Eastside 2000 Ltd

Bartestree Environmental Park

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Report references	*SS-19-3792*
Commission date	*September 2018*
Draft report	*10th June 2019*
Report audited	*29th June 2019*
Report to Client	*1st July 2019*
Revised report to Client	*25th June 2019*
Digital copies	*1 to Client* *1 to James Spreckley* *1 to File*
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Contents

Summary

This is an auxiliary document supporting a plan to transform a former forestry site between Bartestree and Dormington into an Environmental Park by excavating several amenity ponds. The site is known locally as the Bartestree Flats and refers to a level area of land adjoining a 585m length of the River Frome.

A general development plan showing the main layout is shown overleaf. The two main syndicate lakes are for use by 'specimen' or association anglers with three stock ponds to support the facilities. A wildlife pond with secure amphibian wetland areas and safe banks is for species protection and habitat development. A further pond next to the visitor parking is specifically for crucian carp. Up to 15 anglers at any one time will be allowed to use the angling amenity which provides regular funding to secure the future of the Environmental Park which can be used as an educational resource and enjoyed by other members of the public. The lakes are contained, formed offline, below ground level and adjacent to the right bank of the River Frome. No work will take place within 25m of the river to preserve its special environmental status. Disruption to wildlife during construction will be managed and of minimal impact on what is a currently poor habitat. Resident animal inhabitants will be seamlessly integrated into the new feature within the natural surrounding area as the overall scheme contains many very significant habitat creation benefits.

Picture a new wetland environment with several lakes, ponds and specially constructed habitats attracting water birds, mammals, fish aquatic and marginal plants, new native woodland, tracks and footpaths etc. Rare and endangered species are being encouraged to the site with targeted support. Overall, the scheme is promoting a significant environmental and habitat enhancement to create biodiversity and improved conditions in which a wide range of species can flourish – The Bartestree Environmental Park.

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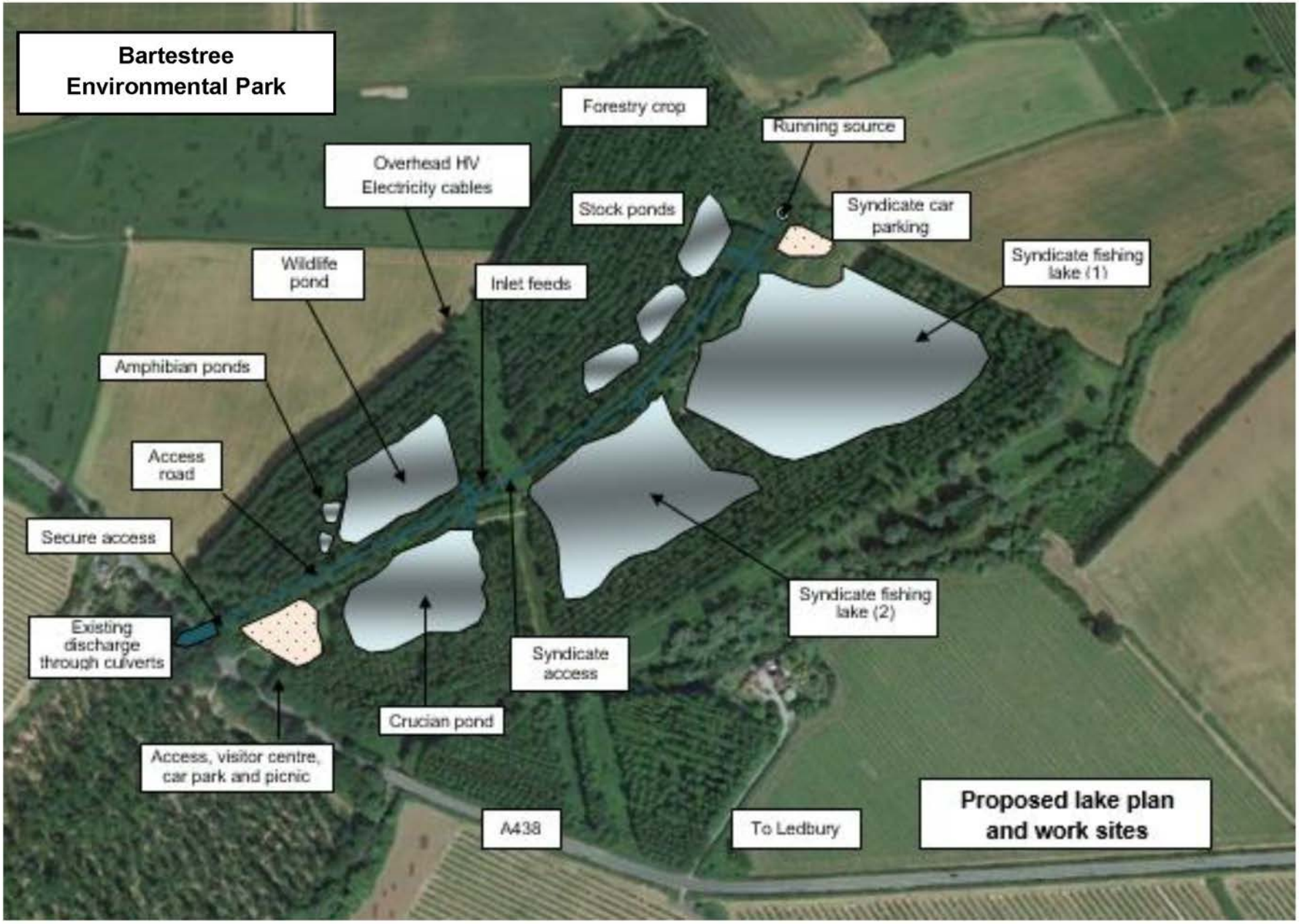

Bartestree
Environmental Park
Forestry crop
Running source
Overhead HV
Electricity cables
Stock ponds
Syndicate car
parking
Syndicate fishing
lake (1)
Wildlife
pond
Inlet feeds
Amphibian ponds
Access
road
Secure access
Existing
discharge
through culverts
Syndicate fishing
lake (2)
Syndicate
access
Crucian pond
Access, visitor centre,
car park and picnic
A438
To Ledbury
Proposed lake plan
and work sites

The site

The Bartestree Environmental Park site is 2.5 miles East of Hereford on the A438 with Worcester and Gloucester being 23 miles distant and Birmingham 50miles. From Hereford, the site can be located on the A438 East of Bartestree village on the left-hand side, before the culverts and bridge over the River Frome. The National Grid reference to the centre of the site is NGR SO5759:4064 (Lat. 52° 3'44.57"N Long. 2°37'12.73"W).

The site was purchased via John Clegg & Co from the Poplar Tree Company by Eastside 2000 Ltd in 2002 who are now the scheme Client owners.

The current poplar crop was planted between 1990 and 1991 at 200 trees per Ha. that will yield a final crop volume of 5000 – 6000 tonnes between 2020 and 2025. The reliable canker resistant variety of Robusta was planted throughout except for 1.0 Ha. at the north river end. This was planted with mixed varieties (predominantly ash) under the aegis of the Forestry Commission as an experimental site. About 50 cricket bat willows have also been planted along the River Frome and as these are harvested new plantings will ensure the sustainability of the crop.

The original plan was to harvest three thinnings leaving a final crop spacing of 8m all of which is covered under a felling license from the Forestry Commission. The final harvesting and site clearance cycle is estimated to take about 15 weeks and will be programmed during 2020 after the nesting bird season and other ecological checks have been carried out.

The scheme is in a rural environment with just two properties close to the boundary. Moor Marsh Cottage is situated about 100m from the excavation for the main lake and is separated by the River Frome. Bartestree Lodge is 135m E of the culvert works, there are no other properties nearby.

The site has a 0.25Ha. hardstanding near the entrance that is used for timber stacking, loading and forestry work. On completion of the forestry work it will be retained as a car park for the visitor area of the scheme. The proposed development will be known as the Bartestree Environmental Park. The greater site covers 21.7Ha as shown on the appended boundary plan (shown in RED). Overhead high voltage power lines, existing tracks and water management features effectively divide the site into quadrants. All the land is within the Client's ownership and the entire site (January 2019) contains a standing of several thousand trees representing the residual commercial forestry crop.

An old orchard to the SE on the left bank of the river (not under Client ownership and unaffected by the Environmental Park), produces 2-4 tonnes of fruit annually and is indicative of the rich alluvial soil associated with the development.

The site follows a course adjacent to the right bank of the River Frome and gently slopes from NNE to SSW. It is conveniently very flat and suited to the construction of lakes and ponds. Typical ground levels are from about 50.25m AOD with a fall of just 350mm over the NW-SW axis of the site, but in the NE it rises to as much as 56m AOD and to 55m in the W. No work is to be carried out within 25m of the riverbank and there is no riverine abstraction or construction. An aerial photograph of the site is featured on the front cover and enlarged with details in the appendix.

Utilities

Utility searches have been carried out and there are no underground services that might impinge on the work. There is however a National Grid main line 132000Kva pylon route through the NE corner of the site and a an overhead 11000Kva line on wooden pylons running under it and EW through the width of the site. This constrains the full development of the site and conveniently divides the area into quadrants in which separate ponds and lakes will be constructed. There is need to segregate anglers from the potential risks associated with long carbon fibre rods and casting and a need to enable the power utility provider safe and easy access to the line under the wayleave conditions. The statutory undertakers Safety Officer will be consulted about the scheme and the general requirements prior to undertaking any work. During construction, the lines will be marked by barriers in accordance with current safety guidelines and be under the control of a trained site safety supervisor. A warning sign will also be displayed at the site entrance for the benefit of anglers using the syndicate facilities.

Public footpaths

There are no public footpaths running through the site, but wayleaves and rights of passage exist for the maintenance of the overhead electricity lines. Maintenance Engineers and Supervisory staff would have access to the South (visitor) car park to eliminate any roadside parking and a new leat culvert will be provided to facilitate easy access along the cable route. Safe designated footpaths will be laid out from the visitor area around the Environmental Park (Amphibian, Newt and Crucian Ponds etc.

Archaeology

There are no listed historical features on the development land which is of no known archaeological value. Two databases have been searched for entries relevant to the site: -

- Herefordshire Historic Environment Record Database
- Field Names and Landowners Database

The only SMR record relating to the site is for Council road bridge over the River Frome (SMR 42050) which is unaffected by the project.

Geological report

A geological report is provided with this submission and test holes were excavated in 2003 and 2019 to probe the underlying geology. The holes were not kept open and standpipes were not installed. Although persistent ground water was not encountered as a water table, significant seepage was found in three of the test holes that were excavated to a maximum depth of 2.6m. into the mudstone bedrock.

The 1:50,000 BGS geological mapping is appended showing the general geo-topography of the site together with soil labels. The mapping shows a wide alluvial tract following the course of the River Frome over nearly all the 21.7Ha. site. The formation of this channel relates to the Devensian Ice Sheet and the post glacial environment formed less than 15000 years ago. Raglan Mudstone bedrock was deposited about 400 million years ago and this forms the bedrock over the Hereford plain to a depth of several hundred metres.

Preliminaries

Abstraction License

As the scheme is non-agricultural and it is proposed to collect surface water harnessed in the leat feeds to maintain lake levels, a water abstraction licence will be needed. Trial holes excavated in 2003 and 2019 have demonstrated that water levels will rise naturally to near surface and this process will be used for the initial filling over the first Winter. If the existing land drainage requirements fall short of that required a well may be installed but investigation of the soil permeability and local hydrology suggest that this is an unlikely requirement. Any pump system would be powered by renewable energy (wind or solar combination) which is fitting for an environmental park.

Environmental Impact Statement

The local planning authority may require an Environmental Impact Statement (EIS) for the work to be carried out if the project is deemed to have a significant environmental impact. The Project Manager is addressing the importance of this work.

Access

A Design and Access Statement has been completed and provided to the Planning Consultant.

Access will be via the A438 Hereford to Ledbury Road and the Planning Consultant has already discussed the arrangements required to engage this through the planning process with the Highways Authority (HA). Significant safety improvement work on the A438 will be required as a precursor to any development. The access junction will need to be widened with some unnoteworthy tree removal to increase visibility and provide an adequate splay for construction traffic and future site and road users.

To mitigate the effect on local traffic, vehicle movements will be scheduled outside peak periods where possible. The main entrance will be signed, reconfigured as required and progress through the site with a track and vehicle running surface as described in the submitted plans. There is no secondary entrance or egress from the site.

Wetland design

Monument Geomatics

The survey team from Monument Geomatics have completed a land topographical survey of the site to map the existing levels and produce detailed contour maps. They have also been engaged in the preparation of schematic details for the various layouts that have been explored as part of the design process. This work has included some engineering detail (such as bank sections and leat details) to ensure that the Bartestree Environmental Park is a practical and viable proposition. Sutton Surveys have also contributed to the lake and pond designs and have carefully assessed the potential impact on surrounding features with the Project Manager and Planning Consultant during the planning submission process. Monument Geomatics will produce detailed working drawings of the final plan once the scope of the works is agreed with planning.

Land use requirements

The construction works will cover approximately 12Ha. with the ponds occupying less than 40% of the site total area excluding marginal zones, hard standing, temporary site compound, storage areas, access tracks, landscaping and tree planting.

Some land not being used for the Environmental Park and syndicate fishery may be replanted with a forestry crop, but selected areas close to the lakes will be transformed to broad leaved native woodland. Selected low growing trees and shrubs will be planted on the islands created within the lakes and ponds. These new plantings will create a mixed environment that will complement and significantly improve the existing habitat. During construction, insitu boundary and stock fencing would be used for safety as the whole area is secluded private land with a good secure fence and locked gate system on the only approach road, the A438 Hereford to Ledbury Road.

