Description of Map Units

Lava flows of the Echo Crater area, Craters of the Moon lava field; Units arranged by age; youngest unit is located in the top left hand column and become progressively older down to the right

MAP SYMBOLS

Cave – lava tubes formed by the withdrawal of molten lava after the formation of a surface crust

Hiking Trail

Contour Line

Scarp – Gravity fault: vertical lines point to areas of lower elevation

Eruptive and Non-eruptive fissures

Contact – relative ages of flows indicated by Y: younger, O: older

Lava Channel

1 **Geologic Points of Interest**

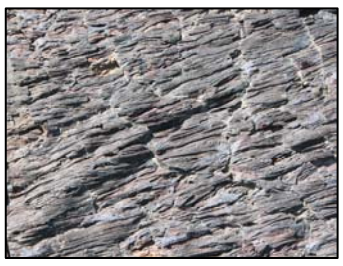
GEOLOGIC UNITS

fa1

Broken Top pahoehoe basalt flow (nd, ~2000)
Surface-fed flow from vents, fissures, cracks, and a few small spatter vents on east and southeast flanks of Broken Top cinder cone (ca1; see Wetherell et al., 2005). Only distal flanks of flow appear in the Echo Crater area. Here, the flow is characterized by hummocky, light-colored lava with significant vegetation and very fluid, glassy breakout flows.

fa2

Blue Dragon pahoehoe basalt-hawaiite flow (2,076±45)
Surface- and tube-fed flow originating from vents at the Spatter Cones (ca2) and Big Craters cinder cone (ca5) in the Inferno Cone quadrangle (Kuntz et al., 1989a). Characterized by spiny pahoehoe flows with glassy, vesicular surfaces and iridescent light and dark blue glassy coatings. Common features: pressure ridges, inflation pits, and drained tumuli.



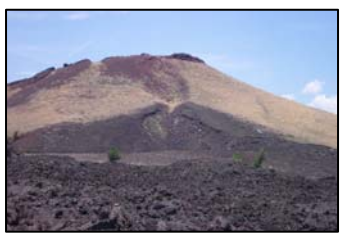
Trench Mortar Flat flow (2,205±25) and related deposits

fa3
aa3

Pahoehoe basalt-hawaiite flow with volcanic ash deposits
Surface-fed, thin, shelly flows erupted from southern set of fissures northwest of the Watchman cinder cone (ca3). Also comprises breakout flows from the slabby pahoehoe (slab-lava) flow that erupted from southeast Watchman flank vent. Partially obscured by deposits of ash and fine lapilli also associated with the Trench Mortar Flat event, mainly <1 m thick.

fa3

Slabby pahoehoe flow
Degassed, highly viscous lava with slabby surface too rough to be obscured by ash. Northeast of the Watchman cinder cone (ca3), slabby pahoehoe (slab-lava) formed where the Trench Mortar Flat pahoehoe flow continued to flow after its crust had congealed. Slabby pahoehoe also formed from degassed lava erupted directly from the southeast Watchman flank vent.



ca3

The Watchman cinder cone and other cinder mounds
Cinder mounds form on either side of the fissure sets associated with the Great Rift along the Trench Mortar Flats. These mounds consist of cinder soils, agglutinated spatter deposits, and occasional volcanic bombs. The Watchman cinder cone, the largest of these deposits, is approximately 140 m high and 750 m in diameter.

fc3

Sawtooth a'a trachyandesite flow (6,020±160)
Long flow erupted from vent on southern flank of Big Cinder Butte cinder cone (cc3) (Wetherell et al., 2005). Characterized by numerous steep-fronted lobes partially buried by large ash units. Edge of flow features occasional pahoehoe squeeze-out flows. Flow is heavily vegetated by sagebrush, limber pine, and various grasses.

South Echo flow and related deposits (nd)

fc4

Pahoehoe basalt flow
Thin, surface-fed flow erupted from fissures running between Echo Crater and the Sentinel cinder cone. Almost entirely covered by cinders, fine lapilli, and vegetation.

cc4

Spatter rampart deposits
Spatter ramparts line eruptive fissures northwest of the Sentinel cinder cone. Ramparts range in height from 5-10 m and are up to 100 m wide. In some cases, spatter ramparts are produced by point vents rather than linear fissures, producing circular ramparts (see Points of Interest). Ramparts are mostly covered by cinders and vegetation.

The Sentinel flow (nd) and related deposits

fc7

Pahoehoe basalt flow
Surface-fed flow erupted from craters and flank vents of the Sentinel cinder cone. The flow is almost entirely covered by cinders and thick sagebrush, but there are periodic linear outcroppings of rough pahoehoe lava 1-2 m high, possibly corresponding to old pressure ridges.

cc7

The Sentinel cinder cone
Cinder cone consisting of two peaks and at least five craters, indicating a complex eruptive history. The cone features agglutinated cinder layers tilting away from the crater vents forming cliffs up to 3 m high. The craters form linear trends roughly corresponding to the direction of Great Rift. The cinder cone is approximately 110 m high and 900 m across.

ch1

Crescent Butte cinder cone (nd, ~15000)
Source for the Crescent Butte pahoehoe flow (fh1) (Wetherell et al., 2005). Cone is composed of cinders and features agglutinated spatter layers surrounding the large crater and numerous volcanic bombs. Western part of cone is mantled with ash from the Trench Mortar Flat volcanic event.

fh2

Little Prairie pahoehoe basalt flow (nd, ~15000)
Surface- and tube-fed pahoehoe flow covered by sagebrush and grasses. Characterized by occasional low outcroppings of weathered pahoehoe basalt and ridges that preserve old flow fronts, significantly in the area just southeast of Crescent Butte. The source vent is unknown.

c
c1

Cinder cones (Holocene and latest Pleistocene) with spatter ramparts
A series of cinder cones having no known associated lava flows; thus, no exact ages can be assigned. Echo Crater is approximately 80 m high and 850 m across, and features huge cliffs surrounding the central crater composed of spatter and lava, as well as spatter ramparts surrounding the rift system southeast of the central crater (c1). Coyote Butte is approximately 55 m high and 700 m across; two prominent crater vents separate its two peaks.

For information concerning references and methodology, refer to the Geologic Points of Interest page.