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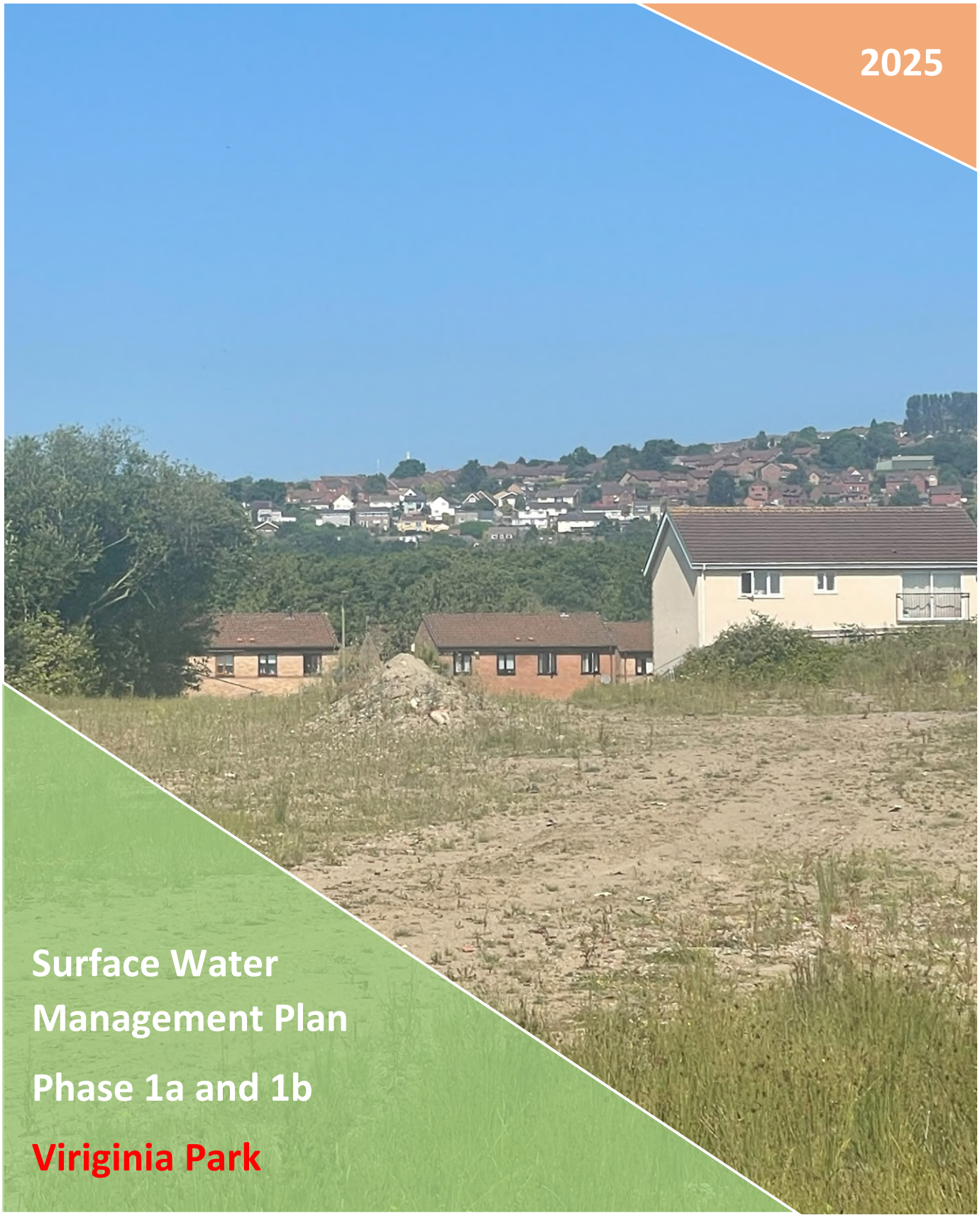


Surface Water Management Plan

Phase 1a and 1b

Viriginia Park

EcoVigour
Integrated Environmental Management

Persimmon
Together, we make your home

Document Information			
Development	Surface Water Management Plan – Viriginia Park Phase 1a and 1b		
Location	Viriginia Park, Caerphilly CF83 3AB		
Title	Surface Water Management Plan		
Document Ref	J002453.02	Issue / Revision	0
File reference	J002453		
Date	26/08/2025		
	Name	Signature	Date
Auditor	Julian Gregory		26/08/2025
Prepared	Tom Meads		26/09/2025
Reviewed	Julian Gregory		17/10/2025

Document Control		
Rev.	Date	Description
0		Issued
1		Updated to include phase 1b

Disclaimer

Contents

1 Introduction

1.1 Background

EcoVigour was instructed by Persimmon Homes East Wales to develop a Surface Water Management Plan for the construction of Phase 1A of the Virginia Park residential development. With the addition of including a plan for Phase 1B once the remediation works carried out by Pritchards Contracting have been completed and the land adopted by Persimmon.

The development for Phase 1A and 1B is to include approximately 174 homes and is part of the wider Virginia Park development. Adjacent land is being developed with groundworks already underway. The adjacent developments and groundworks are not part of the Persimmon land.

This Pollution Control Plan relates to the construction of Phases 1A and 1b as illustrated in the Figures below. The PCP covers the following phases of the project:

- Post remediation / Pre-Construction – the site has been remediated and left as a development ready plateau with some of the services and drainage constructed;
- Construction Earthworks;
- Construction Development.

Figure 1: Phase 1A of Viriginia Park development

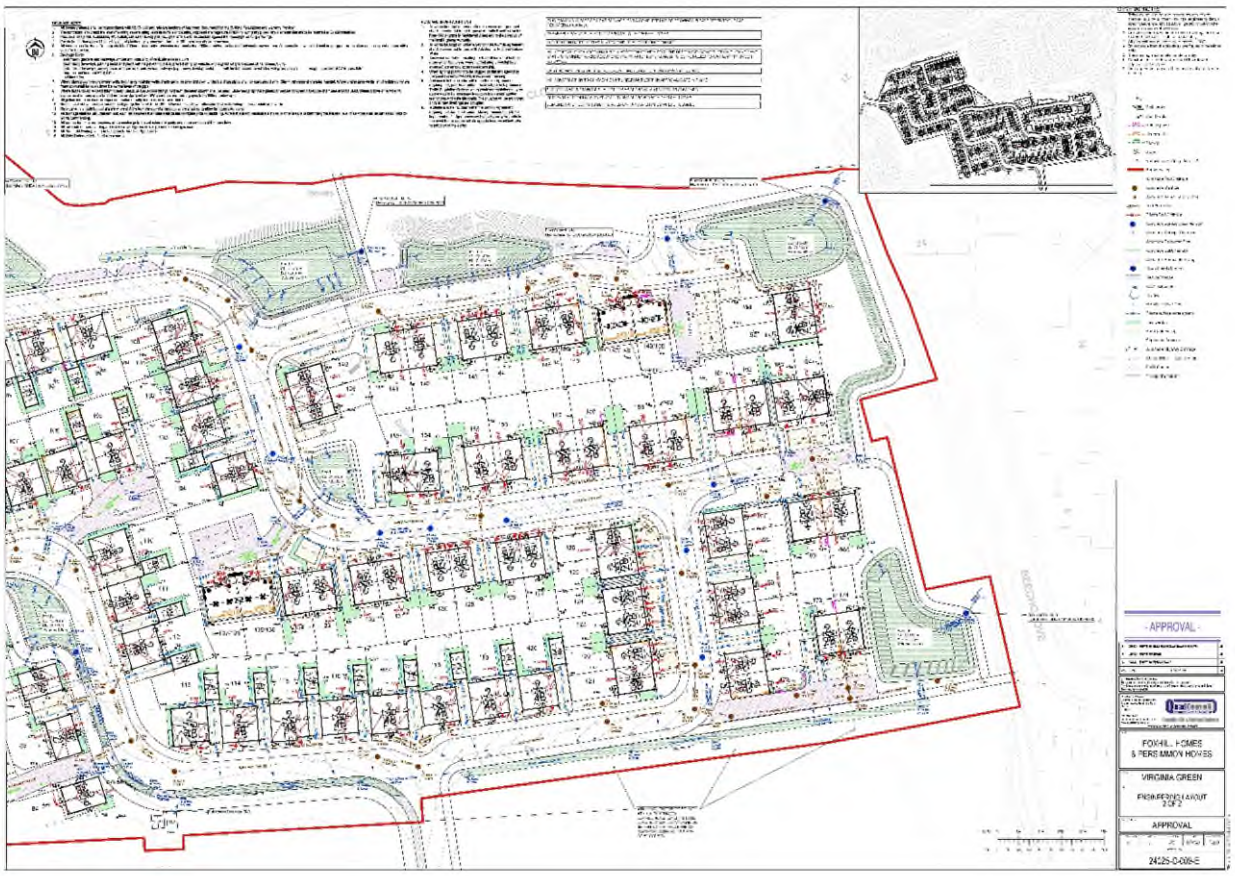


Figure 2: Phase 1b of Viriginia Park development

Phase 1A will have access off the Heol Bro Wen with existing residential properties either side, additional residential properties are located to the North. To the south of the development there is a local tennis club, Caerphilly Tennis Club, consisting of six courts. Phase 1B will be accessed from Phase 1A.

