



*Rewarding Learning*

**ADVANCED**  
**General Certificate of Education**  
**2019**

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## **Geography**

Assessment Unit A2 3  
*assessing*  
Decision Making in Geography

**[AGG31]**

**THURSDAY 13 JUNE, AFTERNOON**

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**MARK  
SCHEME**

## **General Marking Instructions**

### ***Introduction***

The main purpose of the mark scheme is to ensure that examinations are marked accurately, consistently and fairly. The mark scheme provides examiners with an indication of the nature and range of candidates' responses likely to be worthy of credit. It also sets out the criteria which they should apply in allocating marks to candidates' responses.

### ***Assessment objectives***

Below are the assessment objectives for GCE Geography.

Candidates should be able to:

- AO1:** Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change at a variety of scales.
- AO2:** Apply knowledge and understanding in different contexts to analyse, interpret and evaluate key concepts, information and issues.
- AO3:** Use a variety of relevant methods, and techniques to:
- investigate geographical questions and issues;
  - analyse, interpret and evaluate data and resources; and
  - construct arguments and draw conclusions.

### ***Quality of candidates' responses***

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 17- or 18-year-old which is the age at which the majority of candidates sit their GCE examinations.

### ***Flexibility in marking***

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### ***Positive marking***

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 17- or 18-year-old GCE candidate.

### ***Awarding zero marks***

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### ***Marking calculations***

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error. To avoid a candidate being penalised, marks can be awarded where correct conclusions or inferences are made from their incorrect calculations.

### **Types of mark schemes**

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

### **Levels of response**

In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement.

The following guidance is provided to assist examiners.

- **Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- **Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- **High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

### **Quality of written communication**

Quality of written communication is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form. These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level 1: Quality of written communication is basic.

Level 2: Quality of written communication is good.

Level 3: Quality of written communication is excellent.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

**Level 1 (Basic):** The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation, spelling, punctuation and grammar may be such that intended meaning is not clear.

**Level 2 (Good):** The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are sufficiently competent to make meaning clear.

**Level 3 (Excellent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation, spelling, punctuation and grammar are of a sufficiently high standard to make meaning clear.

## General Descriptions for Marking Criteria

Knowledge and Understanding	Skills	Quality of Written Communication	Level
<p>The candidate will show a wide-ranging and accurate knowledge and a clear understanding of the concepts/ideas relevant to the question. All or most of the knowledge and understanding that can be expected is given.</p>	<p>The candidate will display a high level of ability through insightful analysis and interpretation of the resource material with little or no gaps, errors or misapprehensions. All that is significant is extracted from the resource material.</p>	<p>Quality of written communication is excellent. The candidate will express complex subject matter using an appropriate form and style of writing. Material included in the answers will be relevant and clearly organised. It will involve the use of specialist vocabulary and be written legibly and with few, if any, errors in spelling, punctuation and grammar.</p>	3
<p>The candidate will display an accurate to good knowledge and understanding of many of the relevant concepts/ideas. Much of the body of knowledge that can be expected is given.</p>	<p>The candidate will display evidence of the ability to analyse and interpret the resource material but gaps, errors or misapprehensions may be in evidence.</p>	<p>Quality of written communication is good. The candidate will express ideas using an appropriate form and style of writing. Material included will be relevant and organised but arguments may stray from the main point. Some specialist terms will be used and there may be occasional errors in spelling, punctuation and grammar. Legibility is satisfactory.</p>	2
<p>The candidate will display some accurate knowledge and understanding but alongside errors and significant gaps. The relevance of the information to the question may be tenuous.</p>	<p>The candidate will be able to show only limited ability to analyse and interpret the resource material and gaps, errors or misapprehensions may be clearly evidenced.</p>	<p>Quality of written communication is basic. The candidate will have a form and style of writing which is not fluent. Only relatively simple ideas can be dealt with competently. Material included may have dubious relevance. There will be noticeable errors in spelling, punctuation and grammar. Writing may be illegible in places.</p>	1

## Introduction: some guiding principles

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MARKS

The ideas outlined in the 'Guidance on Content' section are lines of thought that candidates might take in their report. They are not to be seen as the definitive answer, though it is to be expected that the points outlined below will feature, if only in part, in most answers.

