



**British  
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL



[www.bgs.ac.uk](http://www.bgs.ac.uk)

# Economic information for planning

Fiona McEvoy

Economic Geologist and GIS Specialist

Kingsley Dunham Centre  
Keyworth  
Nottingham NG12 5GG  
Tel 0115 936 3100

© NERC All rights reserved



# Overview

- Original MIST project environmentally focused but only part of the picture surrounding aggregate extraction
- Integrate environmental data with other key datasets
- Key concern in planning is where to source aggregate
- Recycled material not suitable for high specification uses
- Different qualities for different end-uses
- Sustainable = economic and environmental



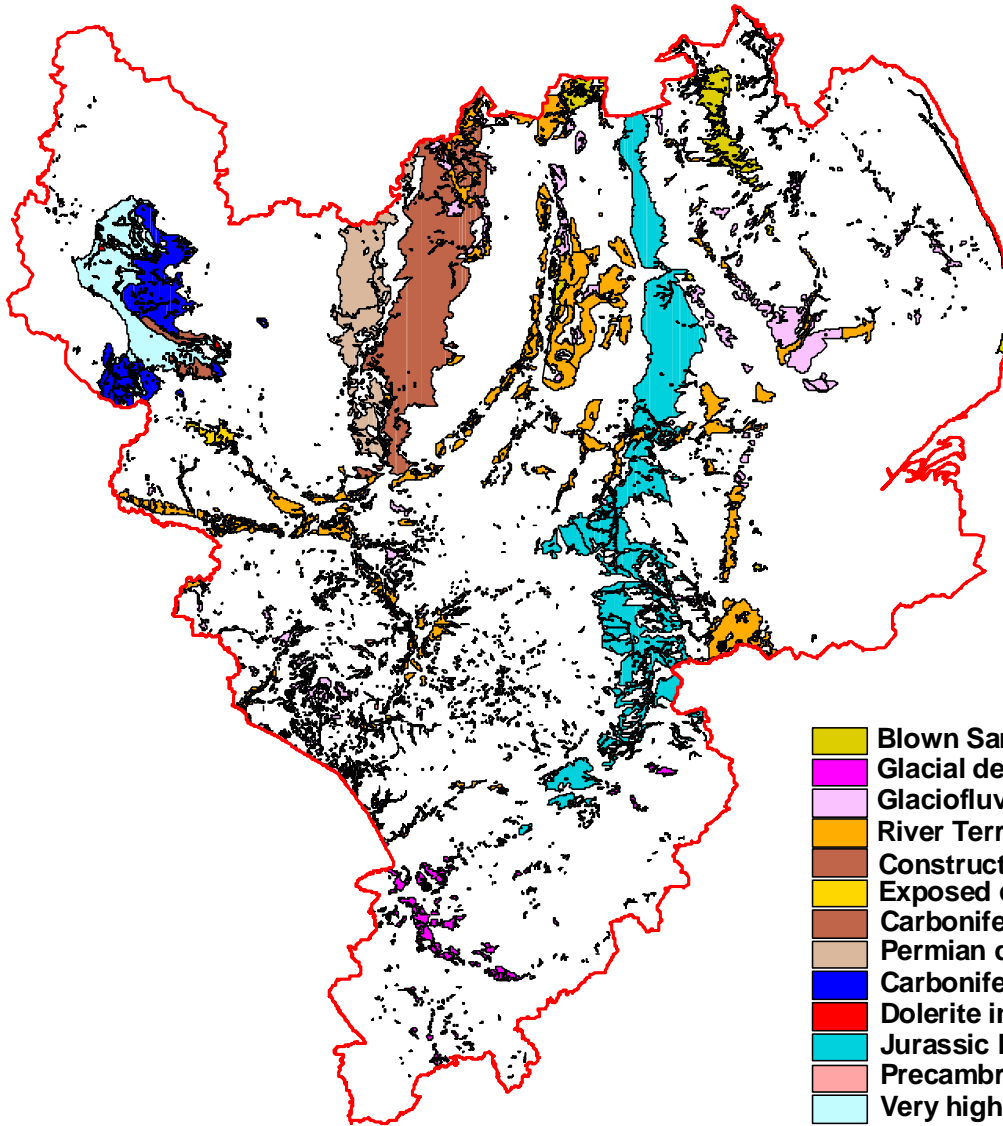
# Objective

- To assign technical specification attributes to aggregate resources in the East Midland Region