Figure 3: Ariel image of Phase 1A

Phase 1B is located to the east of Phase 1A and is currently subject to ground works, including the installation of foul and storm drainage by the appointed sub-contractor (see Figure 5). The site gradient continues to fall eastward, with the lowest point situated in the northeast. Beyond the site boundary, a small, unnamed ditch or brook lies to the east. This feature was observed to be holding low levels of water, suggesting it is an historic swale or runoff channel rather than an active watercourse.

Figure 4 - Arial image of Phase 1B, prior to remediation (ponds now removed)

The site extends over approximately 2.1 hectares and the upper layers of the site are comprised of an alluvium, sandy loamy soil. Ground compaction undertaken by the sub-contractor during the initial works has resulted in runoff occurring predominantly at the surface, as infiltration is limited. Due to the nature of the soils, it is likely that fine, clay suspended solids are likely to be mobilised when soils on the surface of the site are agitated.

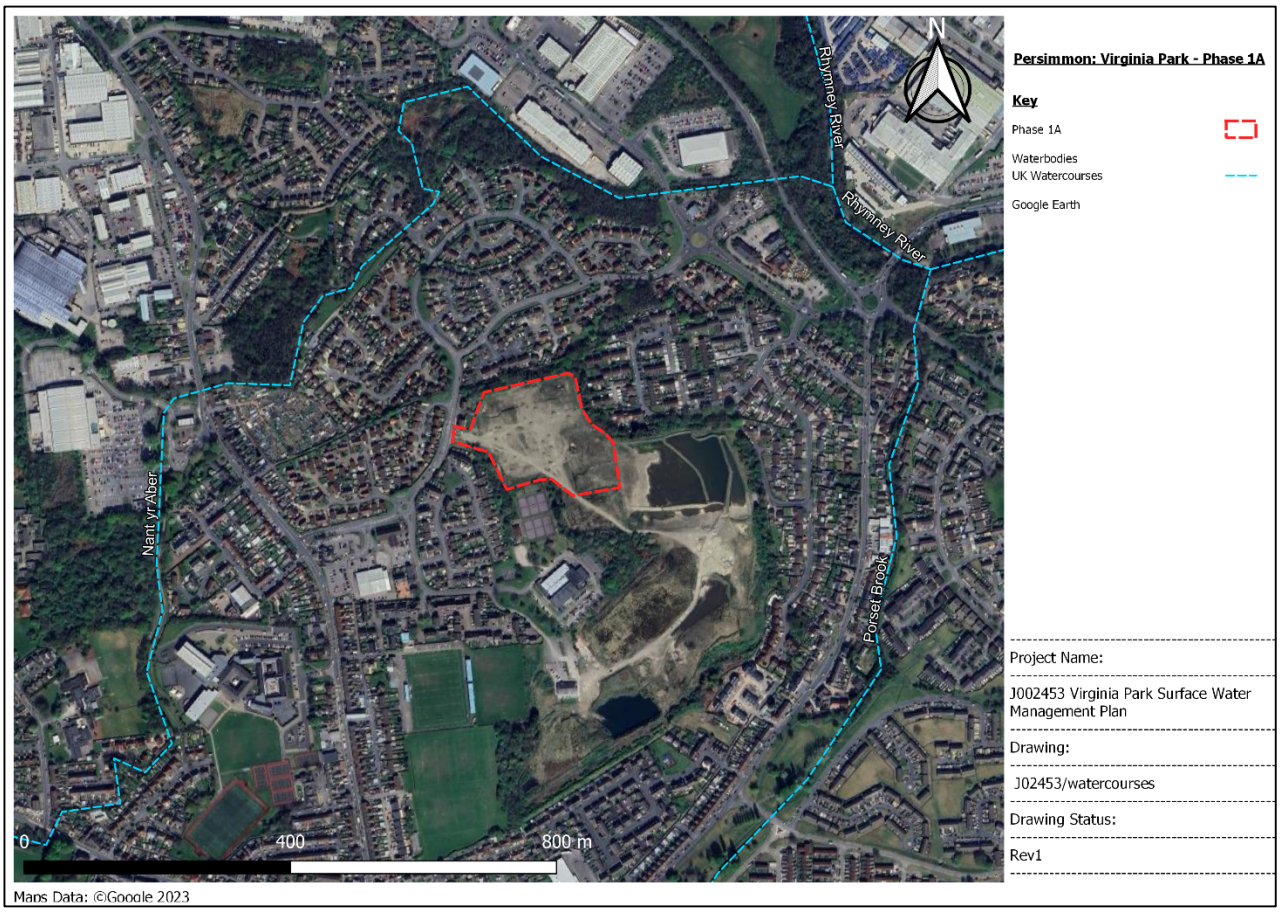


Figure 5: Named watercourses surrounding the site.

The site is located in proximity to three watercourses: the **Nant Yr Aber** to the west, the **Rhymney River** to the north, and the **Porset Brook** to the east. Each watercourse is situated at a distance greater than 250 metres from the site boundary. The closest feature is the Nant Yr Aber, positioned approximately 263 metres from the site entrance, Figure 3. There is a small watercourse flowing along the sites northern and then eastern boundary, which likely flows into the Porset Brook. This appears to be dry for much of the year and flows during periods of rainfall.

Permanent surface water drainage for the development has been designed to collect runoff, via highway gullies, channel drains and filter drains. Water is then fed to underground buried SDS attenuation tanks, swales and open detention basins across the development, primarily to the north. Runoff is discharged via flow control chambers fitted with hydrobrakes, which have been designed to limit discharges to greenfield flows. Once the hydrobrakes reach capacity, runoff will back up into the buried SDS attenuation tanks and detention ponds.

For Phase 1A, surface runoff from the site is conveyed into a network of dry swales, which direct flows towards the primary detention basin located to the east, Pond E. The basin is designed to provide temporary storage of surface water, reducing peak flow rates and promoting settlement of suspended solids. Discharge from the basin will be regulated through a hydrobrake, ensuring a controlled release.

Approximately a dozen mounds are located across the site (Figure 2), these are manhole finished levels for foul and surface water manholes and as part of the development, site levels will be raised to meet these, through the import of fill materials. The site is currently dormant and natural weathering of the surface soils and vegetation growth have occurred, contributing to minimal surface runoff. Topographically, the site is predominantly flat, with a slight

elevation in the west. A topographical survey identified an elevation change of approximately 3 metres between the western and northeastern extents of the site (Figure 4).

Figure 6: Topographical Survey Phase 1A.

This import of materials to achieve site finished level will need to be considered during the design of construction silt mitigation.

2 Construction Runoff Risk Assessment.

2.1 Silt Pollution Risks.

Key Risks:

Runoff from Earthworks

During groundworks (bulk fill and compaction), drainage and foundation preparation, exposed soils may generate runoff carrying suspended solids. This risk is greatest where soils are actively disturbed, particularly along the western part of the site where minor elevation changes exist. Initial runoff can have a high sediment load, although this typically reduces over time as larger soil and stone particles remain on the surface. As soils are worked, fines are bought to the surface and are more available to be washed from the soil structure and taken into suspension.

Runoff from Haul Roads

Construction traffic on temporary haul roads can disturb soil and generate dust in dry conditions. When it rains, this material can be mobilised and form sediment-laden runoff, which may flow overland or enter the site's drainage network. This risk is most significant along access tracks linking the site entrance to active work areas.

Deposition of Site Material on Access Roads

Construction vehicles may deposit soil and debris onto internal access roads, including the shared entrance route with residential traffic. Although road sweeping is undertaken, fine particles often remain. These can be washed into gullies during rainfall, creating a pathway for sediments to enter the drainage system and, ultimately, controlled waters.

