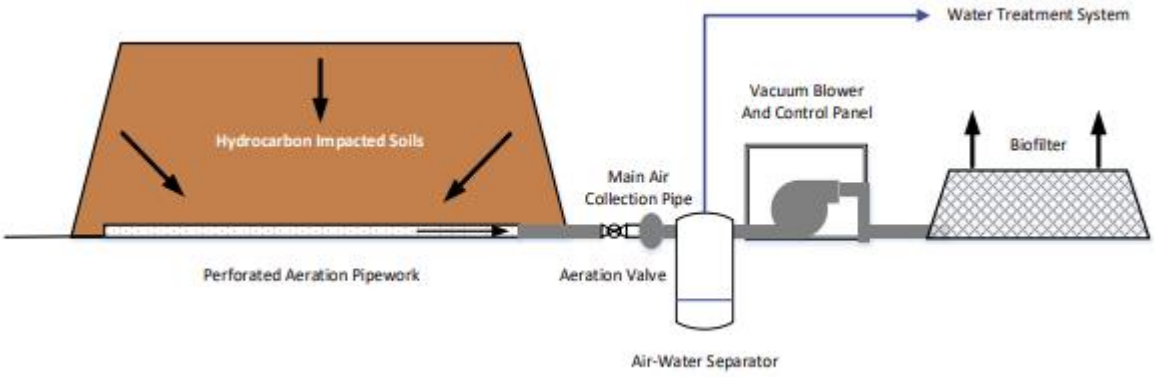
v. **De-compaction of the soil**: Every 4-8 weeks the biopile will be turned to facilitate aeration of the soil.

vi. **Validation testing:** Once the soil meets the re-use criteria, the soil is removed from the treatment pad and transferred to the non-hazardous soils storage area or directly to the non-hazardous landfill void on site.

The biopile Air Extraction System comprises a network of perforated aeration pipes installed beneath the waste biopiles which are linked to a high performance vacuum blower system. The biopiles are operated using vacuum technology that means that >99% of volatile contaminants within soil pore spaces are collected and treated at the adjacent biofilter. The Air Extraction System has been designed and installed to account for full occupation of the bioremediation area. The blower is located within an insulated secure shipping container. An air/water separator is fitted within the collection system to remove liquid from the process air extracted from the biopile. The process water is pumped from the separators via an automated pump with automatic level detection system to a process water tank for primary settlement and carbon filtration prior to discharge to foul sewer.

The air extraction system is connected to a biofilter to capture and treat the degradation products and reduce particulate and odour emissions. The biofilter comprises a woodchip medium filter. The biofilter medium has exhaust holes to allow gaseous emissions to be released.

Figure 2 Biopile Air / Water Flow Diagram



The air extraction system is regularly monitored and maintained. Table S3.1 of the Permit requires the biofilter to be monitored for Total Petroleum Hydrocarbons (TPH), Benzene, Toluene,

Ethylbenzene and Xylenes (BTEX), and Polycyclic Aromatic Hydrocarbons (PAHs) on a monthly basis. The biofilter added to the new soil treatment area will be added to Table S3.1 and monitored monthly in accordance with the Permit. Table S3.3 of the Permit also requires the biofilter to be regularly checked and maintained to ensure appropriate temperature and moisture content. Equipment must be calibrated on a 4 monthly basis or as agreed with the Environment Agency. These procedures ensure the air extraction system is effective at reducing odour emissions and any leaks or damage are detected and repaired. Compliance with this requirement is demonstrated by the monthly biofilter monitoring and regular VOCs monitoring results at the site.

Operational controls during the bioremediation process are in place to ensure no turning of the biopiles is undertaken during high winds. It is understood that there is no distinguishable odour at the site boundary from the biopiles under treatment.

5.3 Pre-Screening and Picking Station

The Operator has advised that it is unlikely that soil accepted for treatment to remove asbestos fragments will also be contaminated with hazardous concentrations of hydrocarbons, as these waste streams are largely from different types of source sites. Processing material heavily contaminated with hydrocarbons through the screen / picking line is not envisaged as it presents significant operational difficulties such as contamination and protection of personnel and plant. Soil which has been subjected to screening and picking is unlikely to be contaminated with solvents or organic residues limiting the potential for VOC release if disturbed. Therefore, odour is expected to be negligible.

Nevertheless, a number of operational controls utilised for the control of asbestos soils within the Soil Treatment Building will also control the potential release of odour such as preventing unnecessary agitation of the material.