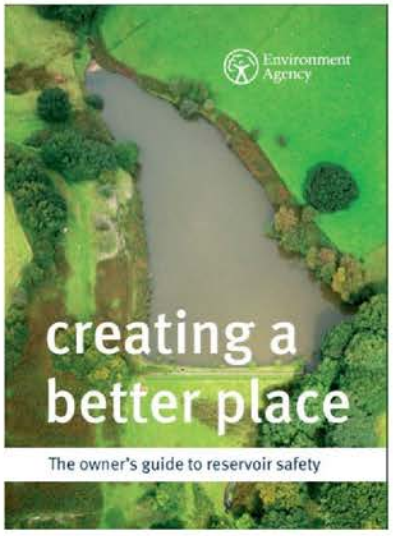
Bartestree Environmental Park (Pond Volumes)				
Water body	**Area (m^2)**	**Average depth (m)**	**Volume ($m^{3)}$**	**Purpose**
Syndicate lake 1	25500	1.8	45900	Stocked with carp and perch – non competing species and predator
Syndicate lake 2	14058	1.8	25304	Stocked with tench and crucian carp – non competing compatible species
Stock ponds (3)	5600	1.4	7070	Three small ponds to rear fish for EA donations and to fishery size
Crucian pond	8875	1.5	13312	Specifically, to raise pure bred A1 strain crucian carp and provide local resource
Amphibian pond	4648	1.2	5577	No fish stocked in this or the newt ponds associated with it, or the leat
	61343	-	97163	**Total area and volume excluding bank and island treatment**
Total	**61343**	**-**	**77730**	**Less 20% allowance for shallow bank margins and islands**

The actual lake volumes are approximately 77,000m^3 when due allowance is made for the shallow margins (safety and enviro/habitat) and the feature islands that serve both nesting (water bird refuge) and segmental fishery purposes. Each lake or pond serves a specific purpose as described in the above table.

Legal requirements

The lakes are for non-agricultural leisure use and do not encroach within 25m of the highway. However, some work at the south end of the leat close to the A438 is required, including ditch cleaning etc. This work will regulate the surface water flow around the road and prevent scour and softening of the embankment. (Some kerbing around the culverts are giving way as a result of the redundant system). Improvements to the access are required within the 25m highway boundary as described above and planning permission must be granted before the commencement of any engineering work. The development will require the removal of a significant amount of subsoil and up to 4000 commercial vehicle movements are envisaged over each annual contract cycle - refer to transport table.

The written consent of the Environment Agency is required as the excavation is within the 'flood plain' of the River Frome. As the Agency's consent could be withheld if the position of a lake is too close to the river the lake boundary has been kept well away from the watercourse to prevent any risk of breaching the intervening bank. A small amount of spoil is required for the main lake at the down gradient side to improve the water level and provide a safety margin. The volume is insignificant when compared to the additional flood capacity provided and the enhanced security of the overall water management system. No other soil will be permanently stored within the flood plain, which will otherwise be retained at or near existing levels.



The lake and pond designs do not include a dam or water retentive structures and the retained water over the whole site is less than 80,000m^3. None of the lakes and ponds to be created are raised or exceed the 25,000m^3 (equivalent to about 5 million gallons) that might otherwise require approval under the 1975 reservoirs act. As a result of climate change, the high volumes of rain and persistent flooding over the last few years, it has been suggested by the Environmental Agency that the impoundment volume threshold be reduced to 10,000 m^3 per unit. The Water Resources Act 1991 and associated byelaws therefore require the developer to contact the local Environment Agency office to apply for formal consent for the works. This has triggered the Planning Consultant to hold preliminary discussions with the Environment Agency concerning the scheme.

Under the Land Drainage Act 1991 the local authority or internal drainage board will need to approve any works that will create or alter an obstruction to the flow of an ordinary watercourse, including any proposals to install culverts or change them in a manner that would be likely to affect the flow of water. Although the existing leat system is silted and the sluices redundant they will be restored and approval under the act is therefore required.

Construction traffic

A temporary construction Traffic Management Plan (TMP) will be provided and approved with the HA as well as general signage and traffic management. Road sweepers would be employed to prevent problems from lorries depositing mud on the roads.

There is an existing access and other forestry tracks in and around the lake areas and the land has been worked by heavy machinery utilised for felling trees to facilitate harvesting of the standing crop over the years. A site compound matching the existing hard standing and suitable for welfare offices would be used for the temporary works and this will be restored into a permanent feature on completion of construction for use by visitors to the Environmental Park at the entrance to the site. A turning area and small hardstanding suitable for up to 10 vehicles will also be provided at the north end of the lake for disabled access and syndicate members as shown on the drawings. The existing spinal track will be maintained for and is the only vehicular access through the development and connects both car parks. A security gate at the leat culvert will prevent unauthorised access to the syndicate fishery. The north car park would be used by fishermen, bailiffs, Environment Agency Officers, owners and security personnel, but will not be open to the general public unless by invitation.

Traffic forecast Year 1 (35 week (5.5 day) contract period)		
Spring Year 1	**Active days (193)**	**Average number of vehicles per day**
Plant deliveries and returns	10	0.05 LGV
Lorries taking material from site	190 (4 vehicles av. 5 trips)	20.0 HGV trips per day
Incoming materials, cement, blocks sand etc.	20	0.1 HGV
Road sweeper	Weekly during contract period and as required	0.2 HGV
Contract vans and site staff cars	Av. 3 daily during contract period	4.0 LGV
	Total vehicles per day on site	**20.5 HGVs and 4 cars per day**

The work will be progressed at a medium pace and lorry movements are not anticipated to rise above 21 HGVs per day during the 35-week first year contract period, dropping to 15 trips a day in the second year. Saturday mornings have been included in the vehicle estimate and any shortfall would be taken up in the second year. No work is allowed on Sundays and three cars or vans (light commercial vehicles (LGVs)) will be present on most days. These relate to site operatives, supervisory staff and enforcement visitors.

Size and shape

The schematic water plan shows two fishing lakes and associated stock pools, two sizeable environmental ponds (one amphibian and one crucian) and two wetland scrapes for newts covering an area of around 11Ha., which is compatible with the Environment Agencies 55 - 65% plot use for these projects. The remaining space is for new forestry, access and car parks, paths, spoil disposal and landscape planting. The uniform shape and depth of the syndicate fishery renders it much easier to manage in terms of fish removal and aquatic husbandry. However, some localised convoluting to create promontories and bays will render the fishing more interesting, provide a greater length of fishable bank with fish holding bankside spots and benefit wildlife.

Two small strip islands are being included in each of the main lakes for interest and to make the fishery more attractive, as well as enhancing its value to waterside wildlife. It will also help to parcel the banks and delineate the fishing into individual areas. This feature will be margined to provide additional shallow water feeding areas and sized to prevent forming an 'iceberg' feature.

The amphibian pond is roughly rectangular and relatively shallow with gently sloping sides. It will be landscaped to encourage bank and wide marginal growth and forms a very important environmental part of the scheme. The crucian pond is also shallow but with formed margins to encourage marginal growth, particularly native lilies. The stock pools are smaller and elongated with less marginal growth to facilitate netting. They are designed with a taper bottom to facilitate easy draining and netting and harbour narrow margins to assist with this, but also provide some shelter and cover with wetland habitat. The stock pools are fundamental features essential to the working of the fishery and crucian pond and will enable fish to be quarrantined and brought on in a manged area in which feed can be introduced to stimulate controlled growth rates.The pond system will be set up initially to enable fish growth to advance ahead of the construction phase and a late year one strat date for this work is envisaged, although a Spring start may become a practical proposition. After construction, imported fry from the main lake and any new imports can be brought on in the stock ponds, one of which might serve as a juinior pond to introduce younger members of the synicate to the piscatorial art and interlink with the local schools initiative.

Off-site material sources

Because of Environment Agency constraints the proposed lake and subsidiary ponds are of the contained type and require material to be exported from the site. No off site borrow pit is required to undertake the construction of the fishery. Some capping layer (SHW 6F2/6F5) may be required to upgrade the access track and form the site compound. Pathways around the main lake will be delineated with woodchip derived from the harvesting operations being carried out during the first year.

To reduce transport requirements and the carbon footprint there would be an exchange mechanism whereby any bulk imported material (concrete, timber, cement, blocks, subbase and plastic pipe etc.) will be delivered to the lake on lorries taking surplus soil off site. All bulk materials exchanged on site would be under the required waste management licences or exemptions regime.

Soil spreading

There is a proposal to spread a small amount of excavated soil (2000m^3) over the higher ground towards the NE which will further reduce HGV journeys. The area on which this soil spreading might take place will be above the recommended flood plain level deemed appropriate by the Environment Agency. The areas will be properly highlighted on accurate contour maps derived from the topographical survey and agreed with the Planning Officer.

Construction

Machinery and method

The construction work will be carried out by the Client who is an experienced ground and earthworks contractor. The work will be under the continual supervision of appropriately qualified staff working with competent and experienced operatives; further detailed operational advice on the construction of the lake is probably outside the remit of this submission but summarised in the following bullet points:-

- The excavations must be carried out in a methodical fashion to the excavation plan
- It is an essential engineering requirement to seal the sides of the excavations to maintain constant water levels in the lakes and ponds.
- Puddling operations on the plastic clays will involve the use of a taper foot (sheeps foot) roller.
- Pumping operations will be required to form the batters and enable effective puddling work to be carried out.
- Works are to be accelerated in the Summer and restricted during inclement weather within the agreed hours.
- Provisions must be made to prevent mud and detritus from being trafficked on the public highway.

Plant to be utilised throughout the construction phase will comprise a combination of hydraulic 360-degree machines for the excavation and loading of soils with a bladed bulldozer for the sculpted earthworks. The leat, stock and wildlife pools will be formed first. This will be followed by forming the inner syndicate lake from 2 to 1m depth and then the marginal bench. It is necessary to excavate to design depth through to the underlying Raglan Mudstone. A tracked machine may be required to rip into any hardened siltstone or cemented calcrete bands common to the material if any outcrops arise within the design depth. The use of compressive machinery or blasting will not be necessary.

Surplus materials would be taken from the lake excavations direct to various short haul locations, some of which have already been earmarked as potential recipient sites, subject to planning approval. Preferentially, the material is loaded directly onto lorries or if unavailable, into a 20-tonne dump truck to a quarantined temporary storage bund from which it is despatched later in available vehicles. A 360 machine will form the marginal bench and this or a tracked machine used for blading out the contours, a BM110/120 taper foot roller will be utilised for puddling the clay to provide the impervious seal. A smooth wheeled vibratory roller may be required to compact any granular materials employed on the compound and access tracks. Pumps of a suitable capacity will be available to control any groundwater entering the lake excavation and discharged into the refurbished leat system.

It is important to prevent the outflow of water through the sides or base of the lakes and ponds. It should not be necessary to construct key trenches (narrow trenches 2m deep infilled with impervious However, it will be necessary to cover any permeable material or seal fissures with a layer of puddle clay. This will not need to be imported as enough suitable material is available on site. These heavy, highly plastic clays are in the surface alluvial tract and have low permeability characteristics ranging over k 10^{-6} to 10^{-8} that will ensure a watertight construction when puddled.

Photographs of the plant and vehicles to be used in the earthworks are shown in the appendix and include suitable machines and excavators of varying capacity. All plant, welfare facilities and the site cabin will be delivered on Client owned low loaders. Other deliveries and general construction items and materials, i.e. fencing, generators etc. are likely to be made company registered vans. Bulk materials will be conveyed in a mix of industry standard 6 or 8 wheelers (8.2 to 9.6m length) open tipper lorries with a nominal 15 to 20 tonne capacity.

Construction sequence

After the standing tree crop has been harvested and the site cleared with ecological supervision, surveyors will set out the lake area and compound. Topsoil (150 mm thick and up to 10,000m^3 would be stripped and stockpiled in a segregated area as shown in the earthworks plan. Surplus topsoil will be transferred off site but there will be a requirement for landscaping with organic rich material to support plant growth. The bulk excavations involve the removal of approximately 85,000m^3 of material during the first and second year.

It is not necessary to construct any new haul roads as most work will take place within the lake excavation area with surplus material being removed by eight wheeled lorries loaded by 360 degree excavators. Dust suppression would be used during dry periods. If lorries are not available to facilitate transfer, material will be left insitu or in the material store, so as not to exceed the projected HGV movement plan.

There are no pedestrian routes or public footpaths to maintain open on this secure site abut adequate warning notices will be displayed at the only access. Access to the site is under separate control as described in the DAS. Special arrangements with the Health and Safety Co-ordinator are to be made when school children are visiting the site.

The main phase of construction work would start in the spring of the first year, but the stock ponds (7500m^3) and sluices associated with the water management system (the leat) would be tackled immediately after harvesting the forestry crop to test the WMS (and pumping scheme) and provide a habitat for the first tranche of fingerlings to grow on. Any underground connecting pipe work associated with the WMS would be constructed using an excavator, flexible pipes and conventional pipe laying techniques. The sluice control structure would be built from reinforced concrete bases and simple blockwork with channels for the screens and either metal or wooden sluice boards with spares.

Following the removal of topsoil, the main excavation would be taken down to 1m and then to the design depths inside the marginal bench. Puddling with plastic clays and taper foot rollers is then carried out followed by landscaping the marginal slope and shoulders to create the bank profile.

Some insitu material not used in the lake construction or transferred to receiving sites could be “bladed” into the slope at the North West side of the site to reduce the off-site soil removal under a soil spreading plan. The highlighted area is well above the ‘flood plain and could accommodate about 2000m^3 of suitable soil spread up to 350mm thick that would help to reduce the HGV burden. (Once construction work is complete, the segregated topsoil should be re-spread over the bank areas to enhance landscape planting which should include a low-maintenance coarse grass seed incorporating a commercially available

amenity or a wildflower mixture to encourage butterflies and specialist birds. Much of this work will be under the control of the Ecologist who has produced an environmental (habitat) report of the site.