When allocating marks look favourably on answers which:

- (a) avoid undue verbatim quoting from Resource Booklet and adopt a consistent style.
- (b) use the full range of the resource material appropriate to the task – particularly where it is provided in non-literary format such as printed maps and photographs.
- (c) apply knowledge and concepts that are not specifically raised in the resource material, yet are both illuminating and relevant to the task.
- (d) maximise opportunities presented by the resource material.
- (e) appreciate that “bias” might exist in resource material which expresses particular views.
- (f) avoid undue repetition of the same answer material in different sections or, if overlap is unavoidable, present it in a fresh way.
- (g) back up points with specific detail, e.g. giving statistical information where it is provided rather than making vague statements when details are readily available.

**A Introduction (Describe the proposed project)**

The proposal is for a coal mine, in the Galilee Basin in Queensland, 400km from the coast of eastern Australia. There are also railway and port developments. The Galilee Basin is 247,000 km<sup>2</sup>, bigger than the whole of the UK and contains extensive coal reserves. This is a remote and inhospitable part of Australia and it was this, alongside the fact that the coal contained in the proposed mine is suitable only for power generation, that prevented mines being developed here before.

If developed, the mine will be very productive with more than 6 times the amount of coal that most Australian coal mines produce, at 60 million tonnes each year. It will continue to produce coal for up to 90 years and would become the largest mine in the whole country and one of the biggest across the globe. It covers 447 km<sup>2</sup> of which 278 km<sup>2</sup> will be made up of six open cast mines. It is around 14 kms at its widest, from east to west and over 50 kms from north to south. The remainder will consist of 5 underground mines used to access the deeper coal. An industrial area will be established around 2 kilometres from the mine and northeast of that will be an airport. This is likely to be mostly used by workers who will fly in and fly out. A Workers' Accommodation Village is planned for a point around 10 kilometres east of the mine.

A new 381 km railway with a capacity of 100 million tonnes per year will run from the coal mine to Abbot Point, taking the coal to the coast for export. This rail line will provide additional capacity for coal transport and may encourage other mines in the Galilee Basin to open. The exported coal is mainly directed at Indian power stations: Adani is an Indian power generating company.

The port at Abbot Point will have two new terminals built to handle the Carmichael Mine coal and the sea bed will be dredged removing 3 million m<sup>3</sup> of spoil to allow the large ships, including 600 more each year, to access the terminals. The spoil was initially going to be dumped in the Great Barrier Reef Marine Park, but it will now be dumped within the Abbot Point coal terminal itself.

**Level 3 ([8]–[10])**

The candidate clearly describes the project including the mine, transportation and port. There is a full description, largely without straying onto information best kept for B. Precise figures and facts will be used where possible, particularly using the maps and diagrams and material throughout the text resources which relate to 'description' rather than arguments in favour of or against the proposed development. Quality of written communication will be excellent.

**Level 2 ([4]–[7])**

The candidate makes fewer clear and correct points. There is little or no development of any point, but points made are valid. There may be a lack of detail. Quality of written communication will be good.

**Level 1 ([1]–[3])**

The candidate presents little content and a lot of it is irrelevant to the description of it. Some of the points made may lack validity. There may be excessive verbatim use of resources. Quality of written communication may be basic. [10]

10

**B The likely impact on:****(i) Employment and the economy (Discuss the possible beneficial effects of the proposed development on employment and the economy and the counterarguments)**

Those in favour of the Carmichael mine proposal claim that it will help the economy of Queensland and of the whole of Australia. Even without the new mine, Queensland employed 29,000 people producing coal in 2013. This mine will eventually be producing another 64 million tonnes, increasing coal output by 21%. This will lead to employment in the coal industry increasing by over 13%. The former Australian Prime Minister Tony Abbott said that the new jobs figure showed that “this mine is good for the country”.

In addition, it is argued, this is just the beginning of the opening up of this mining area, and the Galilee Basin could have many more coal mines open as a result of this development, bringing further economic growth and employment to the area and further afield.

The construction itself will bring an estimated A\$78.2 million into the local region each year. It should be remembered that this area is quite isolated in Australia and has lacked economic development. The State of Queensland will get richer by A\$203 million. While Adani are the company developing the site, and so may be biased, they argue they are “committed to delivering jobs and economic benefits in Queensland” by working with local businesses in the community. An estimated 378 extra full-time equivalent jobs will be created during the construction phase alone. When the mine is in full production between 40 to 80 years into the future, there will still be employment and earnings for the country. It is estimated that this will, each year, bring in A\$4,170 million, and eventually create 3000 full-time equivalent jobs. Even after the underground coal mining stops after Year 40, there will still be an estimated 2000 full-time equivalent posts available. This is long term economic and employment success. Local incomes are expected to rise with households getting over 10% more than they would have had in 2008/09.

