Windermere WwTW Sludge Storage & Transfer Facility

Environmental Permit Application EPR/HB3300TT/A001

Windermere WwTW Sludge Storage & Transfer Facility
Application Support Document

November 2019

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1. Introduction

The purpose of this Application Support Document (ASD) is to provide supplementary information to support an environmental permit (EP) application for the reception, storage and transfer of imported wastewater (sewage) sludge at Windermere Wastewater Treatment Works (WwTW). This application is being made under the Environmental Permitting (England and Wales) Regulations 2016 (the EPR 2016).

The address of the installation is:
Windermere WwTW Sludge Storage and Transfer Facility,
Windermere Wastewater Treatment Works,
Tower Wood
Windermere
Cumbria
LA23 3PW

NGR: SD 38535 91221

In order to maximise efficiencies in wastewater sludge management within the Windermere catchment area, United Utilities Water Limited (UUW) propose to operate a sludge reception, storage and transfer facility at Windermere WwTW. The facility will accept non-hazardous wastewater sludges from a number of smaller works within the region (via tanker) into a dedicated sludge storage tank. Free standing liquor from the sludges will be decanted from the tank via a series of decant portals and the liquor will be disposed of into the works flow to full treatment. Sludges bulked and stored within the tank will be removed by tanker to an appropriately permitted sludge management/treatment facility.

Due to the non-flammable nature of wastes handled at the installation, the site falls outside the requirement to prepare and operate a fire prevention plan (FPP).

2. Non-Technical Summary

This application is for an Environmental Permit for the reception, storage, dewatering and transfer of urban wastewater sludge at Windermere Wastewater Treatment Works (the works). The works are operated by United Utilities Water Limited (UUW).

The only waste to be accepted and stored is sewage sludge produced by UUW's operations at other UUW wastewater treatment works (WwTW) within the catchment area.

Imported sludges will arrive at the site by tanker and discharge into the dedicated closed sludge storage tank via a Bauer connection to the sludge tanker inlet connection, using the tanker's donkey pump. The inlet valve is controlled by a WaSP system linked to an ultrasonic level sensor that will automatically shut the valve when the maximum operational sludge level is reached to prevent overfilling.

A series of 4 decant portals are present at various heights on the opposite side of the tank to the inlet pipe, together with an overflow pipe near the top of the tank. These all connect to a single pipe that discharges to the head of works (and hence flow to full treatment). Free standing liquors within the tank will be manually discharged via the appropriate decant portal (depending upon the height of the sludge stored within the tank) and discharged into the works flow to full treatment. Any overflow from the tank will also follow the same route and discharge into the works flow to full treatment.

Sludge within the tank will be kept mobile via the use of a sludge recirculation mixer pump.

Once sufficient sludge has been collected within the tank, a tanker will connect to the tank outlet point via a Bauer connection and the sludge within the tank will be discharged into the tanker via use of the tanker's donkey pump. The tanker will then remove the sludge from the site to an appropriate sludge treatment facility.

The sludge storage tank is of glass-fused-to-steel construction with a full GRP roof, suitable for the containment of urban wastewater sludges, and the tanker discharge/loading area is impermeably surfaced and drained via a private drainage system that returns all drainage to the head of the works to flow to full treatment. An ultrasonic level probe is provided in the roof of the tank.

The sludge storage tank is connected to a dedicated odour control unit via pipework from a connection in the tank roof. Odorous air from the tank will be treated by passing through activated carbon to remove odour prior to release via a stack.

The maximum storage capacity of the tank is 160m^3; however, the tank will never be filled to full capacity so the actual maximum operational storage capacity is 140m^3. The maximum throughput will be 2,000m^3 per year which given the nature of the sludge is taken to be equivalent to 2,000 tonnes per year.

The only emissions to air are from the odour control unit stack. There are no emissions to land, water or sewer.

3. Application Form B2 Supporting Information

3a: Relevant Offences

UUW have been convicted of a number of relevant offences; these are detailed in the document "List of Relevant Offences for United Utilities Water Limited (formerly United Utilities Water Plc and North West Water Limited)" included with the application.

3b: Technical Ability

A copy of the relevant COTC certificate is provided at Appendix A.

3d: Management Systems

UUW operates a Business Quality and Environmental Management System (BQ&EMS) which is certified against the ISO 9001 and 14001 standards. A copy of UUW's Certificate is included at Appendix B. The management system for the site will be provided by UUW's ISO14001 accreditation.

5a: Plans

A site location plan is provided at Appendix C. A permit boundary and site layout plan is provided at Appendix D.

5b: Site Condition Report

An H5 Site Condition Report (SCR) is provided at Section 10.

5c Non-Technical Summary

Please see Section 2 of this report.

6: Environmental Risk Assessment

Please see Section 9 of this report for a risk assessment and management plan.

4. Application Form B4 Supporting Information

Table 1a: Types of activities

Although the main purpose of the facility is to store and transfer sludge to recovery facilities, it is possible that contingency arrangements may occasionally require the sludge to be sent to a disposal activity. We have therefore included both R13 and D15 Annex I operations.

The maximum amount stored at any one time will be 140m^3. As the sludges received will be quite thin (average 1.2% solids), this is considered to be equivalent to 140 tonnes.

Annual throughput at the facility will be a maximum 2,000m^3 per year, which is taken to be equivalent to 2,000 tonnes per year.

Table 1b: Types of Waste Accepted

The following table details the waste the installation will accept, consisting solely of sewage sludges from other UUW wastewater treatment works (WwTW) within the catchment area (as well as sludge produced by the on-site WwTW).

Table 1b – Types of Waste

19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE	
19 08	**wastes from waste water treatment plants not otherwise specified**	
19 08 05	sludges from treatment of urban waste water	

2: Emissions to Air, Water and Land

The sludge storage tank is connected to a dedicated odour control unit (OCU), which removes odours via an activated carbon filter prior to discharge via a stack. An odour management plan for the site is being developed and will be available prior to activities commencing on site.

Condensate from the OCU is sent to the WwTW flow to full treatment via the site's private drainage system (PDS) – see Appendix E for the drainage plan.

Liquor decanted from the storage tank will be transferred by a dedicated pipeline into the works flow to full treatment. Any overflow from the tank will also follow the same route and discharge into the works flow to full treatment.

There are no point source emissions to water or land.

3: Operating Techniques

Please refer to Section 5 of this document

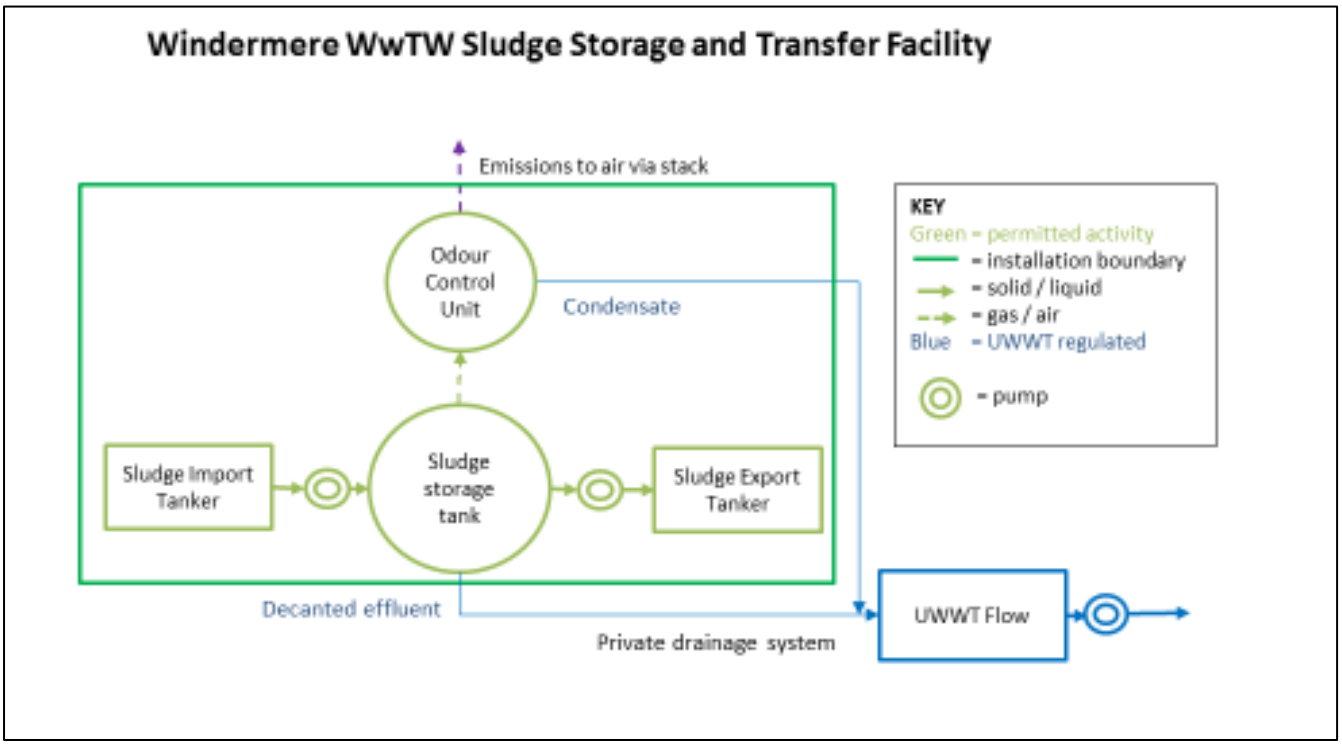
4a: Measures for Monitoring Emissions

No emissions monitoring is required; there are no point source emissions to air, land or water other than the exhaust from the odour control stack, which does not require monitoring. Operation of the OCU will be tested and verified during commissioning.

