

**WSX09 -
Annexes - Base
cost adjustment
claims**

June 2023 early
submission



Wessex Water
YTL GROUP

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CAC5 - Industrial Emissions Directive (IED) costs

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A1-1. Background

A1-1.1. Application of IED to bioresources

In February 2013, the EU Industrial Emissions Directive (IED) was transposed into UK law under the Environmental permitting Regulations (EPR). Under IED, pollutants from industrial emissions are regulated and industrial installations are therefore required to reduce their emissions to air, land and water. The Environment Agency (EA) have decided to enact IED across all industries in England and Wales, including bioresources. The application of IED in bioresources meant that all bioresources treatment sites undertaking the biological treatment of sewage sludge (i.e., anaerobic digestion) exceeding 100 tonnes per day are required to apply for IED environmental permits under EPR.

As sewage sludge has historically been exempted as a waste by way of the Urban Waste Water Treatment Directive, there was initial uncertainty surrounding the applicability of IED to sewage sludge treatment. A legal review was undertaken to resolve this and EA set out an interim position which delayed the need for water companies to apply for IED permits. In July 2019, water companies received an official letter from the EA confirming the requirement to apply for permits by August 2022. This has since been extended to December 2024 to account for permitting delays.

A1-1.2. Implications on sludge treatment assets

All sludge treatment sites that require IED permits will need to comply with:

- The EU Waste Treatment Best Available Techniques (BAT) which are best economically and technically viable techniques in waste treatment to prevent, minimise and reduce emission to air, water and land.
- The EA's 'Biological Waste Treatment: Appropriate Measures for Permitted Facilities' guidance ('Appropriate Measures') which prescribes the measures that are required in the design, construction, operation and maintenance of a waste operation facility.

BAT and Appropriate Measures (AM) are the key guiding principles underlying the EA's approach on IED compliance. The EA expect all sites to be risk-assessed to determine if they comply with BAT and AM. All non-compliant sites would need to be improved and upgraded to BAT and AM standards by December 2024.

Significant capital investment is required to bring the infrastructure at our five sludge anaerobic digestion (AD) sites up to BAT and AM standards, so that they can comply with IED. For example, secondary containment would need to be retrofitted to all existing AD assets to comply with CIRIA 736 which is referenced in BAT as the standard for containment for the wider AD industry. Another example is the need to retrofit tank covers on all existing sludge tanks for reducing emissions to air.

Operationally, there will also be a significant increase in operational and maintenance activities required on sludge AD sites to maintain compliance with BAT and AM after the IED permits have been issued. A few examples are the requirement to undertake additional sampling of sludges and process liquors, leak detection, odour monitoring and drainage surveys.

A1-1.3. Key Issues

A1-1.3.1. Misalignment in PR19 timescales

The formal letter from the EA in July 2019 (Annex J) requesting water companies to apply for IED permits came too late in the PR19 cycle, as business plans for AMP7 was already submitted. While the EA's position is that they have warned water companies about the future inclusion of sewage sludge into IED and EPR, this was challenged legally until 2019, which meant there was uncertainty around the applicability of IED on sewage sludge treatment throughout the PR19 planning process. Furthermore, at that time the EA were not clear on what they deemed as acceptable BAT as the AM guidance document was only consulted on in 2020 and published in 2022. Therefore, there has been a 'moving goalpost' leaving companies in a position where they have not been able to adequately estimate the level of investment required at the sludge treatment sites.

Therefore, in PR19, most companies did not include any costs associated with IED, as evidenced in the table below which shows the 'Allowance v. Submitted' costs in the PR19 Final Determination (based on the WWS5 table of each company's business plan data tables).

Yorkshire Water and Northumbrian Water subsequently included in their CMA submission that they will incur costs of complying with IED which were not considered at PR19. Both companies asked for an uncertainty mechanism that allowed for cost recovery through adjustments to the bioresources RCV in AMP7. CMA findings affirmed the uncertainty around the scope of IED and associated costs for compliance:

"There is a high level of uncertainty around the cost of IED compliance, arising from potential differences in needs, scope, and efficient costs for a large number of activities. This makes setting ex-ante allowances particularly problematic."

Table 2 – Allowance v. submitted cost table from PR19 FD¹

Other costs, allowances for AMP7

Price base: £m Real, 2017/18 prices

Cost: Industrial emissions directive

Company	Business plans		Ofwat allowance	
	Wastewater network plus	Bioresources	Wastewater network plus	Bioresources
ANH	0	0.0	0.0	0.0
HDD	0	0.0	0.0	0.0
NES	0	0.0	0.0	0.0
NWT	0.9	8.7	0.9	8.7
SRN	0	0.0	0.0	0.0
SVE	0	0.0	0.0	0.0
SWB	0	0.0	0.0	0.0
TMS	0	0.3	0.0	0.3
WSH	0	0.2	0.0	0.2
WSX	0	0.0	0.0	0.0
YKY	0	0.0	0.0	0.0
AFW				
BRL				
PRT				
SES				
SEW				
SSC				
Total	0.9	9.2	0.9	9.2

A1-1.3.2. Further scope creep in PR24

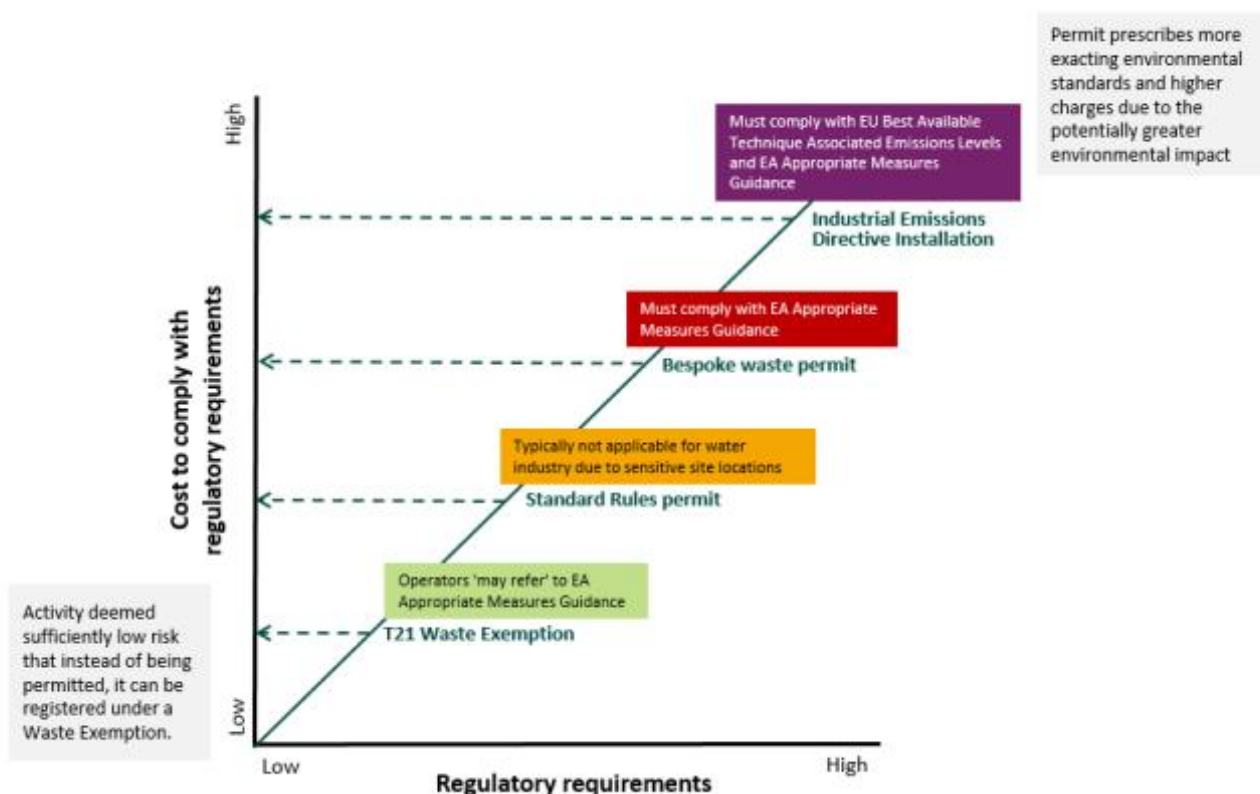
The lack of guidance in PR19 on what the EA deemed as acceptable BAT resulted in uncertainties around the scope of site improvements required and therefore the level of investment required in AMP7. Additionally, the EA stated in a Waste and Recycling Network meeting in June 2019 that they consider the cost implications will relate to permit variation costs and limited asset improvements, as they assumed that there was not a significant step change in standards required under T21 Waste Exemptions (that companies had to comply with prior to IED) to those required under IED. However, this was not the case, as the “goalpost” for what was acceptable BAT solutions continued to move in the following years which resulted in the scope of IED improvements to grow larger than previously expected. This is also supported by Atkins in their independent technical review of IED in April 2023². A figure from their report which shows the significant step change in regulatory requirements and associated cost to comply is provided below.

¹ Ofwat, “PR19 FD Cost tables,” 2020. [Online]. Available:

https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ofwat.gov.uk%2Fwp-content%2Fuploads%2F2019%2F12%2FFM_UC_OtherCosts_FD.xlsx&wdOrigin=BROWSELINK

² Atkins, “Industrial Emissions Directive Supporting Document for Water UK,” 2023.

Figure 1 – Regulatory Requirements and Costs to Comply [2]



The AM guidance, which the EA only formally published in 2022 after permit applications were made, sets out blanket requirements for all assets in a prescriptive approach using terminology such as “you must”, whereas BAT allows for a more risk-based approach. AM effectively raises the bar in environmental protection standards and the associated costs for compliance. AM requirements significantly exceed those of BAT in the areas of covering/storage and secondary containment, which are two areas that require the most significant investment to upgrade. We have seen an instance of the EA’s strict adherence to AM requirements when they rejected our proposal to only provide vehicle collision protection to a concrete tank at Poole, insisting that secondary containment is necessary for this tank despite its extremely low failure rate.

There have also been other instances of scope creep:

- In 2022, the EA started to require groundwater monitoring under IED and referred to additional guidance documents (‘Monitoring discharges to water: guidance on selecting a monitoring approach’ and ‘Surface water pollution risk assessment for your environmental permit’). This has never been a requirement prior to 2022, nor has it been mentioned in the AM guidance.
- Prior to 2022 the EA deemed that short-term cake storage would not require covering as the need for covering was based on the risk of water infiltration. However, they have since backtracked, as they now cite that there is a concern of methane emissions from cake stores which would warrant the need for covering (This was covered in a 2022 IED workshop between the EA and WaSCs; minutes reported in Annex M.)

Initially the EA were not clear on whether sludge liquor treatment was within the scope of IED, with it being included in some draft IED permits and not others. It was only in February 2021 when permit applications were underway that the EA confirmed in writing to the Waste and Recycling Network that liquor treatment is included in the scope of IED.

A1-1.4. Timeline of events

The figure below (taken from a briefing note on IED to Water UK in May 2022³) shows when significant events have taken place in the development of IED within the industry. As can be seen the industry did not have clear guidelines that permitting would be required in AMP7 and so were unable to adequately estimate the investment required. Additionally, delays in the release of the AM guidance have put further pressure on being able to clearly articulate the costs of compliance.

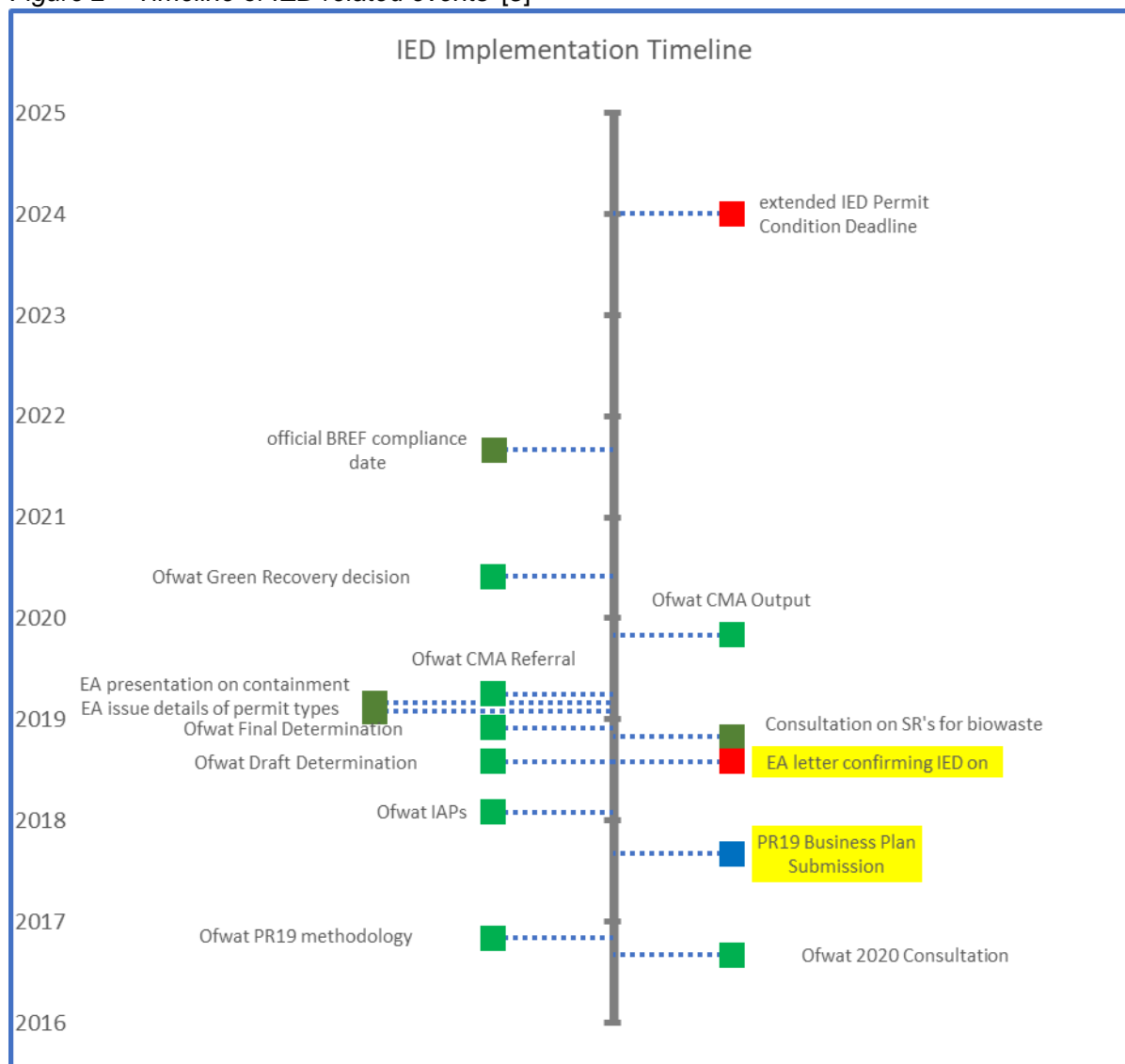
United Utilities submitted IED investment proposals under the Green Recovery scheme in 2020, but were rejected by Ofwat because the deadline for IED compliance was 2024, so IED investment proposals would not need to be brought into AMP8. Ofwat cited the EA's position that companies have been given sufficient time to have their sites BAT-assessed, draw up improvement plans and implement them before 2024. However, we now know that this would have not been the case, and the delivery of IED improvements would likely slip into AMP8 due to the scope creep caused by AM guidance in 2022 and the delays in the permitting process. However, Ofwat acknowledged in their Green Recovery final decision document that:

“...if any IED requirements did extend into the 2025-30 period, [they] would be open to considering an allowance under transition funding allowance for investment in 2024-25 as part of the 2024 price review. This process is available for all companies that did not appeal their PR19 final determinations to the Competition and Markets Authority.”

