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1. INTRODUCTION

This document is provided to support the deployment of the Vertase FLI Environmental Permit (former Mobile Treatment Licence) Ref: EPR/QP3293FY/V004 for works at Phase 4a and Phase 5 of the redevelopment of the former Llanwern Steelworks. This document, the Remediation Working Plan, should be read in conjunction with the relevant MPP2 deployment form.

In summary, Vertase FLI Limited (Vertase) is contracted by St Modwen Developments Limited to undertake the activity of materials processing, ex-situ bio-treatment of soils and solidification/stabilisation. Perched water and surface water will require management and be treated prior to consented discharge.

1.1 Pre-Application Discussions

Vertase has not specifically had pre-application discussions with Natural Resources Wales (NRW) with regards to the deployment application.

1.2 Re-Use of Materials

The Cl:aire Definition of Waste Code of Practice will be used as a mechanism by which 'suitable for use' materials can be re-incorporated back into the site.

It is hoped that the local area Natural Resources Wales contaminated land / groundwater officer reviewing this document, will liaise with their waste team colleagues in order that approval for this activity can be obtained at the earliest possible opportunity.

2. INFORMATION TO SUPPORT THE MPP2 DEPLOYMENT FORM

2.1 MPP2 Section B3 About the Operating Site

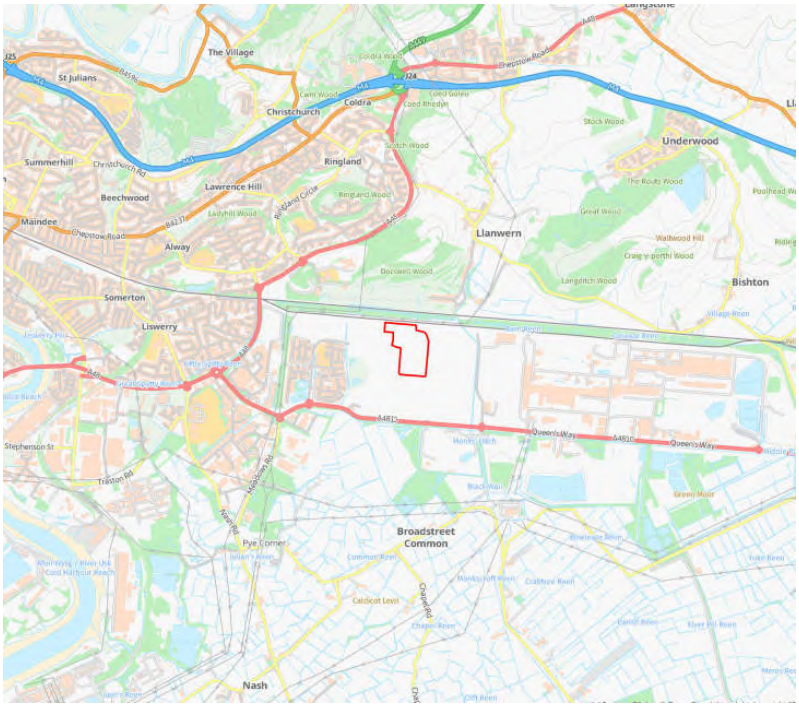
2.1.1 Location, History and Spatial Constraints

The site is at Phase 4a and Phase 5, Glan Llyn Development, Llanwern, Newport and forms the northern part of the wider Glan Llyn development that is being constructed on the former Llanwern Steelworks.

The site is roughly rectangular in shape and covers an approximate area of 14.9 hectares of the former Coking Works and is centred on National Grid Reference (NGR) 336187,187042.

The site is located approximately 4.0km east of Newport City Centre as shown on Figure 1.

Fig 1. Site Location



It is understood that the site was undeveloped agricultural land, separated by reens, from the earliest mapping in 1883 and remained undeveloped until the construction of the coking works in 1967. The main part of the site comprised the coking works of the steelworks. Historical maps have shown coking ovens, benzole plant, benzene plant and gasholders to be present, along with the supporting infrastructure comprising pipelines and tanks. The western portion of phase 4a historically operated as a coal store.

It is understood that all above ground structures were removed by 2004. The site is currently vacant with Phase 4a currently occupied by a surface waterbody in the north west, a surface water drain aligned north to south in the centre of the site and material stockpiles in the north east. Material stockpiles are also present within Phase 5.

The red line boundary is shown on Drawing D4583_02 in Appendix A.

The site is bounded to the south and east by vacant land which will form future phases of residential and open space development and to the west and north by surface water reens. The surface water reen located approximately 45m north of the site is named the Northern East-West Ditch, and forms part of the new Glan Llyn drainage network. Drain 3, located to the west of the site, does not form part of the final Glan Llyn development. Residential housing under construction is located approximately 360m south-west of the site and occupied residential housing is located approximately 530m west of the site. Western Park, an area of public open space with ponds and play facilities, is located 300m west of the site and a primary school is located 700m west of the site.

The site is underlain by Made Ground, Tidal Flat Deposits and Mercia Mudstone Group bedrock. The Made Ground generally comprises sandy gravel with cobbles, sandy gravelly clay and ashy clay and sand with anthropogenic inclusions of slag, refractory brick, iron ore, brick, coke, concrete, metal, mudstone and sandstone. The proven thickness of Made Ground ranges from 0.75m to 4.00mbegl. Tidal Flat Deposits have been encountered as soft to firm silty occasionally peaty clay.

The bedrock geology at the site comprises the Mercia Mudstone Group. The BGS Lexicon of Named Rock Units describes the Mercia Mudstone Group as:
'dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. Thin beds of gypsum/anhydrite [are] widespread, sandstones are also present'.

The Mercia Mudstone Group bedrock is classified as a Secondary B Aquifer and the superficial tidal deposits are classified as unproductive strata. Groundwater is not considered as a receptor because of the poor resource potential of groundwater in the wider area.

There are no surface water features located on the site. The Northern East-West Ditch, part of the new Glan Llyn drainage network, is located 45 m to the north of the site and Drain 3, a residual surface water drain from the former steelworks, is located directly to the west of the site, aligned north to south. Monks Ditch, an above ground canalised surface watercourse which is hydraulically isolated from the site and the wider Glan Llyn development, is located approximately 450m to the east of the site.

Gwent Levels Site of Special Scientific Interest (SSSI) is located approximately 492m south of the site as shown on Drawing D4583_09, Appendix A.

Gross contamination including free product and/or tar has been encountered in 30 exploratory hole locations located in the north-east and east of the site, predominantly related to the forming coking works footprint.

Areas of gross contamination that require addressing to provide an immediate mass reduction in the contaminant loading from the site soils and an overall betterment in groundwater quality are shown on Drawing D4583_007 in Appendix A.

The existing stockpiles across the site are known to comprise similar materials to the Made Ground and require processing / treatment prior to re-use.

To summarise, the contaminants of concern that require addressing, by either treatment or off-site disposal are identified as:

- Grossly impacted Made Ground (TPH, PAH);
- Non licenced ACM within Made Ground and existing stockpiles;

- LNAPL on perched water.

Drawing D4583_06, details the monitoring locations, treatment areas, remediation areas and adjacent facilities. The monitoring locations are described below in Table 2.1. Monitoring frequencies and methodologies are described below and in Section 2.8.

Table 2.1 Environmental Monitoring Locations

Monitoring Points	Location
MP1,2,3,4,5,6	Boundary ambient monitoring locations, visual dust, odour, VOC by PID.
MP5	Surface water monitoring locations (visual)

Monitoring frequencies and management are described in Section 2.5 and 2.8.

2.1.2 Pollution Control Measures

All fuel storage containers will be double bunded (110% capacity minimum) and located within the site compound area on hard impermeable standing and away from any identifiable receptor or route to receptor (watercourse, drains, open excavations, boreholes etc.).

All potentially hazardous reagents for use in the treatment processes, or those which pose a potential risk to human health will be controlled under COSHH.

Spill kits will be available, close to each of the activities described below.

Ex-Situ Treatment of Encountered Groundwater

In order to facilitate excavation works in grossly impacted areas, water is to be removed from the dig area and subject to ex-situ treatment prior to consented discharge.

The water treatment plant is to be located upon a bunded and impermeably lined pad. Any build-up of rain or spillage water will be held upon the pad and passed through the treatment plant for consented discharge.

Ex-Situ Bioremediation

Treatment by bioremediation (windrows) will be undertaken on impermeable and bunded beds. Drawing D4583_08 in Appendix A shows a typical arrangement. Any collected water will be pumped to the water treatment plant or hauled by tractor and bowser.

Stabilisation/Solidification

Treatment by Stabilisation/Solidification will be undertaken on impermeable and bunded beds. Drawing D4583_08 in Appendix A shows a typical arrangement. Any collected water will be used to aid cementitious hydration.

2.1.3 General Working Arrangements

Remediation activities at the site will be undertaken between the hours of 08:00am to 18:00pm Monday to Friday and between the hours of 08:00am to 13:00pm on Saturdays.

Existing fencing will be maintained wherever possible and supplemented with additional fencing as required. The site will be secured to prevent access during working hours and will be controlled by the Site Manager. During the evenings and weekends the site will be secured and locked.

2.1.4 Emergency Procedures

Emergency details including out of hours contact numbers will be presented on the Permit notice board and include the details of the nominated WAMITAB manager.

2.2 MPP2 Section B4 Waste Types and Quantities

Table B5.1 of MPP2 details waste types, EWC codes, medium (solid, water, sludge or gas) and expected quantities.

Approximately 14,000m^3 of soil and stones and 25,000m^3 of groundwater / perched water will be treated by the methods described in Section 2.3.

2.3 MPP2 Section B5 Specified Activities to be Carried Out

The activities described below are designed to address the contamination summarised in Section 2.1.1.

2.3.1 Ex-Situ Groundwater Pump and Treat to Facilitate Excavation

Due to the presence of shallow groundwater, dewatering of perched water shall be required to enable the works to progress to chase out obstructions and/or grossly impacted soils.

The concrete slabs across site will be broken out in sections to reveal the grossly contaminated and 'clean' ground beneath. The contaminated soils will be visually assessed, excavated as required and sent for biological and/or stabilisation treatment (see Section 2.3.2.), if required.

Water will be pumped to the onsite water treatment plant to be sited in the centre-south of the site as shown on Drawing D4583_06.

If free product (LNAPL) is encountered in the excavations, these may be dealt with by capture using oil booms and pads, fixing with sorptive materials or skimming as well as targeted pumping and recovery to suitable storage vessels for chemical testing and subsequent offsite disposal or recycling.

Any free product entrained within groundwater will be removed by skimming from the lamella separator (an element of our bespoke Water Treatment Plant) to appropriate storage vessels. If necessary, skimming will occur on a regular basis to reduce the risk of fugitive odour emissions from the lamella separators.

After settlement and free phase separation, waters will be subject to filtration. Two carbon pods (in series) will be used. At least 1 spare carbon containing pod will always be available on site.

After treatment and confirmatory testing, water will be discharged into Drain 3 and subsequently treated off site via an existing treatment plant operated by others or used for dust suppression.