There are also economic benefits outside Queensland and Australia. India is set to receive much of the coal and this will benefit this country by allowing electricity to be generated more cheaply and reliably than at present. It is said that 100 million Indian people will be lifted out of ‘energy poverty’ as a result.

**Counter**

The economic weakness of this proposal is emphasised by the number of big banks which refuse to get involved with it. HSBC and the Royal Bank of Scotland, along with many other financial institutions, have been reluctant to invest money in the scheme.

There are some doubts as to whether this coal will have a market. While the company says that the main market is India’s coal-fired power stations, India is moving away from generating electricity in this way and using renewables more, in order to meet its targets for climate change. They have a target of 57% of all electricity coming from renewable sources by 2027 when the mine will only be ramping up production (see Graph). One body estimates that India’s importation of coal for power plants will cease even earlier, by 2021. The Managing Director of an Energy Consultancy firm says “it doesn’t make sense to be planning huge long-term investments in coal”, particularly when

India does not require it. If India does not take the coal which is mined, there will be no benefit to Queensland's or Australia's economy and employment, and the investment of A\$16.5 billion will have been wasted.

There is also a lot of scepticism about the number of jobs that would be provided if the mine were to go ahead. While Adani maintained that 10,000 jobs would be created, they admitted in a court case that fewer than 1,500 would actually get jobs. The mine is to be highly mechanised with, for example, driverless trucks so fewer employees will be required. Additionally, the workers are employed on a FI/FO basis. They Fly In and Fly Out of their workplace. This may mean that local people get very little of this employment, and it may not even be Australians who get the few jobs that might be created. Adani, as an Indian firm, may source labour in their own country.

The mine may actually end up costing jobs. Local farmers are concerned that the impact on groundwater will increase droughts in the area, making their land even more inhospitable to farming. Farmers for Climate Action represent 2000 agricultural leaders and farmers and they are fighting the proposed mine development. Adani have no limits to the amount of groundwater that they remove and it is expected that 36.8 million litres of groundwater will be removed every day from an area which already suffers drought. Also any damage to the Great Barrier Reef will cost jobs in a tourism industry which provides employment for 70,000 and also creates A\$6 billion earnings annually, which is much greater than the mine is forecast to bring in.

**NB Some candidates may discuss environmental factors in this section and this is acceptable, so long as they focus on the economic and employment impacts of such changes to the environment. In B ii, should the same environmental factors be revisited, candidates should not merely repeat the information, but should treat it in a fresh way.**

### **Level 3 ([10]–[14])**

Candidate states clearly the main benefits and the counterargument. The discussion will be detailed and comprehensive and cover both employment and economy. The account will have many of these characteristics:

- The points made will be consistently relevant and logically structured
- The ideas will demonstrate insight and a level of sophistication
- Clear understanding of all concepts will be demonstrated
- Use will be made of most of the relevant resource material, and no significant points will be omitted
- Figures, where available and appropriate, will be used to good effect
- Ideas will be expressed clearly and effectively

Quality of written communication will be excellent.

### **Level 2 ([5]–[9])**

Candidate will have fewer lines of thought or discussion may be limited. However, while ideas may lack depth and/or detail, they are still adequate. There may be a heavy imbalance between the two sides of the argument. The account may show deficiencies in the following ways:

- Understanding displayed but an over-reliance on verbatim quoting in places, even though appropriate
- Resource material used but some information not as well exploited as it could be
- Largely related to the question but some irrelevant material introduced
- Ideas not expressed particularly logically or clearly

Quality of written communication will be good.

**Level 1 ([1]–[4])**

- Simple understanding demonstrated but sketchily dealt with
- Excessive verbatim use of resources
- Limited use made of the resource material
- Little or no structure or logic in the ordering of content

Quality of written communication may be basic.

[14]

AVAILABLE  
MARKS

14

**(ii) The environment and people (Discuss the potential impacts on the environment and people of the proposed development and the counterarguments)**

The opponents of this mine proposal claim that it will have a negative impact on groundwater. It is feared that this will have an economic impact on agriculture, as discussed in B(i), but it will also have an impact on the environment. Not only will it be reduced by being abstracted by the mine – it will also be in danger of being polluted. After considerable challenges, eventually the Australian Government put conditions on the proposal, and these were to address groundwater concerns. However, fears remain.