The industry considered including IED investment proposals in the PR24 Water Industry National Environment Programme (WINEP) as the IED obligations are viewed as PR24 sludge enhancement activities. However, Ofwat and EA both disagreed with this view (as evidenced in the Ofwat WINEP feedback letter in 2022 in Annex K, and the EA-WaSCs WINEP evidence log in Annex L). Therefore, we did not include any IED investment proposals in our PR24 WINEP programme.

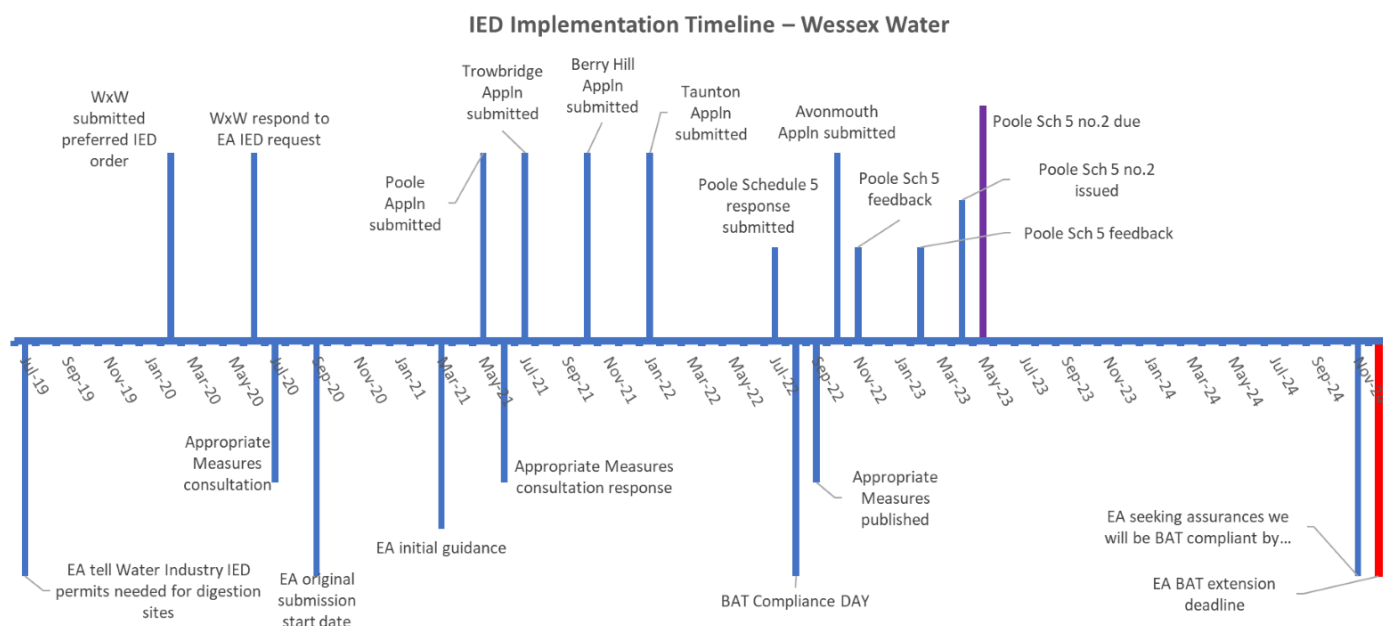
³ Thames Water, “IED Background for Water UK,” 2022

Figure 2 – Timeline of IED related events [3]



The figure below shows the IED implementation timeline for Wessex Water. As can be seen that we had to submit all our IED applications before the AM guidance was published in September 2022, which raised the bar for compliance and the associated cost for compliance. Additionally, it was through the Schedule 5 responses for our Poole application that we learnt of the additional new groundwater monitoring requirements and what secondary containment measures the EA deemed acceptable under BAT and AM.

Figure 3 – Timeline of IED related events – Wessex Water



The EA are also delayed in assessing permit applications, as companies are waiting for permits to be issued for applications made in 2020 (i.e. the 1st permitting tranche). With this considered, as well as the higher compliance requirements under AM, there are concerns within the industry if the extended deadline of 2024 for compliance would even be feasible.

A1-1.5. Estimated costs

The pie chart below outlines the estimated capex required for upgrading our 5 AD sites (Avonmouth, Trowbridge, Poole, Berry Hill and Taunton) to BAT and AM standards for IED compliance. As can be seen that significant investment is required to improve asset condition to meet BAT, implement secondary containment as per the CIRIA 736 standard, and retrofit covers on all open sludge tanks to reduce odour and emissions to air.

The table below shows the capex costs split by site and funding (i.e. either base and enhancement costs). We are claiming all base and enhancement costs in this cost adjustment claim as we believe there is a lack of clarity on Ofwat’s guidance on whether IED related costs are considered base costs, enhancement costs, or split between both. We also unclear of the intended cost assessment to costs reported outside of Line 4K.13 in the APR (which is the only line in the APR for reporting IED costs, but limited to only EA and administrative costs) or equivalent lines for the next price control period.

Figure 4 – Estimated CAPEX for upgrading all existing Wessex Water AD sites to comply with IED

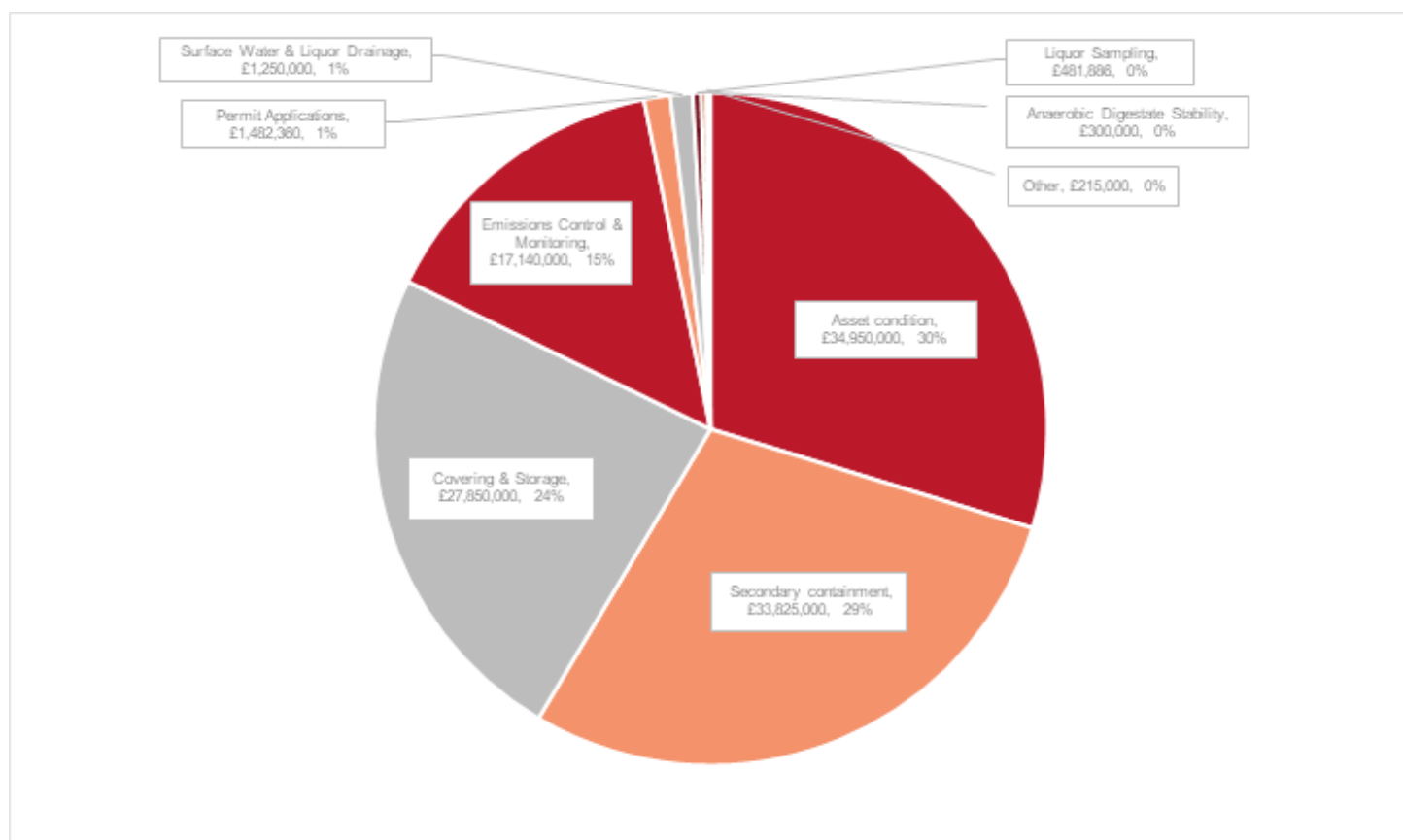


Table 3 - CAPEX breakdown by enhancement and maintenance (base) costs

Site	Enhancement	Maintenance	Grand Total
General / Investigations	£1,165,246		£1,165,246
Avonmouth	£20,029,000	£14,500,000	£34,529,000
Berry Hill	£20,363,000	£1,900,000	£22,263,000
Poole	£15,573,000	£4,750,000	£20,323,000
Taunton	£23,320,000	£3,300,000	£26,620,000
Trowbridge	£7,144,000	£5,450,000	£12,594,000
Grand Total	£87,594,246	£29,900,000	£117,494,246

A1-2. Need for adjustment

As with the rest of the industry, we do not expect to be able to fully comply with IED by December 2024 due to the delays in the permitting process and the large scale of capital works to upgrade all our sites to IED standards. We expect the EA to agree to relaxing the improvement condition programme into AMP8, so we are including our IED investment proposals in PR24. As such we consider it prudent to include a cost adjustment claim on the basis of incurring IED related costs for the first time in PR24. For the same reason, we also expect to incur a higher level of efficient costs in the round, compared to the historical period.

A1-2.1. Unique circumstances

Like most other companies, we did not include any costs associated with IED compliance in PR19 because the formal letter from the EA requesting for companies to apply for IED permit came too late in the PR19 process. Prior to that there was a high level of uncertainty around the scope and applicability of IED on sewage sludge treatment. Furthermore, the late request to comply with IED also meant there was limited time to assess the implications of IED at a site level and therefore include any accurate cost estimates for IED in our PR19 plans. This is aligned with the 2020 CMA findings which state:

*'In general, the CMA observes that IED compliance costs appear highly sensitive to the assessment of detailed requirements at specific sites. This accords with the Environment Agency's view that 'accurate estimates of the costs attributable to IED will only be available once all the site and company specific factors have been assessed and the review or issue of permits has been completed.'*⁴

Any cost estimations for IED in PR19 would now be inaccurate given the significant scope development of IED post-PR19 through the publication of the EA's AM guidance which raised the bar for compliance, and the various additional requirements included in the IED scope during the permitting process.

In PR24 we have since undertaken site-specific risk assessment of our AD sites to scope the site upgrades required for IED in more detail. Like the other companies, we have found that the scope of capital works and the associated investment required are significant. This is also largely due to the pressure from the EA to complete all site upgrades within an AMP, ignoring the fact that the industry normally phases asset replacement or refurbishment programmes over several AMPs.

We have 5 AD sites that fall within the remit of IED – Avonmouth, Trowbridge, Poole, Berry Hill and Taunton. The estimated capital investment required to bring these 5 sites up to IED standards amounts to c. £117.5m. The bulk of this investment is made up of costs for replacing or refurbishing assets to meet BAT and AM standards, constructing bunds or impermeable surfaces to provide secondary containment to sludge tanks and digesters, and retrofitting covers on all open sludge tanks. These are significant capital investment costs that will drive up the level of efficient costs in bioresources in AMP8.

We have considered alternative options for secondary containment and covering sludge tanks to reduce the overall level of investment required. However, the EA have been very strict in their adherence to the AM guidance in deciding what is acceptable in both areas. The EA have not been accommodating of risk-based approaches we have proposed for both areas. In the case of secondary containment at Poole, the EA deemed that secondary containment is necessary for all sludge tanks regardless of how likely they would fail. In the case of covering sludge

⁴ Competition and Markets Authority (CMA), "Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations," 2020

tanks, the EA agreed to proposals for emissions monitoring programmes but (at a 2020 IED workshop; minutes in Annex M) insisted that all open sludge tanks will still need to be covered as this is a “regulatory requirement”.

Given these unique circumstances, we believe a cost adjustment is warranted in this instance.

A1-2.2. Management control

Our IED investment proposal for AMP8 is based on the EA’s AM guidance and their interpretation of acceptable BAT measures. We have undertaken site-specific risk assessment of our 5 AD sites to identify the areas that do not currently comply with the standards set out by BAT and AM. We have then scoped the necessary improvements works for bringing the assets up to the required standards within the timescales required by the EA. These standards and the timescale for compliance are solely in the control of the EA. Therefore we do not see that our management has any control in the factors that drive the required IED investments.

We have considered steps to control the costs associated with IED. We proposed alternative measures to meet BAT and AM standards that are more cost efficient and affordable. For example, in the area of controlling emissions to air, we proposed emissions monitoring programmes as a step in a risk-based approach for designing better-suited solutions for covering open sludge tanks. However these alternative measures are subject to EA approval as mentioned above.

We have also considered any opportunities for potential cost savings. For example, where there is a cluster of sludge tanks for secondary containment, we proposed a shared containment system to reduce the cost and carbon footprint of the containment solution.

A1-2.3. Materiality

The EA have taken a very cautious approach in assessing the pollution risk associated with the operation of a biowaste treatment or handling facility. As such their AM guidance recommends very prescriptive measures or interventions for mitigating these pollution risks. We have reviewed the AM guidance and undertaken site-specific risk assessments for our 5 AD sites to identify gaps in compliance with BAT and AM. We have then undertaken a bottom-up site-level scoping exercise to develop the engineering solutions required to upgrade each site and its assets to meet BAT and AM standards. The estimated costs for the capital works identified in the scoping exercise are significant (c. £117.5m); we are therefore confident that IED is a material driver for increased expenditure in AMP8.

In Atkins technical review of IED [2], they estimated a significant investment programme is required to bring sites across all companies to meet BAT and AM standards. This proved to be true when they collated IED investment costs from all companies and reported that the total estimated capital and one-off opex expenditure for the industry is £2.0b. Secondary containment and covering of sludge tanks were identified as the 2 most significant areas of expenditure across the industry – which is consistent with our IED expenditure profile.

A1-2.4. Adjustment to allowances (including implicit allowance)

In considering an adjustment to allowances, we have recognised several broad types of IED-related costs.

First, there are the costs which Ofwat refers to in its April 2023 econometric model consultation as “wastewater Industrial Emissions Directive (IED) operating costs” which Ofwat excluded from the scope of modelled costs.

Second, there are enhancement costs for the improvements needed for compliance with IED.

Third, as reflected in this claim, there is some additional capital maintenance expenditure which is expenditure that would not be incurred in the absence of IED.

Our claim covers costs falling under all three types.