2.3.2 Ex -Situ Bioremediation and Stabilisation/Solidification

As excavation progresses across the site Vertase staff will be mindful of the potential presence of asbestos. In the event that asbestos materials are found, works will be suspended in that area and the area will be cordoned off. Suspected asbestos materials will be assessed and sampled for laboratory analysis. Due to the likelihood of asbestos on site an asbestos risk assessment has been written by a competent person in accordance

the Control of Asbestos Regulations 2012 (CAR2012) and a plan of works (POW) has been developed in order to manage the materials appropriately.

Small quantities of Asbestos Containing Materials (ACMs) may be handpicked and segregated for offsite disposal. If Asbestos Containing Soils (ACS) is encountered then this will be managed appropriately onsite in accordance with CAR2012 and the site specific MMP.

Pre-treatment of suitable arisings where required may consist of crushing and screening and these will be undertaken on the hardstanding, structurally sound and impermeable areas.

Once soil has been placed for treatment, any soil amendments or conditioners (which may include spent mushroom compost in low concentrations) will be added to optimise the process, with parameters such as available nutrient concentrations, soil temperature and contaminant concentrations within the beds being tested for and followed.

Treatment beds will be mechanically turned by excavator on a frequency of nominally once every week to ensure sufficient oxygen is within the biopiles. This turning also aids in the disaggregation of material and is the only available option for cohesive or semi cohesive soils. The soils will be turned with a specialised mechanical turning bucket.

Progress of treatment will be followed by taking representative soil samples on a regular basis with analysis for the contaminants of concern.

With reference to the most contaminated/grossly impacted tarry soils, these will be excavated and transported to a secure treatment area, where they may be physically screened for oversized material. This will also produce a physically uniform material to be stabilised/solidified. Reagents (which will be transported to site in bulk container lorries) will be mixed with the grossly impacted/tarry soils and blended using screeners and/or alu buckets. At this stage, water (including impacted perched groundwater) is added to the material to aid cementitious hydration.

Once the binders have been added to the soils, hydrated, and mixed, they will be stockpiled for curing and subsequent testing. Upon verification, and in accordance with the Remedial Strategy, the soils will be placed into the excavations and compacted. Alternatively, if beneficial to the programme, the soils may be placed immediately after mixing and validated in situ.

Following treatment, or if arisings are suitable for use without treatment, material shall be used onsite for the attainment of levels in accordance with Remedial Strategy and Materials Management Plan.

In accordance with the Permit, the following technology will be deployed at the site:

- pump and treat of groundwater with LNAPL separation
- bioremediation
- stabilisation/solidification
- treatment plant for blending, mixing, bulking, screening, shredding, particle size reduction and / or particle separation in order to facilitate remedial action.

2.4 MPP2 Section B7 Duration of the Deployment

The works associated with this deployment are expected to last for 7.5 months. Following a period of demobilisation over the winter months, we will apply to re-deploy our MPP for an additional phase of works lasting 8.5 months.

2.5 MPP2 Section B8 Management Supervision

The Site Manager and Engineer are fully conversant with the requirements set out in this Working Plan and with the requirements of the Bespoke Environmental Permit and will be supported by a technically competent manager on a weekly basis, as a minimum.

The qualifications of the WAMITAB holders can be found in Appendix B. Claire Lilley is the identified primary WAMITAB technically competent manager for this project. In her absence the site will be supported by other staff of appropriate qualification.

Vertase will ensure that all WAMITAB staff maintain their certificated competencies.

2.6 Acceptance Procedures

Vertase has accepted the made ground soils within the redline boundary of the site as potentially contaminated and requiring treatment. Perched water is also accepted as potentially contaminated and requiring treatment to reduce the risk to controlled waters (surface water features, not groundwater) and human health via betterment of subsurface conditions.

2.6.1 Soils / Solids

Solid materials identified as potentially contaminated, and/or requiring pre-treatment to enable site re-use, include the Made Ground beneath the site, including those associated with subsurface structures, and the existing stockpiles across the site.

The site will be turned-over to address historic subsurface structures and drainage runs.

A Materials Tracking System shall be used that accords with the Cl:aire Definition of Waste Code of Practice. The tracking system will be managed, on a daily basis, by the Site Manager or Engineer, both of whom are suitably qualified and experienced in earthworks, remediation and dealing with the system described. The forms, and procedures, discussed in this and subsequent sections are shown in Appendix C.

A record of each excavation area/horizon will be recorded on a plan each being given a unique number (Unique Identification Code – UIC), a stockpiling plan will be kept and accompany records for temporary storage and general movements (Form ENV-003 Materials Audit) and a further plan shall be produced showing the areas of placement and depths of the source material replaced within the excavation. This will enable an absolute audit trail of the material from source excavation to deposition.

Excavation and assignation of treatment methodology will be based upon the site investigation details and degree of contamination, as assessed by the experienced Vertase Engineer by visual or olfactory evidence aided by the use of a photoionisation detector (PID). As material is being excavated, and as general activities are undertaken, Form CON-003, the Site Diary, will be used.

Each time a sample is taken the relevant line in Form ENV-003 will be completed. Soil sampling methodology will accord with SOP011.The date of sampling and dispatch to the laboratory will be recorded as will the UIC for each sample. When the results for a sample are received the Laboratory Report number will be added and then an assessment of the results will be undertaken by a suitably experienced and qualified member of the site staff. Samples are sent to an accredited laboratory for testing.

Should treatment be required, to ensure that the material can be re-used in accordance with Earthworks Specification and Remediation Strategy, material will be accepted for treatment with the completion of the relevant section of Form ENV-003 (this procedure will

ensure that all materials are checked/ assessed prior to processing to confirm their suitability for treatment).

Upon excavation any materials deemed unsuitable for treatment or re-use will be quarantined for further testing and will be clearly labelled. A quarantine area sufficient for at least 500m^3, to the same design as the and forming part of the treatment pad is shown in Drawing D4583_06.

Quarantined materials that have been tested and subsequently considered unsuitable for treatment are to be removed from site.

A Verification Report will be produced by Vertase showing final fill and recovery locations for each batch of material (denoted by its UIC). The Verification Report will satisfy the requirements of the Cl:aire Code of Practice.

It is envisioned that six arisings types will require management / processing / treatment:

Group 1: Granular soils not requiring treatment -

Processed to remove oversize and deleterious material as required. This material will then be stockpiled for categorisation and visual assessment backed up by laboratory analysis as required to confirm treatment requirements. Should the material require treatment then it shall be re-incorporated into the treatment train. Otherwise this material will be segregated for re-use.

Group 2: Granular soils requiring treatment –

As Group 1, but with a determination of windrowing or stabilisation treatment requirements based on visual assessment backed up by laboratory analysis as required.

Group 3: Cohesive soils not requiring treatment –

Materials will be passed through a screen or processing bucket for the processing of cohesive materials. This will break up the cohesive materials to improve engineering properties of the soil and to ensure that the material is suitable for re-use as an engineered material. Lime amendment may be required for wet soils below optimal moisture content (OMC).

Group 4: Cohesive soils requiring treatment –

As Group 3 but the process will aid in homogenisation and allow the contamination within any discrete fractures, desiccation cracks or clasts to be treated. This material will then be classified, categorised and transported to the treatment area. This treatment will be through windrowing and/or stabilisation as required.

Group 5: Oversized hard materials –

From either excavation, or from the product of the screening operation, this material type will be visually assessed before being stockpiled and crushed to specification ahead of sampling and analysis prior to re-incorporation into the works.

Group 6: Unsuitable materials –

Generated either from excavations or from the screening operation, this material type will be segregated to the quarantine area for disposal off site following characterisation.

A record will be kept of all rejected wastes and materials. The Off-Site Disposal Record in Form ENV-003 shall be used.

If wastes are rejected and removed from site to landfill, all relevant documentation (e.g. Duty of Care) will be filed for inspection for a minimum of 2-years and included within the Validation/Verification Report.

2.6.2 Water

Vertase has accepted perched water as a waste requiring treatment via the removal of LNAPL. A treatment plant has been designed to manage the volume estimated and to ensure the discharge water quality meets the agreed discharge limits into Drain 3 (prior to offsite treatment via a third party). Form ENV-003 'Discharge Water' section shall be completed.

Encountered water in excavations and collected in sumps will be passed to the water treatment plant as described in Section 2.3. Records of encountered water will be made using forms ENV-010 or 015, as applicable.

Treated water, not re-used for the purpose of dust suppression, will be discharged in accordance with the discharge limits into Drain 3.

2.7 MPP2 Section B9 Conceptual Site Model and Risk Assessment

Appendix D details the Risk Screening and Environmental Control Measures (Risk Assessment) adopted throughout the works for the proposed treatment option.

2.8 MPP2 Sections B10 and B11 Pollution Control and Emission Monitoring Plans

Pollution control methods, associated with the siting of remedial activities are described in Section 2.1 Treatment activities are discussed in Section 2.3. Data recording pertinent to soils and water management are discussed in Section 2.6. Operating processes correctly, as described in previous sections will control pollution and limit emissions.

Based on Vertase' s experience of remediating similar sites, it is proposed that the levels presented in Table 2.2 are the targets not to be exceeded at either off-site receptors or at boundary locations.

Table 2.2 Environmental Monitoring Targets

Species	**Target Level**	**Method of Determination**
VOC's (General)	1 ppm	PID
Odour	No Nuisance	Olfactory
Noise	5 - 10dBA > Background	Sound Level Meter
Asbestos Fibres	0.01 f/cm^3	Filter Microscopy
Dust	No Nuisance	Visual
Surface Water Quality	No Deterioration	Laboratory Testing and Visual

The monitoring locations are shown on Drawing D4583_06. The monitoring plan table can be found in Appendix E.

Prior to commencement of operations, a background study will be undertaken to define the baseline to which results obtained during the works would be compared. The background study will be undertaken by the methods described in the following sub-sections.

Procedures for the monitoring requirements and record sheets are shown in Appendix C. For simple, routine monitoring Form ENV-002 may be used. Implemented mitigation will be recorded on Form CON-003, the Site Diary, the ultimate mitigation implemented being cessation of activities, if required.

2.8.1 Odour

Due to the nature of the site, its environment and site neighbours it is not anticipated that odour will be problematic; however, Vertase staff will undertake monitoring set out in a procedure that has regard to the recommendations in Environment Agency Technical Guidance Note H4 – 'Odour Management' 2011 and subsequent amendments. The Vertase odour monitoring procedure, SOP020, and record form ENV006 will be used. Form CON-003 may also be used to record odour where odours are detected and mitigation implementation required.

The olfactory monitoring will be undertaken daily at boundary monitoring locations (MP1,2,3,4,5, and 6) when the site is operational.

The Vertase Engineer / Technician, following the necessary site inductions and tool box talk, will proactively manage the works to minimise the generation of odours and such control procedures will include:

- managing excavation works to minimise odour generation as far as reasonably practicable (minimising surface exposure);
- temporarily covering (or infilling) exposed excavations to minimise further odour generation;
- assessing excavated soil material and stockpiles as soon as possible in order to implement covering (as appropriate) expediently to prevent/minimise odour release;
- suspended turning of windrows until prevailing weather conditions are considered more appropriate;
- facing down/blading smooth stockpiles;
- the sheeting of lorries;
- using carbon filtration for air purification (water treatment and forced ventilation beds);
- water treatment plant containerisation; and
- monitoring weather conditions on site and adapting site work accordingly.