Timing and duration

Harvesting is scheduled in the first year together with an effort to construct the stock ponds and refurbish the water management system a priority. The main excavation is planned to commence in the Spring of the following year and carry on through to Autumn over a 35 week period. Winter and wet weather working would be avoided to help keep the highway clean. The main excavations and lake sculpture would be carried out in the second year and completed in the third, together with planting, although this is likely to proceed throughout the work and following it. These are preliminary best estimates as delays (for example in receiving the relevant permissions) or factors beyond the Client's control (such as the weather) could always result in changes or suspension of the programme. The initial enabling works would involve operations such as: -

- Setting out
- Formation of the capping layer base for the site compound
- Setting up site facilities
- Animal translocation if required
- Vegetation clearance and tree works
- Construction of safe access in accordance with the DAS
- Refurbishing water management features to provide continuity of supply
- Initial excavations in the stock pond to test the materials and process
- Making good the site access tracks and reforming the hard standings

Hard landscaping and detailing work would take place during favourable weather after forestry work, this might also involve setting up some site accommodation (welfare facilities) and security on site. The main works would begin in the Spring of the first year to further develop some of the infrastructure and allow work to begin as soon as practicable following environmental checks (for example nesting birds and checks to ensure that tree stumps do not contain dormice etc). Earthworks would not commence until weather conditions are favourable (probably April) to reduce the possibility of mud and transfer to the public highway. Work would be ongoing until September (weather permitting) with most of the bulk transfers having been completed by then. Final excavation of the environmental ponds would begin in the second year followed by reinstatement and other landscaping works, although this could be postponed to year 3. The syndicate lakes would be filled at the end of Year 1 over the Winter period.

Programme Cycle (proposed)			
Water body	**Volume m^3**	**Year**	**Excavation Sequence**
Stock ponds and leat	7070	Year 1	1
Syndicate lake 1	45900	Year 2	2
Syndicate lake 2	25304	Year 2	3
Crucian pond	13312	Year 3	4
Amphibian pond	5577	Year 3	5

Land use requirements

Major earthworks will take place within the confines of the lake excavation. Minor earthworks are associated with grading around the bank and some soil spreading in the north east corner. The existing leat will be refurbished and a regular channel formed to about a metre depot. Contract drawings have been drawn up to show the scale of the work involved which is all within the confines of the commercial forestry site. Following the forest harvest further landscaping involving planting new native woodland saplings and other vegetation will be made. The total area covered by this work is about 12 Ha. During the project phase existing boundary and stock fencing would be used for security as the whole area is private land, some temporary Heras fencing may be provided around the site office at the compound to provide some protection for valuable machinery. The main excavations would not be fenced.

Lighting

The installation of permanent lighting is not anticipated as no work would be undertaken outside daylight hours at any stage of the project. Some solar powered security lighting might be required at the compound and syndicate car parks. This would be low level, possibly motion sensitive directional lighting. A 50-hour working week (including Saturday mornings) is envisaged, with normal contracting hours being specified in the planning conditions.

Operation

According to the preliminary Flood Risk assessment (FRA) the Environmental Park would be at little risk (less than 1 in 40 years) of flooding from the River Frome – including climate change allowances. During a significant 'heavy' flood affecting the Frome catchment extra water could be channelled through low level swales through the A438 culverts. At higher levels flood water would enter the lakes to take advantage of the additional flood protection provided by them. This part of the system could provide flood storage after which it would spill over the system and carry on downstream similar to the present regime at a frequency less than the 1 in 100-year design level. The installation of a small 150mm berm landscaped around the lip of each lake would ensure no overtopping (eliminating the additional risk of fish losses) and generate some floor storage from the leat delivery system. The berm would also ensure that the lakes and ponds were properly contained and although only native fish species are being introduced, the aim would be to prevent any escapees from entering the river system. The installation of any berm feature world have to be agreed with the Environment Agency.

The Fishery Manager will need to be linked into the Environment Agency flood warning service (Floodline 0845 988 1188) to close the site if there was a serious flood forecast. In practice the fishery is unlikely to attract fishing enthusiasts during inclement weather resulting in flood events of this magnitude and the depth of flooding (even with climate change allowances) is likely to be less than a very manageable 150mm. Once the flood waters recede, the lake level would gradually return to normal and the fishery could continue with regular arrangements. The Fishery Manager is responsible for ensuring that

debris is removed from the water management control system and maintaining a flood record from the water level marker post installed in the stock pond and syndicate lakes.

Surface Water Management System (WMS)

The natural ground water level will nearly fill the ponds to level, but it is proposed to use the restored water management system (WMS) to control the levels. The existing leat/ditch system running NE to SW will feed intercepted surface water into the various ponds in sequence with a facility to discharge any excess into the existing outlet back to the River Frome. Wherever possible the boundary ditches and existing land drains will be used to channel water into the leat that will enable a controlled overflow into the main lakes (Syndicate lakes 1 and 2, stock ponds amphibian and crucian ponds) through a controlled sluice system. Runoff from the syndicate permeable hard standing and proposed shelters will also ensure that the scheme is SUDS compliant and compatible with greenfield rates.

The conveyance will be directed through the leat by simple sluice gates (type similar shown right) that will provide individual control. The existing ditch will require reconstruction and gradient profiling in accordance with the drawings and regular maintenance to preserve the integrity of the system. The control plan will maintain water levels to within the design 100mm with a maximum managed seasonal (Summer/Winter) difference regulated to 250mm. There is a fall of 850mm over the 580m length of the leat.

In the unlikely event that the proposed land drainage refurbishments do not provide enough water a renewable energy pump with a fixed intake capacity at the upstream boundary might be needed to tap into the ground water regime through a borehole or sump. The River Frome has high banks and the Mean Summer Level (MSL) is much lower than the proposed lake levels which means that water will also have to be pumped into the system from that source. A pumped facility to provide water is a last resort rendered redundant by a functioning leat system.

Abstraction license

Once the lake is filled and the leat, land drainage and surface water intercepts are installed, any additional daily water requirement is likely to be less than $20m^3$ - which is below the limit required for an abstraction licence. However, a transfer licence will still need to be applied for to ensure the long-term reliability of the supply and advice from the Environment Agency will be sought concerning this.

Abstraction licences are issued for a time-limited period, normally 12 years. These licences carry a presumption of renewal, but the Client will need to re-apply for the licence and satisfy the EA that the water is being used efficiently and does not impact on the environment.

There are three types of abstraction license: -

- Full abstraction licence – for most types of abstraction over 20 cubic metres a day;
- Transfer licence – for moving water from one source of supply to another with no intervening use;
- Temporary licence – for abstractions over 20 cubic metres a day over a period of less than 28 consecutive days.

The Agency will require a groundwater investigation report to validate the source volumes and possibly a test on the quality. This work has been carried out by excavating trial holes that filled with water to within 300mm of ground level during March. Tests for quality are best taken during construction work and it is worth noting that the site is within a Nitrate Vulnerable Zone (NVZ).

Monitoring and Maintenance

The Fishery manager would ensure that the water control features (the leat structures) are monitored frequently and he will undertake regular maintenance of the site by: -

- Removing rubbish from the leat mesh and grills
- Monitoring the water levels
- Removing all debris after any high water levels and within the leat.
- Strimming undergrowth and grass cutting where required.
- Undertaking or co-ordinating any repair works needed
- Undertaking maintenance and checks on the function of the infrastructure
- Discharge any excess water at appropriate times into the ditch control system
- Checking on the silt trap and routine cleaning if necessary.

Prevention of water overflow

Water would not be extracted during periods of high precipitation or periods of flood. With the lakes containing freeboard of 250mm there is a potential to contain 15000m^3 of surface water without overflow and secures the system from a 1 in 100-year storm. If the river Frome overtops its banks it would overwhelm the surrounding land and leat but flow around the lakes. The refurbishment of the disused leat and installation of a functioning WMS will help mitigate the potential for surface water flooding at the site.

Water source, lake feed and levels.

An overview of the potential water source suggests that filling and maintaining water levels during most years will not be difficult. An abstraction license will be required for the leat water. In the unlikely event of a well being required it would be operated on a renewable energy basis, (wind or solar or combination). However, this would probably only ever be needed in times of severe drought when a license for even small quantities might be difficult to obtain. The Frome does contain a heavy silt load but water in the trial holes was shown to clear to a depth of 300mm after only two hours.

The River Frome yielded a 4lb trout in 2002 and historically contained coarse fish, principally stickleback, minnow and higher up the food chain, chub pike and dace. It has not been fished for years. However, the River was heavily polluted with high phosphates and is in a Nitrate Vulnerable Zone and subject to pesticide wash and general farm pollution, which

could quickly kill fish and aquatic populations. However, the Environment Agency have made great strides in cleansing the River over the last 20 years and it is much cleaner now. The river is an important integral feature of the site and no activities carried out as a result of the scheme should affect the water quality.

The existing silted ditch watercourse at the site boundary at the head of the leat would efficiently convey surface water from the upstream catchment into the system. The source would feed into an open leat engineered carefully so that outlets would fall gravimetrically into the lake through simple sluices and 200mm plastic pipes. An open system is preferred on environmental (habitat) grounds and piping the feed has not been considered.

Excess water would feed into the refurbished sluice at the south end of the site and into the two large culverts running under the A438. The restoration of this system and the controls built into the conveyance will: -

- improve the land drainage to help reduce Winter water logging
- provide some flood alleviation with additional storage capacity
- prevent waterlogging around the culverts affecting the highway embankment

The only record of surface flooding on the site was in 1947, according to anecdotal evidence the site remained dry in 1960 which was probably near to a 1 in 360-year flood. A carefully balanced control of the lake levels are through a reversed (inlet/outlet) via the leat system. However, there is a limited depth range through which this system can function, and it must be carefully designed and constructed.

A 500mm deep swale could be constructed to provide some flood relief and control. If constructed, this water would discharge through the site into the large diameter double and single A438 culvert constructions to join the Frome down stream

These overflow control measures should be accepted by the EA as adequate for a contained lake system.

If seems likely that water can be intercepted at 49.45m at source and conveyed down the leat through sluices to drop into the A438 culverts at 48.5m. The bottom sluice gate would hold water back at a level of about 48.80 resulting in a fall of 650mm and a gradient of approximately 1 in at the bottom sluice it's a fall of 800mm over a length of about 590m (1 in 900) which is enough to gravitate flow and keep the feed level as high as practical to feed the lake gravimetrically. This means the two syndicate lakes a should be set at a water level of 49.25 and a little less for the stock ponds, with the amphibian and crucian ponds at 49.00. The leat ditch need only be 750mm deep as shown in the long section attached to the report.

Lake lowering and silt removal

Special facilities need not be installed to enable the waters to be partly emptied for netting and desnagging purposes. Lowering can be achieved by natural means or by pumping water into the leat system. It is not anticipated that the lake will be lowered below the marginal contour, but if required, the lake contours will have been sculpted to create a

deeper area at the 'downstream' (SW) end. If draining down was required, it would be carried out in Autumn and Winter so as not to discourage any breeding birds, pre-draining checks are not required. Pumping would be used to lower the lake with suitable screens to prevent fish transfer to the main river, (all fish are indigenous species). Fish removal would best take place when temperatures are cool and generally, this work should be avoided in the Summer season. It is not anticipated that lowering the syndicate lakes will be required with a programme of fish transfers by anglers to the stock pond and an active predator (perch) species. Netting of the stock ponds would be required annually, and the narrow marginal bench and tapered design means this can be easily controlled. A clear strimmed bankside margin would facilitate snag free netting. The stock pond levels can be easily and quickly controlled via the leat system.

A specialist fish consultant (A F Fisheries) would be employed to supervise the fish removal and a fish management plan would be agreed prior to works commencing. It is proposed that surplus fish grown on in the stock pond are removed either for sale by the syndicate or transferred to the main lakes .when of specimen size.

The bed of the lake will be infertile after forming and some topsoil or imported farm manure could be spread on the lakebed around the bench margin to provide a good growing medium for water plants.

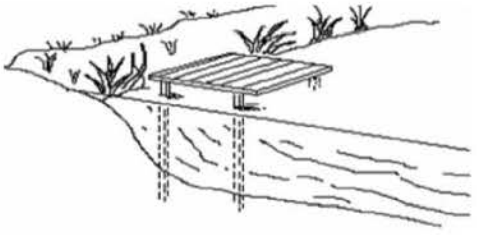
Bank erosion

The banks of a newly created lake and any islands within it are liable to wind induced wave erosion (especially along downwind shores) although the site is partially protected within valley topography. To prevent this, the edges of banks and islands will be planted with marginal plants to act as absorbent wave buffers. If erosion becomes a problem in the North and Easterly banks in future years, localised armouring (50-100mm stone) or untreated timber might be utilised to curb the problem. However, existing and newly planted trees should provide the required wind shelter.

Access arrangements

It is sensible to retain a border of at least 10 metres wide as a fringe round the banks of the lake, close to the water's edge, to serve as access for maintenance vehicles and a route for bankside paths. These surfaces and any car parking areas should be firm and prevented from becoming muddy or unstable during wet weather using natural wood chip produced on site. A layer of 6F2 capping or similar serviceable material will be spread over the car park area directly off the existing access rack. It will be levelled and compacted with a vibratory roller to provide a regular surface.

Angling stations



Angling stations (or "pegs or swims") are being provided at selected positions around the banks of the lake to provide safe, comfortable areas for anglers to fish and to help establish bankside marginal growth. The fishery manager will open selected areas within the bankside margin where anglers can 'watch and stalk' the fish with good background cover. Usually, fishing pegs are spaced at intervals of between 20 metres around de-snagged commercial coarse fisheries, but the stations here will be more sparsely sited to afford greater privacy

for syndicate members. The plan is for a target of 20 permanent fishing stations around both lakes, the exact positions will be dictated by marginal contour. These 'cosmetic' features will be created after the main works and prior to the use of the fishery in 2022.

The land surface at the water's edge will be level and connected by pathways covered in wood chip or bark. Commercially unsuitable lengths of round timber could be used for delineating the routes. A similar technique will be used to furnish areas for fishing bivvies (4 x 3m). Some double swims will be provided (7x 4m) and a typical arrangement is shown in the appendix. The bank may need to be strengthened with driven stakes pressure-treated with a non-toxic preservative and the swim area levelled with wood chip or other suitable inert material, similar to that used on the connecting pathways.

At a few selected stations temporary open sided shelters (metal sheet roof attached to a timber frame) can be erected to serve as a shelter. These 4 x 3m temporary constructions will drain naturally to ground.

At the land/water interface in front of each permanent fishing station there will be a small cut in the margin bench to accommodate a safe landing zone and fish retaining sacks, compliant with fishery rules. Two small elongated islands along the centre line of the syndicate lakes will add value to the vista, provide a safe habitat for ground nesting birds and help segregate the opposing fishing stations.

