MINERALS AND SECONDARY AGGREGATES TECHNICAL GROUP TECHNICAL MINERALS REPORT

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Introduction

In January 2011 the Department of Infrastructure (DOI) set up a Minerals and Secondary Aggregate Technical Group (MSATG), comprising representatives from the Islands minerals industry, Department of Economic Development (DED) and DoI – Planning and Building Control Division. The remit of the MSATG was to identify and discuss technical aspects of minerals planning, and to present a technical report to advise the drafting of minerals and waste planning policies and proposals. Whist the IoM Strategic Plan 2007 contains overarching policies for minerals and waste related development, there is a need for more detailed mineral policy guidance on, for example, need, minerals sustainability, site development, location and site restoration.

The MSATG met between January and September 2011. This Report summarises the technical minerals and secondary aggregate matters discussed by the Group, and presents its recommendations for the development of minerals and waste policy.

Purpose of the Technical Report

The purpose of the Report is to advise:

1 the development of policies, proposals and planning policy guidance for the winning and working of minerals, and restoration and aftercare of former mineral workings;
2 the need for, production, and management of, recycled and secondary aggregates; and,
3 consideration and determination of planning applications for the extraction of minerals

The DOI has determined not to progress with the drafting of an all Island Area Development Plan covering minerals and waste. Minerals planning policy is currently delivered through the 2007 Isle of Man Strategic Plan. The Strategic Minerals policies will in the short/medium term be supplemented by:

i. Publication of the MSATG Technical Report;
ii. Publication of a Minerals Planning Policy Statement (MPPS) based on the recommendations of the MSATG Technical Report and with reference to other UK minerals policy guidance (MPS,PPS,MTAN)
iii. Establishing a Minerals and Secondary Aggregate Technical Planning Group. The MSATPG to produce, in correspondence with the DED Minerals Resources Plan, an annual monitoring report including a statement of minerals need and landbanks, and identifying major minerals issues.

In the longer term it is proposed to revise the 2007 Strategic Plan Policies for Minerals and Waste, taking account of, and with reference to:

a. The MSATPG Annual Monitoring Report
b. The Minerals Planning Policy Statement

Status of the Technical Report

The MSTAG Technical Report is a non statutory document until assimilated within a Minerals Planning Policy Statement. However, once endorsed by the Department, the Report will be a material consideration for the determination of minerals or secondary or recycled aggregate related planning applications.

ISSUES AND RECOMMENDATIONS

1 The Environmental Impact of Supplying Minerals

The process of extracting, processing, and transporting minerals, or processing and transporting secondary or recycled aggregate impacts on the environment. Impacts from noise, dust, loss of habitat or landscape are considered and addressed through the planning application process. However also key to minerals sustainability is the need to consider, and minimise, the energy consumed and climate change gases emitted as a result of mineral extraction and processing, aggregate reprocessing and aggregate importation.

The Environmental Impact of Supplying Minerals

Proposals for the supply of minerals need to take account of, and seek to minimise, any detrimental impact on the environment, including the consumption of energy produced from non renewable sources and emission of climate change gases.

2 Minerals Sustainability – ensuring the long term supply of minerals

There are two sources for primary minerals: on Island and imported. The geology of the Island dictates the types of minerals that can be exploited on-Island. Minerals can be imported. To ensure a long term supply of minerals there are two potentially conflicting policies approaches which need to be considered: increasing self-sufficiency, and promoting primary minerals conservation.

- A policy focussed on maximising Island self sufficiency would demand that all accessible minerals are utilised to the full, until exhausted. Access is, in general, constrained where minerals are located beneath the built environment. Access is further constrained through proximity to, and location within, areas of acknowledged national importance for eg historical or nature conservation value. However these constraints are not absolutes, and the need for minerals can exceptionally override policies on nature conservation or policies to protect areas of historic importance.

- A policy focussed on conserving minerals reserves for future generation would promote the extraction and use of the minimum tonnages necessary, and only then following an assessment that no alternative recycled or secondary resources are available. This policy may promote the importation of minerals, with an associated increase in greenhouse gas emissions. Importation of minerals will also have a negative impact on the local minerals industry.

Adoption of either policy approach would therefore be detrimental to the environment and biodiversity of an area, and reduce the overall sustainability of minerals. Mineral policies will need to balance an aim of minerals self sufficiency with the need to conserve mineral resources.

Minerals Sustainability – ensuring the long term supply of minerals

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3 Minerals Supply - Self Sufficiency

The Island needs a number of minerals to sustain its economy, infrastructure and welfare. These include hydrocarbons such as coal and oil, salt, limestone, peat, polished stone value aggregate (psv), and sand for use in concrete manufacture. Geologically some of these are readily available and accessible on Island, whilst others, such as coal, are not.

In discussing the degree to which the Island should aim to be self sufficient in its supply of key economic minerals, the MSATG agreed that the critical factor was the need to support the Islands construction sector. This was needed to maintain the infrastructure, housing and development necessary for economic growth. Key therefore are minerals used by the construction sector and specifically aggregate products.

Minerals Supply - Self Sufficiency

The Island should aim to be self sufficient in its supply of key economic minerals. This means ensuring a supply from on-Island sources of the aggregates required for construction and maintenance of infrastructure, and buildings. This supply should include aggregate from primary, recycled and secondary sources.

4 Minerals Supply - Mineral Importation

In acknowledging the risks associated with reliance on imported minerals to maintain the economy of the Island (specifically hydrocarbons), a policy on mineral importation should:

- acknowledge the vital role that imported hydrocarbon minerals/rock salt etc currently play in sustaining the economy of the IOM
- promote the use of minerals supplied on-Island by the local industry to sustain the local economy, keep to a minimum the distance minerals have to be transported and associated impact on greenhouse gas production[1] and reduce the strategic risks associated with reliance on mineral imports;
- acknowledge that importation of aggregate minerals will occur but seek to develop on-Island replacements for these imported materials.

Minerals Supply - Mineral Importation

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- acknowledge that importation of aggregate minerals will occur but seek to develop on Island replacements for these imported materials.

2 Government should seek to maintain a database on mineral imports, specifically aggregates.

1 BGS Mineral Planning Fact Sheet - Construction aggregates www.bgs.ac.uk/downloads/start.cfm?id=1355Similar

5 Minerals Supply - Aggregate

One of the main uses for aggregate on Island is for the construction, maintenance and repair of roads. The Department of Infrastructure (Highways Division) DOI are responsible for all trunk and adopted roads and set construction design standards for residential roads. Government therefore has an opportunity to promote the sustainable consumption of aggregate, through the adoption of policies and practices for reducing aggregate consumption and using recycled aggregate. In addition through its Capital Project programme and tender process Government can promote the reduction in aggregate use, the recycling of construction and demolition waste, and the use of recycled materials. Key for use for recycled materials is quality. The 1997 Department of Infrastructure: Manx Roads 2 (MR2) Residential Roads Construction Guide does not preclude the use of recycled aggregate. The main constraint against its use is the absence of a scheme for guaranteeing the performance standards of recycled aggregate. This has perpetuated the prescriptive approach to road design rather than a more innovative materials performance led design.

