

## ***Address significant gaps in the education and training provision for current and prospective managers in the quarrying and extractive industries.***

### ***Background to the project.***

The Extractive and Mineral Processing Industries in general and the aggregates sector in particular have been under increasing pressures to introduce fundamental changes in business practices particularly since the introduction of the Quarries Regulations 1999. The sector has also had to respond to increasingly stringent local authorities' requirements on consents for both new and existing sites. Further pressure for change has come from the environmental and sustainability agenda. At the same time the industry has found it increasingly difficult to attract young people into the industry even though it has made significant efforts to maintain a positive profile. Despite the acknowledged need to increase the amount of recycled materials and decrease environmental impact there remains a need to continue to extract primary aggregates. The industry is a major contributor to the GDP of the United Kingdom and a supplier of raw materials not only to construction but to a wide range of manufacturing industries. All these customers are seeking higher quality products at minimum cost whilst also responding to their own environmental and sustainability agendas. The Extractive and Mineral Processing Industries in general and the major aggregates companies in particular have recognised that they have an obligation and responsibility to make a positive contribution to the overall objectives of the Government and society in general; to minimise aggregate extraction through increased use of recycled materials, minimising the environmental effects of quarrying and developing improved approaches to dealing with existing environmental effects from past, present and future quarry operations.

The industry has therefore to establish best operational practices which provide individual customers and the economy in general with the products they need, whilst carrying out this primary function with due regard to the environment and embracing the sustainability agenda.

The Extractive and Mineral Processing Industries will not be able to achieve this objective unless all employees share this vision. Critically, those involved in management must be equipped with the necessary knowledge and understanding of operational issues and how they apply in the wider context of government initiatives, legislation and the expectation of society.

EPIC Training and Consulting Services Limited, in its capacity as the industry training organisation, was asked, through this project, to develop an additional range of education and training materials to ensure quarry and other managers in the extractives industry have the necessary knowledge to extract and transport aggregate in an environmentally friendly manner, and reduce the environmental effects of mineral extraction through development, promotion and implementation of sustainable technologies.

### ***Module Preparation.***

Commencing in October 2004, consultation took place with industry representatives, education and training providers, professional bodies and the Health and Safety Executive to establish what learning materials were available, and the precise amendments or new materials that were needed. The review confirmed that course development had not been maintained to match the pace of change, and in particular with changes in environmental practice and expectations.

The decision was taken to write 16 new modules, whilst over 70 others were identified which would need to be substantially re-written, to include the environmental aspects which all quarry management must now consider.

What was expected to be the most difficult aspect of the project now followed. It was essential that the materials must be both technically accurate and also reflect current best practice. To achieve this great care was taken to select technical writers, and also peer reviewers of high reputation in the Extractive and Mineral Processing Industries in general and also who were well known for their particular expertise in the specific subject. In the event, due to the great enthusiasm for the project from the industry, and the support received from the Institute of Quarrying, Institute of Asphalt Technology and Doncaster College, this was resolved to the satisfaction of all concerned.

Rather than embark on a wholesale preparation exercise, an initial group of 21 subjects of a varied nature were selected and written to evaluate whether a preferred style and standard format could be established. In this respect, the project was successful, as the vast majority of the modules proved to be able to be produced in a similar way. The final chosen style was to write the materials in a dialogue text style, including relevant illustrations. This gave the benefit of flexibility, allowing the material to be used for self study, distance learning, or to provide tutor notes for a taught course as desired. In most cases the modules were further subdivided into relevant sub-sections, as shown by the following contents from the introductory module on Environmental Awareness.

### ***Contents; Environmental Awareness 1*** INTRODUCTION

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EMISSIONS TO AIR  
WATER MANAGEMENT  
NOISE PREVENTION AND CONTROL  
    Dealing with Noise Problems  
WASTE MANAGEMENT  
EMERGENCY RESPONSE  
BIODIVERSITY  
    Protected Species  
    Working Near protected Species  
RESOURCE USE/WASTE MINIMISATION  
CASE HISTORY

To assist in both self learning and the evaluation of taught courses, sample test questions were included within the majority of modules where appropriate.