5.4 Housekeeping Practices

All Site roads and surfaces will be inspected on a daily basis. A street sweeper will regularly clean site roads of any mud trailed on from site vehicles. Dampening of site roads / surfaces as necessary using a tanker during dry periods will minimise odour.

All vehicles would arrive sheeted and would only remove their sheets once at the point of material inspection / deposition to prevent odour nuisance along the access route and beyond. Empty vehicles containing odorous residues should, whenever possible, be hosed out to prevent releases occurring whilst using the public highway.

Drop heights will be minimised as far as practicable during the loading and unloading of materials to reduce the likelihood of dispersion and minimise the potential for odour release as a consequence of agitation.

All treatment will take place on maintained hardstanding to reduce dispersion and control measures will be implemented to minimise odour release. Any soils that could pose an odour can be covered temporarily either with tarpaulins or other soils that have nil odour potential whilst initial treatment is taking place.

Regular housekeeping will be undertaken to minimise the spread of odorous residues and ensure effective containment and all site staff, including contractors, will receive appropriate training in order to ensure that employees are conversant with the odour control and management procedures.

5.5 Drainage

Water is reused on site where possible with any surplus disposed to foul sewer after treatment. All surfaces used to treat or store waste comprise impermeable hardstanding. There are no direct releases off-site other than via the engineered surface water management system. All collected surface water drains to settlement tanks located to the south east of the Site. The water from the tanks is then pumped to a combined sewer outfall located to the east of the tanks. In the event the pump was unable to perform, water from the settlement tank can drain to the surface water sewer under a trade effluent consent. The Operator has submitted a separate trade effluent consent application. Volume and quality is and will be monitored in accordance with the Environment Permit and trade effluent consent. The surface water drainage system has cut-off values that can be isolated in the event of a spill or contamination.

All drainage infrastructures will be inspected, maintained and repaired as necessary.

In the highly unlikely event that odour should become an issue as a result of the on-site drainage system, a full review of the infrastructure will be conducted and cleaning and inspection frequencies adjusted accordingly.

6 Odour Monitoring and Reporting

6.1 Overview

Prevention will be viewed as the most effective means of controlling odour before an impact occurs. The Source → Pathway → Receptor model determined above allows for the identification of the critical control points where odour can arise, how it can travel to a receptor and the likely impact.

The performance of an odour management system will ultimately be judged by the impact of the site on the receptors. Should complaints be received, a procedure will be in place to effectively deal with the issue in a sensitive, efficient and auditable manner.

The controls are detailed in previous sections of this report. The management of those controls will be based on the on-going monitoring regime on Site. The monitoring regime can work as an early warning system against potential problems (e.g. meteorological monitoring) or a diagnostic tool to establish the cause of an odour event (e.g. perimeter monitoring).

6.2 Monitoring

6.2.1 Off-Site Olfactory

The Site has an Emissions Management and Monitoring Plan and a Fugitive Emissions Management Plan for Dust (Report Ref: K0182-BLA-R-ENV-00005) in place which sets out the measures taken to manage and control emissions of dust, PM10, asbestos fibres and VOCs/odours (Appendix C and Appendix D of the Environmental Risk Assessment).

The Site Manager will be responsible for ensuring that daily odour monitoring is undertaken at the Site and its perimeter in order to identify any sources of odour and to establish whether any odours are discernible. Due to the potential for de-sensitisation to odours, odour monitoring will only be carried out by personnel who do not regularly work at the site. These personnel will be the most suitable to detect any fugitive odour outside the STC.

Off-site olfactory monitoring will also be carried out with reference to the protocol in Appendix 1 of the Environment Agency H4 Odour Management Guidance. All site operatives will be responsible for reporting any odour problems as soon as practicable to the Site Manager or the next level of management if the manager is not available.

The following locations will be targeted for odour monitoring by the nominated site personnel:

- Weighbridge or waste reception area (continuous monitoring of vehicles);
- Point of waste deposition;
- Bioremediation area, particularly during initial placement, aeration and turning; and

- Subject to prevailing wind direction (i.e. up and down wind), appropriate areas of the site perimeter.

The following information will be recorded during each round of monitoring:

- Name and job position of assessor;
- Nature of any problem identified including location / source, date, time, duration, prevailing weather conditions and likely cause;
- The intensity of the odour based on the VDI 3882 Part 1 Odour intensity scale which provides intensity levels 0 to 6.