2.8.2 Vapours and Gases

Monitoring during these works using a PID meter will be undertaken primarily for the purpose of reassurance. Vertase will be responsible for calibration on a weekly basis. The PID's will be calibrated with 100ppm isobutylene equivalents such that the value recorded will be in isobutylene equivalents, in accordance with SOP003.

Monitoring will be carried out at the same time as olfactory monitoring at the monitoring points previously described. Should results exceed 0.5ppm then 15-minute surveys will be undertaken. In such cases the 15-minute average for each location and minimum/maximum concentration will be recorded, together with the time that the monitoring was carried out. VOC levels at the boundary shall not exceed 1ppm.

Results will be recorded with the odour monitoring on form ENV-006 or in the Site Diary Form CON-003.

In order to ascertain whether excavation works, or materials arising from those works, may pose boundary vapour/gas issues, PID monitoring will be carried out at and around excavation faces and stockpiles.

2.8.3 *Dust, Particulates and Fibres*

The trained and competent Vertase Site Engineer shall make a daily assessment of airborne dust using visual means at the boundary monitoring points MP1,2,3,4,5 and 6.

The 'dust rating', below, will be adopted:

1. not noticeable
2. slight dust – not likely to be a nuisance off-site
3. moderate dust – not likely to be a nuisance off-site
4. unacceptable dust – likely to be a nuisance off-site (remedial action required)

The Vertase Site Manager, nominated deputies and all site staff, following the necessary site inductions and tool box talk, will proactively manage the works to minimise the raising of dust and controlling risk. Such control procedures will include, where appropriate:

- carrying out operations with the potential to generate significant dust away from the sensitive receptors whenever possible;
- using dust suppression spray bars on crushers and maintain a water bowser on site as required;
- the cleaning of access roads to the site and internal routes by a road-sweeper as necessary;
- suspending some operations during unfavourable weather conditions, i.e., crushing if wind is blowing towards or beyond site boundaries;
- use of jet-wash/wheelwash facilities;
- the use of tractor and bowser to damp down site haul routes;
- the damping down of spoil and excavations where appropriate;
- the damping down or sheeting of stockpiles as necessary;
- the facing down/blading smooth stockpiles;
- the minimising of drop heights; and
- the sheeting of lorries.

Where asbestos is identified and remedial works undertaken to address the contamination, monitoring for asbestos fibres, primarily for the purpose of reassurance, will be undertaken in accordance with the Plan Of Works.

Where there is a risk of fibre generation measures, will be adopted to mitigate the aerial transport of asbestos fibres such as the use of additional water sprays/dampening. Ordinarily, the mitigation and controls described previously in relation to general dust will limit fibre release in any case.

2.8.4 Noise

The site lies >350m from residential properties close in an industrial environment; however, monitoring will be undertaken to demonstrate compliance with the EA standards of:

- 5dBA above background at receptor – level below which there is marginal significance
- 10dBA above background at receptor – level above which complaints are likely

Pre-works background monitoring will be undertaken at the off-site locations reported in Section 2.1.1 in order to determine targets. Calculations will then be undertaken to determine appropriate limits at the site boundary monitoring positions.

Surveys will be undertaken by a competent operative. Data will be recorded using the Form ENV005. Operations will be undertaken as per the standard procedures SOP021.

In order to demonstrate that the remedial activities are not causing an exceedance of the specified / determined limits at the receptor locations, monitoring will be undertaken at the boundary monitoring positions:

- as soon as practically possible after commencement of treatment activities;
- weekly thereafter; and
- when operations change.

Should the levels be exceeded further monitoring will be undertaken at the off-site receptors, where practical. If exceedances are determined at the receptor properties themselves, a study will be undertaken by way of noise inventory. Each operation and piece of plant associated with the permitted activities will be subject to individual surveys. The sum of the contributing factors will be calculated using BS5228 guidance to determine the site derived noise increase at the five receptor locations.

Generally, best practicable means will be employed to ensure that the level of noise generated on site is as low as reasonably practicable (ALARP), thus:

- plant and machinery shall only be operated during the agreed working hours;
- selection of 'low noise' plant;
- insulation, where necessary, of forced ventilation plant and water treatment plant components (using non-flammable foam);
- idle plant shall be switched off;
- plant will be serviced in accordance with manufacturers / supplier's guidance and in accordance with statutory responsibilities;
- all plant and machinery fitted with adequate silencers not be operated unless in good condition; and
- noisy plant being positioned away from boundaries with sensitive receptors, or behind earth bunds, when possible.

Noise barriers / additional insulation will be installed if management techniques prove ineffective.

2.8.5 Water

Water (General)

The risk to sensitive receptors via the horizontal and lateral migration of potential contaminants during the treatment process is reduced to negligible due to the bunded construction of the treatment area design shown in Drawing D4583_08. A puddle pump will be available to direct standing water to the water treatment plant or via a tractor/bowser. The same system of water transfer will be available for the removal of water from excavations. As part of the management of the process a daily walkover will be made by the Site Manager who will inspect and record the structural integrity of pads and bunds. Improvements to defects will be immediately actioned in line with the Permit requirements. Capacity of the sump will be carefully reviewed to ensure sufficient capacity if heavy rainfall is forecast.

Spill kits will be available on site in the event of accidental leakage from site traffic/ delivery of fuel to bowsers etc. outside of the treatment pads. All fuel bowsers will be double bunded and located within the site compound area on an impermeable surface at distance from manholes, excavations and boreholes etc.

Surface Water

In order to demonstrate that there is no worsening of reen/ditch water quality during the remediation works, surface water monitoring (at position MP5) will be undertaken. Up to 4no monthly samples will be taken and analysed for an appropriate suite of contaminants (suite tbc depending on the results of the baseline analysis).

The visual appearance of the water in the reens/ ditches will be noted. Any chemical or visual deterioration in water quality resulting from the discharge will result in the cessation of discharge until any problem with the water treatment plant has been adequately addressed.

2.9 MPP2 Section B12 Record Keeping – Commissioning, Operating and Maintenance

Please refer to Appendix F.

APPENDIX A

Drawings

A3

Key

Site Boundary

Rev.	Description	Revised By	Date
	FIRST ISSUE		26-04-2021

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Sheffield Office: Tel: 01246 813289 Fax: 01246 812963

Site Address:

Llanwern Coking Works
Llanwern

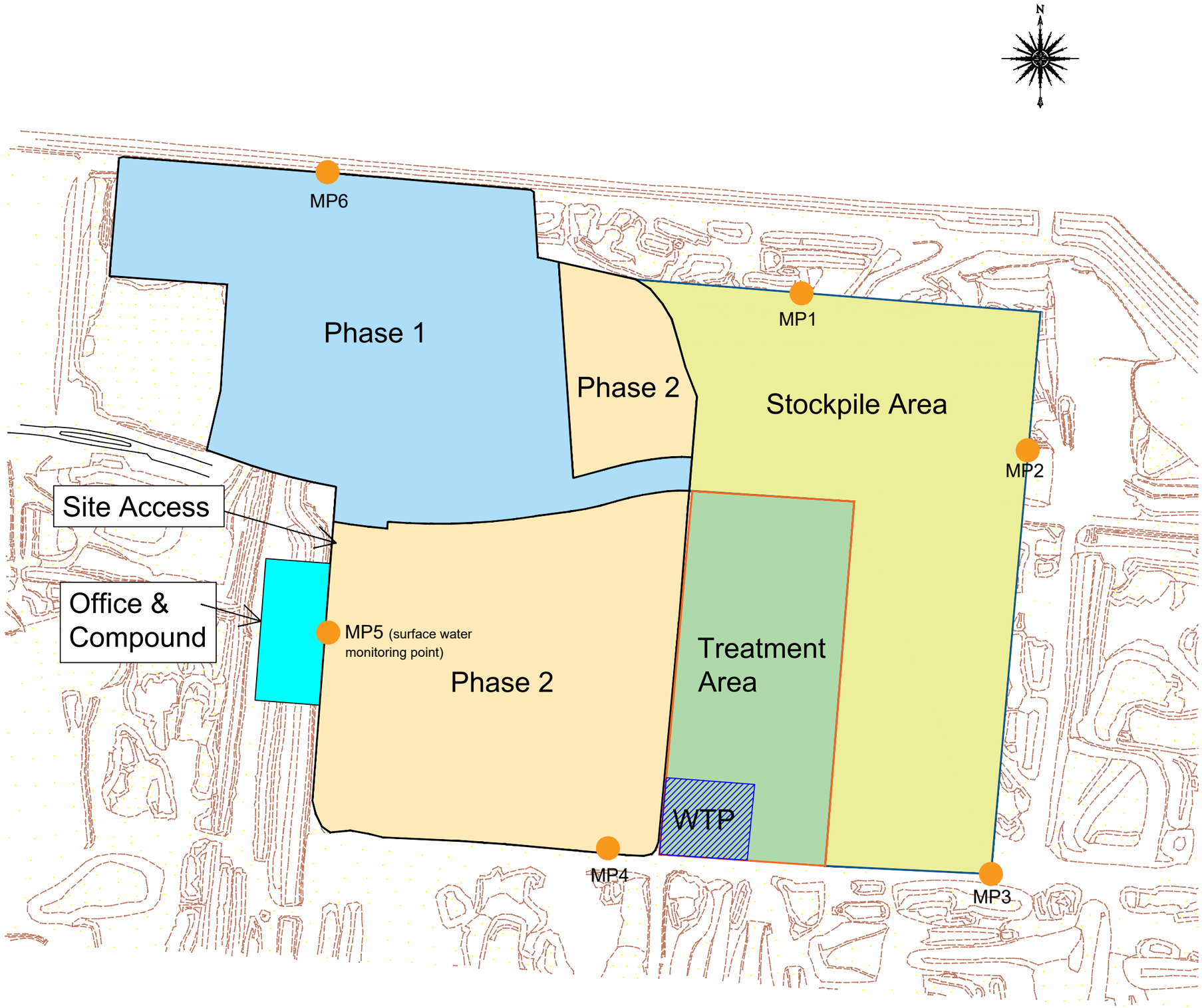
Rev:

Title: Site Location Plan

Client: St Modwens

Drawn: JGL	Checked: AR	Approved: AR
Dwg: D4583_02	Contract: 4583STM	Scale: NTS

A3



Key

MP6 Environmental Monitoring Point

Rev.	Description	Revised By	Date
	FIRST ISSUE		26-04-2021

Vertase FLI

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Sheffield Office: Tel: 01246 813289 Fax: 01246 812963

Site Address:

Llanwern Coking Works
Llanwern

Rev:

Title: Site Plan

Client: St Modwens

Drawn: JGL	Checked: AR	Approved: MK
Dwg: D4583_06	Contract: 4583	Scale: 1:3000

A3

Key

Site Boundary

Tar/Free Product Impacted Soils
(13,889m³)

Rev.	Description	Revised By	Date
	FIRST ISSUE		19/04/2021

Vertase FLI

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Bristol Head Office: Tel: 01275 397600 Fax: 01275 397601

Sheffield Office: Tel: 01246 813289 Fax: 01246 812963

Site Address:

Llanwern Coking Works
Llanwern

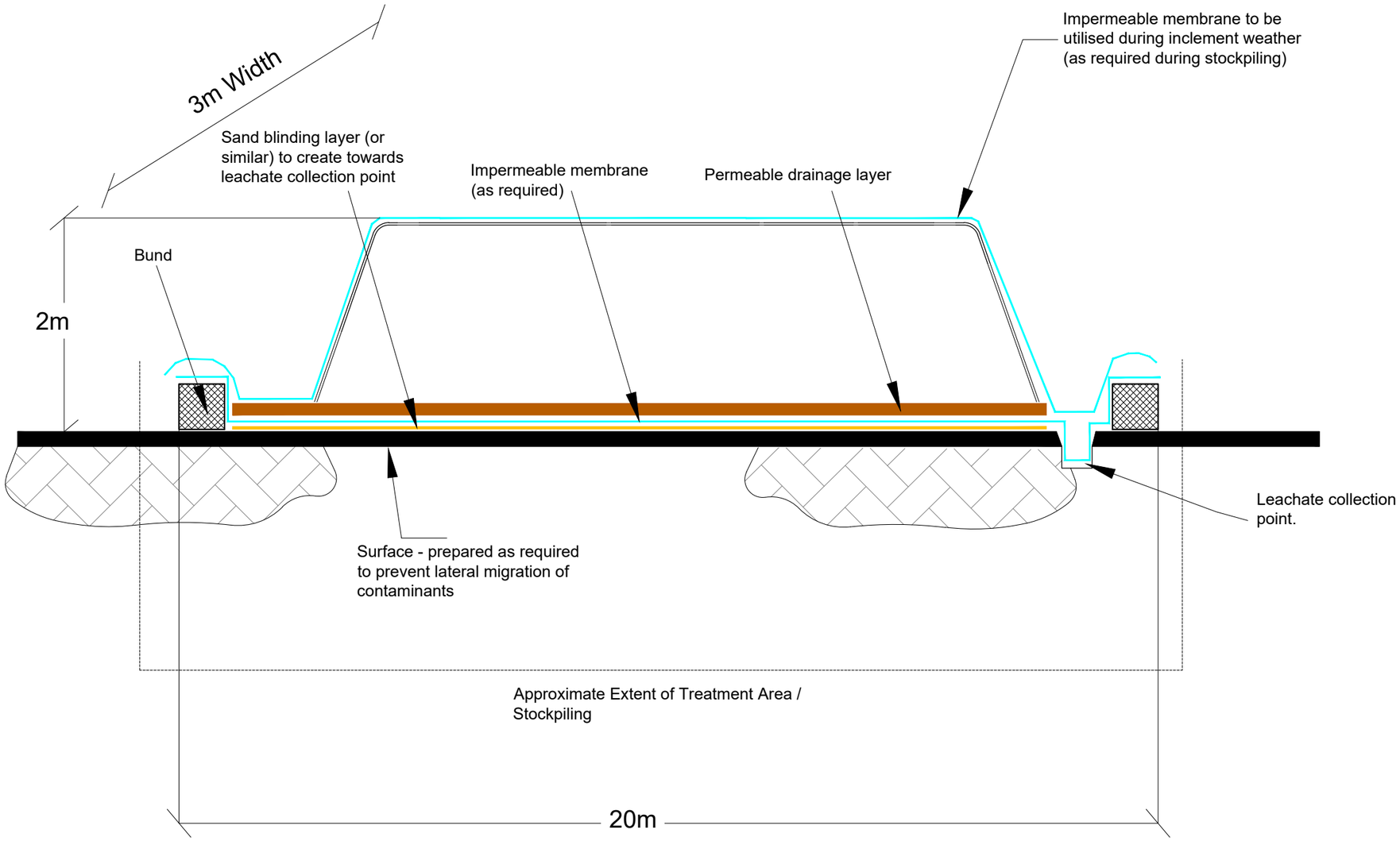
Rev:

Title: Tar/Free Product Impacted Soils

Client: St Modwens

Drawn: JGL	Checked: AR	Approved: AR
Dwg: D4583_07	Contract: 4583	Scale: 1:3000

A3



Rev.	Description	Revised By	Date
	FIRST ISSUE		26-04-2021

Vertase FLI

Contaminated Land, Brownfield & Environmental Contracting Specialists

email: info@vertasefli.co.uk
www.vertasefli.co.uk

Bristol Head Office: Tel: 01275 397600 Fax: 01275 397601

Sheffield Office: Tel: 01246 813289 Fax: 01246 812963

Site Address:

Llanwern Coking Works
Llanwern

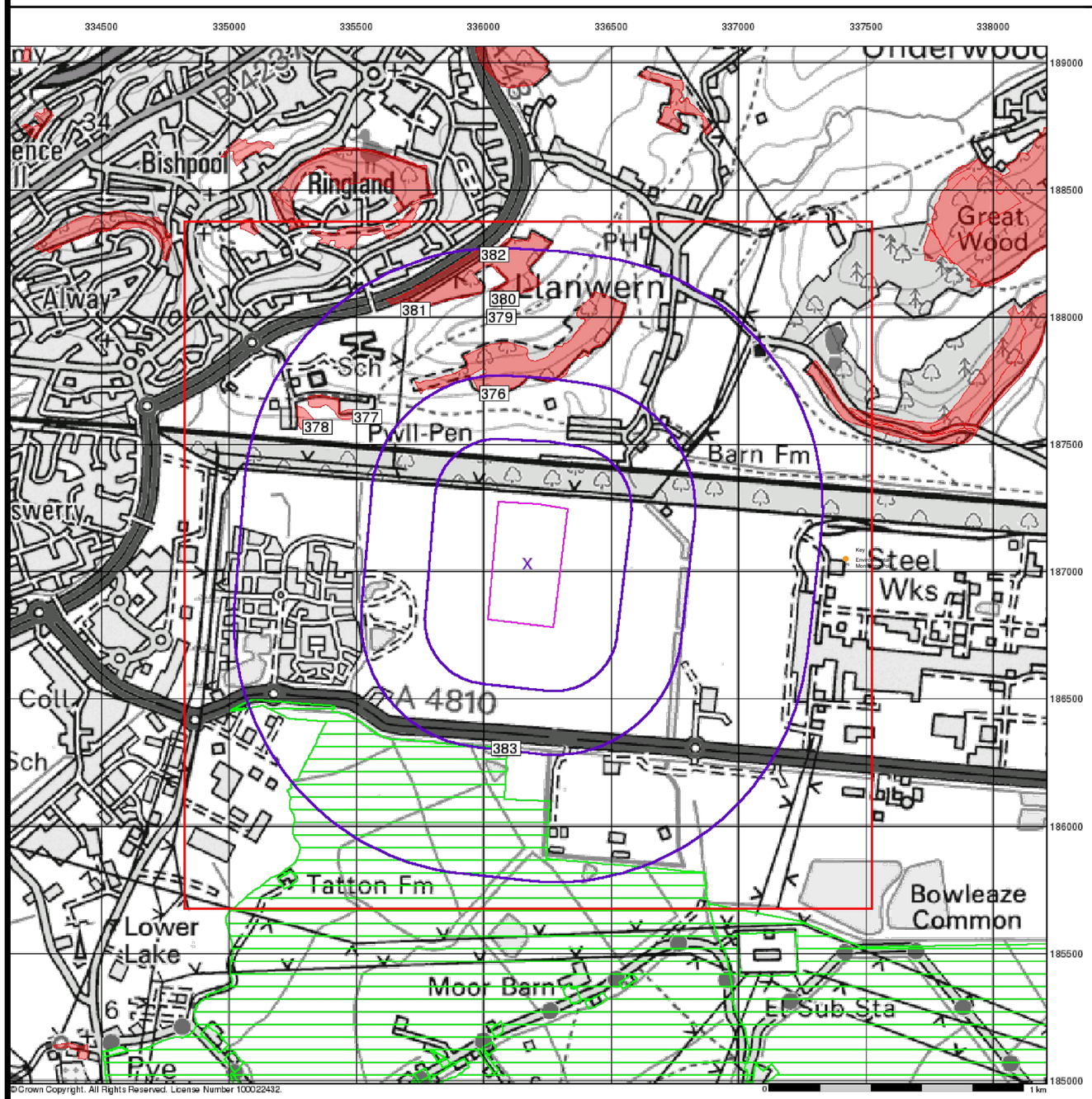
Rev:

Title: Treatment Schematic

Client: St Modwen's

Drawn: JGL	Checked: AR	Approved: MK
Dwg: D4583_08	Contract: 4583STM	Scale: NTS

A3



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Sensitive Land Uses

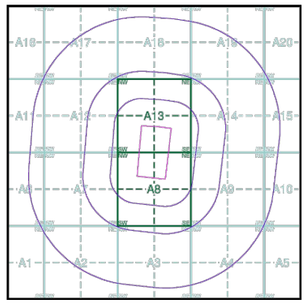
General

Specified Site
Specified Buffer(s)
Bearing Reference Point
Slice
Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	251024562_1_1
Customer Ref:	LlanwernCoking
National Grid Reference:	336170, 187030
Slice:	A
Site Area (Ha):	12.53
Search Buffer (m):	1000

Site Details

, 10, Tennyson Avenue, Llanwern, Newport, NP18 2DY

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Fax: 0844 844 9951
Web: www.envirocheck.co.uk

A Landmark Information Group Service v15.0 04-Aug-2020 Page 5 o

Rev.	Description	Revised By	Date
	FIRST ISSUE		26-04-2021

Vertase FLI

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Bristol Head Office: Tel: 01275 397600 Fax: 01275 397601

Sheffield Office: Tel: 01246 813289 Fax: 01246 812963

Site Address:

Llanwern Coking Works
Llanwern

Rev:

Title: Designated Areas

Client: St Modwens

Drawn: JGL	Checked: AR	Approved: MK
Dwg: D4583_09	Contract: 4583	Scale: See Bar

APPENDIX B

WAMITAB

Certification

wamitab

Qualification Title:

WAMITAB Level 4 Medium Risk Operator Competence for Contaminated Land Remediation

Qualification Accreditation Number:

601/8518/1

This Certificate is awarded to

Claire Lilley

Awarded: 04/12/2017

Serial No:28700/MROC13/1

Authorised

Chris James
Chief Executive Officer, WAMITAB

Regulated by Ofqual

For more information see http://register.ofqual.gov.uk

Corff dyfarnu cydnabyddedig
CYMWYSTERAU CYMRU QUALIFICATIONS WALES
Recognised awarding body

The qualifications regulators logos on this certificate indicate that the qualification is accredited only for England, Wales and Northern Ireland.

00118957

Credit certificate

This certificate determines credit awarded to:

Claire Lilley

Units gained:

		Credit Value	Credit Level
A/508/0756	Maintain health and safety in the waste resource management industry	4	4
F/508/0757	Manage the environmental impact of work activities	3	4
F/508/0760	Manage the movement, sorting and storage of waste	5	4
R/508/0861	Control work activities on a waste management facility	6	4
D/508/1009	Manage site operations for the remediation of contaminated land	5	4
R/508/1007	Manage the transfer of outputs and disposal of residues from remediation of contaminated land	5	4

Awarded: 04/12/2017

Serial No.: 28700/OCS01/1

Authorised

Chris James
Chief Executive Officer, WAMITAB

Regulated by Ofqual

For more information see http://register.ofqual.gov.uk

Corff dyfarnu cydnabyddedig
Cymwysterau Cymru Qualifications Wales
Recognised awarding body

The qualifications regulators logos on this certificate indicate that the qualification is accredited only for England, Wales and Northern Ireland.