Water Pumped from Excavations

Excavations for services and foundations often collect groundwater and rainfall. When pumped out, this water may contain high levels of suspended solids due to soil agitation within the excavation. Without suitable settlement or filtration, this poses a risk of discharging sediment-laden water into the drainage system.

3 Runoff Rates – Phase 1A

Hydrological modelling indicates that the mean annual peak runoff rate (Qbar) for the site is 17.78 litres per second, while the estimated peak flow rate for a 1 in 100 year storm event is 38.8 litres per second. These figures reflect the expected surface water discharge under both typical and extreme rainfall conditions. The proposed attenuation pond strategy will be designed to accommodate these flows, ensuring effective attenuation and to mitigate flood risk across the site. Calculations for this can be found in Appendix 1

4 Runoff Rates – Phase 1B

Hydrological modelling indicates that the mean annual peak runoff rate (Qbar) for the site is 12.5 litres per second, while the estimated peak flow rate for a 1 in 100 year storm event is 27.2 litres per second. These figures reflect the expected surface water discharge under both typical and extreme rainfall conditions. The proposed attenuation pond strategy will be designed to accommodate these flows, ensuring effective attenuation and to mitigate flood risk across the site. Calculations for this can be found in Appendix 1

5 Post Remediation / Pre-Construction Runoff Control – Phase 1A

Remediation at the site was completed in 2023, with an attenuation pond constructed in the low spot of the site at the approximate location of Pond E (eastern boundary) water gathered here, allowed suspended solids to settle and then flowed into the adjacent ditch / watercourse.

Since then the surface of the site has weathered and vegetation has started to grow. In the short term, until development is ready to progress, the site should be maintained in this condition. Traffic should be confined to the haul route through the site and the remainder of the site should be left undisturbed over the winter of 2025 – 26.

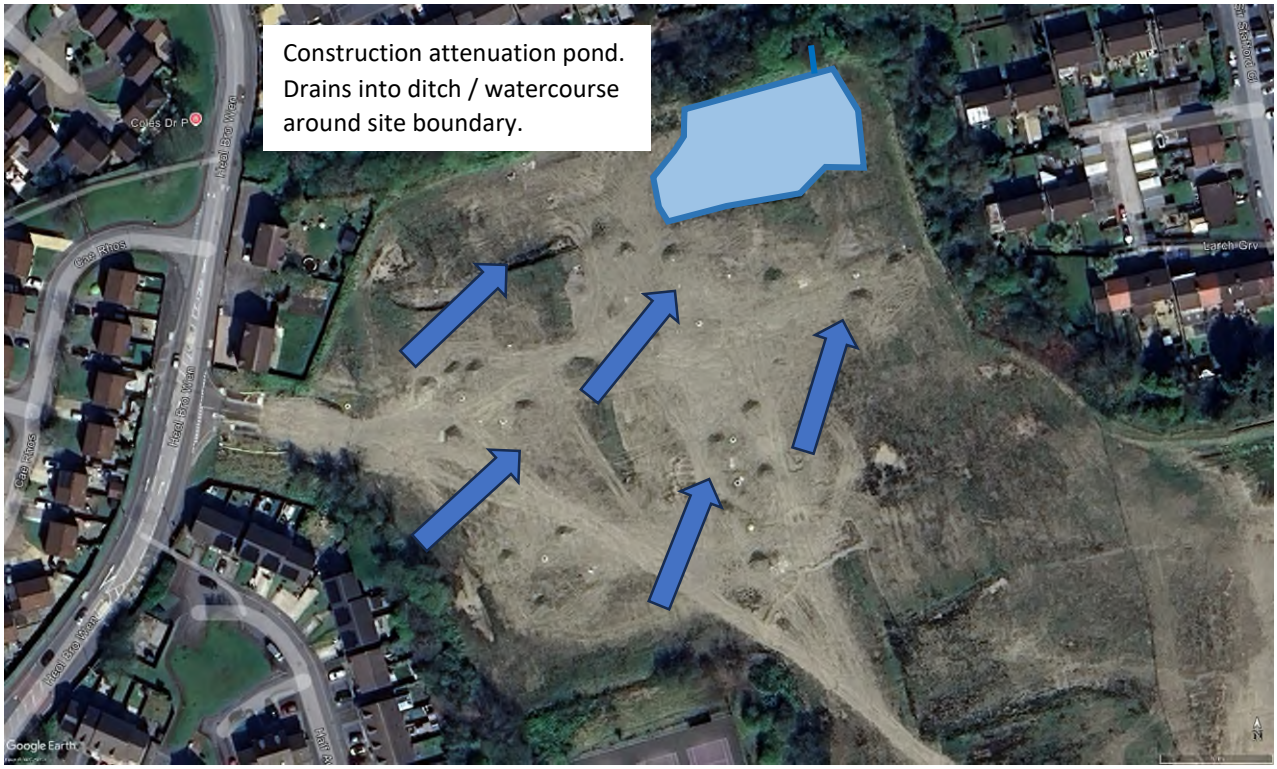


Figure 7: Current Silt Mitigation for Phase 1a (2025)

6 Post Remediation / Pre-Construction Runoff Control – Phase 1B

Phase 1B is currently undergoing foul and storm drain installation (2025) which once completed will leave the site stripped of vegetation. A small amount of vegetation growth was observed and is encouraged to be retained to prevent further scouring and erosion of the ground.

Additional pollution control measures will be required to safeguard from impacts due to runoff from these stockpile areas and material storage on site.

Figure 8 - Existing runoff controls and direction of surface runoff flow

Silt fencing has been installed and should remain in place until a full surface water management plan is put in place as part of the development of the phase. The fencing appeared to be controlling the flow of surface runoff, Figure 8. Bunds should be constructed in the NE corner of the site to form an attenuation pond, this should have a high level outfall, abstracting runoff from the surface of the pond (the surface of the pond is always the cleanest section of the water column).

Figure 9 - Existing silt fencing installed along the north of Phase 1B

7 Construction Silt Mitigation

7.1 Key Principals for Silt Pollution Control at Virginia Park

The key principals for silt pollution control for the Virginia Park – Phase 1A development will be:

- Preventing clean water from becoming contaminated with suspended solids.

- Capture and attenuation of all runoff from construction areas and pumping / gravity feeding this into attenuation ponds.
- Divert clean runoff from areas outside the construction areas, away from the construction areas, using cut off ditches and bunds to capture runoff from above the site, to the west.
- Only vegetation / topsoil stripping areas immediately required for development, to minimise areas of exposed soils – the site has been previously remediated and is hence comprised of exposed sub-soil. However, this has weathered over time and become vegetated, which prevents runoff being generated.
- Segregation of Construction and Residential Runoff - Runoff from construction areas and completed areas of the site should be segregated. This will reduce the volume of runoff to be treated i.e. if you halve the volume of runoff into a pond you double the residency time and increase efficiency by approximately 35%.
- Construction runoff should be contained, collected and discharged via attenuation and / or treatment measures designed for construction runoff only.
- Localised silt mitigation such as Siltfence, small sumps, and geotextile filters are good for reducing the force of runoff and hence reducing scour, directing runoff into further treatment or away from sensitive areas and removing larger particulates which could quickly silt up or clog ponds.

7.2 Segregation of runoff from construction areas and completed areas of the site.

As sections of the development are completed and cease to be used by construction traffic, drainage from these areas is segregated and runoff from these areas is discharged to permanent outfalls. This is only done once it is certain that runoff from these areas will not be impacted by construction runoff i.e. will not be used by construction traffic.

This is done as a phased approach by placing bungs in sections of drainage and pumping runoff from manholes, either to the outfall if clean or to the central attenuation ponds if contaminated with silt.

Permanent drainage should not be made live and able to discharge runoff directly to a watercourse until all construction work in that area has been completed, and there will be no further construction traffic movements, and it is certain that this water will not contain suspended solids or other pollutants.

8 Construction Runoff Control – Phase 1A

8.1 Installation of Runoff Attenuation Pond – Pond E.

To manage construction-phase surface water and minimise the risk of sediment-laden runoff entering controlled waters, a dedicated system will be implemented to segregate and direct construction runoff flows to **Pond E**, the primary attenuation feature for the development. This will be used as an attenuation pond for surface flows from the development but will be initially constructed as a construction runoff attenuation pond.

