

**Take Home Quiz # 2 KEY**

Take home quizzes are due at the beginning of the following lecture. They are worth 2 points of EXAM credit. Please attach this sheet to your answers if additional sheets are used.

1. There are several types of small volcanic vents, including scoria or cinder cones, maar, tuff rings, and tuff cones. Describe each, considering the following factors:

- A. Size
- B. How do beds dip?
- C. How do they form?
- D. Of what type of material are they composed?
- E. Where possible, cite a well-known example

Hint: See pages 57-58 in text; Wikipedia; other web sources (cite), lecture Powerpoint

**Size**

Scoria Cone - 0.25 to 2.5 km in diameter, usually less than 300 meters tall

Maar - 0.2 to 3.0 km in diameter

Tuff rings - 0.2 to 3.0 km in diameter

Tuff Cones - 0.1 to 1.5 km in diameter, typically 100 to 300 meters high

**Dip of beds**

Scoria Cone - All bedding dips outward

Maar - All bedding dips outward

Tuff rings - Dip inward and outward at the same angle

Tuff Cones - Bedding dips inward at a steep angle and outward at shallower angles

## **Formation**

Scoria Cone - Pyroclastic cone formed from airborne eruptions (ash through blocks) falling back to earth around a central vent

Maar - Negative topographic features caused by explosive removal or preexisting rock. They are not depositional features. excavated by hydromagmatic (phreatic) explosions. Such explosions occur when magma interacts with meteoritic water (either surface or groundwater). The water flashes into steam, with a huge increase in volume. Rock above the magma chamber is usually blasted away. This suddenly reduces the confining pressure on the magma and its dissolved gas. The sudden pressure reduction allows an immediate and violent expansion of the dissolved gas. The magma then degasses like a can of shaken soda when the pull tab is removed. When degassing magma adds to the explosive force, the eruption is known as "phreatomagmatic."

Tuff rings - Basaltic magma gets close to the surface before encountering meteoritic water. The magma : water ratio is high.

Tuff Cones - Magma interacting with shallow surface water

## **Material**

Scoria Cone - usually basaltic

Maar - existing rock type

Tuff rings - basaltic magma

Tuff Cones - Solidified magma droplets that have been fractured into tiny fragments.

These fall back around the vent to form tuff. This tuff is often later chemically modified to a yellowish alteration clay mineral called palagonite.

## **Example**

Scoria Cone - Surtsey, Iceland; Parícutan, Mexico

Maar - Hole in the Ground, Oregon

Tuff rings - Diamond Head, Hawaii

Tuff Cones - Daphne Mayór Tuff cone (Galapagos, Ecuador)