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Mineralogy and geochemistry of the impact breccias of the Bosumtwi impact structure, Ghana : genesis and secondary proccesses

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Appendix 1: Bosumtwi impact crater: Geological Map; prepared by Christian Koeberl and Wolf Uwe Reimold.

Originally published as part of: **Koeberl C. and Reimold W.U. (2005). Bosumtwi impact crater, Ghana (West Africa): An updated and revised geological map, with explanations. Jahrbuch der Geologischen Bundesanstalt, Wien (Yearbook of the Geological Survey of Austria) Vienna, 145, 31-70 and 1 map, 1:50,000.**

Jb. Geol. B.-A., 148. H. 1, 2005 - Beilage 1
KOEBERL, C. & REIMOLD, W. U. - Tafel 1

Geological Map of the Bosumtwi Impact Crater 1 : 50 000

Compiled by C. Koeberl and W. U. Reimold

Map supplement to the yearbook of the Geological Survey of Austria 2005



Available from the publishing house of the Geological Survey of Austria, A-1030 Vienna, Neulinggasse 38, http://www.geologie.ac.at
and from the Commission for the Geological Map of the World, F-75005 Paris, 77 rue Claude Bernard, http://cgmw.free.fr
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Topography © 1978 by the Survey Department, Ministry of Lands and Mineral Resources of Ghana;
published by approval - Survey of Ghana

1 : 50 000 (1 cm ≙ 500 m)

500 0 1000 2000 3000 4000 5000 m
5 000 2.5 0 5 10 15 20 Miles

Grid – Accra Ghana Grid
Projection – Transverse Mercator
Spheroid – War Office Spheroid of 1924
Semimajor Axis : 6378721
Inverse Flattening : 296
Units of Measurement – Gold Coast Chain
Meridian of Origin – 0°56' West of Greenwich
Latitude of Origin – 04°40' North
False Northing at Origin – 800000 N
False Easting at Origin – 800000 E

Grid North
Magnetic North
True North
Magnetic Variation as of January 1973: Annual Change 7' East

Digital Reproduction of GHANA GEOLOGICAL BULLETIN 28, 31: Geological Map Sheet N.W. (1 : 62,500)
Original Geology by: P. A. Moon, D. Mason and P. D. Woodfield (1967)
revised geologically by C. Koeberl, W. U. Reimold, D. Boamah, A. Deutsch 1997 - 2004,
with contributions by A. P. Watkins, J. E. Iliffe and W. E. Sharp 1994 - 2004;
Cartography: M. SCHMOLL, Printed: F. Deferlurta, Wien.

Situation of the Map 1: 50 000 000



LEGEND

- Lake Beds
- Suevite
- Polymict and monomict clastic breccias (unspecified)
- Polymict clastic breccias (genetically unclassified)
- Polymict clastic impact breccia

TARKWAIAN SUPERGROUP

- Banket member quartzite and Kawere Conglomerate

BIRIMIAN SUPERGROUP

- Metavolcanics (incl. meta-sediments and altered intrusives, basalt and spilitic basalt)
- Metasediments (incl. metatuffs, phyllite, metagreywacke shales and schist)

Proterozoic

Intrusives

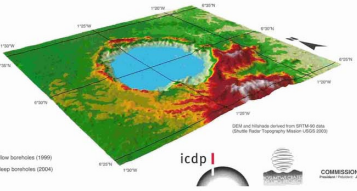
Basin type
- Biotite muscovite granodiorite of the Kumasi batholith
- Biotite granite with hornblende-biotite granodiorite (Paipaidease granite)

Belt type
- Biotite granodiorite of the Banso intrusion (Hornblende granodiorite in the main mass to south)
- Biotite granodiorite of the Trobiokro sill.
- Micro-granite and quartz porphyry

Minor Intrusives
- Olivine pyroxenite, dolerite and gabbro
- Amphibolite, pyroxenite, epidiorite
- Granitic dykes associated with Kumasi batholith
- Carbonated intermediate dykes

- Bedding, strike and dip
- Bedding, vertical
- Bedding, dip unknown
- Cleavage (schistosity), strike and dip
- Cleavage (schistosity), vertical
- Cleavage (schistosity), dip unknown
- Joint, strike and dip
- Joint, vertical
- Fault (from geological and geomagnetic evidence)
- Fault (from geological evidence)
- Fault breccia
- Shear zone
- Axis of anticline
- Axis of syncline

BH1..6 - Shallow boreholes (1999)
ICDP project deep boreholes (2004)



DEM and Hillshade derived from SRTM-90 data
(Shuttle Radar Topography Mission USGS 2000)

Selected topographical entries as of Dec. 1972

- Railways
- Roads
- Tracks and Major Footpaths
- Other Footpaths
- P T Post, Telegraph Office
- + Ch x M Church, Mission
- Ct H Sch Court House, School
- H RH Hotel, Rest House
- Mkt Cem Market, Cemetery
- Borehole, Waterhole, Well, Spring
- Trigonometrical or Precise Traverse Beacon

COMMISSION FOR THE GEOLOGICAL MAP OF THE WORLD / COMMISSION DE LA CARTE GÉOLOGIQUE DU MONDE
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Appendix 2: Full sample list for this study: LB-07A core (KR7-), and samples of the out-of-crater suevites (BS-).

Table 1: Core LB-07A

Sample #	Depth	Designation	Lithology
KR7-54	334.48	Upper impactite	Polymict lithic breccia
KR7-1	334.91	Upper impactite	Polymict lithic breccia
KR7-55	336.52	Upper impactite	Polymict lithic breccia
KR7-57	336.80	Upper impactite	Polymict lithic breccia
KR7-56	337.80	Upper impactite	Polymict lithic breccia
KR7-2	339.22	Upper impactite	Polymict lithic breccia
KR7-58	342.20	Upper impactite	Polymict lithic breccia
KR7-3	346.66	Upper impactite	Polymict lithic breccia
KR7-59	347.16	Upper impactite	Polymict lithic breccia
KR7-60	352.91	Upper impactite	Polymict lithic breccia
KR7-4	353.16	Upper impactite	Polymict lithic breccia
KR7-62	355.02	Upper impactite	Polymict lithic breccia
KR7-61	355.05	Upper impactite	Polymict lithic breccia
KR7-34	355.72	Upper impactite	Polymict lithic breccia
KR7-5	356.61	Upper impactite	Polymict lithic breccia
KR7-63	357.45	Upper impactite	Polymict lithic breccia
KR7-35	359.33	Upper impactite	Suevite
KR7-64	359.96	Upper impactite	Suevite
KR7-6	360.65	Upper impactite	Suevite
KR7-65	362.99	Upper impactite	Suevite
KR7-7	363.20	Upper impactite	Suevite
KR7-36	364.45	Upper impactite	Suevite
KR7-8	370.34	Upper impactite	Polymict lithic breccia
KR7-66	370.39	Upper impactite	Polymict lithic breccia
KR7-9	377.46	Upper impactite	Polymict lithic breccia
KR7-50	378.20	Upper impactite	Suevite
KR7-37	379.09	Upper impactite	Suevite
KR7-10	380.21	Upper impactite	Suevite
KR7-67	382.94	Upper impactite	Suevite
KR7-51	383.14	Upper impactite	Suevite
KR7-11	383.74	Upper impactite	Suevite
KR7-43	384.84	Upper impactite	Suevite
KR7-38	387.59	Upper impactite	Suevite
KR7-68	390.23	Upper impactite	Suevite
KR7-39	390.85	Upper impactite	Suevite
KR7-12	391.85	Upper impactite	Polymict lithic breccia
KR7-52	392.00	Upper impactite	Polymict lithic breccia
KR7-13	393.78	Upper impactite	Polymict lithic breccia
KR7-69	395.14	Upper impactite	Suevite
KR7-14	398.44	Upper impactite	Suevite
KR7-70	398.58	Upper impactite	Suevite
KR7-40	400.06	Upper impactite	Suevite
KR7-53	400.58	Upper impactite	Suevite
KR7-15	402.73	Upper impactite	Suevite

KR7-16	404.26	Upper impactite	Suevite
KR7-17	405.57	Upper impactite	Suevite
KR7-44	407.77	Upper impactite	Suevite
KR7-20	408.32	Upper impactite	Suevite
KR7-41	408.72	Upper impactite	Suevite
KR7-18	411.34	Upper impactite	Suevite
KR7-42	412.17	Upper impactite	Suevite
KR7-21	413.13	Upper impactite	Suevite
KR7-71	415.67	Lower impactite	Monomict breccia (mgw)
KR7-72	416.07	Lower impactite	Monomict breccia (mgw)
KR7-22	420.86	Lower impactite	Monomict breccia (mgw)
KR7-73	421.56	Lower impactite	Monomict breccia (mgw)
KR7-74	430.03	Lower impactite	Monomict breccia (mgw)
KR7-23	430.13	Lower impactite	Suevite
KR7-75	430.28	Lower impactite	Suevite
KR7-24	439.01	Lower impactite	Monomict breccia (mgw)
KR7-25	439.61	Lower impactite	Monomict breccia (mgw)
KR7-76	441.60	Lower impactite	Monomict breccia (mgw)
KR7-77	445.13	Lower impactite	Suevite
KR7-45	445.22	Lower impactite	Suevite
KR7-78	450.37	Lower impactite	Monomict breccia (mgw)
KR7-26	454.35	Lower impactite	Monomict breccia (mgw)
KR7-79	454.52	Lower impactite	Monomict breccia (mgw)
KR7-27	468.28	Lower impactite	Monomict breccia (shale)
KR7-28	470.55	Basement metasediment	Shale
KR7-80	471.88	Basement metasediment	Shale
KR7-29	475.76	Basement metasediment	Shale
KR7-81	483.00	Basement metasediment	Suevite
KR7-82	487.12	Granophyric textured lithology	Granophyric-textured lithology
KR7-29A	487.36	Basement metasediment	Metagreywacke
KR7-30	491.01	Basement metasediment	Shale
KR7-31	512.15	Basement metasediment	Metagreywacke
KR7-83	513.90	Basement metasediment	Suevite
KR7-32	514.77	Basement metasediment	Suevite
KR7-46	530.63	Basement metasediment	Shale
KR7-47	530.79	Basement metasediment	Shale
KR7-84	538.29	Basement metasediment	Shale
KR7-48	538.89	Basement metasediment	Shale
KR7-49	538.99	Basement metasediment	Metagreywacke
KR7-85	539.66	Basement metasediment	Shale
KR7-33	542.70	Basement metasediment	Shale

**Designations for LB-07A lower impactite lithologies: The lithology in brackets indicates the type of monomict breccia, where mgw = metagreywacke; shale = shale.*

Table 2: Out-of-crater suevites

Sample #	Outcrop #*- GPS co-ordinates	Location w.r.t crater lake
BS-1	Outcrop 1 – 0673437, 0713135	South
BS-2	Outcrop 1 – 0673437, 0713135	South
BS-3	Outcrop 2 – 0672300, 0714393	South
BS-4	Outcrop 3 – 0676968, 0725874	North
BS-5	Outcrop 4 – 0677361, 0725615	North
BS-6	Outcrop 4 – 0677361, 0725615	North
BS-7	Outcrop 4 – 0677361, 0725615	North
BS-8	Outcrop 4 – 0677361, 0725615	North
BS-9	Outcrop 3 – 0676968, 0725874	North
BS-10	Outcrop 3 – 0676968, 0725874	North
BS-11	Outcrop 3 – 0676968, 0725874	North
BS-12	Outcrop 3 – 0676972, 0725872	North
BS-13	Outcrop 3 – 0676970, 0725869	North
BS-14	Outcrop 3 – 0676983, 0725867	North
BS-15	Outcrop 3 – 0676966, 0725872	North
BS-16	Outcrop 3 – 0676988, 0725849	North

**For outcrop locations, see also Fig. 6.1; GPS coordinates, all taken on UTM = 30N.*

Appendix 3a: Main lithologies recognized throughout the LB-07A core, and their defining characteristics.

Rock type	Description
Suevite	Polymict impact breccia that includes melt particles (in a glassy or crystallized state) in a clastic matrix containing lithic and mineral clasts in various stages of shock metamorphism.
Polymict lithic impact breccia	An impact breccia that contains shocked and unshocked clasts of multiple progenitors, but that lacks cogenetic melt particles.
Monomict lithic breccia	A cataclasite produced from a single precursor lithology as the result of impact; generally displaying weak or no shock metamorphism.
Shale	A fine-grained, fissile sedimentary rock composed of clay- and silt-sized particles of unspecified mineral composition. Commonly appears dark grey-black and may be iron-stained and is commonly laminated.
Metagreywacke	Metamorphosed, texturally and mineralogically immature sandstone that contains more than 15 % of phyllosilicate. It may consist of quartz and feldspar, small pebbles, and a matrix of phyllosilicate, chlorite and carbonate. The clasts of feldspar and quartz are usually rounded.
Phyllite	Regional metamorphic rock, light silvery-gray in color, and is metamorphically intermediate to slate and schist. Sericite gives sheen to rock. Similar to both a shale and metapelite, but contains a schistose fabric, defined by fine-grained phyllosilicates.
Schist	Metamorphic rock that is not defined by mineral composition but rather by the well-developed parallel orientation of more than 50% of the minerals present, especially those of elongate habit.
Slate	A fine grained metamorphic rock derived mostly from shale. It is characterised by slaty cleavage, i.e., the ability to be split into thin, flat sheets.

Definitions after: Stöffler and Grieve (2007); Stöffler and Reimold (2006); Allaby and Allaby (1999); Lapidus and Winstanley (1990).

Appendix 3b: Hand-specimen and thin section descriptions of samples from the LB-07A core and out-of-crater suevites collected by L. Coney; out-of-crater suevites and target rock lithologies collected by W.U. Reimold and C. Koeberl ; target rock lithologies collected by W.B. Jones.

Table 1. Core LB-07A: descriptions of hand specimens

Sample #	Depth (m)	Lithology	Description
KR7-54	334.48	LB	60% matrix (light grey); sub-rounded to rounded clasts; metagreywacke, shale, quartz; secondary calcite veining. Maximum clast size: 3 cm.
KR7-1	334.91	LB	Hand-specimen is dominated by one large (>10 cm) metagreywacke clast. 10% matrix (light grey); angular to sub-rounded clasts; metagreywacke (some quartz-rich), slate, quartz.
KR7-57	336.80	LB	60% matrix (light grey); sub-angular to sub-rounded clasts; metagreywacke, shale, phyllite; post-impact calcite pods. Maximum clast size: 1.5 cm.
KR7-56	337.80	LB	80% matrix (light grey); sub-angular to sub-rounded clasts; metagreywacke; extensive calcite overprint (ca. 80% of sample). Maximum clast size: 3 cm.
KR7-2	339.22	LB	70% matrix (light grey); angular to sub-rounded clasts; metagreywacke, shale. Maximum clast size: 2 cm.
KR7-3	346.66	LB	Three pieces of metagreywacke-rich polymict lithic breccia; sub-rounded clasts; ca. 50-70% matrix (light grey).
KR7-59	347.16	LB	80% matrix (light grey); sub-angular to sub-rounded clasts; shale; quartz. Maximum clast size: 1 cm.
KR7-4	353.16	LB	Hand-specimen is dominated by one large (4 cm) laminated shale clast.
KR7-62	355.02	LB	40% matrix (light grey); sub-angular to sub-rounded clasts; laminated shale, metagreywacke. Maximum clast size: 3 cm.
KR7-34	355.72	LB	50% matrix (light grey); sub-angular to sub-rounded clasts; metagreywacke (some quartz-rich), shale (some laminated); quartz. Maximum clast size: 1.5 cm.
KR7-5	356.61	LB	60% matrix (light grey); angular clasts; quartz, metagreywacke (all quartz-rich), laminated shale, layered metasediment (3 cm piece). Maximum clast size: 4 cm.
KR7-63	357.45	LB	40% matrix (light grey); sub-angular to sub-rounded clasts; laminated shale, metagreywacke, phyllite; quartz. Maximum clast size: 1.5 cm.
KR7-35	359.33	SB	50-70% matrix (light grey); sub-rounded clasts; metagreywacke (some quartz-rich), shale (some laminated), phyllite; quartz. Maximum clast size: 3 cm.
KR7-64	359.96	SB	40% matrix (light grey); sub-angular to sub-rounded clasts; shale, metagreywacke; calcite overprint. Maximum clast size: 1.5 cm.
KR7-6	360.65	SB	50% matrix (grey); sub-rounded clasts; phyllite, metagreywacke, laminated shale; quartz; notable clast size variation. Maximum clast size: 1 cm.
KR7-65	362.99	SB	40% matrix (light grey); sub-angular to sub-rounded clasts; shale, metagreywacke. Maximum clast size: 1 cm.
KR7-7	363.20	SB	30% matrix (grey); angular to rounded clasts; metagreywacke (some quartz-rich), phyllite, laminated shale; quartz; notable clast size variation (few mm to 5 cm). Maximum clast size: 5 cm.
KR7-36	364.45	SB	50% matrix (grey); angular to sub-rounded clasts; laminated shale, quartz-rich metagreywacke; quartz. Maximum clast size: 2.5 cm.
KR7-8	370.34	LB	40% matrix (grey); angular to sub-rounded clasts; laminated shale, quartz-rich metagreywacke; quartz. Maximum clast size: 1.5 cm.
KR7-66	370.39	LB	70% matrix (light grey to green); angular to sub-rounded clasts; shale. Maximum clast size: 4 cm.
KR7-9	377.46	LB	40% matrix (light grey); sub-angular to sub-rounded clasts;