Pond E, located along the eastern boundary of the site, figure 10, will be constructed and commissioned prior to the start of the bulk fill process for the phase. The outline of the pond will be constructed and as site levels are increased, the sides of the pond will be raised with them. This will ensure that suitable attenuation and settlement capacity is available prior to significant earthworks or road construction. The pond will serve as the designated receptor for surface water runoff throughout the construction phase. As site levels are raised, it may be necessary to raise the level of the outfall from Pond to suit.

Figure 10: Location of Pond E - to be used as Construction Runoff Attenuation Pond.

Pond E is located in a low-lying area of the site, allowing surface water to flow into the pond by gravity without the need for pumps or sumps. Runoff is expected to enter from the southern side, with a northern outfall designed to draw water from the surface of the pond (this is always the cleanest part of the water column) through a pipe, with a 90 degree bend fitted, to form a surface water weir, figure 13.

Once the bulk fill operation has been completed, the access roads for the site and associated drainage will be constructed to base layer. The permanent drainage relies on swales, as part of the SUDs system and these swales will be constructed early in the project programme to allow them to be used for the channelling and attenuation of construction runoff. Runoff from access roads and earthworks areas will be collected by swales, ditches and sections of permanent drainage and channelled to Ponds D and E, where it will be attenuated prior to discharge from the site.

Based on the build sequence for the site, open ditches can be constructed to feed the attenuation pond. The trenches will need to avoid property footings, haul roads, and drainage routes and hence the construction of wide ditches, with attenuation, within the footprint of the permanent swales. These should be designed so that they hold water and hence have attenuation capacity. Short sections of open ditch or temporary pipes may be required to connect the swales. These will all discharge into Pond E.

The footprint of the swales will provide primary settlement and will remove larger suspended solids, prior to the runoff entering Pond D and E. Stone weirs / dams should be constructed at 10m intervals along the swales to create small attenuation ponds.

Once sections of highway have been constructed to base course level, runoff from these should be run along the kerb line, into the system of ditches / swales and then fed to Pond E.

The following controls can be adopted during the Phase 1A works to control runoff and direct runoff to the attenuation pond located at Pond E:

Figure 11: Phase 1A – Pollution Control Measures (ditches to feed Pond E will be moved and updated as the development progresses).

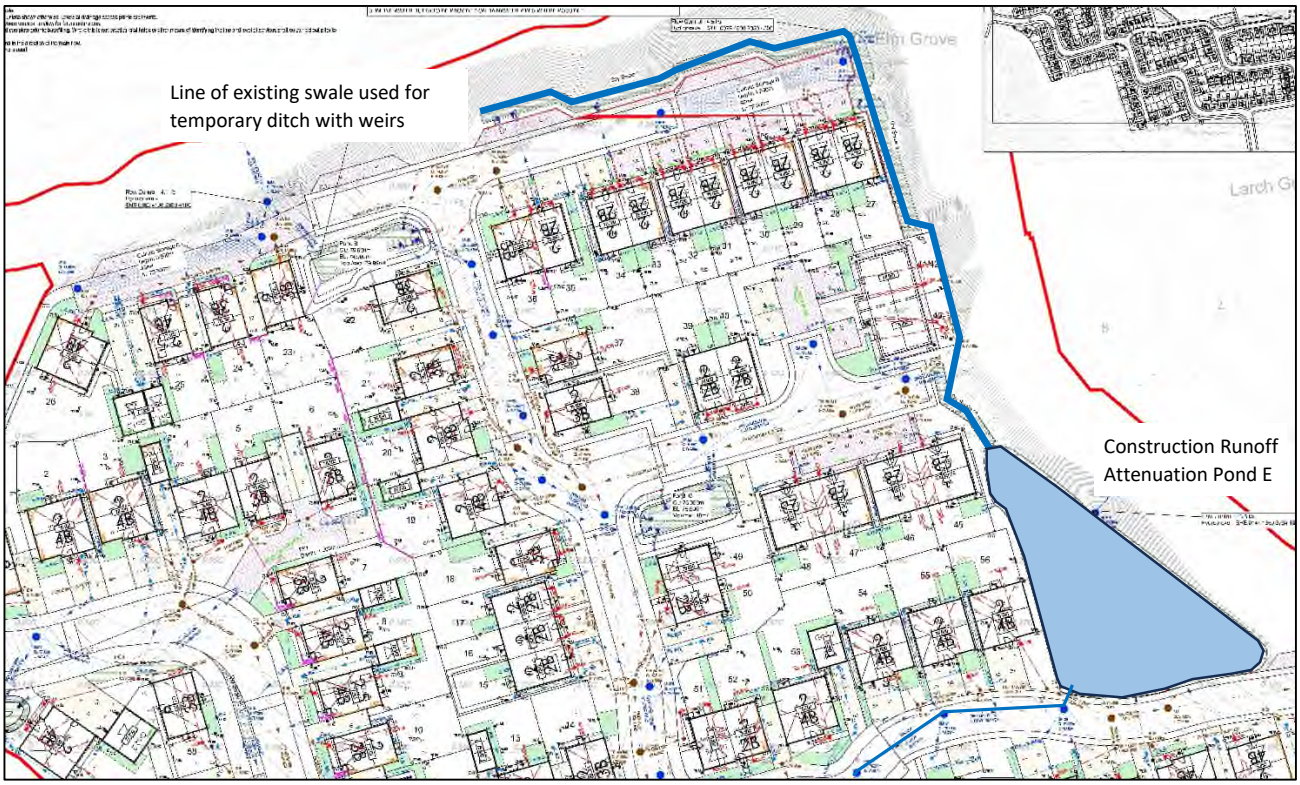
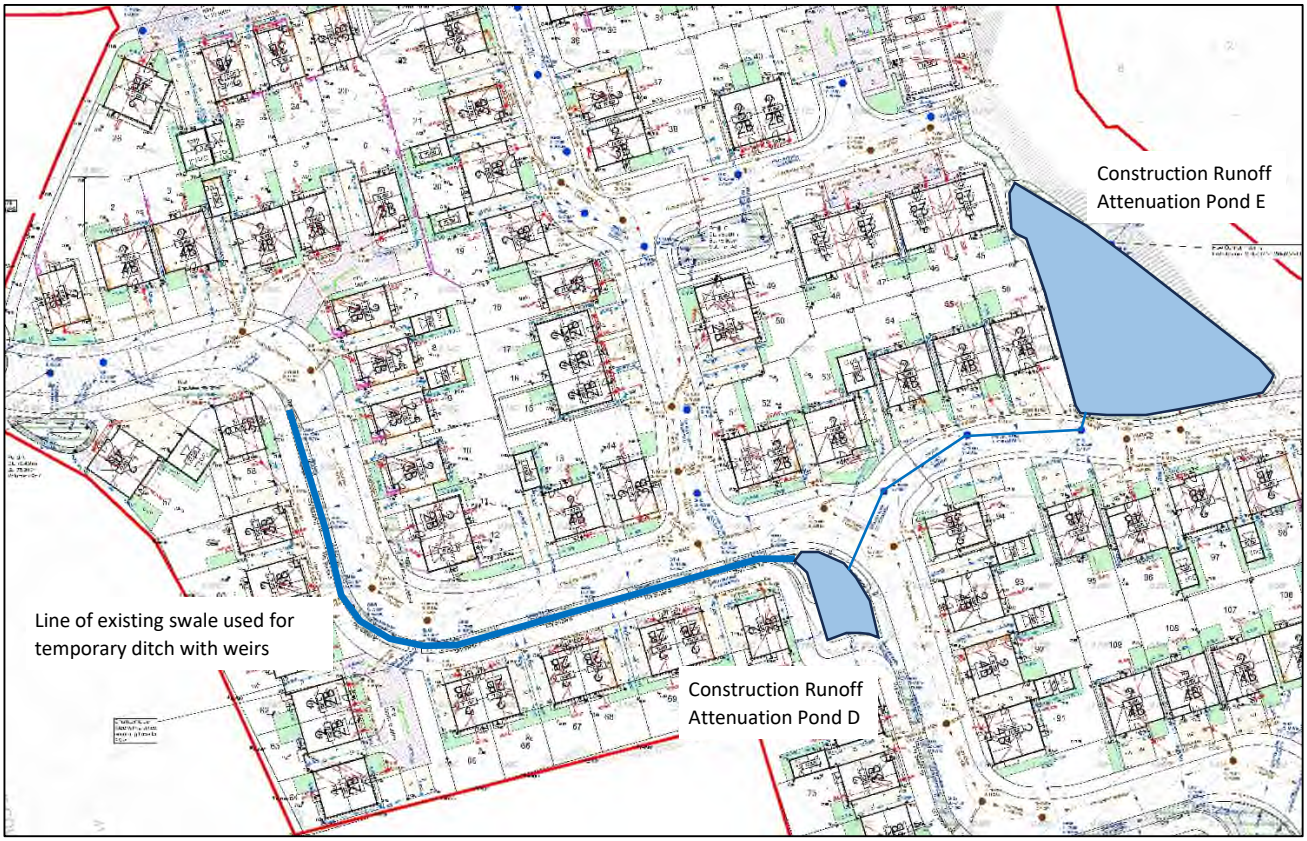


Figure 12: Phase 1A – Pollution Control Measures following completion of earthworks.