At present there is no robust framework for setting standards and assessing the quality of the materials. A quality control assurance would enable DOI to guarantee that any recycled or secondary aggregate, including Incinerator Bottom Ash (IBA) currently being trialled in road surfacing, was fit for purpose. The Waste Strategy, currently being revised, is intended to outline how these standards may be implemented and advise of a Code of Practice.

Sand and Gravel

The availability of suitable quality sand and gravel resources are fairly widespread in the north and west of the Island. Although there are variations in sand quality, with reserves of very fine aeolian sand suitable for use as a building sand in the manufacture of mortars, render and plaster, the supply of these are generally controlled through market forces. There is limited importation of sand for construction purposes. Bulk importation of sand and gravel is possible, although at present there is no bespoke wharf facility on the Island capable of unloading large quantities of sand and gravel, and the cost per tonne is high. Opportunities for material substitution are currently limited on-Island to crushed/ground glass, in the form of Ecosand.

Hard Rock

There are relatively few geological reserves that have the necessary physical properties to be processed to high grade aggregate. There are more widespread reserves that can be extracted and used for lower grade end uses. This indicates the need to conserve mineral reserves providing high grade aggregate through for example, minimal use on a 'fit for purpose' basis, with phased extraction over a strategic time period. Opportunities for aggregate substitution are available through the recycling of construction and demolition waste and quarries waste (and possibly IBA). This aggregate could replace the lower grade bulk fill type primary aggregates.

Minerals Conservation: Aggregate

- The need for good husbanding of minerals to ensure sustainable aggregate consumption is critical, particularly for Government controlled quarries.
- As a major driver of aggregate consumption through capital projects and highways construction and maintenance, Government needs to define, implement, monitor and review policies for reducing aggregate consumption and using recycled aggregate.

6 Minerals Supply - Aggregate Hierarchy

Aggregate can be produced from a number of sources: reuse of existing stone from demolition projects; recycling of construction and demolition waste or secondary material, or through primary mineral extraction and processing. In keeping with the principles of sustainability, which seeks to minimise the environmental impact of sourcing the aggregate, and reduce the energy used, the reuse of existing material is more sustainable than extraction of primary mineral, and generally more sustainable than recycling of aggregate. These distinctions produce a preferred hierarchy for sourcing aggregate:

- reduce the need for aggregate through careful project design and management
- reuse material husbanded from demolition of an existing building or structure
- recycle Construction and Demolition waste or industry waste to produce an aggregate
- primary extraction and processing to produce aggregate

This hierarchy mirrors in part the preferred hierarchy for managing resources and waste[2]

Mineral sourced through primary extraction can be processed into different grades of aggregate suitable for a number of end uses. The range of grade and potential end uses varies between mineral types, and depends principally on its physical and mechanical properties, although for some applications chemical and mineralogical properties are also important e.g. aggregate used in load bearing layers in road construction.

Critical for meeting the tests of sustainability and self sufficiency is the need to ensure a mineral, particularly one which has a limited occurrence on Island, is conserved and used for the highest specification end use. A key example on Island is the igneous gabbro found at Poortown. This gabbro has a high polished stone value (psv) and is therefore ideal for use as coated road stone. When processed to the required size the gabbro becomes a high value graded aggregate. As there are limited resources of psv quality on Island, to ensure self sufficiency of this aggregate, it is crucial that it is not used for lower grade applications. A by-product of the extraction and production of psv stone is a lower grade or waste aggregate which can be sold for use for lower grade applications.

A planning application for extraction of minerals to produce aggregate or a facility for aggregate reprocessing, should take account of, and be tested against, the degree to which it accords with a preferred hierarchy for aggregate production.

A policy supporting the preferential use, where appropriate, of secondary and recycled aggregate as part of an aggregate hierarchy, would support both the need to conserve mineral resources, and promote Island self sufficiency. It may also assist in reducing the environmental impact of providing aggregate.

[2] http://www.defra.gov.uk/environment/waste/legislation/waste-hierarchy/

Preferred Hierarchy for Aggregate Production

A planning application for extraction of minerals to produce aggregate or a facility for aggregate reprocessing, should take account of, and be tested against, the preferred hierarchy for aggregate production.

1. Reduce – policies and practices which result in a reduction in the need for aggregate eg through technological advances or more efficient and effective working practices which reduce wastage, or increase access to material for reuse/recycling

2. Recycled or secondary aggregate – aggregates made from Construction and Demolition or Incinerator Bottom Ash. Subject to the material meeting the necessary quality assurance. As government is a major consumer of aggregate through road maintenance and construction and capital projects, this will require a change in design specification (MR2) and criteria for capital project

3. Primary Extraction, for use as:

    a. High Grade Aggregate (eg psv): mineral suitable for and used for their highest specification end use/coated/wearing surface.

    b. Dry Sized Aggregate, dust, specialist (drainage) - aggregate processed to provide quality assured materials (eg used in concrete manufacture, road base)

    c. Lower Grade Aggregate eg Manx Group crushed – aggregate required for bulk fill purposes and for which recycled or secondary aggregate is not suitable or not available. Type 1– holding some form of quality assurance/performance specification.

7 Minerals Supply - Dimension or Building Stone

There is a need to maintain a source of stone for use as a building material, paving and kerbstones. This is particularly important for the repair, refurbishment, extension or construction of buildings within Conservation Areas, or the management of Registered Buildings, but also to maintain the vernacular characteristics of buildings around the Island.

Ideally the building material should be indigenous stone, sourced either through the reuse of suitable quality stone arising from demolition projects, or stone won from a local quarry. There are several reasons for this: indigenous material is similar in colour and characteristics to that used in existing buildings; reusing stone is more sustainable than extracted stone; using indigenous material has a lower carbon impact than imported material; using indigenous stone supports the local economy.

It is acknowledged that the appropriate application of good quality manufactured stone veneers and composites can play a role in maintaining the vernacular characteristics of the Island, and contribute to the conservation of minerals resources. However their use on a building within a Conservation Area or a Registered Buildings is not considered acceptable.

The main mineral types required are:

- **Peel Sandstone (Sst):** there are two 'veins' of Peel Sst. The darker, more purple, stone is a better quality building material. The lighter sst is soft and a poor material for some of its historic uses as (walling, cills, copings and decorative detailing) as it is subject to erosion by the elements. The Sst is required to maintain the regional identity of Peel, and to repair many Registered Buildings throughout the Island, such as Douglas Railway Station and the Registry Building.

- **Castletown Limestone (Lst) - light grey stone:** Lst required to maintain the regional identity of Castletown. Unlike Peel Sst the rock is not used for detail stonework of cills, copings etc. The quarries that were mined for this limestone are no longer operational. One possible source for similar material is Billown Quarry, although this is reaching the end of its operational life.

- **Pooil Vaaish/Castletown 'Marble'**: traditionally used in Castletown for kerbing, and some paving, it has been exported for use in eg the steps to St Paul's in London. Its use is more specialist and restricted, and is not known to have been used in general building works.

- **Stoney Mountain Granite – Upland Spa:** the honey coloured Granite is used in and around the Ballamodha, Grenaby, Ballasalla area of the south for lintels over windows and doors and quoins (cornerstones), more in vernacular, rural buildings both outbuildings and farm dwellings. Stoney Mountain quarry is still operational.

- **Manx Formation Stone** - grit/mud/sandstones: traditionally used as dimension or building stone. There are permitted reserves on Island for the supply of Manx formation suitable for use as dimension stone.