Intensity	
0 No odour	4 Strong odour
1 Very faint odour	5 Very strong odour
2 Faint odour	6 Extremely strong odour
3 Distinct odour	Ref: German Standard VDI 3882, Part 14

- On-site activities and operational condition at the time of the monitoring visit (this should include any abnormal events);
- Records of the likely source of any odour even if it is not from the Site;
- Details on the corrective action taken, realistic timeframes for remedial works and any subsequent changes to monitoring and operational procedures.

The Site Manager will be informed immediately of any findings of odour attributed to the Site and will authorise remedial measures to be taken.

Control and trigger levels are applied as shown in Table 4.

6.2.2 Control and Trigger Levels

Control and trigger levels for odour are presented in Table 4.

Table 4 Control and trigger levels for odour

Parameter	Monitoring Technique	Control Levels
Odour	Olfactory monitoring	Odour Intensity ≥3 Distinct odour recorded at any monitoring location (Actions detailed in Section 6.3)
	Complaint	Complaint received (Actions detailed in Section 6.4)
Volatile Organic Compounds	Use of calibrated PID around working areas on biotreatment pad	1 mg/m^3 benzene (Actions detailed in Section 6.3)

In the event of a complaint being received the procedure specified in Section 6.4 will be actioned.

6.3 Odour investigation

6.3.1 Odour investigation procedure

Any exceedance of the trigger levels identified in Table 4 related to a distinct odour or benzene above 1 mg/m^3 above will trigger an internal investigation into the source of any odour and efficacy of current control measures.

The following procedure will be undertaken:

- Identification of source of odour during the monitoring visit or type of odour identified in a complaint.
- On-site activities and operational condition at the time of the monitoring visit or complaint (this should include any abnormal events).
- Nature of any problem identified including location / source, date, time, duration, prevailing weather conditions and likely cause.
- If odour continues to breach trigger levels the activities will temporarily cease until actions can be undertaken and effective controls are in place.

6.3.2 Corrective Actions

Corrective actions may require the adoption of additional control measures at the STC.

Corrective actions may comprise but are not limited to the following:

- Additional olfactory monitoring and/or PID monitoring.
- Review of all processes on site.
- Review of odour control measures.
- Replacement of wood medium filter in the biofilter if required.
- Adoption of additional odour abatement equipment which may include the addition of odour surfactant to the dust suppression systems if required.

6.4 Complaints Procedure

6.4.1 Complaints

Any complaints received at the STC or via the Regulatory bodies including the Environment Agency and Local Authority, will be recorded using the Odour Compliant Report Form contained in the Site Management System. This will instigate further olfactory monitoring at the location of the complaint and on site to determine the extent of the odour and whether a mobile mister should be employed. Where possible, as much information and detail about the complaint will be recorded, whether this is from the relevant authority or complaint direct to site. This information will assist in the investigation and determining the source of the odour e.g. differentiating between potential off-site odours.

All complaints and queries will be logged in accordance with the management system as soon as is practicably possible. All complaints logged will be subject to investigation and complainants responded to within 48 hours of receipt, where possible.

In the event that a substantiated odour complaint is received arising from the site, additional monitoring will be undertaken at the nearest sensitive receptors to determine any off-site odour emissions.

Complaints regarding odour from the Site will be investigated and appropriate records maintained which may include:

- Complaints received including name and contact details of complainant (if known), and complainants description of the odour.
- Nature of problem including date, time, duration, prevailing weather conditions and cause of the problem.
- Onsite activities and operational condition at the time of the complaint.
- Records of the likely source of the odour even if it is clearly not from the Site.
- Details on the corrective action taken, and any subsequent changes to monitoring and operational procedures.

The Environment Agency will be informed by WRG of the complaint and WRG will confirm to the best of its knowledge the information described above.

WRG will ensure that the complainant has all the relevant contact details of the site (i.e. the Site Manager) and the officer responsible at the Environment Agency. WRG will be in regular contact with the complainant and the Environment Agency whilst the cause of the odour is being investigated and if required remediated.

An evaluation of the effectiveness of the techniques used will be carried out on completion of any remedial measures or if the complaints persist. Records of the above will be retained by site for future reference.

6.4.2 Complaints Investigation

As part of each odour complaint received, these will be objectively assessed against the wider environment to ensure that the source of the emission is traced back to the correct source. As discussed earlier in this OMP, it is essential that the source is correctly identified in order that mitigating measures can be applied effectively and correctly. The complaint will also be assessed against previous records to place the nature of the complaint into context.