00118955

Operator Competence Certificate

Title:

Non-Hazardous Waste Treatment and Transfer

This Certificate is awarded to

Claire Lilley

Verification date: 19/06/2019

Authorised:

Learner ID: 28700

Certificate No.: 5145397

Date of Issue: 19/06/2019

WAMITAB Chief Executive Officer

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

This certificate is jointly awarded by WAMITAB and the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.

00140594

wamitab

Qualification Title:

WAMITAB Level 4 Medium Risk Operator Competence for Non-Hazardous Waste Treatment and Transfer

Qualification Accreditation Number:

601/8528/4

This Certificate is awarded to

Claire Lilley

Verification date: 19/06/2019

Authorised:

Chris James
WAMITAB Chief Executive Officer

Learner ID: 28700

Certificate No.: 5145397

Date of Issue: 19/06/2019

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Cymwysterau Cymru Qualifications Wales
Recognised awarding body

Regulation

The qualifications regulators logos on this certificate indicate that the qualification is accredited only for England, Wales and Northern Ireland. Qualifications Wales regulates this qualification where it is awarded to learners assessed wholly or mainly in Wales.

00140592

Credit certificate
This certificate determines credit awarded to:

Claire Lilley

Units gained:

		Credit Value	Credit Level
A/508/0756	Maintain health and safety in the waste resource management industry *		
F/508/0757	Manage the environmental impact of work activities *		
F/508/0760	Manage the movement, sorting and storage of waste *		
J/508/0887	Manage the reception of non-hazardous waste	6	L3
K/508/0980	Manage transfer and disposal from non-hazardous waste treatment and recovery operations	8	L4
M/508/0995	Manage site operations for the treatment of non-hazardous waste	8	L4

Verification date: 19/06/2019

Authorised:

Learner ID: 28700

Certificate No.: 5145397

Date of Issue: 19/06/2019

*Unit/s marked with an asterisk have been achieved previously

Chris James
WAMITAB Chief Executive Officer

Regulated by Ofqual

For more information see http://register.ofqual.gov.uk

Corff dyfarnu cydnabyddedig
Cymwysterau Cymru Qualifications Wales
Recognised awarding body

The qualifications regulators logos on this certificate indicate that the qualification is accredited only for England, Wales and Northern Ireland. Qualifications Wales regulates this qualification where it is awarded to learners assessed wholly or mainly in Wales.

00140593

Certificate No. OCC8297

Operator Competence Certificate

Title:

Contaminated Land Remediation

This Certificate is awarded to

Claire Lilley

Awarded: 04/12/2017

Authorised

WAMITAB Chief Executive Officer

CIWM Chief Executive Officer

This certificate is jointly awarded by WAMITAB and the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.

The Chartered Institution of Wastes Management

00118953

Continuing Competence Certificate

This certificate confirms that

Claire Lilley

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 14/01/2020

TSNH	Transfer - Non Hazardous Waste
TMNH	Treatment - Non Hazardous Waste
CLR	Contaminated Land Remediation

Expiry Date: 14/01/2022

Verification date: 07/01/2020

Authorised:

WAMITAB Chief Executive Officer

Learner ID: 28700

Certificate No.: 5157978

Date of Issue: 14/01/2020

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

00133062

APPENDIX C

Worksheets and Procedures

DAILY SITE DIARY

Week No:	Date:	Project Name:	Project No:

Security (night activity & condition of site fencing):

Weather:

Name of Visitors to Site:	Reason for visit:

Activity Report:

Hours Lost this day:	Reason for Delay:

Environmental Monitoring in place (tick if applicable)	Dust:	Noise:	Odour:	Vibration:	Asbestos:	Mud on Road: Yes / No

Complaints / Non-conformances:

Labour on Site	
Job Title	**Total**
Site Manager	
Site Supervisors	
Engineer	
Site Operatives	
Labourers	

Inspection & Tests:

Plant in Use	Total

Name:	
Signed:	

Other Trades on Site	Total

Distribution: Project Lead / Main File

Site:		**Contract Ref:**		**Organisation:**	
Date:		**Site Manager:**		**Assessor name:**	
Daily activity:					

		ODOUR									DUST		NOISE	HOUSEKEEPING			
Location	**Time**	**Detectability**	**Intensity**	**Quality**	**Hedonic tone**	**Odour frequency**	**Location sensivity**	**Odour source**	**PID reading**	**Odour Control Inspection**	**Visual**	**PM10**	**Average**	**Litter**	**Pests**	**COMPLAINTS**	**ACTIONS REQUIRED**
	Start	(Y/N)	(0 to 6)	(Description)	(-4 to + 4)	(1-5)	(H/M/L)	(1 to 5)	(ppm)	On/Off	Y/N	(ug/m3)	(dBa)	(Y/N)	(Y/N)		(Description)

Meteorological and environmental conditions							**General Notes**
Wind speed	**Wind Direction**	**Temp**	**Weather description**	**Cloud cover**	**Ground conditions**	**Barometric Pressure**	
(mph)	(e.g. N, SW)	(^{0}C)	(e.g. rain, sun, wet, dry)	(0 to 8)	(e.g. wet, dry)	mbar	

Assessors Signature.....

ODOUR MEASUREMENT

Detectability
Yes or no. If "no", proceed to meteorological and environmental conditions.

Intensity
1.Barely traceable
2.Faint/weak
3.Moderate
4.Strong
5.Intense/unbearable

Quality
Describe.

Hedonic Tone
3. Very pleasant
2. pleasant
1. slightly pleasant
0. Neutral
-1. slightly unpleasant
-2. unpleasant
-3. Very unpleasant / offensive

Frequency
1.Local and infrequent (only detectable when the wind drops)
2.Infrequent as above, but detected away from site boundary
3. More widespread and fairly frequent
4.Frequent and widespread(up to 50m from the site boundary)
5.Persistent and widespread (odour detected >50m from site boundary

Location sensitivity
Low – e.g. footpath road field
Medium – e.g. commercial buildings, industrial premises
High – e.g. Housing, public amenities, public open space.

Odour Source
1. 100% of the odour detected is from external source (non site)
2. 75% of the odour detected is from external source, 25% from site source.
3. 50% of the odour detected is from external source, 50% from site source.
4. 75% of the odour detected is from site source, 25% from external source.
5. 100% of the odour detected is from a site source.

METEOROLOGICAL CONDITIONS

Wind Speed
1. Calm, still
2. Light breeze (air movement just felt on face, leaves rustle)
3. Moderate breeze (Raises dust, leaves, paper in constant motion)
4. Strong breeze (as above plus large branches in motion, difficulty using umbrellas)
5. Gale (Twigs break from trees, difficult to walk or remain still)
6. Storm (Trees uprooted, property damaged)

Wind direction
Where the wind originates based on the eight compass points (e.g. N, SW etc).

Cloud Cover
0.No cloud
1.13% cloud
2.25% cloud
3.38% cloud
4.50% cloud
5.63% cloud
6.75% cloud
7.88% cloud
8.Full cloud cover

Materials Audit

Project Ref:		Project Name:		Client:		Project Engineer:	

Materials Origin					Initial Characterization (Chemical/ Geotechnical)				Treatment		Reinstatement			Off-Site Disposal Record Ref	Comments
Grid Square	Depth	Geological Description / Classification	Date Generated	Volume (m3)	No. Samples	Testing Ref	Stockpile Ref	Destination (Treatment/ Reinstatment/ Disposal)	Processing / Treatment Type	Location Ref	Grid Square/Location Ref	Depth	Date		

ENV-003 MATERIALS MANAGEMENT SOIL WATER AUDIT - Issue 1
Off-site Disposal Record

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2	**VFLI Disposal Ref**	**Haulage Company**	**Waste Carriers Licence Number**	**Disposal Site**	**Disposal Site Permit Number**	**Waste Description**	**European Waste Code**	**Purchase Order**	**Quantity**	**Date**	**VFLI Ticket No**	**Haulage Company Ticket No.**	**Tonnage**	**Tipping Ref.**
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
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35														
36														
37														

ENV-003 MATERIALS MANAGEMENT SOIL WATER AUDIT - Issue 1
Discharge Water

Project Ref:		Project Name:			Client:		Project Engineer:	
Origin	**Storage Location**	**Treatment Activity**	**Visual Classification**	**Volume(m3)**	**No. Samples Tested**	**Test Report No.**	**Result PASS/FAIL**	**Discharge/Disposal**

NOISE MONITORING

Contract Title: ..... Contract Number: .....

Date: ..... Weather: .....

Ref	Max	LPeak	LEQ	L10	L90	Location

Influences / Comments

Sketch

Taken by:

Instrument: CEL

Note: All measurements in dBA

ODOUR ASSESSMENT FORM

Contract Title: ..... Contract Number: ..... MPL.Number: EAWML

Date: ..... Site Manager: ..... Type of Treatment: .....

Taken By: ..... Start Time: ..... Finish Time: .....

Complaint Received	YES/NO	Date	
Location of Complaint Area		Grid Reference (where not a property)	

Weather		Wind (strength and direction)	
Temperature (deg. C)		Bar Pressure (mbar) (rising/falling)	
% Cloud Cover		General Air Stability	
General Air Quality		Ground Condition	

Plan attached showing location and extent of odour Yes/No

Additional Comments

Action Required

Reported to on site:

Signature:

ODOUR ASSESSMENT FORM

Location	Odour Intensity	Odour Extent	Location Sensitivity	Odour Description	External Sources Of Odour	Waste Sources of Odour

GROUNDWATER MONITORING

Site Location:	**Job Number:**
Date:	**Operator:**
Weather Conditions/ATM Pressure Trend:	**Ground Conditions:**

Borehole Ref	Depth to Product (mBTM)	Depth to GW (mBTM)	Depth to Base of Well (mBTM)	Samples collected for laboratory analysis:

Comments

GROUND WATER PRODUCT MONITORING DATA

Project Ref: **Project Name:** **Engineer Name:**

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

GROUND WATER PRODUCT MONITORING DATA

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

GROUND WATER PRODUCT MONITORING DATA

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

GROUND WATER PRODUCT MONITORING DATA

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

GROUND WATER PRODUCT MONITORING DATA

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

GROUND WATER PRODUCT MONITORING DATA

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

GROUND WATER PRODUCT MONITORING DATA

Date	Time	Location	Depth to Product (mBGL)	Depth to GW (mBGL)	Depth to Base of Well (mBGL)	Thickness of product (m)	Type of Product	Colour	Viscosity (High - Honey - 10) (Low - Water - 1)	Monitored with:	PID (ppm)	Assessor	Comments

SOP 003 - STANDARD OPERATING PROCEDURE PHOTO-IONISATION DETECTOR (PID) (SOIL AND GROUNDWATER SCREENING)

PURPOSE / BACKGROUND

This standard operating procedure (SOP) covers monitoring of agitated head space for volatile organic compounds (VOCs) using a PID. *However*, General Instructions, Tools and Equipment, Limitations of Method and Preparation contain general important information for the proper care and maintenance of a PID.