Dimension or Building Stone

The Island needs to maintain a source of stone for use in the repair, refurbishment, extension or construction of buildings within conservation areas, management of listed buildings or to maintain the vernacular character of the area. Ideally this should be indigenous stone, sourced either through the reuse of suitable quality stone arising from demolition projects, or stone won from a local quarry

7 Mineral Supply - Building Conservation Purposes

There are three main sources of minerals for conservation purposes:

a. Recovered
b. Extracted on Island
c. Sourced off Island

a Recovered Stone

Applying the principles of mineral sustainability the first source for minerals for conservation use should be stone recovered from demolition works. Utilising weathered, indigenous, recovered stone in new build or repair will support the aim of conservation areas to maintain local identify. It is known that, primarily due to the value of recovered local stone, where demolition work is undertaken on old buildings the indigenous mineral is kept separate. Unless used on site it is sold for other projects. It is recognised however that this is an unregulated, voluntary process, which does not ensure the recovery of indigenous stone. Availability of recovered stone is limited and not available on a regular basis.

There is a need therefore to identify more formal processes to support the preservation of the indigenous minerals considered of local importance. Options for achieving this include:

- Discussions with Planning - Development Control, to consider the option of conditioning the retention of indigenous stone on planning permissions for demolition in predominantly Conservation Areas;
- Discussion with Building Control to consider the option of including within Demolition Orders on buildings built in local stone to need to retain local stone for re-use.
- Include reference to retention/stockpiling of demolition materials within the appraisals of any proposed Conservation Areas such as those identified within the Southern Area Plan: (Ballabeg, Cregneash, Port Erin, Port St Mary, Extension to Silverdale);

b Extracted on Island

Applying the principles of self sufficiency mineral planning policies should identify, and ensure the provision of, local stone from local sources. Due to the relatively small tonnage of recovered stone available, and the uncertainty about its availability, primary mineral will be needed. This may be particularly relevant for the (re)development of buildings close to former quarries whose mineral has been used for other buildings in the vicinity. Many quarries supplying local stone have however been worked out or abandoned. The environmental impact of reopening such quarries, even on a 'campaign' basis, is not known but could be significant. There are permitted reserves for Manx Group building stone. The former Sandstone quarries supplying Peel Sandstone are no longer operational, although it is acknowledged that, as this mineral is soft and easily weathered, alternative sources may be preferable. Limestone for building is no longer produced from the one active Lst Quarry. One option may be to include abandoned quarries with Mineral Safeguarding Areas to safeguard them from redevelopment and mineral sterilisation. The DED Minerals Resources Plan maps all known former quarries although many are likely to be unworkable.

c Sourced off Island:

It is acknowledged that in certain circumstances it is prudent to use imported stone. For example Peel Sandstone is soft and subject to weathering through attrition from wind and rain. Imported sandstone from the North West of England (St Bees, Cumbria) is of a similar colour and

stratification but is harder wearing, less porous and therefore a more suitable building material. There are significant reserves of suitable minerals available from off-island sources. In evaluating the options for supplying stone for conservation purposes, the sustainability of imported stone (in terms of embedded energy and climate change gas emissions) and the potential impact on the local minerals industry, and the potential impact of reopening disused or abandoned quarries, will be key factors.

MINERALS FOR BUILDING CONSERVATION PURPOSES

The following policy approach be adopted for the supply of minerals for Conservation Areas and Registered Buildings:

i. during the approved demolition of any building or structure containing any indigenous mineral, part of that approval include the need to:
   - separate out for storage and reuse any stone of a size and quality for re-use in building facing, local boundary wall facing
   - retention of the small rubble/fines for use as aggregate/colouring medium within the manufacture of specialist concrete products such as coloured concrete lintels and cills;

ii. during the demolition of any building or structure containing any indigenous mineral, developers be encouraged to:
   - separate out for storage and reuse any stone of a size and quality for re-use in building facing, local boundary wall facing
   - retain of the small rubble/fines for use as aggregate/colouring medium within the manufacture of specialist concrete products such as coloured concrete lintels and cills

iii. former or dormant quarries supplying local building stone required for conservation purposes (eg Creg Malin) be assessed for inclusion within a Mineral Safeguarding Area

8 Mineral Supply - Peat[3]:

There are no planning permissions for commercial peat extraction on Island. Any peat used for horticultural purposes, particularly the mushroom growing sector, is imported. However Peat digging for fuel has been a feature of the Manx way of life and the Manx upland landscape for thousands of years. Evidence of disused peat workings can be seen throughout the Island. There remains one operational public turbary on the Island which extends to around one acre and is situated on the northern slopes of Beinn y Phott on the Brandywell Road.

The control of turf cutting is vested in the Department of Environment Fisheries and Agriculture (DEFA) in accordance with the Forestry Act 1984. Under the terms of the Act the 1997 Byelaws regulate and control the cutting of peat through the issue of Licences. The Byelaws allow individuals to establish an allotment 6 foot by 10 foot within the fenced confines of the turbary for digging peat. Plots are marked by a numbered wooden stake issued by the Department. Digging is allowed between the 1st May and 30th June each year. Turf can be removed from the turbary between 1st May and 30th September, and can only be used in the licence holders own dwelling (section 2(1)(b) of Byelaws). Warden and Rangers monitor use of turbary, and a breach of Byelaws can result in a potential £1,000 fine.

DEFA have acknowledged that, whilst extraction of peat per se is at odds with conservation and management strategy, the operation of turbary has traditionally been considered to have a relatively low impact on the environment. The provision of a turbary remains an obligation under Section 8 of the Forestry Act 1984. However the Department has recently announced that it is considering the need to review the legislation concerning Turbary rights.

Peat

The extraction of peat from raised or blanket bogs should be prohibited for biodiversity/nature conservation purposes.

Subject to a revocation of Turbary By-laws, this policy to allow an exception for areas specified by DEFA under Section 8 of the Forestry Act 1984. DEFA to be consulted about the designation afforded to the area of Beinn y Phott, and any proposals they may have for expansion of this turbary area.

[3] Source http://www.gov.im/daff/hfg/hill/turbaries.xml

9 Forecasting Need

Key for business planning in the minerals industry is certainty about the availability of reserves over a circa 20 year period. This includes identifying reserves acceptable for extraction, and protecting these areas from development which would sterilize reserves. Forecasting need for minerals based on changes in measures of economic activity (eg GPD) has previously proven to be unreliable. An alternative use of landbanks to ensure the on-going availability of minerals was considered. However to meet the needs of industry, landbanks would need to be calculated over a much longer time period than the current three years to account for any unusual peaks or troughs in extraction in any one year. A review of the past 5 years data provided an average demand for primary and recycled aggregate. Given the impact a specific major infrastructure construction project can have on skewing average aggregate use, the MSATG recommended that a 10 year rolling average of annual aggregate production from all quarries be used to forecast the future 12 month need for aggregate.

Forecasting Need for Aggregate

A 10 year rolling average of annual aggregate production be used for both Hard Rock Quarries and Sand & Gravel Quarries to forecast the future 12 month need for aggregate.

10 Policy Framework for Minerals

The current planning policy framework for minerals is set out in the 2007 Isle of Man Strategic Plan. It is proposed that the policy within this document is further explained through the production of a Planning Policy Statement as specified in Part 1 Section 3 of the Town and Country Planning Act 1999. This document will be known as the Minerals Planning Policy Statement and will be a statutory document.