6.5 Community engagement

The Site will be readily contactable to outside organisations and to members of the public. The Site signage board (placed in a readily visible location) will contain the necessary contact details for both the Site operations and Environment Agency. The company website also contains the necessary contact details for each individual Site.

Any complaints received directly to Site will be notified to the Environment Agency. Should an off-site issue arise, therefore, the complainant has a readily available means of getting in touch with WRG.

6.6 Abnormal Events and Contingency Procedures

6.6.1 Abnormal Events

6.6.1.1 Temperature Inversions

Temperature is one of the parameters that is monitored and manipulated in the bioremediation process. Biodegradation is optimised by maintaining a temperature of 30 and 40°C in the biopiles to ensure the mesophilic microflora are predominately stimulated. These management controls reduce the impact of external temperature changes on the soils being treated and limit the potential of temperature inversions on the potential for causing odour. The air extraction system effectively controls odour emissions by capturing and treating volatile compounds to reduce odour emissions.

6.6.1.2 Strong Winds

Daily visual inspection of the site infrastructure will be undertaken and recorded. Additional inspection for damage resulting from high wind events will also be undertaken and contingency actions identified below considered should high wind conditions result in escape of significant odours. A mobile mister may be employed to limit the potential for any odour emissions.

6.6.1.3 Snow / Ice

Severe cold weather may result in disruption to waste deliveries and removal of materials from site however due to the nature of the soils to be treated it is unlikely to cause an increase in odour.

6.6.1.4 Hot Conditions

The warmer the waste the greater the potential to generate odour therefore an increase in ambient air temperature may result in increased odour from the biopiles due to the promotion of the biodegradation process. However, the biopiles are maintained at a temperature of between 30 and 40°C therefore hot conditions will not impact this process. The air extraction system will enable control any potential odour by capturing and treating volatile compounds reducing odour emissions from the soils. A mobile mister may be employed to limit the potential for any odour emissions.

6.6.1.5 Unscheduled unavailability

Unscheduled unavailability should only take place due to unscheduled maintenance, emergency situations and for Health and Safety reasons such as a fire at the site. In such cases the site operative will initially inform the manager who will in turn inform the Site manager, the Authority and the Environment Agency. WRG will implement measures to store or divert soils as required.

6.7 Records and Review

A daily record relating to the management and monitoring of odour will be maintained. It will include the following details:

- The results of inspections and olfactory monitoring carried out by installation personnel;
- Weather conditions including atmospheric pressure, wind speed and wind direction;
- Problems including date, time, duration, prevailing weather conditions and cause of the problem;
- Complaints received including address of complainant; and
- Details of the corrective action taken, and any subsequent changes to operational procedures.

The OMP will be reviewed on an annual basis with the scheduled review of the site management system or with every major increase, or alteration to the odour generated at site (i.e. a change to odour source term, pathways or receptors).

Appendix A – Drawings

A3

GENERAL NOTES

1. SURVEY INFORMATION SUPPLIED BY THE WASTE RECYCLING GROUP .
2. DO NOT SCALE
3. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM
4. ANY ANOMALIES ON THIS DRAWING ARE TO BE BROUGHT TO THE ATTENTION OF BYRNE LOOBY