This field procedure allows for soil and groundwater samples to be screened by means of agitated headspace analysis and ambient air, for VOCs, including aromatic compounds, amines, alkanes (>C4), alkenes, heterocyclics and certain chlorinated solvents, but does not indicate a specific compound. The values obtained by the instrument in parts per million per (ppm) provide a reasonable indication of the hydrocarbon vapours that may be present in soil pore spaces and in water.

For the purpose of field screening of soil samples a 10.6v lamp is recommended. An optional 11.7v lamp should be used if ionised chlorinated solvents are also suspected to be present – however it should be noted that all VertaseFLI PIDs are fitted with the 10.6v lamp as standard. A list of compounds included within the suite for which the 10.6v lamp has been designed to measure is attached.

In the event that a specific compound is known to be present exclusively in the soil sample, then the PID reading needs to multiplied by a conversion factor to give a more accurate reading. Details of conversion factors for various compounds are contained in the attached document.

Positive readings can be used as field evidence that VOCs are present within the soil fabric and can be used as confirmation that soil samples are being submitted for an appropriate analytical suite.

A reading of equal to or greater than 100ppm is usually considered to be significant. In the absence of any known sources of solvents on a site, a reading of 10ppm may be considered to be of equal significance with respect to field evidence of contamination.

A reading of >1ppm in ambient air is considered to be the Human Health limit based on the eight hour exposure limit for Benzene. If readings are >1ppm operatives in effected area should be instructed to wear a half mask with carbon filter or other filter depending on known contaminants on site.

GENERAL INSTRUCTIONS

1. This SOP provides sequential instructions which should be undertaken in the correct order.
2. If the sequence of instructions can not be completed as described, the Vertase FLI Project Lead should be informed so that amendments can be made or steps can be clarified.
3. This SOP should be read in conjunction with any other SOP's that are applicable to the works being undertaken.

TOOLS, MATERIALS AND EQUIPMENT

- MiniRae3000 PID.
- 100ppm Isobutylene calibration gas.
- Gas Regulator.
- Carbon filter.
- Moisture / Dust Filters.
- Tubing.
- Sealable clear plastic bags or sample jar and cling film.
- Appropriate labelling materials.
- Agitating instrument (agitation of bagged sample can be achieved by hand).

PPE – Standard PPE as a minimum: disposable gloves; safety boots; high vis jacket; and hardhat. Additional PPE as per site rules.

LIMITATIONS OF METHOD

1. PID units are very susceptible to moisture and heat, which may cause failure of the unit. When using in a saturated vapour stream (monitoring air stream from a force ventilation / extraction system for e.g.) it is important to change the filter as soon as it shows condensation build up.
2. Avoid using a PID in adverse weather conditions (moderate to heavy rain or fog) if possible.
3. Exposure to dust and moisture can cause the PID to report false readings. If this occurs the PID will require cleaning internally which requires great care (refer to instruction manual).
4. The filter inherently causes a delayed response in recording VOCs, so it may be difficult to respond to sudden changes in real time.
5. Exhaust fumes generated from motor vehicles and plant will result in elevated readings being recorded.
6. If the PID is exposed to extreme levels of VOCs (greater than circa 500ppm) then this may 'poison' / damage the PID cause the PID to 'wander' resulting in false readings.
7. Excessive or prolonged exposure to VOCs can 'poison' / damage the PID. This may be evidenced if the PID is recording elevated readings in clean air (away from VOC sources or through the carbon filter).

PREPARATION

1. Access to site should be agreed in advance with relevant people (site owners, client etc).
2. Site engineers should have received site specific H&S induction by Site Managers.
3. Permits to Work should be obtained in advance, where required (to be advised by Site Manager).
4. Site induction to be received by all site engineers, where applicable (to be advised by Project Lead)
5. The aforementioned equipment needs to be booked out by the equipment supervisor and on completion of the monitoring booked back in. Any faults should be reported promptly to the equipment supervisor.
6. The equipment supervisor is responsible for the aforementioned equipment which should be checked prior to each site visit to ensure that it is in a good state of repair, fully operational (i.e. fully charged) and that calibration certificates, where appropriate, will be valid at the time of monitoring.
7. If the site engineer suspects that the unit is faulty then carry out a 'bump' test using the 100ppm Isobutylene calibration gas. Readings +/- 3ppm of 100ppm are considered an acceptable tolerance.
8. The PID requires calibration (refer to user manual for instructions) on the commencement of a new project and then once a week thereafter – unless 'bump' tests show that the PID readings have exceeded the 3ppm tolerance limit against the 100ppm Isobutylene gas, or the engineer suspects readings have 'wandered' – in which case they should carry out a 'bump' test to confirm. A record should be kept of the results of each calibration and each bump test.
9. As excessive exposure to VOCs can 'poison' / damage the PID, calibration should only be carried out when necessary.
10. The PID should be calibrated to both the 100ppm Isobutylene Calibration gas – and to clean air, ideally by using the carbon filter. If there is no carbon filter available in the PID case, then the equipment manager should be informed and a replacement ordered. If no carbon filter is available to carry out the clean air calibration, then carry out the clean air calibration away from any potential sources of VOCs including roads.

PROCEDURE FOR AGITATED HEADSPACE TEST	
1.	During soil sampling for chemical and geotechnical laboratory scheduling, a small quantity of soil should be retained at regular intervals throughout the ground profile, changes in lithology or where visual or olfactory evidence of contamination has been observed.
2.	The sample should be placed into a plastic bag or a glass/plastic cup/tub, sealed and appropriately identified with sample location and sample reference / depth.
3.	Within 5 minutes of sampling each soil sample should be subject to agitated volatile headspace analysis.
4.	Manually agitate the soil before inserting the PID probe into the chosen soil receptacle – be very careful to not push the end of the probe into the soil as this will block the inlet and cause the PID to malfunction. When using a plastic/glass container a bulk bag can be stretched over the opening to create a temporary seal and the PID probe pushed through the bag to obtain a reading.
5.	The same method can be used to screen groundwater during sampling. The use of a plastic or glass container is preferable to a bag.
6.	Record the maximum PID reading and note the time period that elevated readings are maintained. Wait for the readings to stabilise (usually lower than the maximum as VOCs are trapped in soil and suddenly liberated when agitated – resulting in a higher reading). When the PID readings have stabilised record the stabilised reading in your note book. A stabilised reading is usually of greater importance if you may only report one reading – otherwise report both.

RECORDS AND DOCUMENTATION	
1.	Monitoring results to be recorded in field note book or on standardised form.
2.	Date and time of attendance of site.
3.	Any H&S related incidents (slips, trips, falls etc).
4.	Permits to Work and site inductions, where applicable.
5.	Any relevant TBRAs and/or RAMS.
6.	All operatives associated with the work are to be given a tool box talk to describe the content of this SOP and related documentation and sign a register to acknowledge that they have received such instruction and understand the method and health and safety issues related to the task.

PURPOSE

This standard operating procedure (SOP) covers the taking and recording of general soil samples from trial pits, boreholes, windrows and stockpiles. Where specific parameters are required or where the operative further advice should be sought from the line manager of laboratory.

GENERAL INSTRUCTIONS

1. This SOP provides sequential instructions, which should be undertaken in the correct order.
2. If the sequence of instructions can't be completed as described, the Vertase FLI Project Lead should be informed so that amendments can be made or steps can be clarified.
3. This SOP should be read in conjunction with any other SOP's that are applicable to the works being undertaken.

TOOLS, MATERIALS AND EQUIPMENT

- Clean stainless steel trowel.
- Measuring Tape.
- Sampling tubs/jars appropriate for sampling soils. Quantity and type of container based on analysis required. Advice should be sought from the laboratory prior to visiting the site if unsure.
- PPE - disposable gloves, hard hat, safety boots and safety glasses as minimum.
- PID and zip lock plastic bags if potential volatiles are expected.
- GPS if accurate recording of sample positioning is required.
- Face fitted mask suitable for volatiles (best practice to bring due to unforeseen contamination)
- Coolbox, ice pack, bubble wrap

PREPARATION

1. Access to site should be agreed in advance with relevant persons (client, site manager etc).
2. Site engineers should have received site-specific H&S induction by the site manager.
3. Permits to Work / Dig should be obtained in advance, where required.
4. Appropriate paperwork to include blank chain of custody forms.
5. Where the site has been classified as an **asbestos** site, you must comply with the full requirements of the site specific asbestos risk assessment and Plan of Work (POW).

PROCEDURE

Label all sample containers with permanent ink prior to filling with soil.

If breaking ground, ensure a CAT scanner is used and service drawings are reviewed.

Ensure all glass sample containers are filled to the top with soil pushed in firmly, leaving no room for air.

When sampling suspect asbestos, ensure that soils and suspect ACMs are placed in separate plastic tubs (different forms of suspect ACM should also be placed in separate tubs). Combining samples results in falsely elevated asbestos concentrations in soils.

Sample jars/tubs are to be placed in cool boxes securely packaged with bubble wrap. Ice packs are to be placed in the cool boxes such that samples are kept below 4°C.

Trial Pits and Boreholes

1. Measure the depth of the sample. The depth may be specific or have a range between two depths (composite sample). For boreholes, use the side of a trowel to scrape across the exposed soil core so a fresh surface is visible for soil logging and sampling (removes smearing).
2. In the field notebook, record the time, location, depth and description of the sample, making a note of any visual or olfactory evidence of contamination, such as oily films, staining, odours etc.
3. For trial pits excavated to a depth of less than 1m bgl, the best technique for logging and obtaining a soil sample is to climb into the pit and take it directly from the side of the pit, providing it is stable and there is no risk of ingress of groundwater/vapours/gas. For excavations greater than 1m bgl samples should be taken from the excavator bucket.

Composite Windrow/Stockpile Samples

1. A validation sample is to be representative of the whole cross sectional area of a windrow or stockpile. Begin excavating a hole into the side of the windrow or stockpile with an excavator. If an excavator is not available then a clean hand auger or trowel should be used.
2. Samples should be taken from within the stockpile not the surface to get a representative sample. Take a small amount from all over the stockpile to fill the sample container to the top. If the analysis does not include VOCs, SVOCs or TPH then a bucket can be used for mixing.
3. Clean the equipment thoroughly using de-ionised water before taking the next composite sample.
4. The volume of composite samples per m3 of soil should be discussed with the project manager prior to sampling. When creating stockpiles / windrows it is best practice to create piles equal to the sampling frequency, ie: If one sample per 250 m3, create 250 m3 piles of soil.