5. Technical Description and Operations

Process Flow

A process flow diagram for sludge storage and transfer is provided below.



Pre-acceptance Procedures

UUW produced sewage sludge (EWC Code: 19 08 05) is the only waste material being treated at the facility; therefore there are no incompatible waste materials treated within the installation. Pre-acceptance procedures are therefore not required.

Sludge Acceptance Procedures

Load arrival, inspection, sampling, analysis and rejection procedures are not applicable to this application as only UUW produced sludge is accepted and treated.

Volumes of sludge accepted will be recorded via a WaSP control and datalogger unit that will record volume and solids content of all inputs. Volumes of sludge removed will be recorded as tanker movements. Quarterly and annual reports will be prepared on sludge movement.

Upon arrival at the site, tanker drivers will be instructed to proceed to the tanker parking bay adjacent to the sludge storage tank. The tanker parking bay is bunded along three sides (local to the tank) using kerbs, the hardstanding entrance is sloped inward towards the bay to capture any surface run off. Drains are installed to collect any spillages and transfer them to the flow to full treatment via the site's sealed private drainage system.

The tanker will connect to the fixed tanker import point via a flexible hose and Bauer couplings. The fixed pipe from the Bauer coupling enters the tank near its top, then runs down inside the tank to near the base

so that the sludge is discharged into the base of the tank. The tanker's contents will be discharged via the use of the tanker's donkey pump. An ultrasonic level sensor is present on the roof of the tank and this is connected to the WaSP control and datalogger unit; the WaSP unit will close the valve once the operational capacity of the tank is reached, preventing overfilling. As a contingency, should the tank become close to being overfilled there is an overflow near the top of the tank that will direct any overspill to the works' flow to full treatment (see "Sludge Storage" below for more details of this system).

Sludge Storage

The sludge storage tank is constructed of glass-coated, vertical, cylindrical, bolted sectional steel keyed into a concrete base (see general arrangement drawing at Appendix F). The tank was constructed in 2018. The base of the tank slopes down to a central point with the sludge extraction taking place at the centre of the base (see general arrangement drawing at Appendix F). The tank has a maximum capacity of 160m^3 and a maximum operational capacity of 140m^3, and is fitted with a sludge recirculation pump system to homogenise the sludges within the tank and keep them mobile.

The tank is fitted with a series of 4 decant portals at various heights on the opposite side of the tank to the inlet pipe (as well as the overflow pipe near the top of the tank). These all connect to a single pipe that discharges to the head of works (and hence flow to full treatment). Free standing liquors within the tank will be manually discharged via the appropriate decant portal (depending upon the height of the sludge stored within the tank) and discharged into the works flow to full treatment. This will reduce the volume of water included in the tanker removing the sludge from site. Any overflow from the tank will also follow the same route and discharge into the works flow to full treatment.

Sludge Removal

As for tanker imports, upon arrival at the site, tanker drivers will be instructed to proceed to the tanker parking bay adjacent to the sludge storage tank. The tanker parking bay is bunded along three sides (local to the tank), kerbs and drains are installed to collect any spillages and transfer them to the flow to full treatment via the site's sealed private drainage system.

The tanker will connect to the fixed tanker export point via a flexible hose and Bauer couplings. The fixed pipe from the Bauer coupling leaves from the base of the tank (see **Sludge Storage** above) and is encased within concrete beneath the base of the tank to the point where it exists the concrete base – see general arrangement drawing, Appendix F.

The tank's contents will be removed via the use of the tanker's donkey pump.

Spill kits will be available on site and any small spillages will be washed away into the site's sealed private drainage system.

Photo 1: Sludge Storage Tank

Containment and Drainage

The existing containment and drainage infrastructure has been designed and constructed in accordance with UUW asset standards. CCTV survey of the existing drainage infrastructure has been conducted. The footage indicates some evidence of infiltration at a pipework joints and heavy scaling in places. Arrangements will be made for the pipework to be repaired.

As for all such tanks on our WwTW sites, the sludge storage and transfer tank is not in itself bunded (although it is surrounded by a concrete base ring); however, these tanks very rarely suffer from any major structural failure that results in a release of the contents of the tank. Instead, any leaks that may occur over time usually start very small in nature and are easily identified by visual inspection. UUW therefore propose to include an inspection of the tank within the daily site inspection programme. Should any leaks be identified then arrangements will be made to collect the sludge within the tank and then to effect repairs of the tank before any more sludge is stored within it.

Pipework is constructed of ductile steel and is mainly above ground, with the following exceptions:

- The initial section of the sludge removal pipe, which exits through the concrete base of the tank and is encased in concrete before exiting the base to the connection point. The concrete provides the containment for the below ground section.
- The decant and overflow pipe for the tank enter the concrete base and are encased in concrete from this point up to the discharge into the site's private drainage system. Again, the concrete provides the containment for the below ground section.

All pipework will be subject to inspection when in use.

The tanker parking area for discharging and collection sludge is impermeably surfaced and kerbed with drainage connected to the site's sealed drainage system.

Monitoring and Maintenance Plan

The site operates under an EMS manual detailing the Standard Operating Procedures (SOP's) and Site Specific Instructions (SSI's) applicable to each process. These instructions have been designed to ensure safe and effective operation and to minimise known hazards from the installation and include procedures for maintenance, training and accident response.

The Production Manager will review the EMS for the installation and arrange the necessary updates to include the operations, inspection and maintenance of the new plant. The Production Manager will also arrange staffing resources and training for operation, monitoring and maintenance of the new plant.

All scheduled maintenance will be set up on the Master Asset Management System (MAMS) and all proactive and reactive maintenance undertaken will be recorded on MAMS against the requirements of the plan.

6. Odour Control System

A dedicated Odour Control Unit (OCU) will treat the odorous air from the sludge tank. Odorous air is drawn by fans within the OCU and treated prior to being discharged via a stack. The OCU consists of an activated carbon column to treat the air by dry scrubbing prior to emission via the OCU stack. See Appendix G for plan arrangement drawings for the OCU. Condensate from the OCU is routed by above ground pipework to site drainage for treatment in the WwTW.

Pre and post-commissioning testing will be conducted following installation and refurbishment to verify odour abatement efficiency.

Table 6 below details the Odour Abatement Efficiency Requirements for the OCU:

Table 6: Odour Abatement Efficiency

Parameter	Value
Hydrogen Sulphide removal	>99%
Stack outlet compliance	<2,000 OU_E/m^3
Mercaptans	>98%
VOC	>98%
Ammonia	>95%

Due to the low risk of odour from the site generally and from the sludge management, odour dispersion modelling has not been deemed required. A background odour survey has been conducted that verified the low risk from odour emissions.

7. Application Form F1 Charges

In accordance with the Environmental Permitting Charges Guidance (01 August 2018), whilst we know the subsistence charging code for this site from the tables of charges (2.16.8); there does not appear to be a code that directly correlates to this within the application charge table. As the permit only covers the acceptance and storage of wastes, we have therefore assessed the code to be 1.16.10 as the site is effectively operating in a manner similar to that of a non-hazardous waste transfer station. The permit application charge is therefore £7,930.00.