			metagreywacke, shale; some folding. Maximum clast size: 1 cm.
KR7-50	378.20	SB	40-50% matrix (light grey); angular to sub-rounded clasts; shale (some laminated), quartz-rich metagreywacke; flow textures. Maximum clast size: 2 cm.
KR7-37	379.09	SB	30% matrix (light grey); angular to sub-rounded clasts; laminated shale, metagreywacke (quartz-rich), phyllite, mica-schist. Maximum clast size: 1.5 cm.
KR7-10	380.21	SB	30% matrix (light grey); angular to sub-rounded clasts; laminated shale, metagreywacke, quartz. Maximum clast size: 2 cm.
KR7-67	382.94	SB	20% matrix (light grey); sub-angular to rounded clasts; shale, metagreywacke, phyllite, quartz. Maximum clast size: 3.5 cm.
KR7-51	383.14	SB	40% matrix (light grey); angular clasts; metagreywacke, laminated shale, phyllite, quartz. Maximum clast size: 4 cm.
KR7-11	383.74	SB	40% matrix (light grey); sub-rounded clasts; metagreywacke, shale; quartz; flow texture around main metagreywacke clast. Maximum clast size: 2.5 cm.
KR7-43	384.84	SB	Hand-specimen is dominated by one large (>5 cm) metagreywacke clast. 70% matrix (grey); shale (some laminated), metagreywacke; maximum clast size is 1 mm; flow textures, as with KR7-11, of suevite into and around metagreywacke.
KR7-38	387.59	SB	40% matrix (grey); angular to sub-rounded clasts; metagreywacke (some quartz-rich), shale (some laminated), minor mica-schist. Maximum clast size: 1.5 cm.
KR7-68	390.23	SB	90% matrix (light grey); sub-rounded clasts; shale; quartz; notable sulphide overprint. Maximum clast size: 0.5 cm.
KR7-39	390.85	SB	40% matrix (grey); angular clasts; phyllite, laminated shale; minor quartz. Maximum clast size: 1 cm.
KR7-12	391.85	LB	40% matrix (grey); angular to sub-rounded clasts; phyllite, laminated shale, metagreywacke. Maximum clast size: 4 cm.
KR7-52	392.00	LB	40% matrix (grey); angular to sub-rounded clasts; shale (some laminated), quartz-rich metagreywacke; deformation flow. Maximum clast size: 5 cm.
KR7-13	393.78	LB	40% matrix (grey); angular to sub-rounded clasts; shale (some laminated), phyllite, metagreywacke (some quartz-rich). Maximum clast size: 1.5 cm.
KR7-69	395.14	SB	70% matrix (light grey); sub-angular to rounded clasts; shale, metagreywacke; quartz. Maximum clast size: 0.5 cm.
KR7-14	398.44	SB	60% matrix (grey); angular to sub-rounded; metagreywacke, shale (some laminated); quartz. Maximum clast size: 2 cm.
KR7-70	398.58	SB	40% matrix (light grey); sub-angular clasts; shale; quartz; post-impact calcite overprint. Maximum clast size: 3 cm.
KR7-40	400.06	SB	80% matrix (grey); rounded clasts; shale (some laminated), quartz. Maximum clast size: 0.5 cm.
KR7-53	400.58	SB	20% matrix (grey); angular to sub-rounded clasts; metagreywacke (some quartz-rich); laminated shale; phyllite; quartz. Maximum clast size: 3 cm.
KR7-15	402.73	SB	30% matrix (grey); angular to sub-rounded clasts; metagreywacke (some quartz-rich), shale, phyllite; quartz. Maximum clast size: 2.5 cm.
KR7-16	404.26	SB	40% matrix (grey); angular to sub-rounded clasts; laminated shale, phyllite; quartz. Maximum clast size: 2.5 cm.
KR7-17	405.57	SB	Hand-specimen is dominated by one large (3 cm) quartz-rich metagreywacke clast. 30% matrix (grey); sub-rounded clasts; quartz-rich metagreywacke, laminated shale; quartz.
KR7-44	407.77	SB	30% matrix (grey); angular to sub-rounded clasts; laminated shale, metagreywacke, phyllite; quartz, lighter Fe-rich material (orange in colour) forms a flow texture. Maximum clast size: 1.5 cm.
KR7-20	408.32	SB	40% matrix (grey); angular clasts; phyllite, laminated shale, quartz-rich metagreywacke; quartz. Maximum clast size: 2 cm.
KR7-41	408.72	SB	70% matrix (grey); angular to sub-rounded clasts; metagreywacke (some quartz-rich), shale (some laminated), quartz. Maximum clast

			size: 2 cm.
KR7-18	411.34	SB	50% matrix (grey); angular to subrounded clasts; quartz-rich metagreywacke, shale (some laminated), phyllite. Maximum clast size: 3 cm.
KR7-42	412.17	SB	50% matrix (grey); sub-rounded clasts; metagreywacke (some quartz-rich; looks melted on the edges of the clast), minor laminated shale; quartz. Maximum clast size: 3 cm.
KR7-21	413.13	SB	10% matrix (white); angular clasts; metagreywacke. Maximum clast size: 1 cm.
KR7-71	415.67	MB	Metagreywacke (white) with sub-mm, sub-parallel (aligned) shale (grey) intercalations.
KR7-22	420.86	MB	Metagreywacke (white to light grey); angular clasts.
KR7-73	421.56	MB	Metagreywacke (white to light grey); angular to sub-rounded clasts.
KR7-74	430.03	MB	Phyllite (light grey); angular to sub-rounded clasts.
KR7-23	430.13	SB	40% matrix; sub-rounded clasts; shale, schist, phyllite; quartz. Maximum clast size: 2.5 cm. Light brown to green ovoid melt particles (mm scale to a maximum size of 1 cm).
KR7-75	430.28	SB	40% matrix, sub-rounded to rounded clasts; shale; quartz. Maximum clast size: sub-mm. 2 ovoid brown melt particle (mm scale).
KR7-24	439.01	MB	Metagreywacke (white to light grey); angular to sub-rounded clasts; post-impact quartz vein.
KR7-25	439.61	MB	Metagreywacke (white to light grey); angular to sub-rounded clasts.
KR7-76	441.60	MB	Phyllite (grey), fissile, fine-grained; post-impact calcite overprint (pods).
KR7-77	445.13	SB	40% matrix (light grey); angular to rounded clasts; metagreywacke, shale; quartz. Maximum clast size: 1 cm, others all sub-mm; darker brown patches of melt (sub-mm).
KR7-45	445.22	SB	30% matrix (light grey); angular clasts; laminated shale, metagreywacke (quartz-rich); quartz, phyllosilicates. Maximum clast size: 1.5 cm.
KR7-26	454.35	MB	Metagreywacke (white to light grey); sub-rounded clasts; post-impact quartz vein.
KR7-79	454.52	MB	Metagreywacke (white); sub-rounded clasts; post-impact calcite veining.
KR7-27	468.28	MB	Metagreywacke (white); post-impact quartz veining.
KR7-28	470.55	B-S	Shale (grey) with post-impact calcite veining and quartz and calcite spots.
KR7-29	475.76	B-S	Shale (grey) with quartz clasts.
KR7-81	483.00	SB	80% matrix (light grey); angular to rounded clasts; shale; quartz; all clasts sub-mm in size.
KR7-82	487.12	G	Quartz grains up to 0.5 cm. large piece of granite – 3 cm. flakes of muscovite. Sugar crystal texture. Post-impact calcite.
KR7-29a	487.36	B-MGW	Metagreywacke (white); powderised.
KR7-30	491.01	B-S	Shale (grey), powderised.
KR7-31	512.15	B-MGW	Metagreywacke (white), powderised; extensive post-impact calcite overprint
KR7-83	513.90	SB	70-80% matrix (grey); angular clasts; shale; post impact calcite overprint. Maximum clast size: 1 cm.
KR7-32	514.77	SB	Light grey pieces of suevite, very fine-grained and powderised.
KR7-46	530.63	B-S	Shale (grey) with mm-sized quartz pieces.
KR7-47	530.79	B-S	Shale (grey), powderised.
KR7-84	538.29	B-S	Shale (grey), powderised.
KR7-48	538.89	B-S	Shale (grey), powderised.
KR7-49	538.99	B-MGW	Metagreywacke (white), powderised, part of a 30 cm band in lithostratigraphy.
KR7-33	542.70	B-S	Shale and slate (grey), powderised with some fissile pieces.

**LB = lithic breccia, SB = suevitic breccia, MB = monomict breccia; G = granophyric-textured lithology, B-MGW = basement metasediments predominantly composed of metagreywacke; B-S = basement metasediments predominantly composed of shale.*

Table 2. Core LB-07A: description of thin sections; where more than 1 thin section was made, number is indicated in brackets.

Sample #	Depth (m)	Lithology	Description
KR7-54	334.48 m	LB	Matrix-supported. Clasts: metagreywacke, phyllite, organic shale; quartz. Maximum clast size is 7 mm (metagreywacke). Clast shapes: sub-angular to rounded. Shock: quartz (PFs, 1 set of PDFs maximum; randomnly-oriented fracturing).
KR7-1	334.91 m	LB	Single metagreywacke clast (2.5 cm) composed of quartz, phyllosilicates, plagioclase (enhanced cleavage, rectangular habit, similar to ladder structure, but no PDFs). Shock: quartz (some toasted, extensive PDFs, 3 sets of PDFs maximum); diaplectic quartz glass.
KR7-57	336.80 m	LB	Single metagreywacke clast (2 cm), composed of quartz, phyllosilicates, plagioclase. Texture is composed of lensoids of quartz and plagioclase surrounded by finer quartz and feldspar and minor phyllosilicate material. Shock: quartz (fractured; PFs, 2 sets of PDFs maximum). Some breccia on edge of section (matrix-supported; clasts: metagreywacke, quartz, shale; clast shape: sub-rounded; shock: no melt, cannot ascertain shock statistics – too few grains).
KR7-56	337.80 m	LB	Soft sample, so only fragments preserved. Matrix-supported. No melt. Clasts: shale (organic), metagreywacke; quartz, phyllite (with cross-cutting quartz veins). Maximum clast size: 5 mm. Clast shapes: Sub-angular to rounded. Shock: quartz (1 set of PDFs maximum).
KR7-2	339.22 m	LB	Matrix-supported. Clasts: laminated shale (with sulphides), metagreywacke (angular), shale, phyllite; quartz, plagioclase, muscovite, carbonate. Maximum clast size: 4 mm. Clast shapes: angular to rounded. Shales form largest and most variably sized clast component. Shock: No evidence of shock, though undulatory extinction of plagioclase and quartz.
KR7-59	347.16	LB	Clast-supported. Clasts: quartz, feldspar, muscovite, calcite, pyrite, magnetite. Maximum clast size: 6 mm. Clast shapes: sub-angular to rounded. Shock: quartz (reduced birefringence, 1 set of PDFs maximum); calcite is densely twinned.
KR7-62	355.02	LB	Matrix-supported. Clasts: metagreywacke, quartzite, schist, phyllite, shale; plagioclase (sericitised). Maximum clast size: 5 mm. Clast shapes: angular to sub-rounded. Shock: quartz (toasted; 2 sets of PDFs maximum, some decorated); calcite with shock fractures.
KR7-34	355.72	LB	Single shale clast of 1.5 cm size. Carbonate and quartz veins. Rounded and acicular sulphides (pyrite).
KR7-5	356.61	LB	Interlaminated graphitic schist, chert and phyllosilicates. Distinct bedding. Very fine-grained – maximum clast size is 1 mm. Minerals in clast include quartz, graphite, phyllosilicates, rutile. Shock: quartz (PFs and 2 sets of PDFs maximum; in mm-sized grains, undulatory extinction).
KR7-63	357.45	LB	Matrix-supported. Clasts: Shale (organic), mudstone, schist, metagreywacke, minor granite; quartz. Maximum clast size: 5 mm. Clast shapes: angular to rounded. Shock: quartz (2 sets of PDFs maximum).
KR7-35 (2)	359.33	SB	First section dominated by a weathered metagreywacke clast (quartz, K-spar, plagioclase, post-impact calcite). Both sections contain breccia: matrix-supported. Clasts: metagreywacke, shale (both laminated and graphitic; similar proportions), phyllite; quartz, muscovite, chlorite, graphite. Maximum clast size: 3 mm. Clast shapes: angular to rounded. Shock: quartz (fractures, rare PDFs - decorated, 2 sets of PDFs maximum); densely twinned carbonate (possible shock fractures); melt particles are dark-brown to black, flow structures, rounded to ovoid (maximum size: 2 mm).

KR7-64	359.96	SB	Matrix supported, but less matrix than other samples. Clasts: metagreywacke, laminated shale. Maximum clast size: 1.5 cm. Clast shapes: angular to sub-rounded. Shock: quartz (toasted, PFs and PDFs - decorated; 3 sets of PDFs maximum); melt particles are light to dark-brown, flow structures, sub-rounded to rounded (maximum size: 1 mm).
KR7-6	360.65	SB	Matrix-supported. Clasts: metagreywacke, schist (with quartz stringers), shale (organic and laminated); calcite. Maximum clast size: 1 cm. Clast shapes: angular to sub-rounded. Shock: Quartz (fractured; PFs and PDFs – 1 set of PDFs maximum); melt particles are dark-brown (maximum size: ~1 mm).
KR7-65	362.99	SB	Matrix-supported. Clasts: metagreywacke, phyllite, granite; plagioclase (sericitised), muscovite. Maximum clast size: 6 mm. Clast shapes: sub-angular to rounded. Shock: quartz (some toasted, 2 sets of PDFs maximum); melt particles are dark-brown to black, contain unshocked quartz inclusions (maximum size: 750 µm).
KR7-7 (3)	363.20	SB	All 3 sections contain matrix-supported breccia. Two sections contain large clasts of mylonitic metagreywacke. Clasts: metagreywacke (with some fluid inclusion trails), shales (organic), schist; quartz, plagioclase, chlorite (both Mg-rich and Fe-rich); pyrite (pre-impact), calcite (post-impact). Maximum clast size: 2 cm. Clast shapes: angular to rounded. Shock: quartz (fractured; undulatory extinction; some toasted; 2 sets of PDFs maximum); plagioclase with lowered birefringence, strongly fractured but no PDFs; densely twinned carbonate (possible shock fractures); diaplectic quartz glass; melt particles are dark-brown to black (maximum size: 0.5 mm).
KR7-36 (2)	364.45	SB	Matrix-supported. Clasts: organic shale, schist, metagreywacke, leucogranite, breccia-in-breccia; quartz, plagioclase. Maximum clast size: 6 mm. Clast shapes: angular to rounded. Flow structures in matrix. Shock: quartz (PFs and 1 set of PDFs maximum); plagioclase with lowered birefringence; diaplectic quartz glass; melt particles are dark brown and vesiculated (maximum size: 0.5 mm)
KR7-8 (3)	370.34	LB	Matrix- to clast-supported in parts. Clasts: metagreywacke, schist, shale; quartz, plagioclase, graphite, pyrite (globular), fine-grained phyllosilicates. Post-impact carbonate and quartz vein. Flow in matrix (phyllosilicates flakes). Maximum clast size: 5 mm. Clast shapes: angular to rounded. Shock: quartz (3 sets of PDFs maximum), plagioclase with lowered birefringence.
KR7-66 (2)	370.39	LB	Metagreywacke clast – quartz, plagioclase, chalcedony, calcite; grains are angular to sub-rounded. Shock: quartz (2 sets of PDFs maximum).
KR7-9	377.46	LB	Matrix-supported. Clasts: Shale; quartz, feldspar. Maximum clast size: 5 mm. Clast shapes: angular to sub-rounded. Shock: quartz (only PFs and random fracturing).
KR7-50 (2)	378.20	SB	Matrix-supported. Clasts: metagreywacke, shale (organic and laminated), schist, leucogranite; quartz; post-impact calcite. Maximum clast size: 2 cm. Clast shapes: sub-angular to sub-rounded. Shock: quartz (PFs and 1 set of PDFs maximum); melt particles are dark-brown to black, not vesiculated (maximum size: 3 mm).
KR7-37 (2)	379.09	SB	Matrix-supported. Clasts: Leucogranite, laminated shales (with pyrite), phyllite, quartzite; chlorite. Maximum clast size: 1 cm. Clast shapes: angular to rounded. Shock: quartz (PFs); diaplectic quartz glass; melt particles are dark-brown to black, not vesiculated (maximum size: 0.5 mm).
KR7-67	382.94	SB	Matrix-supported. Clasts: metagreywacke, phyllite, shale, schist. Maximum clast size: 2 cm. Clast shapes: angular to rounded. Shock: quartz (toasted, 1 set of PDFs maximum); melt particles are dark-brown to black, vesiculated (maximum size: 2 mm).
KR7-51	383.14	SB	Matrix-supported. Clasts: metagreywacke, laminated shale, phyllite-