KEY

- PERMIT BOUNDARY
- NEW BIOREMEDIATION AREA
- 85.0 / 86.0 EXISTING GROUND CONTOURS
- BUFFER ZONE
- 9 RECEPTOR MARKER

Rev	Date	Description	By	Chk	App
01	23/12	BOUNDARIES ADDED	GH	EG	CF

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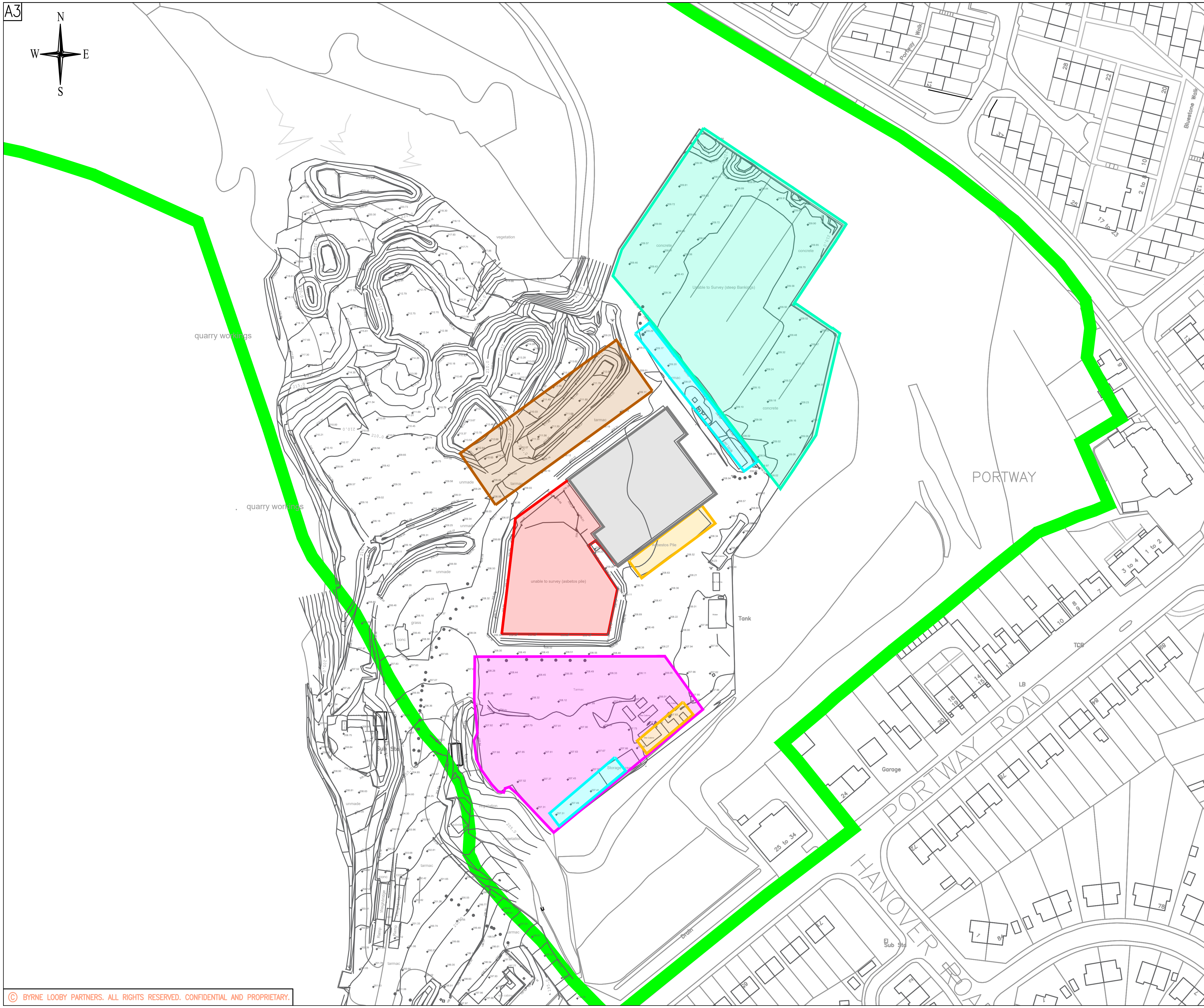
PROJECT
EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE
SENSITIVE RECEPTOR PLAN

STATUS
FINAL

Date: 21.12.22	Scale: N/A	Drawn: JM	Chk: JW	App: JW
Project No: K0182	Drg. No: K0182.1.001			Rev: 01



GENERAL NOTES

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KEY

- PERMIT BOUNDARY
- NON-HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING

Rev	Date	Description	By	Chk	App

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

SITE LAYOUT PLAN

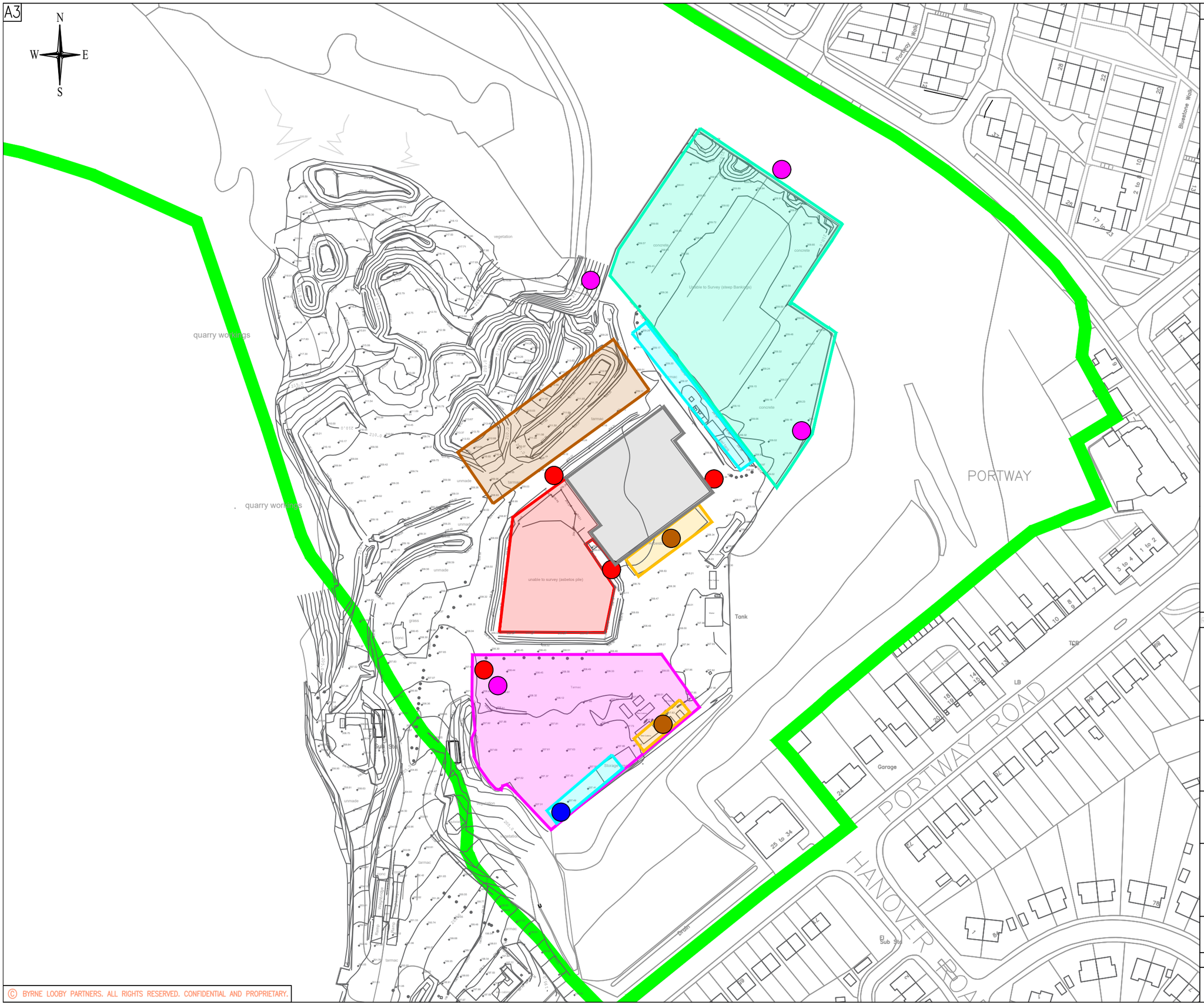
STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.002	01

A3



GENERAL NOTES

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KEY

- PERMIT BOUNDARY
- NON–HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING
- AIR SAMPLING: ASBESTOS/PM10
- AIR SAMPLING: TPH/BTEX/PAH'S
- AIR SAMPLING: DUST/NOISE/ODOUR
- WATER SAMPLING: SEVERN TRENT

