2004 HSC Notes from the Marking Centre
Earth and Environmental Science

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2004 HSC NOTES FROM THE MARKING CENTRE EARTH AND ENVIRONMENTAL SCIENCE

Introduction

This document has been produced for the teachers and candidates of the Stage 6 course in Earth and Environmental Science. It provides comments with regard to responses to the 2004 Higher School Certificate Examination, indicating the quality of candidate responses and highlighting the relative strengths and weaknesses of the candidature in each section and each question.

It is essential for this document to be read in conjunction with the relevant syllabus, the 2004 Higher School Certificate Examination, the Marking Guidelines and other support documents which have been developed by the Board of Studies to assist in the teaching and learning of Earth and Environmental Science.

General Comments

In 2004, approximately 1100 candidates attempted the Earth and Environmental Science examination.

Teachers and candidates should be aware that examiners may ask questions that address the syllabus outcomes in a manner that requires candidates to respond by integrating their knowledge, understanding and skills developed through studying the course. This reflects the fact that the knowledge, understanding and skills developed through the study of discrete sections should accumulate to a more comprehensive understanding than may be described in each section separately.

Overall, the candidate's responses were appropriate and indicated a level of understanding of Earth and Environmental Science concepts that is appropriate for HSC candidates. Candidates need to be reminded that the answer space allocated is a guide to the maximum length of response required. Similarly, the key word used in the question gives an indication of the depth of the required response. The option question is divided into a number of parts: candidates should clearly label each part of the question when writing in their answer booklets.

Section I – Core

Part A – Multiple choice

Question	Correct Response
1	A
2	C
3	A
4	B
5	B
6	D
7	C
8	D

Question	Correct Response
9	C
10	B
11	D
12	B
13	C
14	D
15	A

Part B

Specific Comments

Question 16

(a) Generally well answered.

(b) Generally well answered with candidates recognising that the zone of convergence and subduction progresses from west to east.

Question 17

(a) Most candidates were able to plot the points correctly and plot a line of best fit. Accuracy in the plotting of points and construction of the graph is essential. There was considerable evidence that many candidates did not have the required ruler.

(b) This was generally well answered. Some candidates described the hazard in detail but not the impact on people. Candidates needed to expand their descriptions of the impact of volcanoes on people rather than provide simplistic answers such as 'people are harmed'.

Question 18

This question required an understanding of the overall concept of Plate Tectonics and the Plate Tectonic Supercycle. It was essential that candidates were able to analyse the information provided in the diagrams and link these geological structures to the process of their formation and the Plate Tectonic Supercycle.

A significant proportion of responses demonstrated a knowledge of the plate tectonic process but did not link this to each of the structures. Many candidates ignored the chronology provided.

Question 19

This question focused on the technologies used during the course. The responses included a very large variety of technologies.

(a) and (b) Most candidates were able to describe their technology but many had difficulty outlining an advantage and a disadvantage.

(c) Better responses included a judgement on the effectiveness of using the other identified technology in gathering information.

Question 20

(a) Most candidates were able to identify at least one feature needed to distinguish between a mass extinction event and a smaller extinction event.

(b) Two hypotheses to explain mass extinctions were required in answer to this question. In the better responses candidates provided features of the two hypotheses cited.

Question 21

(a) Generally well answered. It was important to focus on the descendants of the Crossopterygian fish and describe how each of the three problems is overcome in these descendants.

(b) There was too great an emphasis on carbon-14 dating rather than the more commonly used methods for dating fossils. It is important that candidates understand that carbon 14 can only be used to date very young sediments. There was some evidence that the concept of half-life is not well understood.

Question 22

The common misconception that the hole in the ozone layer and the enhanced greenhouse effect are the same thing, was apparent in this question. This question required responses that focused on the enhanced greenhouse effect and examined the causes by both geological events and recent human impact. It is important to specify whether the temperature rises or falls, not simply changes.

Question 23

There was considerable evidence of good skills in the construction of flow charts. An understanding of the concept of ozone depletion by chlorofluorocarbons was not well demonstrated.

Question 24

(a) This was well answered.

(b) The open-ended nature of this question allowed candidates a broad opportunity to display an understanding of a variety of management practices.

Question 25

(a) Most candidates had a clear understanding of an appropriate investigation. It is important that the concept of the aim and method of an experiment are clearly differentiated.