(3)			schist; quartz, phyllosilicates. Maximum clast size: 1.5 cm. Clast shapes: sub-angular to sub-rounded. Shock: quartz (1 set of PDFs maximum); diaplectic quartz glass; some clasts are partially melted (e.g., metagreywacke); melt particles are dark-brown (maximum size: 0.5 mm).
KR7-11 (3)	383.74	SB	Clast-supported. Clasts: shales (laminated to mylonitic and rarely organic, containing sulphides), graphitic schist, metagreywacke; quartz (minor); carbonate. Some myrmekitic texture (< 10% of 1 section). Matrix is somewhat greener than previous samples. Pre-impact quartz veins in shales. Maximum clast size: 1.5 cm. Clast shapes: angular to sub-rounded. Shock: quartz grains (toasted, 1 set of PDFs maximum); densely twinned calcite; melt particles are light- to dark-brown, show flow textures, lightly vesiculated (maximum size: 2 mm).
KR7-43 (4)	384.84	SB	Matrix-supported. Clasts: metagreywacke, shales (laminated to mylonitic), quartzite, phyllite, leucogranite; quartz, sericite. Some myrmekitic to kinked cleavage on phyllite. Matrix is greyer than sample KR7-11. Maximum clast size: 7 mm. Clast shapes: angular to rounded. Shock: diaplectic quartz glass, clasts are partially melted; melt particles are light to dark-brown (maximum size: 2 mm).
KR7-68	390.23	SB	Single clast of shale – 3 cm size. Pre-impact sulphides and rutile.
KR7-39	390.85	SB	Matrix-supported. Clasts: metagreywacke (dominant phase), phyllite, shale; quartz, calcite. Some layering in matrix (alignment of shale clasts). Maximum clast size: 6 mm. Clast shapes: sub-angular to sub-rounded. Shock: melt particles are light-brown to black (maximum size: 1.5 mm).
KR7-12	391.85	LB	Single clast of metagreywacke (medium-grained) with quartz, feldspar and minor phyllosilicates.
KR7-52	392.00	LB	Matrix-supported. Clasts: metagreywacke (some mylonitic), metapelites; quartz, calcite. Cross-cutting quartz veins in the metagreywacke; sulphides in shales (all pre-impact). Some clasts are heavily folded, and flow is observed in the matrix. Maximum clast size: 6 mm. Clast shapes: angular to sub-rounded. Shock: quartz (1 set of PDFs maximum).
KR7-13	393.78	LB	Matrix-supported. Clasts: Dominated by a single carbonaceous metagreywacke clast; quartz, feldspar, chlorite (Fe-rich). Maximum clast size: 1.5 cm. Clast shapes: Angular to rounded. Shock: quartz and feldspar has a blocky habit; quartz (2 sets of PDFs maximum); diaplectic quartz glass.
KR7-69	395.14	SB	Matrix-supported. Clasts: metagreywacke, shale, phyllite; calcite. Maximum clast size: 3 mm. Clast shapes: Sub-angular to sub-rounded. Shock: quartz (reduced birefringence, 2 sets of PDFs maximum); calcite is densely twinned; melt particles are dark brown (maximum size: 4 mm).
KR7-14 (4)	398.44	SB	Matrix-supported. Clasts: metagreywacke (some mylonitic), shale (laminated), phyllite; chlorite (Fe-rich), pre-impact calcite. Maximum clast size: 2 cm. Clast shapes: Angular to sub-rounded. Shock: quartz (PFs, 2 sets of PDFs maximum, reduced birefringence); diaplectic quartz glass; some clasts are partially melted (particularly shale); feldspar is heavily fractured (similar to a ladder structure) and has reduced birefringence, but no PDFs; calcite is densely twinned; melt particles are light to dark-brown (maximum size: ~1 mm).
KR7-70	398.58	SB	Metagreywacke clast (quartz, plagioclase, K-feldspar, sericite, calcite) from matrix-supported suevite. Shock: quartz (some toasted, 2 sets of PDFs maximum); densely twinned calcite.
KR7-40	400.06	SB	Matrix-supported. Clasts: shale (laminated and organic), metagreywacke (some mylonitic); quartz, feldspars, phyllosilicates, carbonate. Maximum clast size: 5 mm. Clast shapes: angular to sub-rounded. Shock: quartz (2 sets of PDFs maximum); diaplectic quartz glass; melt particles are dark-brown to black (maximum size: 2 mm).
KR7-53	400.58	SB	Matrix-supported. Clasts: shales (laminated, with sulphides),

			metagreywacke, phyllite; kinked chlorite and biotites, carbonate. Cross-cutting quartz veins (post-impact). Maximum clast size: 8 mm. Clast shapes: sub-angular to rounded. Shock: quartz (2 sets of PDFs maximum; some decorated); diaplectic quartz glass; melt particles are dark-brown to black (maximum size: 2.5 mm).
KR7-15	402.73	SB	Matrix-supported. Clasts: metagreywacke (some mylonitized), laminated shale; quartz, calcite, plagioclase. Maximum clast size: 9 mm. Clast shapes: angular to sub-rounded. Shock: quartz (PFs and 2 sets of PDFs maximum); calcite is densely twinned; sample contains a lot of melt particles, as well as partially melted phases; melt particles are dark-brown to black (maximum size: 2 mm).
KR7-16	404.26	SB	Matrix-supported. Clasts: Shales (laminated and organic), metagreywacke, phyllite (minor); quartz, chlorite (Fe-rich). Part of the matrix looks melted. Maximum clast size: 1 cm. Clast shapes: angular to sub-rounded. Shock: quartz (2 sets of PDFs maximum); diaplectic quartz and feldspar glass; melt particles are dark-brown to black (maximum size: 1.5 mm).
KR7-17	405.57	SB	Matrix-supported. Clasts: Shales (laminated and organic), metagreywacke, schist, phyllite (minor); quartz, biotite, sericite, one sphene clast. Maximum clast size: 1 cm. Clast shapes: angular to rounded. Shock: quartz (some toasted; 3 sets of PDFs maximum); diaplectic quartz glass; melt particles are dark-brown to black (maximum size: 0.5 mm).
KR7-44	407.77	SB	Matrix-supported. Clasts: Metagreywacke, shale (laminated), phyllite; quartz, feldspar. Maximum clast size: 1.8 cm. Clast shapes: sub-angular to rounded. Shock: quartz (PFs, 2 sets of PDFs maximum; mosaicism); feldspars have enhanced cleavage; diaplectic quartz glass; many grains are partially melted; melt particles are light to dark-brown (maximum size: 0.75 mm).
KR7-20	408.32	SB	Matrix-supported. Clasts: Metagreywacke (reduced birefringence), shale; quartz, calcite, chlorite. Maximum clast size: 17 mm. Clast shapes: sub-angular to rounded. Shock: quartz (3 sets of PDFs maximum); diaplectic quartz glass; calcite is densely twinned; melt particles are dark-brown to black (maximum size: 2 mm).
KR7-41	408.72	SB	Matrix-supported. Clasts: metagreywacke, granite, phyllite, breccia-in-breccia; quartz, feldspars, calcite. Maximum clast size: 20 mm. Clast shapes: sub-angular to rounded. Shock: quartz (toasted, PFs, 3 sets of PDFs maximum); diaplectic quartz and feldspar glasses; melt particles are light to dark-brown (maximum size: ~1 mm).
KR7-18	411.34	SB	Matrix-supported. Clasts: shales (laminated), metagreywacke, granite, phyllite; quartz, feldspars, carbonate, amphibole. Less shales and more metagreywacke than KR7-20 and KR7-41. Maximum clast size: 1.5 cm. Clast shapes: sub-angular to sub-rounded. Shock: quartz (PFs and 2 sets of PDFs maximum; toasted; random fractures; mosaicism); feldspars with enhanced cleavage; diaplectic quartz and feldspar glasses; melt particles are white or light to dark-brown, vesicular (maximum size: 1 mm).
KR7-42 (4)	412.17	SB	Matrix-supported. Clasts: Shale (laminated), metagreywacke (some mylonitic); quartz, chlorite. Equal proportions of metagreywacke and shale. Maximum clast size: 4 mm. Clast shapes: sub-angular to sub-rounded. Shock: quartz (PFs 2 sets of PDFs maximum, reduced birefringence); melt particles are light to dark brown, vesiculated (maximum size: 2 mm).
KR7-71	415.67	MB	Metagreywacke. Quartz, feldspars and minor post-impact patchy carbonate. Maximum clast size: 1 mm. Shock: quartz (1 set of PDFs maximum).
KR7-73	421.56	MB	Metagreywacke, with a fabric. Quartz, plagioclase (sericitised) and minor post-impact patchy carbonate. Less carbonate overprint that in sample KR7-71. Maximum clast size: 0.5 mm. Shock: quartz (3 sets of PDFs maximum).
KR7-74	430.03	MB	Phyllite. Quartz, plagioclase (sericitised), muscovite and minor post-

			impact patchy carbonate. Less carbonate overprint that in samples KR7-71 and KR7-73. Maximum clast size: 2 mm. Shock: quartz (2 sets of PDFs maximum).
KR7-23 (2)	430.13	SB	Matrix-supported. Clasts: metagreywacke, pelite, shale; quartz, phyllosilicates. Maximum clast size: 1 mm. Clast shapes: angular to rounded. Shock: quartz (3 sets of PDFs maximum); both sections are dominated by the presence of moderate yellowish-green rounded melt particles, with a maximum size of 1 cm. Melt particles display flow textures, and have quartz inclusions.
KR7-75	430.28	SB	Matrix-supported. Clasts: metagreywacke; quartz and sericitized plagioclase, phyllosilicates; post-impact calcite overprint. Maximum clast size: 1 mm. Clast shapes: sub-rounded to angular. Shock: quartz (highly fractured, 3 sets of PDFs maximum); densely twinned carbonate (possible shock fractures); melt particles are the same in character and size as sample KR7-23, but proportionally there is less melt.
KR7-76	441.60	MB	Phyllite. Maximum clast size is < 0.5 mm. Shock: quartz (1 set of PDFs maximum).
KR7-77	445.13	SB	Matrix-supported. Clasts: metagreywacke, shale (laminated and organic); quartz, feldspar. Maximum clast size: 7 mm. Clast shapes: angular to sub-rounded. Shock: No PDFs in quartz. Melt particles are dark-brown, vesiculated (maximum size: 1 mm).
KR7-45	445.22	SB	Matrix-supported. Clasts: metagreywacke, phyllite, shale (laminated and organic); quartz, feldspar. Maximum clast size: 5 mm. Clast shapes: angular to rounded. Shock: No PDFs in quartz. Melt particles are dark-brown, vesiculated, show flow textures (maximum size: 3 mm).
KR7-79	454.52	MB	Metagreywacke, with a light fabric: quartz, plagioclase, K-feldspar. No evidence of shock.
KR7-27 (2)	468.28	MB	Metagreywacke (mylonitised), with a small phyllite clast on one side of section. Metagreywacke: Quartz, feldspars and primary calcite. Maximum clast size is 3 mm (quartz). Shock: quartz (2 sets of PDFs maximum); feldspars are heavily fractured; calcite is densely twinned.
KR7-28	470.55	B-S	Quartz occurs as µm-size blebs with a few grains containing PDFs (toasted). Most quartz is angular, maximum size is 1 mm. Much post-impact calcite overprint (60% of thin section).
KR7-29	475.76	B-S	Quartz, feldspars, muscovite. Minor calcite. No fabric. Grains are all sub-µm. No shock features in quartz.
KR7-81 (2)	483.00	SB	Matrix-supported. Clasts: metagreywacke, phyllite, laminated shale; quartz. Maximum clast size: 1 mm. Clast shapes: angular to rounded. Shock: No PDFs in quartz; melt particles are black (maximum size: 0.5 mm).
KR7-82 (2)	487.12	G	Quartz-feldspar intergrowth, muscovite, secondary calcite. No shock features in quartz.
KR7-29a	487.36	B-MGW	Quartz, feldspar, post-impact calcite. Grains are all sub-µm. Thin section is poor. Shock: quartz (1 set of PDFs maximum, in a single clast); densely twinned carbonate (possible shock fractures).
KR7-30	491.01	B-S	Quartz, feldspar, micas. Grains are all sub-µm except for quartz which has a maximum size of 0.25 mm. Sub-angular to sub-rounded. No shock features in quartz.
KR7-31	512.15	B-S	Quartz, feldspar, muscovite (maximum size 0.25 mm). Quartz and feldspar have a maximum grain size of 0.5 mm. A minor part (ca. 10% of thin section) shows quartz-feldspar granophyric intergrowth. Hornblende clast (1 mm size).
KR7-83 (2)	513.90	SB	Matrix-supported. Clasts: granite; quartz, feldspar, muscovite, post-impact calcite. Maximum clast size: 2 mm. Clast shapes: angular to sub-rounded. Shock: No PDFs in quartz; densely twinned carbonate (possible shock fractures); melt particles are black, vesiculated, flow structures (maximum size: < 0.5 mm).
KR7-32	514.77	SB	Matrix-supported. Clasts: quartz, sericitized feldspar (both K-spar

			and plagioclase), muscovite (kinked); post-impact calcite (patches up to 0.75 mm). Maximum clast size: 2.75 mm. Clast shapes: angular to sub-rounded. Shock: no shock features in quartz; melt particles are black, vesiculated, flow structures (maximum size: < 0.5 mm).
KR7-46	530.63	B-S	Quartz, feldspar, minor mica, sulphides. Grains are all sub-µm. No shock features in quartz.
KR7-47	530.79	B-S	Quartz grains (maximum size: 300 µm), plagioclase (maximum size: 200 µm). Minor mica (muscovite). No shock features in quartz.
KR7-84	538.29	B-S	Quartz and plagioclase grains (sub-rounded; maximum size of 500 µm) with biotite (angular; maximum size of 300 µm). Fabric.
KR7-48	538.89	B-S	Quartz grains (maximum size: 300 µm), with some fractures but no PFs or PDFs. Sericitized plagioclase, phyllite, muscovite. Most grains are sub-mm. Grains are angular to sub-rounded. No shock features in quartz.
KR7-49	538.99	B-MGW	Quartz (maximum size up to 500 µm), feldspars, chlorite. Much calcite overprint. No shock features in quartz.
KR7-33	542.70	B-S	Fine-grained (sub-µm). Quartz grains (maximum size: 167 µm). No mica. No shock features in quartz.

**LB = lithic breccia, SB = suevitic breccia, MB = monomict breccia; G = granophyric-textured lithology, B-MGW = basement metasediments predominantly composed of metagreywacke; B-S = basement metasediments predominantly composed of shale.*

Table 3. Out-of-crater suevites collected by L. Coney.

Sample #	Location w.r.t. crater lake	Hand specimen description	Thin section description
BS-1	South	Medium dark grey matrix-supported suevite. Quartz and shale clasts (maximum size: 1 cm). Melt particles are either white-grey or green-grey, vesiculated and are round in shape (maximum size: 2 cm).	Suevite. Matrix-supported. Clasts: metagreywacke, schist; quartz, chlorite. Maximum clast size: 4 mm. Clast shapes: sub-rounded to rounded. Shock: two melts: clear and brown (sub-rounded to rounded), and contain small white vesicles (maximum size: 300 µm). Vesicles are sub-rounded to rounded. Maximum melt size: 3 mm. Quartz is all toasted.
BS-2	South	Medium dark grey matrix-supported suevite. Quartz and graphitic shale clasts (with quartz veining; maximum size: 2 cm). Laterite = post-impact phase, affects fractures and melt particles preferentially. Melt particles are either white-grey or green-grey, vesiculated and are round to ovoid in shape (maximum size: 1 cm).	Suevite. Matrix-supported. Clasts: metagreywacke, shale, phyllite, schist. Schist is clearly a primary phases as indicated by two tectonic cleavage directions (unrelated to impact). Post- impact Fe oxides (limonite). Maximum clast size: 4 mm. Clast shapes: sub-rounded to rounded. Shock: two melts: clear and brown (sub-rounded to rounded), and contain small white vesicles (maximum size: 300 µm). Vesicles are sub-rounded to rounded. Maximum melt size: 2 mm.
BS-3	South	Medium dark grey matrix-supported suevite. Quartz and shale clasts (maximum size: 2 cm). Laterite = post-impact phase, affects fractures and melt particles preferentially. Melt particles are either white-grey or green-grey, vesiculated and are round to ovoid in shape (maximum size: 2 cm).	Suevite, bad slide, very little preserved.

