Water Crisis in Las Vegas!

What solutions are there to the water crisis in the American Southwest?

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Piers Morgan in Las Vegas

• Watch from 01.08 to 4.45 (Intro & growth of hotels)
'World's tallest' Ferris wheel opens in Las Vegas

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What is being billed as the world's tallest Ferris wheel has opened in Las Vegas.

BBC News video clip
Task 1 – The Background
( use the graphics in Resource 2 )

a. Locate Las Vegas, the Colorado River and the American Southwest (Include an annotated map)
b. Compare the climate of Las Vegas with London (Include climate graphs. Manipulate the data)
c. Describe and explain the growth of Las Vegas (use a graph)
d. Include an annotated photo of Lake Mead
e. Describe how the levels of Lake Mead are changing (use historical water height data).
a) Locate Las Vegas, the Colorado and the American Southwest

- Describe Las Vegas’ location.
- Mention state, distance and direction to other places.
- Go on the Google Earth virtual tour!
b) Compare the climate of Las Vegas with London

• Compare Las Vegas’s climate to that of London’s
• Which is wetter? Which is warmer? Are there seasonal differences?
• In what way does Las Vegas’ climate create problems for the sustainability?
Climate graph – Las Vegas

### Annual climate data

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total annual precipitation</td>
<td>108 mm</td>
</tr>
<tr>
<td>Annual average Temperature</td>
<td>19.5 °C</td>
</tr>
</tbody>
</table>
Climate graph - London

<table>
<thead>
<tr>
<th>Month</th>
<th>Precipitation (mm)</th>
<th>24 Hour Average Temperature °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>55.2</td>
<td>4.3</td>
</tr>
<tr>
<td>Feb</td>
<td>40.9</td>
<td>5.3</td>
</tr>
<tr>
<td>Mar</td>
<td>41.6</td>
<td>7.6</td>
</tr>
<tr>
<td>Apr</td>
<td>43.7</td>
<td>9.9</td>
</tr>
<tr>
<td>May</td>
<td>49.4</td>
<td>13.3</td>
</tr>
<tr>
<td>Jun</td>
<td>45.1</td>
<td>16.4</td>
</tr>
<tr>
<td>Jul</td>
<td>44.5</td>
<td>18.7</td>
</tr>
<tr>
<td>Aug</td>
<td>49.1</td>
<td>18.4</td>
</tr>
<tr>
<td>Sep</td>
<td>49.1</td>
<td>15.7</td>
</tr>
<tr>
<td>Oct</td>
<td>68.5</td>
<td>12</td>
</tr>
<tr>
<td>Nov</td>
<td>59</td>
<td>8</td>
</tr>
<tr>
<td>Dec</td>
<td>55.2</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Annual climate data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total annual precipitation</td>
<td>602 mm</td>
</tr>
<tr>
<td>Annual average Temperature</td>
<td>11.3 °C</td>
</tr>
</tbody>
</table>
• Supersize Earth clip – Las Vegas rises from the desert
The geographical growth of Las Vegas – an increasing area
c) Describe and explain the growth of Las Vegas
Explaining the growth of Las Vegas

• Mormons first settled in the Las Vegas area in 1855, and the town of Las Vegas was established in 1905.
• For the first part of the 20th century it was just a stop along the railway, but it started to grow in the 1930s when gambling was legalised.
• The first hotels were built in the 1940s. Members of criminal groups were involved in the running of some of them – the gambling meant large profits.
• Las Vegas grew still further in the 1960s and 1970s, as people migrated here in search of work and tourism grew.
• In the 1980s and 1990s it became known as a Convention Centre with hotels and conference centres hosting big corporate conferences and events.
• The really big hotels came in the 1990s. e.g. The MGM Grand, The Luxor and New York New York. The hotels have become like theme parks. Gambling is possible 24 hours a day. Weddings are possible 24 hours a day. Las Vegas is known as Sin City.
Piers Morgan in Las Vegas

• Water issues 29.00 to 32.40

Lake Mead is at the lowest level

The water intake tower’s base is a couple feet beneath the water
Annotated photograph of Lake Mead

Annotate this image. Discuss foreground, background, Lake Mead. Use arrows and textboxes.
Lake Mead image analysis

• Where would these labels go? Did you spot them correctly?