Rev	Date	Description	By	Chk	App

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

EMMISIONS MONITORING PLAN

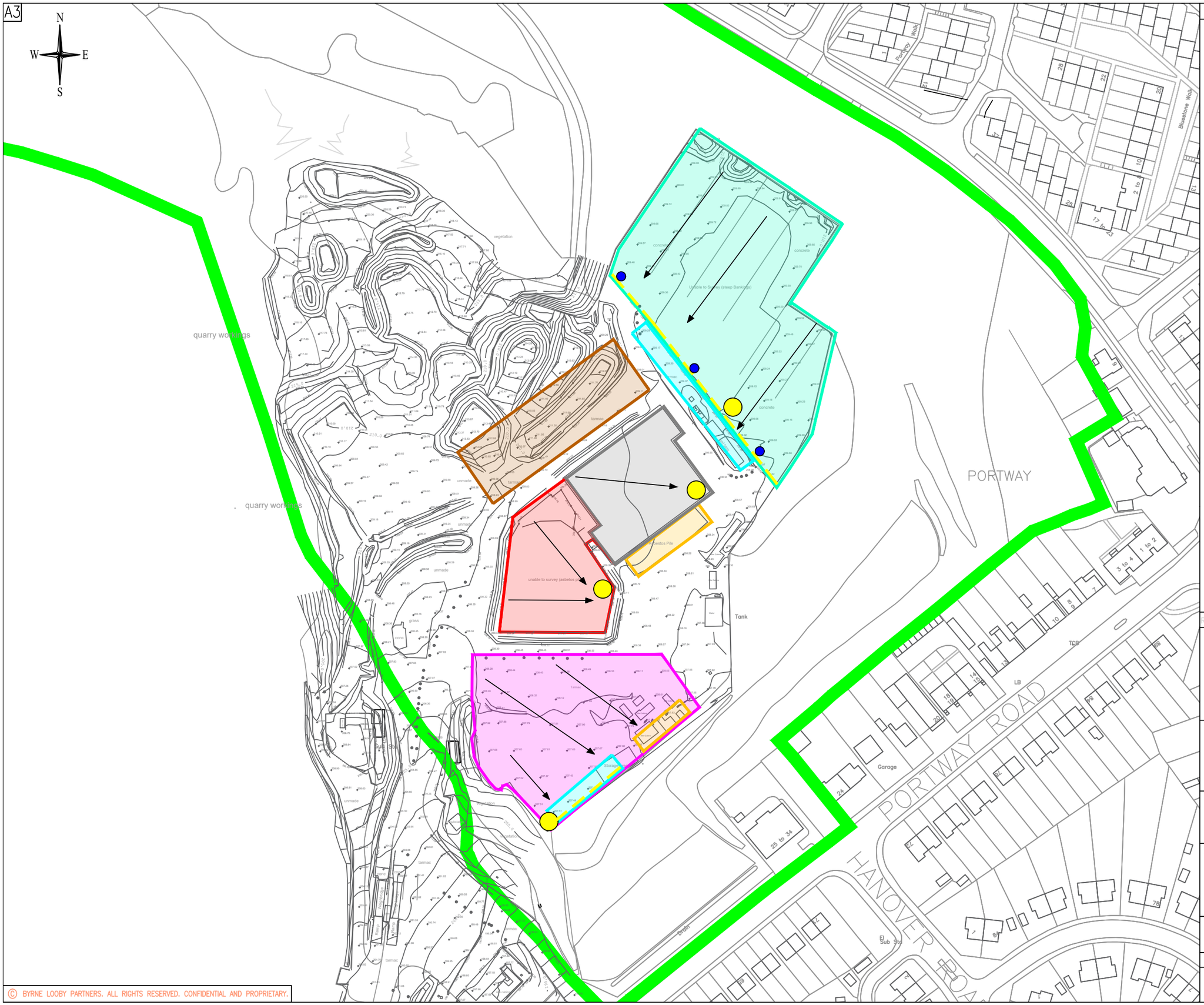
STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.003	01

A3



GENERAL NOTES

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KEY

- PERMIT BOUNDARY
- NON-HAZARDOUS SOIL STORAGE AND SCREENING AREA
- BIOLOGICAL TREATMENT AREA
- BIOFILTERS
- HAZARDOUS SOILS STORAGE AREA
- BIOLOGICAL TREATMENT AREA/SOIL WASHING AREA
- WATER TREATMENT PLANTS
- SOIL TREATMENT BUILDING
- PUMPING CHAMBERS
- DRAINAGE GULLY
- DRAINAGE DIRECTION
- SURFACE WATER DRAINAGE PIPE

Rev	Date	Description	By	Chk	App

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PROJECT

EDWIN RICHARDS QUARRY
SOIL TREATMENT CENTRE

DRAWING TITLE

DRAINAGE PLAN

STATUS

FINAL

Date: 20.06.23	Scale: 1:1500	Drawn: JM	Chk: JW	App: JW

Project No:	Drg. No:	Rev:
K0182	K0182.2.004	01

Appendix B – Appendix I of H4 Odour Guidance

Appendices

Appendix 1 – Forms

This appendix provides examples of a report form for sniff testing, a complaint form and an odour diary. Word versions of these are available[11].

Odour reporting form (sniff testing)

You may need to carry out an assessment either to work out whether you are complying with your permit, or as a part of an investigation into a complaint.

You can use routine assessments to build up a picture of the impact the odour has on the surrounding environment over time. You can develop 'worst case' scenarios by doing assessments during adverse weather conditions or during particularly odorous cycles of an operation. Ideally, you should use the same methodology to follow up complaints.