Facilities for Disabled People

Most of the swims (pegs or fishing stations) will be feature level areas where disabled anglers will have access to the water. There will be restraining logs around the stage for wheelchair anglers and a compacted wheelchair friendly pathway for access from the car park, or discretionary parking where necessary at the fishing station. A modern composting toilet catering for people with disabilities will be provided on the syndicate car park hard standing. The Composting Arctic Toilet MKII shown is a sanitation solution for locations without access to water or connection to a sewer system. These units are solar powered and have an automatic light for when using the toilet at night. Windows let in natural light during the day and a multi-charging point is installed to help keep phones charged and to help ensure an emergency connection. A flat pathway allowing 'stalking routes' and access around the lake will link other swims with shelters around the fishery. These facilities will be especially useful to wheelchair users' and the aim is to provide easy access to them.

Phased construction

The best time to dig a lake is usually in the Winter but ground conditions, low water levels and mitigating the potential for mud to be transferred on the A438 highway, suggests that Spring and Summer would be better. Landscaping is best carried out in late Autumn followed by a Winter planting when most vegetation is dormant, and the success rate is higher. The following Spring should see the plants begin to establish when fish can be introduced from the stock pond after the lake has stabilised.

Aquatic Plants

There is a risk of introducing unwanted fish parasites and diseases through the introduction of new aquatic plants so all supplies will be sourced from accredited suppliers to mitigate this risk. The owners' consent is a legal requirement under the provisions of the Wildlife & Countryside Act 1981.

Submerged plant species with finely divided leaves are appropriate in coarse fisheries, although it would be prudent to exclude Canadian pondweed (*Elodea Canadensis*) because it can grow too profusely in shallow lakes. Planting is best accomplished by introducing loosely tied, weighted matter. Additional information is given in the booklet "The Creation of Angling".

Most species of floating plant are useful, including water lilies, but the fringed variety (Nymphoides peltata) should be excluded because of its invasive properties. Weighted sections of rhizomes, or whole plants in containers should be placed on the marginal bed. Lilies should also be placed in shallow marginal water to benefit from full sun.

Bankside trees and shrubs

As part of the post construction work, landscaping will incorporate trees and shrubs around the periphery and on the adjacent land. Large trees are to be introduced in the face of the prevailing winds to provide some shelter supplemented by carefully chosen forestry stock. They will be sited well away from the margins in small groups with evergreen or larger shrubs near to the margins. Small evergreen shrubs and trees can be planted closer to the margins so as not to restrict angling. Native species that flourish in damp conditions are probably more suited to this l environment and could include various willow species, poplar, alder but hawthorn and dog rose are not popular with anglers. Willows provide an extensive bankside subterranean root system that can generate silkweed (a valuable food source) and which will form a perfect spawning medium.

Establishing the fishery

Some funding for the Bartestree Environmental Park will arise from establishing a high-quality fishery to forge a revenue stream. All surplus revenue will be channelled back into the scheme. The syndicate lakes represent specialist fisheries aimed at the specimen hunting fraternity with a short-term goal of developing 40lb plus carp and quality tench fishing in Syndicate 1 and Crucian carp tench fishing in Syndicate 2 to attract discerning anglers. It will be the only fishery in Herefordshire to offer these species of indigenous fish. The target weight of fish per unit area (or fish standing crop) is about 600 kilograms per hectare (kg/ha). This stock density will be maintained to guarantee a productive fishery with carp ultimately growing to 50 and 60lb by ensuring a growth rate of 5-8lb a year. Modern specimen anglers are prone to baiting heavily and will introduce quality feed that can sustain a higher number of fish. Carp are prolific species so some perch will be introduced as a natural predator in Syndicate 1 to prevent the target species from outstripping the food source by over breeding. Anglers will be encouraged to transfer any small fish to the stock pond for growth development and if breeding becomes too prolific, the water will be netted to reduce numbers. This may become necessary in Syndicate 2 where juveniles transferred to the stock ponds will be a valuable resource.

As the site is in the flood plain and there is a risk of natural spawn transfer from ducks etc. only native stocks can be introduced into the lakes and imports like catfish, zander, etc. will not be induced. Two endangered native species will be introduced or encouraged into separate environments that can be trumpeted as a first for Herefordshire.

European Eels (Anguilla Anguilla)

Eels are now an endangered species (International Union for Conservation of Nature (IUCN) Red List of Threatened Species and UKBAP Priority Species on the OSPAR list of threatened and/or declining species and habitats). Their demise is attributable to: -

- Degraded environment
- Loss of habitat specifically due to reclamation
- Dams obstructing riverine access
- General reduction in water quality
- Parasitic nematode
- Overfishing (the largest contributory cause) by decimating elver runs)

However, a small number are known to access the River Wye and Frome system rendering the lakes a likely future habitat to this threatened migratory species. Eels breed in the Sargasso Sea, travel 5000km to our shores and are very capable of travelling the short distance overland and through water supply ditches etc. to all the lakes and ponds in the park.

European Commission Scientists have given a stark warning that, without effective conservation measures, it will be impossible to halt the continuous decline of the eel population. The Environment Park proposal at the Bartestree Flats is one such conservation measure.

Crucian Carp (Carassius Carassius)

Herefordshire is not a stronghold for the much-loved crucian carp (Carrasius carassius). Recent research on the distribution of CC has revealed a species decline of around 80% between the 1970s and 2009 with a further deterioration since. No fishery in Herefordshire contains true carrasius and although there may be some undetected and secluded farm pond with the strain it seems unlikely.
The threat to the species include: -

- Genetic contamination through hybridization with introduced varieties of common carp (Cyprinus carpio), including 'koi' and 'chagoi' and common goldfish (Carassius Auratus) , which are released into open waters.
- Loss of habitat due to river regulation
- Changes in agricultural and land use practices, especially the terrestrialisation of ponds.
- A previous lack of recognition of C. carassius as a characteristic pond species.

Several ponds in Norfolk (the crucian heartland) have been set up under the North Norfolk Biodiversity Action Plan (NNBAP) to save the species from extinction in the Country and the Client is working with Will Watson (HARP) to provide a habitat in which to enable Crucians

and other amphibians to thrive. A guaranteed pure strain of verified crucians from Mill Lodge Farm (an NCCP water) has been secured and from scheduled netting each January AF Fisheries in Gloucester (a licensed fish transporter) will be contracted to transfer the fish to one of the nursery (stock) ponds and then on to the virgin crucian pond. Other supplies can be obtained from the Agency's Calverton fish farm which has been set up to specifically support the NCCP. The aim will be to preserve the species locally and develop a unique fishery and Environment Agency resource. With careful management the Environmental Park will provide a perfect habitat for this hardy species to regenerate and enable anglers to enjoy a somewhat forgotten way of fishing for a species unobtainable to anglers in most waters today.

True strain Crucian Carp (CC) not hybridised with goldfish and other cyprinids) are a medium sized indigenous native species that can tolerate the conditions that will be created in the shallow crucian and Syndicate pond. It is listed on the International Union for Conservation (IUCN) red list of endangered species. The creation of this 'nursery pond' will provide Herefordshire with its only insitu source of these carps and help prevent the species from slow extinction by cross breeding in this country. The National Crucian Carp Programme (NCCP) supported by the Angling Trust aims to generate ponds with true strains of the species and the Crucian pond at the Bartestree Environmental Park will provide a valuable resource supported by introductions grown from pure bred strains in the stock ponds. The resource can also be cropped by the syndicate to provide certified strain fish for other such projects. An NCCP data sheet appended.

ANGLING TRUST FISH LEGAL

Stocking

An initial stocking of common/mirror carp and tench/crucian carp at about 150-250 kg/ha is appropriate for the newly created Syndicate lakes and this will be through a phased programme of stocked individuals to flourish and grow to larger sizes. Individual fish selection will be influenced by the fishery syndicate, but initial species stocking will be as described in the summary. All fish will be quarantined in the stock ponds then introduced into one of the receiving lakes or ponds when a stabilised lake habitat has been achieved.

Fish sizes

In general, fish of about 10cm and longer will have a far greater rate of survival than smaller but cheaper fish in what is a non-predatorial environment. It is important that the stock fish are young, to trigger maximum growth potential. If fish are obtained from commercial sources, the introduction of two or more size groups helps ensure that fish of different ages are stocked.

Cormorants and otters are the main fish predators and discussions with the Environment Agency regarding an otter fence and methods to restrict cormorant predation will be carried out to ensure that fish populations can be maintained.

Stock fish from AF Fisheries (an Environment Agency supplier) will ensure that disease free certified strains of pure-bred crucian or F1 carp or tench will be supplied. The company will undertake to complete the necessary documentation and will be responsible for the well-being of the fish.

Timing

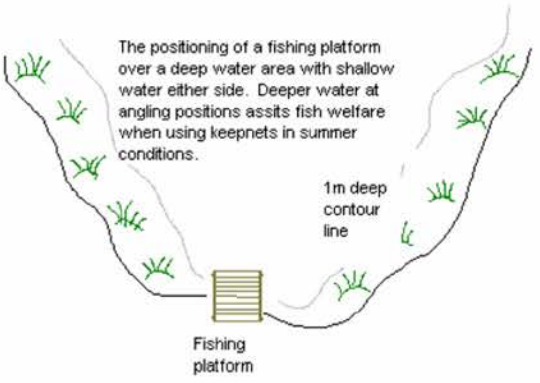
It is sensible to let a new fishery mature for the minimum period of one summer before fish are released from the stock ponds. This should ensure the adequate development of the aquatic flora and fauna on which fish will rely for food, spawning and shelter. Fish should not be introduced in the warmer months, and most stocking should take place between October and April.

Environmental targets

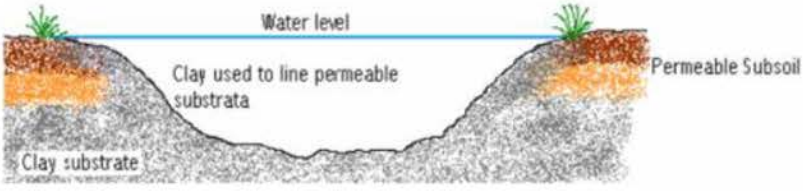
Wetlands

The world's amphibian population is disappearing at an alarming rate and at the same time natural wildlife ponds, bogs and wetlands are disappearing fast. Creating a proper habitat for these and other species have special importance in plans for the Bartestree Environmental Park. The scheme will help establish colonies of locally rare and nationally endangered fish and other species which will make a significant contribution to the Herefordshire biodiversity plan.

The average water depth of the syndicate lakes is just less than 2m which is ideal for the specimen type of fishing envisaged. The environmental ponds are less than 1.6m deep. Shallow water warms more quickly than deeper water which will also encourage the development of water plants and invertebrate animals. These marginal areas are vitally important in generating fish food, provide spawning areas and sanctuary for breeding fish and fry.

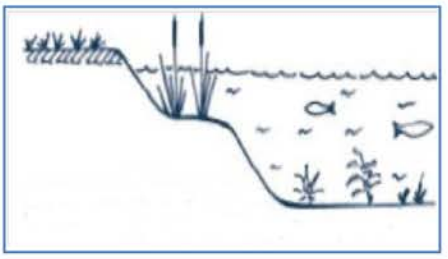


Bank side fishing stations will be sculpted to accommodate landing fish safely and to install fish cradles or safety sacks for fish retention and weighing etc. Larger fish will be photographed in the water to prevent fish damage. This work will not affect the important status of the marginal areas for vegetative development. The shallow scrape will also provide several safety routes for any animals getting into the water.



Contours

The proposed lake contours are shown on the appended schematic layout and topographical plans and engineering drawings are being prepared by Monument Geomatics. The “batter” (or slope) of the banks in the syndicate lakes have margins designed at between 1:1.5 and 1:2.5. An underwater ledge or submerged “bench” 1-2m wide will allow the rapid establishment of fringe marginal plants but prevent their encroachment into the deeper water in the main body of the lake. It will also serve as a safety feature for anyone who may slip or fall into the water, enable anglers to safely net and handle specimen fish, facilitate bankside access for maintenance and most importantly provide additional feeding and spawning grounds .



The crucian and amphibian ponds are shallow by comparison to the syndicate lakes and have very gently sloping sides with a reduced batter. The amphibian pond has multiple shallow islands and shelfs suited for newts, salamanders frogs and toads etc. This serves as a safety feature and provides all round access for pond users as well as encouraging bank and marginal growth.

The project involves the development of new reed beds and wetland areas at strategic locations across the lake site to generate new feeding and breeding ground for several bird species that inhabit the area. The wetland and marginal benches also provide a fitting habitat for some rare wetland plant species to develop.

The Client has already been involved in developing Herefordshire’s most prolific great crested newt site and is seeking to replicate this at Bartestree in the wildlife ponds. Will Watson (HART) is a local expert on amphibian development and is a published authority on the subject and is being invited to advise on the development of this new habitat.

HART
Herefordshire Amphibian & Reptile Team

The scheme will quickly create new feeding grounds for warblers, heron, coot, moorhen, duck and other water birds. It is also likely to attract other species (possibly marsh harrier) that should quickly occupy these favoured environmental development zones that will attract mammals, amphibians, invertebrates and insects. These environmentally sensitive wetland areas are shown on the ecological map of the site and include revitalised wet ditches associated with the WMS.

Creating these new wetland routes will be achieved by reinstalling sluices to artificially raise the water within the redundant dry ditch courses, whilst still maintaining full control. These refurbished water control structures and underground pipe work will enable incoming fresh water to be distributed along the existing WMS network of ditches that provide a wetland passage route. The sluices will control access into the ponds, any elevated lake levels would be controlled by a higher outlet into the leat fitted with screens to prevent fish migration and maintain the secure containment lake principal.

The diverse new wetland habitat created by this scheme provides a home and feeding ground to a large array of new wildlife including water birds. It is hoped in that the facility will become an attractive environment for encouraging a diverse selection of bird species including the lapwing and possibly marsh harrier, flocks of redshank and curlew, particularly at the wildlife wetland. The Client is also undertaking a breeding program to introduce rare English grey legged partridge to the environment with a target release of 25 mixed birds each year for 5 years.