PROCEDURE

Hotspot Removal Validation Sampling

1. After excavating a hotspot, samples should be taken from the sides and base of the excavation void to confirm that the extent of the contamination has been removed.
2. Validation samples should be labelled using the standard labelling system: N, S, E, W, or B (base) followed by description of excavation that identifies the excavation according to agreed site plans. If more than one N sample is taken then N1, N2 etc is appropriate, eg: N1Tank1, N2Tank1.
3. Validation samples should be taken from the depth of contamination was originally found to be a problem. If there is no specific depth then a composite sample should be taken using an excavator bucket and taking a sample at regular intervals up the side of the excavation and mixing in a stainless steel bucket. A clean stainless steel trowel should be used when taking samples from the excavator bucket.
4. Validation samples at the base of the excavation should be taken using an excavator bucket in a similar way to the samples taken from the sides of the pit.
5. If the excavation is less than a depth of 1m bgl, then validation samples can be taken by hand from inside the pit providing the pit walls are stable.

RECORDS AND DOCUMENTATION

The following should be recorded in a field notebook or preferably on a standardised form:

1. Location, date and time of sampling, ground conditions, weather conditions.
2. Any H&S related incidents (slips, trips, falls etc).
3. Permits to Work / Dig and site inductions, where applicable.
4. All operatives associated with the work are to be given a tool box talk to describe the content of this SOP and related documentation and sign a register to acknowledge that they have received such instruction and understand the method and health and safety issues related to the task.

Chain of Custody

1. A chain of custody should be completed and sent with the samples detailing all sample numbers, sampling depths and which sample containers have been taken. State the project number and analysis suites required.
2. The site engineer should ensure that they are aware of how to fill in all forms and the chain of custody before going on site.

HEALTH AND SAFETY CONSIDERATIONS
▪ Appropriate PPE must be worn at all times to include nitrile gloves, safety boots, safety glasses, hi-vis and hard hat. ▪ An underground services scan using a CAT and Genny as a minimum should be undertaken prior to breaking ground. Services drawings must be reviewed. ▪ Supervision of trial pit excavation and borehole drilling should only be undertaken by suitably experienced personnel. If there are any concerns then the project manager must be consulted. <u>Trial Pits / Hotspot Removal Validation</u> ▪ Edges of excavation voids greater than 1m bgl should not be entered without proper shoring. ▪ When working near an excavator for trial pitting and windrow sampling, personnel must stand in a position where they are clearly visible by the excavator operator and a safe distance away from the excavator boom. ▪ When viewing trial pit excavations personnel must view trial pits from the end of the excavation rather than the sides in case of pit collapse. ▪ Care must be taken to avoid cuts from sharp objects when handling made ground. <u>Boreholes</u> ▪ Inspection pits must be hand dug to 1.2mbgl before drilling commences. ▪ Only experienced personnel are to operate the drill rig. ▪ Safety gloves must be worn whilst splitting plastic core sample tubes. Best option is to ask the driller to cut the tube open for you. <u>Windrows</u> ▪ Exercise precautions when working around an excavator as detailed above.

SOP 020 - STANDARD OPERATING PROCEDURES FOR ODOUR MONITORING USING OLFACTORY METHODS

PURPOSE

This standard operating procedure (SOP) covers the standard procedure for odour monitoring using olfactory methods and is aligned to the Environment Agency's H4 Guidance.

Odour is monitored for both environmental monitoring purposes and health and safety.

GENERAL INSTRUCTIONS

1. This SOP provides sequential instructions which should be undertaken in the correct order.
2. If the sequence of instructions can not be completed as described, the Vertase FLI Project Lead should be informed so that amendments can be made or steps can be clarified.
3. This SOP should be read in conjunction with any other SOP's that are applicable to the works being undertaken.

TOOLS, MATERIALS AND EQUIPMENT

- Access to weather monitoring programme data.
- Site drawing of monitoring locations marked.
- *VFLI ENV.006-Odour Assessment Form* – Issue 1.
- Clipboard.
- Pencil.

ODOUR DESCRIPTION – INTENSITY CATEGORIES

1. An appropriate number of monitoring positions are required this number depends on the size of the site and the sensitivity of the receptors.
2. To ensure monitoring locations stay constant a marker should be placed where possible to indicate the exact monitoring location.
3. Consider all information required to complete the odour assessment form and complete the appropriate sections before entering the field.

ONSITE RECORDED DATA – ATMOSPHERIC STABILITY CATEGORIES

Category	Stability	Dispersion	Occurrence (% time in the year)	Wind Speed (km/hr)	Time of Day	Sunshine or cloud cover
A	Very unstable	Very good	<1	<5	Day time only	Strong sunshine. Most common in the summer.
B	Unstable	Good	5 – 10	7 to 18	Day time only	Slight to moderate sunshine

C	Slightly unstable	Moderate	20	>7	Mainly day time	Moderate sunshine
D	Neutral	Moderate	45 - 60	7 to 29	Day or Night	Sight sunshine or overcast
E	Stable	Poor	5 – 10	7 to 18	Night time only	Clear or overcast
F	Very Stable	Very Poor	10	<11	Night time only	Clear or overcast

ODOUR DESCRIPTION – INTENSITY CATEGORIES	
0	No detectable odour
1	Very faint odour
2	Faint odour (barely detectable, need to stand still and inhale while facing into the wind)
3	Distinct odour (odour easily detectable while walking and breathing normally, possibly offensive)
4	Strong odour (bearable, but offensive odour)
5	Very strong odour (unbearable)
6	Extremely strong odour (likely to induce vomiting due to strength)

ODOUR DESCRIPTION – EXTENT CATEGORIES	
1	Local and non-persistent (only detectable during brief periods when wind drops or blows)
2	Non-persistent as above, but detected away from the site boundary
3	Persistent, but fairly localised
4	Persistent and pervasive up to 50m from the site boundary
5	Persistent and widespread (odour detected >50m from site boundary)

ODOUR DESCRIPTION – SENSITIVITY CATEGORIES	
1	Remote (no housing, commercial/industrial premises or public area within 500m)
2	Low sensitivity (no housing etc within 100m of location)
3	Moderate sensitivity (housing etc within 100m of location)
4	High sensitivity (housing etc within area affected by odour)
5	Extra sensitive (complaints arising from residents within area affected by odour)

PROCEDURE

1.Prior to completing the odour assessment the initial fields must be completed:

- Date
- Name and initials of engineer undertaking assessment
- Start time

2.On site recorded data

- Weather conditions
- General air quality
- Ground condition
- % cloud cover
- General air stability

3. Weather station data

- Temperature
- Wind strength and direction
- Barometric pressure

4.Odour classification by human perception using the following classifications:

- Odour intensity
- Odour extent
- Location sensitivity

5.Once the assessment is complete the following fields must be completed

- Finish time

RECORDS AND DOCUMENTATION

1. Once the assessment is completed the engineer should print and sign *ENV.006 Odour Assessment Form* to indicate that the assessment has been undertaken and the information is complete.

PURPOSE

This standard operating procedure (SOP) covers the standard procedure for noise monitoring. Noise is monitored for both environmental monitoring purposes and health and safety.

GENERAL INSTRUCTIONS

This SOP provides sequential instructions which should be undertaken in the correct order.

If the sequence of instructions cannot be completed as described, the Vertase FLI Project Lead should be informed so that amendments can be made or steps can be clarified.

This SOP should be read in conjunction with any other SOP's that are applicable to the works being undertaken.

TOOLS, MATERIALS AND EQUIPMENT

- Noise monitor and required peripherals
- Notebook
- Plan of site
- PPE – as a minimum hard hat, safety boots and hi vis jacket

PREPARATION

1. Access to site should be agreed in advance with relevant people (site owners, clients etc).
2. Site engineers should have received site specific H&S induction by Project Lead.
3. Permits to work should be obtained in advance, where required (to be advised by Site Manager/Project Lead)
4. The aforementioned equipment needs to be booked out by the equipment supervisor and on completion of the monitoring booked back in. Any faults should be reported promptly to the equipment supervisor.
5. The equipment supervisor is responsible for the aforementioned equipment which should be checked prior to each site visit to ensure that it is in a good state of repair, fully operational (i.e. fully charged) and that calibration certificates, where appropriate, will be valid at the time of monitoring.
6. If the site engineer suspects that the unit is faulty, advice should be sought from the equipment supervisor.

PROCEDURE

1. Background readings will be required out of operating hours.
2. The user manual for equipment used should be read in conjunction with this SOP to provide more detailed explanation of specific operating procedures.
3. The sound monitor may require calibration prior to daily monitoring (refer to user manual for instructions)
4. Ensure if the equipment is not fully waterproof it doesn't get exposed to excessive quantities of water, as this will affect the quality of results and the performance of the equipment.
5. Turn instrument on, ensuring all necessary peripherals are attached and working correctly.
6. Walk around the site and along the site boundary, monitoring and recording the sound in decibels at regular intervals. Monitoring locations should be targeted to ensure all possible sources of noise are included, especially those in sensitive areas of the site such as close to the site boundary.
7. If noise exceeds 85 dBA, appropriate ear protection is required for site workers. If noise exceeds 85dBA at the site boundary, remedial actions will be required including the installation of silencers on machines, the creation of a noise bund or activity ceased if no other possible action is appropriate.

RECORDS AND DOCUMENTATION

1. Monitoring results to be recorded in field notebook or on standardised form *ENV-005 Noise Monitoring Form*.
2. Date and time of attendance of site should be recorded as well as activities being undertaken at the time. Monitoring should be recorded at different times of the day to allow for variation.
3. Any H&S related incidents (slips, trips and falls etc).
4. Permits to work and site inductions, where applicable.
5. All operatives associated with the work are to be given a tool box talk to describe the content of this SOP and related documentation and sign a register to acknowledge that they have received such instruction and understand the method and health and safety issues related to the task.