(b) This question provided candidates with an opportunity to demonstrate an extensive knowledge of strategies used to treat soil erosion in NSW. It was important to make a judgement about the strategy and support this judgement with appropriate information.

Question 26

Candidates demonstrated a good general knowledge of landfill and recycling as waste disposal processes but a judgement about the effectiveness of the two methods was frequently omitted. Many good responses included a table showing comparisons of the two methods. An example of a good response follows.

Recycling		Landfill	
Positive	Negative	Positive	Negative
• items are re-used reducing strain for raw materials • less environmental impact • less waste	• can only be used for certain substances • expensive	• cheap • can be used for most things (except radioactive or medical wastes)	• ugly/smells • noise pollution due to trucks dumping rubbish • subsidence can occur • attracts feral animals, eg rats, cats • not environmentally friendly eg glass takes years to break down • leachate can cause water pollution if in contact with ground water

Both methods have positives and negatives. For a large city like Sydney, recycling programs are effective as there are large amounts of recyclable waste. By recycling the waste it is better for the environment and reduces the strain on Sydney's full landfills. However, it cannot be used for all substances. This is why a combination of recycling and landfill is most appropriate for large cities such as Sydney.

Section II – Options

Question 27

(a) (i) Generally well answered.
(ii) A correct response included an identified plant and animal. It was important to describe the reasons for the introduction.

(b) (i) Most candidates were able to describe the trends in the graphs.
(ii) Many candidates described the features of the graph rather than giving reasons for the trend in cost.
(iii) Generally well answered.

(c) Many candidates wrote a clear description of their case study but neglected to make a judgement about the impact on the environment. It was important to discuss the relative contributions of the different conditions that caused the organisms to become pests.

(d) (i) Most candidates were able to identify two methods. Better responses provided the main features of the two methods used.
(ii) Most candidates were able to identify the potential hazards, but detailing steps to minimise risks proved to be more difficult.
(iii) Generally well done. Better responses provided reasons to support the steps taken to identify, classify and account for the presence of an introduced species.

Question 28

(a) (i) Generally well answered.
(ii) Generally well answered.

(b) All parts of this graph interpretation question were well answered.

(c) A carefully planned answer was essential. This question required a level of knowledge integration that proved difficult for some candidates.

(d) (i) A large number of responses incorrectly included descriptions of fossil fuels in their answer to this question.
(ii) Generally well answered.
(iii) Most answers included a description of the investigation. Better responses provided reasons to support the steps taken to make the conclusions.

Question 29

(a) (i) Generally well answered.
(ii) Generally well answered.

(b) All parts of this graph interpretation question were well answered.

(c) Generally well done.

(d) (i) Most candidates were able to identify two methods. Better responses provided the main features of the two methods used.
(ii) In this question it was important to relate the steps taken to the way they minimised risk from potential hazard.
(iii) Most answers included a description of the investigation. Better responses provided reasons to support the steps taken to make the conclusions.

Question 30

(a) (i) Generally well answered; however, a number of candidates did not select long-lived pollutants.
(ii) Generally well answered.

(b) (i) Most candidates were able to describe the trend of the graph.
(ii) Generally well answered.
(iii) This part was poorly answered as candidates had difficulty applying their knowledge to explain the graph.

(c) A carefully planned answer was essential. It was important to distinguish between ocean environments and sea-floor environments and link them to technologies used for resource evaluation.

(d) (i) Most candidates were able to identify two methods. Better responses provided the main features of the two methods used.
(ii) In this question it was important to relate the steps taken to the way they minimised risk from potential hazard.
(iii) Most answers included a description of the investigation. Better responses provided reasons to support the steps taken to make the conclusions.