Until the preparation of the Minerals Planning Policy Statement (MPPS) is published the Department will produce the MSATG Report which, whilst not being a statutory document shall nevertheless be a material consideration in the determination of minerals or recycled aggregate planning applications.

In addition to the MPPS a Mineral and Secondary Aggregate Technical Planning Group will be established which will produce an annual monitoring report including a statement of minerals need and landbanks and identifying major mineral issues.

The current Isle of Man Strategic Plan has a timescale of up to 2016. It is therefore envisaged that a review of the Strategic Plan will take place in the very near future. At this time it will be pertinent to review the content of the Minerals Planning Policy Statement to inform the review of the Strategic Plan policies.

Minerals Policy – duration, review, and content

The MSATG agreed that a 10 year planning policy framework is not sufficient when taking account of business planning and investment costs associated with mineral prospecting, submitting a planning application, developing, operating and restoring a site. To ensure aggregate self sufficiency and availability of minerals it was agreed that the framework for minerals needed to cover a longer time period. Whilst a 20 years minerals policy framework could provide more certainty for industry and the Island, the policies would, within the life of the framework, be out of date, even allowing for a five year review period.

The MSATG therefore proposed that the minerals policy framework for should:

1. cover a 15 year timeframe, in line with the regional planning framework in England. This would provide the necessary strategic overview whilst ensuring that minerals policy was contemporary;

2. be subject to review every five years;

3. identify strategic objectives together with a strategy for delivering those objectives. For example, an objective to conserve minerals and promote mineral sustainability could be delivered via the following processes: determination of minerals planning applications; Government specification for use of aggregates in capital projects; Government specification for road construction and maintenance; and/or, other Government Department policies on use of minerals (eg agricultural lime).

4. incorporate the most contemporary data on reserves, rates of extraction and end use. This could be achieved through the establishment of a Minerals and Secondary Aggregate Technical Planning Group, the function of which would be to provide, on an annual basis, a monitoring

report including information on landbanks, material end use, permitted and preferred reserves, and progress towards strategic minerals objectives.

Policy Framework for Minerals

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1. cover a 15 year timeframe, in line with the regional planning framework in England. This would provide the necessary strategic overview whilst ensuring that minerals policy was contemporary;
2. be subject to review every five years;
3. identify strategic objectives together with a strategy for delivering those objectives.
4. incorporate the most contemporary data on minerals eg annual rates of extraction, minerals end use, permitted reserves, landbanks, forecast need, and preferred areas, by way of an Annual Minerals Monitoring Report, published by a Minerals and Secondary Aggregate Technical Planning Group.

11 Landbanks

The MSATG agreed that the landbanks for government owned/operated quarries Poortown (PT) and Stoney Mountain (SM) need to be considered separately from commercially operated quarries. This decision was made with reference to UK planning guidance (MPS1 Annex 1 para 4.5, and Planning and Minerals a Practice Guide paras 72-74), and the definition of economic mining as that which attempts 'to achieve an acceptable return on capital invested'[4]. Neither quarry was considered economic in the true commercial sense.

Landbank calculation

Mineral reserves in a Government owned/operated quarry should be excluded from calculation of the commercial landbank

i. Commercial (non-government owned/operated) Quarries

Calculation of landbanks for commercial, non-government owned/operated, quarries should be calculated on average production over the previous 10 years. The 10 year average would prevent an unusually high or low tonnage in any one year skewing an average production figure.

For example the landbank for Hard Rock on the Island would be calculated as follows:

$$\text{Landbank for Hard Rock} = \frac{\text{Total Mineral reserves remaining at hard rock quarries}}{\text{Average 10 year annual mineral production from hard rock quarries}}$$

Landbanks – Commercial Quarries

Landbanks for Hard Rock and Sand & Gravel commercial quarries should be calculated from the combined remaining reserve at each individual operation divided by the average annual mineral production over the previous 10 years.

ii. Government Owned Quarries

Poortown Quarry

In its review of the ownership and operation of Poortown Quarry, Government (COMIN 2010)[5], determined that in terms of Island self sufficiency, maintaining a supply of gabbro for highways

[4] http://www.jorc.org/pdf/vaughan.pdf 'International Mineral Resource and Mineral Reserve Classification and Reporting Systems'

[5] January 2010 COMIN report on the Review and Scope and Structure of the Isle of Man Government 'The Committee considers that self –sufficiency on the Island regarding the supply of gabbro for highways construction demonstrated the national strategic importance of Government's continuation of the operation by the Department of Transport of Poortown Quarry and would not support private ownership of such a national strategic asset.'

construction was of national strategic importance. The quarry itself produces high quality psv grade minerals suitable for coating and for use in highway construction. Although some material is sold to the commercial sector, this is mainly to serve the need for non Government highway construction and maintenance.

Due to the way in which the gabbro was intruded into the surrounding rock, as part of the process of mineral extraction, occasional pockets of surrounding rock need to be quarried along with the gabbro. This surrounding rock produces a non-psv material which is sold as quarry waste. Whilst the quarry waste is not considered to be a Type 1 product, the commercial sector occasionally use this material as Type 1. Although at present this accounts for 1/3 of total material sold, it is a relatively low tonnage. The amount available is predicted to decline in the next few phases of development as working progresses deeper into the igneous intrusion away from zones of weathering and surrounding rock.

DOI (Highways Division) requires a range of primary aggregate grades and types predominantly psv, and Type 1. The MSATG agreed that, in applying the policy of sustainable aggregate use, the high grade psv material from Poortown needed to be protected from use for lower grade applications e.g. Type 1. If the sale of psv material ' was restricted to within Government (and private contractors working on Government contracts), and Government was applying a policy of sustainable aggregate use by which it protected the Poortown psv for higher grade applications only, then the reserves at Poortown could be promoted as of national importance in servicing the strategic needs of Government and removed from the calculation of commercial hard rock landbank. Since the waste material from Poortown was unsuitable for use as Type 1, it was acknowledged that an alternative source of Type 1 material would be required by DOI.

The MSATG agreed that

1. Government acknowledged the strategic need for a national supply of high grade psv material to support the construction and maintenance of road infrastructure and preclude the need for importation at high cost;
2. Whilst Government had not indicated that high grade psv mineral from Poortown should be used exclusively by DOI, as the Department responsible for the majority of road construction and maintenance on the Island, this was by default the case;
3. Key to conserving the psv reserve is the need for Government to ensure it is used exclusively for the highest grade use. To achieve this Government needs to develop policies and practices to husband the mineral sustainably.
4. The reserve should not be included in the calculation of national aggregate landbank for hard rock.
5. The landbank requirement for high grade psv aggregate needs to be established through consultation within Government.

Landbanks for Government Owned Quarries - Poortown

1. Poortown Quarry is acknowledged by COMIN as providing the strategic national supply of high grade psv material to support the construction and maintenance of road infrastructure and preclude the need for importation at high cost;
2. The mineral reserves at Poortown need to be conserved and used for the highest grade end use. To achieve this Government needs to develop policies and practices to husband the mineral sustainably.
3. The mineral reserve at Poortown should not be included in the calculation of national aggregate landbank for hard rock.
4. The landbank requirement for high grade psv aggregate needs to be established following consultation within Government.