8. Assessment Against Applicable Guidance in S5.06: Guidance for the Recovery and Disposal of Hazardous and Non-hazardous Waste

S5.06 Technical Guidance Note Section:		With Reference To S5.06, The Following Will Apply To The Tankered Imports Activities
2.1.1	Pre-Acceptance	Only sludges produced by UUW will be accepted at the installation under this permit; these wastes are well known to UUW and do not require any further characterisation.
2.1.2	Acceptance	Sludge is delivered to the facility by tankers. There is a designated tanker loading area adjacent to the sludge storage tank with an impervious surface connected to the site's private drainage system. Spill kits will be available. Records will be kept of the quantity of sludges being discharged into the tank (and their solids content) and the number of tankers removing sludges from the tank.
2.1.3	Waste Storage	Sludge is stored in an above ground tank constructed of glass-fused-to-steel tied into a concrete base. Glass-fused-to-steel tanks are strong and highly corrosion resistant and require little maintenance; they are used extensively within the wastewater sector. The tank has a maximum capacity of 160m^3, with the actual maximum capacity of storage limited by level controls to 140m^3. The average storage time for sludge in these tanks is 9 days. Only UUW sludge is stored (one waste type); hence there are no incompatibility issues. The tank is closed and located within an impermeably surfaced (concrete) apron to provide containment in case of leaks. All pipework connected to the tank is capable of being closed via suitable valves. The content of the tank is restricted to a safe level by level meters and overflow valves. Tanker connection points are located adjacent to the tank in an area of impervious surface with self-contained drainage, to prevent any spillage escaping off-site. The tanker loading points and storage location are all well within the boundary of the Windermere WwTW site and located away from watercourses. Only couplings of the correct size for the connection will be used and the coupling will be able to withstand the maximum shut valve pressure of the transfer pump. The storage vessel and tanker connection points will be clearly signed. Storage area drainage infrastructure will ensure that any contaminated run-off is contained. Procedures will be in place for the regular inspection and maintenance of the storage vessel and paved areas. Inspections pay particular attention to signs of damage, deterioration and leakage and records will be held to detail any issues and required action identified and taken. Faults will be repaired as soon as practicable. If containment capacity or capability of pavement is compromised, then waste will be immediately removed until the repair

S5.06 Technical Guidance Note Section:		With Reference To S5.06, The Following Will Apply To The Tankered Imports Activities
		is completed (unless effecting a repair is more expedient and working with wastes in close proximity does not compromise safety). S5.06 indicates that above ground storage vessels should be located on an impervious surface that is resistant to the material being stored, with sealed construction joints within a bunded area with a capacity at least 110% of the largest vessel or 25% of the total tankage volume, whichever is the greater. In this case (and as is the case for all such tanks on our WwTW sites), the sludge storage and transfer tank is not in itself bunded but is constructed upon an impervious concrete base, surrounded by a concrete apron and adjacent to the imperviously surfaced tanker connection area that is drained to the site's private drainage system. Tanks of this design and construction very rarely suffer from any major structural failure that results in a release of the contents of the tank. Instead, any leaks that may occur over time usually start very small in nature and are easily identified by visual inspection. UUW therefore propose to include an inspection of the tank within the daily site inspection programme. Should any leaks be identified then arrangements will be made to collect the sludge within the tank and then to effect repairs of the tank before any more sludge is stored within it. Supporting structures, pipes, hoses and connections are resistant to the substances being stored. The storage vessel is equipped with suitable abatement systems and a level sensor. Connections to the tank are capable of being closed via suitable valves. An overflow pipe directs any overflows to the site's private drainage system and hence the work's flow to full treatment. All connection pipework is routed above ground, with the exception being the sludge discharge pipe which is fully enclosed within concrete from the base of the tank until it leaves the concrete for the tanker connection point. Drainage pipes are also located below ground.
2.1.4	Treatment	There is no treatment as such, although the design of the tank does allow the decanting of free-standing liquors within the tank. These will be manually discharged via the appropriate decant portal (depending upon the height of the sludge stored within the tank) and discharged into the works flow to full treatment. This will help to slightly thicken the sludge and thereby reduce the volume of water included in tanker removing the sludge from site.
2.2.1, 2.2.2 & 2.2.3	Point source emissions	There are no point source emissions from the storage of the sludge other than the stack from the odour control unit and the discharge of free-standing liquors to the site's private drainage system.
2.2.4	Fugitive Emissions to Air	Internal site roads are all suitably paved to prevent dust from tanker movements. All tanker connections will be made via closed couplings. The tank is closed and connected to a dedicated odour control unit.
2.2.5	Fugitive emissions to	For the subsurface element of the sludge removal pipe, secondary containment is provided by being encased within the concrete base of the tank.

S5.06 Technical Guidance Note Section:		With Reference To S5.06, The Following Will Apply To The Tankered Imports Activities
	surface water, sewer and groundwater	The sludge storage and transfer tank is constructed upon an impervious concrete base, surrounded by a concrete apron and adjacent to the imperviously surfaced tanker connection area that is drained to the site's private drainage system. An inspection and maintenance programme for impervious surfaces and containment facilities will be written. Unless the risk is negligible, improvement plans will be put in place where operational areas are identified as not providing an impervious surface, spill containment kerbs, sealed construction joints and / or connection to a sealed drainage system.
2.2.6	Odour	The activity to be authorised by the permit are not considered to present a significant odour risk as the storage tank is closed and connected to a dedicated odour control unit. The OCU will be serviced and maintained in order to continue its effective operation. See Section 6 Odour Control System and Section 9 Environmental Risk Assessment and Management Plan for further details.
2.3	Management	United Utilities Water Ltd operates the site under a fully certified ISO14001 management system. A copy of the ISO14001 certificate is included at Appendix B to this document. See report Section 5 above for further detail on the management for the tankered import activities.
2.4	Raw Material and Water Use	The only raw material to be used will be replacement carbon for the odour control unit. Water may be used to wash down any spillages.
2.5	Waste Handling	Free standing liquors will be discharged to the site's private drainage system and hence to the works' flow to full treatment.
2.6	Waste Recovery or Disposal	The purpose of the application is to allow the collected sludge to be sent to UUW's sludge treatment facilities where it will be subjected to anaerobic digestion to recover energy in the form of biogas and create a treated digestate that can be spread to land for agricultural benefit.
2.7	Energy	The process is not an inherently energy intensive process.
2.8	Accidents and Abnormal Operations	A formal structured Accident Management Plan will be in place at Windermere WwTW by the time of permit issue.
2.9	Noise	Tanker discharge and collection is not considered to present significant noise impact on the current operational WwTW. Tanker locations are away from the boundary of the site.
2.10	Monitoring	There are no emissions that require monitoring. The tanker discharge points and the sludge storage tank will be included in the inspection rounds for the wider site to check for integrity.

S5.06 Technical Guidance Note Section:		With Reference To S5.06, The Following Will Apply To The Tankered Imports Activities
2.11	Closure	The permit application Site Condition Report will be updated during the operational phase of the permit to provide a coherent record of the state of the site over time. Should any instances arise which have, or might have, impacted on the state of the site, the Operator would record them along with any further investigation or ameliorating work carried out.
4.1	Impact Assessment	See Section 9 of this document for the Environmental Risk Assessment and Management Plan.
4.3	Conservation	The permitted activity is to be carried out within the wider boundary of a currently operational WwTW. Conservation screening was conducted via the pre-application service in accordance with the EA permitting application process for a new permit and the results were assessed accordingly. See Section 9 of this document for the Environmental Risk Assessment and Management Plan.

9. Environmental Risk Assessment and Management Plan

Odour Risk Assessment

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk**
Sludge storage tank	Local residents (at least 165m away). Users of Lake Windermere (shoreline approximately 110m away)	Air	Closed tank connected to odour control unit	Very low (the site receives very few, if any, odour complaints)	Localised odour annoyance	Not significant
Spillage of sludge during import/export			Closed couplings, any spillages likely to be minor in nature and swiftly washed away			

Fugitive Emissions Risk Assessment

What do you do that can harm and what could be harmed			Managing the Risk	Assessing the Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Dust, mud and litter	Local environment to the site	Ground, water, air	The area of the site where the tankers deliver and remove sludge is impermeably surfaced and any sludge spillages will be washed away into the site's private drainage system. There are no likely sources of dust from the operation, as the sludge is too wet to become dusty and airborne.	Low	Localised pollution	Low
Fine particulate and fumes	Local residents (at least 165m away). Users of Lake Windermere (shoreline approximately 110m away)	Air	There is one emission point to air, the odour control unit stack. This emission is not considered to present a risk of pollution.	Low	Health impacts upon human population.	Negligible
Vermin	Local environment to the site. Local residents (at least 165m away).	Ground, air	An enclosed process with very limited, if any, access for vermin. The WwTW has vermin control protocols in place.	Low	Localised impact	Insignificant

Noise Risk Assessment

What do you do that can harm and what could be harmed			Managing The Risk	Assessing The Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Transfer pumps	Local residents (at least 165m away). Users of Lake Windermere (shoreline approximately 110m away)	Air	Limited period of operation. Use within operational WwTW site.	Low	Noise disturbance	Not significant

Accidents

What do you do that can harm and what could be harmed			Managing The Risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk**
Sludge storage Failure of any of the sludge	Ground / Groundwater / surface water	Ground	Good design; all transfer pipework is constructed of appropriate materials (ductile steel). Environment Management System in place for inspections, management and monitoring	Very low	Minor risk of impact to ground / groundwater as a result of spillage Minor localised odour	Not significant

