

Table 1  
Mineralogy and petrography of Lost City carbonate samples

Sample ID <sup>a</sup>	Type <sup>b</sup>	Location	Depth <sup>c</sup>	Temp <sup>d</sup>	Hand sample description	Mineralogy <sup>e</sup>	<sup>14</sup> C Age <sup>f</sup>	Porosity <sup>g</sup>	Stage
3651-1022	A	Top of Poseidon	731	75	White cauliflower formation, friable	arag, bru	50 ± 45		II
3651-1149	A	IMAX flange	792	55	Bright white, fragile	arag, bru	195 ± 45		II/III
3862-1219	A	Poseidon, S side	730	59	White tower	arag, bru, ±cc, ik?	34.3	III	
3862-1325	A	Poseidon, S spire	733	59	Cream/bright white tower	arag, bru, ±cc		56.7	III
3864-1524	A	IMAX flange	764	53.5	Bright white, fragile	arag, bru, cc, ik?			II
3864-1537	A	edge (front) IMAX flange	764	53.5	Bright white, friable, quill-shaped flow channels	arag, bru, cc, ik?			II
3869-1443	A	Marker C, spire above flange	780	9.4	Reddish discoloration, cream-white with meringue-like texture	arag, bru, cc		33.0	II/III
3869-1446	A	Marker C, flange	780	9.4	Reddish discoloration, friable, rough texture with visible blades of aragonite	arag, bru, cc			II
3876-1436	A	Beehive	746	91	Ivory color, feathery texture	arag, bru, cc			II
3877-1606	A	Near Nature Tower, small chimney on 30m tall active structure	841	62	Bright white, friable, quill-shaped flow channels, filaments on surface	arag, bru, cc			II/III
3880-1532	A	Below Nature Tower	845		White, very friable, filaments	arag, bru, cc			II
3651-0908	I	Base of Poseidon, S face	844		Dark brown exterior, well-lithified, fossils	cc, high-Mg cc	25120 ± 210		V
3651-0938	I	Poseidon, S face	786		Intact chimney, dark exterior, ivory interior, well-lithified, fossils	arag, cc	11820 ± 85		V
3651-1123	I	W of IMAX flange in saddle	799		Gray exterior, well-lithified	arag	970 ± 35		IV/V
3651-1231	I	Top of Poseidon, in saddle	731		Gray exterior, white interior mottled surface, well-lithified,	arag, cc	585 ± 35		IV/V
3862-1517bs <sup>h</sup>	I	Marker 6	777		Gray exterior, ribbon-like texture	arag, cc		36.2	IV
3862-1517tp <sup>h</sup>	I	Marker 6	777		Gray exterior, ribbon-like texture				III
3863-1811	I	Low area N of Poseidon	787		Resembles natural concrete in texture & color, fossils	arag, cc		7.4	V
3864-1647	I	Below Marker 1	805		Dark, weathered rind, well-lithified, flow channels preserved, fossils	arag, cc		25.2	IV
3867-1308	I	W part of main field, below Poseidon?	851		Dark gray spire, bright white interior, fossils	cc, bru		12.9	IV/V
3871-1512	I	Below W part of vent field	911		Dark brown/black exterior, bright white interior, exterior had abundant biological growth	arag, cc			V

Sample ID	Type	Location	Depth	Temp	Hand sample description	Mineralogy	<sup>14</sup> C Age	Porosity <sup>e</sup>	Stage
3872-1530	I	Talus below main field	819	9.9	Ivory color, coarse-grained carbonate, well-lithified	arag, cc, talc, serp		III/IV	
3873-1233	I	Talus, W of main field	956		Dark brown exterior, massive, vuggy texture, contains frags of basement rock and fossils	cc			V
3876-1113	I	E part of field, on serpentinite basement	872		Gray, fossils, fluid channels visible, coral on exterior	arag, bru, cc			IV/V
3881-1338	I	Nature Tower	855		95cm tall intact spire, mostly white, sections of pistachio green interior (points 2, 3), H <sub>2</sub> S smell, recently active?	arag, bru, cc			III
3651-0944	F	Face of Poseidon	785		Growing out of cc crust, H <sub>2</sub> S smell upon recovery; poss. recently active	arag, bru, cc	300 ± 35		I/III
3862-1659	F	btwn Marker 1 and Marker 4	755		Carbonate fissure cross-cutting carbonate	arag, bru, cc		53.9	I
3863-1551	F	serpentinite wall, E part of field	768		Delicate carbonate fissure	arag, bru, cc		37.4	I/II
3865-1322	F	near Marker 7, on top of carbonate cap	742		Growing out of crack in cap, flow channels evident, rec. active?	arag, bru, cc		35.5	I/III
3876-1219	F	serpentinite wall, E part of field	799		Mottled dark exterior, with embedded oxidized serp., relict fluid channels visible	arag, bru, cc			I/III
3879-1258	F	serpentinite wall, S of Nature Tower	847		Mottled brown/cream exterior, ivory interior, some flow channels visible	arag, bru, cc			I/IV
3880-1353	F	serpentinite wall, SW of Marker 7	818		Cream white, mottled, relict flow channels visible, shells, fossils	arag, cc			I/IV
3881-1132b	F	serpentinite wall, E part of field	822		Dark cream color, friable, swirled, sub-vertical flow channels, some in-filled with brucite, poss. recently active	arag, bru, cc			I/III

<sup>a</sup> Samples beginning with 3651 from 2000, samples beginning with 3862 through 3881 are from 2003 cruise.

<sup>b</sup> A, actively venting structure; I, inactive structure; F, carbonate growing from fissure in serpentinite bedrock unless otherwise noted; categories based on field observations.

<sup>c</sup> Depth in meters.

<sup>d</sup> Temp indicates temperature in °C of fluid flowing from where sample was collected. Inactive samples were at ambient water temperature (~7 °C).

<sup>e</sup> Mineralogy abbreviations: arag, aragonite; cc, calcium carbonate; bru, brucite; ik, ikaite; serp., serpentine.

<sup>f</sup> <sup>14</sup>C age reported in years, from Fröh-Green et al. (2003).

<sup>g</sup> Porosity reported in percent (determined using thin sections).