My interest in land restoration started about 20 years ago, when I was involved in a project for British Coal, based at Newcastle University.

The project highlighted to me the variety of opportunities that were available in the sector, as well as potential areas for development within soil science with respect to land restoration.

Following the successful completion of the project I decided to set up my own consultancy, Soil Environment Services, which now employs six people. We have worked on a number of projects, providing advice on all current major soil issues. A particular focus has been on exploring different ways of restoring brownfield sites, on which we have undertaken a series of studies.

The main issue when regenerating brownfield sites is restoring the land to a high quality as quickly and cost-effectively as possible, especially if it is contaminated. A common method developers have used has been to import quality topsoil onto sites and dispose of contaminated material to landfill, which can be costly and detrimental to the environment.

In addition, developers have used sewage sludge and manure to restore and regenerate the land, which provides only short-term benefits. During the past 10 years compost (which is produced primarily from municipal garden waste such as grass cuttings, prunings and leaves) has become a material that has been much more readily available, and through our projects we have investigated its use in land restoration and regeneration.

Compost can have high nutrient levels and, when mixed with other materials such as paper mill crumb to manufacture topsoil, provides an excellent balance of nutrients and water retention capacity, giving plants ideal conditions for root growth.

Once the roots of the plants have been established, the soil is also less susceptible to erosion, providing longterm benefits with respect to reducing maintenance costs and replacing weak or unhealthy plants.

If the soil manufacturing process is carried out on site, using existing subsoils, mineral materials and locallysourced quality compost, the need to import new topsoil from elsewhere is eliminated, saving on transportation costs. Using quality compost also helps to meet the Government's landfill diversion targets, making the whole process sustainable and cost-effective.

During the past year we have been working with WRAP (Waste and Resources Action Programme) to look at the practical, economical and environmental issues of implementing a soil development strategy using quality PAS 100 compost to regenerate the brownfield land of the former Lambton Cokeworks site in County Durham. The site, which extends to more than 60 hectares, forms part of the National Coalfields Regeneration Programme, managed by English Partnerships.

The land has been earmarked for the development of 350 new houses, woodland and open space, and the developers wanted to restore the land without importing topsoil into and exporting contaminated material out of the site.

The site had a shortage of soil reserves available and, as the end land uses will mainly consist of woodland and grassland, there was a need to develop appropriate soils to support sustainable, healthy plant communities that would establish quickly.

From our experience of previous research and trials, we decided that BSI PAS 100 compost would contain the best form of organic matter with which to manufacture soil on site – both physically and in relation to plant nutrients.

We have already carried out a series of successful pilot and full-scale trials on part of the site, which used 6,500 tonnes of BSI PAS 100 compost. A variety of soil profiles were required for the woodland and grassland areas. Both topsoil and subsoils were manufactured on site, using varying proportions of colliery shale and paper mill crumb mixed with the compost.

The trials have resulted in successful and quickly established tree and plant communities, which provided the partners involved in the site regeneration with the reassurance they needed to regenerate the whole site using the technique. The trials found that the best soil profile for the woodland was two metres deep, with 1.90m of subsoil, comprising upper and lower subsoil. The

lower subsoil contained paper mill crumb and colliery shale (in a ratio of 5:2) and the upper subsoil contained quality compost, paper mill crumb and colliery shale (on a ratio 1:1:5), which was covered with 0.1m site-won topsoil.

The grassland soil profile was 0.25m deep, with 0.2m of subsoil, consisting of paper mill crumb and green waste compost (50:50) and 0.5m topsoil.

The site was the first project to sign up to WRAP's brownfield 'trailblazer' programme, which has been designed to help developers, designers and contractors realise the financial and environmental benefits of specifying high-quality compost in brownfield projects. It is expected the regeneration of the whole site will use a total of up to 50,000 tonnes of BSI PAS 100 compost and is due for completion in the spring of 2009.

The overall results from the initial trials have shown that manufacturing topsoil and subsoil on site, using mixtures of colliery shale, paper mill crumb and BSI PAS 100 compost, is a practical, costeffective and environmentally beneficial way to regenerate brownfield land. We estimate that using this method to regenerate the Lambton site will save the project a staggering £1.2m compared with using the traditional soil importation method.

We hope that the work we have undertaken already, and the results we have achieved with projects such as Lambton Cokeworks, will illustrate the cost and environmental benefits of using BSI PAS 100 compost to those involved in the regeneration and restoration of brownfield sites.

To find out more about using PAS 100 compost in brownfield regeneration projects, contact Paul Mathers at WRAP, on 01295 817899; or visit www.wrap.org.uk/composting.