Note: Pond D will be connected to Pond E via permanent drainage constructed as part of highway construction. In the early stages of the project, this will be replaced by an open ditch along a suitable line, to be agreed on site.

Figure 13: Phase 1A – Pollution Control Measures (ditches to feed Pond E will be moved and updated as the development progresses).

Additional ponds:

In addition to Pond E, the final development includes four permanent ponds and a series of dry swales located along the southern section in front of the properties. Using these additional ponds for construction runoff would require cleaning and possibly reconstructing them to ensure all construction-related water is removed. While this would incur additional costs, it could be considered if Pond E reaches its runoff capacity.

If fully constructing the additional ponds is not a viable option, then the areas can be used as areas for holding with temporary sumps made from bale and geotextile, figure 9. This will allow additional holding capacity before pumping to the main attenuation pond, Pond E.

The additional ponds are located along the proposed open trench routes and can serve as containment areas or, as noted earlier, as sump areas for over-pumping to the attenuation pond.

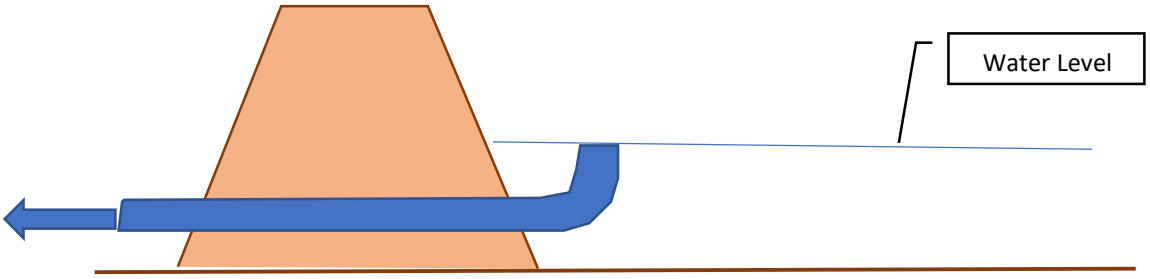


Figure 14: Outfall design from pond to allow surface water to be extracted.

9 Construction Runoff Control – Phase 1B

9.1 Pollution Control during the Construction Phase

There are 6 permanent attenuation ponds within Phase 1B, 3 along the sites northern boundary adjacent to the watercourse – Ponds F - H, 2 within the site – I and J, and 1 in the SE corner also adjacent to the watercourse Pond K.

Ponds H and K have outfalls into the watercourse, whilst ponds F and G connect into Pond H and Pond K is a standalone pond fed by a Swale. There are also swales which will be used as part of the permanent design

Silt mitigation will be achieved through the attenuation of construction runoff. The footprints of permanent attenuation ponds will be used for the construction of construction runoff attenuation ponds, as described above.

Fill will be placed to raise site levels to finished level. The temporary pond in the NE corner will be maintained during this process and then once site levels are approaching finished level, the temporary ponds will be constructed within the footprints of the permanent attenuation ponds. This will be Ponds F, G, H, I, J and K. Ponds I, F, G and H will be operated in series, with water flowing from one pond to the next, before discharging into the watercourse along the northern boundary from Pond H.

The swales around the site boundaries will also be excavated and used for the channelling of construction runoff. Sections of permanent drainage will be connected into the construction runoff attenuation ponds F – K. Surface runoff from other areas will be chenneled into this drainage and the ponds, through the use of permanent drainage, temporary drainage, ditches and bunds. Runoff will not leave site without passing through the construction runoff attenuation ponds.

*Figure 15 – **Phase 1B Construction Runoff Mitigation.***

The main roads through the site will be constructed early in the project programme, along with the spine road drainage. Throughout construction, all runoff will be fed to the six ponds, which will act as construction runoff attenuation ponds with high level outfalls.

During the construction process, all runoff will be diverted away from the buried SDS crates to prevent them from becoming contaminated with silt. Pipework into the SDS crates will be securely bunged, with upstream manholes allowed to overflow into the construction runoff attenuation ponds.

Runoff will only be allowed to discharge into permanent drainage once all construction works are complete in that area of the site and the access roads are no longer used by construction traffic. The outfalls from the attenuation ponds will then be amended to their permanent designs and the high level outfalls removed. This can be done on a pond by pond basis, as works to the site are completed.

9.2 Installation of Silt Fence

Silt fence is designed to capture runoff and filter it to remove suspended solids. It will also break the force of runoff flowing down slopes, reducing runoff velocity and reducing scour or site material, which could be carried into watercourses or other mitigation.

In reality, Siltfence's filtration is limited, with a small filtration effect initially but the pores in the geotextile, soon become blinded. Siltfence does have the effect of forming small attenuation features.

Siltfence will predominantly be used to break the force of runoff and reduce scour and direct runoff into capture areas.

Siltfence should be used to slow the flow of runoff across the site, reducing scour of further suspended solids. It should also be used to direct runoff away from sensitive features and to provide small attenuation features, which are effective for removing larger suspended solids.

It is vital that siltfence is well buried into the ground and the soil compressed back around it, so that when water builds up against it, it does not pull out of the ground or get undercut by runoff. It also needs to be well staked, otherwise it will collapse under the weight of the water. Stakes should be placed on the downstream side of the siltfence so that the geotextile sits against the stake.

A line of silt fencing is recommended as a last line of defence at the boundary along the lowest point of the site, figure 6. This is unlikely to be utilised however during periods of extended precipitation the silt fence will keep all runoff on site allowing transfer to the attenuation pond.

9.3 Maintenance of Siltfence

Inspect Silt Fences at least once a week and after each rainfall. Make any necessary repairs when bulges occur or when sediment accumulation reaches 50% of the fabric height.

Any areas of collapse, decomposition or ineffectiveness need to be immediately replaced.

Remove sediment deposits as necessary to allow for adequate sediment storage and reduce pressure on the Silt Fence. Ensure that the sediment is removed to a secure area where it cannot re-enter watercourses or attenuation systems

Do not remove Silt Fence materials and sediment deposition until the catchment area has been appropriately stabilised. Stabilise the area of the removed Silt Fence.

9.4 Gravel weirs

We have seen great success in utilising gravel weirs within open ditches in regard to controlling the flow of runoff and aiding in the attenuation of runoff and the settling of larger suspended solids.

Clean stone can be placed in trenches at intervals of approximately 10–15 m, depending on the fall of ditches. Weirs within the ditches retain runoff, creating a controlled, slow flow that promotes sediment settlement and increases the overall storage capacity of the surface water management system.

Figure 16: Example of gravel weir/bund within an open ditch

9.5 Gully Bags / Green Rhino EnviroHorns

Gully bags and Silt Stops, are effective at trapping larger particles within runoff. Larger particles become trapped but smaller particles are carried through by the water. As the volume of larger particles builds up, the capacity of the gully is reduced, until it eventually becomes blocked, preventing all runoff entering.

Gully bags and Silt Stops will not remove fine suspended solids, which will stay in suspension for several hours, however they will remove larger suspended solids which could accumulate in drainage, causing blockage and reducing the volume of permanent drainage attenuation systems.

Gully bags or Silt Stops will be installed in all gullies in areas where construction is ongoing or where construction vehicles are active.

9.6 Flocculant / Coagulant Dosing System with Siltbuster Settlement:

If the required water quality cannot be achieved through gravity settlement alone i.e. flows are too high, particles are too small, it will be required to introduce a Chemical Dosing System. There are two ways of doing this:

- Flow Proportional Dosing - This would use sensors to determine the flow and turbidity of the water and then accurately dose it with the right volume of pH adjustment and coagulant. The coagulant would then bind together all of the small particles into a larger particle, which would settle out as it has a larger mass.