Stoney Mountain Quarry

Unlike Poortown Quarry, the mineral product from Stoney Mountain (SM) is not considered of national importance by Government. However DOI emphasise the strategic role played by SM in providing contingency access to aggregates needed for Government in emergency or very large scale construction projects. The rate of extraction of aggregate from SM is, in general, determined by requirements for aggregate for Government operations and projects. The quarry is not therefore operated as a commercial undertaking.

The granite at SM Quarry is acknowledged as being of lower grade than the gabbro at Poortown and so the aggregate produced from the granite at SM Quarry is largely Type 1. Although the majority of aggregate produced from SM is used by DOI, material is sold to the commercial sector as an aggregate. The need to include the SM reserve in the calculation of commercial hard rock landbank was reviewed. In the event that the tonnage of aggregate sold to commercial sector was found to be significant, then excluding the SM reserve from the calculation of commercial hard rock landbank would produce an underestimate of the hard rock landbank. However including the total SM reserve (now over 2 million tonnes) would produce an overestimate. Any artificially inflated landbank could seriously undermine any need argument put forward by a commercial quarry operator.

The MSATG considered the option of applying a percentage split in mineral reserve from SM, based on the sale of minerals to Government and the commercial sector. Calculation of Hard rock landbank for the commercial sector would then include the agreed percentage of reserve from SM.

Analysis of aggregate sales and products from SM identified that the tonnage sold per annum to the commercial sector is not large, the equivalent of 8% of the total hard rock aggregate sales on the Island. This was not considered significant. In terms of product type, the aggregate sold to the private sector is a lower grade material, produced as a by product of processing igneous rock. This lower grade material would be produced irrespective of whether there was a commercial market for it. Including a percentage of total reserve in calculation of the commercial landbank for hard rock would, it was concluded, present a false statement of mineral availability.

The MSATG agreed that a critical consideration when defining a landbank is the need to ensure that it reflects the true position in relation to available reserves. There was therefore a need to acknowledge the contribution SM makes to the supply of aggregate to the commercial sector, and that this should be accommodated in the reporting of aggregate statistics.

The MSATG agreed that
1. Stoney Mountain reserves be excluded from calculation of commercial landbank.
2. The aggregate contribution from SM be reported as actual tonnage, based on a ten year annual average of sales to the commercial market.
3. The landbank requirement for Type 1 and bulk fill aggregate for DOI be established through consultation within Government.

Landbanks for Government Owned Quarries - Stoney Mountain

1. Stoney Mountain reserves be excluded from calculation of commercial landbank.
2. The aggregate contribution from Stoney Mountain be reported as actual tonnage, based on a ten year annual average of sales to the commercial market.
3. The landbank requirement for Type 1 and bulk fill aggregate for DOI be established through consultation within Government.

12 Landbank Categories

Traditionally landbanks have been split by Hard Rock and Sand and Gravel only. The MSATG considered what benefits would accrue from splitting the two main categories to identify landbanks for key economic minerals such as eg high grade psv from Hard Rock. Following discussion it was agreed this was not necessary.

Landbank categories

Landbanks should be calculated for the following two aggregate categories:

1. Hard Rock
2. Sand & Gravel

13 Identification of Future Mineral Resources

The MSATG reviewed the methods available for identifying areas for future mineral reserves. The Group considered the need for a 'call for sites' as part of the drafting of minerals policy and proposals, and the use of Mineral Safeguarding Areas (MSA).

It was agreed that, where Minerals policy seeks to identify future resources, extensions to existing quarries were preferable. In general extended quarries utilise existing infrastructure and do not increase significantly the environmental impact of quarrying. Mineral extraction on a greenfield site introduces a new industrial type activity into an area, with associated potential for environmental disruption and nuisance. However the MSATG recognised that extensions alone may not provide the mineral reserves required to maintain a landbank throughout the preferred minerals planning framework (15years +5).

Adopting the policy approaches recommended for forecasting need and calculating landbanks, the MSATG calculated the commercial landbank for minerals. This identified a shortfall in reserves within a 15 year period. It was agreed that DOI:

a. undertake a restricted call for sites in advance of and, to advise, policy development. The invitation will, in the first instance, be open to operators of operational quarries
b. consider identifying an Areas of Search for Hard Rock and Sand & Gravel to identify major mappable constraints against minerals development;

Formal selection of sites to be undertaken following evaluation of any submissions, and once the policy approach has been agreed and the landbanks calculated.

The MSATG recommended that Mineral Safeguarding Areas be used to ensure that the Islands minerals are protected from sterilisation. It was suggested that allocating a MSA to an Area of Search (AoS) would ensure the need for mineral extraction prior to other development was considered as part of all planning applications.

Identification of Future Mineral Resources

To advise development of a minerals policy framework the Department of Infrastructure:

a. undertake a restricted call for sites in advance of and, to advise, policy development. The invitation will, in the first instance, be open to operators of operational quarries
b. consider identifying an Areas of Search for HR and S&G to identify major mappable constraints against minerals development;

Formal selection of sites to be undertaken following evaluation of any submissions, and once the policy approach has been agreed and the landbanks calculated.

Mineral Safeguarding Areas be used to ensure that key minerals are protected from sterilisation. MSA's to be linked to AoS to ensure the need for mineral extraction prior to other development was considered as part of the planning applications process.

14 Buffer Zones

Buffer Zones (BZ's) are considered a useful tool for segregating incompatible land use activities. They advise consideration of:

1. planning applications for new, or extensions to existing, quarries which have the potential to cause noise and dust nuisance, with the aim of ensuring protection for sensitive development. Applicants may be able to propose measures to mitigate the effects of that specific quarrying activity during site development, operation, and restoration. It is the purpose of the BZ to set in policy terms a minimum distance acceptable; and

2. applications or proposals for other development of activities which may be sensitive to the impact of quarrying.

Existence of a BZ has significant weight as a policy constraint. Where a BZ is established around a quarry it can be used as grounds to refuse permission to develop, for example, a dwelling within the BZ. The delineation of the BZ can also be used as grounds to refuse an extension to that quarry, unless it can be demonstrated that the operation would not give rise to an unacceptable detrimental impact on nearby sensitive developments.

The option of delineating BZ's around sensitive dwellings near to quarries to protect them from encroachment through quarry extensions was discussed. It was considered that, as the BZ may subsequently act to prevent extensions to those dwellings by bringing the sensitive development within the BZ, this option should not be pursued.

It was agreed that the BZ policy needed to include a caveat indicating that the width of the BZ could be reduced provided the applicant/operator can demonstrate that there would not be any detrimental impact on a sensitive dwelling.

The MSATG agreed that the size of a BZ should be based on an objective assessment of the distance required to ameliorate the effects of dust and noise to acceptable levels, and where relevant take account of the resultant noise, vibration and stone debris produced through blasting. Where a Preferred Area (PA) for mineral extraction around existing mineral operations is included within a development plan, the PA would have to be mapped with the addition of a BZ boundary.

Buffer Zones

The following BZ distances should be applied around existing and future mineral permissions:

- Hard Rock quarries 200m
- Sand and Gravel 100m

Where the initial application/mapping of BZ's results in a property being included within the new BZ, there would be no recourse for compensation by the owners of that property. Matters of nuisance etc were dealt with through environmental health or waste licencing.