- Key technical properties include PSV, AIV, AAV, Water Absorption, Aggregate Crushing Value, 10% Fines Value, Micro-Deval Coefficient and Los Angles Coefficient.
- Information on sand to gravel ratios and clast composition will be incorporated where available.
















# Methodology

1. Collate technical property data including:
  - Data previously held by BGS
  - Industrial Minerals Assessment Unit (IMAU) data
  - Data provided by current operators in the region
2. Develop a methodology to representing each of the technical properties in the GIS
3. Develop a methodology to combine the technical properties datasets into end-use suitability maps



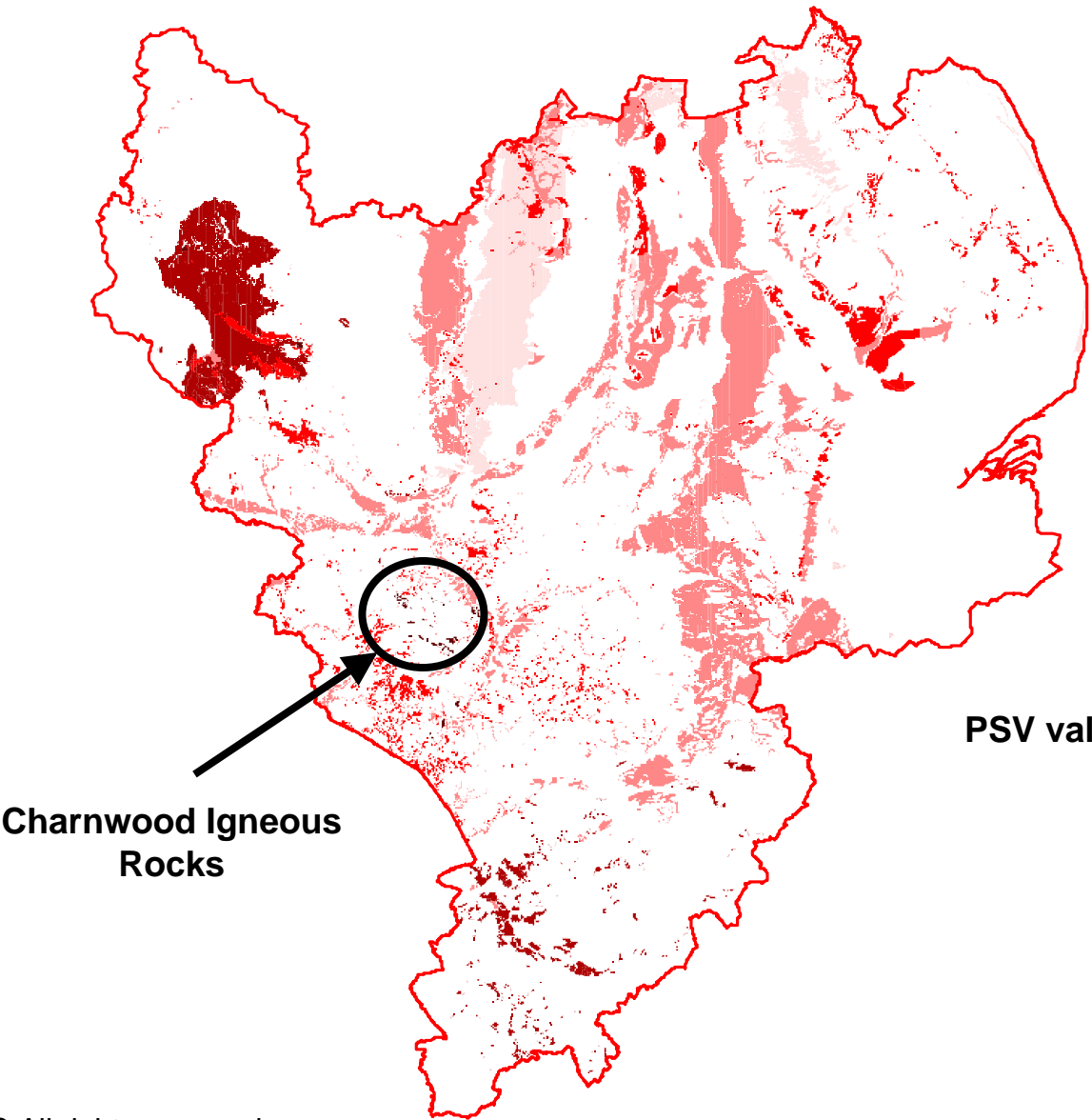
## Aggregate resources of the East Midlands Region