  This system would require a power source, storage for 2 IBC's of flocculant and coagulant, this will need to be secure and bunded, two mixing tanks, a minimum of 1 clarifier and facilities to de-sludge the system. It will also need attendances on this, i.e. daily checks by a member of the site team and regular servicing by Siltbuster.

  These systems only work, with a throughput between certain parameters and hence a form of storage is required to store runoff during periods of heavy rain, which can then be pumped through the system during periods of dry weather. The volume of this storage needs to be determined based on the anticipated flow from construction areas. Reference should be made to information used within the drainage design.

  This treatment process would also require an Environmental Permit to Discharge.

- Flocculant blocks – These are blocks of biodegradeable coagulant / flocculant which is placed into the flow stream of runoff, generally as water enters a pond, or leaves the outfall from a pump. Water is dosed and the suspended solids and coagulant / flocculent settles with it. As this process is not accurately flow proportional it is required that there is sufficient volume downstream and distance from the discharge to the watercourse to ensure that all coagulant / flocculent is settled out prior to water discharging into the watercourse.

10 Environmental Permit to Discharge

Natural Resources Wales controls all activities which have potential to impact the environment, through Environmental Permitting. Treated site runoff is classed as Trade Effluent and therefore a Bespoke Environmental Permit to Discharge will be required. For this, there will be an application fee, a subsistence fee and a surrender fee for surrendering the permit at the end of the works. Costs are dependent on the number of outfalls being permitted.

Bespoke Environmental Permit Applications for the discharge of Trade Effluent, are currently charged at up to £9802. There is also an Annual Subsistence fee which is charged to cover the cost of the operation of the permit by NRW. This will be dependent on the likely input required.

Permits take up to three months to put in place and require the submission of an Environmental Management System and a Monitoring Strategy, which will require monitoring of water being discharged using handheld meters and taking samples and sending them to a UKAS / MCERTs accredited laboratory for analysis.

11 Prevention of Silt Contamination During Pumping Operations:

As part of the planning of pumping operations consideration must be given to:

- The likely volume of water which will be required to be pumped – if this water can be maintained clean and be abstracted and pumped prior to it being contaminated, minimal silt mitigation will be required.
- The degree of siltation of the water, i.e., will it be ground water intercepted prior to it reaching an excavation or is it likely to be water which is continually being agitated through excavation activity. The choice of silt mitigation will then depend on the anticipated volume i.e., the size of pump, the distance from a sensitive

receptor i.e., a watercourse or other water body and the duration of the pumping operation (small volumes of silt contaminated water pumped onto dry ground for a short duration will percolate into the ground, whereas larger volumes over a longer duration will not and will flow away.

- All water pumped from excavations shall be pumped via a pipe and gravel sump. In order to prevent silt being agitated from the base of the excavation and to provide rudimentary filtration to the water prior to abstraction.
- For low volume pumping (25mm pump), water will be pumped into a small attenuation lagoon / tank prior to being directed into the drainage system. Discharges will be continuously visually monitored and if silt contamination is identified, pumping shall cease, and additional mitigation will be implemented.
- For medium volume pumping (50-75mm pump) water shall be pumped via a small attenuation lagoon / bale and geotextile sump or an attenuation tank with a capacity of not less than five cubic meters, the outlet from this may be placed directly into site drainage provided water is free from silt. Drainage from the lagoon/tank will be in the form of a gravity system or a siphon. The quality of discharged water will be continuously visually monitored and if silt contamination is identified, pumping shall cease, and additional mitigation will be implemented.

Figure 17: Bale and Geotextile Sump

- For high volume pumping (100mm or above) water shall be pumped to an attenuation pond if available. If the required water quality cannot be achieved through this alone, water will be passed through an attenuation tank with a capacity of not less than eight cubic meters, the outlet from this may be placed directly into site drainage, provided water is free from silt contamination. The water in the tank will be regularly inspected / tested.
- In the case that the silt cannot be controlled by the above measures, lamella clarifiers such as those produced by Silt buster will be brought to the site. All water will be pumped through these before being released to drainage.

Figure 18: Pumping silt contaminated water through Lamella Clarifiers

- If the required degree of settlement cannot be achieved by settlement alone flocculants may be used. Note: For the use of coagulants / flocculants an Environmental Permit to Discharge will be required. This can take up to 4 months to put in place. The flocculent dosing system should be a flow proportional system to ensure that there is no flocculent in the overflow from the settling pond / tank. A testing regime will be required to demonstrate that water is free from flocculants at the discharge point (through testing for iron)
- Discharges from pumping systems will be monitored continuously for the initial four hours and if there are works taking place which have potential to generate silt contamination. Discharges will be assessed visually on a daily basis throughout the pumping operation.

12 Flood Risk

Flood risk for the site is low. There is a risk of localised flooding in low areas of the site, along areas previously used as water features as part of the preexisting use as a golf course.

There is also potential for water logging / shallow flooding in low lying areas of the site during prolonged periods of heavy rain.

It will be crucial that the passage of water across the site is not impeded during the works, to ensure flooding and pooling areas do not agitate the ground resulting in an elevated amount of mobilised silt.

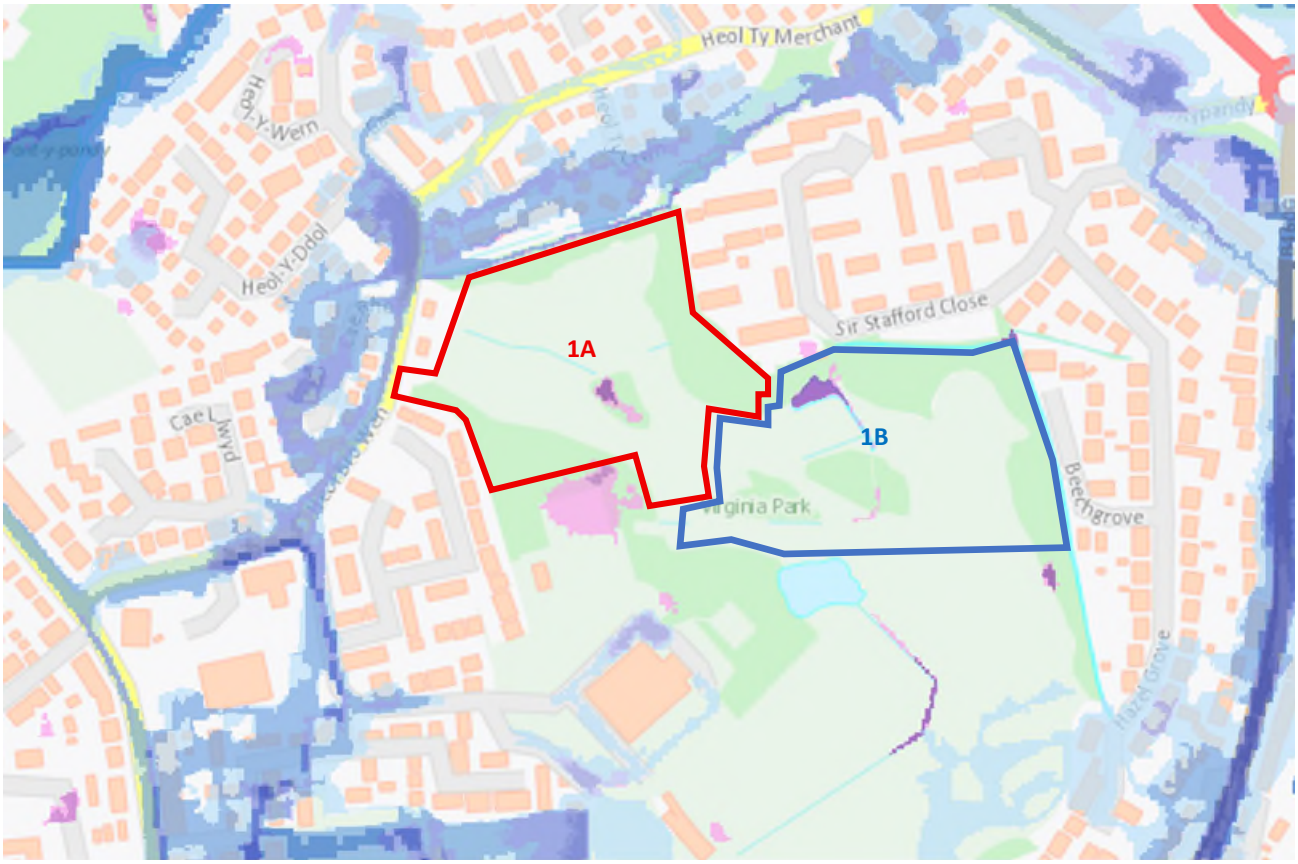


Figure 19: NRW Flood Risk Map

13 Cleanliness of Highways and Haul Roads

The following measures will be employed to maintain the cleanliness of the surround highway network if required:

- As far as is reasonably practical, construction traffic will be segregated from other highway traffic
- Hard surfaced runoff areas, which are regularly cleared of site material.
- Hard surfaced site haul roads throughout the site.
- Ensuring staff vehicles do not have to pass through construction areas to access parking.
- Jet washing of vehicle wheels prior to leaving site – jet wash areas will be located at the west access onto Heol Bro Wen.
- Road brushing of the highway network adjacent to the site, Heol Bro Wen.