BS-4	North	Pale yellow to yellowish-green matrix supported suevite. Majority of sample is dominated by a dark grey to white layered melt particle with variable vesiculation – coarser at edges. Extensive laterisation.	Suevite. Matrix-supported. Clasts are either melted or unmelted. Unmelted clasts: metagreywacke; quartz, feldspar (perthite) and post-impact Fe oxide phases (limonite). Melted clasts: metagreywacke and quartz. Clast shape: sub-rounded to rounded. Maximum clast size: 2 mm. Shock: most of slide is composed of melt (rounded), brown in PPL, very hydrous, lots of large vesicles (maximum size: 300 µm), but few inclusions. Vesicles are sub-rounded to rounded. Flow structures around rounded clasts). Devitrified radiating needles in melt matrix. Quartz displays no PDFs.
BS-5	North	Pale yellow to yellowish-green matrix supported suevite. Quartz clasts (maximum size: < 1 mm). Melt particles = grey, with quartz inclusions, vesiculated, round to aerodynamic shapes (maximum size: 3 mm).	Melt particle and a little suevite (matrix-supported). Melt particle is dark brown with large vesicles (maximum size: 1 mm). Vesicles are sub-rounded to rounded. Clasts: quartz; post-impact Fe oxides. Quartz (toasted, 4 sets of PDFs maximum; extensive PFs).
BS-6	North	Pale yellow to yellowish-green matrix supported suevite. Quartz clasts (maximum size: < 1 mm). Extensive laterisation. Melt particles = grey, with quartz inclusions, vesiculated, ovoid shapes (maximum size: 1 cm).	Melt particle. Melt particle colour varies from light to dark brown with large vesicles (maximum size: 1 mm). Vesicles are sub-rounded to rounded. Quartz inclusions. Quartz contains no PDF sets; ballen quartz; diaplectic glass noted.
BS-7	North	Melted granite clast and unmelted granite clast.	Melted granitic clast - brown. Vesicular (maximum size: 100 µm) feldspar material in mafic melt. Vesicles are sub-rounded to rounded.
BS-8	North	Ovoid melt particle with flow structures. White to light grey. Quartz inclusions.	Melt particle. Melt particle colour is brown, very vesicular (maximum size: 100 µm), vesicles are sub-rounded to rounded. No inclusions.
BS-9	North of crater	Pale yellow to yellowish-green matrix supported suevite. Quartz, metagreywacke clasts (maximum size: < 5 mm). Laterisation.	N/A
BS-10	North of crater	Pancake-shaped melt particle with flow structures. White to dark grey. Quartz inclusions.	Melt particle; melt particle colour varies from light to dark brown with white vesicles (maximum size: 2 mm), vesicles are ovoid to rounded.
BS-11	North of crater	Pale yellow to yellowish-green matrix supported suevite. Quartz, granite clasts (maximum size: 1 cm). Grey melt particles, ovoid (maximum size: 0.5 cm).	Melt particle. Melt particle colour varies from light to dark brown, very vesicular (maximum size: 1 mm), vesicles are sub-rounded to rounded. Extensive Fe staining. Quartz inclusions.
BS-12	North of crater	Pale yellow to yellowish-green matrix supported suevite. Quartz, shale clasts (maximum size: 5 mm). Laterisation. Grey melt particles, aerodynamic shapes (maximum size: 3 cm).	Melt particle with a little suevite. Clasts: metagreywacke; quartz, biotite. Matrix contains devitrified needles. Shock: quartz has no PDFs. Melt colours are clear and brown, with white vesicles (maximum size: 3 mm). Vesicles are sub-rounded to rounded.
BS-13	North of crater	Pale yellow to yellowish-green matrix supported suevite. Quartz, metagreywacke clasts (maximum size: 5 mm). Laterisation. Grey melt particles, ovoid (maximum size: 1 cm).	Melt particle. Much of section is stained with Fe. Inclusions in melt particle are quartz (toasted) and orthoclase. Vesicles in melt (maximum size: 1 mm). Vesicles are sub-rounded to rounded.
BS-14	North of	Pale yellow to yellowish-green	Melt particle. Melt particle colour varies from

	crater	matrix supported suevite. Quartz clasts (maximum size: 5 mm). Laterisation. Grey melt particles, ovoid (maximum size: 1 cm).	light to dark brown, very vesicular (maximum size: 1 mm). Vesicles are sub-rounded to rounded. Some needle-like structures.
BS-15	North of crater	Pale yellow to yellowish-green matrix supported suevite. Quartz, granite clasts (maximum size: 5 cm). Grey melt particles, ovoid (maximum size: 1 cm).	Melt particle with large quartz-rich metagreywacke clast (maximum size: 1 cm). Melt is light brown, with small white vesicles (maximum size: 500 µm). Vesicles are sub-rounded to rounded.
BS-16	North of crater	Pale yellow to yellowish-green matrix supported suevite. Quartz clasts (maximum size: 5 cm). Laterisation. White to grey melt particles, aerodynamic shapes, vesiculated (maximum size: 0.5 cm).	Suevite. Matrix-supported. Clasts: granite, quartz. Some of section is stained with Fe. Melt particles are various shades of brown with white vesicles (maximum size: 1 mm). Vesicles are ovoid to rounded. Quartz (toasted, 1 set of PDFs maximum); diaplectic quartz glass.

Table 4. Out-of-crater suevite and target rock samples collected by W.U. Reimold & C. Koeberl.

Sample #	Thin section description
LB-2	Phyllite. Quartz and feldspars, biotite, minor chlorite, minor opaques. Fe-stained. Maximum grain size: 100 µm (biotite); very fine-grained. Distinct fabric. Quartz = feldspars = 45 vol%, phyllosilicates = 10 vol%, opaques = < 1 vol%.
LB-3a, 3b	Schist. Defined by bands of quartz and biotite. Maximum grain size: 1 mm (quartz). Quartz grains are rounded, biotite grains are acicular. Biotite displays undulose extinction. Mineral proportions unable to be ascertained.
LB-5	Carbonaceous shale. Equal proportions of quartz, feldspars, sericite. Very fine-grained (<100 µm).
LB-7	Metagreywacke. Quartz, plagioclase (sericitized), biotite set in fine-grained matrix of quartz, feldspar and sericite. Maximum grain size: 2 mm (quartz, feldspar). All grains except phyllosilicates are sub-rounded to rounded, while phyllosilicates are acicular. Matrix = 55 vol%, feldspars = 5 vol%, quartz = 40 vol%, phyllosilicates = 1 vol%.
LB-8	Metagreywacke. Quartz, plagioclase, K-feldspar, muscovite set in fine-grained matrix of quartz, feldspar and sericite. Maximum grain size: 1 mm (quartz, feldspar). All grains except phyllosilicates are sub-rounded to rounded, while phyllosilicates are acicular. Quartz is polycrystalline in parts. Matrix = 40%, feldspars = 30%, quartz = 20 %, muscovite = 10%.
LB-9	Granite. Quartz, plagioclase, microcline sub-rounded to rounded; equal proportions), biotite, chlorite, pyrite. Maximum clast size: 2mm (quartz). Quartz and feldspars are rounded, while phyllosilicates are acicular. Quartz = feldspars = ~45 vol%; phyllosilicates = 10 vol%; pyrite < 1 vol%.
LB-10, 10/1	Altered granite. Quartz, plagioclase, K-feldspar, biotite and muscovite. Maximum clast size: 1 mm (biotite). All grains except phyllosilicates are sub-angular to sub-rounded, phyllosilicates are acicular to patchy. Quartz = 20 vol%, feldspars = 40 vol%; phyllosilicates = 40 vol%.
LB-11	Laminated shale. Quartz, feldspars, biotite. Fe staining. Maximum grain size: 1 mm. Fabric, defined by dragged biotite. Quartz = feldspars = 20 vol%; phyllosilicates = 60 vol%.
LB-12	Granite. Quartz, plagioclase, microcline, K-feldspar, biotite and sericite. Maximum grain size: 750 µm. All grains are sub-angular to sub-rounded. Quartz = 45 vol%, feldspars = 45 vol%, phyllosilicates = 10 vol%.
LB-17	Granite. Quartz, plagioclase (sericitized), K-feldspar (sericitized) and biotite. Maximum grain size: 2 mm (quartz). All grains are sub-rounded except biotite which is acicular. Quartz = 55 vol%, feldspars = 30 vol%, phyllosilicates = 15 vol%.
LB-18	Granite. Quartz, plagioclase, K-feldspar and biotite. Maximum grain size: 100 µm. All grains are sub-rounded to rounded except biotite which is acicular. Local spherulitic texture. Quartz = 40 vol%, feldspars = 40 vol%, phyllosilicates = 20 vol%.
LB-19	Altered granite. Quartz, plagioclase, microcline, K-feldspar, biotite and sericite. Maximum grain size: 100 µm. All grains are sub-angular to sub-rounded. Much spherultic to granophyric texture. Quartz = 45 vol%, feldspars = 45 vol%, phyllosilicates = 30 vol%.
LB-20	Altered granite. Quartz, feldspars, biotite, minor chlorite. Maximum grain size: 2 mm (quartz). Quartz and feldspar grains are all sub-rounded to rounded. Biotite and minor chlorite grains

	are acicular, sub-µm in size. Quartz = feldspars = 40 vol%; phyllosilicate phases = 20 vol%.
LB-21	Altered granite. Quartz, feldspars, biotite, muscovite. Maximum grain size: 0.5 mm (quartz). Quartz and feldspars are rounded - extensive recrystallisation – and acicular phyllosilicates. Secondary quartz veins. Quartz = feldspars = 40 vol%; phyllosilicates = 20 vol%.
LB-22	Metagreywacke. Quartz, plagioclase, K-feldspar, phyllosilicates. Maximum grain size: 2 mm (quartz). Quartz = 50 vol%, feldspars = 30 vol%, phyllosilicates = 20 vol%.
LB-24	Altered granite. Quartz and feldspar grains are all rounded (maximum size: 0.5 mm). Biotite and minor chlorite grains are acicular, sub-µm in size. Some Fe oxides and opaques (<10 vol%). Local patches of myrmekitic texture. Secondary quartz veins cross-cut the granite (larger sized grains, but still sub-µm. Quartz = feldspar = 35 vol%; phyllosilicate phases = 30 vol%.
LB-25	Altered granite. Quartz, K-feldspar and plagioclase (some sericitized). Maximum grain size: 1 mm (plagioclase). Quartz and feldspars are sub-angular to rounded in shape. Biotite and Fe-oxide phases are acicular and occur in patches. Local patches of spherulitic texture. Quartz and feldspars = 60 vol%; phyllosilicates and Fe oxide phases = 40 vol%
LB-26	Altered granite. Quartz, feldspars, biotite and minor chlorite, Fe oxides and opaques. All grains are sub-µm in size. Quartz and feldspar grains are all rounded while the phyllosilicates are acicular. Local patches of spherulitic texture. Secondary quartz veins cross-cut the granite (larger grains, but still sub-µm). Quartz = feldspar = 35 vol%; phyllosilicate phases = 30 vol%, Fe oxides and opaques = <10 vol%.
LB-28	Granite. Quartz, plagioclase, K-feldspar, muscovite, biotite, chlorite. Maximum grain size: 300 µm. Quartz and feldspars are rounded while phyllosilicates are acicular. Quartz = feldspars = 45 vol%, phyllosilicates = 10 vol%.
LB-30a, -30b	Melt agglomerate. Sample contains 80 vol% melted matrix together with melt particles, and 20 vol% preserved clasts where 15 vol% is granitoid and quartz, 5 vol% is schist and iron oxides. Only a few phases show little to no melting, and most phases are partially to fully melted, the melt structures are vesicular and can display flow structures (schlieren), though these structures never occur together, but form discrete entities. Sample 30b contains some suevite matrix, with shale; quartz (undulose extinction), plagioclase and Fe oxides.
LB-31a-,a, b, c, e	Melt agglomerate. Two distinct colours and types of melt: dark-brown in colour (locally variable in darkness) with white vesicles (ovoid to round in shape), and a light brown-beige with needles. Mineral inclusions (<0.5 mm) include quartz (can be toasted and displays PFs), plagioclase, Fe oxides.
LB-31a M2 and M3	Melt agglomerate. Melt particles are distinctively vesicular. Suevite matrix varies in colour from light beige to light grey, and contains rosettes of needles, which are crystallites (devitrification). Individual outlines of phyllite and quartz. Some dark brown vesicular structures in the matrix = hydrated ferromagnesian minerals. Iron oxides. Angular grains. Sample M2 contains no evidence of shock, while M3 contains toasted quartz displaying up to 2 PDF sets.
LB-32	Phyllite. Quartz, feldspars, biotite, opaques. Very fine-grained (< 100 µm). Quartz and feldspar are sub-rounded, biotite is acicular. Strong fabric. Quartz = feldspars = 15 vol%, biotite = 70 vol%, opaques < 1 vol%.
LB-35	Pepiakese granite. Quartz, plagioclase, microcline, muscovite, sericite, bioitite and minor chlorite. Maximum grain size: 3 mm (plagioclase). All grains except for the phyllosilicates are sub-rounded to rounded, and some have a blocky appearance. Quartz = 40 vol%; plagioclase = 44 vol%; microcline = 10 vol%; phyllosilicates = 6 vol%.
LB-36	Granite. Quartz, plagioclase (sericitized), K-feldspar (sericitized), biotite, chlorite, opaques. Maximum grain size: 500 µm. Clast shapes: angular to sub-rounded. Quartz = feldspars = 40 vol%, phyllosilicates = 20 vol%; opaques < 1 vol%.
LB-39 a1/1, a1/2 b	Suevite, from south of crater. Matrix-supported. Clasts: shale (graphitic), schist, phyllite, metapelite, granitoid, metagreywacke (minor); quartz, feldspar (minor), phyllosilicates, laterite. Maximum clast size: 1 cm. Clast shapes: Angular to sub-rounded. Shock: quartz with PFs and 2 PDF sets maximum; melt particle colours vary from light to dark brown, with white vesicles.
LB-39a	Metagreywacke. Quartz and plagioclase grains set in a fine-grained (sub- µm) fabric of quartz, feldspars, phyllosilicates. Maximum grain size: 1 mm (quartz). Quartz grain shapes are lensoid, the other grains are acicular. Quartz = 30 vol%, plagioclase = 20 vol%, matrix = 50 vol%.
LB-41	Melt particle. Variable shades of brown with white vesicles. Local Fe staining. Mineral inclusions: quartz (undulose extinction, up to 1 PDF set).
LB-43	Melt particle. Dark brown with large white vesicles – up to 3 mm.

LB-44	Melt particle. Dark brown with white vesicles – up to 1 mm. Very few inclusions – quartz with undulose extinction.
LB-45	Melt agglomerate. Variable shades of brown, with white vesicles (ovoid to round; variable sized, up to 1 mm). Isotropised lithic clasts. Some Fe staining.
LB-47	Melt agglomerate with suevite. Both thin sections show the same features. Beige-brown melt particles which are very vesicular (vesicles are small in size), and display local flow textures. Very few clasts (< 1 mm size) – quartz, biotite and iron oxides (variably coloured from yellow to dark brown to red-brown). The biotite is kinked. Original clast boundaries are evident in the melt particles in cross-polarized light. Shock deformation: quartz with planar structures.
LB-48	Melt agglomerate. Dark brown to black, with white vesicles (ovoid to round; variable sized, maximum size: 1 mm). Isotropised lithic clasts (phyllite, shale). Some Fe staining. Mineral inclusions in melt: quartz (reduced birefringence; 2 sets of PDFs maximum) and feldspar (undulose extinction); mineral inclusions are angular to sub-rounded.
LB-49b	Granite. Quartz, plagioclase, K-feldspar (sericitized), microcline, biotite, chlorite. Maximum grain size: 2 mm (quartz and feldspars). Large interlocking grains, sub-angular. Quartz = 30 vol%; feldspars = 40 vol%; phyllosilicates = 30 vol%.
LB-50	Granite. Quartz, plagioclase, microcline, K-feldspars, biotite and chlorite. Maximum grain size: 2 mm. Large interlocking grains; quartz and feldspars are sub-rounded to rounded; phyllosilicates form jagged pieces. Quartz = 30 vol%, feldspars = 60 vol%, phyllosilicates = 10 vol%.
LB-51	Graphitic schist. Very fine-grained (sub-µm).
LB-57	Altered granite. Quartz, feldspars, biotite, muscovite. Maximum grain size: 0.5 mm (phyllosilicates). Quartz and feldspars are rounded - extensive recrystallisation – and acicular phyllosilicates. Quartz = feldspars = 40 vol%; phyllosilicates = 20 vol%. Local granophyric texture.

Table 5. Target rock lithologies collected by W.B. Jones

Sample #	Target rock	Thin section description
J-490, J-497	Shales	Fine-grained, composed of quartz, feldspar and biotite. Rare large pieces of quartz. Blebby Fe-staining. Extensively kinked, and cross-cutting quartz veins. Quartz + feldspars = 40 vol%, phyllosilicates = 60 vol%.
J-492, J-506,	Metagreywacke	Quartz, plagioclase (sericitized), biotite (30 vol%) in a finer-grained matrix of the same material. Maximum grain size is 2 mm, majority of the grains in the samples are <100 µm. Samples contain variable proportions: quartz (ca. 40 vol%), biotite (up to 30 vol%) and feldspars (up to 40 vol%)
J-501, J-502	Phyllite	Porphyroblasts of quartz, plagioclase (rarely sericitized), which are strongly extended (lensoid shapes). Maxmum grain size is 1 mm, though 90% of grains are <100 µm. Strong fabric. Quartz>plagioclase. Matrix of fine-grained biotite, quartz and feldspars. Quartz + feldspar = 15 vol%; phyllosilicates = 70 vol%.
J-505	Granite dyke	Quartz, plagioclase, K-feldspar, sericite, biotite, minor chlorite. Quartz = feldspars = 35 vol%, phyllosilicates = 30 vol%. Maximum grain size: 2 mm.
J-508, J-509	Pepiakese granite	Quartz, plagioclase, microcline, muscovite, sericite, biotite, minor chlorite. Either dominated by plagioclase or biotite = 45 vol%, with quartz = 40 vol%.

Appendix 4a: Geochemical Data: Major (wt%) and trace element (ppm, unless indicated otherwise) data for samples from the LB-07A core determined by XRF and INAA (trace elements only).