What do you do that can harm and what could be harmed			Managing The Risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk**
transfer pipework	Local residents	Air	Staff are trained in the operation of spillage kits to ensure that prompt and effective action is taken in the event of accidental spillage. Spillage containment is provided as required.			
Loss of containment of vessels	Ground / Groundwater / surface water	Ground	Vessel designed to contain intended material and volumes. Any uncontrolled outflows will go to the site's private drainage system and hence to the works' flow to full treatment. The storage tank is constructed upon an impervious concrete base, surrounded by a concrete apron and adjacent to the imperviously surfaced tanker connection area that is drained to the site's private drainage system. Tanks of this design and construction very rarely suffer from any major structural failure that results in a release of the contents of the tank. Instead, any leaks that may occur over time usually start very small in nature and are easily identified by visual inspection. UUW therefore propose to include an inspection of the tank within the daily site inspection programme. Should any leaks be identified then arrangements will be made to collect the sludge within the tank	Very low	Minor risk of impact to ground / groundwater as a result of spillage Potential impact on adjacent ground if containment breached. Minor localised odour	Not significant
	Local Residents	Air				

What do you do that can harm and what could be harmed			Managing The Risk	Assessing the risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of exposure**	**Consequence**	**Overall Risk**
			and then to effect repairs of the tank before any more sludge is stored within it. Staff are trained in the operation of spillage kits to ensure that prompt and effective action is taken in the event of accidental spillage. Environment Management System in place for inspections, management and monitoring			
Equipment / plant item fire e.g. electric cabling	Ground / Groundwater	Ground	Design and fabrication standards; Inspection and maintenance; Routine operator inspection; Firefighting systems; Emergency Response procedure; Limited sources of ignition adjacent to likely leak sources (e.g. hot surfaces, hot work).	Very low	Possible toxic hazard. Fire / explosion	Not significant
Flood	Ground / Groundwater / surface water	Ground	The site is within flood zone 1 and therefore has a low probability of flooding.	Very low	Permitted waste types are non-hazardous and stored within tanks so should any flooding arise it is unlikely that any waste will escape. Deliveries of sludge from external sites will cease during any such flooding events.	Not significant

Nature and Heritage Conservation

The Environment Agency's conservation pre-application screen (EPR/HB3300TT/A001) identified the following sites and protected species:

Site Type	Site Name	Distance from Activity Boundary	At Risk from Activities?
Local Wildlife Site	Great Tower Plantation	45m	See assessment below
Local Wildlife Site	Lake Windermere	110m	See assessment below
Ancient Woodland	Great Tower Plantation	45m	See assessment below
Protected Species	European Eel migratory route	According to the protected species map provided, the site is within the protected species migratory route. We consider that the actual migratory route is within Lake Windermere, 110m away from the permit boundary.	See assessment below
Protected Species	Atlantic Salmon migratory route		
Protected Species	River Lamprey migratory route		
Protected Species	Arctic Char		

What do you do that can harm and what could be harmed			Managing The Risk	Assessing The Risk		
Hazard	**Receptor**	**Pathway**	**Risk Management**	**Probability of Exposure**	**Consequence**	**Overall Risk**
Fugitive emissions, including odour and noise.	Local wildlife sites, ancient woodland, protected species (see above table)	Air	See odour Risk Assessment & Fugitive Emissions Risk Assessment.	Very low	None	Negligible

10. Site Condition Report

1.0 SITE DETAILS	
Name of the applicant	United Utilities Water Ltd
Activity address	Windermere WwTW Sludge Storage and Transfer Facility, Windermere Wastewater Treatment Works, Tower Wood Windermere Cumbria LA23 3PW
National grid reference	SD 38535 91221
Document reference and dates for Site Condition Report at permit application and surrender	This is the application SCR
Document references for site plans (including location and boundaries)	See Appendices C and D to Application Support Document.

2.0 Condition of the land at permit issue	
Environmental setting including: • geology • hydrogeology • surface waters	Due to the small footprint of the permitted area, the following information relates to the whole Windermere WwTW site. **Superficial Deposits** Glacial Till is shown at surface across most of the site. Glacial Till typically comprises interstratified clays, silts and sands with sand and gravel layers, cobbles and occasional boulders. Made Ground is also expected across the site associated with its development as a Wastewater Treatment Works. **Solid Geology** Strata of the Bannisdale Formation are shown to underlie the site. These rocks comprise banded siltstone and mudstone. These rocks are shown to be outcropping across the northern and eastern parts of the site, where Glacial Till deposits are indicated to be absent. Outcropping rock can be observed forming a steep bank to the eastern boundary of the active works site. A major syncline within the bedrock is indicated locally immediately to the south of the site. The general inclination of the strata is indicated locally to be between 52º and 64º dipping generally to the south east, i.e. away from the lake. It is considered likely that locally rock head levels might be highly variable with steep sided pinnacles present beneath the superficial strata, hence the presence of isolated rock outcrops as noted above. This irregular rock head profile has

	been observed during previous works in the Windermere area. **Hydrogeology** The superficial deposits, Glacial Till, across the majority of the site are classified as unproductive strata. The solid geology beneath the site is classified as a Secondary B Aquifer. No groundwater Source Protection Zone (SPZ) is shown within a 1km radius of the site. No groundwater abstraction licences are situated within 500m of the site boundary. **Hydrology** The nearest surface water feature is Lake Windermere situated next to the western boundary of the site. Also, two minor streams are shown to enter the site along the eastern boundary. Data provided by the UU Hydraulics team indicate that recorded lake levels range between 39.3 and 40.9mOD, with a design water level taken as 40.463mOD. The western section of the site is located within a flood zone 3, giving it a 1 in 100 chance of flooding without defences each year. No flood defences are shown on the Environment Agency website for this area. Note – the permitted area is within flood zone 1.
Pollution history including: 1. pollution incidents that may have affected land 2. historical land-uses and associated contaminants 3. any visual/olfactory evidence of existing contamination 4. evidence of damage to pollution prevention measures	The earliest mention of the site being a sewage treatment works occurs on the 1956 OS map. Prior to that the site appears to have been green field. There are no historical or registered landfill site located within 500m of the site area. Three pollution incidents to controlled waters are located within 500m of the site; the closest being 124m north of the site which involved diesel/ oils to Lake Windermere and was classified as Category 3, minor incident. A site walkover did not identify any evidence of existing contamination. All pollution prevention measures installed within the permitted area (and over the wider WwTW) appeared to be in excellent condition with no signs of damage or malfunction.
Evidence of historic contamination, for example, historical site investigation, assessment, remediation and verification reports (where available)	None known
Baseline soil and groundwater reference data	A number of ground investigations have been undertaken at the site. The closest window sample to the permitted area is WS512A, approximately 35m to the WSW of the permit boundary. The sample testing results (including leaching analysis) are included as Appendix H to this report.

3.0 Permitted activities	
Permitted activities	As detailed in the Environmental Permit application
Non-permitted activities undertaken	
Document references for: 1. plan showing activity layout; and 2. environmental risk assessment.	1. See Appendices C and D to Application Support Document. 2. See Section 9 to the Application Support Document

Appendix A: CoTC Certificates (Original COTCs and latest CCC)

WAMITAB

WASTE MANAGEMENT INDUSTRY TRAINING AND ADVISORY BOARD

CERTIFICATE No: 3302

CERTIFICATE OF TECHNICAL COMPETENCE

This Certificate confirms that

Andrew David Padgett

has demonstrated the standard of technical competence required for the management of a facility of the type set out below

Facility Type:

Managing Transfer Operations :

Clinical or Special Waste (Level 4) - TSS4

Authorising Signatures:

Director General

Director

Date of issue: 07 December 2000

wamitab

Certificate No. CCC17209

Continuing Competence Certificate

This certificate confirms that

Andrew David Padgett

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 15/03/2018

TSH	Transfer - Hazardous Waste
TMH	Treatment - Hazardous Waste

Awarded: 15/03/2018

Expiry Date: 15/03/2020

Authorised

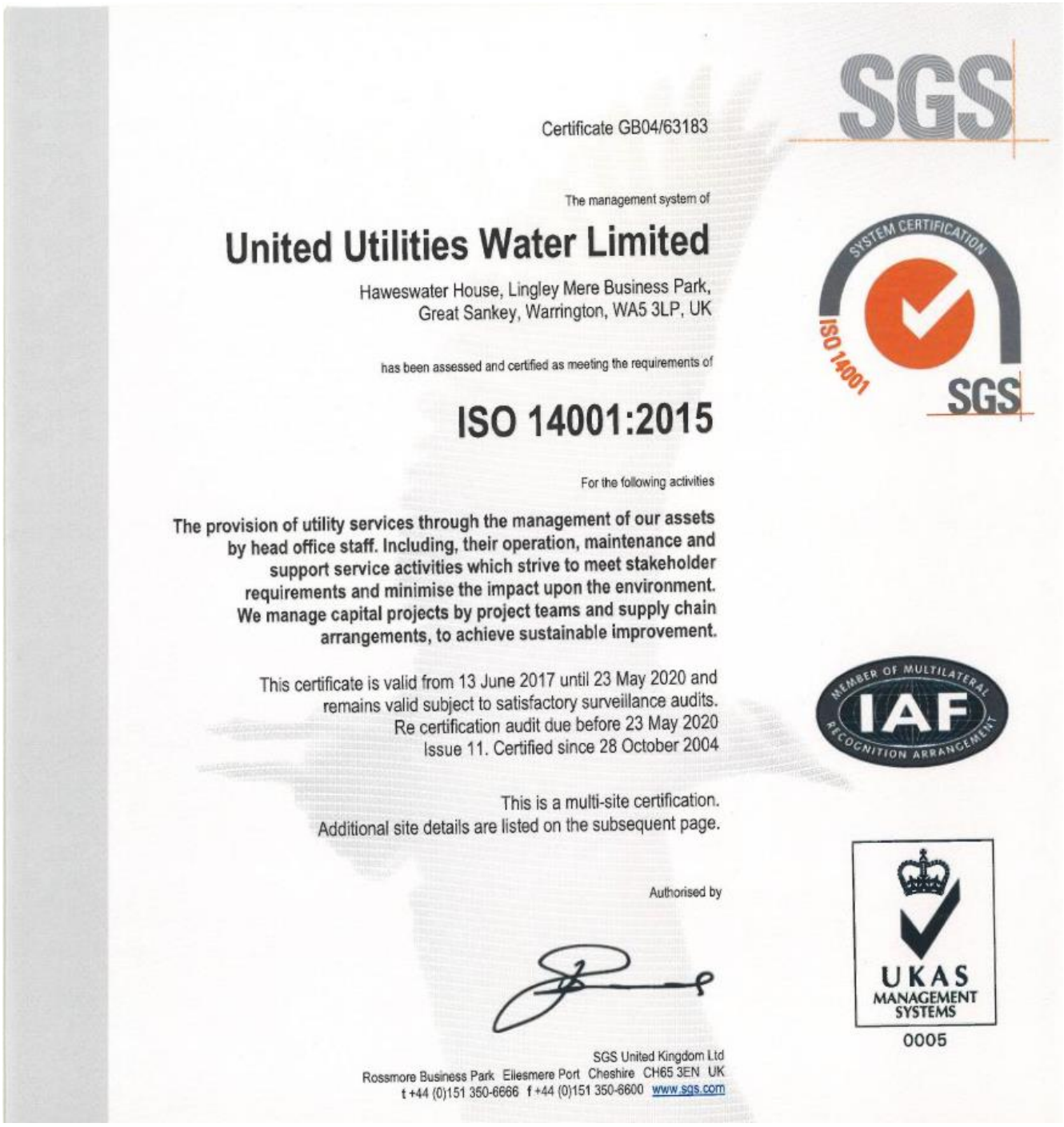
WAMITAB Chief Executive Officer

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

00126330

Appendix B: ISO 14001 Certificate



Certificate GB04/63183

The management system of

United Utilities Water Limited

Haweswater House, Lingley Mere Business Park,
Great Sankey, Warrington, WA5 3LP, UK

has been assessed and certified as meeting the requirements of

ISO 14001:2015

For the following activities

The provision of utility services through the management of our assets by head office staff. Including, their operation, maintenance and support service activities which strive to meet stakeholder requirements and minimise the impact upon the environment. We manage capital projects by project teams and supply chain arrangements, to achieve sustainable improvement.

This certificate is valid from 13 June 2017 until 23 May 2020 and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 23 May 2020
Issue 11. Certified since 28 October 2004

This is a multi-site certification.
Additional site details are listed on the subsequent page.

Authorised by

SGS United Kingdom Ltd
Rossmore Business Park Ellesmere Port Cheshire CH65 3EN UK
t +44 (0)151 350-6666 f +44 (0)151 350-6600 www.sgs.com

SYSTEM CERTIFICATION ISO 14001 SGS

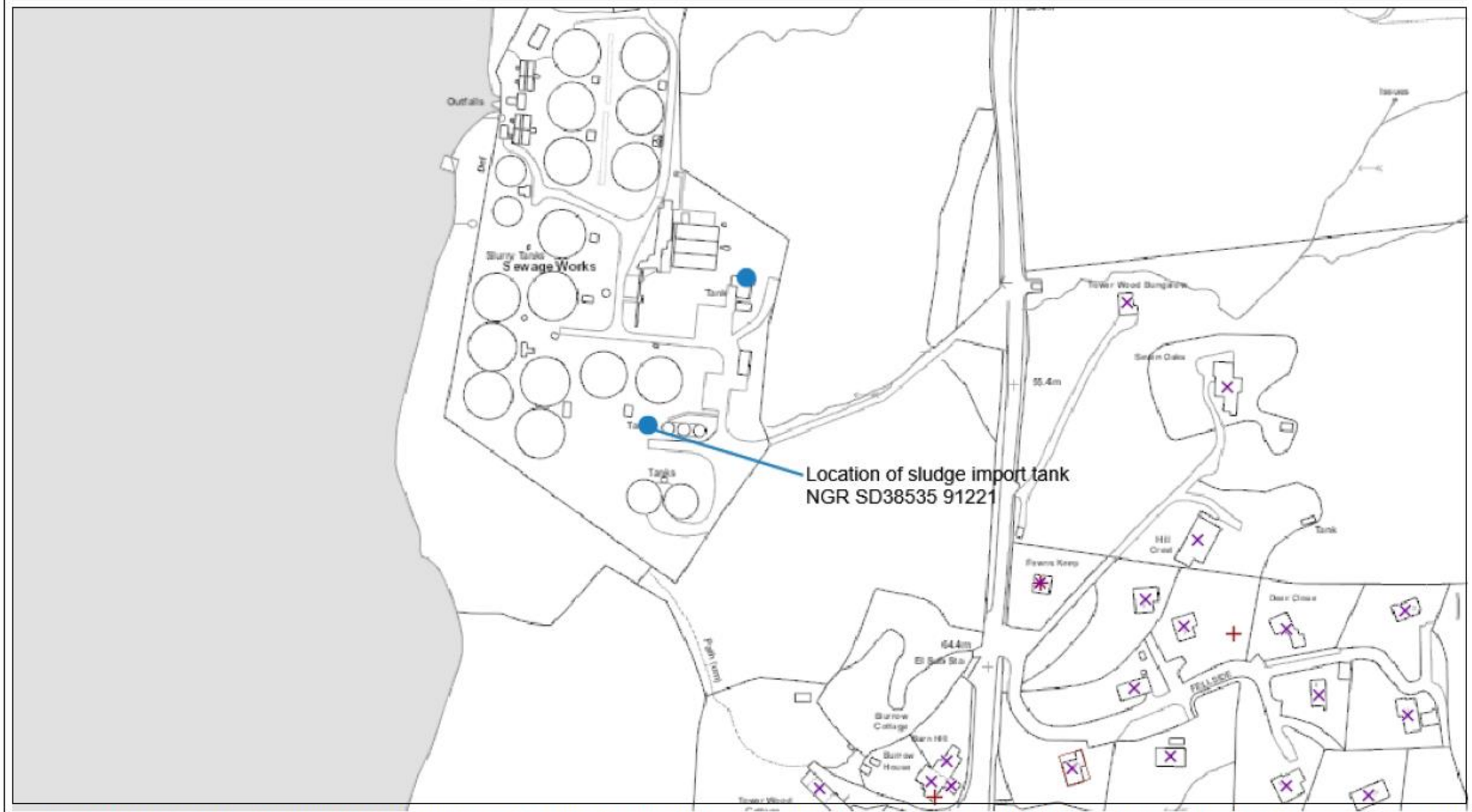
MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