### *Modules Produced*

The range of individual modules produced is extensive, and includes:

Accident Investigation  
Alternatives to Blasting  
Archaeology for Quarry Managers and Estate Managers  
Binders  
Bituminous Materials Manufacture  
Bituminous Materials Laying  
Blasthole Drilling  
CDM Regulations  
Circuit Control and Introduction to Electronics  
Community Stakeholder Engagement  
Compaction of Bituminous Materials  
Compressors and Compression of Gases  
Control of Explosives Regulations  
Conveyers  
Corrosion  
COSHH Regulations 2002  
Crushing  
Dumptrucks  
Earthing and Earth Leakage Protection  
Earthmoving Principles  
Earthmoving Plant  
Electrical Power Transmission  
Electrical Safety in the Quarry  
Environmental Awareness (Modules 1 & 2)  
Environmental Considerations of Blasting  
Environmental Legislation  
Environmental Management  
Explosives – General  
Fire Prevention and Control  
First Aid Regulations 1981  
Generators  
Geotechnical Appraisal and Assessment  
Hazardous Substances in the Workplace  
Health and Safety at Quarries  
Health and Safety Awareness  
Health and Safety at Work Act 1974  
Health and Safety in the Laboratory  
Health Surveillance  
Heat and Burners  
Initiation and Primary Systems  
Internal Combustion Engines  
Introduction to Aggregates  
Introduction to Hydraulics  
Loading at the Face  
Lone Working

Lubrication  
Maintenance of Fixed Structures  
Managing Health and Safety  
Marine Aggregates  
Mechanical Power Transmission  
Methods of Working  
Mineral Planning  
Monitoring the Workplace Environment  
Motors  
Noise in the Workplace  
Overload Protection  
Planning for Emergencies  
Plant Maintenance  
Power Factor Correction  
Pressure Systems Safety Regulations  
Primary Blast Design  
Principles of Management (Modules 1&2)  
Project Planning (Modules 1,2,3,4)  
Properties and Testing of Materials  
Pumps  
PUWER Regulations 1998  
Quality Control of Concrete  
Quarry Planning and Development  
Quarry Restoration  
Reclamation of Mineral Workings  
Safe Guarding of Machinery  
Safe Systems and Permits to Work  
Safety at Roadworks  
Safety Committees and Safety Representatives  
Safety Promotion and Safety of the Public  
Screening  
Strength of Materials  
Surface Water Drainage  
Surface Dressing  
Sustainability  
Sustainable Resource Management  
The Aggregates Industry  
Transformers  
Transportation and Storage of Explosives  
Tyres and Chains  
Waste Management  
Welding  
Workplace Regulations 1992

### *Signposting to National Vocational Qualifications (NVQs).*

The Quarries Regulations 1999 require all persons working in a quarry to be competent. National Vocational Qualifications are widely recognised as the method of demonstrating competence. The production of these modules was an opportunity to help those wishing to become quarry managers, or currently in that position but wishing to improve their knowledge, to gain the knowledge they would be required to show they know in the process of gaining their NVQ.

Each module therefore includes an outline to point out where the particular module provides knowledge included in the National Vocational Qualification "Health, Safety and Environmental Management in the Extractive and Minerals Processing Industries", at level 4, this being the level that most closely equates to an appointment under Quarries Regulations 1999, Section 8(i)c.

### *Example Mapping to:*

*Health Safety and Environmental Management in the Extractive and Minerals Processing Industries*

Knowledge Statements: NVQ Level 4

DAPS Unit Title:	Environmental Awareness 1	
Subject	Degree of coverage	Supports Units
Legislation	1	1, 2, 3, 4, 5, 6, 7, 8,
Best Practice	1	1,2,3,4, 5,6,7,8
Managing Operations	1	2,3,4,5,7,8, 9,10,11,13
Benefits of improved health, safety and environmental performance	1	1
Health, safety and environmental management	1	1
Principles of environmental management	1	4,5

Support level codes - see Note 1	0 – Little or none 1 – Partial 2 – Significant
<p>Notes:</p> <ol style="list-style-type: none"> <li>1. A complete level of supporting knowledge is not possible because the NVQ Standard also requires knowledge of workplace procedures.</li> <li>2. The mandatory Unit 9 of the National Vocational Qualification at Level 4, and the additional Units 10, 11, 12, and 13 (which the candidate can take if appropriate) are general management Units taken from the Institute of Management suite of Awards. As such, they apply across all the management functions in the workplace.</li> <li>3. For information about the National Vocational Qualification "Health, Safety and Environmental Management in the Extractive and Minerals Processing Industries", please visit the EPIC website <a href="http://www.epicltd.com">www.epicltd.com</a>. The National Occupational Standards include a full list of the knowledge requirements.</li> </ol>	

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Copies of the materials are available from EPIC Training and Consulting Services Limited. However, it should be noted that for education and training providers wishing to be recognised as an approved deliverer, of all or any part of the produced materials, may only do so after having gained prior approval from EPIC Training and Consulting Services Limited and the Institutes of Quarrying and Asphalt Technology, as appropriate.

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