13.1Manual Jet Washing:

Wheel washing in its simplest form could be an operative using a jet wash. Runoff from the jet washing should be collected and fed to construction runoff treatment facilities and should not be allowed to discharge directly into highway drainage. Jet washing stations should therefore be positioned in locations where it is possible to collect runoff and channel it to treatment / collection locations. Treatment will consist of a hydrocarbon trap to remove hydrocarbons and silt management. Silt management will be achieved through the diversion of runoff into the construction runoff capture system, which is then pumped to the attenuation ponds.

14 Emergency Preparedness and Response

14.1 Emergency Contacts:

Incident Manager:	Adam Spiller - 07763877144
Works Manager:	TBC
Natural Resources Wales:	03000 065 (to be informed in the event of oil/chemical spill or fire).
Emergency Services:	999 (Request service required)

14.2 Environmental Incident:

Table 5: Environmental Incident Types and Examples

Incident/Issue Type	**Example**
An inappropriately controlled emission to land, sea, air or water (e.g., spillage, fumes, dust, vibration, noise, disposal) that has potential to cause environmental harm if not controlled properly.	Release of silt contaminated water to the protected adjacent sites. Dust emissions to neighbouring properties or onto agricultural land and areas of ecological significance.
A breach of a consent licence that may lead to statutory intervention	Breach of discharge limits agreed with NRW. Breach of Planning Conditions
A breach of Environmental Legislation	Failure to ensure the Duty of Care for waste has been complied with.
Issue of a statutory enforcement notice, Local Authority, Natural Resources Wales	NRW prosecution or warning letter. Local authority abatement notice.

14.3 Responsibilities:

In all cases responsibility for immediate action lies with the person discovering the incident. They should take whatever actions they can, without creating new risks or hazards, to immediately stop the source and contain the pollution.

In all cases the incident shall be immediately reported to the general foreman who shall report it immediately to the site manager who will act as the incident controller. The Incident Controller shall coordinate resources to put the containment and mitigation plan in place. The Environmental Coordinator and Health and Safety Manager shall be informed immediately and shall assist in the supervision of the containment and mitigation plan as necessary.

The Environmental Coordinator (ECO) shall assist in post incident training, incident reporting / monitoring and documentation.

14.4 Specific Pollution Incidents:

Fuel or Oil entering a watercourse or drainage:

The response will depend on the amount of hydrocarbon spilt and the flow of the stream. As a general rule the following steps should be taken.

- Stop release of fuel by removing the source or by using plastic sheeting and bunding.
- Deploy an oil absorbent boom across the watercourse to contain the spill.
- Place oil absorbent mats on the water surface to absorb the oil. N.B. once used these are to be stored and disposed of as special waste. Impermeable gloves and boots and disposable overalls are to be worn.
- The above items can be found in the oil spill kit, these are located with foremen, environmental coordinator, store man and in the environmental emergency area in main stores.
- Contaminated water can also be pumped from the watercourse into a sealed container for disposal by a registered waste handler.
- Natural Resources Wales to be contacted: 0300 065 3000.

14.5 Incident Reporting:

All surface water–related environmental incidents must be reported immediately to the Incident Controller, who will take the necessary action to contain and manage the incident and notify the relevant statutory agencies (e.g., NRW, CADW, Environmental Health). The Site Agent and/or Project Manager must also be informed so that additional control measures can be implemented if required. Each incident must be documented on an Environmental Incident Report within 24 hours, that complies with Persimmons EMS. This report must detail the time, date, and location of the incident, the root cause, actions taken to mitigate impacts, personnel involved, statutory bodies engaged, and measures introduced to prevent recurrence.

Incidents will be ranked by severity:

- Category A – major incident (e.g., pollution release causing fish kill, serious environmental harm, or death of a protected species, requiring statutory intervention and notification to NRW on 0300 065 3000)
- Category B – moderate incident (e.g., spillage of 5 litres or more of a polluting substance or silt contamination of a watercourse extending beyond the site boundary, requiring notification to NRW)
- Category C – minor incident (e.g., spillage of less than 5 litres of a polluting substance or silt contamination controlled before reaching the site boundary, not requiring notification to NRW).

Assessment of incident severity will be made by the Incident Controller in consultation with the HS&E.

14.6 Reporting of Hazards:

A hazard is any situation with the potential to cause environmental harm to surface water if left unaddressed. Examples include pumps operating without drip trays, waste materials left on site where they could enter drainage routes, full concrete washouts at risk of overflowing, or retained vegetation and archaeological features not appropriately fenced or signed, which may affect drainage or runoff pathways. All hazards must be reported immediately to the Site Agent, and corrective action must be taken without delay. The Site Agent is responsible for completing a Hazard Removed Report, or similar to align with the Persimmon EMS. This report records the name of the person reporting the hazard, the nature of the hazard, and the corrective action taken.

14.7 Near Miss Reporting:

A near miss is any breach of environmental procedures relating to surface water that creates a risk but does not result in a significant impact.

- *Examples:*
    - Concrete washout occurring outside a designated washout area, with no contaminated water entering drains or surface water.
    - Oil leaking from plant or equipment but not reaching controlled waters.

Near misses must be reported immediately to the Site Agent, so that corrective action can be taken without delay. The Site Agent will complete a Near Miss Report in compliance with the Persimmon EMS and submit it for record. Reports would usually require, Name of the person reporting, Description of the incident, and Corrective action taken.

15 Training

All staff involved with the project shall be trained to a level to ensure that they are more than capable of carrying out their duties with minimal environmental impact. Training will be undertaken in the following forms:

15.1 Site Induction:

ALL personnel on the project shall undergo a site induction. This induction will include information on the environmental aspects of the works.

Site Induction will include a briefing on the importance of the environmental / ecological features of the site, including the risks of associated with surface water runoff.

15.2 Formal Training:

Key personnel have Site Environmental Awareness Training (SEATS) certification.

15.3 Toolbox Talks:

Toolbox Talks will be undertaken as part of Task Specific Construction Method Statements. These will include environmental mitigation specific to that task.