UKAS MANAGEMENT SYSTEMS 0005

Appendix C: Site Location Plan

Windermere WwTW Sludge Import Tank

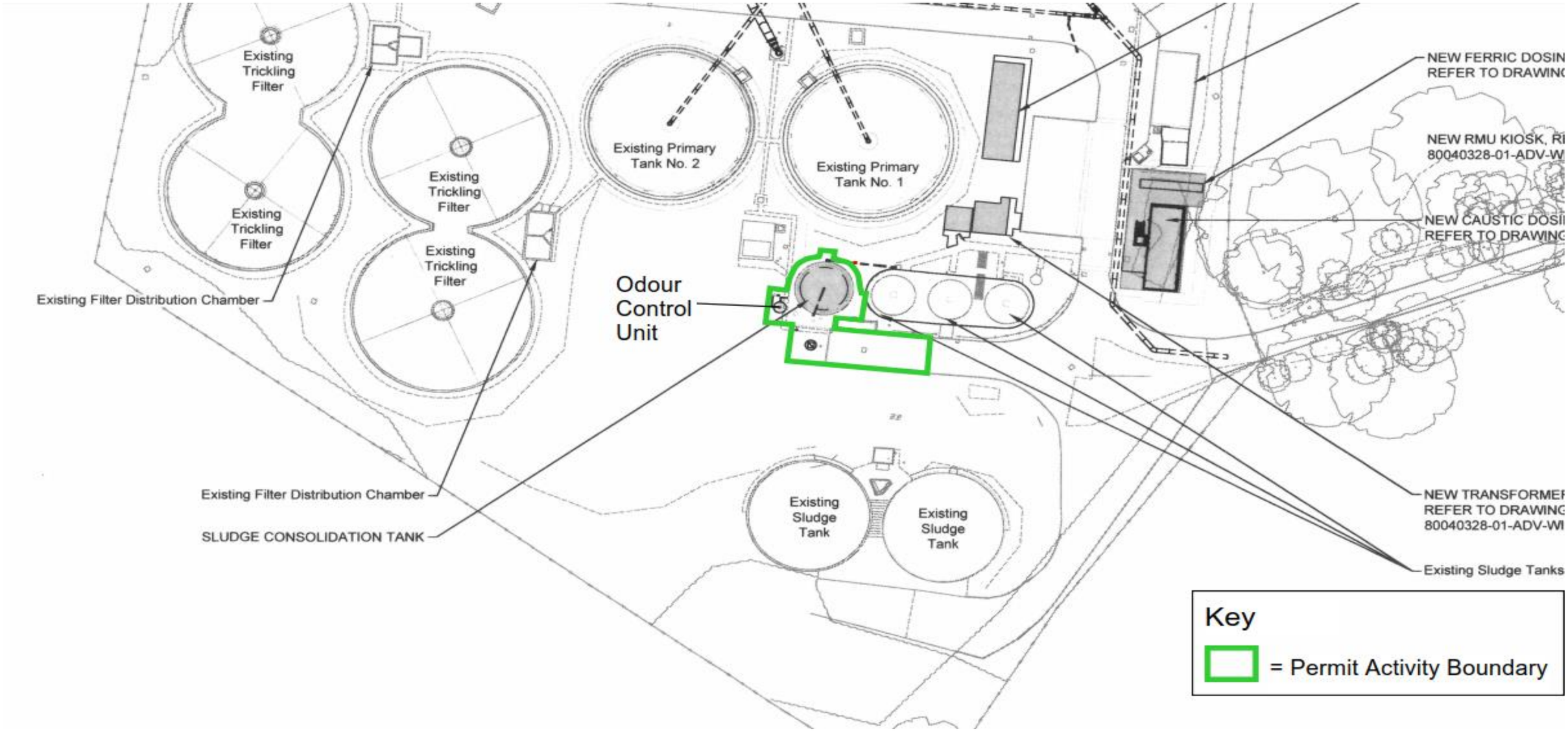
Centre : X : 338575 Y : 491229 | Date : 06/03/2019 | Scale Approx : 2336



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

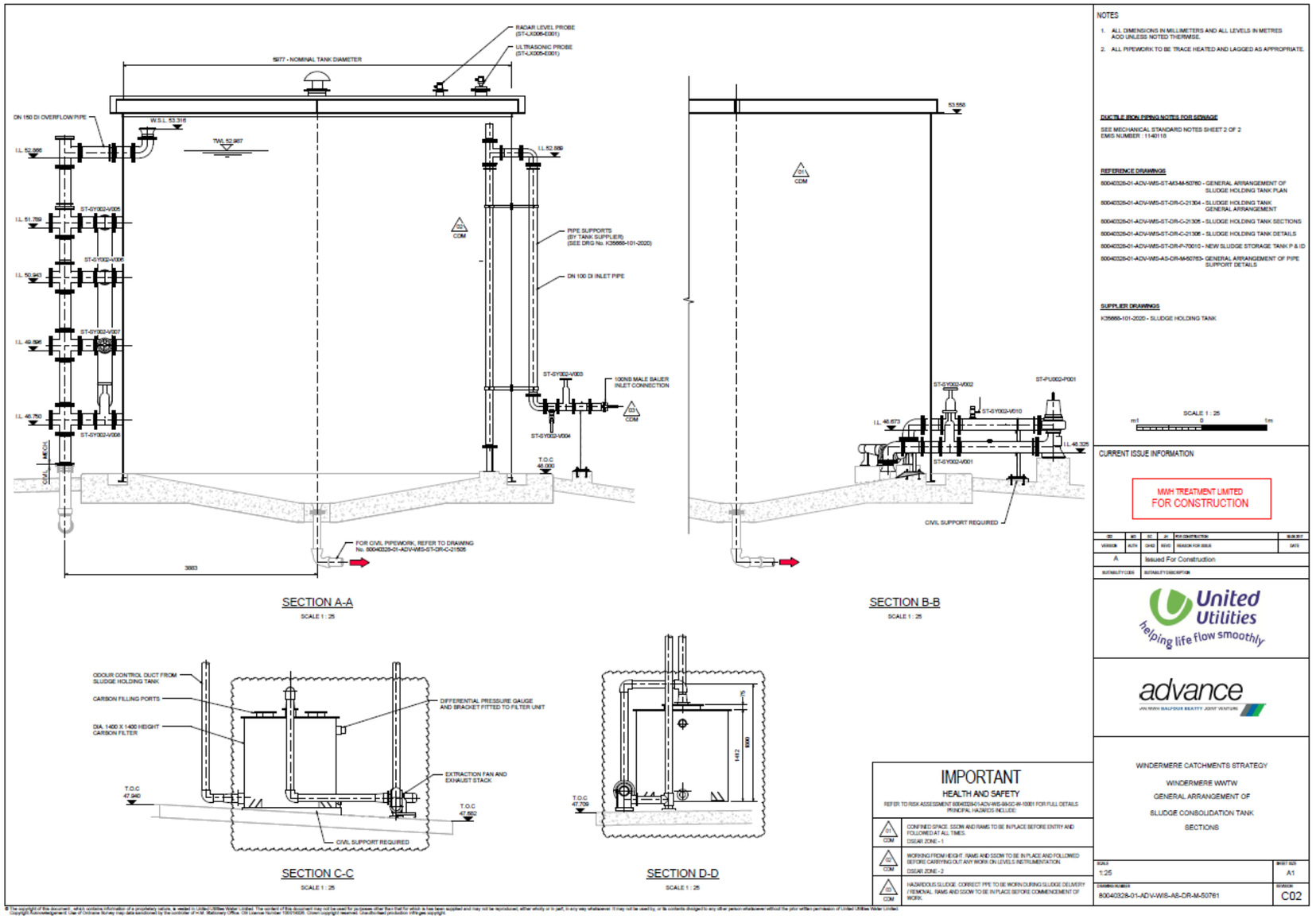
Crown copyright and database rights [2016] Ordnance Survey 100022432.

Appendix D: Site Permit Boundary and Layout Plan



Appendix E: Drainage Plan

Appendix F: Sludge Tank General Arrangement



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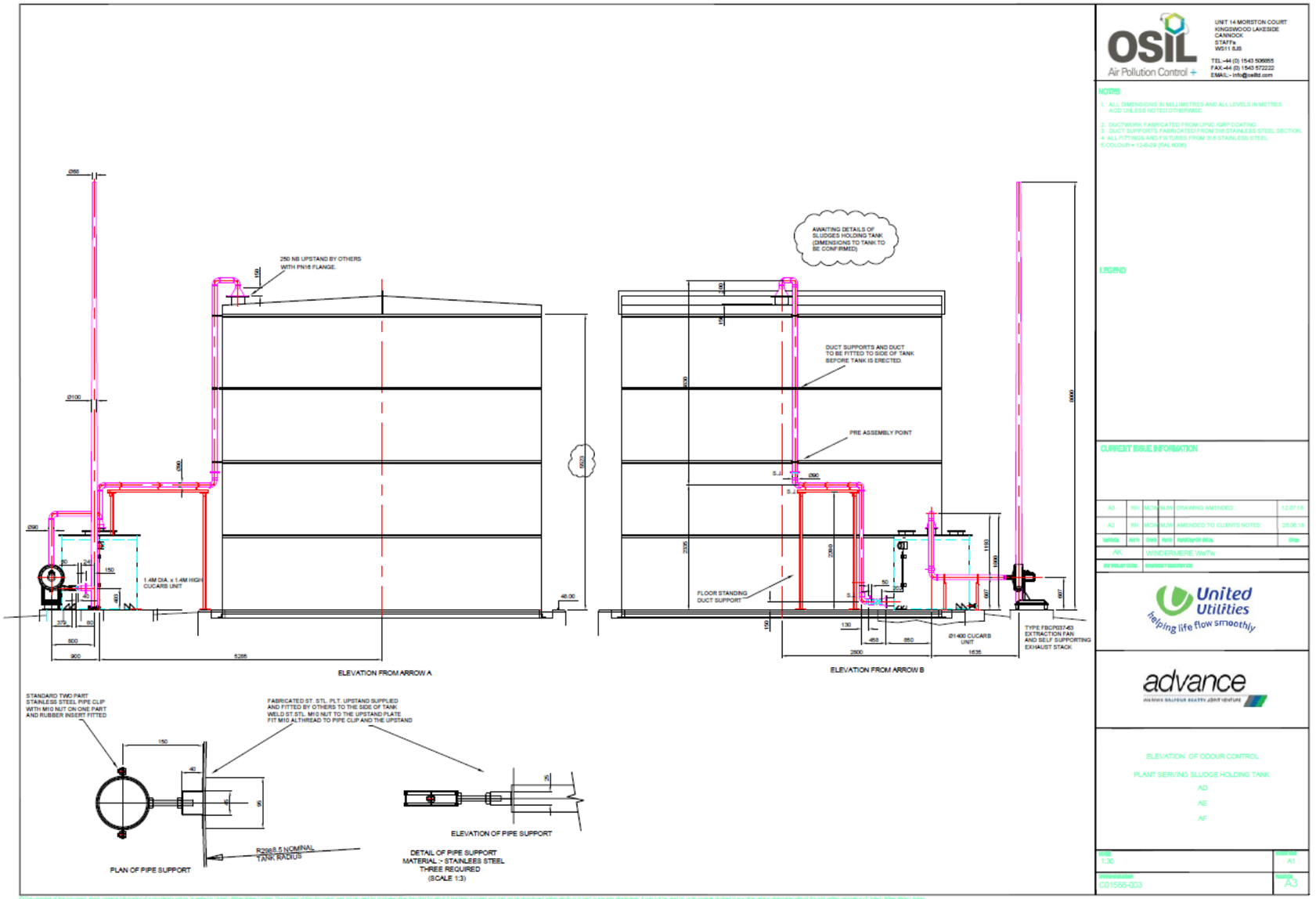
Copyright Acknowledgement: Use of Ordnance Survey map data sanctioned by the controller of H.M. Stationery Office. OS Licence Number 100019626. Crown copyright reserved. Unauthorised production infringes copyright.

