Thames Community Hydro at Ash Island

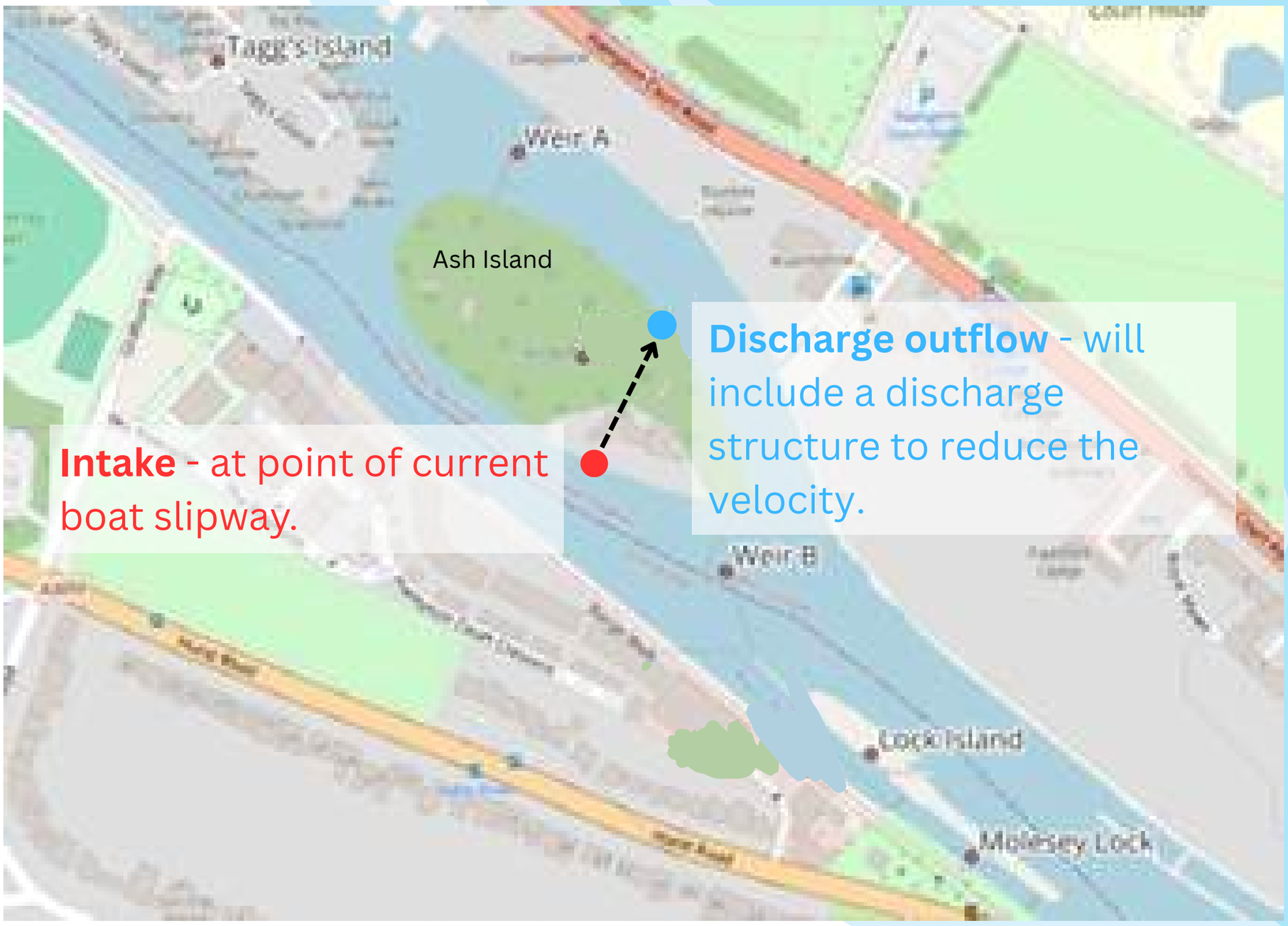
Community energy scheme

Thames Community Hydro CIC are assessing the feasibility of a community hydro scheme located on Ash Island, near Molesey weir. The proposed plan meets the objectives of Great British Energy (GBE) a publicly owned company set up to invest in, develop and own clean energy projects designed to increase energy security, cut exposure to gas prices, and support net zero.