-  Blown Sand
-  Glacial deposits
-  Glaciofluvial deposits
-  River Terrace deposits
-  Construction & Silica Sand (Sherwood Sst Gp)
-  Exposed conglomerate (Sherwood Sst Gp)
-  Carboniferous dolomite & dolomitic lmst
-  Permian dolomite & dolo lmst (Cadeby Fm)
-  Carboniferous limestone
-  Dolerite intrusive rocks
-  Jurassic limestone (Lincolnshire lmst)
-  Precambrian/Cambrian intrusives & volcanics
-  Very high purity limestone (>98% CaCO)



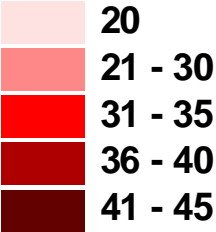


**Example PSV values of aggregate resources**



Charnwood Igneous Rocks

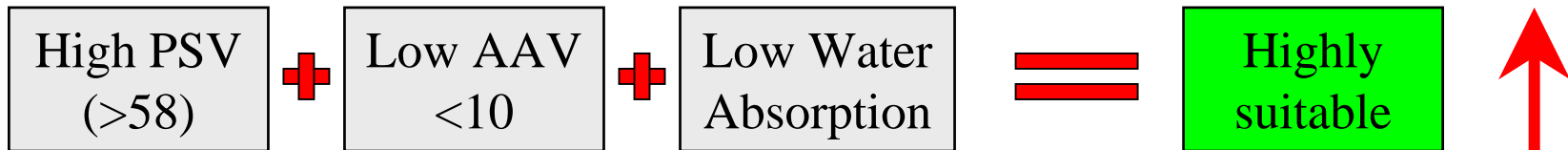
PSV values of aggregate resources



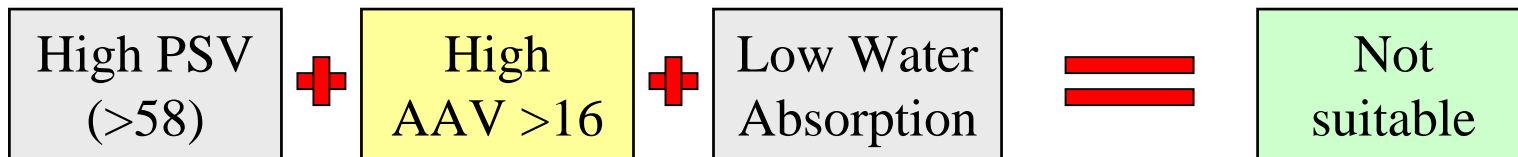


# End-use suitability

Example: High Specification Aggregate for road surface dressing



Example: Pennant Sandstone (S. Wales)  
Ordovician greywacke (YDNP)



Example: many sandstones including ORS (Devonian)  
Millstone Grit (Carboniferous)