Earth and Environmental Science

2004 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I Part A			
1	1	9.2.1 Col 2 dp1	H7, H14
2	1	9.2.1 Col 2 dp2, 9.2.2 Col 2 dp1	H7
3	1	9.2.4 Col 2 dp8	H7, H8
4	1	9.2.1 Col 2 dp3, 9.2.2 Col 2 dp1	H7, H14
5	1	9.2.5 Col 2 dp1, 2	H4, H7
6	1	9.3.2 Col 2 dp2, 3, 9.4.6 Col 2 dp2, 4, 9.4.6 Col 3 dp3	H4, H12, H14
7	1	9.3.4 Col 2 dp2, 9.3.4 Col 3 dp1	H7, H14
8	1	9.3.3 Col 2 dp1	H2, H14
9	1	9.3.3 Col 2 dp4	H2, H7, H8
10	1	9.3.1 Col 2 dp2, 9.3.1 Col 3 dp3	H8
11	1	9.4.1 Col 2 dp1	H6, H9, H10
12	1	9.4.4 Col 2 dp1	H4, H7, H10, H12
13	1	9.4.7 Col 2 dp1	H3, H6, H9, H10
14	1	9.4.6 Col 2 dp2	H10, H12, H14
15	1	9.4.6 Col 3 dp2	H4, H12, H14
Section I Part B			
16 (a)	1	9.2.3 Col 2 dp1	H7
16 (b)	3	9.2.3 Col 2 dp1	H7
17 (a)	3	9.2.4	H4, H13
17 (b)	2	9.2.4 Col 2 pt5	H4
18	8	9.2.2 Col 2 dp1, 9.2.2 Col 3 dp1, 9.2.3 Col 2 dp2	H2, H8, H14
19 (a)	1	9.3.3 Col 3 dp 2	H11, H12
19 (b)	1	9.3.3 Col 3 dp 2	H11, H12
19 (c)	3	9.3.3 Col 3 dp 2	H11, H12
20 (a)	2	9.3.3 Col 3	H7, H8, H13
20 (b)	4	9.3.3 Col 3	H7, H8, H13
21 (a)	3	9.3.5 Col 2 dp2, 9.3.5 Col 2 dp3, 9.3.5 Col 3 dp3	H7, H13
21 (b)	3	9.3.5 Col 3 dp1	H7, H14
22	6	9.4.7 Col 2 dp2, 9.4.7 Col 2 dp3, 9.4.7 Col 3 dp3	H1, H4, H7, H8, H9, H10
23	3	9.2.3, 9.3.1, 9.4.6 Col 2 dp2	H1, H3, H4, H6, H9, H10, H13

Question	Marks	Content	Syllabus outcomes
24 (a)	1	9.3.5 Col 2 dp5	H4, H10
24 (b)	3	9.3.5 Col 2 dp1	H4, H10, H14
25 (a)	3	9.3.4 Col 2 dp3	H6, H10, H11, H12, H13, H14
25 (b)	3	9.3.4 Col 2 dp3	H6, H10
26	7	9.4.2 Col 2 dp1, 9.4.2 Col 3 dp1, 9.4.2 Col 3 dp2	H1, H4, H5, H6, H9, H10
Section II **Question 27 — Introduced Species and the Australian Environment**			
27 (a)	4	Introduction of species, 9.5.1 Col 3 dp3	H4, H10
27 (b)	6	Rehabilitation programs – graph data	H4, H5, H7, H14
27 (c)	7	Case study and impact on environment, 9.5.3 Col 2 dp1, 9.5.4 Col 3 dp1, 9.5.4 Col 2 dp1, 2	H2, H4, H5, H7, H10, H14
27 (d)	8	Investigation, 9.5.1 Col 3 dp2	H1, H12
Section II **Question 28 — Organic Geology – A non-renewable Resource**			
28 (a)	4	Coal formation, 9.6.1 Col 2 dp4, 9.6.2 Col 2 dp1	H6, H7
28 (b)	6	Energy Sources – graph data, 9.6.5 Col 3 dp3	H1, H4, H5, H6, H9, H14
28 (c)	7	Exploration programs, 9.6.3 Col 2 dp1, 3, 9.6.2 Col 2 dp1, 2, 3, 6, 7, 9.6.2 Col 3 dp1, 2	H1, H5, H7, H14
28 (d)	8	Investigation, 9.6.6 Col 3 dp2	H6, H9, H11, H12, H14
Section II **Question 29 — Mining and the Australian Environment**			
29 (a)	4	Laws and mining, 9.7.2 Col 2 dp1, 2, 9.7.2 Col 3 dp1	H6, H9, H10
29 (b)	6	Gold production – graph data, 9.7.3 Col 2 dp6	H4, H6, H9, H10, H14
29 (c)	7	Exploration programs, 9.7.1 Col 2 dp1, 2, 9.7.4 Col 2 dp1	H1, H5, H9, H14
29 (d)	8	Investigation, 9.7.3 Col 3 dp3	H6, H9, H11, H12, H14
Section II **Question 30 — Oceanography**			
30 (a)	4	Mass motions, 9.8.4 Col 2 dp1, 3	H10
30 (b)	6	Salinity and density – graph data, 9.8.1 Col 2 dp1, 9.8.3 Col 3 dp2	H2, H8, H14
30 (c)	7	Technological and resources, 9.8.8 Col 2 dp1, 9.8.8 Col 3 dp1, 9.8.5 Col 2 dp3, 4	H1, H5, H6, H14
30 (d)	8	Investigation, 9.8.6 Col 3 dp1	H7, H8, H11, H12

