

Surname	Centre Number	Candidate Number
Other Names		2



GCE A level

1215/02



GEOLOGY – GL5
Thematic Unit 2
Geology of Natural Resources

A.M. TUESDAY, 16 June 2015

ONE of TWO units to be completed in 2 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
Section A 1.	15	
Section B 2.	25	
3.		
4.		
Total	40	

1215
020001

ADDITIONAL MATERIALS

In addition to this and one other examination paper, you will need a calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **question 1** in Section A (15 marks) and **one** question from Section B (25 marks).

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

SECTION A

1. **Figure 1a** is a map of the Spence Copper Deposit in the Nevada desert, U.S.A., showing the concentration of copper (Cu) taken from groundwater samples in parts per billion (ppb). **Figure 1b** shows a model of the Spence Deposit along the line of cross-section shown on **Figure 1a**.

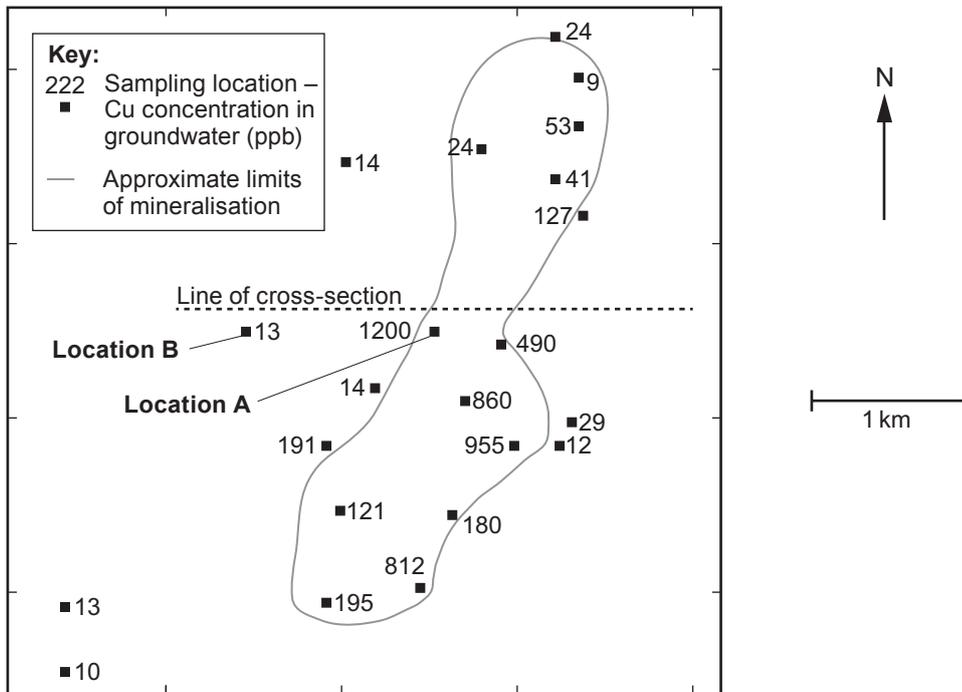


Figure 1a

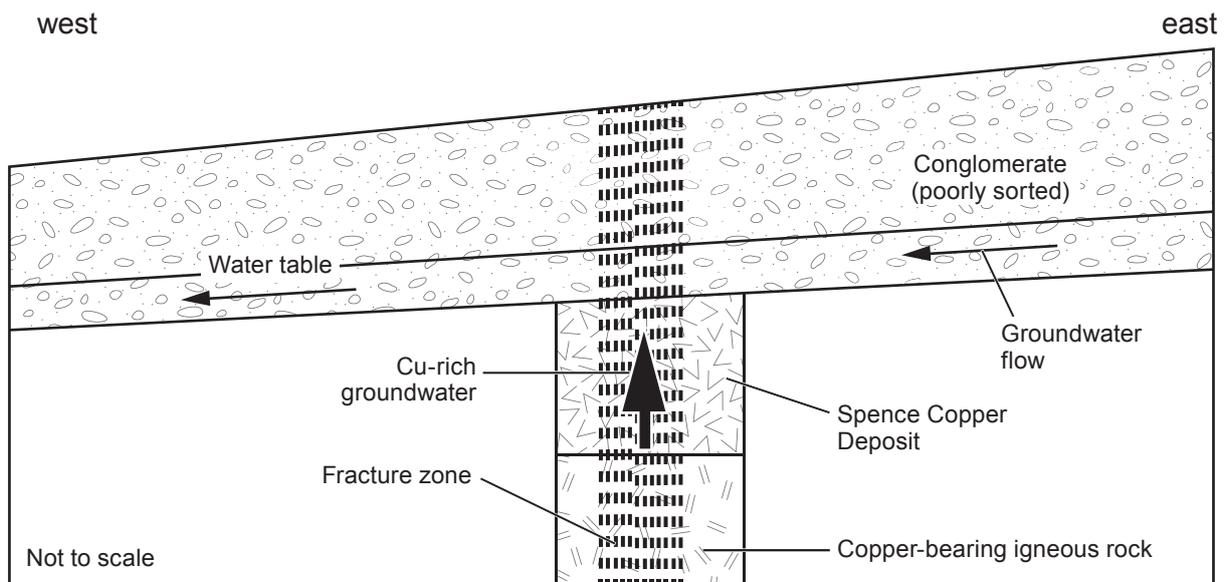


Figure 1b

(a) The Spence Deposit has been estimated to have recoverable reserves of 231 million tonnes (Mt) of sulphide copper (Cu) ore at an average concentration of 1.18% Cu.

(i) Calculate the maximum amount of recoverable copper (Cu) in tonnes (Mt) from this deposit. Show your working. [2]

..... Mt

(ii) For **one** environmental problem that might be caused by the extraction of the Spence Deposit:

1. Describe the problem.

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2. Suggest a suitable planning control that could be used to limit the adverse effects of this problem. [4]

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(b) The Spence Deposit was located by geochemical prospecting of groundwater.

Refer to **Figures 1a** and **1b**.

(i) Explain why the groundwater in the conglomerate on **Figure 1b** flows to the west. [1]

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(ii) Explain why the copper concentrations in groundwater are anomalously high at **Location A** on **Figure 1a**. [2]

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(iii) Explain the low concentration of copper in groundwater at **Location B** on **Figure 1a**, despite the groundwater flow in the conglomerate being towards the west. [3]

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(c) Explain why prospecting techniques other than a geochemical groundwater survey were considered to be less effective in locating the Spence Deposit. [3]

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15

SECTION B

Answer **one** question only.

Write your answer in the remaining pages of this booklet.

2. (a) Describe the geological factors that favour the formation and accumulation of large scale oil and gas reserves.
- (b) Evaluate the use of seismic surveying techniques to identify potential traps for hydrocarbons (oil and natural gas). [25]
3. (a) Describe the formation of coal deposits.
- (b) Evaluate the use of the following techniques in the exploration of mineral and/or energy resources.
- (i) Geological mapping
- (ii) Satellite remote sensing [25]
4. *“Sedimentary processes can produce metalliferous ores and non-metallic minerals of economic value.”*
Evaluate this statement with reference to the processes of formation of these resources. [25]

Acknowledgements

Adapted from: Society of Economic Geologists Newsletter, No. 63 October 2005