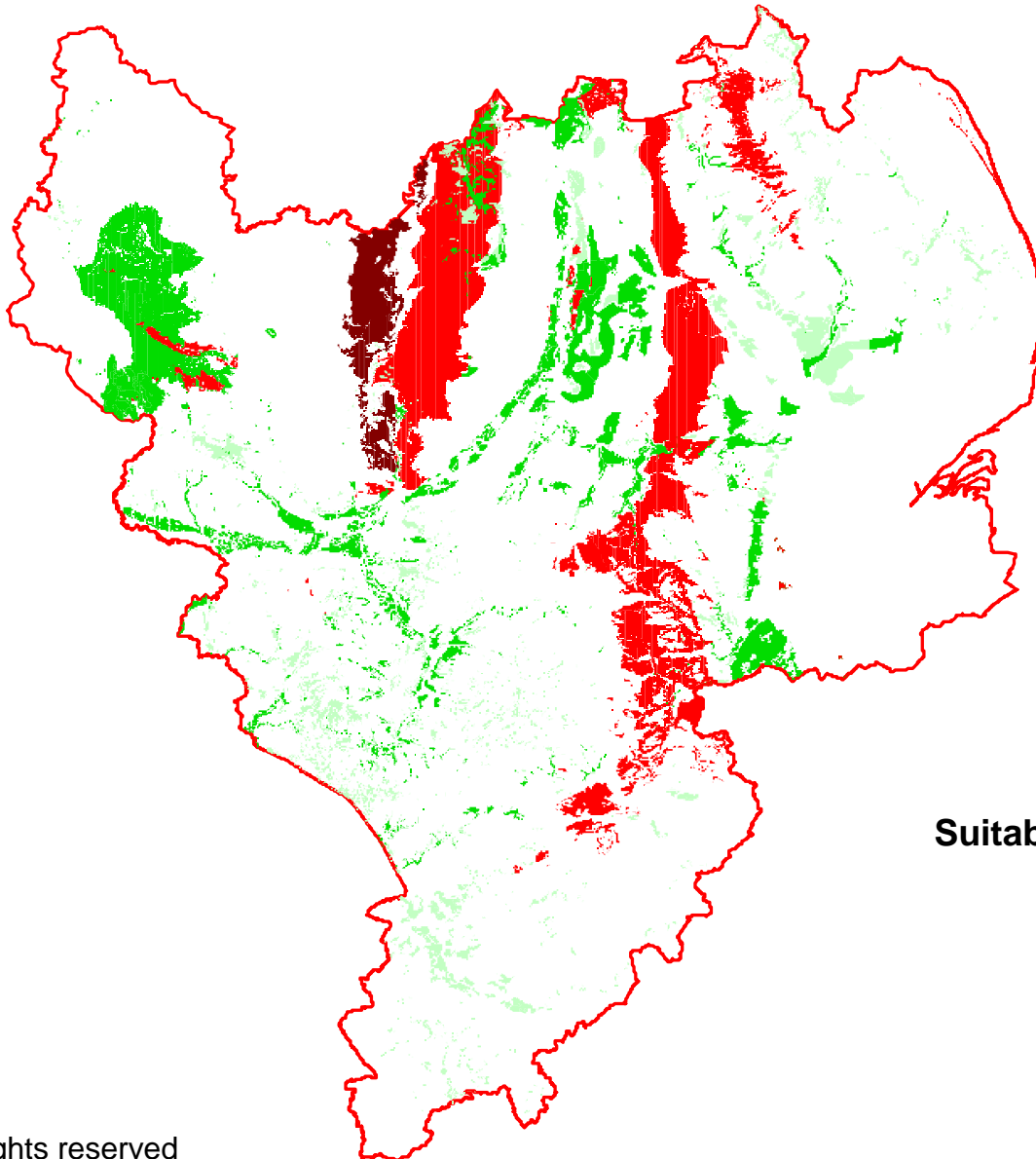


British Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

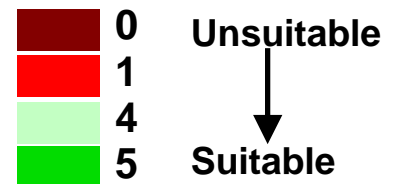


[www.bgs.ac.uk](http://www.bgs.ac.uk)