Other environmental benefits being installed are: -

- Native species rich hedge lines are to be planted along bare boundaries and furnished with hedgehog homes compatible with a BAP habitat.

- During harvesting some wood and dead wood stacks and log piles will be placed at strategic locations especially near the wildlife pond to provide habitat for woodlice, centipedes, stag beetles, slugs ants etc together with invertebrates, reptiles and hopefully amphibians.

- Following harvesting, efforts will be made to manage the open grassland under a differential mowing regime to encourage wildflower production as follows:

    - 50% cut twice a year in early July and August/Sept
    - 25% cut once a year in early July
    - 25% cut once every two years in August/Sept

The environmental benefits of the scheme are huge and too numerous to describe in detail at this stage, although there are several environmental targets: -

- The European water vole is a species target as it is under serious threat from habitat destruction due mostly to farming intensification from 1940 and predation, specifically by the non-native American introduced mink. It has disappeared from 94% of its former sites and is the fastest declining land mammal. In the UK. Several schemes (notably in the west Country) have shown that they can be re-established and inserted into new habitats through sibling groups and mating pairs.

- Although common frog and toad populations will thrive in all the ponds the larvae of great crested (Triturus cristatus) are highly susceptible to fish predation and may not become established in them. But it is hoped that the development of the leat system will enable the development of a suitable habitat for great crested newts to develop a strong colony to add to the 57 sites already identified in Herefordshire. This linear feature provides an opportunity to spread throughout a wide area over the site. The large fish free amphibian pond and two shallow fish free wetland scrapes (about 5 x 5m) adjacent to the leat will be made to provide a perfect habitat and newt sanctuary to preserve the population. These systems score highly in the HART Habitat Suitability Index (HIS) Herefordshire is an important County in which to pursue newt generation sites being on the western edge of the species range. Newt transfers from a successful development at Lyde Arundel will be made under

licence with Mr. W Watson through HART (The Herefordshire Amphibian and Reptile Team) and tuned to the Herefordshire Biodiversity Action Plan (BAP). Smooth newts (T. Vulgaruis) and Palmate newts (Lissotriton helveticus) should also develop on the site, although these species are widespread in Herefordshire and not at risk.

- The fish free amphibian pond should attract common frogs (Rana lessonae) and toads (Bufo Bufo) without any nurturing, however two endangered species British Pool Frog (Rana lessonae) and Natterjack Toad (Bufo Calamita) will require specialist development and funding will be made available to pursue the amphibian development of the site through HART and with the Herefordshire nature Trust HNT.

- Other mammals it is hoped to attract to the Environmental Park are some of the 18 British species of bat (Chiroptera). Bat roosting opportunities are to be created by the installation of boxes on the retained trees at various locations on the site. New sections of open water will supplement that of the Frome river and provide a perfect environment to encourage bats to develop a colony based on insects arising from the aqueous environment.

- The aqueous habitat will attract a range of new bird species to the site and these will be encouraged to breed by introducing bird nesting boxes (including owl boxes) as directed by the ecologist.

Common water birds anticipated at the site are: -

- Coots
- Moorhen
- Swan
- Grey heron
- Canada geese
- Mallard
- Kingfisher
- Great crested grebe
- Mandarin ducks

- Mandarin ducks will be introduced from incubated eggs in concert with the grey legged partridge programme.

- Nesting Kingfishers have been observed in the Frome and the introduction of new wetland areas will provide additional territorial feeding habitat and almost certainly secure an increase in numbers.

- The hedgerows have not been managed over the last 15 years and the ecologist will advise on a hedgerow plan that will transform the mature rows into more attractive nesting habitat for non-water birds with appropriate undercover to encourage mammals etc.

Schools initiative

Eastside 2000 Ltd are keen to engage both local catchment schools (St Marys and Lugwardine Primary) and have approached staff with a view of encouraging school children of various ages in the project. Staff at the Gateway Centre and Nursery School have already expressed an interest and wish to become involved in the scheme. The Client will provide some funding for this work which (following discussions with the Headmaster and Science Heads) might will include: -

Delivery of the project and its targets through classroom and field visits using the structures set out in RSPB and Freshwater Habitats Trust 'wetland' documents and to: -

- Agreeing and organising content and tailoring educational sessions to individual cohorts and year groups (pre-school, juniors, seniors, special needs etc.)
- Delivering presentations and providing resources in the classroom
- Arranging field trips to interlink with various school environment projects.
- Explaining the processes involved in the development and the various career opportunities arising, e.g., environmental management, consultancy, civil engineering, surveying, highway work, planning and agency officers, etc.

During, and at the fruition of the project, children will be able to use the facilities for field trips (pond dipping, bird watching, fishing, environmental and career learning etc.) and there will be an opportunity to form a local Environmental Group (HART?) to undertake the husbandry of the wildlife. The erection and siting of a temporary timber hut for syndicate members could also serve as a wet weather and classroom centre for educational visitors. Discussions with the Planning Officer will determine siting and feasible practicality of the hut proposal.

Both the amphibian and crucian ponds associated with these visits are relatively shallow waters with gently sloping sides. Health and safety issues documented in the site record will need to be tailored and agreed with the school administrators.

List of publications

Buyer Beware - A Guide to Fish Stocking
Published by the Environment Agency, 1996. Free from Environment Agency regional offices.

Freshwater Fisheries and Wildlife Conservation, a good practice guide.
Published by the Environment Agency, 1998. Free from Environment Agency Regional offices.

Freshwater Fisheries Management edited by R. Templeton.
Published by Fishing News Books Limited, 1995.

The Creation of Angling Facilities for Disabled People
Produced by the Angling Foundation, 1994.
Free from Convenience Marketing, Regency Business Centre, 26 Queens Road, Kenilworth, Warks CV8 1JQ.

The New Rivers and Wildlife Handbook by the RSPB, NRA and RSNC.
Published by the RSPB, The Lodge, Sandy, Beds SG19 2DL.

MIDLANDS
Sapphire East
550 Streetsbrook Road
Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

WALES
Rivers House/Plas-yr-Afon
St Mellons Business Park
St Mellons
Cardiff CF3 0LT
Tel: 01222 770 088
Fax: 01222 798 555


Chris Yates NCCS
founder member NCCP

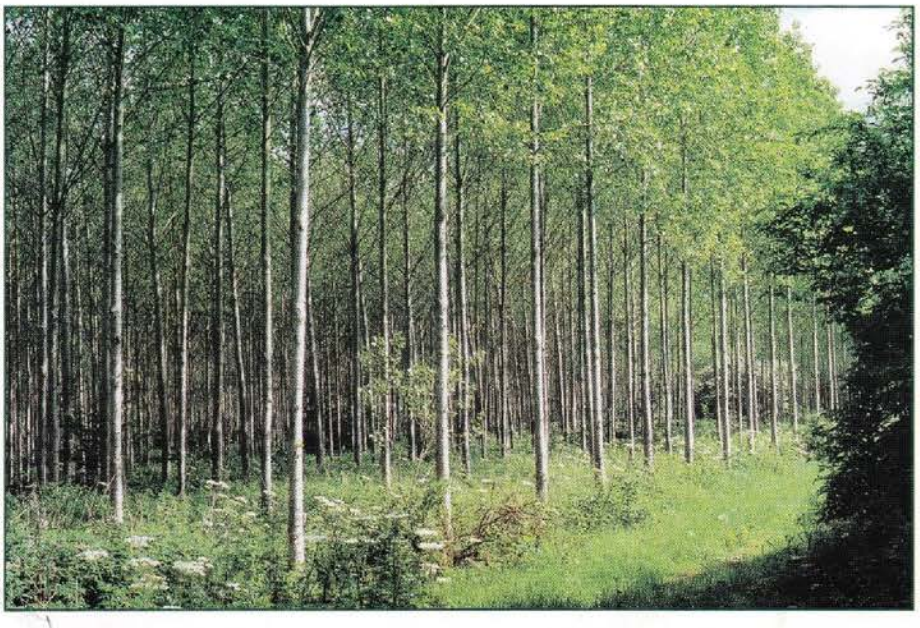
Environment Agency incident hotline 0800 80 70 60 (24hrs)

Environment Agency floodline 0845 988 1188

Bartestree Flats 2003 Sale Particulars

John Clegg & Co

RURAL SURVEYORS | VALUERS & CONSULTANTS



THE BARTESTREE FLATS

Near Hereford, Herefordshire

57.0 Acres (23.1 Hectares)

A highly productive Poplar woodland adjoining the River Frome, with fishing and shooting rights. This exceptional rural investment mainly planted in 1990/91 offers tax free timber income, guaranteed annual grant income of £2475 until 2012 and the fascination of developing its leisure and environmental potential.

FREEHOLD FOR SALE BY PRIVATE TREATY

ENGLAND	The Old Coach House, Southern Road, Thame, Oxfordshire OX9 2ED	Tel:01844 215800	Fax:01844 215252	thame@johnclegg.co.uk
SCOTLAND	2 Rutland Square, Edinburgh EH1 2AS	Tel:0131 229 8800	Fax:0131 229 4827	edinburgh@johnclegg.co.uk
WALES	Apex House, Wonastow Road, Monmouth, Monmouthshire NP25 5JB	Tel:01600 715311	Fax:01600 714234	monmouth@johnclegg.co.uk

www.johnclegg.co.uk

Leat Levels from topographical survey				
C/S 590m total	Top NW shoulder	Base of ex. ditch	Top SE shoulder	Note
1	50.24	49.56	50.24	Water level in ditch by hedge on boundary
2	50.38	49.94	50.38	
3	50.15	49.75	50.10	
4	50.26	-	50.26	
5	50.10	49.58	50.10	First road surface level 50.21
6	50.22	49.56	50.15	Road surface at bend 50.15
7	50.23	49.59	50.15	Road surface 50.30
8	49.97	49.73	49.97	Road surface 50.38
9	49.97	49.77	49.97	Road surface 50.40
10	49.57	49.70	49.96	Road surface 50.33
11	49.83	49.61	49.88	Kink in leat Road 50.22
12	49.90	49.56	49.91	Kink in leat road 50.22
13	50.11	49.61	50.12	Leat very near road 50.11
14	49.76	49.42	49.82	
15	49.75	49.47	49.76	
16	49.61	49.38	49.76	Road 50.06
17	49.61	49.40	49.57	
18	49.67	49.33	49.67	
19	49.77	49.26	49.66	
20	49.55	49.15	49.55	
21 (355m)	49.17	49.11	49.15	At N end of culvert power line track
22	49.61	49.22	49.61	At S end of culvert power line track
23	49.46	48.96	49.47	
24	49.83	49.03	49.81	Road 49.83
25	49.54	49.03	49.48	
26	49.72	48.98	49.72	Kink in leat
27	49.60	48.97	49.52	Kink in leat
28	49.42	48.89	49.42	
29	49.54	49.05	49.15	
30	49.47	-	49.47	N end of hardstanding
31	49.49	-	49.48	
32	50.42	48.98	49.92	
33	49.63	48.71	49.64	Road 50.22
34	49.32		49.33	
35		48.51	49.71	
36				Invert culvert 48.18 and 48.15
	Top 49.45	**Bottom**	**48.65**	800mm fall over 590m (1 in 740 fall?)
THA				49.56
THB				50.36
THC				50.62
THD				Not known

THE BARTESTREE FLATS, HEREFORDSHIRE

John Clegg & Co

The Old Coach House, Southern Road,
Thame, Oxon. OX9 2ED Tel: 01844 215800

and at Monmouth Tel: 01600 715311
and Edinburgh Tel: 0131 229 8800

N

Not to scale

Bartestree Environmental Park at the Bartestree Flats. National Crucian Carp Conservation Project (NCCP)

Terms of Reference

The NCCP is a group of representatives from public, academic and voluntary sector organisations and individuals who share a common interest in furthering the status of Crucian Carp (Carassius Carassius) in the UK. The group came together in February 2014 following widespread concerns about the loss of crucian habitat and the threat to the species through hybridisation caused by inappropriate stocking practices.

Crucian Carp are endangered across their natural international range and as such are designated by the International Union for the Conservation of Nature (IUCN) as a red listed species. Therefore, this project is also designed to assist in the UK government's IUCN obligations.

The primary objectives of the project are to:-

- Promote the conservation of the species and its habitat
- Encourage the development of well managed crucian fisheries

The resulting benefits will include improved understanding and protection of 'wild' or 'pure' crucian stocks; habitat restoration; creation of 'community waters'; more angling opportunities; increased resources for young anglers and better sharing of information on lake and pond conservation.

Some suggested outputs and/or aspirations are:-

- A regional network of growing on centres to increase the availability of wild crucian stocks
- A 'pure' crucian accreditation scheme
- Factsheets on creating/managing waters, avoiding hybridisation and an ID guide
- Courses or events for fishery owners and managers
- Create 'Crucian Champions'?