Appendix G: Odour Control Unit Plans



Appendix H: Borehole Sample Test Results

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH Units
Method Codes :			ELESULP	GROHSA	ICPACIDS	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	PHSOIL
Method Reporting Limits :			20	0.2	20	0.5	0.1	0.3	0.2	1.2	1.6	0.7	6	0.5	2	0.5	16	
Accreditation Code:			UM		UM	UM	U	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM
LAB ID Number CL/	Client Sample Description	Sample Date	Elemental Sulphur	GRO (AA-UK) HSA-GCFID	SO4-- (acid sol)	Boron (H20 Soluble)	Antimony (MS)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Manganese (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	pH units (AR)
1551908	BH202 ES 5 2.00	29-May-15	<22	Req‡	167	0.7	0.9	10.4	<0.22	38.7	13.3	17.9	799.2	<0.5	24.4	<0.5	72.2	8.6
1551909	WS512 ES 2 0.50	08-Jun-15	<20	Req‡	84	<0.5	1	10.8	<0.20	44.6	20.6	19.3	920.4	<0.5	44.0	<0.5	69.4	8.0
1551910	WS512A ES 5 1.00	08-Jun-15	<20	Req‡	22	<0.5	1	11.2	<0.20	46.1	22.1	15.5	1220	<0.5	48.9	<0.5	71.8	7.8
1551911	WS514 ES 2 0.50	09-Jun-15	<20	Req‡	89	<0.5	1.1	12.2	<0.20	46.9	21.8	18.6	1050	<0.5	48.6	<0.5	71.9	8.0
1551912	WS516 ES 1 0.20	09-Jun-15	<20	Req‡	520	0.6	2.3	13.4	0.40	42.0	34.0	69.5	1150	<0.51	41.1	0.7	103.0	7.8
1551913	WS517 ES 1 0.20	09-Jun-15	<21	Req‡	264	<0.5	1	10.1	0.29	42.4	25.1	41.1	876.4	<0.52	39.0	<0.5	77.7	8.0

ESG
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel +44 (0) 1283 554400
Fax +44 (0) 1283 554422

Client Name	ESG Deeside
Contact	Mr A Bird

A592 Windermere

Sample Analysis

Date Printed	23-Jun-2015
Report Number	EFS/154006M
Table Number	1

Units :			mg/kg	mg/kg		%	mg/kg	mg/kg	mg/kg	Mol/kg	%	%	mg/kg	mg/kg	%	µg/kg	mg/kg	% M/M
Method Codes :			SFAPI	SFAPI	Sub002a	TMSS	TPHFIDUS	TPHFIDUS	TPHUSSI	ANC	CEN Leachate	CEN Leachate	ICPMSS	KONECR	LOI(%MM)	PCBUSECDAR	SFAS	WSLM59
Method Reporting Limits :			0.5	0.5		0.2	10	10	10	0.04	0.1	0.1	0.6	0.1	0.2		0.5	0.02
Accreditation Code:			UM	U	U	U	N	UM		N	N	N	N	N	N		N	N
LAB ID Number CU	Client Sample Description	Sample Date	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos Screen	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH by GCFID (SI-UKCWG)>44	Acid Neut. Capacity	Fraction of non-crushable material %	Fraction of sample above 4 mm %	Vanadium (MS)	Chromium vi:	L.O.I. % @ 450C	PCB-7 Congeners Analysis	Sulphide as S (AR)	Total Organic Carbon
1551908	BH202 ES 5 2.00	29-May-15	<0.6	<0.6	NAIIS	13.5			Req		0	76	38.7	<0.1			1.47	
1551909	WS512 ES 2 0.50	08-Jun-15	<0.5	<0.5	NAIIS	2.6	23	23	Req	0.56	0	44	32.2	<0.1	1.5	Req	<0.5	0.44
1551910	WS512A ES 5 1.00	08-Jun-15	<0.6	<0.6	NAIIS	11.0			Req		0	86	34.2	<0.1			<0.6	
1551911	WS514 ES 2 0.50	09-Jun-15	<0.6	<0.6	NAIIS	11.3	<11	<11	Req	0.88	0	53	35.9	<0.1	1.8	Req	<0.6	0.28
1551912	WS516 ES 1 0.20	09-Jun-15	<0.7	<0.7	NAIIS	24.4			Req		0	54	32.2	<0.1			0.75	
1551913	WS517 ES 1 0.20	09-Jun-15	<0.6	<0.6	NAIIS	15.8			Req		0	46	33.5	<0.1			<0.6	

ESG
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel +44 (0) 1283 554400
Fax +44 (0) 1283 554422

Client Name	ESG Deeside
Contact	Mr A Bird

A592 Windermere

Sample Analysis

Date Printed	23-Jun-2015
Report Number	EFS/154006M
Table Number	1

		Units :	µg/kg	µg/kg	ug/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg								
		Method Codes :	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	PAHMSUS								
		Method Reporting Limits :	5	1	2	1	6	4	2									
		Accreditation Code:	UM	UM	UM	UM	UM	UM	UM									
LAB ID Number CU	Client Sample Description	Sample Date	Toluene	Benzene	Ethyl Benzene	MTBE	Xylenes	m/p Xylenes	o Xylene	PAH (17) by GCMS								
1551908	BH202 ES 5 2.00	29-May-15	<6	<1	<2	<1	<7	<5	<2	Req								
1551909	WS512 ES 2 0.50	08-Jun-15	<5	<1	<2	<1	<6	<4	<2	Req								
1551910	WS512A ES 5 1.00	08-Jun-15	<6	<1	<2	<1	<7	<4	<2	Req								
1551911	WS514 ES 2 0.50	09-Jun-15	<6	<1	<2	<1	<7	<5	<2	Req								
1551912	WS516 ES 1 0.20	09-Jun-15	<7	<1	<3	<1	<8	<5	<3	Req								
1551913	WS517 ES 1 0.20	09-Jun-15	<6	<1	<2	<1	<7	<5	<2	Req								

ESG
Bretby Business Park, Ashby Road
Burton-on-Trent, Staffordshire, DE15 0YZ
Tel +44 (0) 1283 554400
Fax +44 (0) 1283 554422

Client Name	ESG Deeside
Contact	Mr A Bird

A592 Windermere

Sample Analysis

Date Printed	23-Jun-2015
Report Number	EFS/154006M
Table Number	1

Polycyclic Aromatic Hydrocarbons
GC/MS (SIM)

Customer and Site Details:	ESG Deeside: A592 Windermere		
Sample Details:	WS512A ES 5 1.00	**Job Number:**	S15_4006M
LIMS ID Number:	CL1551910	**Date Booked in:**	12-Jun-15
QC Batch Number:	150589	**Date Extracted:**	16-Jun-15
Quantitation File:	Initial Calibration	**Date Analysed:**	16-Jun-15
Directory:	1615PAH.GC5\	**Matrix:**	Soil
Dilution:	1.0	**Ext Method:**	Ultrasonic