## Suitability of resources for concreting applications

Suitability for concreting aggregate







# Limitations

- Lack of baseline data
- 49 active sand & gravel quarries
- Large gaps in data knowledge
- Need to collect new baseline technical properties data
- New specifications – new and old data to different standards



# Summary

- This project is attempting to integrate environmental and economic information to support planning for the future supply of aggregates
- This baseline data will not only inform decision making but also help explain the decision making process in this increased climate of public participation
- Its an objective and transparent method of presenting these disparate datasets



**British  
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL



[www.bgs.ac.uk](http://www.bgs.ac.uk)

# Yorkshire & Humber: Sand & gravel and environmental assets

Fiona McEvoy  
and  
Ellie Steadman

Kingsley Dunham Centre  
Keyworth  
Nottingham NG12 5GG  
Tel 0115 936 3100

© NERC All rights reserved



# Introduction

- Regional Assembly (RA) and RAWP seeking advice on apportionment
- First region to use the ODPM 'Guidance on good practice on the environmental appraisal of the provision of aggregates'
- Step 4 of the guidance requires a 'resource and constraint map'
- RA commissioned BGS to carry out Step 4
- Relatively small project, 3 months duration



# Objectives and stages

## 1. Resource identification;

- General extent of sand and gravel
- Extent of sand and gravel potentially suitable for concreting aggregate

## 2. Identify environmental and cultural assets; and

## 3. Produce a composite environmental and cultural assets layer.





# Stage 1: Resources

## **LEVEL 1**

**IDENTIFICATION OF BROAD SAND AND GRAVEL RESOURCES  
IN THE REGION**

## **LEVEL 2**

**IDENTIFICATION OF RESOURCES POTENTIALLY SUITABLE FOR  
CONCRETING AGGREGATE**



# Stage 1: Resources

## LEVEL 1

### IDENTIFICATION OF BROAD SAND AND GRAVEL RESOURCES IN THE REGION

Selection of all superficial sand and gravel resources from 1:50,000 scale  
BGS digital geological maps

Categorisation and refinement of selected resources using published materials  
and geologists knowledge, into standardised BGS sand and gravel categories



# Stage 1: Resources

## LEVEL 2

### IDENTIFICATION OF RESOURCES POTENTIALLY SUITABLE FOR CONCRETING AGGREGATE

Overlaying and merging of BGS Industrial Minerals Assessment Unit indicated sand and gravel resources with inferred resources identified in Level 1

Elimination of sand and gravel resources not suitable for concreting aggregate using (where available) deposit type, variability, grain size and clast composition

Overlying and intersection of available regional borehole information to refine areas of sub-alluvial resources. Use of 3D geological models for the Vale of York