Public Meeting:

Monday 18th May, 6.30pm - 8.00pm

Molesey Boat Club, Barge Walk, East Molesey, Surrey, KT8 9AJ



Map showing proposed location of the hydro scheme at Molesey weir

Components of the scheme

Remedial works to the existing channel will be required to permit the required flow with minimal efficiency loss.

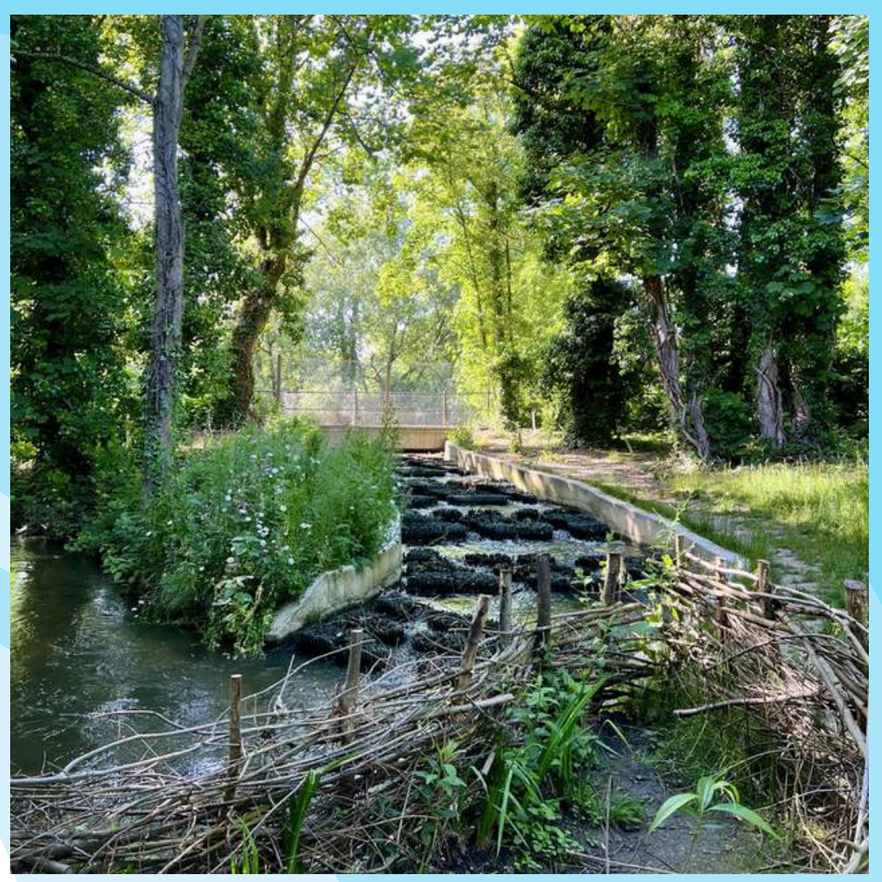
Landscape architects will manage the re-planting and enhancement of the dug-out and backfilled chanel.

An underwater cable conduit will be required to export power into the local substation

To permit moorings on the downstream bank, the discharge velocity should be limited to <0.5m/s

THAMES COMMUNITY HYDRO

Case study: Reading Hydro



A **community shares scheme** - as proposed for Ash Island. Local residents invest with profits supporting community initiatives that benefit people and the environment.

Environmental benefits
Carbon emissions are cut as renewable, nature friendly and clean energy is supplied to homes.

Archimedes screw turbines are used in Reading. These are more obtrusive than the VETT turbines proposed for Ash Island, which won't be visible or as audible. In both cases, the existing weir masks any sound made by the turbine.

Useful links:
Hydro-Schemes-along-the-Thames.pdf
Community Hydro introductory article

Local engagement and education is supported by case study resources and a website created as part of the scheme.