In relation to the first of these, our understanding is that Ofwat will exclude these from modelled costs and, as a consequence, we would not expect an implicit allowance.

In relation to the second type, these would most naturally be classified as enhancement expenditure and outside of the scope of modelled base costs (most of the expenditure we identify in this claim is enhancement expenditure). It is possible that there is some element of costs associated with these interventions in reported base expenditure, but we would not expect this to be significant relative to the value of the claim. Given the time period over which Ofwat's econometric modelling and the five-year time window for the efficiency scores used to set catch-up adjustments, we would not expect a significant implicit allowance. This reflects our understanding that, across the industry, companies have not yet proceeded to incurring substantial amounts for interventions to achieve compliance.

On the third category above, there is an implicit allowance for capital maintenance with the modelled costs derived from econometric models of bioresources base expenditure. However, our claim is intended to capture additional capital maintenance in AMP8 that would not be needed in the absence of IED.

Our current assumption is that the implicit allowance is not material, but this is something that we will consider further for the business plan submission.

We do not consider this claim to be symmetrical. We are incurring costs related to IED, which is an industry-wide regulatory requirement.

A1-3. Cost Efficiency

We are confident the cost estimates of our IED investment proposals are robust and efficient. As mentioned in Section 3.3, we have undertaken a risk-assessment at each of our 5 AD sites to produce a site-level gap analysis of BAT and AM requirements. We then developed the scope of engineering works for each site and built our cost estimates based on this. We benchmarked the cost estimate of our scope using an independent body (ChandlerKBS) for assurance. As an example, the internal cost estimate for upgrading Trowbridge was found to be only 1% different from the benchmarked cost.

The scope of works required at Trowbridge is provided in Annex G and the benchmarked costs are provided in Annex H.

A1-4. Need for investment

The EA have formally confirmed to us in 2019 that sewage sludge treatment facilities that process more than 100 tonnes of sewage sludge per day fall within the regulation of IED. This affects all 5 of our AD sites. We were given until August 2022 to apply IED permits for these sites, but this deadline was pushed back to December 2024.

All new and existing sites will need to comply with standards set out in the 2018 BAT reference documents (BREF) and AM guidance published in 2022. Our 5 existing AD sites will need to retrospectively made compliant by upgrading existing assets to BAT and AM standards. The EA expect all existing sites to be made compliant at the time of permit application before 2024, or at the very least demonstrate an improvement programme towards compliance.

Due to the significant scope creep and delays in the permitting process, there is a recognition within the industry that the deadline of December 2024 for IED compliance is not likely to be achievable in full. Capital enhancement improvements, such as secondary containment and covering of sludge tanks, will need to be relaxed into AMP8 through a phased delivery approach. The EA have been made aware of the issue but have yet to formally agree to slipping the compliance deadline into AMP8, or a phased improvement condition programme that is relaxed into AMP8.

The site-specific risk assessments and BAT gap analysis we have done for our 5 AD sites show significant areas that require improvement to BAT and AM standards (the list of site upgrade works required is provided in Annex B). The areas of secondary containment and covering of sludge tanks account for more than 50% of the £117.5m capital enhancement improvements required (which is similar to the rest of the industry, as reported by Atkins [2]).

The lack of funding for IED in AMP7 would mean that this investment is then required in AMP8. Furthermore, from a capital delivery perspective, the delivery and implementation of improvements of such a scale will likely extend into AMP8 given that companies are only receiving 1st tranche permits in April 2023 (with the 2nd and 3rd Tranche permits likely to be issued later in 2023 and early 2024). Committing to large-scale improvements like these prior to permits being issued carries huge risk with no mitigation due to the precedence of scope creep and uncertainty in the EA's interpretation of guidance documents.

There is no overlap in the proposed IED investment with activities already funded at previous price reviews because the improvements required under IED are completely new, and have never been required under any existing environmental legislation.

A1-5. Best option for customers

We have considered a range of options to meet the requirements for IED. In the example of Poole's IED permit application, we presented a range of options for secondary containment and emissions control. However, the EA have taken a very prescriptive approach in deciding what solutions would be considered acceptable BAT, effectively leading to only single-type solutions prescribed in their AM guidance. For secondary containment, this means providing >70% containment volume for a cluster of tanks; and for emissions control, retrofitting a cover on all open sludge tanks.

The EA have maintained their position that cost-benefit analysis cannot be considered when evaluating appropriate measures under IED because IED is a statutory obligation for environmental protection. At an IED workshop in September 2022, water companies raised the concern that it would be extremely difficult and expensive to retrofit covers on most existing sludge tanks because they have not been designed for covers, but the EA replied that cost is not a consideration. The minutes of the workshop recorded their response as:

"Cost benefit in BREF/BAT. The industry standard and cost is not a factor as it is considered during BREF drafting. Cost shouldn't be a barrier and is not taken into consideration."

The EA's approach on implementing IED in the water industry is for their national permitting team to review all permit applications and decide on the improvement conditions for each permit; and when the permits are issued, the responsibility of interpreting and enforcing the permits fall on the team of local EA officers. This approach will likely result in inconsistent interpretation of site requirements by each local EA officer and therefore a lack of standardisation of improvements by site. This would make comparison of costs across companies challenging when the assessment of risk is performed in isolation for each site. A standardised approach for risk assessment would be required, as highlighted in the Atkins report.

A1-6. Customer protection

As IED is a regulatory requirement, each site with an IED permit, after issue, will be audited annually by the local EA officer to monitor compliance against the requirements of the permit, as well as the progress against improvement conditions set out when the permit is issued. All audit findings and non-conformances will be recorded in Compliance Audit Reports (CAR) issued to the operator/company. The EA are also proposing to include a new metric in the EPA related to compliance with IED/EPR permits. Any non-conformances logged under an IED permit can adversely affect this metric and the overall EPA score.

We believe the regulatory system for IED put in place by the EA would ensure our proposed investment for IED improvements are delivered and therefore provide sufficient customer protection.

Given the scale of investment required for IED compliance, we are expecting IED to be covered under a price control deliverable (PCD) in PR24. A PCD will protect customers from non-delivery of the large programmes of work, such as the one for IED. Should a company fail to deliver all or part of a programme, or delivery within an AMP is delayed, customers would be recompensed.

A2 Annex A. CAPEX and OPEX breakdown

Table 4 - CAPEX breakdown by site and area

Site	Anaerobic Digestate Stability	Asset condition	Covering & Storage	Emissions Control & Monitoring	Liquor Sampling	Other	Permit Applications	Secondary containment	Surface Water & Liquor Drainage	Grand Total
General / Investigations	£300,000			£20,000	£1,886	£215,000	£628,360			£1,165,246
Avonmouth		£14,500,000	£5,000,000	£2,505,000	£96,000		£178,000	£12,050,000	£200,000	£34,529,000
Berry Hill		£5,000,000	£2,500,000	£6,700,000	£96,000		£167,000	£7,500,000	£300,000	£22,263,000
Poole		£8,200,000	£2,500,000	£1,355,000	£96,000		£172,000	£8,000,000		£20,323,000
Taunton		£2,800,000	£16,650,000	£3,905,000	£96,000		£169,000	£3,000,000		£26,620,000
Trowbridge		£4,450,000	£1,200,000	£2,655,000	£96,000		£168,000	£3,275,000	£750,000	£12,594,000
Grand Total	£300,000	£34,950,000	£27,850,000	£17,140,000	£481,886	£215,000	£1,482,360	£33,825,000	£1,250,000	£117,494,246

Table 5 - OPEX breakdown (annual cost)

Site	Sum of Est. OPEX
General / Investigations	£1,210,300
Avonmouth	£42,500
Berry Hill	£67,500
Poole	£52,500
Taunton	£62,500
Trowbridge	£52,500
Grand Total	£1,487,800

A3 Annex B. List of IED site upgrade works

Table 6 – List of IED site upgrade works for Avonmouth, Berry Hill, Poole, Taunton and Trowbridge

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Poole	Primary digester area	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£4,000,000		AMP8
Poole	Secondary digester area	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£2,000,000		AMP8
Poole	Digester feed tank	Asset condition	Maintenance	Repair tank	£150,000		AMP7
Poole	DEMON liquor treatment	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£2,000,000		AMP8
Poole	Secondary digestors 1 & 4	Asset condition	Split	Replacement digestors	£6,900,000		AMP8
Poole	Secondary digestors	Covering & Storage	Enhancement	Covering, extraction, treatment of secondary digestors	£2,500,000		AMP8
Poole	Drum thickener feed tank	Asset condition	Maintenance	Repair tank	£150,000		AMP7
Poole	Demon OCU	Asset condition	Maintenance	Refurbish / replace OCU to achieve required standard	£1,000,000		AMP7
Poole	Siloxane plant (PP Tek units)	Emissions Control & Monitoring	Enhancement	Re-gen gases from PP tek unit are emitted with no abatement and cause odour issues. Either pass to an OCU or replace with a carbon filtered unit (such as CC Jenson)	£500,000	£5,000	AMP7

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Poole	Drainage system	Surface Water & Liquor Drainage	Maintenance	Change in discharge point - this change currently incorporated into secondary containment work			AMP8
Poole	Odour sampling	Emissions Control & Monitoring	Enhancement	6 monthly odour sampling / model updates		£10,000	-
Poole	DEMON Boiler stack	Emissions Control & Monitoring	Enhancement	New stack required	£250,000		AMP8
Poole	Below ground assets - groundwater monitoring	Emissions Control & Monitoring	Enhancement	GW monitoring boreholes and sampling regime	£250,000	£25,000	AMP8
Poole	Below ground rising mains	Emissions Control & Monitoring	Enhancement	Additional monitors for burst detection	£250,000		AMP8
Poole	Imported sludge tanks, digester feed tank, drum thickener feed tank	Emissions Control & Monitoring	Enhancement	Connection to odour extraction/OCU	£50,000		AMP7
Poole	Centrifuges	Emissions Control & Monitoring	Enhancement	Vent stack on centrate line may need emissions control.	£50,000		AMP8
Poole	Liquor Sampling	Liquor Sampling	Enhancement	BAT 3 inventory sampling on liquor returns	£96,000		AMP7
Poole	Bioaerosol Assessment	Emissions Control & Monitoring	Enhancement	Initial / future bioaerosol sampling and analysis	£5,000	£5,000	AMP7
Poole	Permitting	Permit Applications	Enhancement	Permit application, work to produce, ongoing permit fees	£172,000	£7,500	AMP7
Trowbridge	Screened sludge tank	Asset condition	Maintenance	Replacement tank - 600m3	£750,000		AMP7
Trowbridge	Pre-Thickened sludge tank	Asset condition	Maintenance	Replacement tank - 900m3	£850,000		AMP7
Trowbridge	Thickened sludge tank	Asset condition	Maintenance	Replacement tank - 600m3	£750,000		AMP7

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Trowbridge	Post digested tank	Asset condition	Maintenance	Replacement tanks - 2x 500m3	£1,000,000		AMP7
Trowbridge	Post digested tank	Covering & Storage	Enhancement	Covering / extraction of secondary digesters	£1,200,000		AMP8
Trowbridge	Return liquor balance tanks	Asset condition	Maintenance	New tank - 500m3	£1,000,000		AMP7
Trowbridge	Tank containment	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£3,000,000		AMP8
Trowbridge	Return liquor gravity pipelines	Asset condition	Maintenance	Struvite blockages - new pipework to replace temporary above ground pipework	£100,000		AMP7
Trowbridge	Propane tank	Secondary containment	Enhancement	Bunding improvements	£25,000		AMP8
Trowbridge	Drainage system	Secondary containment	Maintenance	Repairs/replacement for issues identified by CCTV	£250,000		AMP7
Trowbridge	Siloxane plant (PP Tek units)	Emissions Control & Monitoring	Enhancement	Re-gen gases from PP tek unit are emitted with no abatement and cause odour issues. Either pass to an OCU or replace with an carbon filtered unit (such as CC Jenson)	£600,000	£5,000	AMP7
Trowbridge	Liquor return pipeline - rising main	Surface Water & Liquor Drainage	Maintenance	Change in discharge point - new PS / pipeline Struvite blockages - new pipework to replace temporary above ground pipework	£750,000	£5,000	AMP7
Trowbridge	Odour control	Emissions Control & Monitoring	Enhancement	Potential odour control unit(s) required. Odour modelling indicates low risk, but awaiting EA feedback on permit application.	£1,500,000	£5,000	AMP8

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Trowbridge	Centrifuges	Emissions Control & Monitoring	Enhancement	Vent stack on centrate line may need emissions control.	£50,000		AMP8
Trowbridge	Below ground assets - groundwater monitoring	Emissions Control & Monitoring	Enhancement	GW monitoring boreholes and sampling regime	£250,000	£25,000	AMP8
Trowbridge	Below ground rising mains	Emissions Control & Monitoring	Enhancement	Additional monitors for burst detection	£250,000		AMP8
Trowbridge	Liquor Sampling	Liquor Sampling	Enhancement	BAT 3 inventory sampling on liquor returns	£96,000		AMP7
Trowbridge	Bioaerosol Assessment	Emissions Control & Monitoring	Enhancement	Initial / future bioaerosol sampling and analysis	£5,000	£5,000	AMP7
Trowbridge	Permitting	Permit Applications	Enhancement	Permit application, work to produce, ongoing permit fees	£168,000	£7,500	AMP7
Berry Hill	Site drainage - SW Area	Surface Water & Liquor Drainage	Maintenance	Drainage system improvements - repairs/removing cross connections	£75,000		AMP7
Berry Hill	Grit & screening area drainage assessment	Surface Water & Liquor Drainage	Maintenance	Drainage system improvements - repairs	£75,000		AMP7
Berry Hill	Howard Tanks - Import storage	Asset condition	Split	Replacement/relocate tanks w/covers	£5,000,000		AMP8
Berry Hill	Storage tanks Raw holding tank SAS holding tank Centrifuge feed tank Secondary Digester Overflow tank	Emissions Control & Monitoring	Enhancement	Cover tanks	£2,000,000		AMP8
Berry Hill	Grit/rag processing	Emissions Control & Monitoring	Maintenance	Relocate to another site	£250,000		AMP7
Berry Hill	Sludge pipelines	Emissions Control & Monitoring	Maintenance	Surveys / testing of pipe condition Pipe refurb works	£250,000		AMP7

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Berry Hill	secondary containment - site wide	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£7,500,000		AMP8
Berry Hill	Odour control	Emissions Control & Monitoring	Enhancement	Likely to require odour control unit(s) and covering/extraction from all process units including Demon tank	£3,000,000	£20,000	AMP8
Berry Hill	Secondary digesters	Covering & Storage	Enhancement	Covering / extraction of secondary digesters Emissions either to new OCU or connected to gas system	£2,500,000		AMP8
Berry Hill	Mechanical Thickening - emissions control	Emissions Control & Monitoring	Enhancement	Vents on GBTs likely to require connection to OCU	£50,000		AMP8
Berry Hill	Siloxane plant (PP Tek units)	Emissions Control & Monitoring	Enhancement	Re-gen gases from PP tek unit are emitted with no abatement and cause odour issues. Either pass to an OCU or replace with an carbon filtered unit (such as CC Jenson)	£600,000	£5,000	AMP7
Berry Hill	Odour sampling	Emissions Control & Monitoring	Enhancement	6 monthly odour sampling / model updates		£10,000	-
Berry Hill	Below ground assets - groundwater monitoring	Emissions Control & Monitoring	Enhancement	GW monitoring boreholes and sampling regime	£250,000	£25,000	AMP8
Berry Hill	Below ground rising mains	Emissions Control & Monitoring	Enhancement	Additional monitors for burst detection	£250,000		AMP8
Berry Hill	Centrifuges	Emissions Control & Monitoring	Enhancement	Vent stack on centrate line may need emissions control.	£50,000		AMP8
Berry Hill	Liquor returns	Surface Water & Liquor Drainage	Enhancement	Flow measurement on each liquor stream	£150,000		AMP8
Berry Hill	Liquor Sampling	Liquor Sampling	Enhancement	BAT 3 inventory sampling on liquor returns	£96,000		AMP7

