Sustainable Construction Aggregates for Northern Ireland
Andrew Bloodworth
• A global leader in the compilation, provision and analysis of mineral statistics
• The major UK national provider of spatial and statistical minerals information.
• Carries out research in areas such as metallogenesis, land-use impacts of mineral extraction, resource security and geomaterials.
• www.mineralsUK.com
Minerals and society

• Minerals are essential for development of the economy and for maintaining our lifestyle but…
• Extraction, processing and transport creates significant environmental and social impact;
• mineral operations can be very contentious;
• issues related to minerals often divisive and politically sensitive;
• debate is often ill-informed.
Primary aggregates: N Ireland in a UK context

- Total UK production of primary aggregate (crushed rock and sand & gravel) was about 230 million tonnes in 2005.
- Northern Ireland produced about 11% of that total.

UK primary aggregate production 2005

- Crushed rock
- Marine sand & gravel
- Land-won sand & gravel

© NERC All rights reserved
N Ireland: primary aggregate production by rock type (total production 25.5 mt)

- Basalt & igneous rock (other than granite): 24%
- Sandstone: 24%
- Limestone: 25%
- Sand & gravel: 20%
- Others: 7%
Aggregate production by area

NI primary aggregate production 2006

- Antrim: 24%
- Armagh: 12%
- Down: 21%
- Fermanagh: 18%
- Londonderry: 10%
- Tyrone: 15%
Aggregate production by area/ type
Aggregate quarries in N Ireland
Local stone for local use

- Typical pattern of supply in N Ireland is that stone is used within 25 km of the quarry
- Added-value products (such as concrete blocks) may travel further
Economic impact

- 160 quarries produce £300 million of products pa
- Underpins a construction sector worth about 12% of NI GDP
- The quarry products industry employ 5600 people in N Ireland
- Relatively high quality employment, mostly in rural areas – direct + indirect and induced in local economy
Aggregate ‘exports’

- Some Lower Palaeozoic sandstones are premium quality road-surfacing materials (skid-resistant high PSV)
- N Ireland has become an important exporter of high PSV stone to England
Sustainable development?

UK objectives for sustainable development:

• Social progress which recognises the needs of everyone;

• Effective protection of the environment;

• Prudent use of natural resources; and

• Maintenance of high and stable levels of economic growth and employment.
Sustainable development?

- Our economy is minerals based
- Minerals can only be worked where they occur
- Good quality information on the spatial extent and quality of mineral resources critical in sustainable development
- Spatial information allows system to:
  - Identify extraction areas/sites with least negative environmental impact
  - Safeguard resources for future generations by preventing unnecessary sterilisation
Towards a better planning system

- An **efficient** planning system is vital sustainable development (i.e., the economy and protection of the environment).
- The planning system has to **balance** the many different pressures on the use of land and between conservation and development.
- Access to and interpretation of high **quality data and information** allows more informed debate and should lead to **balanced** judgements.
TELLUS: Better understanding of NI aggregate resources

• Conventional geological mapping forms a good basis for definition of exposed aggregate resources
• TELLUS EM data can potentially be used for rapid reconnaissance of concealed sand and gravel bodies within glacial deposits in the east of the province, although this will require investment in geological control and processing.
Mineral resource information in support of National, Regional and Local Planning
Mineral Safeguarding

- Cumulative impact of other land-use and designations means that options are reducing and will reduce further in the future.

- Danger of sterilising known resources by inappropriate development.

- Sterilisation can divert extraction to other, perhaps more sensitive or costly, locations.
Environmental impact

- Aggregate extraction, processing and transport has impacts (-ve and +ve) on the environment.
- Baseline information is required in order to make assumptions on the significance of these impacts.
- -ve impacts will require the design and implementation of mitigation strategies.
- Monitoring against baseline measures success of mitigation.
Environmental impact

- TELLUS geochemistry data provides a comprehensive and consistent baseline for some aspects of impact assessment for active and proposed quarry operations.
- Relevant areas might include water chemistry & suspended solids, dust, soil conservation/management and ecology.
Stream water conductivity/ pH

Conductivity

pH

© NERC All rights reserved
Total dissolved iron/ aluminium in stream water
Conclusions

Aggregates are a non-renewable resource but...

- Our economy is minerals based – ‘if you can’t grow it, you have to mine it’
- The economic and social pillars of sustainable development would collapse without aggregates
- Aggregate resources in N Ireland are relatively abundant but unevenly distributed
- If anything, it is the renewables (air/ climate, water, soil, biodiversity) that are in crisis now
- Along with effective regulation, resource maximisation, recycling, careful site management and restoration, TELLUS data can assist in mitigating the impact of extraction of non-renewables on fragile renewable resources
Questions?

MineralsUK
Centre for sustainable mineral development

www.mineralsUK.com