The landscape itself is set to change. At present it is used for cattle which graze it at low intensity, but it will become a mining landscape, with 278 km<sup>2</sup> lost to opencast mining. Ecosystems will be damaged, particularly the Brigalow Threatened Ecological Community (TEC) which Resource 1b shows as located largely on the area which is to be used for open cast mining. It will be virtually eradicated. There will also be impact on the Bygana West Nature Reserve. The project was even halted at one time as the law on endangered species, particularly the Yakka Skink and the Ornamental Snake, had not been followed. Despite assurances by the Environment Minister, people are still worried about the potential environmental damage.

It is also claimed that the loss of habitat would threaten rare birds such as the black-throated finch. The offers of Adani to provide habitats elsewhere to compensate for the damage to birds (biodiversity offsetting) reinforced how much damage will be caused to the environment, and no amount of biodiversity offsetting will compensate for the damage to this threatened species. As experts from the James Cook University confirm, if the mine is allowed to go forward, they are unlikely to survive and will become extinct.

Perhaps of even greater risk on the world scale is the damage to the protected Great Barrier Reef, particularly from dredging and the movements of larger and larger coal transporters going ashore at Abbot Point. The Great Barrier Reef is one of the world's largest reefs and is an important ecological site. The reef has already suffered through coral bleaching and 49% of it is said to be dead. This proposed mine will increase the risks to the reef.

There is also the risk to climate change around the world, if coal fired power stations burn this fuel, whether in India or elsewhere. The Carmichael Mine would be among the most enormous mines on the earth. It is set to be almost three times bigger than the city of Paris and the mine will discharge more CO<sub>2</sub> into the atmosphere than a whole country such as Chile. If all the coal in the Galilee Basin were to be mined and burned, there would be an additional 705 million tonnes of the CO<sub>2</sub> released into the atmosphere, contributing further to climate change. This threatens the Paris Climate Change Agreement which Australia signed in 2015. That agreement aims to cap rises in temperature around the world to less than 2° C above what they were before the Industrial Revolution.

The mine project would also impact on the Australia's original population. While the Australian aborigines are divided about the mine, many are strongly opposed. One elder, claiming to speak for most of the 12 indigenous

families who will be affected by the mine, says it will “tear the heart out of the country’. They are also opposed because some of the plants and animals in the ecosystems affected are considered ‘living symbols’ by the Aborigines. Spiny anteaters, emus and some trees are located on the affected land and their loss would have a very serious impact on the connections between the Aborigines and their ancestral land.

### Counter

The developers accept that an open cast coal mine is going to have an impact on the environment. However, even though areas of large areas of Threatened Ecological Communities will suffer some damage, many areas will remain around the mine. It is estimated that the proposed mine will cause the loss of less than 1% of the TECs. It is also accepted that some birds such as the Black-throated Finch will be affected if the development proceeds. However, the vegetation in the open cast mine will be cleared in stages during the 90 years in which the mine will operate, and that will give time for the birds to adapt. This mine has had environmental protection measures placed upon it in a way that no other development has ever had. Adani will ensure, through biodiversity offsetting that the improvement of habitats elsewhere will compensate for the loss of habitats in the open cast mining area. In fact the overall effect may be that habitats are richer as a result of the mine. In any case, the company will limit or remove if possible any causes of environmental damage. The mine is located in an area which has some protected landscapes, but there are no World Heritage Areas or National Heritage Areas affected. The Great Barrier Reef is over 400 km away, and there will be no impact on it from the mine.

Adani recognises the concerns of farmers and environmentalists and it will be priority of the company to ensure that groundwater supplies are protected, so that springs necessary for agriculture and for local ecosystems will not run dry. The water that the mine will take will be insignificant, at most reducing the water table by 0.12m during the 90 years in which the mine will operate. There are five boreholes which will lower the water table by 2 m, but the impact of this will vary from place to place and the project will be developed in such a way as to reduce the impact as much as possible.

There are also concerns that the coal from the mine will add to global carbon emissions when burnt in Indian power stations. However, the Carmichael Mine coal is actually lower in emissions than coal from other mines, so overall using the coal from the proposed mine will actually reduce the emissions from the power stations.

