

Surname	Centre Number	Candidate Number
Other Names		2



GCE AS/A Level – LEGACY

1213/01



GEOLOGY – GL3 Geology and the Human Environment

FRIDAY, 17 MAY 2019 – AFTERNOON

1 hour 15 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
Section A	1.	12
	2.	13
Section B	3.	
	4.	25
	5.	
Total		50

1213
010001

ADDITIONAL MATERIALS

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 **all** questions from Section **A** and **one** from Section **B**.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

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

Candidates are reminded that marking will take into account the use of examples and the quality of communication used in answers, especially in the structured essay.

SECTION A

Examiner
only

Answer both questions 1 and 2 on the lines provided in the questions.

1. **Figure 1a** is a 1995 map of an area of coast undergoing changes in the shoreline. **Figure 1b** is a model of the effect of a beach nourishment scheme on the predicted retreat for East Bay in **Figure 1a**

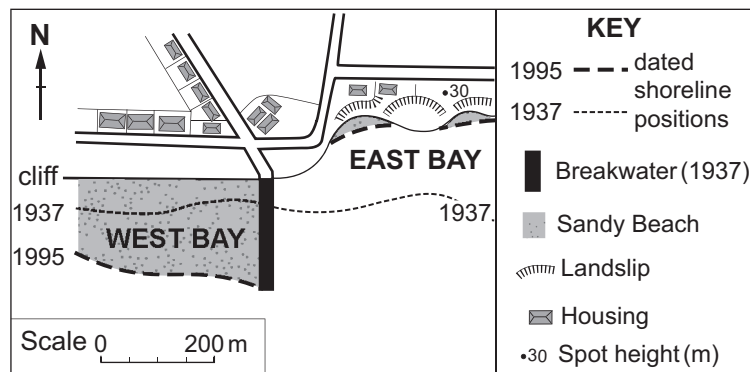


Figure 1a

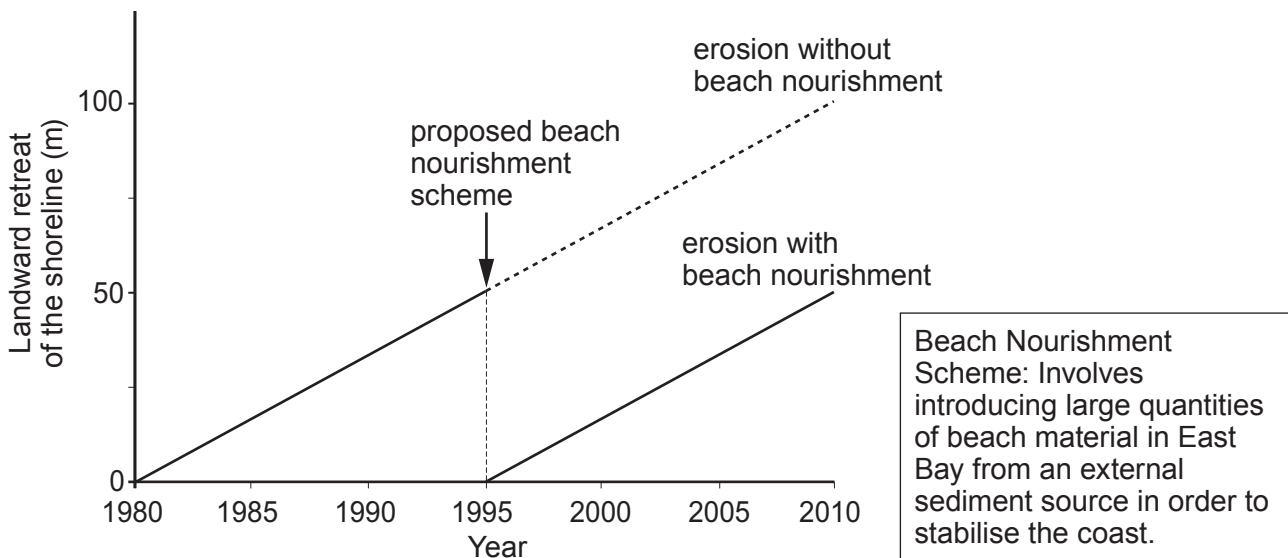


Figure 1b

Refer to **Figure 1a**.

- (a) (i) State the direction of longshore drift in **Figure 1a**. Give a reason for your answer. [1]

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- (ii) Explain the effect of building the breakwater in 1937 on the later position of the shoreline of both West and East bays. [2]

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(b) Refer to **Figure 1b**. In 1995 a beach nourishment scheme was considered for East Bay.

- (i) Using **Figure 1b**, calculate the mean rate of shoreline retreat that is predicted for East Bay **without** a beach nourishment scheme.
Show your working. [2]

..... m y^{-1}

- (ii) Complete **Table 1** by stating the net amount of shoreline retreat at East Bay predicted between 1980 and 2000 under the following conditions; [2]
- with the implementation of a beach nourishment scheme
 - without the implementation of a beach nourishment scheme.

net shoreline retreat between 1980 and 2000 (m)	
with beach nourishment	•
without beach nourishment	•

Table 1

- (iii) “A beach nourishment scheme at East Bay would reduce the **amount** and **rate** of landward retreat of the shoreline due to erosion.”
Critically evaluate this statement with reference to the evidence in **Figure 1b**. [3]

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- (c) Explain how the addition of sand to the beach might be effective in managing the cliff erosion at East Bay. [2]

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2. **Figure 2a** shows the geological setting for a proposed radioactive waste disposal store in an area of very low seismic activity.

