

2008 VAAE Trial Examination 2
Suggested Solutions

MULTIPLE CHOICE

1A	11A
2B	12A
3D	13C
4B	14A
5A	15D
6C	16C
7D	17D
8D	18A
9C	19B
10B	20B

SHORT ANSWER

Question 1

- a) Answers must correctly identify source as diffuse or point¹ give evidence that this source is due to human action¹ and relate this to the definition of pollutant¹
- b) Answers must describe a specific situation¹, using the terms exposure¹ and dosage¹ in the correct context
- c) Answers must give an overview of the fate of the pollutant, describe the pathways it would move through¹ and/or it's sink given no human intervention¹, reference must be made to how long it remains in the environment¹
- d) Allocate 1 mark for each valid point. To gain full marks answers must outline a detailed plan, provide quantitative evidence of its success and give an opinion of its relative effectiveness.

Question 2

- a) Sulfur Dioxide¹ - two physical properties could include a colourless¹ gas¹ or more dense than atmospheric gases¹. The 4th mark is awarded for stating that the transport mechanism is airborne¹
- b) Acceptable Property includes - low pH¹, acidic¹ (sulphuric acid) or water soluble¹.
Transport mechanism- waterborne¹
- c) Marks are awarded for each valid point made about the effects on two distinct ecosystems at C. Valid effects could be: Sulfuric acid can destroy plant epidermis of trees in the forest, which inhibits water exchange for the plants and may cause death¹. Can also cause acidification of lakes and waterways, sulfuric acid concentration in waterways becomes is beyond the tolerance level for many aquatic species to survive.¹
- d) Volcanoes¹ - natural source¹, diffuse as source can not be controlled/filtered¹
Award one mark for a valid anthropogenic source of SO₂, a mark for correctly stating whether the source is point or diffuse and the 3rd mark for correctly identifying why the source is classified as point or diffuse. There are a number of possibilities here - a possible source is:
Metal smelting - sulfur impurities in metal that are emitted in the form of sulphur dioxide when being smelted¹. Point source¹- when SO₂ waste exits plant through a clearly identifiable area eg; a pipe, or in this case usually a chimney stack.¹

Question 3

- a) B,A then C¹
- b) Methyl mercury¹
- c) Both terms describe a process where a toxin, in this case methyl mercury in fish, is taken up and stored by an organism. The difference between the processes is that bioaccumulation is where the mercury has built up, or accumulated in the body tissues of the fish at a faster rate than

it can be excreted.¹ The source of the methyl mercury may be from suspended particulate matter, sediments or smaller prey fish.

Biomagnification refers to the process whereby the source of methyl mercury is from many prey fish thus leading to an overall increase in the concentration of mercury up the food chain of the fish species (From 2ppm in Species C to 5.5 in Species A and 7.8 in Species c)¹. The 3rd marks is awarded for linking the explanation to the data provided in the table. Eg: Results also show that methyl mercury persists in the sediment as the concentration is very high in Minamata Bay (8ppm)

d) One mark is awarded for each valid point being made. Such points might include: The sampling and testing procedure can be repeated/replicated; Including a baseline or control; A statistically valid number of samples taken randomly in the bay¹; Individually analysed¹; An average taken; ¹

e) One mark is awarded for each valid point being made in relation each of the following: a possible advantage with the proposal; a possible disadvantage with the proposal; an overall opinion statement; a justification using data from the table; linking any of these to a valid property of methyl mercury. Points could include -

* Sediment can act as a sink for mercury and therefore removing the sediment reduces the risk of the mercury being taken up by aquatic organisms in Minamata Bay.

* Dredging may bring the small, water soluble methyl mercury molecules into the water part of the bay thereby increasing the risk of mercury exposure and uptake for more aquatic organisms.

* The level of mercury in the suspended particulate matter is much less (2ppm) compared to that found in the sediment (8.5ppm) and it would therefore be foolish to increase the risk of mercury uptake by mobilizing the mercury into a suspended form by dredging.

Question 4

a) Timeline¹, major objectives described in sufficient detail², 3 stakeholders described referring to their interest in the project³

b) Methods must refer specifically to objectives³

c) One mark is awarded for each valid point being made in relation each of the following: a relative advantage of a method/s in meeting one or more project objectives; a relative disadvantage of a method/s in meeting one or more project objectives; an overall stance taken of the relative advantages/disadvantages of the project objectives being met; a coherent justification of the stance taken; stance supported by evidence.

Question 5

a) One mark is awarded for each valid point being made Some possibilities are:

- Potential loss of threatened vegetation communities that should be conserved, such as grassy forests, banksia woodlands and sand heathlands, that have already been lost in other areas of Victoria as a result of European settlement
- Potential land degradation from increased human habitation
- Potential species population decline due to habitat degradation/fragmentation
- Potential degradation of important aesthetic and cultural attractions including uninhibited coastal views and historically significant buildings.

b) One mark is awarded for each of the following aspects of an EMP:

- * A clear environment policy in accordance with legislation (eg. EPA)¹
- * Continual monitoring¹
- * Continual evaluation of performance and improvement¹

c) One mark is awarded for each valid point being made in relation each of the following: Defining the key features of ecotourism activities; stating a valid current use/feature at Point Nepean that meets the criteria of an ecotourist activity; stating a current use/feature at Point

Nepean that may not meet the criteria of an ecotourist activity; overall stance taken with a coherent justification, supported by evidence of the stance taken. Points could include:

1. Providing humans an opportunity to come into contact with the environment, by having walking trails and viewing platforms for the species of the park
 2. Environmental impact is minimised by rotating tracks, allowing for park regeneration
 3. Tours can educate tourists, and improve attitudes towards environmental protection
 4. Funds from daily entry fees are put back into the park for conservation activities
 5. MAINLY: the tourism has an educative component: both historical (buildings) and environmental (interpretative signs).
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- c) One mark is awarded for each valid point being made in relation each of the following: Defining the key features or principles of the term 'ecologically sustainable'; discussing whether the development meets these key features/principles; giving examples from the scenario to support the discussion. This question can be marked relatively sternly as a discriminating question.

Principles of ESD - inter/intra-generational equity especially regarding health of the environment. This includes the preservation of biodiversity. Other possible principles include: precautionary principle & polluter pays principle. Responses that consider the other pillars of ESD (economic and social responsibilities) can also be rewarded.

Points could include:

1. financially viable for this and future generations by charging public entry fee. This also supports the economic responsibility of esd and may be seen to be a form of the polluter or user pays principle. This feature can help the development towards ecological sustainability if the funds are re-invested into conservation programs/strategies within the Port Nepean National Park.
 2. socially beneficial by allowing people access to experience and learn about the natural assets/attractions of the PNNP & it providing a high aesthetic value in Morn Pen area
 3. environmentally sustainable because environment is currently in good position and will be in future years if conservation efforts are maintained
 4. An environmental monitoring and evaluation system should be established, if it isn't already, as part of the EM of the NP so that practices that lead to ecological degradation are identified and modified. If there is a lack of scientific certainty of the environmental effects of an activity in the park then they should be post-poned until further research is undertaken and the environmental risks understood, thus supporting the precautionary principle.
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