BZ's to be measured from the boundary of existing mineral planning permissions, or a preferred areas of extraction.

15 SITE RESTORATION

The MSATG agreed there was a need to secure the restoration of, and aftercare for, existing mineral workings. In general on the IOM options for restoration include:

- landfill to amenity, conservation or agricultural afteruse;
- low level dry restoration to amenity, conservation, or agricultural afteruse;
- low level wet restoration to amenity or conservation afteruse;
- wetland restoration to conservation or amenity afteruse;

Each quarry will have a site specific restoration scheme and this will be dependent upon number of issues such as the nature conservation value of the site, hydrogeology, lease agreement with the land owner. For hard rock quarries the availability of infill material will be a significant factor in determining the scheme of restoration for the site. It will also advise the drafting of development plan policies for restoration.

The following issues were identified in relation to restoration by landfill:

- a policy seeking to secure restoration of a mineral working either by phased restoration or restoration on completion may be stymied by the lack of available materials for landfill;
- a policy requiring landfill of a mineral working within a specific time period may counter a policy requiring the recycling and reuse of waste aggregate;
- where it is not possible to secure restoration of a mineral working within a fixed time period, this may lead to applications for interim restoration schemes of lower level restoration schemes.

Critical to an assessment of the need for landfill void space is the availability of contemporary data on C&D and inert waste arisings, need for disposal capacity, and existing void space. This information is not currently available, although it should be provided in both the revised Waste Strategy and DED Mineral Resources Plan.

The main source for this information is Waste Disposal Licence quarterly returns. However it is known that some demolition projects give rise to material which is not formally recorded. This can be material which is: processed on site and used in-situ or processed then removed off site for use in another project; or, removed off site to an unauthorised treatment or disposal facility. In each instance the waste tonnage is not recorded. The need to include this information as part of the Demolition Permitting process is being progressed with DOI Building Control.

Subject to an assessment of the arisings of waste material by cubic metre and type over the development plan period, it may be possible to identify a landbank of void space to ensure future provision of landfill void capacity.

RESTORATION

All mineral planning permissions to include full details of site restoration

To advise the drafting of the policy on quarry restoration and need for a landbank of landfill void capacity, Government work to improve both the accuracy and comprehensiveness of data on inert C&D waste arisings and requirement for landfill void capacity for the disposal of non recyclable waste, hazardous solid waste, or Incinerator bottom Ash.

16 SECURING RESTORATION / AFTERCARE

Mineral extraction represents a temporary use of land which can have a considerable impact on the environment. One of the most important ways to minimise the impact of extraction is to ensure that suitable restoration takes place at the earliest practicable opportunity following extraction, and is monitored/treated over successive years to ensure it succeeds. For example in order to improve the structure and stability of the soil, it may be necessary to install drainage and establish and manage the vegetation. The aftercare period starts once the restoration conditions are satisfied. In the case of progressive restoration the aftercare period begins from compliance with the restoration condition on the relevant part of the site. Best practice advises an aftercare period of 5 years, although the duration can be varied depending on the nature of the restoration.

It is essential that financial provision is secured following the cessation of minerals extraction to ensure a site is restored fully and subject to the necessary aftercare. Some mineral sites are operational for many decades, increasing the risk that any financial provision made at the initial site planning stage will not be available for restoration and aftercare. To mitigate this risk the MSATG identified that financial bonds/Section 13 agreements could be used to secure restoration and fund aftercare. For example where sites are restored in phases, the value of any bond/agreement could be calculated for each individual phase of restoration, and negotiated sequentially. However as bonds/S13's had not been used widely in relation to site restoration/aftercare the MSATG advised this required further discussion with industry.

SECURING RESTORATION / AFTERCARE

The use of Financial bonds/Section 13 Agreements to secure restoration and fund aftercare of mineral sites be discussed with, and considered by, the minerals industry.

17 CRITERIA FOR CLASSIFYING THE EXTRACTION OF MINERAL AS A MINERAL WORKING

There are currently no threshold criteria for classifying the extraction of minerals as a mineral working. The MSATG acknowledged this as an issue when determining:

- the need to apply mineral planning policies to an application where mineral extraction is ancillary to the main proposed development;
- the need for submission of an EIA,
- the need for a mining licence, lease, or permission.

It was also acknowledged to have implication for H&S in terms of ensuring the employment of 'fit and proper' persons to undertake excavation operations.

The MSATG considered possible threshold criteria that could be developed from planning application forms, EIA regulations, and/or DED guidelines. Following discussion it was agreed that it was not practicable to identify a threshold tonnage, Ha or m^3 for the purpose of classifying a development as a mining activity as:

- each development is site specific and the impact of the mineral extraction, and therefore need for DED or H&S involvement, is also site specific;
- it would be impracticable for planning Development Control officers to seek to obtain a detailed split for soil, overburden and mineral involved in the 'cut'; and,
- any threshold figure would be open to abuse.

However the Group emphasised the need for ancillary mining activities to be clearly identified as part of the overall development and addressed as such. It was felt this would become increasingly relevant in relation to development of large houses in the countryside where applicants would propose far more extensive levels of cut and fill to reduce the visual impact of the development. It was agreed that most architects involved in a proposed development would be able to identify the need for mineral extraction as part of their proposal.

The Group proposed that the DOI - Planning be asked to modify the planning application forms to include a question about whether minerals are to be extracted and taken off site. This would be a 'tick' box response which, if checked, DC officers could follow up with further questions concerning tonnages etc. It was agreed that the term 'mineral' may not be understood by some. It was agreed that this be clarified 'rock, stone or sand'.

CRITERIA FOR CLASSIFYING THE EXTRACTION OF MINERAL AS A MINERAL WORKING

Ancillary mining activities need to be clearly identified as part of an overall development to allow determination of:

- the need to apply mineral planning policies to an application where mineral extraction is ancillary to the main proposed development;
- the need for submission of an EIA,
- the need for a mining licence, lease, or permission.

and to ensuring the employment of 'fit and proper' persons to undertake excavation operations.

DOI - Planning to be asked to modify the planning application forms to include a question about whether rock, stone or sand are to be extracted and taken off site. This would be a 'tick' box response which, if checked, would trigger the need for further questions concerning tonnages etc.