Please note:

- Staff normally exposed to the odours may not be able to detect or reasonably judge the intensity of odours off-site. You might be better off using office staff or people who have not recently been working on the site to do this.
- Anyone who has a cold, sinusitis or a sore throat, is likely to underestimate the odours.
- To improve (or to check) data quality, you can get two people to do the test independently at the same time.
- Those doing the assessment should avoid strong food or drinks, including coffee, for at least half an hour beforehand. They should also avoid strongly scented toiletries and deodorisers in the vehicle used during the assessment.

Where you test will depend on:

- whether you are responding to a complaint;
- whether you are checking your state of compliance at sensitive receptors;
- whether you are trying to establish the source of an odour;
- wind direction.

The assessment may involve someone walking along a route that you have selected either because of these factors, or in response to the conditions they found when they got there. Another option is to choose fixed points so that you can evaluate the changing situation over several weeks or months. Or the test points may vary from test to test according to local conditions, which would help you identify worst case conditions.

You should also keep a note of any external activities (such as agricultural practices) that could be either be the source of the odour, contribute to the odour, or be a confounding factor. Remember that an odour will become diluted and may change character as this happens.

You should also take the factors given in Section 5.2 Monitoring – Ambient Air into account.

[11] Via EPR guidance at http://www.environment-agency.gov.uk/business/topics/permitting/36414.aspx#Horizontal_guidance

Appendices

Odour report form				Date	
Time of test					
Location of test e.g. street name etc					
Weather conditions (dry, rain, fog, snow etc):					
Temperature (very warm, warm, mild, cold, or degrees if known)					
Wind strength (none, light, steady, strong, gusting) Use Beaufort scale if known					
Wind direction (e.g. from NE)					
Intensity (see below)					
Duration (of test)					
Constant or intermittent in this period or persistence					
What does it smell like?					
Receptor sensitivity (see below)					
Is the source evident?					
Any other comments or observations					

Sketch a plan of where the tests were taken, the potential source(s).

Intensity		**Receptor sensitivity**
0 No odour	4 Strong odour	Low (e.g footpath, road)
1 Very faint odour	5 Very strong odour	Medium (e.g. industrial or commercial workplaces)
2 Faint odour	6 Extremely strong odour	High (e.g. housing, pub/hotel etc)
3 Distinct odour	Ref: German Standard VDI 3882, Part 14	

Appendices

Odour Complaint Report Form	
Time and date of complaint:	Name and address of complainant:
Telephone number of complainant:	

Date of odour:	
Time of odour:	
Location of odour, if not at above address:	
Weather conditions (i.e., dry, rain, fog, snow):	
Temperature (very warm, warm, mild, cold or degrees if known):	
Wind strength (none, light, steady, strong, gusting):	
Wind direction (eg from NE):	
Complainant's description of odour: o What does it smell like?	
o Intensity (see below):	
o Duration (time):	
o Constant or intermittent in this period:	
o Does the complainant have any other comments about the odour?	
Are there any other complaints relating to the installation, or to that location? (either previously or relating to the same exposure):	
Any other relevant information:	
Do you accept that odour likely to be from your activities?	
What was happening on site at the time the odour occurred?	
Operating conditions at time the odour occurred (eg flow rate, pressure at inlet and pressure at outlet):	
Actions taken:	

Form completed by:	Date	Signed

Intensity

0 No odour
1 Very faint odour
2 Faint odour
3 Distinct odour
4 Strong odour
5 Very strong odour
6 Extremely strong odour

Odour Diary					Form version 110319	Sheet No
Name: Telephone Number:	Address:					
Date of odour:						
Time of odour:						
Location of odour, if not at above address (indoors, outside):						
Weather conditions (dry, rain, fog, snow etc):						
Temperature (very warm, warm, mild, cold or degrees if known):						
Wind strength (none, light, steady, strong, gusting):						
Wind direction (eg from NE):						
What does it smell like? How unpleasant is it? Do you consider this smell offensive?						
Intensity – How strong was it? (see below 1-5):						
How long did go on for? (time):						
Was it constant or intermittent in this period:						
What do believe the source/cause to be?						
Any actions taken or other comments:						

Intensity

0 No odour
1 Very faint odour
2 Faint odour
3 Distinct odour
4 Strong odour
5 Very strong odour
6 Extremely strong odour

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