Accredited?: Yes

Target Compounds	CAS #	R.T. (min)	Concentration mg/kg	% Fit	Accr. code
Naphthalene	91-20-3	-	< 0.09	-	**UM**
Acenaphthylene	208-96-8	3.28	1.71	65	U
Acenaphthene	83-32-9	-	< 0.09	-	UM
Fluorene	86-73-7	-	< 0.09	-	UM
Phenanthrene	85-01-8	-	< 0.09	-	UM
Anthracene	120-12-7	-	< 0.09	-	U
Fluoranthene	206-44-0	-	< 0.09	-	UM
Pyrene	129-00-0	-	< 0.09	-	UM
Benzo[a]anthracene	56-55-3	-	< 0.09	-	UM
Chrysene	218-01-9	-	< 0.09	-	UM
Benzo[b]fluoranthene	205-99-2	-	< 0.09	-	UM
Benzo[k]fluoranthene	207-08-9	-	< 0.09	-	UM
Benzo[a]pyrene	50-32-8	-	< 0.09	-	UM
Indeno[1,2,3-cd]pyrene	193-39-5	-	< 0.09	-	UM
Dibenzo[a,h]anthracene	53-70-3	-	< 0.09	-	UM
Benzo[g,h,i]perylene	191-24-2	-	< 0.09	-	UM
Coronene	191-07-1 *	-	< 0.09	-	N
Total (USEPA16) PAHs	-	-	< 3.06	-	N

* Denotes compound is not UKAS accredited

"M" denotes that % fit has been manually interpreted

Internal Standards	% Area
1,4-Dichlorobenzene-d4	NA
Naphthalene-d8	98
Acenaphthene-d10	96
Phenanthrene-d10	92
Chrysene-d12	88
Perylene-d12	85

Surrogates	% Rec
Nitrobenzene-d5	NA
2-Fluorobiphenyl	103
Terphenyl-d14	75

Concentrations are reported on a dry weight basis.

The Total PAH result is the sum of non-rounded individual PAH results and therefore may differ to the sum of the rounded individual PAH results printed above. By convention, where any one or more result is a "less than", the total is expressed as a "less than" and includes the "less than" concentration within the total.

Gasoline Range Organics
(BTEX and Aromatic/Aliphatic Carbon Ranges)

Customer and Site Details: ESG Deeside : A592 Windermere
Job Number: S15_4006M
Directory: D:\TES\DATA\Y2015\0615HSA_GC12\150615 2015-06-15 12-13-52\137B3101.D
Method: HEADSPACE GCFID
Accreditation Code: UM

Matrix: Soil
Date Booked in: 12-Jun-15
Date extracted: 15-Jun-15
Date Analysed: 15-Jun-15, 22:06:
Units: mg/kg

*** Sample data with an asterisk are not UKAS accredited.**

		BTEX				Aromatics		Aliphatics		Total GRO
Sample ID	**Client ID**	**Benzene**	**Toluene**	**Ethyl benzene**	**Xylenes**	**C5 - C7**	**>C7 - C8**	**C5 - C6**	**>C6 - C8**	**C5 - C10**
CL1551908	BH202 ES 5 2.00	<0.012‡	<0.012‡	<0.012‡	<0.023‡	<0.01‡	<0.01‡	<0.2‡	<0.2‡	<0.2‡
CL1551909	WS512 ES 2 0.50	<0.010‡	<0.010‡	<0.010‡	<0.021‡	<0.01‡	<0.01‡	<0.2‡	<0.2‡	<0.2‡
CL1551910	WS512A ES 5 1.00	<0.011‡	<0.011‡	<0.011‡	<0.022‡	<0.01‡	<0.01‡	<0.2‡	<0.2‡	<0.2‡
CL1551911	WS514 ES 2 0.50	<0.011‡	<0.011‡	<0.011‡	<0.023‡	<0.01‡	<0.01‡	<0.2‡	<0.2‡	<0.2‡
CL1551912	WS516 ES 1 0.20	<0.013‡	<0.013‡	<0.013‡	<0.026‡	<0.01‡	<0.01‡	<0.3‡	<0.3‡	<0.3‡
CL1551913	WS517 ES 1 0.20	<0.012‡	<0.012‡	<0.012‡	<0.024‡	<0.01‡	<0.01‡	<0.2‡	<0.2‡	<0.2‡

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: ESG Deeside : A592 Windermere
Job Number: S15_4006M
QC Batch Number: 150589
Directory: D:\TES\DATA\Y2013\02\061715TPH_GC3\082B5701.D
Method: Ultra Sonic
Separation: Silica gel
Eluents: Hexane, DCM

Matrix: Soil
Date Booked In: 12-Jun-15
Date Extracted: 16-Jun-15
Date Analysed: 18-Jun-15

This sample data is not MCERTS accredited.
Ba * This sample data is not ISO17025 accredited.

		Concentration, (mg/kg) - as dry weight.												
		>C8 - C10	>C8 - C10	>C10 - C12	>C10 - C12	>C12 - C16	>C12 - C16	>C16 - C36	>C16 - C21	>C36 - C44*	>C21 - C36	>C36 - C44*	>C8 - C44*	>C8 - C44*
Sample ID	Client ID	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics	Aromatics	Aliphatics	Aromatics
CL1551908	BH202 ES 5 2.00	<5	<5	<5	<5	<5	<5	<13.8	7.5	<6.50	42	<6.50	<23	52.4
CL1551909	WS12 ES 2 0.50	<4	<4	<4	<4	<4	<4	<12.2	<4	<5.77	<8.99	<5.77	<21	<21
CL1551910	WS12A ES 5 1.00	<4	<4	<4	<4	<4	<4	<13.4	<4	<6.31	<9.84	<6.31	<22	<22
CL1551911	WS14 ES 2 0.50	<5	<5	<5	<5	<5	<5	<13.4	<5	<6.34	<9.88	<6.34	<23	<23
CL1551912	WS16 ES 1 0.20	<5	<5	<5	<5	<5	<5	<15.7	<5	<7.43	38.6	10.09	<26	53
CL1551913	WS17 ES 1 0.20	<5	<5	<5	<5	<5	<5	<14.1	<5	<6.57	<10.40	<6.57	<24	<24

			Units :	pH units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
			Method Codes :	WSLM3	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPMSW	ICPWATVAR	ICPMSW	ICPMSW	KONENS	SFAPI	SFAPI
			Method Reporting Limits :		0.001	0.001	0.0001	0.001	0.001	0.002	0.002	0.01	0.001	0.01	0.0001	0.001	0.01	0.02	0.02
			UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number EX/	Client Sample Description	Sample Date		pH units w	Nickel as Ni (Dissolved)	Chromium as Cr (Dissolved)	Cadmium as Cd (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Zinc as Zn (Dissolved)	Manganese as Mn (Dissolved)	Iron as Fe (Dissolved) a	Arsenic as As (Dissolved)	Boron as B (Dissolved) a	Mercury as Hg (Dissolved)	Selenium as Se (Dissolved)	Ammoniacal Nitrogen as N	Cyanide (Free) as CN	Cyanide (Total) as CN
1600862	BH202 ES 5 2.00	12-Jun-15		7.6	0.002	0.001	<0.0001	0.006	0.001	0.007	0.011	0.24	0.012	0.07	<0.0001	0.001	0.3	<0.05	<0.05
1600863	WS12 ES 2 0.50	12-Jun-15		7.9	0.002	0.001	<0.0001	0.006	0.005	0.009	0.022	0.41	0.002	0.02	<0.0001	<0.001	<0.01	<0.05	<0.05
1600864	WS12A ES 5 1.00	12-Jun-15		7.6	0.001	<0.001	<0.0001	0.004	0.001	0.011	0.009	0.24	0.001	0.02	<0.0001	<0.001	0.05	<0.05	<0.05
1600865	WS14 ES 2 0.50	12-Jun-15		7.8	0.003	0.002	<0.0001	0.005	<0.001	0.012	0.037	0.70	0.001	0.01	<0.0001	<0.001	<0.01	<0.05	<0.05
1600866	WS16 ES 1 0.20	12-Jun-15		7.6	0.003	0.004	0.0001	0.018	0.007	0.02	0.091	0.94	0.004	0.17	<0.0001	0.002	0.20	<0.05	<0.05
1600867	WS17 ES 1 0.20	12-Jun-15		7.8	0.004	0.004	<0.0001	0.016	0.01	0.039	0.186	1.75	0.005	0.06	<0.0001	<0.001	0.10	<0.05	<0.05

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		Units :	mg/l															
		Method Codes :	ICPWATVAR															
		Method Reporting Limits :	0.01															
		UKAS Accredited :	No															
LAB ID Number EX/	Client Sample Description	Sample Date	Aluminium as Al (Dissolved) a															
1600862	BH202 ES 5 2.00	12-Jun-15	0.74															
1600863	WS512 ES 2 0.50	12-Jun-15	0.51															
1600864	WS512A ES 5 1.00	12-Jun-15	0.29															
1600865	WS514 ES 2 0.50	12-Jun-15	0.92															
1600866	WS516 ES 1 0.20	12-Jun-15	1.06															
1600867	WS517 ES 1 0.20	12-Jun-15	1.57															

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