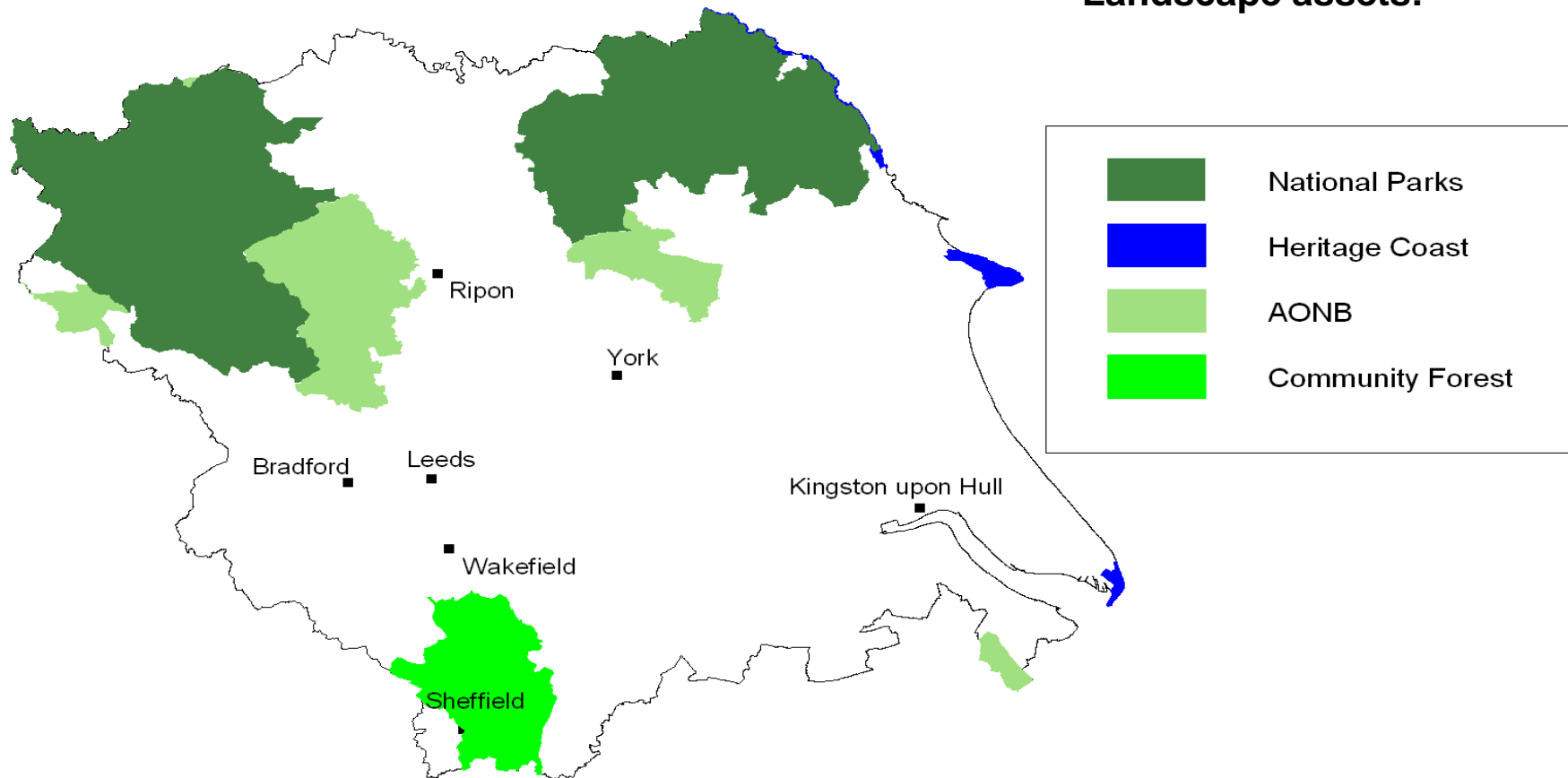


# Stage 2 and 3

- Identify and map ‘environmental and planning constraints’ as outlined in the ODPM Guidance
- Environmental constraints are referred to as:
  - environmental and cultural assets
- Planning constraints are referred to as:
  - other features relevant to planning
- Compile an environmental sensitivity map using environmental assets and planning features



## Landscape assets:







# Limitations

- Resources
  - data quality and availability are variable
  - areas outlined are not of uniform potential
  - reserves must still be established and their size and quality proved by detailed exploration and evaluation
- Environmental sensitivity
  - relies on mapped, measured and digitally available assets
  - is not restricted to outline of resources



# Conclusions

- Sand and gravel resources have been identified
- These have been refined to those with greatest potential for use as concreting aggregate
- Environmental and cultural assets and other features relevant to planning have been compiled
- These data have been integrated into a single GIS layer which summarises environmental sensitivity
- Assembly is now ready to proceed with the remaining steps set out in the ODPM Guidance