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Berry Hill	Permitting	Permit Applications	Enhancement	Permit application, work to produce, ongoing permit fees	£167,000	£7,500	AMP7
Taunton	Cake import building	Emissions Control & Monitoring	Enhancement	Potential that GAC unit will need upgrading to chemical scrubber	£1,000,000	£5,000	AMP8
Taunton	Import sump	Emissions Control & Monitoring	Enhancement	A replacement OCU will be needed - existing unit does not achieve required emissions	£750,000	£10,000	AMP8
Taunton	Siloxane plant (PP Tek units)	Emissions Control & Monitoring	Enhancement	Re-gen gases from PP tek unit are emitted with no abatement and cause odour issues. Either pass to an OCU or replace with an carbon filtered unit (such as CC Jenson)	£600,000	£5,000	AMP7
Taunton	Import sump	Asset condition	Maintenance	Replace with import tank - 100m3	£500,000		AMP8
Taunton	Raw storage tanks	Asset condition	Maintenance	Refurb / Replace ageing tanks - 3x	£2,250,000		AMP8
Taunton	Flare Stack modifications	Covering & Storage	Enhancement	Replace flare	£400,000		AMP7
Taunton	secondary containment - site wide	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£3,000,000		AMP8
Taunton	Secondary digesters	Covering & Storage	Enhancement	Covering / extraction of secondary digesters	£15,000,000		AMP8
Taunton	Below ground assets - groundwater monitoring	Emissions Control & Monitoring	Enhancement	GW monitoring boreholes and sampling regime	£250,000	£25,000	AMP8
Taunton	Below ground rising mains	Emissions Control & Monitoring	Enhancement	Additional monitors for burst detection	£250,000		AMP8
Taunton	Cake barns	Asset condition	Maintenance	Gravel surround made impermeable and protection of roof water drains from wastewater ingress	£50,000		AMP7

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Taunton	Cake barns	Emissions Control & Monitoring	Enhancement	Provide OCU	£1,000,000	£5,000	AMP8
Taunton	Centrate tank / centrate pumping station	Covering & Storage	Enhancement	Cover tank / provide OCU	£750,000		AMP8
Taunton	Digesters 1 and 2	Covering & Storage	Maintenance	Repairs to digester roofs to prevent fugitive emissions identified from LDAR surveys	£500,000		AMP7
Taunton	Centrifuges	Emissions Control & Monitoring	Enhancement	Vent stack on centrate line may need emissions control.	£50,000		AMP8
Taunton	Liquor Sampling	Liquor Sampling	Enhancement	BAT 3 inventory sampling on liquor returns	£96,000		AMP7
Taunton	Bioaerosol Assessment	Emissions Control & Monitoring	Enhancement	Initial / future bioaerosol sampling and analysis	£5,000	£5,000	AMP7
Taunton	Permitting	Permit Applications	Enhancement	Permit application, work to produce, ongoing permit fees	£169,000	£7,500	AMP7
Avonmouth	Siloxane plant (PP Tek units)	Emissions Control & Monitoring	Enhancement	Re-gen gases from PP tek unit are emitted with no abatement and cause odour issues. Either pass to an OCU or replace with a carbon filtered unit (such as CC Jenson)	£600,000	£5,000	AMP7
Avonmouth	MAD digesters	Asset condition	Maintenance	Repairs to digester roofs to prevent fugitive emissions identified from LDAR surveys	£2,000,000		AMP7
Avonmouth	APD digesters	Asset condition	Maintenance	Fugitive emissions - tank refurb required	£2,000,000		AMP7
Avonmouth	Biogas Flare	Emissions Control & Monitoring	Enhancement	New flare required - candle flare is not BAT	£400,000		AMP7
Avonmouth	Below ground rising mains	Emissions Control & Monitoring	Enhancement	Additional monitors for burst detection	£250,000		AMP8

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Avonmouth	Internal pumping station	Asset condition	Maintenance	Repair or replacement - poor structural condition	£10,000,000		AMP7
Avonmouth	Sludge import tank	Asset condition	Maintenance	Repair - Holes and deterioration in top ring close to roof	£400,000		AMP7
Avonmouth	Bellmer Thickened sludge tank	Asset condition	Maintenance	Repair	£100,000		AMP7
Avonmouth	Permeable surfaces in between MADs, SAS tank, temp centrifuges in road	Secondary containment	Enhancement	Hardstanding	£50,000		AMP7
Avonmouth	Below ground assets - groundwater monitoring	Emissions Control & Monitoring	Enhancement	GW monitoring boreholes and sampling regime	£250,000	£25,000	AMP8
Avonmouth	secondary containment - site wide	Secondary containment	Enhancement	Hard standing / drainage / bund walls	£12,000,000		AMP8
Avonmouth	Tank covers GBT Feed tank Consolidation tanks Centrifuge feed tank	Covering & Storage	Enhancement	Cover tanks	£2,500,000		AMP7
Avonmouth	Secondary sludge storage	Covering & Storage	Enhancement	Covering / aeration / extraction of secondary storage tanks Emissions then either treated (new OCU) or connected to gas system	£2,500,000		AMP8
Avonmouth	Mechanical Thickening - emissions control	Emissions Control & Monitoring	Enhancement	Vents on GBTs likely to require connection to OCU	£500,000		AMP8
Avonmouth	Centrifuges	Emissions Control & Monitoring	Enhancement	Vent stack on centrate line may need emissions control.	£500,000		AMP8
Avonmouth	Liquor returns	Surface Water & Liquor Drainage	Enhancement	Flow measurement on each liquor stream	£200,000		AMP8

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
Avonmouth	Liquor Sampling	Liquor Sampling	Enhancement	BAT 3 inventory sampling on liquor returns	£96,000		AMP7
Avonmouth	Bioaerosol Assessment	Emissions Control & Monitoring	Enhancement	Initial / future bioaerosol sampling and analysis	£5,000	£5,000	AMP7
Avonmouth	Permitting	Permit Applications	Enhancement	Permit application, work to produce, ongoing permit fees	£178,000	£7,500	AMP7
General / Investigations	TCM Requirements	Other	Enhancement	Additional staff training or EU skills certification of internal management systems	£15,000	£15,000	AMP7
General / Investigations	TCM Requirements	Other	Enhancement	TCM / CMS Audits. Gap Analysis and subsequent audits to include IED sites in the current CMS scope. This includes cost to date to set up CMS initially.		£25,300	Ongoing
General / Investigations	Scientist Resource	Other	Enhancement	Additional process science resource for ongoing odour management activities		£60,000	Ongoing
General / Investigations	Sampling / Monitoring / Governance	Other	Enhancement	Additional resource to cover regular sampling / monitoring, and EA regulation implementation/governance		£60,000	Ongoing
General / Investigations	Odour Modelling	Emissions Control & Monitoring	Enhancement	Update odour model baselines w/additional sampling.	£20,000		
General / Investigations	Annual permit fees	Permit Applications	Enhancement	First year additional operational charge for table 2.16 activities (waste treatment). To cover additional regularly effort by the EA to provide support, advice during the first year	£3,360		AMP7
General / Investigations	Liquor Sampling Trial	Liquor Sampling	Enhancement	Assessment of analysis that can be carried out (internal laboratory)	£1,886		AMP7

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
General / Investigations	Sludge sampling	Other	Enhancement	Pre-acceptance characterisation of satellite sites exporting need periodic sampling modifications need to obtain a representative sampling point on some sites		£50,000	Ongoing
General / Investigations	Sludge sampling	Other	Enhancement	Pre-acceptance sampling requirements. Regular sampling for a wide range of dets		£50,000	Ongoing
General / Investigations	Odour Sampling	Other	Enhancement	Sampling diffuse odour from open tanks (secondary digesters onwards)	£100,000		AMP7
General / Investigations	Improvement condition assessment	Permit Applications	Enhancement	Local EA officer charges for reviewing evidence submitted to close an IC. Highly likely to be charged for the more technical ICs	£25,000		AMP7
General / Investigations	Sludge sampling	Other	Enhancement	RBP testing on open tanks to check stability of digestate	£100,000		AMP7
General / Investigations	All assets	Anaerobic Digestate Stability	Enhancement	Fugitive emissions particularly VOCs. Develop a suitable LDAR system Monitoring, quantifying gaseous fugitive emissions. Gas optical image camera and / electronic sniffer	£300,000		AMP7
General / Investigations	Additional FTEs	Other	Enhancement	3x FTEs required per STC due to additional operational and maintenance activities		£750,000	Ongoing
General / Investigations	Corporate overhead	Permit Applications	Enhancement	Corporate overhead for permit application, upkeep, audits and EA inspections		£200,000	Ongoing

Site Name	Asset	Issue	Funding	Improvement Required	Est. CAPEX	Est. OPEX	Delivery
General / Investigations	Consultancy for permit application	Permit Applications	Enhancement	Stantec work on D14219 and D17969	£600,000		AMP7

A4 Annex C. Avonmouth upgrades

Proposed Work Plan

Digested sludge centrifuge feed tank. Install new 11m dia GRP roof.

Replace 5m Dia Raw sludge tank that feeds liming centrifuges. Tanks to be fitted with a roof

Install 24m Dia GRP roof on Picket Fence Thickener Consolidation tanks. Assume moving scraper bridges / walkways will need to be replaced to accommodate

Install 8m Dia Grp roof on Bellmer Raw Sludge tank (GBT Feed).

Install 20m Dia GRP roof to the existing Secondary digester tanks. The existing tanks to be fitted with air mixing system. Refer to Utilite quote.

NOTE: Existing Food waste (post digestion) sludge tank is being replaced under this AMP and it is assumed that a new roof will be installed as part of the scope. No requirement to include in the assessment

Provide odour control unit to remove methane build up within the secondary digester tanks. OCU will be twice as big as the odour unit installed at Vale Road