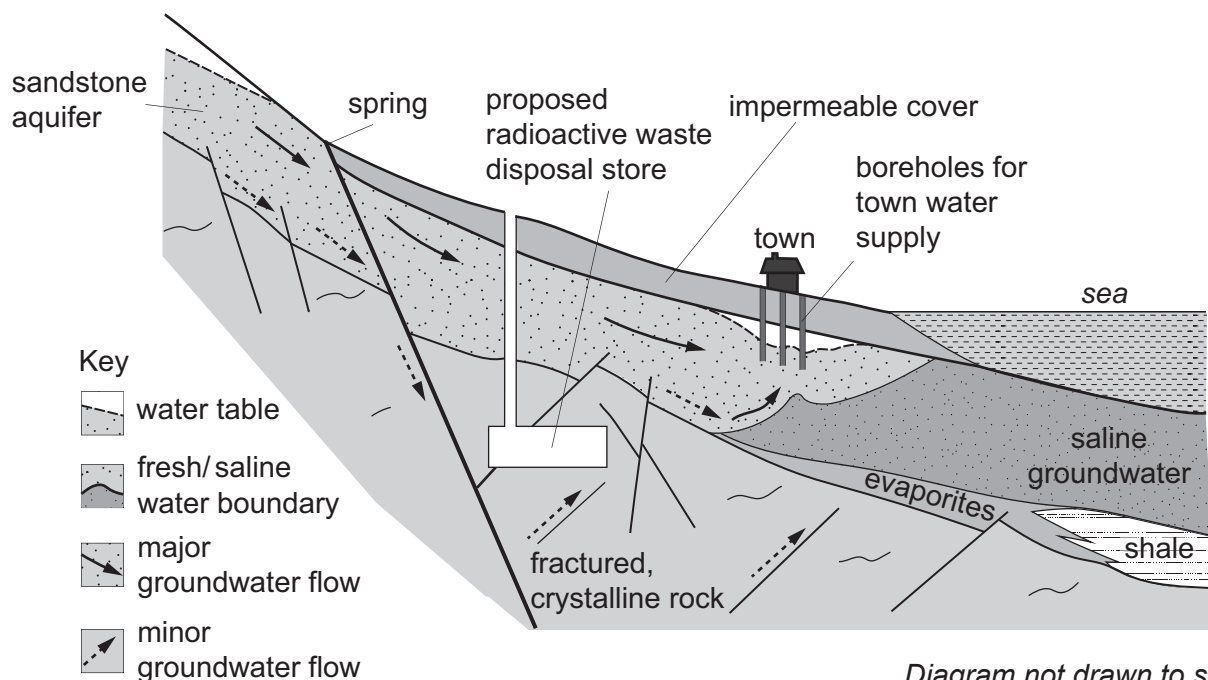


Figure 2a

Refer to **Figure 2a**.

- (a) Water is supplied to the town by pumped boreholes.
- (i) Explain why water once flowed freely to the surface via natural springs in the town. [2]
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-
- (ii) Stating your evidence, describe **one** potential problem which may affect the water supply to the town before the construction of the radioactive waste disposal store. [2]

problem

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evidence

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(b) The sandstone in the aquifer in **Figure 2a** has a high porosity.

- (i) Complete **Figure 2b** by drawing a scaled diagram to show the characteristic **texture** you might expect to find in the sandstone aquifer. [2]

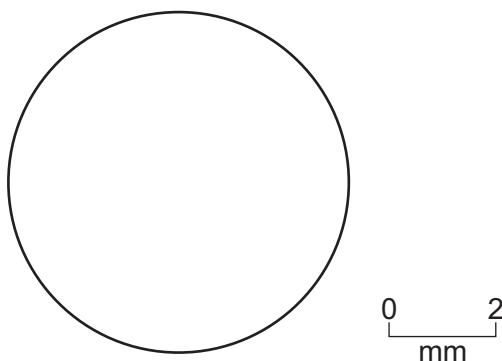


Figure 2b

- (ii) Explain how the **texture** of the impermeable cover in **Figure 2a** might prevent the flow of water through the impermeable cover. [2]

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- (c) (i) Explain **two** geological factors from **Figure 2a** that would favour the siting of the proposed radioactive waste disposal store at this site. [2]

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- (ii) Explain the **geological** reasons why the local water authority might oppose this proposal. [3]

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SECTION B

Answer **one** question from this section on the following pages.

The marks you will be awarded in your essay take into account:

*evidence of geological knowledge and understanding;
the use of geological examples;
legibility, accuracy of spelling, punctuation and grammar;
the selection of an appropriate form and style of writing;
the organisation of material, and use of geological vocabulary.*

EITHER,

3. (a) Describe how the magnitude and intensity of earthquakes can be measured. [10]
- (b) With reference to a named major earthquake(s), explain the factors that affect the intensity of earthquake damage. [15]

OR,

4. (a) Explain why dangerously high concentrations of radon gas are found in some buildings in Britain. [10]
- (b) Describe how the foundations of large structures can be affected by unfavourable geology leading to problems of ground instability. [15]

OR,

5. (a) Describe **two** geological hazards associated with a **named** volcanic eruption at a convergent plate boundary. [10]
- (b) Assess the effectiveness of the monitoring techniques used to predict eruptions. [15]

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