

# Collecting and shredding carpets from Household Waste Recycling Centres

Blackwater Ltd collects over 1,000 tonnes a month of post-consumer carpets from domestic and commercial sources located in northern England and Scotland for recycling into equestrian surfaces or fuel flock for waste recovery.



## **Shredding of carpets for equestrian surfaces and recovery: Alnwick, Northumberland**

This is an example of the collection of post-consumer domestic and commercial carpets from Household Waste Recycling Centres (HWRCs). The collection is undertaken by Blackwater Ltd using its own vehicle fleet. The carpets are subsequently shredded to produce equestrian surfaces or fuel flock.

## Key facts

Organisation: Blackwater Ltd

Type of business: Private waste contractor

Location: Alnwick, Northumberland, England

Type of non-textile: Post-consumer carpets from domestic and commercial sources

Type of collection: Collection from HWRC sites

Tonnes collected per year (2010/11): 1,000 tonnes per month

Recycling rate (2012): 50%

Energy recovery rate (2012): 50%

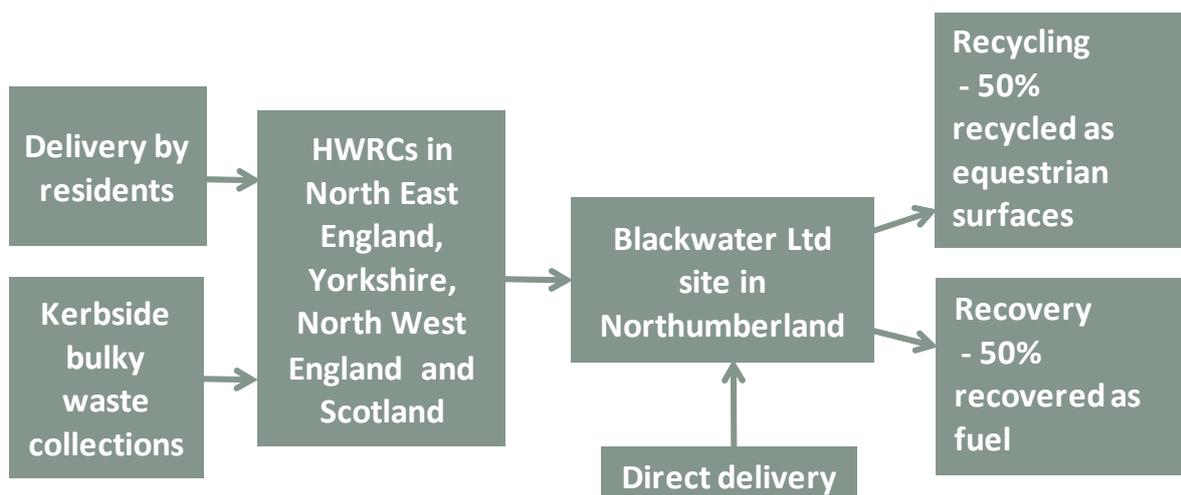
Number of full-time equivalent employees: 9

## Introduction and background

Since 2011, Blackwater Ltd has been collecting waste carpets from HWRC sites in Scotland and northern England. Owner, Jim Douglas contacted local authorities with the offer of a service to collect and recycle their carpets for less than the cost of sending them to landfill. The carpets are brought to its site near Alnwick to be sorted, shredded and processed into material either suitable for use in equestrian surfaces or as a fuel source. The shredded material is used as a riding surface in arenas and horse manèges (schooling areas for horses) all over the UK, from Aberdeen to the south coast.

## Description of the operation

Carpets are either delivered directly to site by waste management companies or collected by Blackwater's articulated lorry with a walking floor trailer. Blackwater sources waste carpets from HWRCs in northern England including Northumberland, Durham, Cumbria and North Yorkshire. It also carries out collections from HWRCs in Scotland including in Glasgow, Fife, Renfrewshire, East Ayrshire, West Ayrshire, West Lothian, Scottish Borders, Aberdeen, Edinburgh and East Lothian. The material is segregated from other waste streams on arrival at the HWRCs and protected from the weather.



Loads are hand sorted into synthetic and natural fibre batches which are processed separately. Main contaminants are metals, which are sent on for recycling. The carpets are sorted because only synthetic material can be used for stable outdoor equestrian surfaces as it doesn't break down, unlike natural fibre. Carpets are fed into the shredder by a small excavator. The shredded material is transferred via a conveyor belt to a baler. Once compacted and baled, the shredded material is moved by a forklift to the storage area.

## Performance/outcomes

Number of collections/deliveries: Around 10-12 per week using walking floor articulated lorries, approximately 17-23 tonnes each.

Non-clothing textiles collected: Around 12,000 tonnes per annum

Recycling rate: 50%

## Innovation/good practice

Blackwater's shredded carpet and underlay-based equestrian surface satisfactorily passed the Environment Agency's 'end of waste' test. This requires the demonstration that the product can be used in the same manner as a virgin product without having any detrimental effects on the environment or human health. Blackwater's equestrian surface can be used in its present condition and is a suitable replacement for surfaces made of synthetic fibres such as nylon or polypropylene, elastic fibre and granulated rubber. This process allows for approximately 6,000 tonnes of carpets to be recycled each year into equestrian products rather than going to landfill. A further 6,000 tonnes of carpet is shredded for use as fuel recovery abroad, saving on the use of coal in cement production.

## Description of costs and revenues

A summary of the main annual costs and revenues (detail given where provided).

### Costs:

Licensing/set up costs: planning permission, licensing and insurance around £25,000.

Collection vehicles: One walking floor articulated lorry, around 90m<sup>3</sup> volume (operating within approximate 250 mile radius of site) estimated cost of each second hand vehicle £60,000.

Site vehicles: One telescopic forklifts and one counterbalance forklift (around £55,000) and one excavator (around £7,000)

Buildings: One warehouse (around 1,500 m<sup>2</sup>), a small office and a weighbridge (around £15,000).

Specialised equipment: 1 baler (estimated £35,000 second hand) and 1 heavy duty single shaft shredder with cutting knives (estimated £250,000). Replacement cutting knives for the shredder blades are also needed (£8,000 per annum, assumed 10 year lifetime)

Dedicated staff: 9 FTEs and 1 PTE (3 drivers, 3 operatives, 3 office staff and 1 PT finance)

Energy and water use: Energy use around £50,000 per annum

Fuel use: Around £50,000 per annum for collections and £8000 per annum on site.

Delivery of all materials using own vehicles

### Revenues:

Around £60/tonne of materials collected (around £720,000)

Collection fees: Haulage fees of around £1.25 per tonne of materials collected per km (around 70,000 km per annum)

Sale for fuel at £50/tonne (around £300,000)

Equestrian surfaces: £50/tonne (around £300,000)

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**Figure 1** The blade and cutting knives inside the shredder (left); carpet being loaded into the shredder (right)



### **Conclusions/key learning points**

This is an example of an efficient and fast growing operation which shreds over 230 tonnes of carpet a week. Care is taken to assign the different materials to their best end use. The shredded product is then baled and sold on for use in equestrian arenas and to be used as fuel as a direct replacement for coal.

The operation allows for the processing of relatively large amounts of carpets, carpet tiles and underlay (1,000 tonnes a month). Blackwater Ltd carries out stringent environmental testing, providing a regulated product. Jim Douglas, MD at Blackwater Ltd says "We are trying to solve the serious problem that waste carpet creates by providing local authorities with a better alternative to landfill".

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