Avonmouth BC CIRA736 IED Report
Secondary Containment Assessment

September 2022
Revision 1

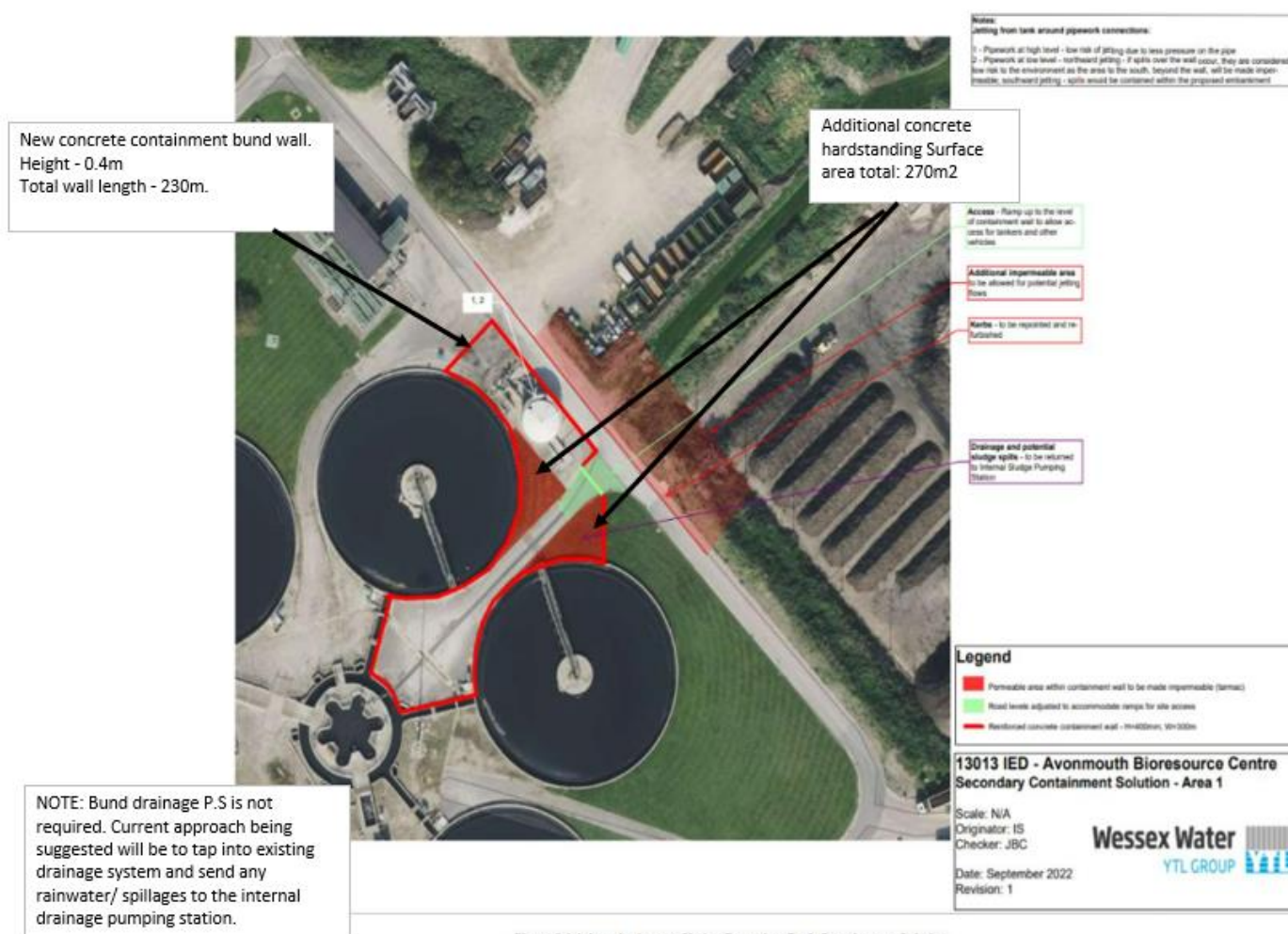
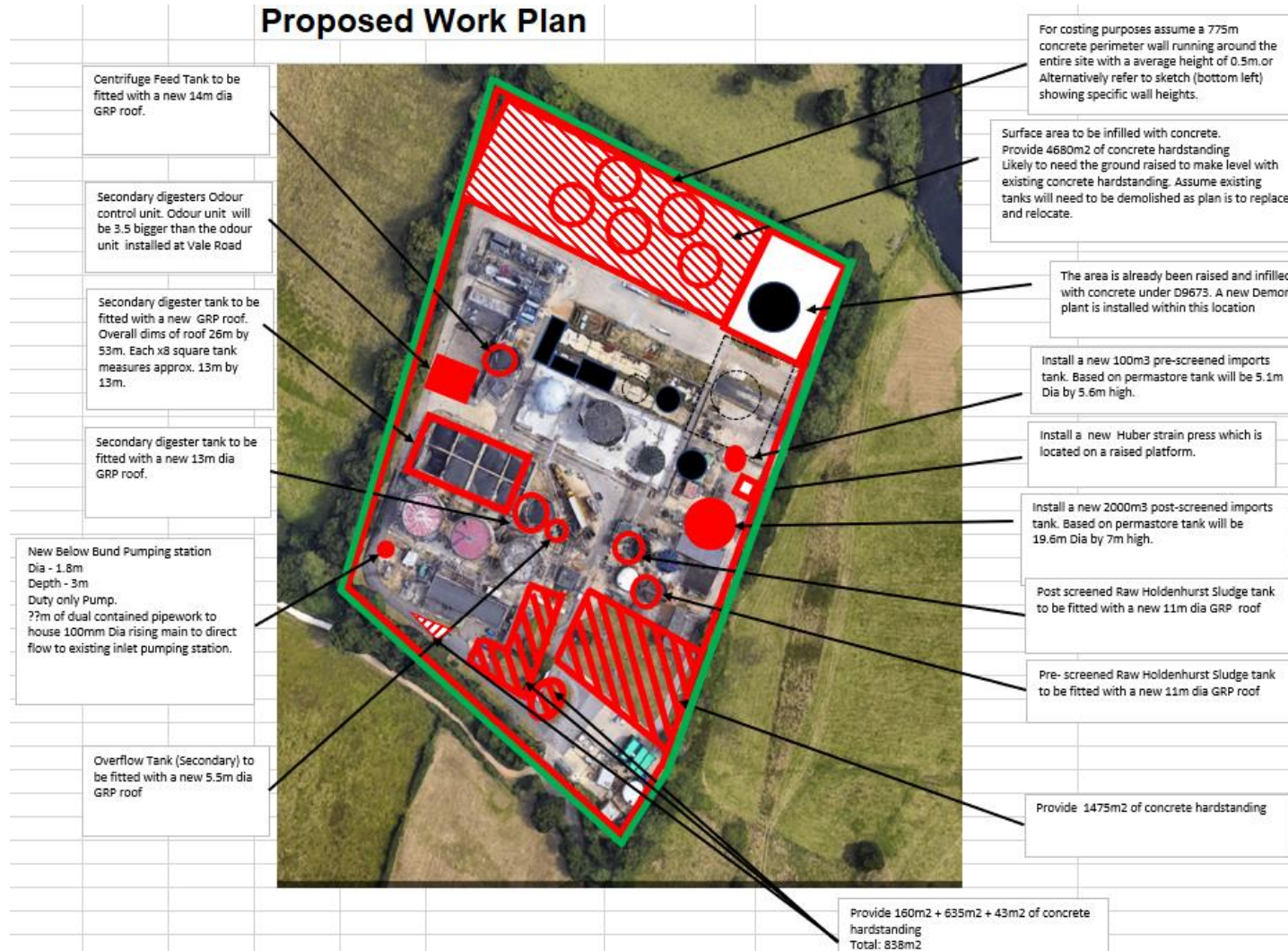
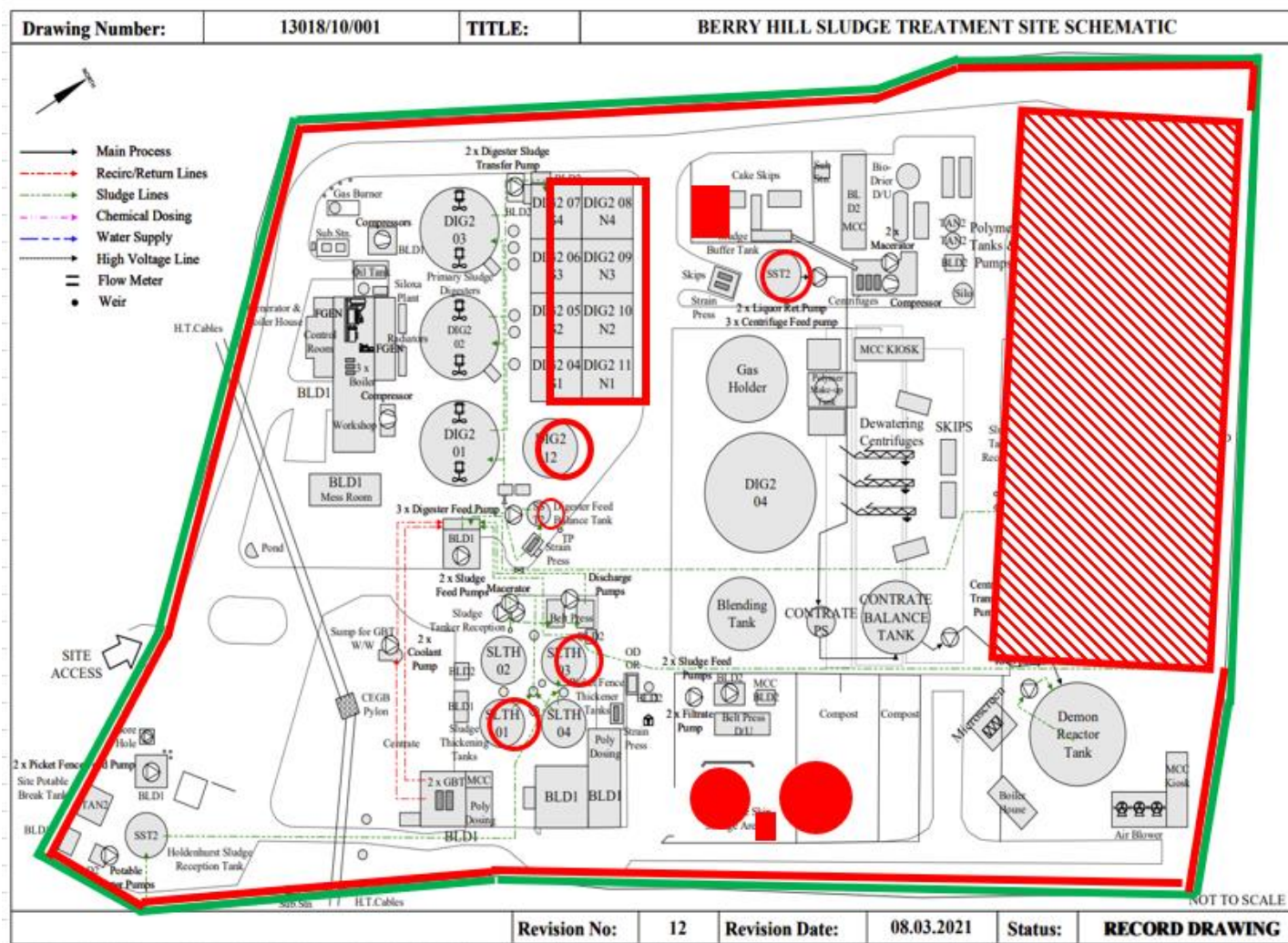


Figure 9.1.1 Area 1 – Import Sludge Reception Tank Containment Solution

A5 Annex D. Berry Hill upgrade

Proposed Work Plan





South Entrance to the site



The perimeter bund will cross the entrance points into the site. To allow vehicles to operate without issue the approaches to the bund will need to be re-profiled to allow vehicles to effectively run over the top of the bund.
The highlighted areas are the suggested extent of reprofiling that will be need to allow tanker movement.
Area "A" and Area "B" each have an approx. area of road mods of 1000m²

Suggested positioning of 400mm to 600mm height bund.

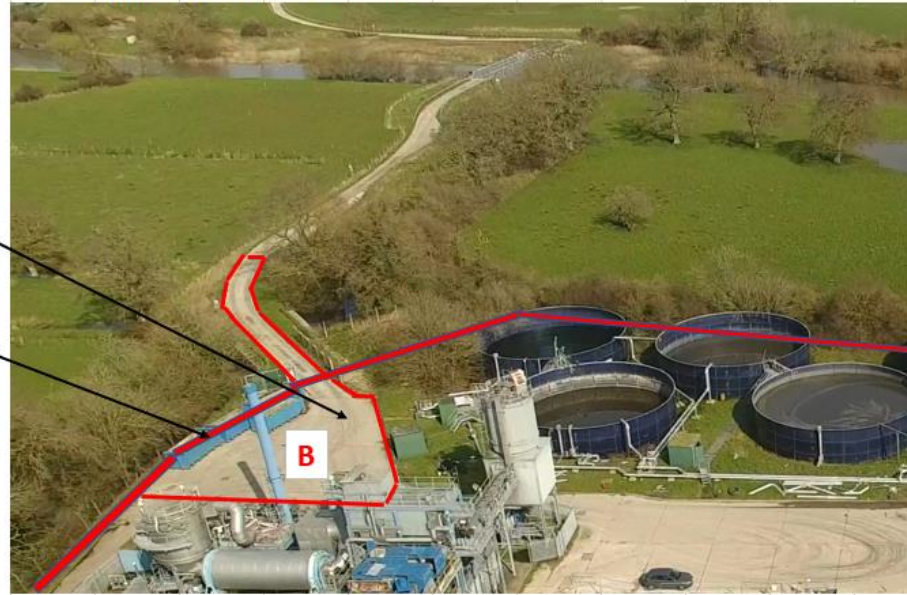
North Entrance to the site

The perimeter bund will cross the entrance points into the site. To allow vehicles to operate without issue the approaches to the bund will need to be re-profiled to allow vehicles to effectively run over the top of the bund.

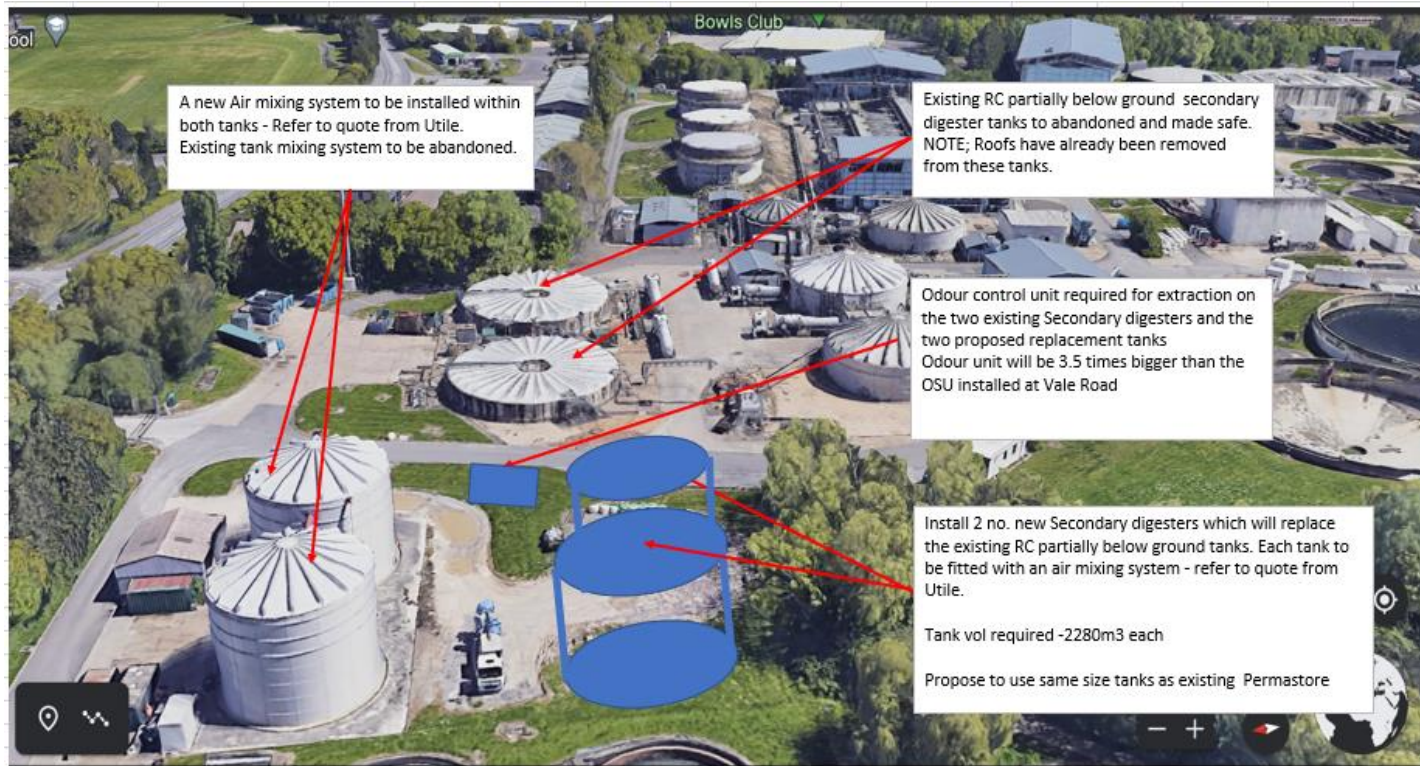
The highlighted areas are the suggested extent of reprofiling that will be needed to allow tanker movement.

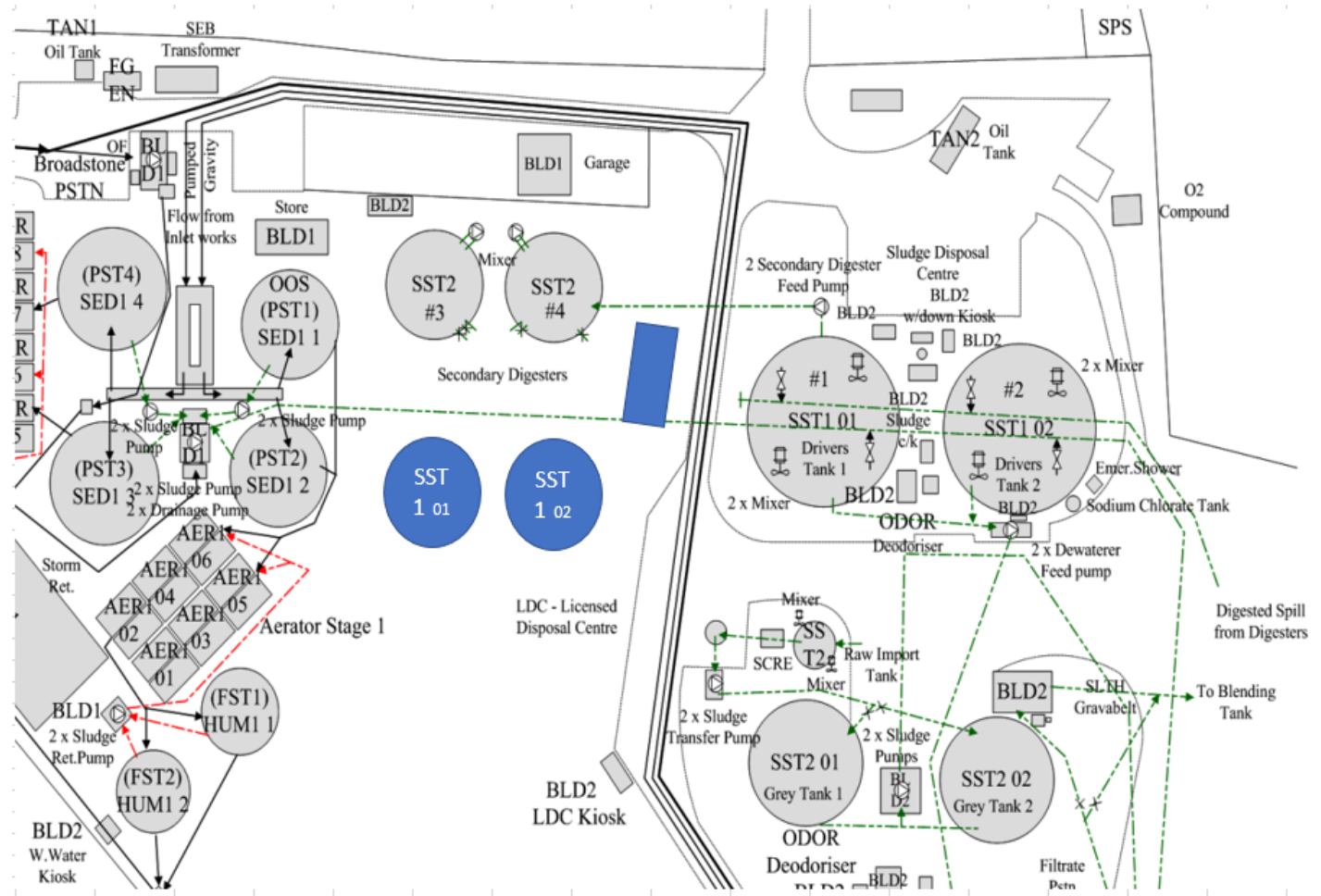
Area "A" and Area "B" each have an approx. area of road mods of 1000m²

Suggested positioning of 400mm to 600mm height bund.

