

Case Study - Cardiff Harbour Authority

Background

Cardiff Harbour Authority (CHA) was formed as part of Cardiff Council on the 1st of April 2000. The Cardiff Bay barrage which encloses the bay, was, and to some extent still is, a controversial development with regards to its environmental impact and due to the ongoing costs. This case study is looking at what the Harbour Authority is doing to maintain environmental standards.

The Barrage



The barrage was constructed to separate the freshwater impoundment from the Severn Estuary. It is 800 m long along with a 300 m long section containing locks, sluices, bridges, fish passage facilities and a control building. The embankment on the Bay side is landscaped to provide a park, while rock stone armour protects the seaward side of the barrage

The Harbour Authority has a range of statutory duties and responsibilities. Operationally the Harbour Authority is responsible for the management of the Barrage and the Bay, including

the rivers Taff and Ely up to the weirs at Blackweir and the former Arjo Wiggins respectively. The Authority also has an important environmental role in Cardiff Bay and is responsible for maintaining the water quality within the 200- hectare freshwater lake and environmental management, in addition to groundwater monitoring and control, the promotion of conservation, and the management of Flat Holm Island.

The Authority's commitment to environmental management is demonstrated by it becoming the first Harbour Authority in the UK to obtain ISO 14001 accreditation and Green Dragon level 5. For further info <http://www.greendragonems.com/english/index.asp>

What is the problem and what is being done?



Cardiff Bay has become a fresh water harbour as a result of building the barrage. This has changed the ecology of the area and has created its own challenges.

Photo courtesy of www.petitcodiac.com/cardiffWales-e.htm



Algae

The environmental conditions within the Bay and rivers are favourable for the formation of large blooms of planktonic algae. Blooms can die forming scums on the surface of the water. Blue green algal scums may contain toxins that could pose a risk to public health and decaying blooms may also cause a breach of the oxygen standard (see below). The Harbour Authority has therefore purchased equipment for the removal of scums from the water surface and has procedures in place for doing so should the need arise.

Dissolved Oxygen

Under certain conditions, particularly during the summer months when the weather is warm, and there is little wind and rain, the dissolved oxygen levels in the deeper waters of the Bay will naturally drop. Low dissolved oxygen levels could significant impact upon the fish, invertebrate and birds living in and on Cardiff Bay. The Cardiff Bay Barrage Act 1993 requires the dissolved oxygen levels to be at a minimum of 5mg/l in all places and all times. Cardiff Harbour Authority uses an aeration system to mix the water thereby raising the dissolved oxygen levels in the deeper waters of the Bay. There is continuous water quality monitoring and oxygen is added to the water using a mobile oxygenation vessel if needed.

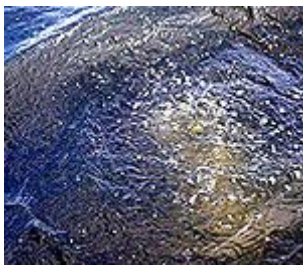


Photo courtesy of www.cardiffharbour.com/environment/w_aeration.htm

Pollution incidents

The Harbour Authority is responsible for managing the water quality of the Bay to provide an area of high ecological and recreational value. The Harbour Authority has developed emergency plans and procedures to minimise the impact of any pollution incidents.

Litter and debris in the Bay

At times of high river flow the two rivers transport large quantities of debris from their catchments into the bay. Prior to the barrage this material entered the Severn Estuary, much being subsequently deposited along the coastline of England and Wales. The Harbour Authority has purchased specialised litter/debris collection vessels and these together with land-based staff remove around 1000 tons of debris per annum from the area of the bay.



Out of the total of 944 tonnes collected in the period 2005-06, 19 tonnes of clean bulky timber was diverted from landfill and used to fuel the biomass boiler in the Environment Building thereby providing heat and hot water from a renewable resource.

The Harbour Authority has also implemented recycling measures in the office and all other buildings under its ownership where feasible. All plastics, cans, paper, glass and cardboard are recycled. www.cardiffharbour.com/environment/w_litter.htm for more information

Recreational management

Cardiff Harbour Authority manages a water activity sports centre offering canoe, sailing and rowing tuition and organised access to the Bay for pilot schemes such as wind surfing and water-skiing. The wash created by speeding vessels in rivers can disturb nesting areas and contribute to bank erosion. The Harbour Authority has therefore set a maximum speed limit of five knots to minimise these effects. The speed limit is enforced by the harbour patrol vessels and speed tracking systems are being installed on commercial vessels operating in the Bay.

The increasing number of recreational vessels moored in the Bay results in an increased risk of water pollution from oily discharges and marine toilets. To reduce the risk the Harbour Authority has installed both bilge water and chemical toilet discharge facilities at the southern end of the barrage that are available to boat users free of charge.

The Harbour Authority has implemented a number of other improvements:-:

- The installation of a biomass boiler in the Harbour Authority's Environment Building.
- The installation of other renewable energy products such as solar panels on the Environment Building and photovoltaic cells on water quality telemetry stations, LED displays in waterbus shelters and pay and display meters
- All staff are encouraged to be environmentally aware and save energy around the office. Targets are set for the reduction of electricity consumption. All energy invoices and consumption levels are monitored on a monthly basis so that action can be taken to ensure the targets are met.

Conclusion

The Harbour Authority aims to provide a high quality environment by:

- Water quality monitoring to determine bacterial content
- Aerating the water when necessary
- Collection of litter and debris in the water
- Effective response to accidental oil spills
- Provision of guidance to prevent the spread of zebra mussels, an alien species
- Provision of bilge water disposal facility
- Using waste wood to heat the Environmental Building
- Using solar panels and photovoltaic panels
- Collection of rain water to reduce water use.

The development of the Bay did remove an important wetland. An alternative location was established as mitigation and this has had some success. Information about the wetlands can be found at

<http://www.rspb.org.uk/reserves/guide/n/newportwetlands/about.asp>



Walkway through the wetlands

http://www.cardiffharbour.com/environment/c_wetlands.htm