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NEW SOUTH WALES

2004 HSC Earth and Environmental Science Marking Guidelines

Section I, Part B

Question 16 (a)

Outcomes assessed: H7

MARKING GUIDELINES

Criteria	Marks
• Shield or craton	1

Question 16 (b)

Outcomes assessed: H7

MARKING GUIDELINES

Criteria	Marks
• Indicates the cause for the geological ages of regions becoming younger from west to east including reference to two of (i) cratons or shields in the west, (ii) fold belts or subduction to the east, and (iii) sedimentary basins	3
• Indicates the cause for the geological ages of regions becoming younger from west to east including reference to just one of (i) to (iii)	2
• Identifies one of the points listed above	1

Question 17 (a)

Outcomes assessed: H4, H13

MARKING GUIDELINES

Criteria	Marks
• Correct and appropriate scale and labels on axes. All points plotted correctly. Line of best fit shown	3
• Two of the above	2
• One of the above	1

Question 17 (b)

Outcomes assessed: H4

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of the impact of one hazard associated with volcanic eruptions that may affect people	2
• States one hazard associated with volcanic eruptions that may affect people	1

Question 18

Outcomes assessed: H2, H8, H14

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies each structure and describes the type of movement or process required to form it in terms of plate tectonics • Explains how the structures 1, 2 and 3 and identified processes can be used as evidence for plate tectonic super-cycle	8
• Correctly identifies each structure and outlines the type of movement or process required to form each structure in terms of plate tectonics • Links this to plate tectonic super-cycle	6–7
• Identifies at least two structures and/or outlines the type of movement or process required to form at least two structures • Links this to plate tectonics OR • Identifies at least two structures and outlines the type of movement or process required to form them	4–5
• Identifies one structure and outlines the type of movement or process required to form it OR • Identifies one structure or outlines the type of movement or process required to form it AND • Links this to plate tectonics OR • Outlines the plate tectonic super-cycle	2–3
• Identifies one structure or outlines the type of movement or process required to form it	1

Question 19 (a)

Outcomes assessed: H11, H12

MARKING GUIDELINES

Criteria	Marks
• Provides one advantage of using the named technology	1

Question 19 (b)

Outcomes assessed: H11, H12

MARKING GUIDELINES

Criteria	Marks
• Provides one disadvantage of using the named technology	1

Question 19 (c)

Outcomes assessed: H11, H12

MARKING GUIDELINES

Criteria	Marks
• Makes a judgement on the effectiveness of using the named technology in gathering information	3
• Describes the use of the named technology OR • Outlines the effectiveness of using the named technology	2
• States how the named technology was used	1

Question 20 (a)

Outcomes assessed: H7, H8, H13

MARKING GUIDELINES

Criteria	Marks
• Names two features that allow you to distinguish between mass extinctions and smaller extinctions	2
• Names one feature that allows you to distinguish between mass extinctions and smaller extinctions	1

Question 20 (b)

Outcomes assessed: H7, H8, H13

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of two hypotheses that explain mass extinction events	4
• Provides characteristics and features of one hypothesis that explains mass extinction events OR • Names two hypotheses	2–3
• Names one hypothesis that explains mass extinction events OR • Provides a feature of one hypothesis	1

Question 21 (a)

Outcomes assessed: H7, H13

MARKING GUIDELINES

Criteria	Marks
• Identifies three problems and provides a description of how each problem is overcome	3
• Identifies two problems and provides a description of how each is overcome OR • Identifies three problems	2
• Identifies one problem and provides a description of how this is overcome OR • Identifies two problems	1

Question 21 (b)

Outcomes assessed: H7, H14

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of two dating methods and indicates how these can be used to establish the age of fossils	3
• Provides characteristics and features of one dating method and indicates how this can be used to establish the age of fossils OR • Provides characteristics and features of two dating methods	2
• Names two dating methods OR • Provides characteristics and features of one dating method	1

