

## CSR case studies



### BAA

**A water management scheme at Terminal 5 reduces BAA's reliance on mains water and economically harvests water from rainfall on campus and boreholes on its own land.**

#### ● The company

BAA is the world's largest airport operator. It manages seven airports in the United Kingdom: Heathrow, Gatwick, Stansted, Southampton, Aberdeen, Glasgow and Edinburgh. In Europe, it manages Naples airports and, farther afield, it has a stake in airports in Australia and the USA. In total, BAA airports serve 370 airlines and around 160.8 million passengers per year.

The London airports are globally important with 122 million passengers travelling through them in 2005/06. Each year, one in seven of all international passenger journeys involve one of these airports.

BAA's approach to corporate responsibility (CR), as it calls corporate social responsibility, comes from its belief that it is not peripheral or optional. CR sits alongside financial profitability as a key driver of long-term value because BAA recognises that whilst airport operations create huge social and economic benefits, they also generate social and environmental impacts and only by addressing these can it earn its licence to grow. The development and operation of Terminal 5 (opening in March 2008 with an expected 30 million passengers per annum) represented an opportunity to demonstrate CR by building a terminal that would demonstrate innovative approaches to reduce environmental impacts.

Following a period of detailed design, construction work on Terminal 5 (T5) started in summer 2002. To deliver T5, the board of BAA plc appointed a T5 executive to deliver

the design and build stages. The design phase involved considering the aesthetics, functionality and environmental impacts of the terminal.

This case study focuses on how BAA integrated environmental considerations – specifically water management – into the operations of the new Terminal 5 at Heathrow.

#### ● The drivers

Heathrow is the country's national airport gateway and key component to the economic prosperity and competitiveness of London and the UK. However, with in excess of 60 million passengers per year using facilities designed for 10 million fewer, it has become increasingly congested and is losing ground to European competitors. While a new terminal would provide both economic and social benefits, there was fierce opposition by various groups concerned about environmental impacts, for example, aircraft noise and road congestion. The recognition of its duty to expand operations in an environmentally responsible manner and commitment to address these concerns was a driver to reduce impacts during the building and lifetime of T5.

Another driver was the desire to reduce the company's reliance on the local water. This was for a number of reasons, which included reducing the company's exposure to likely future water rate increases; the impacts of future water shortages and an increase in water use in the area. BAA did not want to be perceived as an aggravating factor, so reputation was an additional driver.

### ● Taking action

An environmental assessment advisory group (EAAG), which included the BAA Terminal 5 environment team and independent environment experts was established to advise on the design and building of Terminal 5 so that best practice could be applied to deliver best practice solutions. Its role was to challenge the T5 project team to ensure issues like energy, waste, water and environmentally sensitive materials were considered, and to provide advice. This group provided the governance.

Water was one of eight areas identified by the EAAG. The T5 project team researched water use at existing terminals at Heathrow, including the source of the water, how it was used and its disposal. A key finding was that roughly 70% of water use was for non-drinking requirements, for example toilet flushing, irrigation, aircraft cleaning and fire control. This 'grey' water does not have to be the same water quality as that supplied by the local water company, Three Valleys Water.

Because the process of making the public water supply potable is energy intensive and T5 did not require drinking water for up to 70% of its operations, BAA sought alternative solutions to the mains supply. This provided the additional cost benefits of not being as reliant on mains water and exposure to increased water rates.

BAA had already set progressive targets to reduce water use per passenger at its terminals. The cost of retrofitting to achieve these targets at its existing terminals, for example reducing water use in flushing toilets is expensive, so the construction of T5 provided an opportunity to reduce water use through design solutions.

To explore the possibilities for using different sources of water other than mains, BAA consulted and worked closely with the Environment Agency (EA), the leading public body for protecting and improving the environment in England and Wales. This was a ground breaking partnership, as previously

the EA would comment on proposals rather than get involved in developing the proposal. By working closely with the EA, potential issues were readily identified and collectively solutions were found.

BAA decided to obtain water from two sources – harvested rainwater and groundwater abstraction from two boreholes, all on BAA land. It was important for BAA to ensure the boreholes were commissioned early on in the construction phase, so that this water could be used in the construction of T5 for all kinds of non-drinking uses including dust suppression, concrete production, in welfare facilities etc. Geologists and modellers were used to best locate the boreholes and test the impacts of the abstraction on the aquifer. An abstraction licence was applied for and the boreholes were drilled 150 metres down into a chalk aquifer. In addition to the borehole water, all rainwater falling on the T5 catchment enters a surface water drainage system, which discharges to a previously existing lake. BAA then draws water from the lake to service its 'grey-water'/ non-drinking water requirements, i.e. toilet flushing.

The system involves 4.1 kilometres of tunnel. The tunnel has an ingenious dual operating mode that allows water to travel down into the lake and also back up through abstraction to T5.

It was not all plain sailing and five proposals were considered within a short two-month period. The schemes were evaluated against a business case, i.e. the capital investment of infrastructure involved versus water volume collected and savings in water costs. For example, studies using only the roof of T5 (a combined size of 6 hectares or 10 football pitches) to collect and store rainwater revealed it would not yield enough water. So rainwater run-off from the whole T5 campus needed to be included.

The final design means that 30% of T5's grey water requirements will come from boreholes and the remaining 70% from a rainwater harvesting scheme. Up to 85% of the total

rainfall falling on the T5 can be harvested using the system developed at T5. It meets the operational goal of reducing T5's demand on the public water supply by 70%.

● **Business benefits**

It provides a sustainable solution to the supply of water at Terminal 5.

There are major energy savings, as non-drinking water does not require the same level of treatment to achieve the Drinking Water Standards.

There are operational cost savings by obtaining water from boreholes and rainwater harvesting rather than buying it from the public water supply. The water system at T5 will reduce BAA's water rates, as it reduces the need to procure water at 45 pence per metre cubed, to 4 pence per metre cubed when from rainwater harvesting and 5 pence per metre cubed from boreholes.

Other benefits are new relationships and strengthened partnerships, particularly with the Environment Agency.

● **Why is it CSR?**

The water management programme at Terminal 5 is part of BAA's approach to CR as it reduces the environmental impact associated with water use and uses a natural resource – water – as efficiently as possible.

● **What next?**

The water management scheme at T5 has the potential to inspire other constructions and be replicated at other locations.

**Contact us**

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