After an initial meeting at the EA offices in Peterborough the National Crucian Conservation Project (NCCP) was officially launched on 28th May 2014 at the Angling Trust Coarse Fish Conference in Reading. https://www.anglingtrust.net/page.asp?section=1057

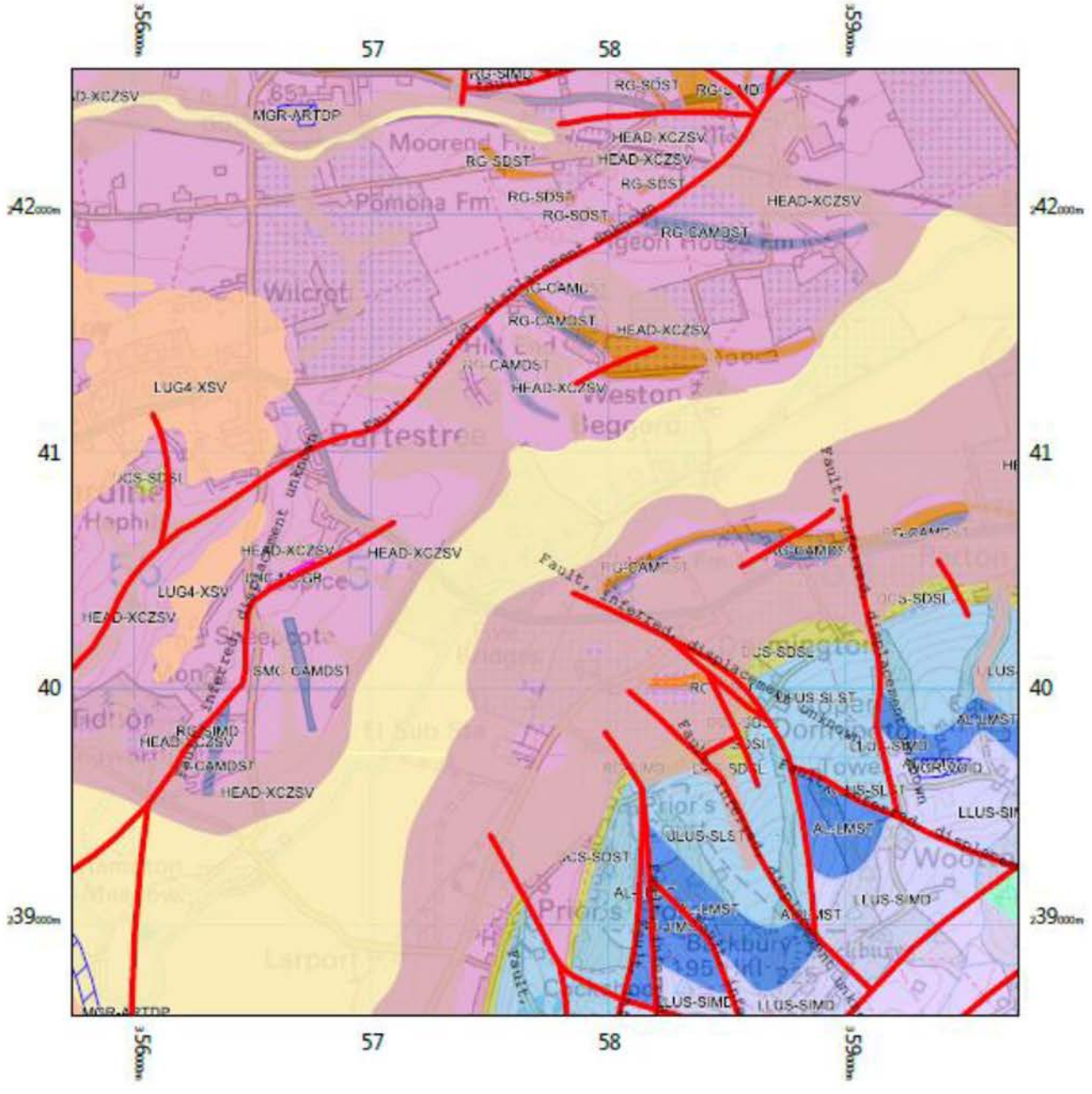
The Crucian Website is managed by Peter Rolfe. http://www.crucians.org/
Certified pure-bred crucian stock are being sourced from Mill Lodge Farm at Great Ryburgh in Norfolk NR21EB with transfers arranged through AF Fisheries Ltd. Fish produced at Mill Lodge – above. https://www.facebook.com/MillLodgeFarmFishery/

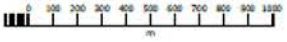
Geological mapping

KEY TO BEDROCK GEOLOGY				
Map Colour	**LEX Code**	**Rock Name**	**Rock Type**	**Max Age (Period)**
	UIIC-MCGB	Unnamed Igneous Intrusion, Carboniferous http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=UIIC	Microgabbro	Carboniferous
	SMG-CAMDST	St Maughans Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=SMG	Mudstone, Calcareous	Devonian
	SMG-SDST	St Maughans Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=SMG	Sandstone	Devonian
	RG-CAMDST	Raglan Mudstone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=RG	Mudstone, Calcareous	Silurian
	DCS-SDST	Downton Castle Sandstone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=DCS	Sandstone	Silurian
	RG-SDST	Raglan Mudstone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=RG	Sandstone	Silurian
	DCS-SDSL	Downton Castle Sandstone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=DCS	Sandstone And Siltstone, Interbedded	Silurian
	RG-SIMD	Raglan Mudstone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=RG	Siltstone And Mudstone, Interbedded	Silurian
	ULUS-SLST	Upper Ludlow Shales Group http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=ULUS	Siltstone	Silurian
	AL-LMST	Aymestry Limestone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=AL	Limestone	Silurian
	LLUS-SIMD	Lower Ludlow Shales Group http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=LLUS	Siltstone And Mudstone, Interbedded	Silurian
	WEL-LMST	Much Wenlock Limestone Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=WEL	Limestone	Silurian
	CBRD-SLST	Coalbrookdale Formation http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=CBRD	Siltstone	Silurian

KEY TO SUPERFICIAL GEOLOGY				
Map Colour	**LEX Code**	**Rock Name**	**Rock Type**	**Max Age (Period)**
	ALV-XCZSV	Alluvium http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=ALV	Clay, Silt, Sand And Gravel	Quaternary
	HEAD-XCZSV	Head http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=HEAD	Clay, Silt, Sand And Gravel	Quaternary
	LUG4-XSV	River Terrace Deposits, 4 (Lugg) http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=LUG4	Sand And Gravel	Quaternary
	RTD1-XSV	River Terrace Deposits, 1 http://www.bgs.ac.uk/Lexicon/lex_list.cfm?pub=RTD1	Sand And Gravel	Quaternary

Geological mapping

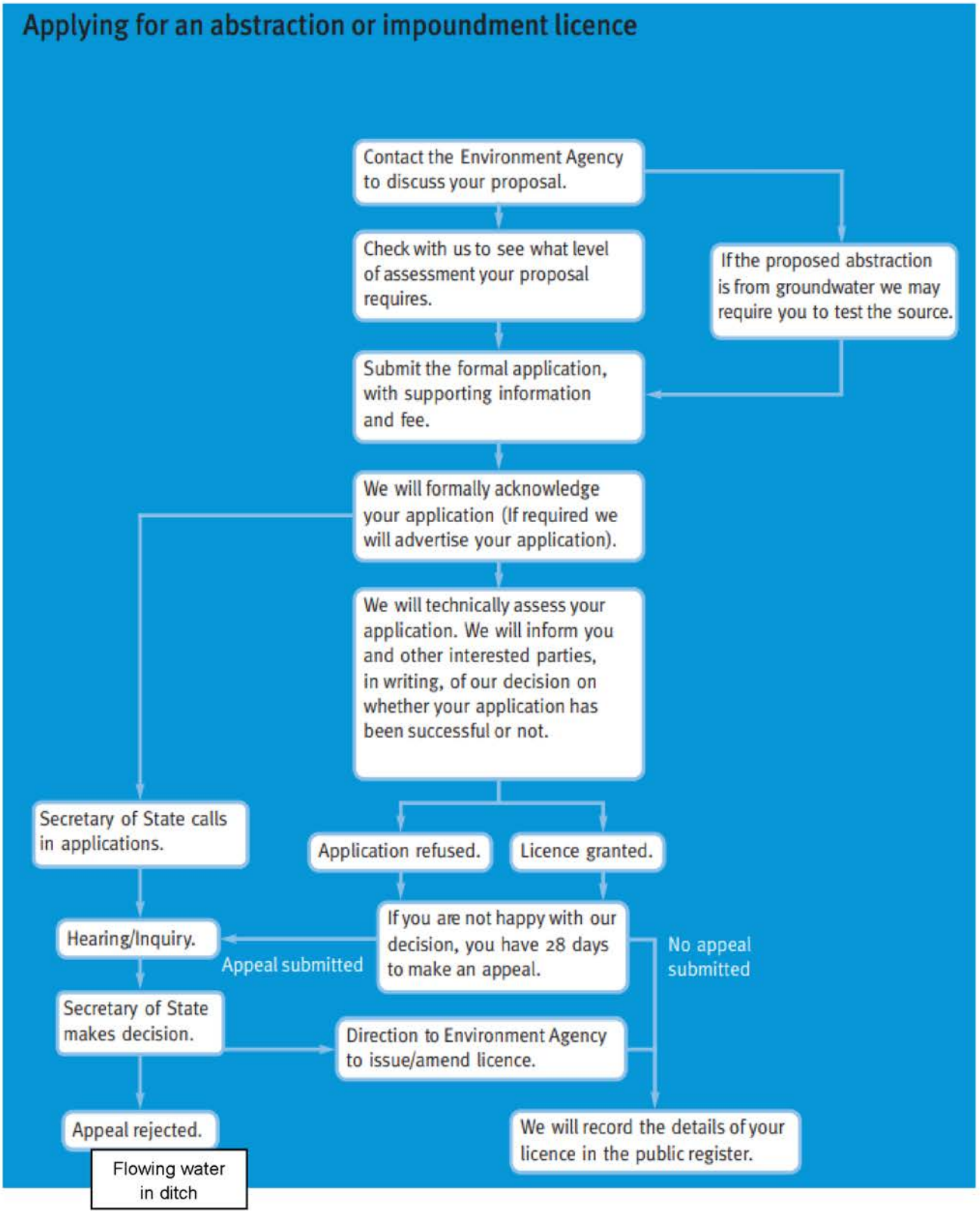




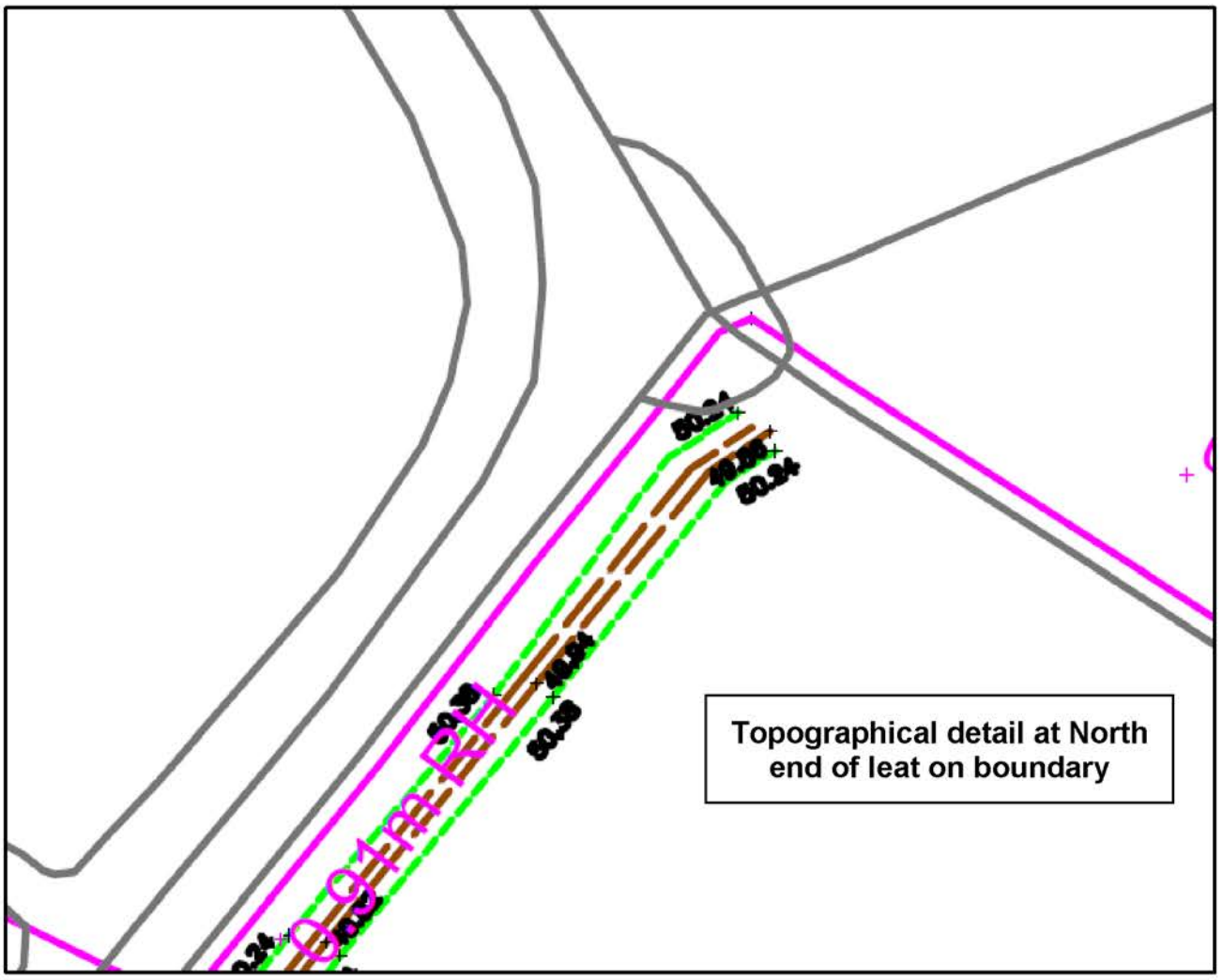
BGS 50k Geology - OS 50k Mapping
Monday, February 11, 2019, ID: HMC-00776878
www.themapcentre.com