Sample #	KR7-54*	KR7-1	KR7-55*	KR7-57*	KR7-56*	KR7-2	KR7-58*	KR7-3	KR7-59*	KR7-60*	KR7-4	KR7-62*	KR7-61*	KR7-34	KR7-5	KR7-63*
Depth (m)	334.48	334.91	336.52	336.80	337.80	339.22	342.20	346.66	347.16	352.91	353.16	355.02	355.05	355.72	356.61	357.45
Lithology	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB	LB
SiO_2	61.9	66.2	60.4	63.9	63.1	56.3	64.1	63.5	62.4	62.5	64.1	62.4	63.9	58.1	63.5	63.3
TiO_2	0.58	0.51	0.66	0.53	0.33	0.65	0.57	0.56	0.56	0.57	0.62	0.61	0.57	0.60	0.65	0.63
Al_2O_3	16.0	15.6	17.7	15.6	11.2	17.2	16.1	17.0	17.1	16.7	16.8	17.1	16.4	15.0	16.6	15.7
Fe_2O_3	6.28	5.18	6.79	5.64	3.26	6.94	5.74	5.64	6.40	6.15	6.17	6.40	6.12	6.69	6.23	5.45
MnO	0.06	0.04	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.07	0.05	0.05
MgO	3.48	1.65	2.83	2.31	1.47	2.46	2.45	1.88	2.42	2.55	2.59	2.57	2.51	5.19	3.13	2.26
CaO	2.00	1.13	2.03	1.78	8.59	0.98	1.79	1.34	1.47	1.76	1.33	1.39	1.47	2.89	0.76	2.48
Na_2O	2.79	3.02	2.56	2.69	3.30	1.71	2.70	2.56	2.69	2.66	1.91	2.70	2.69	3.04	2.95	3.33
K_2O	1.87	1.79	2.46	2.14	0.83	2.18	2.08	1.91	2.33	2.22	1.85	2.34	2.19	1.57	2.24	1.83
P_2O_5	0.10	0.09	0.10	0.09	0.05	0.10	0.10	0.10	0.13	0.11	0.12	0.11	0.09	0.12	0.10	0.12
LOI	4.40	3.64	4.10	4.20	7.70	11.8	4.00	4.27	4.00	3.90	3.80	3.90	3.80	6.49	4.02	4.30
SO_3	0.20		0.30	0.20	<0.1		<0.1		0.10	0.10		0.10	<0.1			0.30
Total	99.7	98.9	99.9	99.1	99.9	100.3	99.7	98.8	99.7	99.6	100.5	99.7	99.8	99.7	100.2	99.8
Sc	16.0	12.4	17.2	14.6	7.28	18.6	13.8	13.9	17.3	15.4	15.4	16.3	14.9	18.1	16.7	13.7
V	118	103	141	113	68	164	115	116	120	123	122	123	117	134	135	107
Cr	159	104	101	92	62	150	97	117	87.7	97	135	98	97	284	128	78
Co	19.5	10.8	18.5	20.0	6.79	18.7	15.9	13.8	17.2.	17.6	15.4	19.4	18.3	23.0	16.0	14.7
Ni	109	33	67	42	b.d.l.	58	50	44	39	57	52	49	42	94	41	28
Cu	58	20	58	51	33	40	39	30	40	59	27	50	42	32	24	42
Zn	83	61	84	76	36	89	73	64	87	81	73	84	81	79	80	73
As	12.4	1.50	7.12	8.42	3.35	<1.1	11.1	6.31	1.38	23.9	8.75	7.56	9.25	7.19	0.16	5.08
Se	<2.2	0.10	<2.4	<2.2	<1.4	0.22	<2.1	0.11	<2.5	<2.68	0.21	<2.7	<2.6	0.18	0.16	<2.5
Br	0.60	<0.4	0.50	0.50	0.40	<0.4	0.30	<0.3	0.60	0.30	0.39	0.50	0.50	<1.2	<0.4	0.50
Rb	65	68	92	80	31	92	76	70	90	85	75	91	84	68	95	70
Sr	272	360	338	374	462	289	346	367	322	337	326	336	323	348	321	377
Y	17	19	17	14	b.d.l.	25	14	22	17	16	22	16	16	23	20	14
Zr	115	113	125	136	96	117	123	124	119	132	122	133	123	104	120	142
Nb	b.d.l.	5	b.d.l.	b.d.l.	b.d.l.	5	b.d.l.	5	b.d.l.	b.d.l.	6	b.d.l.	b.d.l.	4	5	b.d.l.
Sb	0.21	0.18	0.26	0.21	0.14	0.15	0.29	0.19	0.25	0.25	0.21	0.21	0.37	0.23	0.09	0.20
Cs	3.55	3.31	5.02	4.33	1.80	3.98	4.16	3.51	4.77	4.25	3.86	4.39	4.36	3.46	4.80	3.49
Ba	549	521	670	627	287	704	592	583	657	625	591	592	565	479	754	459
La	17.8	15.1	18.9	17.6	14.7	18.8	16.4	17.8	19.1	19.3	19.0	20.4	19.7	15.5	17.4	18.8
Ce	35.6	32.8	39.9	37.6	25.6	40.8	34.9	38.7	39.9	40.8	39.5	44.4	41.6	35.3	37.5	40.1
Nd	19.7	15.7	20.6	18.8	12.7	18.9	17.5	18.5	19.3	18.2	19.6	20.1	20.7	16.6	17.0	20.1
Sm	3.59	2.86	3.77	3.60	2.71	3.83	3.43	3.23	3.76	3.97	3.42	3.95	3.95	3.46	3.20	3.79
Eu	1.04	0.92	1.09	0.98	0.76	1.07	0.93	1.03	1.05	1.12	1.04	1.11	1.07	1.03	1.01	1.16
Gd	2.89	2.35	n.d.	n.d.	n.d.	3.28	n.d.	2.94	n.d.	2.92	2.67	3.21	2.92	3.00	2.06	2.80
Tb	0.46	0.37	0.47	0.44	0.30	0.65	0.41	0.52	0.47	0.53	0.54	0.51	0.52	0.51	0.51	0.45
Tm	0.28	0.21	<0.1	<0.1	<0.1	0.37	0.02	0.31	<0.1	0.27	0.24	0.27	0.28	0.29	0.24	0.25
Yb	2.17	1.23	1.54	1.41	1.44	2.06	1.36	1.42	1.6	1.60	1.54	1.86	1.63	1.56	1.43	1.57
Lu	0.30	0.18	0.26	0.23	0.22	0.29	0.22	0.20	0.26	0.24	0.23	0.28	0.24	0.24	0.21	0.23
Hf	2.60	2.84	3.02	3.07	1.99	2.82	2.99	2.9	3.36	3.21	3.06	3.40	3.01	2.86	2.81	3.20

Ta	0.34	0.28	0.41	0.37	0.22	0.41	0.43	0.27	0.31	0.36	0.31	0.39	0.43	0.33	0.30	0.37
Au (ppb)	<1.5	0.20	<1.3	1.10	<1.1	<1.1	<0,9	<1.0	<1.8	0.60	0.74	0.40	<1.9	1.30	0.79	<1.3
Th	2.74	2.49	3.30	3.02	2.10	3.26	3.11	2.51	3.26	3.18	3.04	3.43	3.58	3.09	2.85	2.89
U	0.86	0.52	1.36	1.01	0.77	1.52	1.24	0.95	1.26	1.14	1.03	1.36	1.38	1.02	0.92	1.16
Eu/Eu*		1.08				0.92		1.02			1.05			0.98	1.20	

Samples analyzed for major and some trace elements at the Museum for Natural History, Humboldt-University, Berlin; KR7-1x** indicate different parts of the same sample have been analyzed; LB = lithic breccia, SB = suevitic breccia, MB = monomict breccia; G = granophyric-textured lithology, B = basement metasediments; b.d.l. = below detection limit; n.d. = not detected. LOI = loss on ignition. All major element concentrations in wt%, all trace element concentrations in ppm (unless stated otherwise); Eu anomaly given by Eu/Eu* = (EuN/√(SmNxGdN)).*

Sample #	KR7-35	KR7-64	KR7-6	KR7-65*	KR7-7a	KR7-7b	KR7-36a	KR7-36b	KR7-8	KR7-66*	KR7-9	KR7-50	KR7-37	KR7-10	KR7-67*	KR7-51
Depth (m)	359.33	359.96	360.65	362.99	363.20	363.20	364.45	364.45	370.34	370.39	377.46	378.20	379.09	380.21	382.94	383.14
Lithology	SB	SB	SB	SB	SB	SB	SB	SB	LB	LB	LB	SB	SB	SB	SB	SB
SiO_2	63.1	60.9	58.5	61.9	61.9	66.9	62.9	61.8	60.0	56.5	46.4	63.0	60.9	65.4	60.9	60.0
TiO_2	0.60	0.55	0.59	0.59	0.57	0.50	0.53	0.53	0.49	0.37	0.26	0.54	0.54	0.56	0.55	0.56
Al_2O_3	16.4	15.7	14.5	16.9	16.4	14.8	15.4	13.7	14.2	9.80	5.98	15.2	15.1	14.9	15.8	15.7
Fe_2O_3	5.90	6.21	6.21	6.38	6.08	6.24	5.58	5.39	5.87	6.91	7.23	6.11	5.99	5.96	6.91	6.62
MnO	0.07	0.06	0.05	0.05	0.06	0.06	0.06	0.05	0.06	0.08	0.14	0.05	0.06	0.05	0.05	0.05
MgO	2.83	3.79	3.53	2.75	2.32	2.17	2.15	2.69	4.06	9.78	15.0	2.27	4.00	3.08	4.51	3.84
CaO	2.36	2.70	2.10	1.84	1.90	0.95	1.95	2.36	1.09	4.61	6.84	1.47	1.97	1.03	1.61	1.09
Na_2O	2.54	2.66	2.39	2.59	2.60	3.28	2.59	3.06	3.78	0.94	0.03	2.43	2.28	3.20	2.81	3.10
K_2O	1.78	1.83	1.77	2.17	1.84	0.89	1.60	1.51	1.66	0.71	0.06	1.83	1.61	1.66	1.95	1.62
P_2O_5	0.09	0.09	0.08	0.11	0.09	0.09	0.09	0.09	0.11	0.06	0.05	0.06	0.09	0.10	0.09	0.17
LOI	4.88	5.20	10.4	4.10	5.22	2.72	6.93	7.24	6.31	9.70	17.2	6.99	6.41	3.66	4.8	5.85
SO_3		0.20		0.40						0.20					<0.1	
Total	100.6	99.9	100.6	99.8	99.0	98.6	99.8	98.4	97.7	99.7	99.1	100.0	99.0	99.6	100.0	98.6
Sc	15.3	15.4	14.6	17.5	12.6	15.6	13.9	14.7	13.9	15.8	18.6	15.7	13.1	13.5	15.8	16.2
V	126	113	136	130	98	125	118	123	126	96	84	134	122	133	120	126
Cr	186	152	194	104	123	160	160	158	347	882	2023	236	279	147	218	196
Co	17.0	21.0	16.0	18.8	13.0	17.6	15.1	16.0	18.9	41.5	77.0	17.7	19.0	16.0	22.2	20.1
Ni	63	84	88	50	34	53	49	53	134	714	1418	90	118	44	130	86
Cu	30	46	19	52	16	29	23	26	25	71	103	38	22	33	43	24
Zn	73	77	77	86	79	75	63	70	65	65	52	79	74	65	77	80
As	6.83	16.5	14.0	8.47	0.87	10.6	4.69	4.99	72.3	401	728	16.5	12.7	3.02	34.1	22.9
Se	0.16	<2.6	0.09	0.67	0.10	0.22	0.17	0.18	0.20	<2.6	0.95	0.19	0.17	0.18	<2.5	0.24
Br	<1.1	0.50	<0.4	0.50	<0.5	<0.4	<0.5	<0.5	<0.4	0.40	<0.3	<1.2	<1.1	<0.4	0.60	<1.2
Rb	68	69	84	84	35	78	70	74	71	31	2	66	65	71	70	79
Sr	332	320	305	359	378	339	317	343	348	300	309	282	351	295	356	336
Y	22	13	25	16	20	23	22	23	21	b.d.l	13	21	21	23	12	23
Zr	116	113	114	113	106	122	127	122	116	59	45	122	115	122	123	121
Nb	5	b.d.l	6	b.d.l	4	6	5	6	5	b.d.l	3	6	5	6	b.d.l	6
Sb	0.14	0.24	0.12	0.20	0.18	0.25	0.22	0.25	0.55	2.55	0.60	0.13	0.28	0.12	0.37	0.40
Cs	3.49	3.42	3.52	4.21	1.92	3.91	3.42	3.67	3.69	1.66	3.02	4.18	3.63	3.47	3.99	4.11
Ba	525	476	518	569	262	534	467	504	525	484	34.0	536	468	648	542	636
La	17.2	16.3	17.5	18.3	14.7	19.6	21.1	21.2	15.3	10.3	5.00	18.6	17.4	17.0	19.2	17.7
Ce	40.7	35.1	34.5	40.2	32.9	43.0	41.3	42.2	33.4	22.6	11.0	42.7	36.9	36.8	40.2	41.2
Nd	20.2	17.4	17.7	19.7	16.6	20.4	21.1	21.6	16.7	10.2	5.74	21.3	19.2	18.0	19.5	21.3
Sm	3.35	3.17	3.34	3.60	2.97	3.75	3.69	3.87	2.92	2.13	1.15	3.82	3.47	3.02	3.61	3.86
Eu	1.02	1.02	1.01	1.10	0.96	1.13	1.12	1.18	0.88	0.65	0.42	1.15	1.10	0.96	1.05	1.10
Gd	3.02	3.07	2.27	2.94	2.45	3.24	4.07	4.32	2.68	1.96	1.04	3.38	2.70	2.54	3.06	3.35
Tb	0.49	0.42	0.52	0.47	0.43	0.58	0.50	0.59	0.53	0.32	0.18	0.54	0.52	0.46	0.46	0.52
Tm	0.27	0.22	0.31	0.21	0.22	0.25	0.25	0.34	0.31	0.20	0.11	0.30	0.29	0.22	0.20	0.28
Yb	1.38	1.43	1.49	1.70	1.49	1.66	1.60	1.87	1.66	1.22	0.46	1.88	1.41	1.41	1.57	1.63
Lu	0.23	0.22	0.21	0.27	0.21	0.24	0.23	0.28	0.24	0.15	0.08	0.28	0.23	0.20	0.24	0.24
Hf	2.58	2.87	2.58	3.02	2.75	3.13	3.28	3.21	2.57	1.63	0.90	3.39	3.72	2.91	3.15	3.55
Ta	0.27	0.30	0.27	0.37	0.27	0.31	0.34	0.35	0.29	0.19	0.25	0.36	0.34	0.27	0.35	0.39
Au (ppb)	0.6	<1.3	<1.0	<1.2	<1.6	<1.4	<1.3	<1.6	1.4	<1.2	0.5	1.4	<1.3	<1.4	0.8	1.4
Th	2.99	2.63	2.70	3.16	2.28	3.32	3.50	3.69	2.66	1.60	0.51	3.51	3.01	2.77	3.31	3.30
U	0.98	0.88	1.00	1.14	0.16	1.25	1.33	1.24	0.97	0.77	0.33	0.62	0.82	0.80	0.87	1.22

Eu/Eu*	0.98		1.12		1.09	0.99	0.88	0.88	0.96		1.17	0.98	1.01	1.06		0.93
Sample #	KR7-11a	KR711b	KR7-43a	KR7-43b	KR7-43c	KR7-38	KR7-68*	KR7-39	KR7-12	KR7-52a	KR7-52b	KR7-52c	KR7-13	KR7-69*	KR7-14	KR7-70*
Depth (m)	383.74	383.74	384.84	384.84	384.84	387.59	390.23	390.85	391.85	392.00	392.00	392.00	393.78	395.14	398.44	398.58
Lithology	SB	SB	SB	SB	SB	SB	SB	SB	LB	LB	LB	LB	LB	SB	SB	SB
SiO_2	59.9	53.8	63.2	56.7	59.2	61.4	63.3	62.2	61.2	66.2	58.7	63.8	64.5	63.9	64.0	70.0
TiO_2	0.65	0.29	0.50	0.38	0.59	0.61	0.66	0.67	0.55	0.41	0.58	0.40	0.56	0.55	0.47	0.39
Al_2O_3	15.3	5.02	13.3	13.2	13.7	17.0	16.2	17.4	14.9	14.5	14.9	16.2	14.2	1.54	14.6	12.6
Fe_2O_3	7.53	5.50	4.73	4.88	5.41	5.94	6.72	6.78	6.12	5.43	6.79	4.50	5.58	5.92	5.46	4.11
MnO	0.05	0.12	0.07	0.02	0.07	0.05	0.04	0.06	0.04	0.03	0.06	0.03	0.04	0.05	0.05	0.05
MgO	4.84	12.7	1.85	3.79	3.44	2.31	2.32	2.86	2.93	1.99	4.31	2.34	2.90	2.63	2.24	1.62
CaO	1.21	6.40	2.45	10.1	3.57	1.61	1.11	1.43	1.90	1.65	1.76	1.79	1.62	1.97	1.88	2.53
Na_2O	2.40	0.11	2.33	1.75	3.71	2.41	2.33	2.00	2.67	2.73	3.15	2.77	2.85	2.73	2.56	3.57
K_2O	2.05	0.00	1.75	1.32	1.49	2.00	2.26	2.44	1.87	1.17	1.79	1.52	1.68	2.10	1.58	1.20
P_2O_5	0.12	0.07	0.08	0.18	0.13	0.11	0.06	0.09	0.10	0.14	0.09	0.10	0.10	0.08	0.09	0.43
LOI	5.87	15.1	8.39	7.85	8.53	5.94	4.2	4.97	7.90	4.34	7.68	5.20	6.72	4.30	5.79	3.00
SO_3							0.40							0.20		<0.1
Total	99.9	99.1	98.6	101.2	99.9	99.5	99.1	100.8	100.2	98.9	99.7	98.7	100.7	99.8	98.7	99.5
Sc	17.8	17.2	12.1	17.2	12.3	16.3	16.3	18.1	15.2	11.0	16.6	11.4	13.3	14.6	12.1	9.13
V	135	89	98	155	101	135	122	149	150	96	140	114	145	114	112	74
Cr	197	1765	127	389	114	177	111	179	342	107	336	125	161	112	172	80
Co	22.8	39.7	13.5	20.0	16.0	16.8	24.2	21.0	18.0	10.2	21.1	12.6	15.4	19.1	22.4	9.57
Ni	101	605	31	177	33	68	61	59	52	24	125	31	78	91	466	27
Cu	35	22	31	34	13	29	48	32	27	46	46	31	28	48	76	45
Zn	79	45	57	76	58	77	86	87	73	56	83	51	68	78	60	56
As	22.5	159	1.09	21.7	2.38	5.01	2.11	6.30	6.57	0.64	12.4	0.26	12.9	23.0	33.4	7.16
Se	0.26	0.14	0.16	0.15	0.15	0.18	<2.8	0.27	0.23	0.20	0.20	0.20	0.19	<2.6	0.22	<2.2
Br	<0.4	<0.2	0.21	<0.2	<0.5	<0.1	0.6	<1.2	<0.4	<0.5	<1.1	<0.5	<0.4	0.6	<0.4	0.60
Rb	91	5.0	77	70	67	86	86	104	86	58	78	75	76	80	62	42
Sr	239	221	296	289	393	326	331	255	280	351	297	258	302	309	340	376
Y	25	15	24	22	21	23	22	26	23	18	22	20	22	16	21	13
Zr	129	56	120	122	124	130	150	140	120	147	117	114	130	143	114	133
Nb	6	3	6	5	5	6	b.d.l	6	6	5	5	5	6	b.d.l	4	b.d.l
Sb	0.15	0.74	0.28	0.24	0.10	0.20	0.73	0.19	0.07	0.07	0.20	0.13	0.12	0.27	0.25	0.24
Cs	4.37	0.41	4.16	3.72	3.64	4.14	3.78	5.40	4.33	3.44	4.03	3.99	3.85	4.42	3.02	1.96
Ba	537	27	477	491	387	587	523	585	597	349	504	521	553	507	527	505
La	21.0	6.62	16.8	17.5	14.2	20.7	19.7	23.9	18.8	19.5	17.5	15.4	18.6	21.1	16.4	20.1
Ce	44.3	14.4	35.0	37.4	29.9	41.7	44.6	51.0	40.8	41.2	39.7	31.9	37.5	45.3	32.0	43.9
Nd	21.8	7.28	17.7	18.7	14.8	21.2	21.6	25.3	20.3	20.3	19.8	16.1	18.8	22.0	16.2	22.8
Sm	3.91	1.49	3.37	3.22	3.02	3.71	4.14	4.27	3.45	3.26	3.35	2.91	3.46	3.90	2.90	4.08
Eu	1.06	0.40	1.02	1.02	0.74	1.16	1.16	1.29	1.05	1.11	1.03	0.87	0.98	1.16	0.91	1.14
Gd	3.89	1.20	3.18	2.17	3.75	4.11	3.38	4.74	3.30	2.24	2.80	3.35	2.79	3.51	3.59	3.06
Tb	0.62	0.30	0.51	0.44	0.42	0.64	0.57	0.56	0.64	0.40	0.48	0.42	0.53	0.50	0.43	0.45
Tm	0.28	0.17	0.30	0.22	0.22	0.37	0.31	0.24	0.33	0.22	0.27	0.25	0.30	0.26	0.22	0.24
Yb	1.91	0.58	1.66	1.62	1.12	2.25	2.17	1.92	1.56	1.23	1.49	1.45	1.44	1.75	1.37	1.68
Lu	0.28	0.09	0.23	0.24	0.19	0.31	0.33	0.31	0.24	0.17	0.24	0.21	0.20	0.27	0.21	0.26
Hf	3.31	1.04	3.03	3.07	2.89	3.18	3.61	3.82	2.93	3.81	3.02	3.00	2.81	3.33	2.75	2.80
Ta	0.42	0.11	0.34	0.31	0.25	0.35	0.46	0.43	0.32	0.28	0.33	0.39	0.36	0.40	0.26	0.29
Au(ppb)	0.6	<0.8	0.6	0.7	0.4	0.6	2.5	0.7	0.6	<1.5	0.5	<1.4	<1.0	1.2	1.5	<1.4