Caversham Weir
Opened in 2021
2 x archimedes screws
46 Kw installed capacity

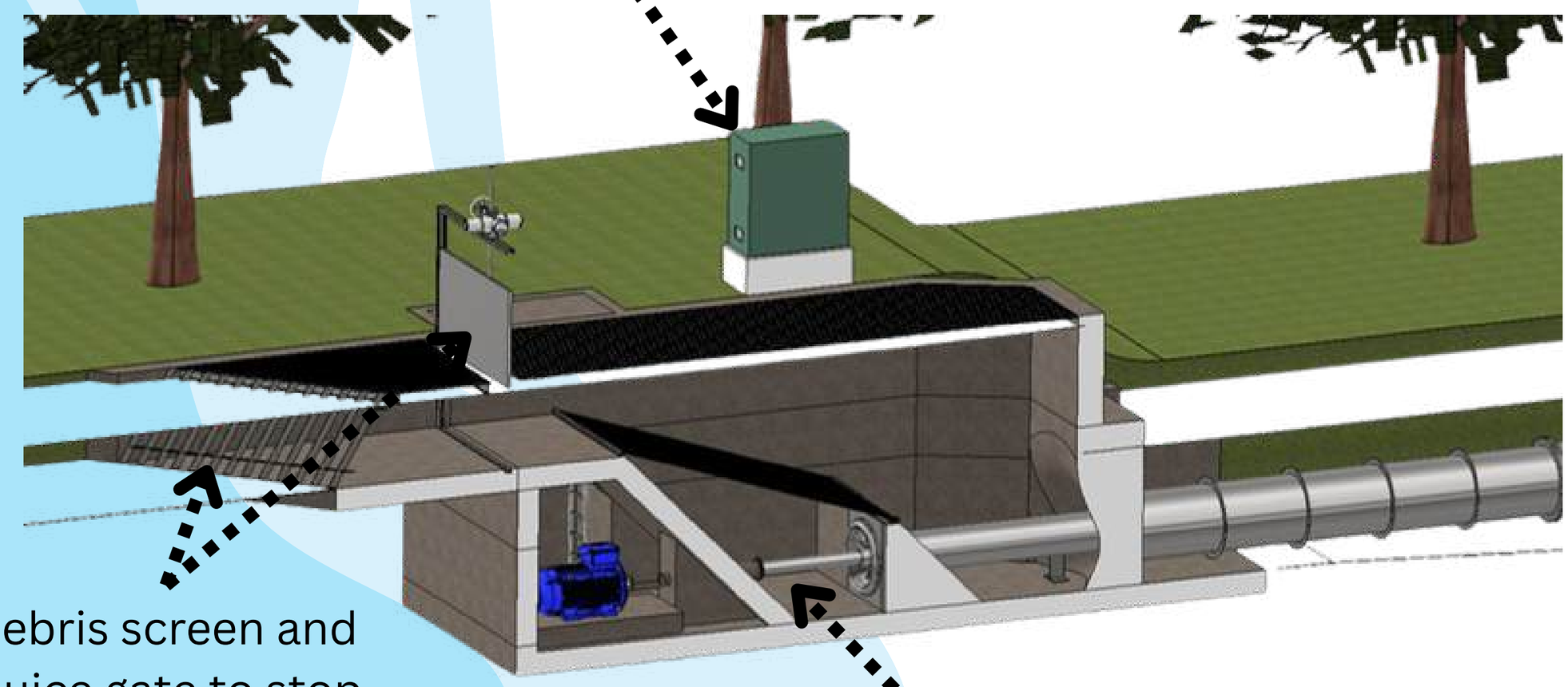
Similar community hydro projects

There are six hydro schemes on the Thames upstream of the proposed scheme on Ash Island. Several are community schemes. Click on the links to find out about these successful projects.