Foreground – Hoover Dam

Middle distance – Lake Mead reservoir

Middle distance – Drop in water levels obvious due to white line (chemical weathering by water)

Background – Hills of Nevada

Background – Steep sided gorge

Foreground – Hydro electricity power cables

Foreground – Water intake towers
What is wrong with this annotation?

- Foreground
  - Hoover Dam

- Middle distance
  - Lake Mead reservoir
  - Drop in water levels obvious due to white line (chemical weathering by water)

- Background
  - Hills of Nevada
  - Steep sided gorge
  - Water intake towers
  - Hydro electricity power cables

Lake Mead image analysis
e) How are the levels of Lake Mead changing?

- How have levels in Lake Mead changed over since 2000?
- Lake Mead levels perilously low – Excellent resource
Task 2 – Background

Explain why there is a water crisis in the American Southwest.

Evaluate the causes – which ones are the main ones?

Use Resource 3 – Causes of the crisis
The Decision

• As a geographer you are known for your ability to see multiple aspects of this water crisis.
• You have been employed to advise a range of key stakeholders on the future of the Southwest’s water use.
• Select a combination of two options to improve the economic, social and environmental sustainability of this whole region.
• Some options are more sustainable than others.
The Options

The following 5 options are available:

A. Build more **desalination plants** on California and Mexico’s Pacific coast. This will supply more water to the people of Southern California. **Build pipelines** to carry ‘blue gold’ into the desert states of Nevada, Arizona and Utah.

B. Increase **water conservation** measures to limit water use. Increase the strictness of water conservation.

C. Raise the **price of water** to consumers.

D. **Scrap government financial** help for house building, mining and high tech industries. **Limit** population and economic growth.

E. **Strict planning controls** on new buildings. Only allow high population density housing developments with water-saving features built-in.
Video clips

• Steve Backshaw on how education is being used to tackle sustainable urban living in Las Vegas
Task 3 – The Decision

Use Resource 3 ‘Viewpoints and options’.

Write a report to

a. State your choice of options (Select 2).
b. Explain the advantages and disadvantages of your recommended options.
c. Explain why you rejected one option.
d. Explain the advantages of your rejected option.
e. Conclusion.

Refer to stakeholder perceptions and sustainability throughout. Discuss why is it difficult to find a perfect sustainable solution.
Mark Scheme – Level 3 (8 to 10 marks)

✓ You complete all tasks, especially task 3 (The decision)
✓ Your writing includes plenty of specific place detail.

✓ Task 3:
  ✓ You refer to sustainability in your answer
  ✓ You demonstrate an appreciation of the complex nature of this crisis and that there is no one perfect solution
  ✓ You back up your statements with data.
  ✓ You explain stakeholder views. May refer to conflicts.
  ✓ You include a conclusion.

✓ Task 2: You explain and evaluate the causes of the water crisis

✓ Task 1: Neat presentation with correct annotations and data manipulation. You include maps.
Mark Scheme – Level 2 (5 to 7 marks)

✓ Maximum L2 - Task 3 complete but tasks 1 and 2 incomplete or missing
✓ You refer to some place detail.

✓ Task 3 attempted but not fully complete:
  ✓ Lacks discussion or sustainability, complexity, stakeholder perceptions, numerical data
  ✓ May name stakeholders but unlikely to refer to their perceptions.
  ✓ Likely to lack a conclusion although this will be brief and unsupported.

✓ Task 2: You explain the causes but don’t evaluate them.
✓ Task 1: Likely to include text only. Lacks data manipulation. May include graphics but these are not referred to or lack annotation.
Mark Scheme – Level 1 (1 to 4 marks)

- Vague writing
- Task 3 missing or vague
- You don’t follow the task instructions
- Lacks place detail