Adani are also concerned to reduce the impact on people. The site is very remote, with the settlements of Clermont and Moranbah around 320km from the proposed mine. There is one farmhouse nearby, but even it is 6km away from the mine and the mine is hidden from view behind a ridge. Drivers on some approach roads, such as the Moray Carmichael Boundary Road, will have a view of the mine but the road is so isolated (Resource 3c) that there are likely to be few travellers. Even when lit up at night, there will be little light pollution from the mine, again reducing any potential visual pollution.

The Aboriginal population are supportive of the mine and the company promise that 7.5% of all jobs will be allocated to Aborigines. The company will protect the cultural heritage of the area and the mine is being developed very sensitively to reduce any potential impact on archaeology. Indeed a 500m buffer will be established on either side of the Carmichael River to preserve any Aboriginal archaeology, such as ancient hunting sites.

**NB Some candidates may discuss employment and the economy in this section and this is acceptable, so long as they focus on the environmental or social impact and its consequent cost. Should the same factors have been covered in Bi, candidates should not merely repeat the information, but should treat it in a fresh way.**

### **Level 3 ([10]–[14])**

Candidate states clearly the potential impact on both environment and people and the counterargument. The discussion will be as detailed and comprehensive as the resources allow. The account will have many of these characteristics:

- The points made will be consistently relevant and logically structured
- The ideas will demonstrate insight and a level of sophistication
- Clear understanding of all concepts will be demonstrated
- Use will be made of most of the relevant resource material, including that in diagrammatic form in the maps, graphs, photographs and other resources – no significant points will be omitted
- Figures, where available and appropriate, will be used to good effect
- Ideas will be expressed clearly and effectively

Quality of written communication will be excellent.

### **Level 2 ([5]–[9])**

Candidate will have fewer lines of thought or discussion may be limited. However, while ideas may lack depth and/or detail, they are still adequate. There may be a heavy imbalance between the two sides of the argument. The answer may concentrate on material from one source, e.g. the text, and not utilise the full range of resources available. The account may show deficiencies in the following ways:

- Understanding displayed but an over-reliance on verbatim quoting in places, even though appropriate
- Resource material used but some information not as well exploited as it could be
- Largely related to the question but some irrelevant material introduced
- Ideas not expressed particularly logically or clearly

Quality of written communication will be good.

### **Level 1 ([1]–[4])**

- Simple understanding demonstrated but sketchily dealt with
- Excessive verbatim use of resources
- Some use made of the resource material but many relevant resources omitted
- Little or no structure or logic in the ordering of content

Quality of written communication may be basic.

[14]

14

## **C Decision**

**State clearly your decision and justify it on the basis of the greater overall benefits**

The recommendation may overlap with some of the points made in B in relation to the potential economic/employment and environmental/social impact of the mine proposal. However, the emphasis here has to be on the greater overall benefits of developing or not developing the Carmichael coal mine and the contrary view. In this section, for example, candidates can weigh up the relative merits of arguable damage to the environment and to people with possible employment and economic opportunities.

*There is no mark for stating a decision alone without a justification.*

**Level 3 ([8]–[10])**

Candidate states clearly a decision. A range of reasons is provided in justification. The account will have many of the following:

- There is evidence that the arguments of both sides are being balanced, one against the other
- Links are made between diverse aspects of resource material, not possible in Section B
- Points are consistently relevant and logically structured
- There is a clear grasp of the concepts used

Quality of written communication will be excellent.

**Level 2 ([4]–[7])**

There are fewer lines of thought or discussion, but what is provided is relevant and correct or supportable in what is argued. There may be deficiencies such as:

- Too much verbatim quoting or overuse of quotations in full
- Important sections of resource material not utilised
- Irrelevant material introduced
- Lack of balanced argument
- Ideas not expressed particularly logically or clearly
- Understanding of concepts not always clearly demonstrated

Quality of written communication will be good.

**Level 1 ([1]–[3])**

- Few lines of thought and sketchy in detail
- Large gaps in the use of resource material
- Little or no structure or logic in the ordering of the concepts
- There may be excessive verbatim use of resources

Quality of written communication may be basic.

[10]

10

**Format**

Clear format headings **using the headings provided** throughout [1]

Clear subheadings **using the subheadings provided** in Section B [1]

[2]

2

**Role**

Role of Ms Sheila Gildea, advisor to the Federal Court in Australia, adopted [1]

Role maintained [1]

[2]

2

**Graph**

Reference in report [1]

Appropriateness of the technique used [1]

Accuracy of the data presented [3]

Conventions (key, labelled axes, title) [3]

[8]

8

**Total****60**