Question 22

Outcomes assessed: H1, H4, H7, H8, H9, H10

MARKING GUIDELINES

Criteria	Marks
• Identifies the link between climate change and the production of greenhouse gases (increased greenhouse gases = increased global temperature). Relates this link to a process that was operating before the Cenozoic and a process due to recent human impact	6
• Describes a geological event before the Cenozoic and describes a recent human impact that can be linked to global climate change, but does not clearly identify the link	4–5
• Identifies a geological event before the Cenozoic and outlines a recent human impact that can be linked to global climate change	2–3
• Identifies a geological event before the Cenozoic or a recent human impact that can be linked to global climate change but does not identify the link	1

Question 23

Outcomes assessed: H1, H3, H4, H6, H9, H10, H13

MARKING GUIDELINES

Criteria	Marks
• Draws a clearly labelled diagram/flowchart showing conversion of O_3 to O_2 by CFC and decreased UV blocking by atmosphere	3
Clearly labelled diagram or flowchart showing EITHER • Conversion of O_3 to O_2 by CFC OR • Decreased UV blocking by atmosphere OR • Shows both processes without labelling	2
• Inadequately labelled diagram showing one of the above	1

Question 24 (a)

Outcomes assessed: H4, H10

MARKING GUIDELINES

Criteria	Marks
• Names one management practice other than pesticide that can be used to control a crop-eating beetle	1

Question 24 (b)

Outcomes assessed: H4, H10, H14

MARKING GUIDELINES

Criteria	Marks
• Identifies the main features of three conditions	3
• As above for two conditions	2
• Identifies one condition	1

Question 25 (a)

Outcomes assessed: H6, H10, H11, H12, H13, H14

MARKING GUIDELINES

Criteria	Marks
• Provides features of appropriate method including necessary equipment and type of data recorded	2–3
• Identifies an appropriate investigation	1

Question 25 (b)

Outcomes assessed: H6, H10

MARKING GUIDELINES

Criteria	Marks
• Provides features of appropriate strategy and makes a judgement about that strategy and relates to results/observations of investigation	3
• Provides features of appropriate strategy and relates to results/observations of investigation OR • Makes judgement on an appropriate strategy without reference to the results/observations of investigation	2
• Names an appropriate strategy used in NSW OR • Outlines their results or observations	1

Question 26

Outcomes assessed: H1, H4, H5, H6, H9, H10

MARKING GUIDELINES

Criteria	Marks
• Discusses both the environmental and logistics / economic aspects of recycling and landfill disposal and provides a judgement on the relative comparison of the two disposal methods, taking into account the amount of waste generated by a large city	7
• Describes the environmental or logistics / economic aspects of the two methods with limited comparison of relative effectiveness	5–6
• Describes some aspects of both methods with a limited comparison between them	3–4
• Identifies some features of both methods	1–2

Section II

Question 27 (a) (i)

Outcomes assessed: H4, H10

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies TWO modes of introduction of introduced species	2
• Correctly identifies ONE mode of introduction of introduced species	1

Question 27 (a) (ii)

Outcomes assessed: H4, H10

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of reasons for the introduction of plants and animals	2
• Identifies reasons for the introduction	1

Question 27 (b) (i)

Outcomes assessed: H4, H5, H7, H14

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of the trend with reference to Native species in *Area 1* and Introduced species 1 in *Area 2*	2
• Provides characteristics and features of the trend of Native species 1 in Area 1 OR of the Introduced species 1 in *Area 2*	1

Question 27 (b) (ii)

Outcomes assessed: H4, H5, H7, H14

MARKING GUIDELINES

Criteria	Marks
• States reasons to support the trend shown for cost in *Area 2*	2
• Describes the trend shown for cost in *Area 2*	1

Question 27 (b) (iii)

Outcomes assessed: H4, H5, H7, H14

MARKING GUIDELINES

Criteria	Marks
• Gives relevant distinguishing features of both methods and makes a judgement of which method is more effective	2
• Makes a judgement of which method is more effective, with no substantial reasons given OR • Describes features of both methods but does not make a judgement	1

Question 27 (c)

Outcomes assessed: H2, H4, H5, H7, H10, H14

MARKING GUIDELINES

Criteria	Marks
For at least two organisms • Provides features of the impact on both the physical and biological environment and makes a judgement about this impact • Makes a judgement about the contribution of different conditions that caused them to become pests	6–7
For at least two organisms • Provides features of the impact on both the physical and biological environment with no judgement and describes different conditions that caused the organisms to become pests	4–5
For each of at least two organisms • Provides features of the impact on the environment OR • As for 6–7 but for one organism only	2–3
• Describes ONE impact on environment OR • Describes ONE condition that caused the organism to be a pest	1