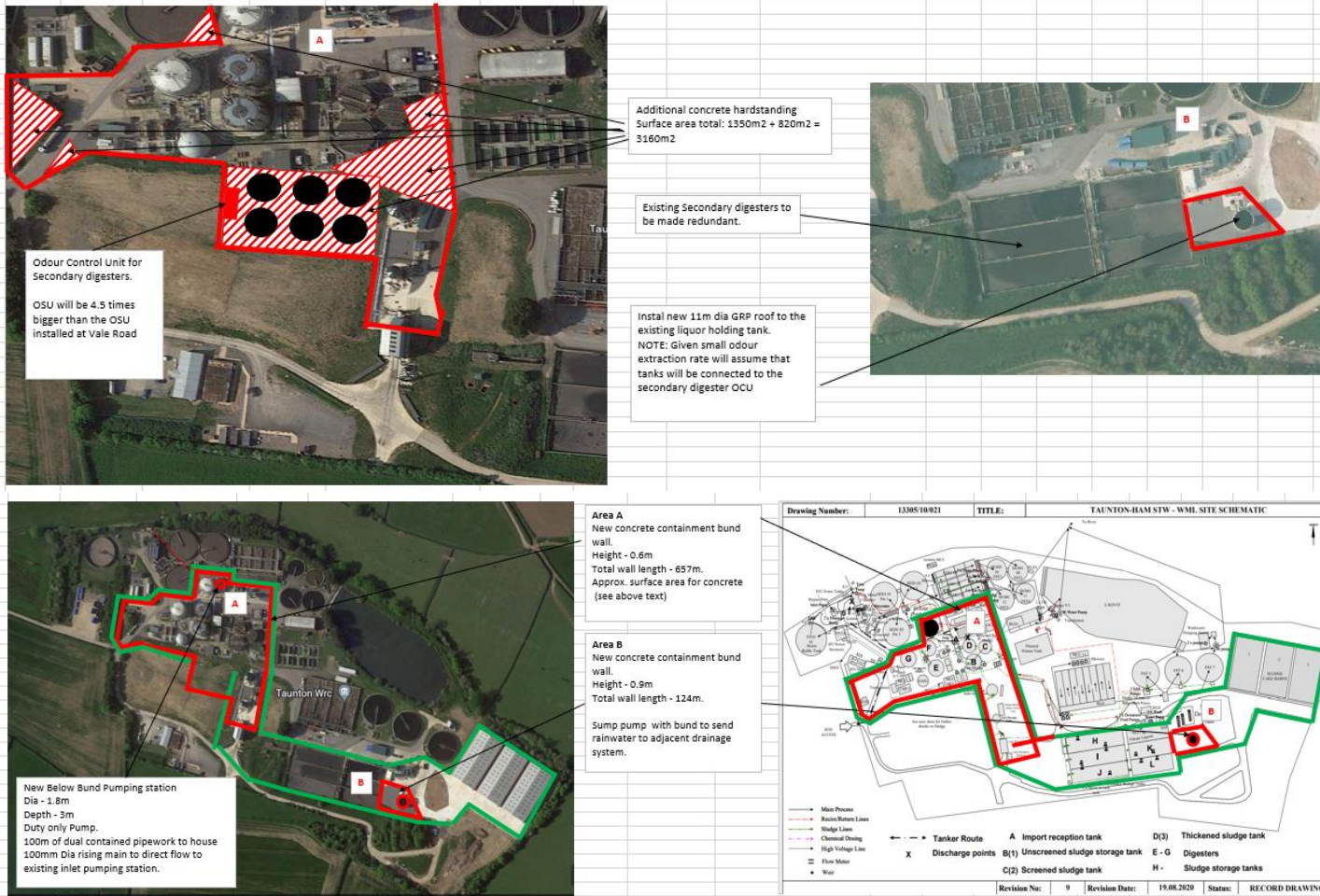


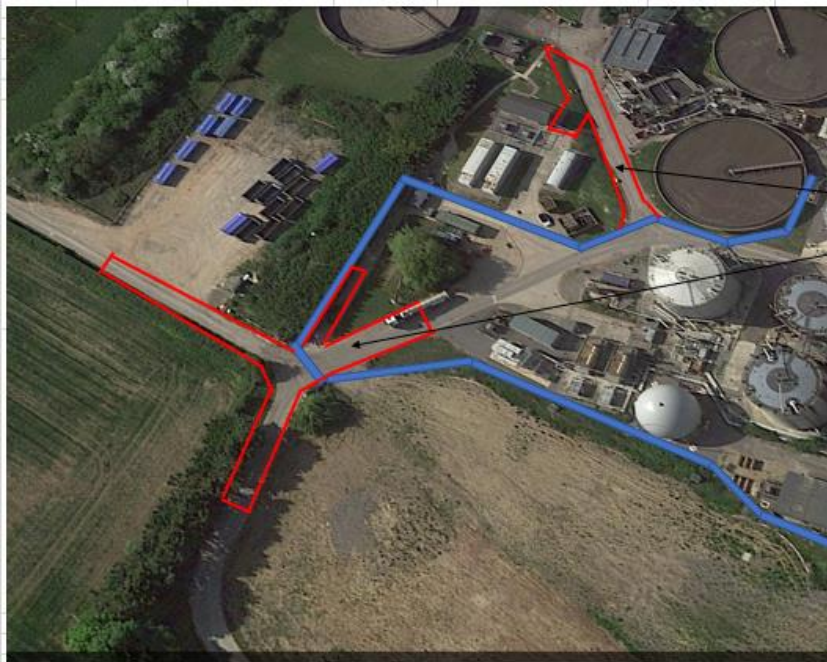
A6 Annex E. Poole upgrades





A7 Annex F. Taunton upgrades





The perimeter bund will cross the entrance points into the site. To allow vehicles to operate without issue the approaches to the bund will need to be re-profiled to allow vehicles to effectively run over the top of the bund. The highlighted areas are the suggested extent of reprofiling that will be needed to allow tanker movement.

Area of road mods of 400m² + 820m²

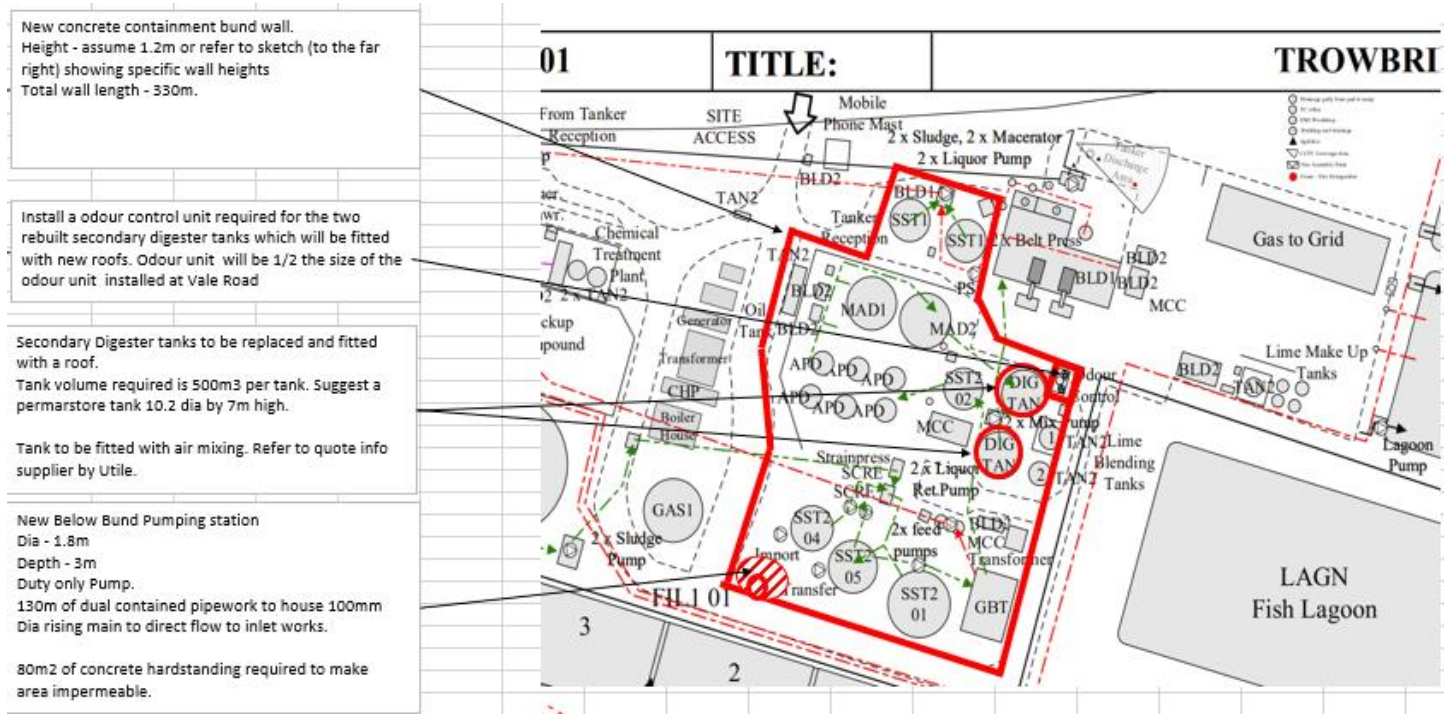
Tankers traffic route will not be affected by the bund as tankers enter and exit the same way



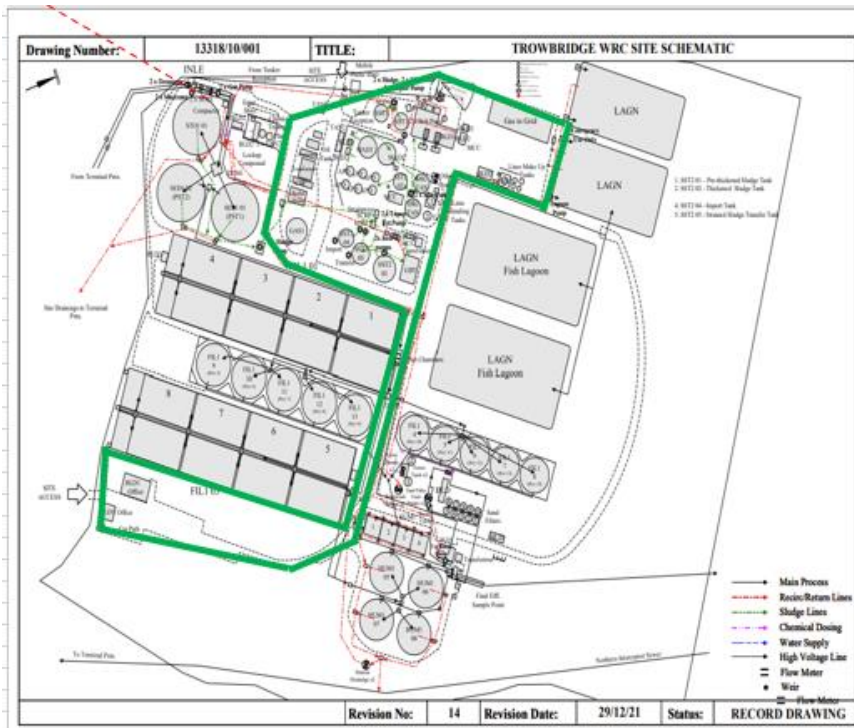
Tanks to be permastore
14.516m dia, 11.23m height (Same dia as Poole GFS secondary digesters)

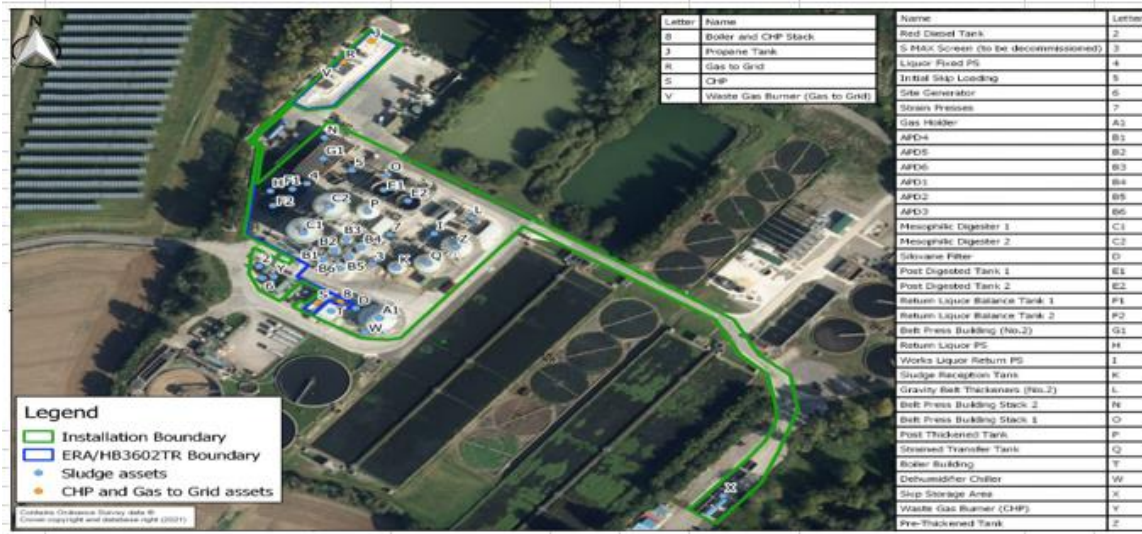
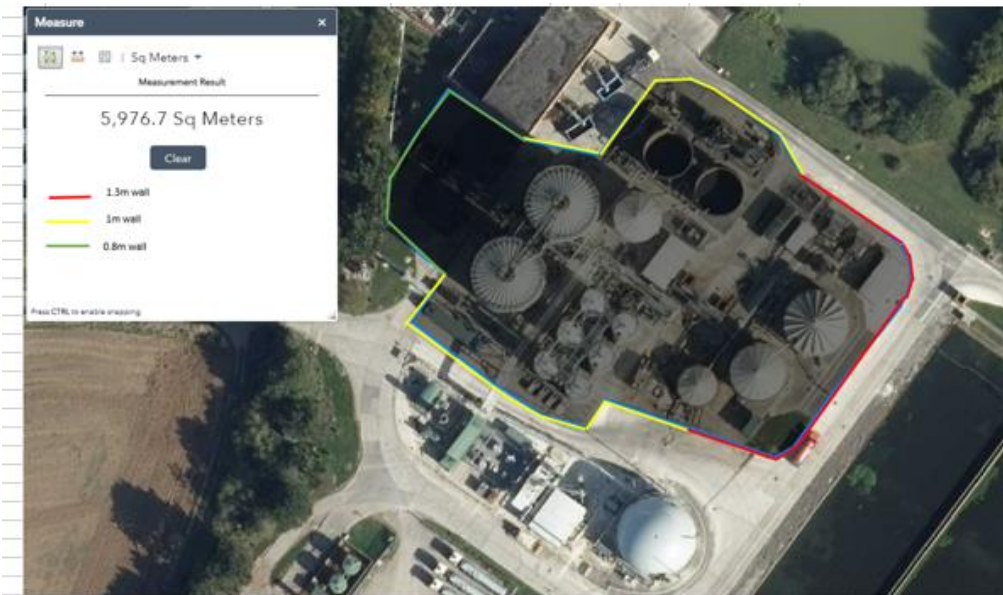
A8 Annex G. Trowbridge upgrades











A9 Annex H. Benchmarking of site upgrade costs

The scope of site upgrades for Trowbridge was used for external benchmarking by ChandlerKBS. The difference between the estimates was only 1%.