Th	3.76	0.82	3.16	2.99	2.49	3.33	4.09	4.32	3.17	4.20	3.28	2.95	3.45	3.49	2.64	2.87
U	1.58	0.36	1.15	1.34	1.06	0.83	1.31	1.28	1.14	0.94	0.95	0.88	1.31	1.17	0.90	3.79
Eu/Eu*	0.83	0.91	0.95	1.18	0.67	0.91		0.88	0.95	1.26	1.03	0.85	0.96		0.86	

Sample #	KR7-40	KR7-53	KR7-15	KR7-16	KR7-17	KR7-44	KR7-20	KR7-41	KR7-41a	KR7-18	KR7-42	KR7-21	KR7-71*	KR7-72*	KR7-22	KR7-73*
Depth (m)	400.06	400.58	402.73	404.26	405.57	407.77	408.72	408.72	408.72	411.34	412.17	413.13	415.67	416.07	420.86	421.56
Lithology	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	MB	MB	MB	MB
SiO_2	65.3	59.9	62.5	58.6	64.2	63.7	61.3	64.1	60.9	61.6	57.1	54.9	65.1	72.7	56.0	69.6
TiO_2	0.49	0.65	0.59	0.56	0.53	0.58	0.55	0.54	0.51	0.51	0.66	0.50	0.44	0.36	0.51	0.44
Al_2O_3	14.4	16.0	15.7	14.5	14.8	14.7	15.1	14.8	14.7	16.3	16.9	12.4	15.6	10.9	12.7	13.9
Fe_2O_3	5.22	6.45	6.13	5.78	5.53	6.00	5.73	5.54	5.39	5.29	6.65	6.50	2.96	3.74	6.46	4.77
MnO	0.06	0.05	0.05	0.06	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.10	0.06	0.05	0.12	0.04
MgO	1.97	1.87	2.87	2.62	2.08	1.56	2.86	2.73	1.99	1.73	3.46	6.40	1.32	1.41	4.44	1.75
CaO	2.20	1.97	1.61	1.97	2.05	2.62	2.46	2.28	2.22	2.06	2.06	5.19	3.94	2.58	6.48	1.45
Na_2O	2.61	2.24	2.96	5.38	2.87	2.58	2.69	1.32	3.16	2.74	3.08	1.66	2.30	2.38	1.88	2.72
K_2O	1.60	2.52	2.01	1.80	1.96	1.98	1.87	1.72	1.75	1.98	1.93	1.27	2.87	1.13	1.13	1.60
P_2O_5	0.37	0.04	0.14	0.10	0.10	0.05	0.14	0.13	0.11	0.11	0.12	0.12	0.09	0.05	0.13	0.08
LOI	4.42	8.80	6.11	7.76	5.27	4.82	6.35	5.81	9.02	6.31	8.17	9.53	4.9	4.0	8.99	2.9
SO_3													<0.1	<0.1		<0.1
Total	98.7	100.1	100.7	99.2	99.5	98.6	99.1	99.0	99.7	98.7	100.2	98.6	99.6	99.0	98.8	99.3
Sc	12.6	17.5	15.7	14.8	14.3	15.7	14.5	8.89	12.8	12.9	17.6	10.9	7.25	7.82	17.5	10.2
V	102	142	129	151	116	122	132	102	93	111	145	94	54	72	147	89
Cr	156	136	183	149	128	145	151	102	110	111	148	457	49	69	459	75
Co	14.0	19.0	15.0	17.0	16.0	16.6	15.4	10.0	13.0	15.0	16.1	29.3	5.98	10.1	20.0	10.5
Ni	74	53	46	53	47	49	50	24	46	36	51	292	b.d.l	b.d.l	110	17
Cu	29	40	32	28	30	31	26	28	28	19	34	b.d.l	b.d.l	b.d.l	b.d.l	b.d.l
Zn	60	82	72	70	66	71	68	45	69	64	86	79	47	56	83	66
As	7.77	4.78	15.7	11.0	9.56	5.03	4.56	1.52	4.50	7.75	4.42	55.1	0.13	<0.70	8.32	<0.88
Se	0.12	0.20	0.18	0.15	0.19	0.15	0.13	0.15	0.14	0.10	0.18	0.11	<1.9	<1.9	0.03	<2.2
Br	<1.2	<0.4	<0.4	<0.4	<0.4	<0.5	<0.5	<1.3	<1.2	<0.4	<1.1	0.16	0.30	0.50	<0.4	0.60
Rb	60	91	80	75	72	80	72	49	66	69	82	53	103	45	54	63
Sr	329	361	383	374	374	375	351	431	372	411	395	373	378	272	359	337
Y	27	26	23	24	23	22	22	21	116	23	24	18	13	<10	23	b.d.l
Zr	126	125	123	122	116	122	126	125	116	137	135	94	109	129	89	128
Nb	5	6	5	6	5	6	5	6	4	5	6	4	b.d.l	b.d.l	4	b.d.l
Sb	0.23	0.27	0.29	0.22	0.19	0.27	0.24	<0.2	0.33	0.09	0.12	0.10	0.04	0.01	0.21	0.10
Cs	3.30	4.65	4.44	3.65	4.13	4.26	3.78	3.43	4.17	4.02	5.19	3.50	5.14	1.98	2.56	2.69
Ba	512	760	654	565	562	552	645	440	537	649	671	469	824	328	346	410
La	20.8	21.2	17.7	17.1	18.0	19.5	18.9	10.6	15.6	19.8	19.5	11.8	13.5	18.4	16.2	14.6
Ce	47.2	42.4	37.8	38.0	38.8	41.0	37.9	24.3	34.4	40.7	44.6	25.5	28.9	37.6	34.2	31.2
Nd	24.4	22.1	19.4	17.4	19.9	20.3	19.1	11.9	18.2	21.1	21.7	13.7	14.8	16.9	18.4	15.1
Sm	4.26	4.01	3.41	3.21	3.44	3.57	3.44	1.86	3.08	3.35	3.71	2.59	2.85	2.97	3.43	2.57
Eu	1.39	1.28	1.02	1.00	1.04	1.14	1.08	0.67	0.86	0.99	1.14	0.84	0.78	0.88	1.06	0.76
Gd	3.12	4.21	3.95	2.79	3.95	4.01	3.94	2.48	2.35	2.89	3.16	1.89	1.93	2.14	3.41	1.90
Tb	0.55	0.68	0.52	0.53	0.52	0.52	0.53	0.29	0.54	0.52	0.50	0.34	0.31	0.35	0.60	0.30
Tm	0.30	0.36	0.26	0.31	0.31	0.26	0.30	0.17	0.36	0.30	0.29	0.16	0.18	0.16	0.27	0.17
Yb	1.85	2.21	1.70	1.42	1.66	1.59	1.96	1.15	1.40	1.69	1.74	0.98	0.97	1.02	1.56	1.05
Lu	0.28	0.31	0.26	0.22	0.23	0.25	0.27	0.16	0.22	0.25	0.28	0.15	0.14	0.16	0.23	0.16
Hf	3.54	3.21	3.15	2.84	2.94	3.21	3.27	3.08	2.71	3.29	3.35	2.38	2.68	2.85	2.18	2.67

Ta	0.32	0.38	0.38	0.34	0.34	0.35	0.31	0.29	0.35	0.32	0.39	0.22	0.23	0.27	0.22	0.25
Au (ppb)	<1.4	0.19	0.80	1.26	0.68	1.20	0.82	<1.4	0.60	<1.4	1.95	<1.3	<1.5	<1.5	0.38	<1.2
Th	3.39	3.50	3.17	2.88	2.99	3.31	3.05	3.18	2.97	3.21	3.97	1.87	2.29	3.59	2.36	2.41
U	1.49	1.20	1.35	0.89	0.81	0.90	0.95	0.50	1.17	0.80	1.40	0.69	<0.6	0.95	0.84	0.72
Eu/Eu*	1.17	0.95	0.85	1.02	0.86	0.92	0.90	0.95	0.98	0.97	1.02	1.16			0.95	

Sample #	KR7-74*	KR7-23	KR7-75*	KR7-24	KR7-25	KR7-76*	KR7-77*	KR7-45	KR7-78*	KR7-26	KR7-79*	KR7-27	KR7-28	KR7-80*	KR7-29	KR7-81*
Depth (m)	430.03	430.13	430.28	439.01	439.61	441.60	445.13	445.22	450.37	454.35	454.52	468.28	470.55	471.88	475.76	483.00
Lithology	SB	SB	MB	MB	MB	MB	SB	SB	MB	MB	MB	MB	MB	B	B	SB
SiO_2	64.9	61.2	69.5	58.3	57.8	61.6	64.3	63.2	67.0	77.0	68.3	67.8	65.4	52.7	64.5	62.7
TiO_2	0.56	0.57	0.41	0.67	0.62	0.67	0.56	0.57	0.49	0.34	0.45	0.48	0.54	0.38	0.60	0.64
Al_2O_3	16.3	14.3	12.9	19.7	19.0	18.3	14.8	15.6	15.2	10.3	15.5	14.2	14.4	12.1	16.3	15.9
Fe_2O_3	5.70	6.33	3.88	7.31	7.44	6.81	5.88	6.04	4.87	3.92	4.39	4.99	5.49	5.34	6.79	6.73
MnO	0.04	0.07	0.06	0.05	0.05	0.04	0.06	0.04	0.04	0.04	0.03	0.06	0.06	0.11	0.05	0.04
MgO	2.28	4.05	1.44	2.53	2.68	2.50	2.16	1.90	1.78	1.93	1.51	1.63	2.70	6.60	2.37	2.44
CaO	1.77	2.89	3.14	1.16	2.10	0.82	2.50	1.96	1.68	1.41	1.14	2.50	1.50	6.50	0.60	1.16
Na_2O	3.06	2.57	3.08	2.38	2.04	2.56	3.32	2.68	4.45	1.29	4.37	2.00	3.29	1.50	2.50	2.57
K_2O	1.89	1.58	1.50	2.46	2.46	2.67	1.49	1.62	1.16	0.57	1.48	1.77	1.52	1.62	2.20	2.34
P_2O_5	0.08	0.13	0.06	0.08	0.08	0.07	0.12	0.05	0.09	0.08	0.07	0.14	0.11	0.09	0.10	0.09
LOI	3.4	6.13	4.00	4.09	4.16	3.50	4.30	6.23	2.60	2.14	2.20	4.03	3.33	12.3	4.11	4.70
SO_3	<0.1		<0.1			<0.1	0.1		0.1		<0.1			<0.1		0.2
Total	100.0	99.9	100.0	98.7	98.4	99.5	99.6	99.9	99.5	99.0	99.4	99.6	98.3	99.2	100.2	99.5
Sc	12.5	15.3	9.50	20.8	21.7	18.0	12.9	14.8	10.5	6.69	9.74	0.19	1.81	10.0	0.07	15.6
V	110	133	84	187	163	133	105	129	94	136	88	117	125	74	140	133
Cr	91	148	73	170	152	96	89	140	87	158	77	99	143	261	168	109
Co	13.1	15.1	9.09	19.7	19.0	19.1	16.6	16.0	11.6	15.0	9.61	12.4	15.0	21.3	19.9	20.1
Ni	33	54	16	47	48	53	28	47	25	18	b.d.l	27	43	224	39	45
Cu	49	25	38	44	42	59	60	28	49	19	31	32	30	b.d.l	29	39
Zn	77	78	54	89	96	90	76	75	66	39	51	58	64	83	80	87
As	3.50	3.79	<0.9	0.42	0.84	<0.9	3.81	3.37	<11	<0.4	<1.4	0.19	1.81	65.0	0.07	2.30
Se	<2.6	0.16	<2.0	0.20	0.19	<2.7	<2.5	0.15	<2.2	0.09	<2.1	0.14	0.17	<1.8	0.24	<2.3
Br	0.40	<1.0	0.40	<0.5	<0.5	0.30	0.70	<1.2	0.40	<0.5	0.30	<0.5	<0.5	0.40	<0.5	0.60
Rb	72	70	60	101	108	104	58	70	47	29	61	77	70	72	94	93
Sr	342	382	334	364	316	306	399	384	379	251	398	280	349	267	221	247
Y	13	24	b.d.l	23	27	19	14	26	b.d.l	18	b.d.l	23	21	b.d.l	27	23
Zr	128	122	117	125	120	119	180	122	162	100	148	116	139	70	139	164
Nb	b.d.l	5	b.d.l	6	6	b.d.l	b.d.l	6	b.d.l	4	b.d.l	4	5	b.d.l	6	b.d.l
Sb	0.14	0.13	0.09	0.14	0.09	0.06	0.22	<0.2	<0.2	0.12	0.16	0.14	0.11	0.29	0.11	0.16
Cs	3.71	3.92	2.72	4.64	4.71	4.87	3.76	4.14	2.23	1.38	2.78	4.04	3.85	4.05	5.34	5.84
Ba	471	556	394	739	737	701	485	539	341	214	402	582	531	282	509	500
La	17.1	19.9	16.8	18.6	20.7	11.5	24.1	18.2	16.2	18.8	15.5	18.6	20.8	8.82	20.6	24.3
Ce	34.3	42.8	34.4	41.3	42.8	24.9	50.8	42.1	34.3	36.2	32.9	39.3	40.6	19.1	43.9	50.6
Nd	16.1	22.1	15.8	20.3	20.8	13.4	21.7	21.3	15.3	16.2	14.6	19.5	20.7	11.0	21.6	26.2
Sm	2.97	4.06	2.63	3.38	3.96	2.47	4.36	3.83	2.84	2.54	2.78	3.36	3.64	1.98	4.22	4.61
Eu	1.00	1.21	0.87	1.09	1.14	0.78	1.32	1.14	0.95	0.78	0.82	1.10	1.08	0.61	1.30	1.27
Gd	3.07	3.56	2.20	4.01	4.61	2.35	3.35	2.90	2.09	2.64	2.05	2.93	4.21	n.d.	3.54	n.d.
Tb	0.42	0.55	0.32	0.57	0.61	0.35	0.59	0.51	0.36	0.30	0.34	0.46	0.54	0.26	0.71	0.54
Tm	0.17	0.27	0.16	0.31	0.31	0.17	0.28	0.30	0.19	0.17	0.16	0.28	0.25	<0.1	0.40	0.06
Yb	1.14	1.62	0.87	2.04	2.15	1.21	2.11	1.57	1.41	0.98	0.93	1.35	1.62	0.70	2.22	1.99