Question 27 (d) (i)

Outcomes assessed: H1, H12

MARKING GUIDELINES

Criteria	Marks
• Provides main features of TWO methods used	2
• Provides main features of ONE method OR • Identifies TWO methods used	1

Question 27 (d) (ii)

Outcomes assessed: H1, H12

MARKING GUIDELINES

Criteria	Marks
• Relates the reasons why steps were taken and how they minimised risk from potential hazards	2
• Sketches in general terms ONE step taken to minimise risk OR • Identifies two hazards	1

Question 27 (d) (iii)

Outcomes assessed: H1, H12

MARKING GUIDELINES

Criteria	Marks
• Provide reasons to support the steps taken to identify, classify and account for presence of introduced species	3–4
• Outline steps taken to identify or classify or account for presence of introduced species	1–2

Question 28 (a) (i)

Outcomes assessed: H6, H7

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies two properties of coal that change with increasing rank	2
• Correctly identifies one property of coal that changes with increasing rank	1

Question 28 (a) (ii)

Outcomes assessed: H6, H7

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features that indicate how coal forms in a sedimentary basin	2
• Provides characteristics and features for several but not all the steps in the formation of coal in a sedimentary basin OR • Identifies all the steps in the formation of coal in a sedimentary basin	1

Question 28 (b) (i)

Outcomes assessed: H1, H4, H5, H6, H9, H14

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features for the trends for crude oil production and renewable energy consumption	2
• Provides characteristics and features for one of the trends listed above	1

Question 28 (b) (ii)

Outcomes assessed: H1, H4, H5, H6, H9, H14

MARKING GUIDELINES

Criteria	Marks
• States reasons to support the trend shown for crude oil production	2
• Identifies reasons for the trend	1

Question 28 (b) (iii)

Outcomes assessed: H1, H4, H5, H6, H9

MARKING GUIDELINES

Criteria	Marks
• Indicates the main features of environmental concerns that could have contributed to the trend shown for renewable energy consumption	2
• Identifies environmental concerns that could have contributed to the trend shown for renewable energy consumption	1

Question 28 (c)

Outcomes assessed: H1, H5, H7, H14

MARKING GUIDELINES

Criteria	Marks
• For either commodity describes key aspects of environment formation and geological features of the deposit and links these to well-defined exploration methods. Provides reasons why these methods are appropriate	6–7
• Describes some aspects of environment formation and geological features and links to appropriate exploration methods	4–5
• Describes some aspects of environment formation and geological features and states ONE exploration method OR • Describes some aspects of EITHER formation environment OR geological features and links to an exploration method	2–3
• Identifies a feature of EITHER the environment formation OR geological features of deposit and states ONE exploration method	1

Question 28 (d) (i)

Outcomes assessed: H6, H9, H11, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Provides main features of TWO methods used	2
• Provides main features of ONE method used OR • Identifies TWO methods used	1

Question 28 (d) (ii)

Outcomes assessed: H6, H9, H11, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Relates the reasons why steps were taken and how they minimised risk from potential hazards	2
• Sketches in general terms ONE step taken to minimise risk OR • Identifies TWO steps	1

Question 28 (d) (iii)

Outcomes assessed: H6, H9, H11, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Provide reasons to support the steps taken to make conclusions about the energy efficiency of various non-fossil fuel alternative energy sources	3–4
• Outline steps taken to make conclusions about the energy efficiency of various non-fossil fuel alternative energy sources	1–2

Question 29 (a) (i)

Outcomes assessed: H6, H9, H10

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies TWO landmark legal decisions	2
• Correctly identifies ONE landmark legal decision	1

Question 29 (a) (ii)

Outcomes assessed: H6, H9, H10

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of the effects of ONE of the named landmark decisions on either mining operations or mineral exploration	2
• Identifies the effects of the landmark decision briefly	1

Question 29 (b) (i)

Outcomes assessed: H4, H6, H9, H10, H14

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of the trend in gold production and average gold price	2
• Provides characteristics and features of the trend in one of either gold production or average gold price	1

Question 29 (b) (ii)

Outcomes assessed: H4, H6, H9, H10, H14

MARKING GUIDELINES

Criteria	Marks
• States appropriate reasons for the trend in gold production	2
• Describes the trend in gold production	1