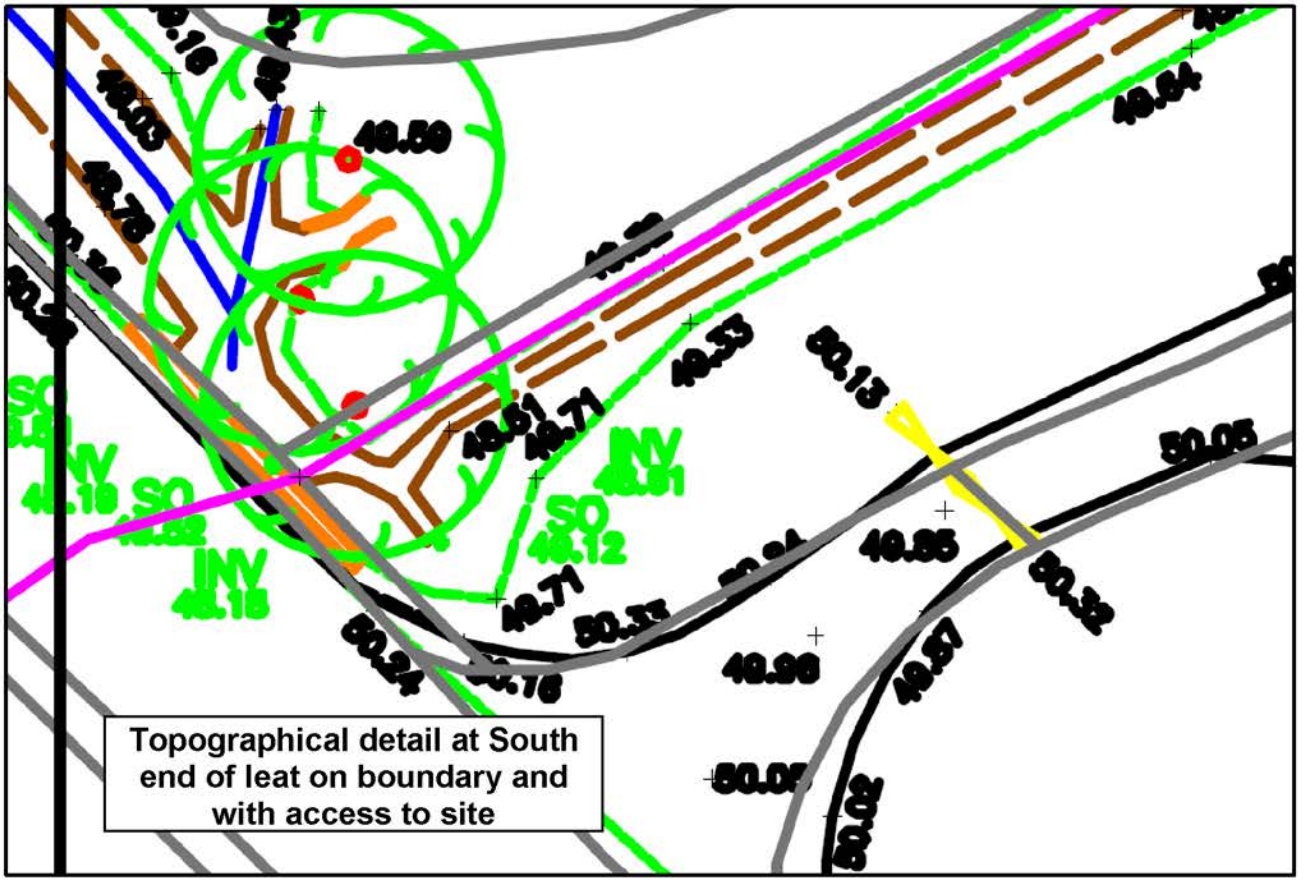
1:25000 scale print at A4, Centre: 357729 E, 240613 N

THE MAP CENTRE
www.themapcentre.com

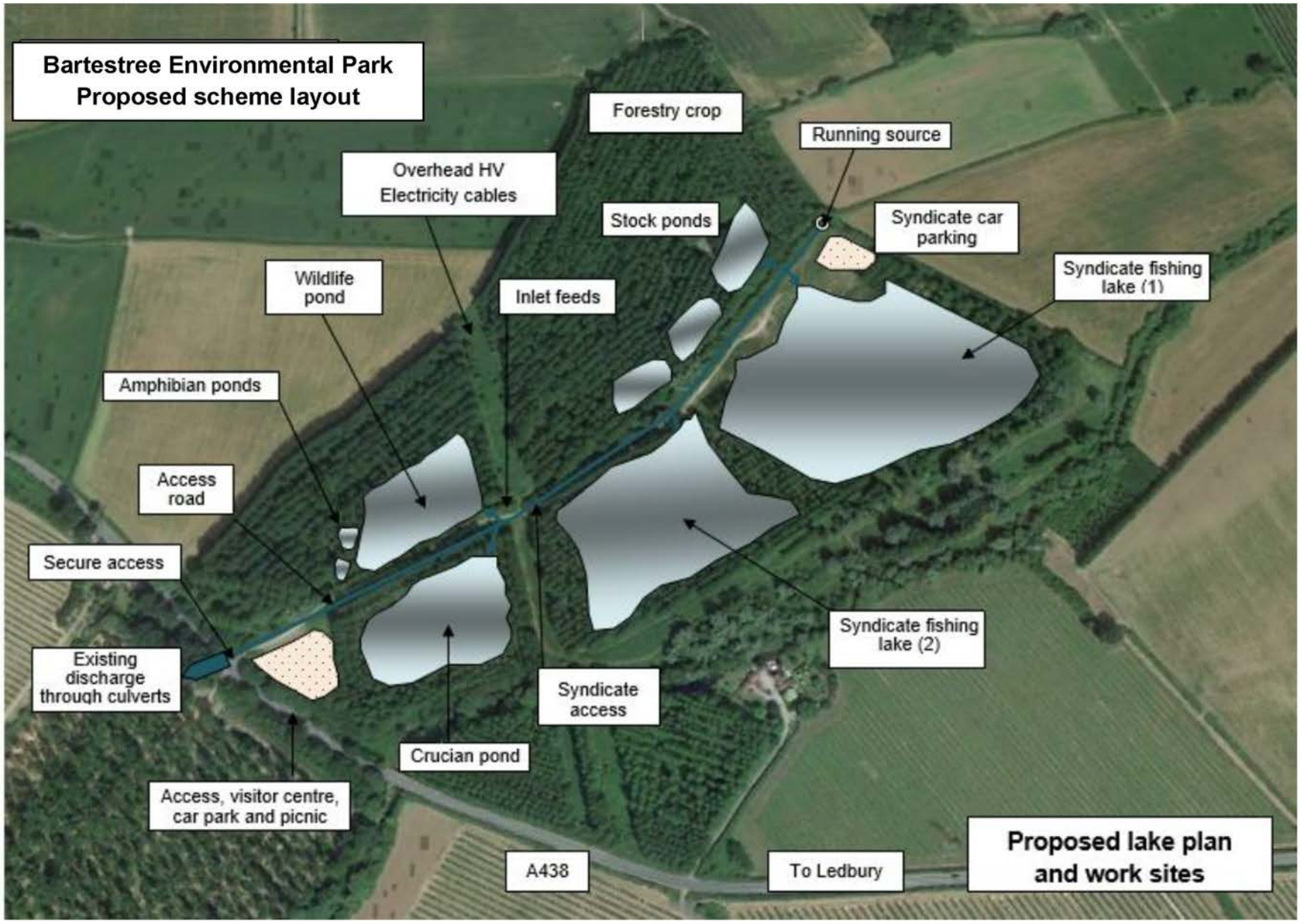


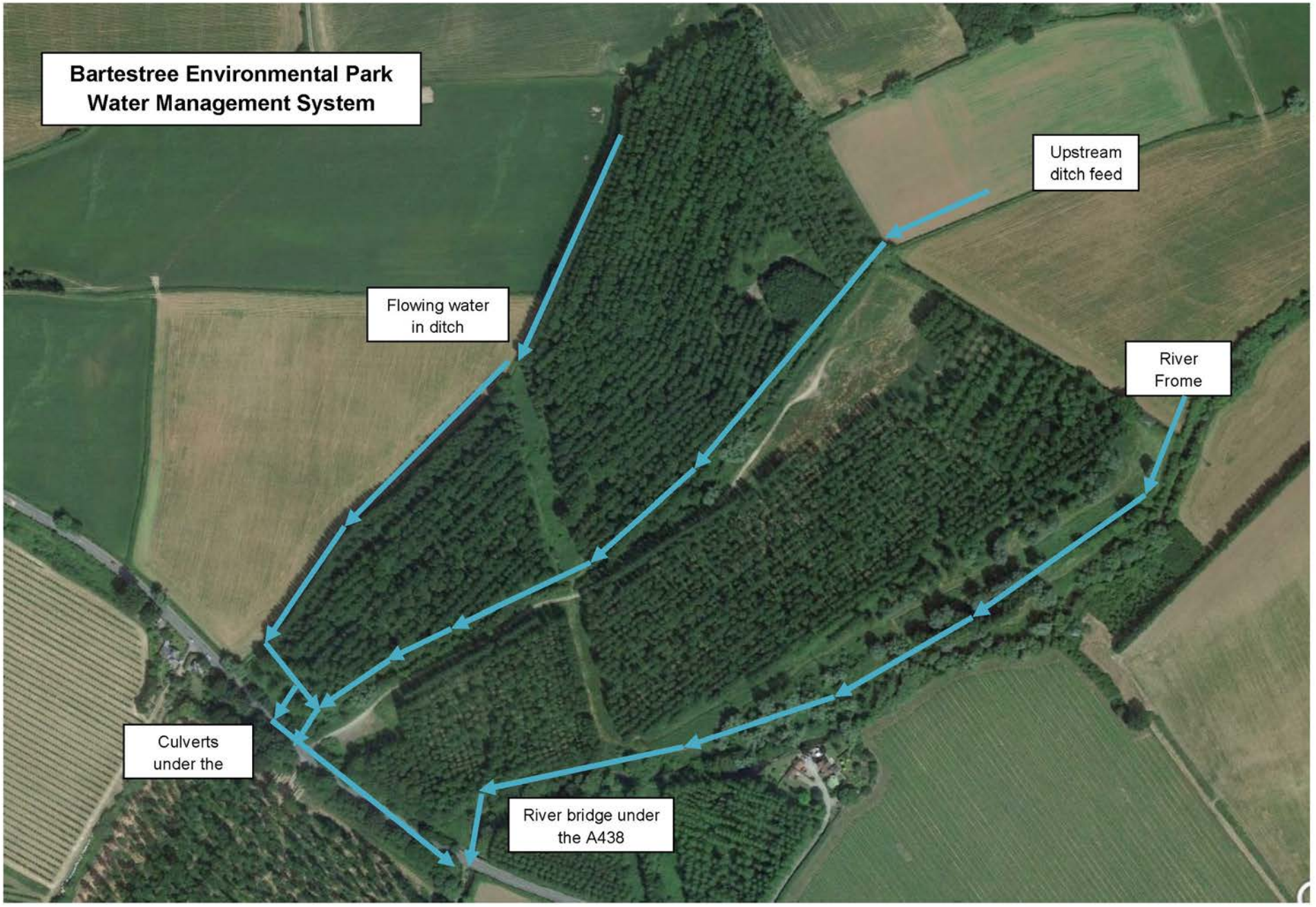
An abstraction or impoundment license will be required and the Client must apply for this before undertaking any work. A temporary (28 day) license may also be needed for maintaining levels