Scheme & link	Information
Osney Lock Hydro River Thames, Oxford. Community owned 1 x Archimedes screw 49 Kw installed capacity Installed 2015	Osney Lock Hydro delivers **community-owned renewable power** while supporting **local climate goals**. Its Archimedes screw operates **quietly and efficiently**, and the integrated fish pass **improves river ecology** by enabling upstream migration. All their **profits** are put to use for the **benefit of the community**. They fund projects that help reduce energy use, support biodiversity and contribute to a more sustainable future.
Sandford Hydro River Thames, south of Oxford. Community Owned 3 x Archimedes screws 485Kw installed capacity Opened 2017	It supports **Oxford's low-carbon goals**. As a **community-owned project**, it delivers local environmental benefits, **enhances river sustainability**, and provides **long-term green energy** while engaging residents in community-led climate action.
Reading Hydro River Thames, Caversham weir A community shares scheme 2 x Archimedes screws 46Kw installed capacity Opened in 2021	Reading Hydro generates around **320 MWh of renewable electricity annually**, **cutting carbon emissions** and powering local facilities including a Lido, spa and restaurant. As a community benefit society, it **reinvests surplus income into local environmental projects**, enhances river ecology with a new fish pass, and strengthens community engagement through **education and public access**.

Venturi Enhanced Turbine Technology (VETT)

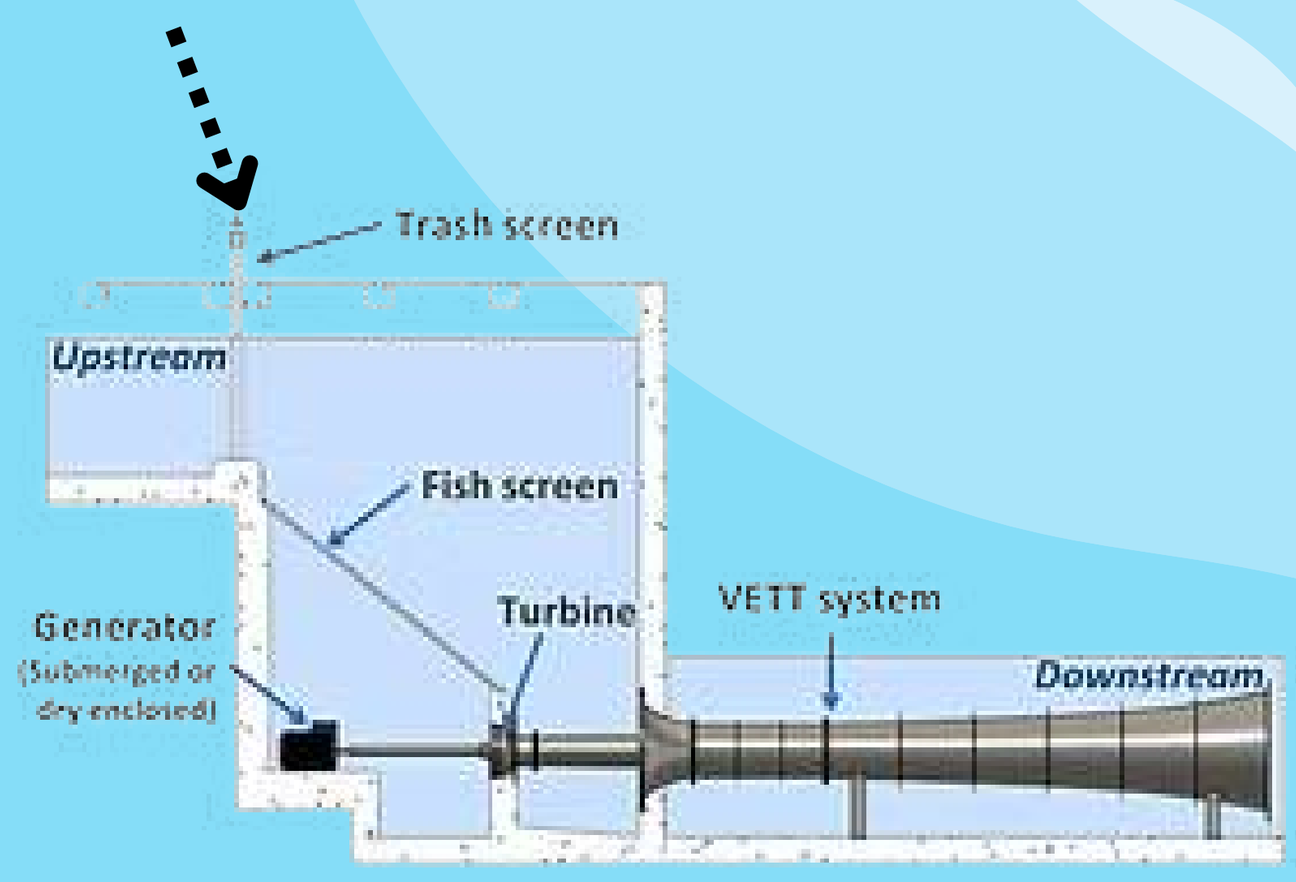
Above surface - the only visible structure is the control system housed in a compact kiosk (1.5m x 1m x 0.5m).