Question 29 (b) (iii)

Outcomes assessed: H4, H6, H9, H10, H14

MARKING GUIDELINES

Criteria	Marks
• Put forward a reason for the increased expedition in gold exploration from 1995 to 1999 which fits the trend in the graph	2
• Identifies a reason	1

Question 29 (c)

Outcomes assessed: H1, H5, H9, H14

MARKING GUIDELINES

Criteria	Marks
• For the deposit and setting studied, describes key aspects of the geological setting and features and links these to well-defined exploration methods • Provides reasons why these methods are appropriate	6–7
• Describes some aspects of the geological setting and features and links these to appropriate exploration methods	4–5
• Describes some aspects of the geological setting and features and states an exploration method OR • Describes some aspects of EITHER geological setting OR features and links these to an exploration method	2–3
• Identifies EITHER a geological setting OR feature and states ONE exploration method	1

Question 29 (d) (i)

Outcomes assessed: H6, H9, H11, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Provides main features of TWO methods used	2
• Provides main features of ONE method used OR • Identifies TWO methods used	1

Question 29 (d) (ii)

Outcomes assessed: H6, H9, H11, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Relates the reasons why steps were taken and how they minimised risk from potential hazards	2
• Sketches in general terms ONE step taken to minimise risk	1

Question 29 (d) (iii)

Outcomes assessed: H6, H9, H11, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Provide reasons to support the steps taken to make conclusions about the difference between waste rock and ore, and ore minerals and gangue minerals	3–4
• Outline steps taken to make conclusions about the difference between waste rock and ore, and ore minerals and gangue minerals	1–2

Question 30 (a) (i)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies TWO long lived pollutants	2
• Correctly identifies ONE long lived pollutant	1

Question 30 (a) (ii)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of ocean currents that cause pollutants to be transferred within an ocean basin	2
• Identifies that ocean currents cause pollutants to be transferred within an ocean basin	1

Question 30 (b) (i)

Outcomes assessed: H2, H8, H14

MARKING GUIDELINES

Criteria	Marks
• Provide characteristics and features of the changes in temperature with depth	2
• Provides only partial characteristics and features of the changes in temperature with depth	1

Question 30 (b) (ii)

Outcomes assessed: H2, H8, H14

MARKING GUIDELINES

Criteria	Marks
• State two reasons to support the trend shown in the density of ocean water on the graph	2
• State one reason to support the trend	1

Question 30 (b) (iii)

Outcomes assessed: H2, H8, H14

MARKING GUIDELINES

Criteria	Marks
• Put forward a correct explanation for the rapid increase in salinity between 1000m and 3000m.	2
• Provides an incomplete reason for the increase in salinity between 1000m and 3000m	1

Question 30 (c)

Outcomes assessed: H1, H5, H6, H14

MARKING GUIDELINES

Criteria	Marks
• Describes key aspects of ocean food chains and the physical environment of the ocean and sea floor and relates these to appropriate technologies for evaluating ocean resources	6–7
• Describes some aspects of ocean food chains and the physical environment of the ocean and sea floor and links these to appropriate technologies for evaluating ocean resources	4–5
• Describes some aspects of ocean food chains and the physical environment of the ocean and sea floor and states an appropriate technology OR • Describes some aspects of EITHER ocean food chains OR the physical environment of the ocean and sea floor and links these to an appropriate technology	2–3
• Identifies an aspect of EITHER ocean food chains OR the physical environment of the ocean and sea floor AND states ONE appropriate technology	1

Question 30 (d) (i)

Outcomes assessed: H7, H8, H11, H12

MARKING GUIDELINES

Criteria	Marks
• Provides main features of TWO methods used	2
• Provides main features of ONE method used OR • Identifies TWO methods used	1

Question 30 (d) (ii)

Outcomes assessed: H7, H8, H11, H12

MARKING GUIDELINES

Criteria	Marks
• Relates the reasons why steps were taken and how they minimised risk from potential hazards	2
• Sketches in general terms ONE step taken to minimise risk	1

Question 30 (d) (iii)

Outcomes assessed: H7, H8, H11, H12

MARKING GUIDELINES

Criteria	Marks
• Provide reasons to support the steps taken to make conclusions about the effect of surface area to volume ratio of solids on their cooling rate in water	3–4
• Outline steps taken to make conclusions about the effect of surface area to volume ratio of solids on their cooling rate in water	1–2