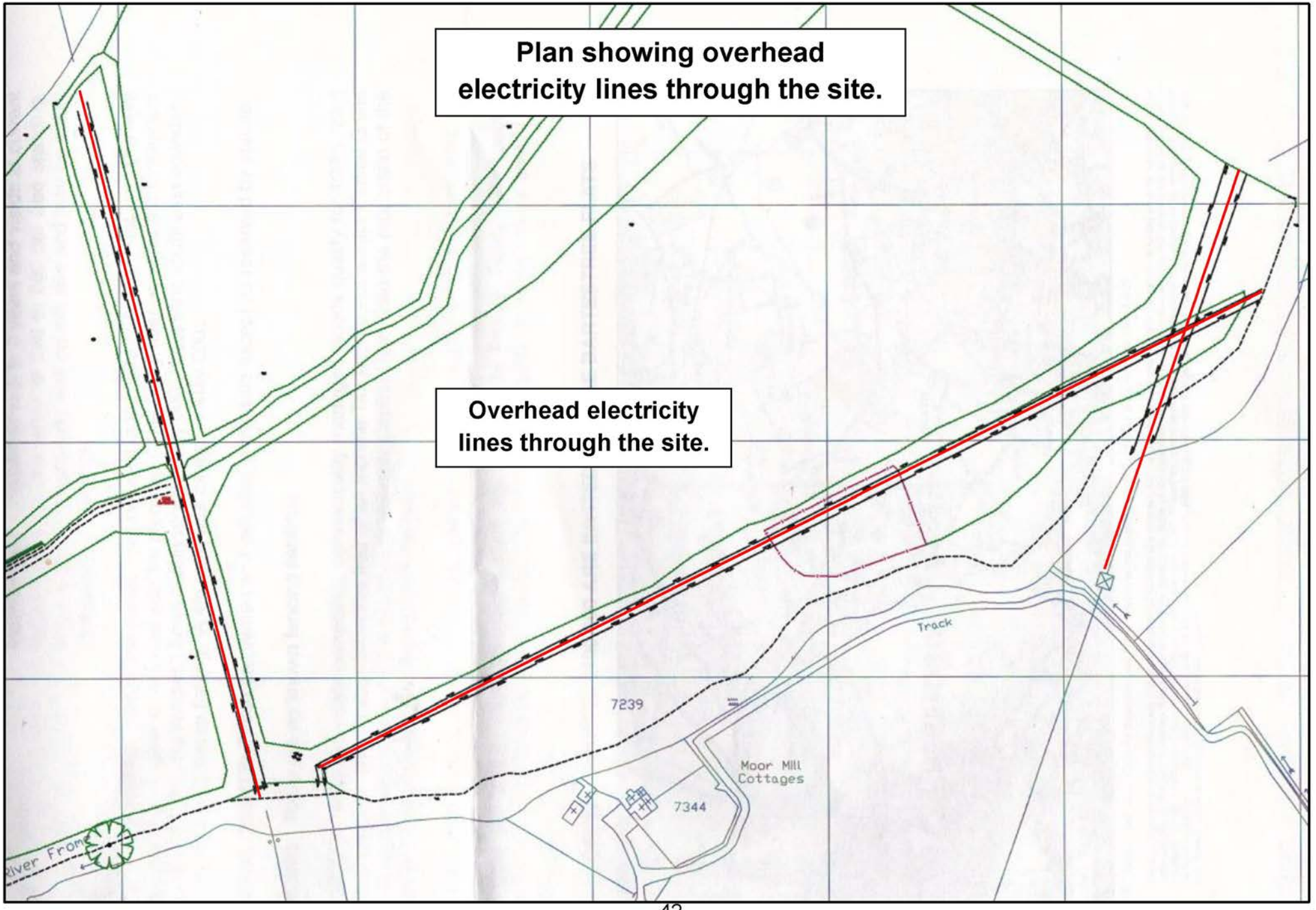

0.91m RH
Topographical detail at North end of leat on boundary

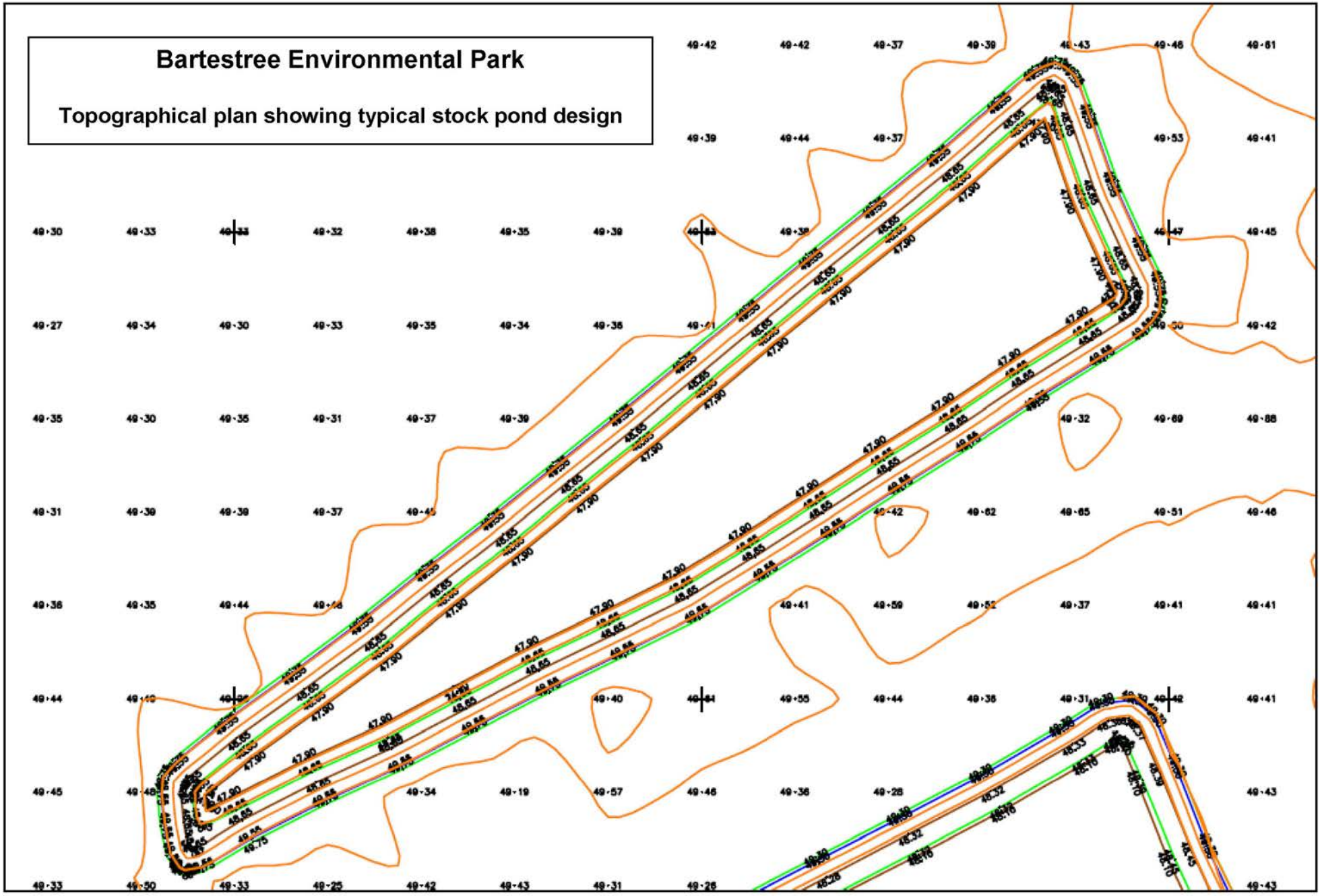

Topographical detail at South end of leat on boundary and with access to site

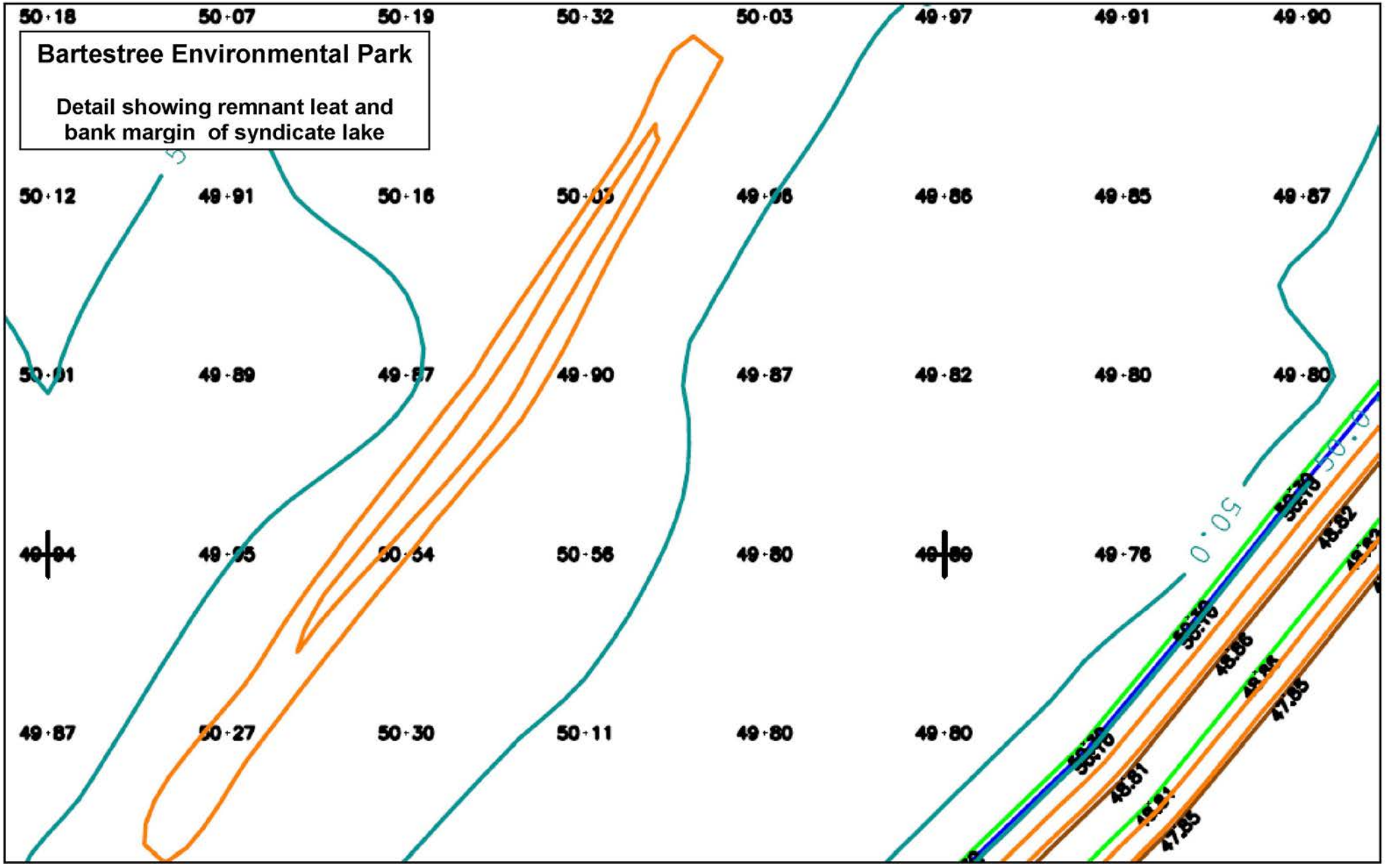
Schematic Layout



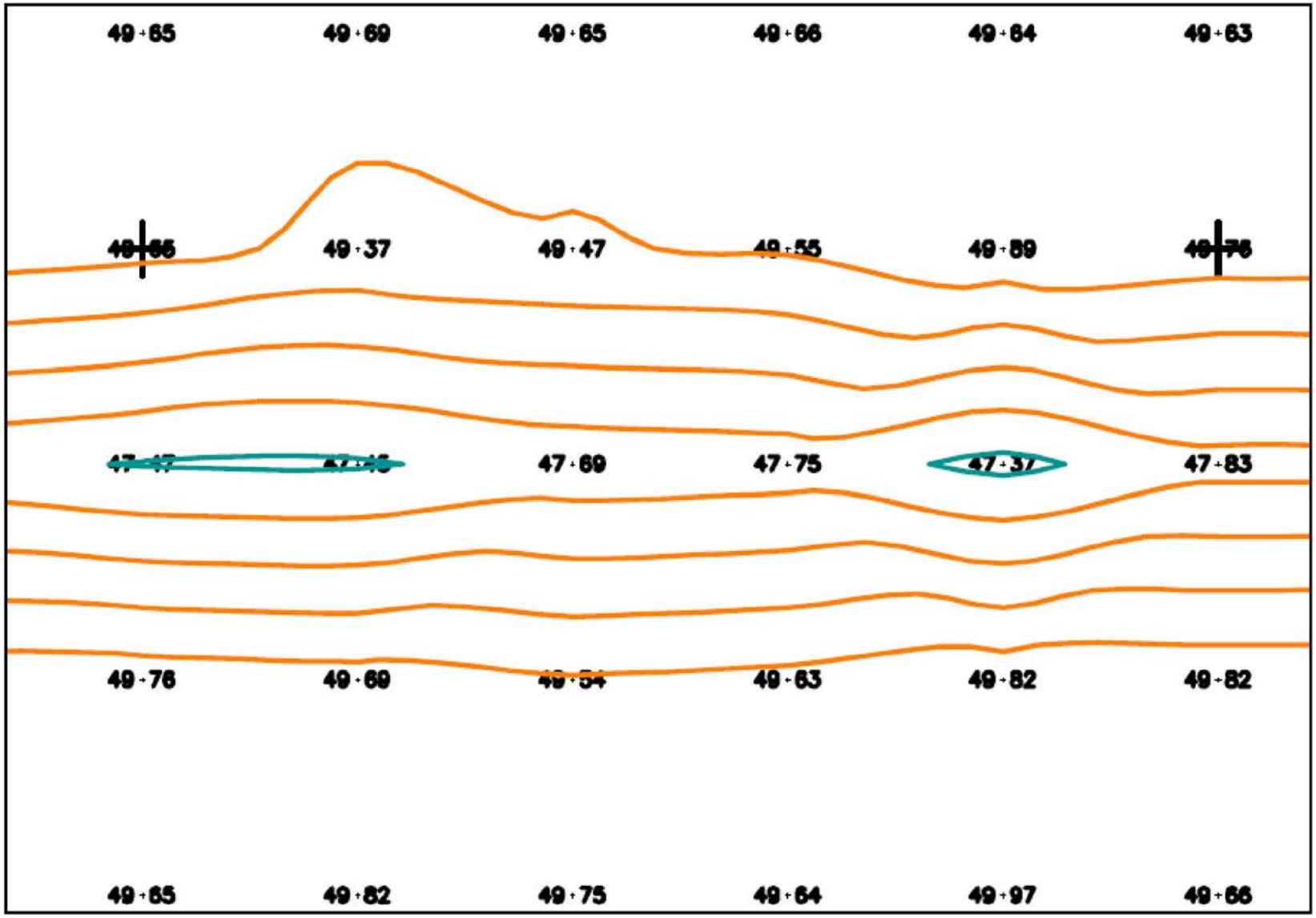

Bartestree Environmental Park
Water Management System
Upstream
ditch feed
Flowing water
in ditch
River
Frome
Culverts
under the
River bridge under
the A438


Plan showing overhead electricity lines through the site.
Overhead electricity lines through the site.
Track
7239
Moor Mill Cottages
7344
River From


Bartestree Environmental Park
Topographical plan showing typical stock pond design


Bartestree Environmental Park
Detail showing remnant leat and bank margin of syndicate lake

LIDAR map along the River Frome
(Note 2 to 2.5m to water level from bank)



Bartestree Environmental Park
Culvert arrangement January 2019


Site entrance


Upstream culvert under A438


Inlet pipe from leat


Broken sluice gate at culvert pool


Downstream outlet of culvert


Twin culvert under A438

Bartestree Environmental Park
Culvert arrangement February 2019


Log pile habitat on site


Overhead national grid power lines


TH 2 filling with water after 2 hrs


TH3 Filling with water after 3hrs


TH1 showing alluvium and ground water entering hole


Alluvial high plasticity clay suitable for puddling

Bartestree Environmental Park
Syndicate lake target fish species

T40lb Common carp

40lb Leather carp

5lb Perch

40lb Mirror carp

10lb Tench

5lb Crucian carp

Bartestree Environmental Park
Typical swim arrangements (Angling stations) on syndicate lake

Bartestree Environmental Park
Plant to be employed on construction

Bulldozer

360 Excavator

HGV lorries

Taper foot roller

Standard vibratory roller

20m^3 dump truck

Bartestree Environmental Park
Lake and landscaping features

Possible walkway through marginally planting in the wildlife pond.

Example of the type of sluice gate control mechanism in the leat.

Example of the wood chip pathways around the lake

Habitat development for target species

Frog and frog spawn

Small wildlife pond (Newt pond) at culvert site

Great crested newt

Wood pile sanctuary

Wood pile sanctuary

Hedgehog in wood pile sanctuary

Sutton Surveys
Unit 8 Mortimer Rd Trading Estate, Mortimer Rd, Hereford, HR4 9SP
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Sutton Asbestos Surveys Ltd trading as Sutton Surveys Company No 5332563 VAT Reg (FRS) 8575618 82
E-mail info@sutton-surveys.co.uk Website www.sutton-surveys.com

Asbestos Surveys and Asbestos Awareness Training, SUDS, Drainage Contaminated Land and Ground Investigations, Waste and Minerals, Recycling, Soils Earthworks Highways.