Table 7 – Internal estimated costs v. benchmarked costs for the scope of works at Trowbridge

Capex Breakdown	Internal Estimation (Capex £'000s)	ChandlerKBS Estimation (Capex £'000s)	% difference
Optioneering and Outline Design	325	325	0%
Overheads	283	285	1%
Detailed Design	651	651	0%
Supervision and Preliminaries	1,064	325	-69%
Civil Work Items	2,213	2,326	5%
M&E Work Items	378	1,036	174%
Risk Items	548	553	1%
Third Party Costs	195	195	0%
Total (excluding corporate overheads)	5,658	5,697	1%

A10 Annex I. National IED investment programmes (Atkins)

Atkins collated information on each company's proposed IED investment programme as part of their technical review on IED. They found that:

- The total national investment programme for IED amounted to c. £2.0b.
- The 2 significant areas of spend are secondary containment and covering / storage.
- Complying with AM requirements required additional spend above what is required to comply with BAT requirements
- There is no consistency in the spend per site by company because the assessment of risk (of not complying with BAT or AM) is performed in isolation for each site and there is therefore a lack of standardised approach in the risk assessment.

The figures below are taken from the Atkins report [2].

Figure 5 – Overall Split of capex and one-off spend by theme

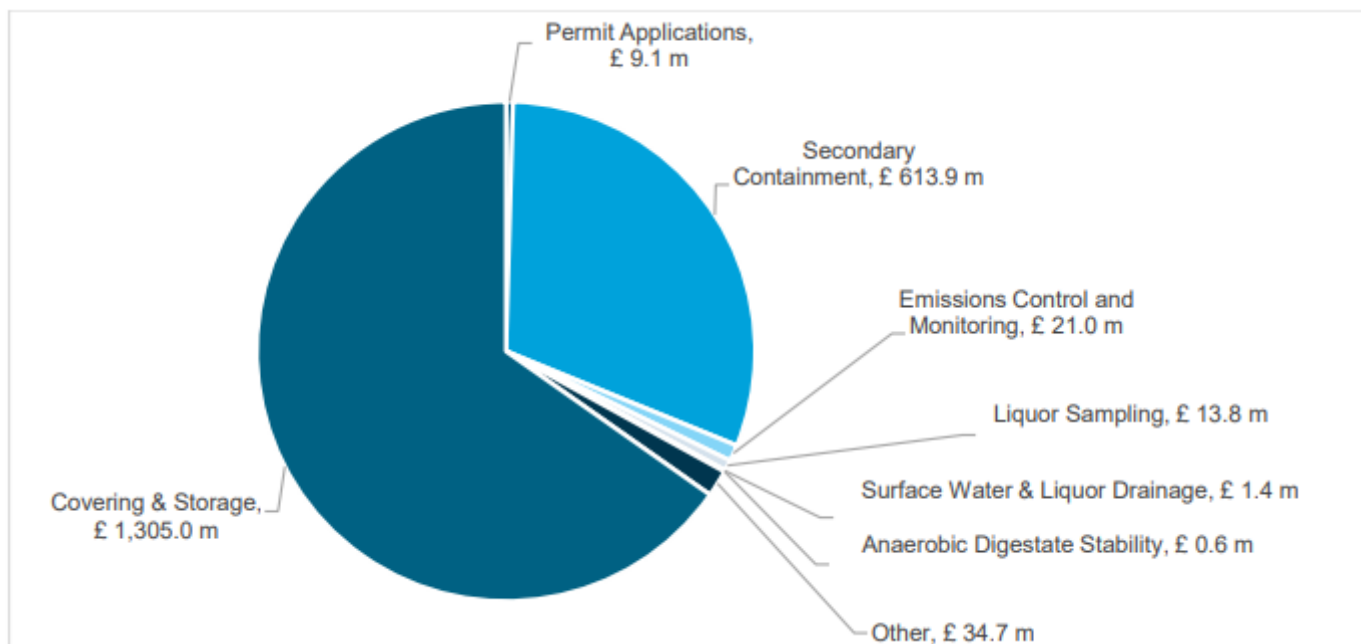


Figure 6 – Aggregate one-off spend by company

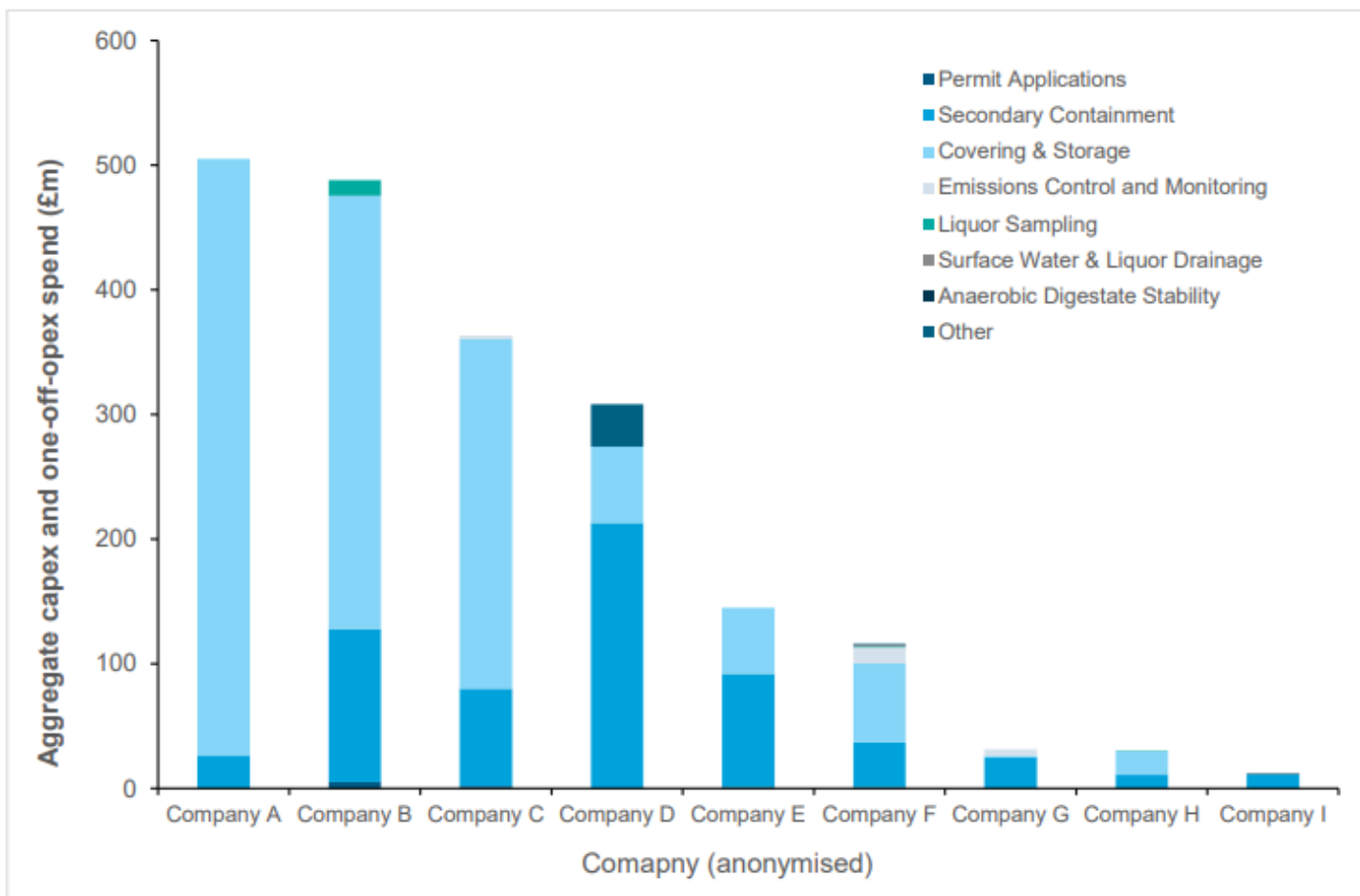


Figure 7 – Spend split between BAT 2018 and Appropriate Measures focus areas

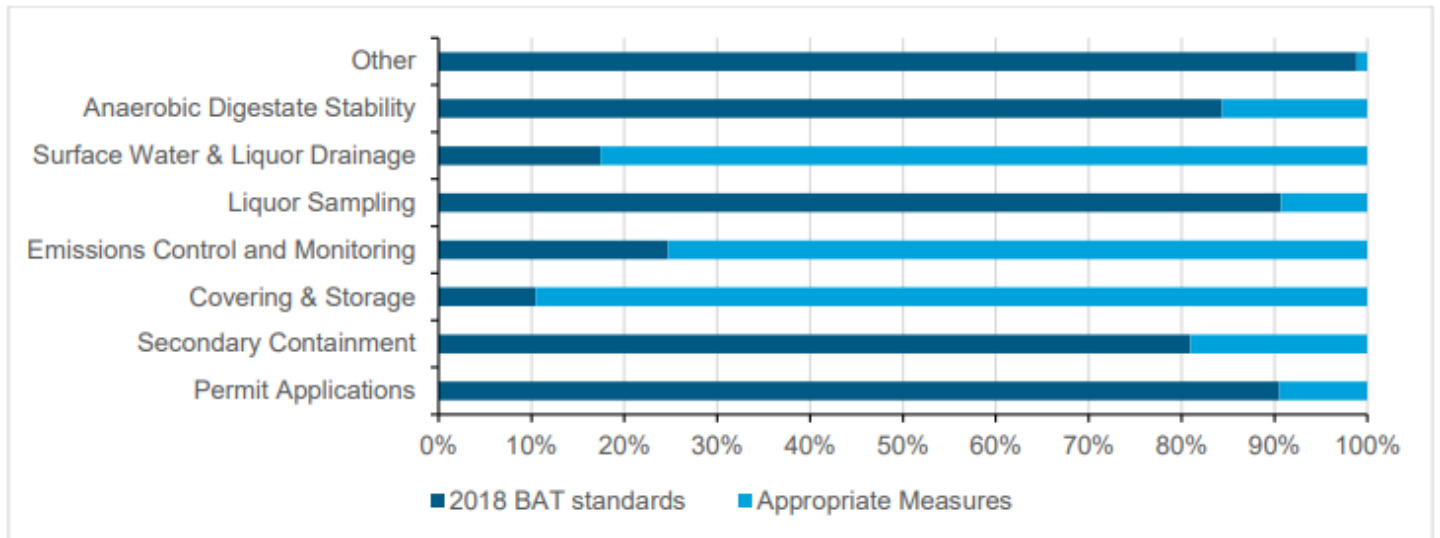
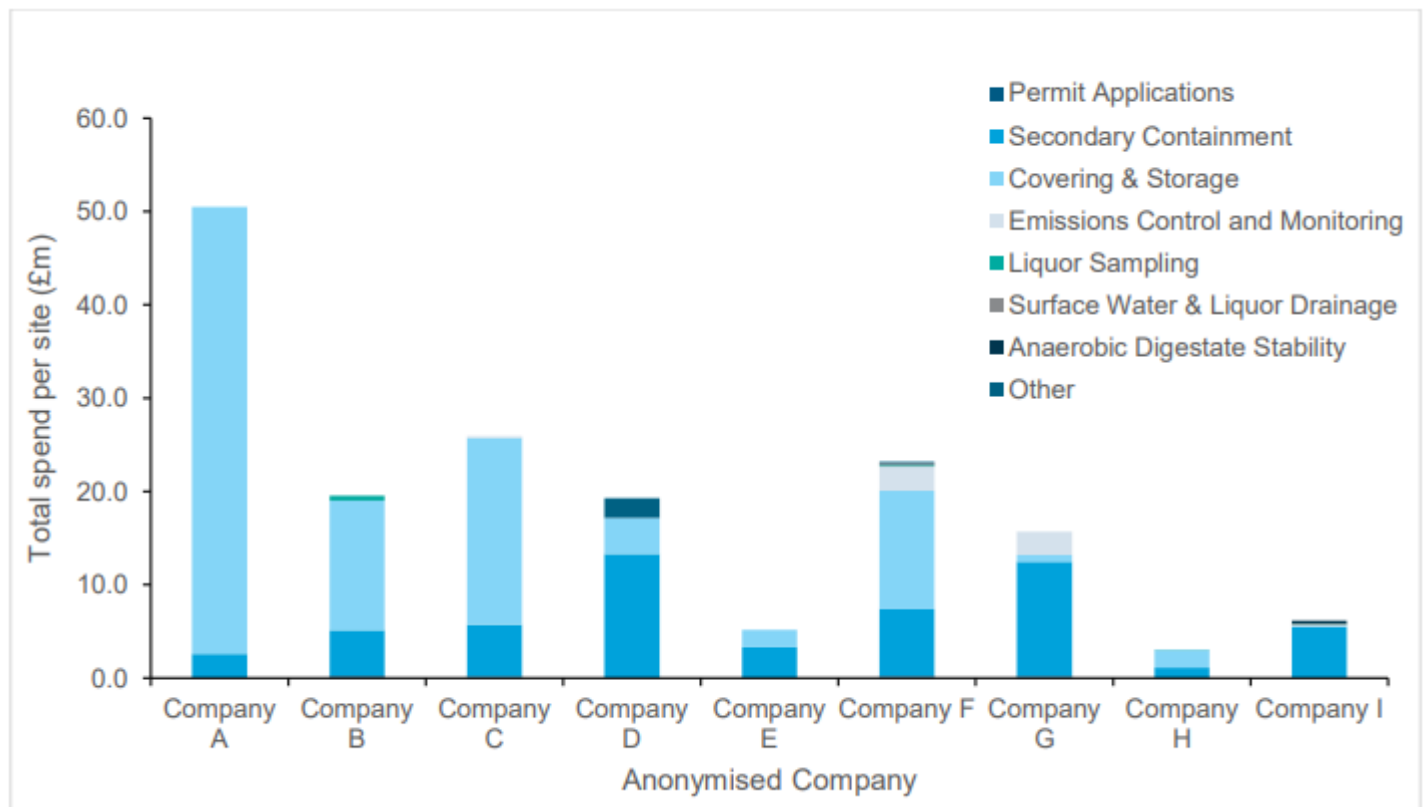


Figure 8 – Total one-off spend per site by company



A11 Annex J. 2019 EA Letter on IED

Matt Wheeldon
Director of Assets and Compliance
Wessex Water

Our ref: MSK/DM
Date: 9 July 2019

matt.wheeldon@wessexwater.co.uk

By email only

Dear Matt,

INDUSTRIAL EMISSIONS DIRECTIVE

At the last Strategic Steering Group meeting on 2 April 2019 we tabled a paper about implementation of the Industrial Emissions Directive (IED) for biological treatments of sewage sludge. The paper (enclosed) informed the group that the IED applies to the biological treatment of sewage sludge, and that we would be discussing the timetable and process for permit applications with the Water UK waste and recycling network. The meeting acknowledged the paper and its contents received some discussion.