18 MINERALS AND SECONDARY AGGREGATE TECHNICAL PLANNING GROUP

The MSATG proposed that a Minerals and Secondary Aggregate Technical Planning Group (MSATPG) be formed to provide a technical overview on the availability and use of minerals, secondary and recycled aggregate on Island, and identify any issues regarding imports or exports.

a. Purpose: to promote government/industry dialogue over, and consideration of, mineral matters to advise the drafting of minerals and determination of planning applications;
b. Terms of reference. The MSATPG will:
    i. maintain, in conjunction with DED, contemporary statistics on minerals;
    ii. assume responsibility for responding to all technical/policy mineral matters;
    iii. advise, on an annual basis through the publication of a minerals monitoring report, the need for minerals, landbanks, and highlight any issues such as a shortfall of minerals, or use of recycled aggregate;
    iv. monitor mineral imports/exports;
    v. make recommendations to Government (DOI/DED) on the preparation of MPPS, drafting of Area Plans and review of Strategic Plan policies;
c. Membership: invitees from the minerals industry, DED and DOI Planning, with representatives from Manx National Heritage, Department of Environment Fisheries and Agriculture and other Departments being co-opted when required to provide specialist advice.
d. Meetings: circa every 6 months
e. Reporting mechanism - via DOI

ESTABLISHING A MINERALS AND AGGREGATE TECHNICAL PLANNING GROUP

A Minerals and Secondary Aggregate Technical Planning Group (MSATPG) be formed to provide a technical overview on the availability and use of minerals, secondary and recycled aggregate on Island, and identify any issues regarding imports or exports.

a. Purpose: to promote government/industry dialogue over, and consideration of, mineral matters to advise the drafting of minerals policies and determination of planning applications;
b. Terms of reference. The MSATPG will:
    i. maintain, in conjunction with DED, contemporary statistics on minerals;
    ii. assume responsibility for responding to technical and policy matters related to minerals;
    iii. advise, on an annual basis through the publication of a minerals monitoring report, the forecast need for aggregate, reserves, landbanks; highlight any issues such as a shortfall of mineral reserves, or use of recycled aggregate; and consider options for identifying future mineral reserves;
    iv. monitor mineral imports/exports;
    v. make recommendations to Government (DOI/DED) on the preparation of MPPS, drafting of Area Plans and review of Strategic Plan policies;
c. Membership: invitees from the minerals industry, DED and DOI Planning, with representatives from Manx National Heritage, Department of Environment Food and Agriculture and other Departments being co-opted when required to provide specialist advice.
d. Meetings: circa every 6 months
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Glossary of Terms

Term	Definition
Aeolian	Sediments deposited after transportation by wind
Aggregate	Granular material used in construction. Aggregate may be natural, manufactured or recycled in origin. In terms of size aggregates can be classified as 'Fine' ie small aggregate with D less than or equal to 4mm, or a large aggregate size called 'Coarse aggregate'.
Aftercare	Steps specified in a planning condition or scheme that are to be taken to bring land to the required standard suitable for its subsequent or proposed use; agriculture, forestry or amenity use, including planting, cultivating, fertilising, watering, draining or otherwise treating the land
Agricultural Lime	Agricultural lime, also called aglime, is a soil additive made from pulverized limestone. The primary active component is calcium carbonate.
Ancillary Mining	Term used to describe the extraction of minerals as part of a larger (non mineral related) development
Area of Search	Broader areas of land where mineral resources may be more uncertain, but permission could be granted to meet a shortfall
Blasting	The breaking of solid rock into smaller fragments by the use of explosives. This enables the product to be fed into crushers or other sizing equipment for further treatment. The detonation of explosives
Buffer Zone	An area of land separating a mineral site from potentially sensitive land uses such as housing, and which acts as a physical barrier
Building Stone	Naturally occurring rock of igneous, sedimentary of metamorphic origin which can be cut or shaped into blocks or slabs for use as walling, paving or roofing materials in the construction of buildings and other structures.
Built Environment	The term built environment refers to the human-made surroundings that provide the setting for human activity
Bulk Fill	General term used to describe low quality aggregate material used for infilling voids where higher grade aggregate is not essential
Coal	The metamorphic product of stratified plant remains. It contains more than 50 percent carbon compounds and burns readily.
Coarse Aggregate	Aggregate sizes more than 4mm.
Coated Road Stone	Alternative name for asphalt concrete where a combination of aggregates, sand and a filler (such as stone dust) in the correct proportions is heated and passed through an asphalt plant where the material is coated with a binder, usually bitumen.

Dimension Stone	Dimension stone is natural stone or rock that has been selected and fabricated (i.e., trimmed, cut, drilled, ground, or other) to specific sizes or shapes
Dust	British Standard 6069 (Part 2) defines dust as particulate matter less than 63 microns in diameter. Dust is also the generic term used to describe particulate matter which, although it may be found resting on the ground or other surfaces as solid matter, is capable of becoming airborne to disperse in the atmosphere prior to returning to surface. In construction work it can be applied to the 3mm (less than 3mm) rock product. The term is also used to describe larger particles resting on the ground or other surfaces that can become airborne to disperse in the air before returning to the surface.
EfW	Energy from Waste plant – waste disposal facility for the mass burn of household, commercial and some clinical and industrial wastes.
Ecosand	A recycled glass product intended for use as a bedding sand under concrete slabs and brick paving. Derived from waste bottles and jars collected in bottle banks and through kerbside collection schemes. Ecosand can be used as a replacement for fine or coarse aggregate.
EIA	Environmental Impact Assessment (EIA) can be summarised as the process by which information about the environmental effects of a proposed activity is collected, analysed and presented to decision makers
Fine Aggregate	Smaller aggregate sizes less than or equal to 4mm. It is stated that 'fine aggregate' can be produced from natural disintegration of rock or gravel and/or by the crushing of rock or gravel or processing of manufactured aggregate, but not from a recycling process
Gabbro	A black, coarse-grained, intrusive igneous rock, composed of calcic feldspars and pyroxene. The intrusive equivalent of basalt
Granite	Coarse-grained igneous rock, composed primarily of quartz and light-coloured minerals: feldspars and micas
Gravel	In civil engineering this refers to particulate material ranging in size from coarse sand to large cobbles (see particle size). In current commercial practice, the term gravel (or more correctly coarse aggregate) is used for general and concrete applications to define particles between 4 and 80 mm
Hard Rock	In the aggregate industry, this refers to indurated rock (rock that is difficult to break) as opposed to unconsolidated deposits
Hydrogeology	Study of the relationship between the Earth's water and geological factors (e.g. rock type and structure)
Igneous	Most igneous rocks have crystallised (solidified) from a magma (liquid) state and are either pushed out on the surface as volcanoes (extrusive) or pushed into the rocks forming the earth's crust (intrusive). Hard and tough crystalline rocks, formed from primary silicate melts which may be coarse-grained (e.g. granite, dolerite, gabbro, granodiorite, etc.) or fine-grained (e.g. basalt or rhyolite)
Incinerator Bottom Ash	Incinerator bottom ash (IBA) is a form of ash produced from the Energy from Waste Facility

Inert	Material which will not react with or be significantly altered by other material
Landbank	This usually refers to the area of mineral reserves for which permission to extract has been given, but where extraction has not yet started.
Landfill	The process of, or facility for, infilling a void space or former quarry with waste materials.
Limestone	Sedimentary rock formed principally from calcium carbonate.
Manufactured Aggregate	Aggregate of mineral origin resulting from an industrial process involving thermal or other modification. (eg on IoM Incinerator Bottom Ash)
Manx Group Formation	The name given to a series of slates, mudstones and sandstones which were previously known as the Manx Slate Series. The Formation forms much of the upland area of the Island
Mechanical Properties	These reflect how minerals respond to the application of external forces. Properties include: cleavage, parting, fracture, hardness, tenacity, and specific gravity.
Mineral	This has two definitions. a) A naturally formed chemical element or compound with characteristic form or structure and definite composition (geology). b) A naturally occurring mineral material with foreseeable use (Industrial).
Mineral Prospecting	Investigations using a variety of methods to determine the nature and extend of a mineral reserve. Methods used include geological surface mapping, borehole sampling, geophysical measurement and geochemical analysis.
Mineral Reserves	Mineral reserves are resources known to be economically feasible for extraction. Reserves are either Probable Reserves *or* Proven Reserves. Generally the conversion of resources into reserves requires the application of various factors
Mineral Resources	Mineral resources are minerals that have undergone enough scrutiny to quantify their quantity but the economics of the mineral deposit may not have been fully evaluated
Mineral Safeguarding Area	An area of known mineral resources that are of sufficient economic value to warrant protection for future generations. The requirement for mineral safeguarding areas is to ensure that proven mineral resources are not needlessly sterilised by non-mineral development, although there is no presumption that such resources within a safeguarding area will be worked. Safeguarding areas can take the form of Areas of Search, Preferred Areas and Specific Areas.
Mineral Vein	A vein is a distinct sheet like body of crystallized minerals within a rock.
Mineralogical Properties	Refers to the crystal structure, chemical, physical and optical characteristics of a mineral.