16 Appendix 1 – Runoff Rate Calculations

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

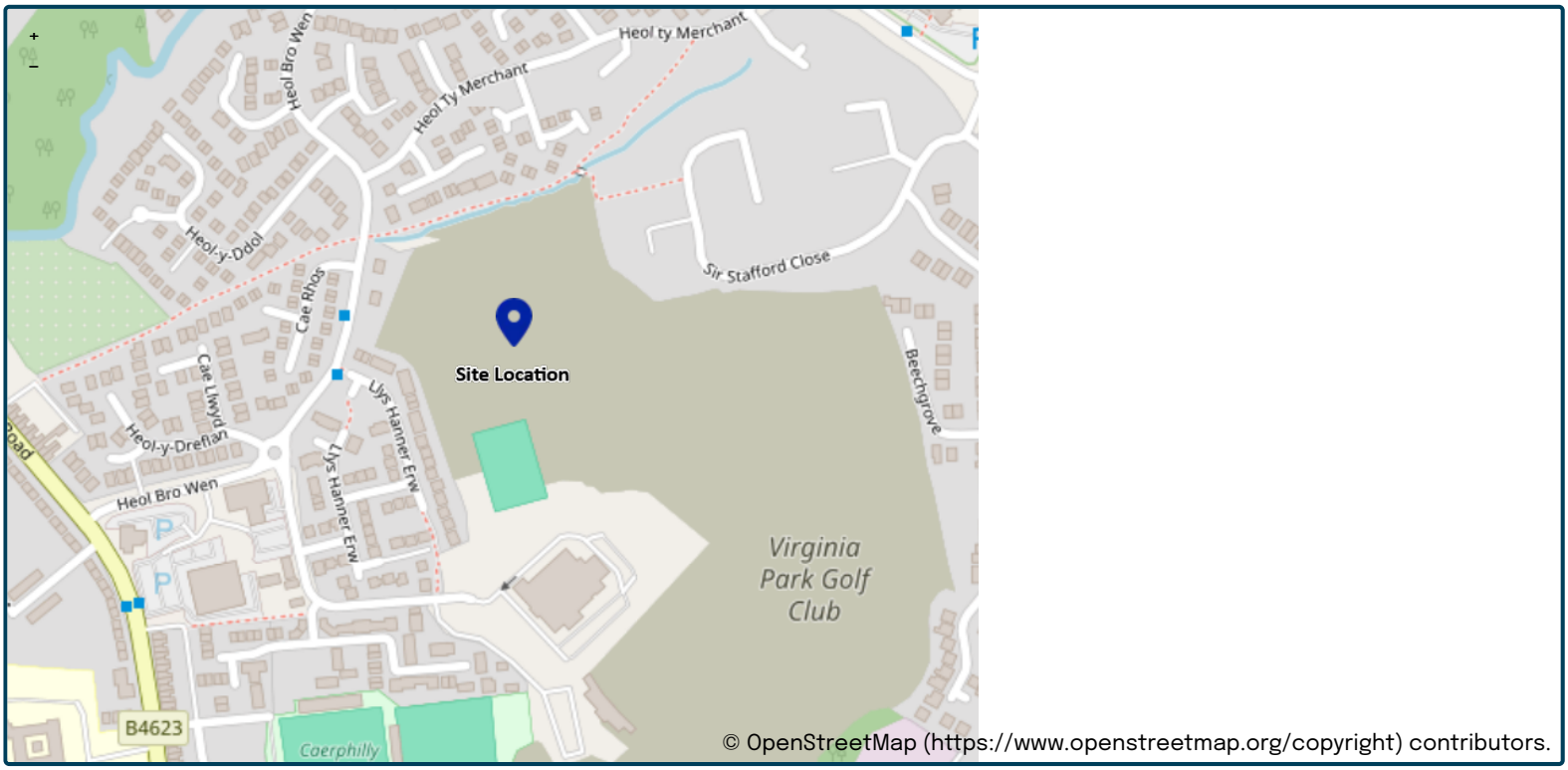
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	08/10/2025
Calculated by	Thomas Meads - EcoVigour
Reference	J002453 - Virginia Park
Model version	2.1.2

Location

Site name	Persimmon - Virginia Park
Site location	Caerphilly - CF83 3SW



Site easting (British National Grid)	315917
Site northing (British National Grid)	188088

Site details

Total site area (ha)	2.87 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	1350 mm		1350
How should SPR be derived?	WRAP soil type		
WRAP soil type	3		3
SPR	0.37		
QBar (IH124) (l/s)	17.78 l/s		

Growth curve factors

	My value		Map value
Hydrological region	9		9
1 year growth factor	0.88		
2 year growth factor	0.93		
10 year growth factor	1.42		
30 year growth factor	1.78		
100 year growth factor	2.18		
200 year growth factor	2.46		

Results

Method	IH124
Flow rate 1 year (l/s)	15.6 l/s
Flow rate 2 year (l/s)	16.5 l/s
Flow rate 10 years (l/s)	25.2 l/s
Flow rate 30 years (l/s)	31.6 l/s
Flow rate 100 years (l/s)	38.8 l/s
Flow rate 200 years (l/s)	43.7 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Greenfield runoff rate estimation tool

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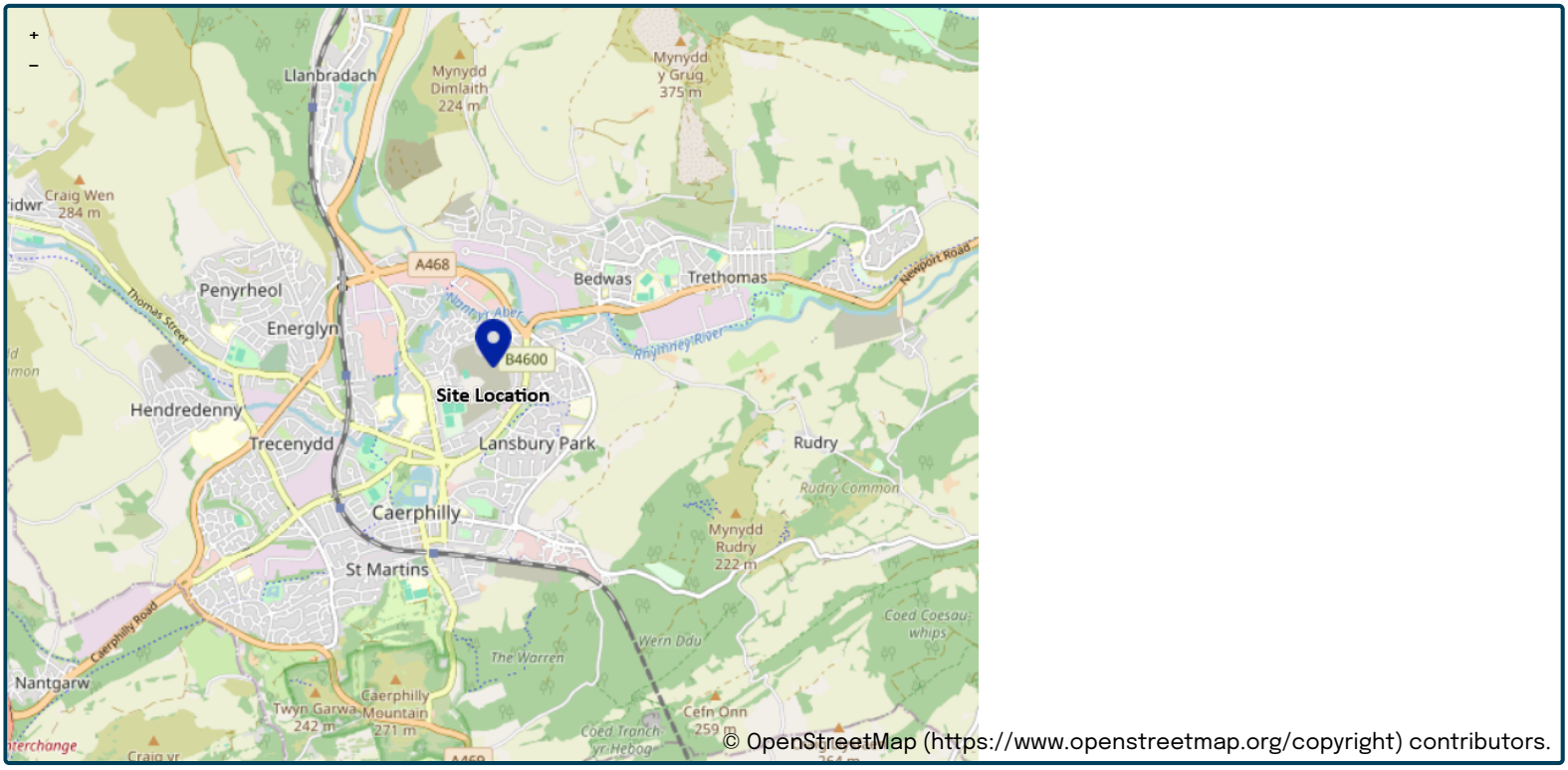
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	03/12/2025
Calculated by	Tom Meads
Reference	J002453
Model version	2.2.2

Location

Site name	Viriginia Park Phase 1B
Site location	



Site easting (British National Grid)	316132
Site northing (British National Grid)	187883

Site details

Total site area (ha)	2.1 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	1302 mm		1302
How should SPR be derived?	WRAP soil type		
WRAP soil type	3		3
SPR	0.37		
QBar (IH124) (l/s)	12.5 l/s		

Growth curve factors

	My value		Map value
Hydrological region	9		9
1 year growth factor	0.88		
2 year growth factor	0.93		
10 year growth factor	1.42		
30 year growth factor	1.78		
100 year growth factor	2.18		
200 year growth factor	2.46		

Results

Method	IH124
Flow rate 1 year (l/s)	11.0 l/s
Flow rate 2 year (l/s)	11.6 l/s
Flow rate 10 years (l/s)	17.7 l/s
Flow rate 30 years (l/s)	22.2 l/s
Flow rate 100 years (l/s)	27.2 l/s
Flow rate 200 years (l/s)	30.7 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.