The purpose of this letter is to inform you that we are now implementing this aspect of the IED. This means that permits will be required for the biological treatment of sewage sludge above the IED thresholds. We will arrange for engagement and further communications to take place, principally through the Water UK waste and recycling network, and will be inviting applications for permits in accordance with a timetable to be agreed.

In order to agree the timetable implementation and to initiate the permitting process we are asking each water and sewerage company to provide details of the following to Clive Humphreys via your waste and recycling network representative by 24th July:

- sites carrying out biological treatment of sludge
- sites carrying out biological treatment of other sewage related wastes such as screenings and grits
- sites operating biogas engines
- sites injecting biogas to the gas grid

Should you require any further information please contact Clive Humphreys at clive.humphreys@environment-agency.gov.uk.

Yours sincerely



Mark Sitton-Kent
Director of Operations – West and Central

Trentside Offices, Scarrington Road, West Bridgford, Nottingham, NG2 5FA.
Customer services line: 03708506506
Email: enquiries@environment-agency.gov.uk
www.gov.uk/government/organisation/environment-agency

Strategic Steering Group Meeting

Item No. SSG19.02.04-02

Subject: Implementation of the Industrial Emissions Directive for biological treatments of sewage sludge

SSG is asked to note that the Environment Agency:

1. has determined that the Industrial Emissions Directive applies to the biological treatment of sewage sludge
2. will be discussing the timetable and process for permit applications through the Water UK waste and recycling network

1.0 Background

- 1.1 Directive 2010/75/EU on industrial emissions (the IED) entered into force on 6 January 2011 and was transposed into UK law on 20 February 2013¹. The IED recast the Directive on integrated pollution prevention and control (IPPC) and introduced a revised schedule of industrial activities falling within scope of its permitting requirements. The schedule of waste management activities includes the recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day involving biological treatment, but excludes activities covered by the Urban Waste Water Treatment Directive² (UWWTD).
- 1.2 There was much discussion about whether the biological treatment of sewage sludge is an activity covered by the UWWTD. In July 2014 we deferred the need to submit permit applications for sewage sludge digestion at sewage treatment works to allow further consideration of the question. All of the UK environmental regulators have now concluded that the biological treatment of sewage sludge is not an activity covered by the UWWTD and is therefore within the scope of the IED. This unanimously held view has been communicated to the UK and devolved governments with a view to commencing implementation.

2.0 Implementation

- 2.1. The IED seeks to achieve a high level of protection for the environment taken as a whole from the harmful effects of industrial activities. It does so by requiring each of the industrial installations to be operated under a permit from the competent authority with conditions based around the use of best available techniques (BAT). In this instance the Environment Agency is the competent authority.
- 2.2. The IED set a deadline of 7 January 2014 for existing installations to obtain an environmental permit. We have therefore delayed implementation of this aspect of the IED for over five years. We now

¹ Environmental Permitting (England and Wales)(Amendment) Regulations 2013

² Directive 91/271/EEC concerning urban waste water treatment

need to address this by ensuring all installations involving the biological treatment of sewage sludge obtain and operate under an environmental permit in as short a timescale as can reasonably be achieved.

- 2.3. We recognise that many sludge treatment facilities were constructed prior to the current permitting requirements and their design may not be compatible with the best available techniques as described in the EU BAT reference documents. Where this is the case risk assessments can be used to demonstrate that an equivalent level of environmental protection is being or can be achieved. Where additional measures are required we will use improvement conditions within permits to allow time to achieve the BAT standard.

3.0 Next Steps

- 3.1. The Environment Agency is developing a sludge strategy in order to plan and deliver clear and consistent regulation of sewage sludge treatment and use activities. It will be finalised by the end of 2019. The permitting of sewage sludge biological treatment activities is one element of the strategy. It will be delivered in parallel with the development of the strategy.
- 3.2. We will use the Water UK waste and recycling network (WaRN) as the main forum to discuss IED and permitting arrangements. We therefore propose that the representatives who attend WaRN act as the main point of contact. We will also ensure that our water company account managers are kept fully informed of progress.
- 3.3. On a practical level all internal resourcing and training needs are being addressed in preparation to support pre-application discussions and the receipt of permit applications later this year. Through WaRN we be asking each company to provide a definitive list of all sites used to carry out biological treatment of sludge, and to provide a best estimate of the number of permit applications they anticipate making.

Clive Humphreys, Environment and Business, Environment Agency

A12 Annex K. Ofwat PR24 WINEP feedback on IED

WINEP meetings, feedback October 2022

Annex 1: Wessex Water specific feedback

In this annex we outline further feedback points that are specific for Wessex Water. These are the main points:

- You stated that spend under Storm Overflows drivers is one of the most significant spend areas of your WINEP. We recognise this but would also encourage you to consider profiling within this area. Storm overflows are one area where profiling across multiple AMPs is possible, profiling based on environmental benefit priorities would help balance the spend and delivery profile, and potentially reduce the bill impact.
- We are supportive of outcomes-based submissions where applicable but emphasise all statutory requirements must be met by your WINEP and any A-WINEP submissions.
- Within your slides and WINEP estimated costs you have included for expenditure to achieve compliance with the Industrial Emissions Directive (IED). The price controls for the 2025-30 period will not include any allowance in relation to the costs of meeting statutory and regulatory obligations (to include IED compliance) that need to be delivered in the 2020-25 period.
- We recognise the majority of the WINEP is Statutory (S), but where this is not the case it is essential you include details of customer support in your November submission.
- We welcome your approach to consider nature based (NBS) and catchment solutions where possible. We recognise developing legislation for the Environment Act targets and Nutrient Neutrality may make utilising NBS and catchment solutions more challenging, but we would still encourage combined solutions incorporating NBS where they can be part of a best value solution.
- We continue to work with government, other regulators, and companies on areas you highlighted, specifically continuous water quality monitoring, storm overflows and nutrient neutrality.

A13 Annex L. EA PR24 WINEP feedback on IED

Aim: collaboratively agree what is the issue and evidence for the issue.

Line Ref	WINEP Driver	Generic Risk	Risk / Issue	Referenced in WINEP Driver Guidance	Commentary (EA driver guidance text in <i>italics</i>)	Water Industry Assumptions	Supporting Evidence	In / Out of Scope	Are Requirements Clear?	EA Action / Agreement	Further Work Needed (Atkins)	Inform Long term Strategy
3	WINEP_IMP	Statutory Obligation	IED (Biological Treatment of Waste)	No	New assets to be delivered to IED standard. Retrospective compliance assumed AMP7 driver and no link to WINEP	Risk that new UK BAT standards may be developed in AMP8. Assumed that any updates to EU BAT standards will not apply to UK. Any updates to BAT are outside WINEP scope (&8 investment) as no known plans. Investment to meet 2018 BREF assumed AMP7, rather than AMP8 driver. Companies may have site specific investment which rolls into AMP8, to be agreed on a permit by permit basis.		Out of Scope	n/a	AGREED		
4	WINEP_IMP	Statutory Obligation	IED (Phys/chem)	No	Linked to need for disposal outlet for resilience	Potential AMP8 driver if company strategy is to move to disposal outlets, rather than biosolids recycling, as upstream Phys/chem sites will fall within IED regulations. Risk of reinterpretation of legislation to apply to sites with a Recovery code, as well as Disposal code. No known plans, so out of scope for AMP8. Risk that new UK BAT standards may be developed in AMP8. Outside WINEP scope as no known plans. Individual companies to assess if sites will require compliance with IED standards in AMP8 resulting from a move to a disposal outlets for biosolids.		Out of Scope	n/a	AGREED		

A14 Annex M. EA-WaSCs IED workshop minutes

EA/WaSC's IED Workshop (via MS Teams)

29/09/2022 14.30 – 16.30

Meeting Notes

Topic	EA/WaSC	Summary Note	Action
Open Tanks	WaSC	Has there been a change in approach by the EA from an initial risk assessment requirement to now full cover and abatement even if it is low risk?	
	EA	Position has not changed the aim being to prevent diffuse emissions as per BAT 14d. Undertake risk assessments and if there are no diffuse emissions then no requirement to cover. The secondary digesters seem to be most common tanks and the expectation is there would be residual gas from these. Any diffuse emissions need to be characterised and appropriate mitigation undertaken.	
	WaSC	Digested cake in bays which produce no diffuse emissions, would it be a given that there are no emissions or would sampling be required?	
	EA	If the digested cake is moved quickly from pad to field, unless there are bio aerosol or odour issues, then no requirement to cover. However to prevent water ingress a low risk cover could be a tarpaulin. A site by site assessment is required.	
	WaSC	BAT 14d mentions health and safety considerations of covering tanks, at what point does the H&S implications outweigh the environmental benefits? Is there a threshold where emissions are not significant therefore no requirement to cover?	
	EA	There is no threshold to give for emissions. Odour can't be used as a proxy for emissions that require monitoring. The HSE have been contacted, they give guidance on enclosed equipment/buildings. HSE view that it is possible for the safe covering of tanks.	
		Share HSE Guidance links	EA
	EA	Cost benefit in BREF/BAT. The industry standard and cost is not a factor as it is considered during BREF drafting. Cost shouldn't be a barrier and is not taken into consideration	
	WaSC	Some existing tanks are structurally not able to take a cover, on small tanks with low emissions there's no cost/benefit	
	EA	No scaling is taken into account, the EA will take a view on very low emissions.	
	EA	Guidance needed on the monitoring standards accepted and the period of time to undertake monitoring which will be acceptable	
		EA to take away and confirm	EA
	WaSC	The amount of tanks this applies to and the timescales to monitor emissions, design and implement a solution should not be underestimated	

	EA	Had since July 2019 to undertake. EA's approach will be to permit facilities and add improvement conditions until the end of 2024. There will be no deadlines beyond this. If best endeavours are being undertaken to comply then recommendation to area colleagues not to implement enforcement post December 2024. It depends on the narrative to try and achieve this. Water industry Net zero roadmap and OFWAT report on open tanks see this as the most productive solution.	
	WaSC	Suggestion to share best practice and monitoring data etc.	
	EA	Use the broader industry, tank producers and consultants for advice	
	WaSC	Covering of cake pads on a biological site or remote transfer station would the same requirement for covering apply?	
	EA	Same principle applies to prevent weather infiltration, if it's moved quickly and short storage times then no cover required. The expectation is that biosolids wouldn't be stored for more than 6 months.	
Containment	WaSC	Standards required for secondary containment of sludge tanks, would earth bunds be acceptable?	
	EA	Yes in principle. Refer to CIRIA736 for guidance or similar standard.	
	WaSC	Delivery of solutions involve a large expanses of concrete required (carbon footprint, loss of ecology, flood risk) A more holistic solution is required. Integrate EA technical teams.	
	EA	Require specific solutions rather than hypothetical to discuss. Flood risk considerations need to be taken into account when designing and issues will be picked up through the permitting process with EA flood teams.	
		WaSC's to flag up to EA any specific sites which may pose a flood risk	WaSCs
		EA to get advice from flood risk & biodiversity/conservation teams	EA
	WaSC	Retrofitting & CIRIA736 are there cost/benefit reasons?	
	EA	Risk assess to CIRIA736 standards, equivalence will be accepted. Look at the site inventory and can the largest tank be contained, 50% containment will not be accepted	
	WaSC	Issue around containment solution having to be inside the permit boundary and the implications of future surrender test.	
	EA	Construction of spill solutions will need to be covered by the permit and then needs to be included in the permit boundary for construction/maintenance regulation.	
	WaSC	Understanding the permit boundary which may change during detailed design resulting in variations being submitted for the boundary.	
	EA	Area containing a spillage the site condition report needs to cover the spill area due to potential contamination.	

	EA	The EA legal view is the area needs to be within the boundary	
	EA	The spill area will also capture run off into those areas. Require regular groundwater monitoring as part of permit conditions.	
	WaSC	This is a new issue that needs WRN/TaF discussion and resolution	
	EA	Can be discussed but cannot move away from legal view that containment solutions should be in permit boundaries.	
Emission Returns	WaSC	Practical terms requirements are needed for liquor returns to head of works, would a risk assessment be suitable?	
	EA	Require the characterisation of liquids when being submitted. The EA need to know what is in the effluent due to the wide range of treatment process pre and post AD. (BAT 20, 6, 7 & 3) A broad range of sampling maybe the only way to determine what's present.	
	WaSC	Not always possible to analyse for some of the determinants	
	EA	Former M18 guidance may be useful to look at shows the minimum sampling requirements. Justification may be that it's not possible to sample for certain elements	
	EA	The CIP3 (Chemical Investigation Programme) work has shown that different works have different substances in the effluent and sludge. Different treatment methods have varying effects.	
	WaSC	What is the aim of the H1 assessment and characterisation of return liquors? Will the Agency then set limits? Implications of limit being breached?	
	EA	Establish if there is an impact on the works e.g. ammonia. 12 months or more, monthly sampling then undertake an H1 assessment. See what is of significance, a lot may be screened out. What measures are needed to be taken to deal with the problematic element?	
	WaSC	This sampling and analysis will then be the water companies' responsibility? Concern over PFOA/PFAS and how these are dealt with, maybe no mechanism for removal.	
	EA	If there is no pre-treatment whatsoever then there is a greater risk with levels of metals being a concern. BAT 3 manages what is being passed to the WwTW at the point of release.	
	EA	Although installations are linked to WwTW the EA don't differentiate from other installations in other industries. Bulk tanker deliveries can be controlled although domestic effluent through the sewer is more difficult to control. This is a complexity not seen in other industries. EA need to see where problems are occurring i.e. there is no mechanism for testing parameters	
WaSC	There is not total control over inputs unlike other industries, there is an implication for the installation to		

		come up with a solution and pass liquors on WwTW – needs further discussion	
EA		A great deal of uncertainty around this. Is there anything else the EA can do to help/reduce uncertainty?	
		Further discussion needed at the WRN forum	WaSCs
WaSC		Tanker imports of sludge, Ww sludge cannot be rejected as a commercial AD would	
EA		What checks are carried out between WwTW? Question of suitability of imports to the WwTW. Should some inputs be received by specialist companies and not by WwTW who are able to treat	
WaSC		Questions not for individual installations, it requires UKWIR/EA research	
EA		Purpose of the permitting process is to stop unacceptable emissions from the installation	
WaSC		We are managing emissions currently with no great number of non-conformances, should be picked up under CIP	
EA		Maybe better options for treating a particular substance due to the WwTW not being able to treat.	
EA		Appreciate questions which are causing difficulties with the permitting process.	
		Meeting timed out any other questions be sent to Katherine Owens/Clive Humphreys	
Close			