Debris screen and sluice gate to stop blockages and control the water flow.

The turbine and generator are housed below ground along with the VETT system pipe. **The result is a noiseless operation with very little visual impact.**

Screens prevent blockage and maintain efficiency. Further screens protect ecology from being harmed.



The VETT system before being installed into a dug out chanel which is then backfilled and re-planted to create wildlife habitat.

The outflow will discharge into discharge structures below the water level which will reduce the velocity.

Proposed positioning of the two VETT turbines on Ash island.

Key

Not visible - hidden below the surface with wildlife habitat established on top.

Visible from the surface

Detail

Intake: This will be positioned at the location of the current boat slip. It will require widening and deepening to reduce hydraulic losses.

Excavation channel: A channel will be dug to allow concrete cases for each turbine to be sunk and backfilled. The placement of the VETT turbines is as far towards the downstream bank as possible to reduce the amount of excavations required.

Access: a grate/ manhole at surface level will permit access to the generator and turbine.

Control system: This is the only visible part of the installation (except the existing boat slip). It will be dark green for camouflage and will stand 1m high by 1.5m long by 0.5 m wide.

Frequently Asked Questions

What is the purpose of the project?

The project aims to generate clean, renewable electricity for local use, helping to reduce carbon emissions and energy costs while improving local energy self-sufficiency. A combination of Direct Supply and the creation of a Local Energy Club(s) will be used to supply residents in the local community with a share of the hydropower generated energy at a discounted rate.

What is the expected output of the project?

Total Design Flow (m3/s)	10.5 m3/s
Average Net Head (m)	1.64 m
Number of VETT Units	2
Total Installed Capacity	80kw
Load Factor	61%
Annual Energy Generation	418 MW/yr

Will we be able to buy energy at a discount?

It is expected that a Direct Supply arrangement (including updated electrical infrastructure) will be available for Ash Island (presently approx. 20% of generation demand). The remaining 80% of generation will be exported to the grid via local sub-station(s) and through Local Energy Club arrangements with a national Electricity Supplier (such as Octopus Energy) and be made available to supply residents on Taggs Island (presently approx. 65% of generation) and those residents on the Thames banks who are served by the connected sub-station(s). Advantages to the community are:

- Access to locally generated green renewable energy,
- Hydropower energy generation matches the peak heating season demands, October to March every year,
- Reduced demand on the National Grid, providing increased local energy security, and
- Discounted supply rates should be available, both through the Direct Supply and Local Energy Club membership routes.

How will the project be funded?

To date, the project has received grant support from the UK government's Department of Energy Security & Net Zero Greater South East Net Zero Hub (GSENZH) to fund an early feasibility study. Stage 2 funding (design & statutory approvals) may be available from GSENZH or Great British Energy. Thereafter, procurement & construction will be financed through a combination of a community share offer and specialist green project financing loans. This approach allows local residents to have a financial stake in the project.

What construction works are involved?

Excavation (and backfilling afterwards) of a new channel across Ash Island to provide waterflow and installation of the turbine machinery. All construction will be carefully managed to minimise disturbance to residents & river users and the local ecology. Materials and construction equipment will be pre-loaded upstream or downstream and brought to site via barges and floating pontoons. Spoil and waste extraction will be managed in a similar way. An overall construction management sequencing and health & safety plan will be agreed with Ash Island residents prior to commencement.