Lu	0.16	0.26	0.14	0.29	0.33	0.20	0.31	0.24	0.21	0.14	0.15	0.23	0.23	0.11	0.33	0.32
Hf	2.81	3.14	2.66	3.28	2.92	3.02	3.88	2.89	3.74	2.42	3.00	2.92	4.06	1.92	3.54	3.71
Ta	0.35	0.35	0.27	0.37	0.34	0.43	0.38	0.35	0.27	0.23	0.30	0.36	0.37	0.15	0.48	0.51
Au (ppb)	<1.7	<1.1	<1.0	1.2	0.9	0.4	<1.6	1.4	<1.7	<1.4	<1.4	<1.4	<1.3	<0.9	1.9	<1.2
Th	2.64	3.06	2.31	3.75	3.40	3.22	3.92	3.30	2.56	2.44	2.31	2.75	3.36	1.38	4.12	4.35
U	0.86	1.12	0.69	1.23	1.32	1.04	1.45	1.11	0.90	0.49	0.80	1.05	1.16	0.56	1.06	1.82
Eu/Eu*		0.97		0.90	0.82			1.05		0.92		1.07	0.84		1.03	

Sample #	KR7-82*	KR7-29A	KR7-30	KR7-31	KR7-83*	KR7-32	KR7-46	KR7-47	KR7-84*	KR7-48	KR7-49	KR7-85*	KR7-33
Depth (m)	487.12	487.36	491.01	512.15	513.90	514.77	530.63	530.79	538.29	538.89	538.99	539.66	542.70
Lithology	G	B	B	B	SB	B	B	B	B	B	B	B	B
SiO_2	51.2	49.7	63.3	62.2	79.1	54.1	60.2	68.8	73.3	68.5	58.1	58.1	60.8
TiO_2	0.51	0.46	0.70	0.54	0.51	0.60	0.57	0.57	0.43	0.59	0.48	0.48	0.72
Al_2O_3	12.1	10.4	17.8	15.2	6.80	12.8	18.6	13.7	12.3	14.3	13.9	14.2	18.6
Fe_2O_3	7.20	6.87	7.01	4.85	3.21	5.54	3.35	5.89	4.37	5.64	5.01	4.95	7.06
MnO	0.12	0.11	0.05	0.05	0.03	0.07	0.10	0.03	0.03	0.05	0.09	0.07	0.05
MgO	6.82	9.28	2.44	2.67	2.08	3.63	1.03	1.40	1.51	1.23	3.64	3.86	2.35
CaO	6.16	6.89	0.43	2.78	2.13	8.49	3.06	0.86	0.82	0.55	4.88	4.59	0.39
Na_2O	1.49	0.36	2.77	2.84	0.48	3.81	1.09	2.35	2.79	2.95	3.03	3.57	2.07
K_2O	1.22	0.79	2.23	1.94	1.17	0.83	5.20	1.89	1.37	1.70	1.44	1.47	2.62
P_2O_5	0.15	0.14	0.09	0.13	0.02	0.22	0.09	0.03	0.06	0.10	0.10	0.10	0.09
LOI	12.3	13.9	3.93	5.63	4.10	8.73	6.92	3.88	2.7	3.21	8.92	8.1	3.98
SO_3	<0.1				<0.1				<0.1			<0.1	
Total	99.3	98.9	100.8	98.8	99.6	98.9	100.3	99.4	99.7	98.8	99.5	99.5	98.7
Sc	15.6	17.8	17.9	12.8	7.10	12.6	16.4	14.7	8.50	13.5	12.5	12.5	20.2
V	103	117	148	120	78	116	90	130	75	121	91	82	168
Cr	405	785	159	106	85	219	31.4	145	151	161	258	140	178
Co	33.2	31.7	18.7	14.5	10.7	23.3	3.50	16.3	13.7	15.0	13.0	14.2	20.4
Ni	259	316	42	74	38	151	14	37	22	42	90	74	52
Cu	b.d.l	b.d.l	35	b.d.l	b.d.l	b.d.l	13	24	b.d.l	23	b.d.l	b.d.l	34
Zn	96	82	96	75	54	73	42	97	66	74	69	68	91
As	125	51.5	<0.8	35.3	22.3	39.3	<0.5	<0.7	1.61	4.05	16.7	21.7	0.46
Se	<3.2	0.20	0.28	0.20	<1.5	0.12	0.51	0.21	<1.7	0.28	0.01	<1.9	0.29
Br	0.50	<1.0	<1.3	<1.2	0.30	<0.6	<0.5	<1.2	0.40	<1.2	<1.2	0.40	<1.3
Rb	53	34	97	76	61	43	210	86	61	76	69	66	127
Sr	337	217	199	492	158	575	279	165	162	190	287	303	222
Y	b.d.l	18	25	21	b.d.l	20	75	25	11	28	19	b.d.l	31
Zr	81	77	144	102	34	94	580	135	252	158	101	104	166
Nb	b.d.l	3	8	7	b.d.l	8	13	7	b.d.l	7	3	b.d.l	9
Sb	<0.1	0.17	0.12	0.09	0.16	<0.2	0.29	0.21	<0.1	<0.2	0.17	0.15	0.19
Cs	2.51	1.54	5.11	4.28	2.84	2.12	10.9	4.56	3.41	3.98	3.32	3.57	5.40
Ba	235	88	526	548	323	210	1071	454	319	410	394	366	598
La	18.0	16.0	25.5	20.5	7.96	19.5	101	22.1	21.4	23.0	11.4	13.2	27.2
Ce	40.0	32.2	53.6	42.2	17.3	40.4	210	46.4	45.0	51.5	27.2	27.2	53.7
Nd	24.0	16.0	22.5	20.1	8.64	20.1	110	22.5	21.2	25.8	13.4	13.7	27.2
Sm	4.34	3.53	4.33	3.71	1.52	3.28	19.7	3.72	3.91	4.35	2.35	2.90	5.00
Eu	1.18	1.01	1.20	1.12	0.44	1.09	4.32	1.09	0.98	1.25	0.77	0.79	1.36
Gd	n.d.	2.63	3.10	2.89	n.d.	3.38	10.7	3.51	n.d.	4.13	2.04	n.d.	2.65
Tb	0.38	0.40	0.54	0.45	0.17	0.39	2.52	0.54	0.45	0.65	0.34	0.35	0.67

Tm	<0.1	0.20	0.31	0.18	<0.1	0.21	1.32	0.32	0,04	0.30	0.18	<0.1	0.37
Yb	1.24	1.04	2.07	0.87	0.48	1.21	6.07	1.82	1.50	2.03	0.95	1.08	2.36
Lu	0.18	0.14	0.31	0.15	0.08	0.16	0.94	0.29	0.23	0.30	0.15	0.17	0.35
Hf	2.14	1.83	3.58	2.78	1.04	2.25	14.5	3.62	5.33	4.02	2.39	2.62	4.28
Ta	0.19	0.16	0.50	0.24	0.36	0.36	1.21	0.46	0.36	0.55	0.21	0.32	0.53
Au (ppb)	<1.0	<1.1	0.4	<1.3	<0.6	<0.4	1.1	0.9	<1.2	0.4	<1.5	<1.1	1.52
Th	2.31	1.77	4.51	2.89	1.20	2.50	8.06	4.07	4.95	4.44	1.94	2.19	5.04
U	0.91	0.54	1.40	1.26	0.90	1.05	4.69	1.51	1.49	1.31	0.61	1.26	1.63
Eu/Eu*		1.01	1.00	1.05		1.00	0.91	0.92		0.90	1.07		1.14

Appendix 4b: PGE and Os isotope data measured by ICP-MS for analyzed samples from the LB-07A core.

Table 1. Data for platinum group elements and Au, by ICP-MS (Cardiff), for samples from core LB-07A, and reference materials Wits-1 (see McDonald and Viljoen, 2006) and TDB1 (see Govindaraju, 1994; Peucker-Ehrenbrink et al., 2003). Standard deviations indicated for some of the Wits-1 preferred and TDB 1 certified values. All data in ppb.

Sample #/ Depth (m)	Ru	Rh	Pd	Ir	Pt	Au
KR7-1/334.91	0.093	0.19	1.30	0.038	2.99	1.43
KR7-9/377.46	1.52	1.29	25.9	0.68	22.4	6.86
KR7-9d/377.46	1.36	1.25	25.1	0.65	23.6	7.76
KR7-14/398.44	0.45	0.34	4.85	0.21	7.90	10.4
KR7-43b/384.84	0.096	0.088	1.43	0.059	1.32	2.90
KR7-21/413.13	0.080	0.13	1.51	0.050	3.60	4.78
KR7-22/420.86	0.065	0.056	1.50	0.033	2.17	1.58
KR7-31/512.15	0.059	0.088	0.74	0.028	2.75	4.99
KR7-29A/487.36	0.071	0.21	1.53	0.039	2.44	1.24
KR7-43c/384.84	0.11	0.17	0.84	0.035	2.16	6.23
KR7-11b/383.74	0.23	0.21	4.19	0.10	3.33	22.7
Wits-1	3.83	1.18	5.19	1.38	7.02	5.73
TDB 1	0.21	0.54	22.4	0.11	4.92	7.07
Wits-1 preferred	3.9 ± 0.8	1.1 ± 0.2	5.0 ± 1.2	1.4 ± 0.3	5.7 ± 1.6	4.9 ± 2.6
TDB 1 certified	0.3	0.7	22.4 ± 1.4	0.15	5.8 ± 1.1	6.3 ± 1.3

Table 2. Sample weights related to chemical preparation for ICP-MS. All data in g.

Sample #	Sample weight pre-fusion	Sample weight post-fusion
KR7-1	15	1.24
KR7-9	15	1.56
KR7-9d	15	1.59
KR7-14	15	1.18
KR7-43b	15	1.11
KR7-21	15	1.51
KR7-22	15.01	1.39
KR7-31	15	1.50
KR7-29A	15	1.57
KR7-43c	15.01	1.28
KR7-11b	15	1.41
Blank (SiO_2)	15.00	1.08
Wits-1	15.02	1.51

Table 3. Data for Os isotopic composition and platinum group element abundances (concentrations in ppt), measured by ICP-MS (Woods Hole), for samples from LB-07A core.

	KR7-29A	KR7-43C
$^{187}Os/^{188}Os$	1.7891	2.8747
2σ%	0.25	0.92
2σ absolute	0.0044	0.0265
Os (ppt)	20	27
Blank corr. (%)	4	3
Ir (ppt)	34	19
Pd (ppt)	1899	646
%dev.	0	1
Pt (ppt)	1464	418
%dev.	0	1

**2σ (%, absolute) provides the constraints for the 95% confidence interval for $^{187}Os/^{188}Os$, and is quoted here in percentage as well as absolute value; Blank corr. (%) = the magnitude of the blank correction in percentage of the Os isotope ratio; %dev. = the percentage difference in concentrations that were calculated using 2 different isotope ratios.*

Appendix 5a: Universal stage data

Table 1. Basement metasediments

Sample #/ Depth (m)	Grain #	C-axis Orientation	PDF Measurement	Polar Angle	Symbol & Miller Index
KR7-28/ 470.55	1	317°, H, E-W	302°/15°E	22°	23°; ω $\{10\bar{1}3\}$
			302°/10°E	17°	
			302°/9°E	16°	
			302°/3°W	18°	
	2	148° H, E-W	180°/18°E	46°	48°; ξ $\{1\bar{1}22\}$
			180°/0°E	42°	
			180°/4°E	42°	
			180°/8°E	42°	
			180°/10°E	42°	
			180°/1°E	42°	
			180°/20°E	47°	
KR7-29A/ 487.36	1	067°, H, E-W	131°/10°E	66°	66°; s $\{1\bar{1}21\}$
			131°/12°E	66°	
			131°/6°E	66°	
			131°/11°E	66°	
			131°/8°E	67°	
KR7-31/ 512.15	1	171°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	2	060°, H, E-W	123°/1°W	64°	66°; s $\{1\bar{1}21\}$
			123°/0°W	64°	
			123°/9°W	64°	
			123°/12°W	65°	
			123°/18°W	66°	
KR7-84/ 538.29	1	228°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	2	031°, H, E-W	332°/7°E	58°	Not indexed
			332°/1°E	58°	
			332°/15°W	60°	
			332°/6°W	59°	
			332°/16°E	60°	
	3	075°, H, E-W	060°/14°W	20°	23°; ω $\{10\bar{1}3\}$
			060°/16°W	22°	
			060°/8°W	16°	
			060°/15°W	20°	

**Polar angle is defined as the angle between the pole to PDF plane and quartz c-axis.*

Table 2. Lower impactites

Sample #/ Depth (m)	Grain #	C-axis Orientation	PDF Measurement	Polar Angle	Symbol & Miller Index
KR7-71/ 415.67	1	348°, H, E-W	AT C-AXIS	0°	0°; c (0001)
KR7-73/ 421.56	1	043°, H, E-W	109°/1°W	68°	66°; s **{** $\{1\bar{1}21\}$ **}**
			109°/2°W	68°	
			109°/9°W	68°	
			109°/6°E	67°	
			109°/0°E	67°	
	2a	276°, H, E-W	AT C-AXIS	0°	0°; **c** (0001)
	2b		194°/14°E	80°	79; **t {** $\{40\bar{4}1\}$ **}**
			194°/8°E	81°	
			194°/12°E	80°	
			194°/9°E	80°	
			194°/10°E	80°	
	2c		103°/3°E	14°	23°; ω $\{10\bar{1}3\}$
			103°/18°E	18°	
			103°/14°E	20°	

			103°/14°W	20°	
			103°/5°W	12°	
			103°/18°W	22°	
	3	235°, H, E-W	248°/11°E	18°	Not indexed
			248°/6°E	14°	
			248°/5°E	14°	
			248°/4°E	12°	
	4	052°, H, E-W	067°/13°E	22°	23°; ω
			067°/9°E	18°	$\{10\bar{1}3\}$
			067°/12°E	20°	
			067°/4°E	17°	
			067°/8°E	17°	
	5	197°, H, E-W	176°/5°E	22°	23°; ω
			176°10°E	22°	$\{10\bar{1}3\}$
			176°/0°E	22°	
			176°/6°E	22°	
			176°/4°E	22°	
	6	343°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	7a	023°, H, E-W	049°/3°W	26°	32°; π
			049°/11°W	29°	$\{10\bar{1}2\}$
			049°/14°W	30°	
			049°/12°W	30°	
			049°/1°E	26°	
	7b		AT C-AXIS	0°	0°; c (0001)
KR7-74/ 430.03	1a	332°, H, E-W	108°/17°W	26°	23°; ω
			108°/18°W	24°	$\{10\bar{1}3\}$
			108°/10°W	24°	
			108°/3°W	24°	
			108°/8°W	24°	
			108°/14°W	24°	
	1b		AT C-AXIS	0°	0°; c (0001)
	2a	316°, H, E-W	294°/12°W	24°	23°; ω
			294°/6°W	21°	$\{10\bar{1}3\}$
			294°/10°W	24°	
			294°/21°W	30°	
			294°/11°W	24°	
	2b		AT C-AXIS		0°; c (0001)
	3	348°, H, E-W	015°/11°E	30°	32°; π
			015°/17°E	33°	$\{10\bar{1}2\}$
			015°/15°E	31°	
			015°/14°E	32°	
			015°/8°E	28°	
	4	350°, H, E-W	056°/5°E	56°	Not indexed
			056°/3°E	56°	
			056°/14°E	57°	
			056°/6°E	57°	
KR7-23/ 430.13	1	045°, H, E-W	309°/8°E	90°	90°
			309°/7°E	90°	
			309°/6°E	90°	
			309°/4°E	90°	
	2	100°, H, E-W	339°/30°W	58°	Not indexed
			339°/16°W	60°	
			339°/17°W	60°	
			339°/12°W	60°	
	3	093°, H, E-W	113°/4°W	22°	23°; ω
			113°/2°W	21°	$\{10\bar{1}3\}$
			113°/9°E	22°	
			113°/1°E	20°	
			113°/1°W	20°	
	4	146°, H, E-W	076°/5°W	23°	23°; ω
			076°/10°W	24°	$\{10\bar{1}3\}$
			076°/4°W	24°	

			076°/8°W	26°	
	5a	231°, H, E-W	210°/6°E	20°	23°; ω
			210°/11°E	23°	$\{10\bar{1}3\}$
			210°/12°E	24°	
			210°/19°E	28°	
			210°/10°E	23°	
			210°/13°E	24°	
	5b		246°/16°E	20°	23°; ω
			246°/18°E	20°	$\{10\bar{1}3\}$
			246°/17°E	20°	
			246°/20°E	21°	
			246°/21°E	21°	
	5c		243°/25°E	30°	32°; π
			243°/29°E	32°	$\{10\bar{1}2\}$
			243°/32°E	35°	
			243°/30°E	30°	
	6a	234°, H, E-W	126°/9°E	73°	74°; **{** $2\bar{1}\bar{3}1\}$
			126°/3°E	72°	
			126°/4°E	73°	
			126°/8°E	73°	
			126°/12°E	74°	
	6b		AT C-AXIS	0°	0°; c (0001)
	7	176°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	8	115°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	9	155°, H, E-W	130°/11°E	29°	32°; π
			130°/14°E	30°	$\{10\bar{1}2\}$
			130°/10°E	28°	
			130°/18°E	31°	
			130°/16°E	30°	
			130°/20°E	32°	
KR7-75/ 430.28	1	246°, H, E-W	223°/1°W	22°	23°; ω
			223°/10°W	24°	$\{10\bar{1}3\}$
			223°/18°W	30°	
			223°/4°W	23°	
			223°/5°W	23°	
			223°/0°W	22°	
	2a	074°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	2b		111°/16°W	42°	Not indexed
			111°/9°W	42°	
			111°/15°W	42°	
			111°/14°W	42°	
	2c		054°/13°W	23°	23°; ω
			054°/11°W	22°	$\{10\bar{1}3\}$
			054°/18°W	28°	
			054°/16°W	26°	
			054°/12°W	23°	
	3	040°, H, E-W	024°/14°E	22°	23°; ω
			024°/12°E	20°	$\{10\bar{1}3\}$
			024°/5°E	16°	
			024°/7°E	17°	
			024°/10°E	18°	
	4	277°, H, E-W	334°/23°W	62°	66°; s $\{11\bar{2}1\}$
			334°/29°W	64°	
			334°/25°W	62°	
			334°/28°W	64°	
			334°/30°W	64°	
	5	111°, H, E-W	036°/3°E	76°	77°; $\{22\bar{4}1\}$
			036°/11°W	76°	
			036°/12°E	76°	
			036°/4°E	76°	
			036°/10°E	76°	
	6	179°, H, E-W	260°/9°E	82°	82°; x **{** $5\bar{1}61$ **}**