Mining Lease	A legal agreement issued by the Department of Economic Development for extracting significant quantities of mineral over a specified period of time.
Mining Licence	A legal agreement issued by the Department of Economic Development intended for extracting mineral over a short period of time e.g. 6 - 12 months
Mining Permission	A legal agreement issued by the Department of Economic Development for a very short period of time e.g. 3 months or where the amount of mineral extracted is very small
MPS	Minerals Policy Statement. These are the new documents with which the Government lays out its national planning policy for minerals in England. They are gradually replacing some of the Minerals Planning Guidance notes
MTAN	Minerals Technical Advice Notes and circulars should be taken into account by mineral planning authorities in Wales when preparing development plans
Natural Aggregate	Aggregate from mineral sources which has been subjected to nothing more than mechanical processing
Need	The requirement to ensure an adequate supply of minerals to provide primary aggregate to meet society's needs which cannot be met through the provision of secondary aggregates
Noise	Noise is defined as unwanted sound and is usually measured in dB(A)
Oil	Term used to describe naturally occurring liquid hydrocarbons and for certain refined products from hydrocarbons
Peat	Peat (turf) is an accumulation of partially decayed vegetation matter. Peat forms in wetland bogs, moors, peat swamp forests. Peat is harvested as an important source of fuel in certain parts of the world
Physical Properties	properties used to identify a mineral, including colour, streak, hardness, cleavage or fracture, crystalline structure
Polished Stone Value	The Polished Stone Value of aggregate is measured using a standardised test (BS EN 13043: Aggregates for bituminous mixtures and surface treatments). This gives a measure of the resistance of the aggregate to the polishing action of vehicle tyres under conditions similar to those occurring on a road surface.
PPS	Planning Policy Statements set out the UK Government's national policies on different aspects of planning. They are gradually replacing the Planning Policy Guidance notes
Preferred Areas	These are areas of known mineral resources where planning permission might reasonably be anticipated
Progressive Restoration	Restoration which takes place before the end of the site in areas no longer required in the mineral operation

Prospecting	The physical search for minerals and is a small-scale form of mineral exploration which is an organised, large scale effort undertaken by mineral resource companies to find commercially viable mineral deposits
Quarry Dust	Also referred to as quarry fines, defined by BS EN standards as the inherent fraction of an aggregate passing 0.063 mm (63 microns). Many quarries also refer to aggregate finer than 4 mm as quarry fines (or quarry dust). The term is used here to denote both fine aggregate and quarry fines (material<63 microns). A mixture of coarse, medium and fine sand material, and silt / clay, quarry dust is a by-product of mining activities. It has the potential to be reused
Recycled Aggregate	Aggregate produced by the processing of: construction and demolition waste, i.e. crushed concrete, bricks; road/asphalt planings i.e. the surface layers of roads removed during roadwork's; or glass bottles and jars etc collected for recycling; Processing includes crushing and screening, as with primary aggregates, but also the removal of metal, plastic or wood waste.
Restoration	Returning the land used in quarrying to some previously agreed purpose. This may be for use by landfill, agriculture, and wildlife or as a new public amenity such as parkland or water sports
Road Planings	Material removed from the reconstruction or rehabilitation of asphalt roads by means of a planing machine
Salt	Common name given to the mineral Halite .
Sand	A naturally occurring granular material composed of finely divided rock and mineral particles. The composition of sand is highly variable, depending on the local rock sources and conditions, but the most common constituent of sand in inland continental settings and non-tropical coastal settings is silica (silicon dioxide, or SiO2), usually in the form of quartz.
Sandstone	Sedimentary rock made of fragments of sand size in a finer grained matrix or cementing material, sand particles are predominantly quartz
Secondary Aggregate	Aggregates produced as a by-product of industrial processes. On the Isle of Man there is currently one source for secondary aggregate, the EfW, which produces Incinerator Bottom Ash (IBA)
Section 13 Agreements	Agreement regulating the development of made under the provision of S13 the Town and Country Planning Act 1990, which can include financial provisions considered necessary or expedient for the purposes of the agreement.
Spar	A pure form of quartz found in mineral veins within the granite at Stoney Mountain, Foxdale. Any shiny, crystalline, non-metallic mineral that cleaves easily into chips or flakes.
Sterilisation	The removal of access to potentially economically workable mineral resources by legislation (designated environmental constraint areas etc) or by other developments (transport, housing, industry etc).

Turbary	Term used to describe the ancient right to cut peat, for fuel on a particular area of bog.
Type 1	This is a material from a certified source having the correct proportion of 'fines' (dusty material) and solids ('lumps'). The mixture of solids and fines is designed to ensure that: there are minimal voids in the sub-base material once compacted; that the aggregate forms an acceptable level of interlock between the angular particles; that it is non frost susceptible; and, that the compacted sub-base will allow any ground water to drain through. This material is typically crushed stone, crushed slag, crushed concrete or non-plastic well-burnt shale. Technical specifications are set out in UK Highways Agency, Specification for Highway Works, Volume 2 Series NG 800 Notes for Guidance on the Road Pavements - Unbound Cement and Other Hydraulically Bound Mixtures. NG 803 (11/04) Type 1 Unbound Mixtures. www.dft.gov.uk/ha/standards/mchw/vol2/pdfs/series_ng_0800.pdf
Vibration	Ground vibration can be generated by a number of sources, including road and railways, construction activities such as piling, blasting and tunnelling. Vibration can be defined as regularly repeated movement of a physical object about a fixed point. The parameter normally used to assess the ground vibration is the peak particle velocity (ppv) expressed in millimetres per second (mm/s). In order to completely define ground vibration, the amplitude and frequency of the motion are measured in the three orthogonal directions generally in terms of velocity which is considered to be the best descriptor for assessing human comfort and the potential damage response of structures. The vibration velocity signals are summed (in real time) and the maximum amplitude of this vector sum is defined as the Peak Vector Sum (PVS). Vibration can cause varying degrees of damage in buildings and affect vibration-sensitive machinery or equipment. Its effect on people may be to cause disturbance or annoyance or, at higher levels, to affect a person's ability to work
Waste Disposal Licence	A licence required for the management of wastes, as specified by the Public Health (Licensing of Waste Disposal) Regulations 1990 and Collection and Disposal of Waste Regulations 2000. Under the terms of S59 (2)of the PH Act 1990, a WDL will not be issued for a use of land, plant or equipment for which planning approval is required in pursuance of the Town and Country Planning Act 1999 unless such approval is in force.