What is the environmental impact of the turbine machinery?

The turbines will be installed fully below ground, allowing the project to be largely hidden from view, both visually and aurally. Only the control system (small electrical cupboard), sluice gates and guard railings around the debris screens are above ground. This underground installation enables post excavation improvements to the surrounding environment through renewed landscaping and planting, with opportunities to enhance local biodiversity.

Will the turbines be noisy?

One of the major benefits of the VETT (Venturi-Enhanced Turbine Technology) technology being installed below ground is that there is no audible noise emission from the turbine. The VETT downstream discharge itself is submerged so there is little to no splashing or churning of flow.

What are the Ecological impacts of the project?

The majority of the site consists of edge woodland habitat, with few tree or shrub species present and is more characterised by open space. There was no recognisable woodland NVC plant community at ground layer present. Up to three trees present on site may be removed as part of the development, all of which are medium-sized sycamores (Acer pseudoplatanus) along the northern edge of the woodland habitat. In accordance with the Statutory Biodiversity Metric Condition Assessment Matrix, the deciduous woodland was assessed to have a poor condition value.

The proposed development may require a Biodiversity Net Gain assessment, to calculate the value of habitats on site and ensure the delivery of a minimum of 10% measurable biodiversity net gain. In addition, a low impact lighting strategy will be adopted for the site during and post-development, which will be designed to incorporate the measures laid out in the latest (2023) bat lighting guide Guidance Note 8 Bats and Artificial Lighting1.

Is VETT technology approved for fish screening?

Live fish trials were conducted in 2014 and 2016 under a scope developed in coordination with the Environment Agency and ecology experts. VETT technology was subsequently approved for installation in the UK by the Environment Agency.

Within a VETT system, only 20%-35% of the total flow actually passes through the turbine. Only this area will require fish screening. Fish and eels can pass through the rest of the venturi pipe unharmed and continue their natural migration.

Where else is VETT technology used in the UK?

Eaton Socon, River Great Ouse, Cambridgeshire was the first commercial VETT installation in the UK. It was commissioned in 2020 and is producing approx. 70 MWh/year. It operates using a 1.2 m net head between a marina/lake and mill pond and is installed within a disused underground culvert.

- Notable features include fish-safe design, zero noise, and remote operation.
- The installation also improved eel passage and fish populations in the area.

How will the system be maintained?

Ongoing maintenance post construction is a core part of the project's design and financial planning. A detailed plan for remote monitoring, regular servicing and maintenance and both regular and emergency debris removal will ensure the installation is regularly inspected and kept operating efficiently over the long term.

What are the benefits to the local community?

The project is designed to deliver both environmental and social value. Local residents will be able to invest through community shares, helping to build a sense of ownership and a financial return. Any surplus income, once the project financing costs are cleared, will be reinvested into local environmental initiatives and community projects.

What approvals are required?

We have already received advice from the London Borough of Richmond (the local planning authority) and the Environment Agency as part of their pre-application process to ensure that the requirements of the detailed statutory approvals required are understood and can be achieved. Apart from local authority planning, Environmental Agency approvals needed will include:

- Abstraction licence
- Fish pass approval
- Environmental impact for flood risk activity

Grid connection approvals will also be required from our local Distribution Network Operator (DNO).

Will the planned Thames River Scheme effect the project?

The River Thames Scheme (RTS) is a £640M flood relief scheme planned to reduce the risk of flooding to thousands of homes, businesses and vital infrastructure while unlocking the economic, health and environmental benefits of the Thames between Egham and Teddington and responding to the challenges of climate change and nature recovery. Additional river level control gates are planned at Sunbury, Molesey and Teddington weirs to provide additional flow area for water to move downstream.

Construction of the new radial gates on Molesey Weir are at the north-west end of Ash Island, well away from our proposed site. This is a UK Government Major Infrastructure Project that has been in the planning process since 2009/10. The earliest date for any construction to commence is presently 2030.