APPENDIX D

Risk Screening and Environmental Control Measures

Mobile Plant Permit Deployment - Risk Assessment **Llanwern Coking Works**

WML No: EPR/QP3293FY/V004

Treatment Type		Receptor Details	What process and/or reagent has the potential to cause harm?	What are the harmful consequences if a problem occurs?	What is the mechanism of exposure to the source?	How likely is the contact?	How severe will the consequences be if contact occurs?	Magnitude of Risk	Justification of judgement	Proposed Risk Control Measures	Final magnitude of the risk
Physical Sorting (including separation, screening, partical size reduction, haulage and management of treated materials). Bioremediation and Stabilisation / Solidification.	**1**	Local population (human health)	Release of particulates (dust, partuculates and asbestos fibres)	Human Health (respiratory)	Air transport and inhalation	Medium	Medium	Medium	Potential for exposure for anyone working close to the site. Potential for increased dust generated during prolonged dry periods.	Use dust suppression techniques as required (e.g. water sprays/ bowsers/spray bars). Use of dust monitoring devices. Consider ceasing operations during prolonged dry or windy periods. Where required cover stockpiles. As required use of a jet wash for cleaning vehicles wheels or use of wheelwash. As required use of road sweepers Use of trained individuals for works involving asbestos under appropriate licence.	Low
	2	Local population - aesthetic problems	Release of particulates (dust)	Aesthetic problems - dust on cars, windows etc	Air transport and deposition	Low	Medium	Medium	Potential for exposure for anyone working close to the site. Potential for increased dust generated during prolonged dry periods.	Use dust suppression techniques as required (e.g. water sprays/ bowsers). Use of dust monitoring devices. Consider reducing the output during prolonged dry periods. Where required cover stockpiles. As required use of a jet wash cleaning vehicles / wheels. As required use of road sweepers.	Low
	3	Local population	Litter/ general debris	Aesthetic problems/ nuisance	Air transport and deposition	Low	Low	Low	Local populus / wildlife often sensitive to litter.	Maintain good levels of site cleanliness. Maximise stand-off of site operations and receptors	Low
	4	Local population - humans	Litter/ general debris and mud on road	Nuisance, loss of amenity, road traffic accidents	Carried from site by vehicle movements	Medium	Medium	Medium	Traffic safety, local populus often sensitive	Maintain good levels of site cleanliness. As required use of a jet wash cleaning vehicles / wheels. As required use of road sweepers.	Low
	5	Local population (human)	Odour	Nuisance and loss of amenity	Air transport and inhalation	Low	Medium	Medium	Local workers sensitive to odour	Consider output of treatment process (reduce operations to reduce odours). Cover stockpiles with membranes. As required install odour suppression techniques. Backfill excavations as soon as possible.	Low
	6	Local population (human)	Noise from remediation processes	Nuisance and loss of amenity	Through the air	Low	Medium	Low	Local populus sensitive to noise	Remediation equipment to be sited away from receptor areas. Restrict working hours to 07:30am - 18:00 (Mon to Fri) and 08:00 - 13:00 (Sat)	Low
	7	Local population (human)	Vibration	Nuisance	Through the ground	Low	Low	Low	Sensitivity to vibration	Maximise stand-off Selection of appropriate plant Limit time relevant works are undertaken	Low
	8	Local population (human)	Scavenging animals and birds	Human health - waste carried off-site Nuisance and loss of amenity	Through the air or over land	Low	Medium	Low	General site rubbish may attract scavenging animals	Maintain good levels of site cleanliness	Low
	9	Local population (human)	Pests (e.g. flies)	Harm to human health, nuisance and loss of amenity	Air transport and over land	Low	Medium	Low	Permitted wastes unlikely to attract pests. General site rubbish may attract pests	Maintain good levels of site cleanliness	Low
	10	Local population (human) gaining unauthorised entry to waste management operation	All on-site hazards including wastes, machinery and vehicles	Bodily injury	Direct physical contact	Medium	Medium	Medium	Plant/ machinery movements on and off	Appropriate site security and warning signs. Dedicated haul routes on site.	Low
	11	Local population (human) and local environment	Arson and/or vandalism causing the release of polluting materials to air, land or water	Pollution of land, air or water	Transport via land, air or water	Low	Medium	Medium	Site operations/ machinery likely to attract interest from outside parties.	Appropriate site security and warning signs. Ensure that waste is contained, where possible covered. Ensure that all potential pathways (e.g. water drains) are blocked prior to operations.	Low
	12	Local population (human) and environment	Accidental fire causing the release of polluting materials to air (via smoke or fumes) water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, visitors or firefighters. Pollution of water or land	Transport via land, air or water	Low	Medium	Medium	Site operations/ machinery likely to attract interest from outside parties.	Appropriate site security and warning signs. Ensure that waste is contained, where possible covered. Ensure that all potential pathways (e.g. surface water drains) are blocked prior to operations. Carry out a fire risk assessment prior to operations.	Low
	13	Ground / Groundwater	Spillage of oils / diesel. Contact with contaminated soils / run-off.	Further contamination of ground / groundwater	Placement of contaminating soils directly upon uncontaminated soils. Run-off of leachate / rainwater from stockpiles. Spillage of oils and diesel to ground.	Medium	Medium	Medium	Uncontrolled operations may cause contamination of ground and groundwater.	Contaminated soils to be placed on impermeably lined, sumped and bunded treatment and / or quarantine beds. Oils / diesels and COSHH chemicals to be stored with 110% spill capacity storage. Staff to be trained. Spill kits to be available. Refuelling to be undertaken on impermeable surface (any imperfections that risk contact to subsurface to be made good). No refuelling to be undertake within 10m of any excavation. Inspections to be made and correctiive action taken when necassary.	Low

Treatment Type		Receptor Details	What process and/or reagent has the potential to cause harm?	What are the harmful consequences if a problem occurs?	What is the mechanism of exposure to the source?	How likely is the contact?	How severe will the consequences be if contact occurs?	Magnitude of Risk	Justification of judgement	Proposed Risk Control Measures	Final magnitude of the risk
Water Treatment System	**14**	Local off-site workers	Odour	Nuisance and loss of amenity	Air transport	Low	Low	Low	Local population sensitive to odour.	Consider prevailing weather conditions throughout the remediation period (e.g. wind direction). Ensure the treatment system is sealed as is reasonably practicable. Testing of carbon filters (air emissions) and replacement.	Low
	15	Local off-site workers	Volatile Organic Compounds (VOCs) / Pesticides	Potential hazard to human health from VOCs	Air transport	Low	Low	Low	Remedial works have potential to generate VOCs which could be transported off site towards off-site areas. Significant dilution of potential VOCs likely to occur in any case.	Consider prevailing weather conditions (wind direction). Ensure systems are sealed as is reasonably practicable. Testing of carbon filters (air emissions) and replacement.	Low
	16	Local off-site workers	Noise from remediation process	Nuisance and loss of amenity	Through the air	Low	Medium	Low	Local population sensitive to noise	Restrict working hours. All plant to be maintained in good working order. Use low-noise plant and acoustically damped where necessary.	Low
	17	Local off-site workers	Litter/ general debris	Aesthetic problems/ nuisance	Air transport and deposition	Low	Medium	Medium	Local residents sensitive to litter	Maintain good levels of site cleanliness ensuring all rubbish is stored in appropriate containers	Low
	18	Local off-site workers and population	Mud on road	Nuisance, loss of amenity, road traffic accidents	Carried from site by vehicle movements	Low	Medium	Low	Traffic safety, local residents sensitive to mud/ litter on the road	Maintain good levels of site cleanliness. Inspect for excessive mud on road if mud is deposited (site to make sweeper arrangements)	Low
	19	Local off-site workers	Transport of contaminated water to entry to ground	Harm to local population and environment including controlled waters	Transport of contaminated water to ground	Medium	Medium	Medium	Potential off-site migration	Ensure that the systems are fully sealed. Ensure that oil storage tank system is bunded	Low
	20	Local population (human) gaining unauthorised entry to storage compound and water treatment system	General chemicals, water treatment system and machinery and vehicles	Bodily injury	Direct physical contact	Medium	Medium	Medium	Unauthorised access from unauthroised persons	Appropriate site security and signage around compound, excavations etc.	Low
	21	Local off-site workers	Arson and/or vandalism causing the release of polluting materials to air, land or water	Pollution of land, air or water	Transport via land, air or water	Low	Medium	Medium	Site operations/ machinery likely to attract interest from outside parties	Appropriate site security and warning signs. Ensure systems are fully sealed. Carry out a fire risk assessment prior to operations	Low
	22	Local off-site workers	Accidental fire causing the release of polluting materials to air (via smoke or fumes) water or land	Respiratory irritation, illness and nuisance to local population. Injury to staff, visitors or firefighters. Pollution of water or land	Transport via land, air or water	Low	Medium	Low	Site operations/ machinery likely to attract interest from outside parties	Appropriate site security and warning signs. Ensure that the system is fully sealed. Carry out a fire risk assessment prior to operations	Low
	23	Ground / Groundwater	Spillage of oils / diesel. Contact with contaminated water.	Further contamination of ground / groundwater	Spillage and infiltration	Low	Medium	Low	Uncontrolled operations may cause contamination of ground and groundwater.	Operations undertaken on an impermeably lined, sumped and bunded pad. Oils / diesels and COSHH chemicals to be stored with 110% spill capacity storage. Staff to be trained. Spill kits to be available. Inspections to be made and correctiive action taken when necassary.	Low

APPENDIX E

Monitoring Plan

Vertase FLI

Monitoring Plan (Remediation Phase) **Llanwern Coking Works**

Location	Frequency	Determinants	Justification	Trigger Level
Dust Boundary Monitoring Positions MP1-6	Daily during activities **	Visual Dust	Some dust may be generated as part of the works	Subjective rating 1 - 4 (4 is trigger)
Asbestos Fibres * Up to six positions downwind of relevant works	Daily becoming weekly where relevant asbestos works are undertaken **	Presence of airborne asbestos fibres	Some fibres may be generated as part of the works	0.01f/ml (four hour pumped sample)
VOCs and Odour 6 Boundary Monitoring Positions	Daily **	Volatile Organic Componds / Odour	Some VOCs may be generated as part of the works	1ppm / Nuisance Odour (at boundary positions)
Noise 6 Boundary Monitoring Positions	Weekly (Daily during noisy works) **	Nuisance Noise	Some noise generated as part of the works resulting in nuisance	Not greater than 5dB elevation at receptor (70dB during crushing activities)
Surface Water MP5	Weekly when discharging	As per discharge consent	Possibility of water quality deterioration	Deterioration of water quality

* Represents minimum requirements. Additional monitoring will be dictated by H&S documentation for specific working tasks.

** Only undertaken if Permitted works are being undertaken in that location

APPENDIX F

Commissioning Plan

Commissioning, Operation and Maintenance

Health and Safety

Refer to H&S Method Statements (Construction Phase Plan) which will be kept on site at all times

PPE

Type	Standard	Task
Hi – Vis vests	BS EN 471	To be worn at all times
Safety Boots	BS EN 345	To be worn at all times
Hard Hat	BS EN 397	To be worn at all times
Gloves	-	As appropriate for task
Protective overalls	-	As appropriate for task
Eye Protection	-	As appropriate for task
Disposable Face Mask	-	As appropriate for task

Commissioning & Operation

Site Set-Up (General)

The site will be prepared for treatment works in accordance with VertaseFLI Drawings

Site Set-Up Works will Include:

- Monitoring Locations and Environmental Preliminaries
- Ground Preparation Works
- Set-up of Water Treatment Plant and Ancillary Equipment
- Set-up of Clean Soils Stockpiling Areas
- Set-up of Gross Soils Treatment Areas
- Health and Safety Preliminaries
- Administrative Set-Up including Record Keeping

No works will be undertaken until satisfactory completion of the above items and until the WAMITAB qualified person is satisfied that works can commence on site.

Water Treatment

Commissioning Works will Include:

- Set up of Water Treatment Plant and Ancillary Equipment
- Procure Carbon and Sand for Filters as required
- Procure Water Treatment Chemicals as required
- Set-up of Plant and Ancillary Equipment
- Comissioning of Water Treatment Plant
- Assessment of Filter Efficacy

Bioremediation and Stabilisation

Commissioning Works will Include:

- Mobilisation of Plant and Ancillary Equipment
- Procure Impermeable Liners
- Procure Sheeting
- Procure stabilisation compounds
- Procure Bioremediation 'additives' as required

Maintenance

Mechanical plant maintenance will be carried out in accordance with statutory legislation in addition to relevant procedures set out in Vertase's Integrated Management System (IMS)

Weekly plant and equipment checks will be made in accordance with the above procedures.

Record Keeping

The Site Diary will be filled in on a daily basis.

All site works will be undertaken in accordance with the approved H&S Method Statements for the Works / Vertase FLI IMS

All documentation will be kept for a minimum period of two years.

Inspection of the treatment areas will be undertaken daily using worksheets and any actions/maintenance undertaken as required.