			260°/6°E	82°	
			260°/7°E	82°	
			260º/5°E	82°	
KR7-76/ 441.60	1	118°, H, E-W	244°/20°E	56°	52°; r $\{10\bar{1}1\}$
			244°/12°E	56°	
			244°/14°E	56°	
			244°/10°E	54°	
			244°/8°E	54°	
	2	270°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	3	183°, H, E-W	299°/14°E	32°	32°; π
			299°/23°E	36°	$\{10\bar{1}2\}$
			299°/15°E	33°	
			299°/16°E	33°	
			299°/11°E	32°	
	4	033°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	5	306, H, E-W	054°/8°E	72°	74°; $\{2\bar{1}3\bar{1}\}$
			054°/13°E	72°	
			054°/9°E	72°	
KR7-27/ 468.28	1a	089°, H, E-W	065°/4°W	26°	32°; π
			065°/12°E	30°	$\{10\bar{1}2\}$
			065°/12°W	27°	
			065°/13°W	27°	
			065°/4°E	26°	
			065°/2°W	26°	
			065°/14°W	30°	
			065°/15°W	30°	
			065°/16°W	30°	
			065°/20°W	32°	
	1b		061°/0°W	28°	32°; π
			061°/6°W	30°	$\{10\bar{1}2\}$
			061°/7°W	30°	
			061°/12°W	30°	
			061°/14°W	32°	
	2	129°, H, E-W	265°/5°E	42°	Not indexed
			265°/3°E	42°	
			265°/5°W	42°	
			265°/3°E	42°	
			265°/2°E	42°	
	3	223°, H, E-W	198°/3°W	26°	23°; ω
			198°/3°E	23°	$\{10\bar{1}3\}$
			198°/4°W	23°	
			198°/1°W	23°	
			198°/6°W	23°	
			198°/8°W	23°	
	4	149°, H, E-W	073°/5°E	76°	77°; $\{22\bar{4}1\}$
			073°/10°E	76°	
			073°/1°E	78°	
			073°/3°E	78°	
			073°/8°E	76°	
	5	220°, H, E-W	195°/9°W	24°	23°; ω
			195°/4°W	25°	$\{10\bar{1}3\}$
			195°/2°W	24°	
			195°/1°E	24°	
			195°/5°W	22°	
	6	187°, H, E-W	290°/3°W	78°	77°; $\{22\bar{4}1\}$
			290°/2°E	77°	
			290°/6°E	77°	
			290°/1°W	80°	
			290°/6°W	78°	

Table 3. Upper impactites

Sample #/ Depth (m)	Grain #	C-axis Orientation	PDF Measurement	Polar Angle	Symbol & Miller Index
KR7-1/ 334.91	1	201°, H, E-W	357°/3°W	34°	32°; π $\{10\bar{1}2\}$
			357°/1°W	33°	
			357°/0°W	33°	
			357°/4°W	34°	
			357°/2°W	33°	
	2a	194°, H, E-W	215°/2°E	23°	23°; ω $\{10\bar{1}3\}$
			215°/2°W	22°	
			215°/1°W	22°	
			215°/3°W	23°	
			215°/0°W	22°	
	2b		176°/4°E	21°	23°; ω $\{10\bar{1}3\}$
			176°/1°E	20°	
			176°/0°E	20°	
			176°/3°E	20°	
	3	069°, H, E-W	AT C-AXIS	0°	0°; **c** (0001)
	4	242°, H, E-W	262°/1°E	20°	23°; ω $\{10\bar{1}3\}$
			262°/4°E	20°	
			262°/6°E	21°	
			262°/7°E	22°	
			262°/8°E	22°	
	5	224°, H, E-W	241°/9°E	19°	23°; ω $\{10\bar{1}3\}$
			241°/6°E	20°	
			241°/5°E	19°	
			241°/10°E	23°	
			241°/4°E	19°	
	6	229°, H, E-W	259°/4°E	30°	32°; π $\{10\bar{1}2\}$
			259°/0°E	30°	
			259°/5°E	31°	
			259°/8°E	32°	
			259°/10°E	32°	
	7	081°, H, E-W	353°/1°E	76°	77°; $\{22\bar{4}1\}$
			353°/0°E	76°	
			353°/4°E	76°	
			353°/5°E	76°	
			353°/2°E	76°	
	8	109°, H, E-W	068°/4°E	40°	Not indexed
			068°11°E	41°	
			068°/8°E	40°	
			068°/6°E	40°	
KR7-59/ 347.16	1	229°, H, E-W	193°/1°W	36°	32°; π $\{10\bar{1}2\}$
			193°/2°W	36°	
			193°/0°W	36°	
			193°/14°W	40°	
			193°/4°W	36°	
			193°/9°W	36°	
	2	210°, H, E-W	233°/5°E	22°	23°; ω $\{10\bar{1}3\}$
			233°/11°E	23°	
			233°/6°E	22°	
			233°/7°E	22°	
			233°/12°E	23°	
	3	286°, H, E-W	235°/4°W	52°	52°; r $\{10\bar{1}1\}$
			235°/5°W	52°	
			235°/3°W	52°	
			235°/7°W	52°	
	4	216°, H, E-W	200°/8°W	20°	23°; ω $\{10\bar{1}3\}$
			200°/0°W	18°	
			200°/7°W	20°	
			200°/6°W	20°	
			200°/10°W	22°	

	5	085°, H, E-W	105°/5°W	22°	23°; ω {10$\bar{1}$3}
			105°/0°W	20°	
			105°/1°W	20°	
			105°/10°W	23°	
			105°/8°E	22°	
KR7-35/ 359.33	1	251°, H, E-W	201°/2°W	48°	48°; ξ {11$\bar{2}$2}
			201°/5°W	49°	
			201°/6°W	49°	
			201°/1°W	48°	
	2	241°, H, E-W	306°/4°E	66°	66°; s {11$\bar{2}$1}
			306°/11°E	66°	
			306°/7°E	66°	
			306°/8°E	67°	
	3	301°, H, E-W	248°/7°W	54°	52°; r {10$\bar{1}$1}
			248°/10°W	55°	
			248°/3°W	54°	
			248°/14°W	54°	
	4	299°, H, E-W	279°/0°W	21°	23°; ω {10$\bar{1}$3}
			279°/4°W	22°	
			279°/5°W	23°	
			279°/6°W	23°	
	5	340°, H, E-W	245°/6°W	84°	82°; x **{**51$\bar{6}$1**}**
			245°/7°W	85°	
			245°/5°W	84°	
			245°/1°W	84°	
	6	338°, H, E-W	003°/5°W	26°	23°; ω {10$\bar{1}$3}
			003°/9°W	26°	
			003°/2°W	24°	
			003°/1°W	24°	
	7	246°, H, E-W	028°/5°W	28°	32°; π {10$\bar{1}$2}
			028°/7°W	28°	
			028°/2°W	28°	
			028°/10°W	30°	
			028°/12°W	30°	
KR7-8/ 370.34	1	332°, H, E-W	038°/3°E	67°	66°; s {11$\bar{2}$1}
			038°/2°E	67°	
			038°/0°E	66°	
			076°/1°E	66°	
	2a	033°, H, E-W	011°/13°W	26°	23°; ω {10$\bar{1}$3}
			011°/14°W	26°	
			011°/7°W	22°	
			011°/8°W	24°	
			011°/6°W	22°	
	2b		058°/5°W	29°	32°; π {10$\bar{1}$2}
			058°/3°W	28°	
			058°/2°W	28°	
			058°/8°W	29°	
	3	304°, H, E-W	194°/2°W	70°	66°; s {11$\bar{2}$1}
			194°/1°W	69°	
			194°/3°W	70°	
			194°/4°E	69°	
			194°/6°W	70°	
	4	083°, H, E-W	123°/1°W	40°	Not Indexed
			123°/2°W	40°	
			123°/3°W	40°	
			123°/10°E	40°	
			123°/5°E	40°	
			123°/3°E	40°	
	5	081°, H, E-W	129°/8°W	50°	52°; r {10$\bar{1}$1}
			129°/9°W	50°	
			129°/12°W	52°	
			129°/13°W	52°	

			129°/14°W	52°	
KR7-13/ 393.78	1	227°, H, E-W	252°/6°W	26°	32°; π {10$\bar{1}$2}
			252°/12°W	28°	
			252°/11°W	26°	
			252°/18°W	32°	
			252°/16°W	30°	
	2	127°, H, E-W	148°/0°E	23°	23°; ω {10$\bar{1}$3}
			148°/5°E	23°	
			148°/10°E	23°	
	3	248°, H, E-W	168°/5°W	68°	66°; s {11$\bar{2}$1}
			168°/9°W	69°	
			168°/0°W	68°	
			168°/4°W	68°	
	4	071°, H, E-W	084°/0°W	24°	23°; ω {10$\bar{1}$3}
			084°/2°W	24°	
			084°/3°W	24°	
			084°/7°W	26°	
	5	172°, H, E-W	136°/2°W	36°	32°; π {10$\bar{1}$2}
			136°/1°W	36°	
			136°/0°W	36°	
			136°/3°E	34°	
	6a	092°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	6b		346°/18°E	74°	77°; {22$\bar{4}$1}
			346°/25°E	76°	
			346°/17°E	75°	
			346°/22°E	77°	
			346°/18°E	74°	
	7	157°, H, E-W	136°/8°W	22°	23°; ω {10$\bar{1}$3}
			136°/1°W	20°	
			136°/13°W	24°	
KR7-14/ 398.44	1	299°, H, E-W	321°/10°W	26°	23°; ω {10$\bar{1}$3}
			321°/9°W	26°	
			321°/3°W	24°	
			321°/4°W	24°	
	2	283°, H, E-W	248°/8°W	36°	32°; π {10$\bar{1}$2}
			248°/4°W	34°	
			248°/1°W	33°	
			248°/0°W	33°	
			248°/6°W	34°	
	3	188°, H, E-W	211°/0°W	23°	23°; ω {10$\bar{1}$3}
			211°/2°W	23°	
			211°/4°W	24°	
			211°/8°W	25°	
	4	132°, H, E-W	117°/5°E	16°	23°; ω {10$\bar{1}$3}
			117°/4°E	16°	
			117°/30°E	25°	
			117°/25°E	22°	
			117°/10°E	18°	
	5	104°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	6	303°, H, E-W	345°/9°W	44°	48°; ξ {11$\bar{2}$2}
			345°/6°W	42°	
			345°/7°W	43°	
			345°/11°W	44°	
			345°/12°W	45°	
			345°/8°W	44°	
	7	132°, H, E-W	058°/0°W	76°	77°; {22$\bar{4}$1}
			058°/1°W	76°	
			058°/2°W	76°	
			058°/4°W	77°	
KR7-40/ 400.06	1	180°, H, E-W	255°/0°E	70°	74°; {21$\bar{3}$1}
			255°/6°W	72°	
			255°/3°W	70°	

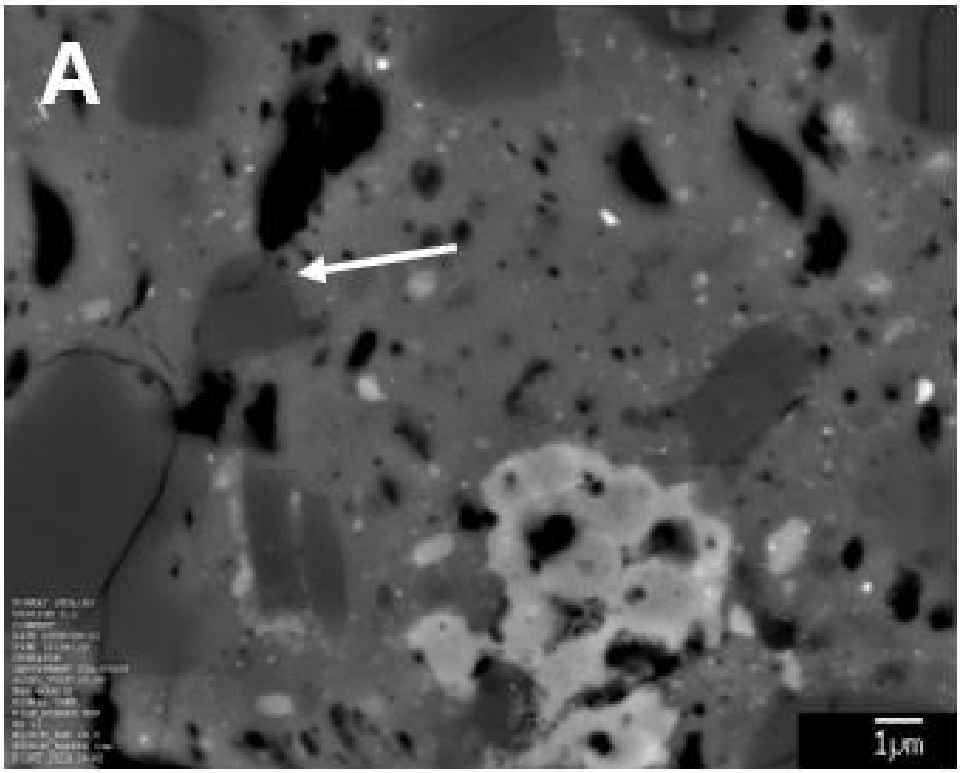
			255°/5°W	72°	
			255°/4°W	72°	
	2	189°, H, E-W	226°/0°E	36°	32°; π {10$\bar{1}$2}
			226°/9°W	30°	
			226°/5°E	36°	
			226°/7°E	36°	
			226°/8°E	36°	
	3a	226°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	3b		294°/0°E	68°	66°; s {11$\bar{2}$1}
			294°/10°E	70°	
			294°/1°E	69°	
			294°/3°E	70°	
	4	153°, H, E-W	173°/0°E	20°	23°; ω {10$\bar{1}$3}
			173°/9°W	22°	
			173°/11°E	23°	
			173°/10°E	23°	
			173°/14°E	25°	
	5	223°, H, E-W	AT C-AXIS	0°	0°; c (0001)
	6	317°, H, E-W	295°/0°W	22°	23°; ω {10$\bar{1}$3}
			295°/4°W	23°	
			295°/6°W	23°	
			295°/10°W	24°	
	7	350°, H, E-W	288°/9°W	62°	66°; s {11$\bar{2}$1}
			288°/10°W	64°	
			288°/1°E	62°	
			288°/6°W	62°	
KR7-41/ 408.72	1	209°, H, E-W	194°/7°W	18°	23°; ω {10$\bar{1}$3}
			194°/6°W	17°	
			194°/10°W	20°	
			194°/14°W	22°	
	2	199°, H, E-W	121°/3°W	76°	77°; {22$\bar{4}$1}
			121°/13°W	76°	
			121°/11°W	76°	
			121°/12°W	76°	
	3	160°, H, E-W	179°/4°W	21°	23°; ω {10$\bar{1}$3}
			179°/5°W	21°	
			179°/6°W	21°	
	4	168°, H, E-W	152°/15°E	23°	23°; ω {10$\bar{1}$3}
			152°/11°E	21°	
			152°/5°E	18°	
			152°/9°E	20°	
	5	083°, H, E-W	109°/6°E	25°	23°; ω {10$\bar{1}$3}
			109°/4°E	24°	
			109°/7°E	25°	

**Polar angle is defined as the angle between the pole to PDF plane and quartz c-axis.*

Appendix 5b: Selected SEM (backscattered electron) imagery of melt particles obtained in this study for the within-crater suevites.

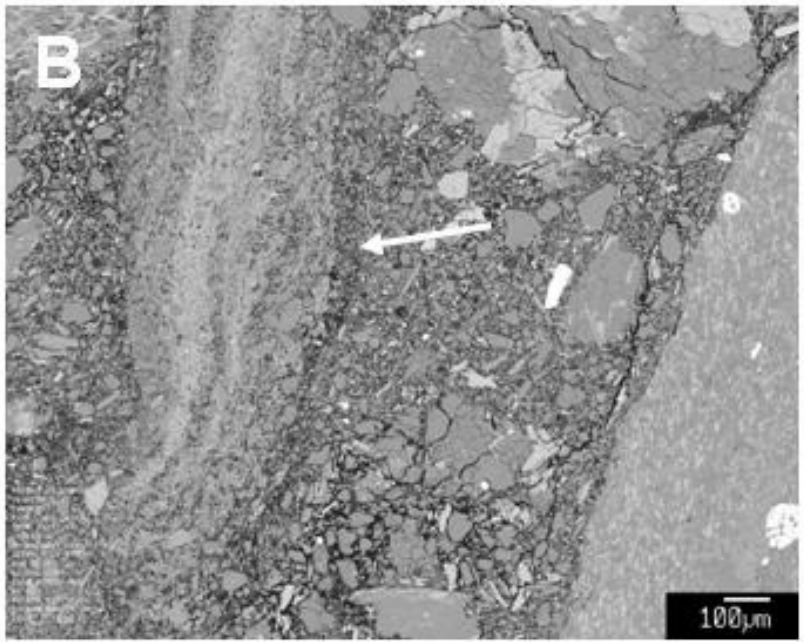
Backscattered electron images. The lightest fragments correspond to rutile, the grey fragments correspond to quartz (moderately grey indicates silica-rich lithologies), with darker grey indicating the mixed matrix, black indicates cracks in the thin section.

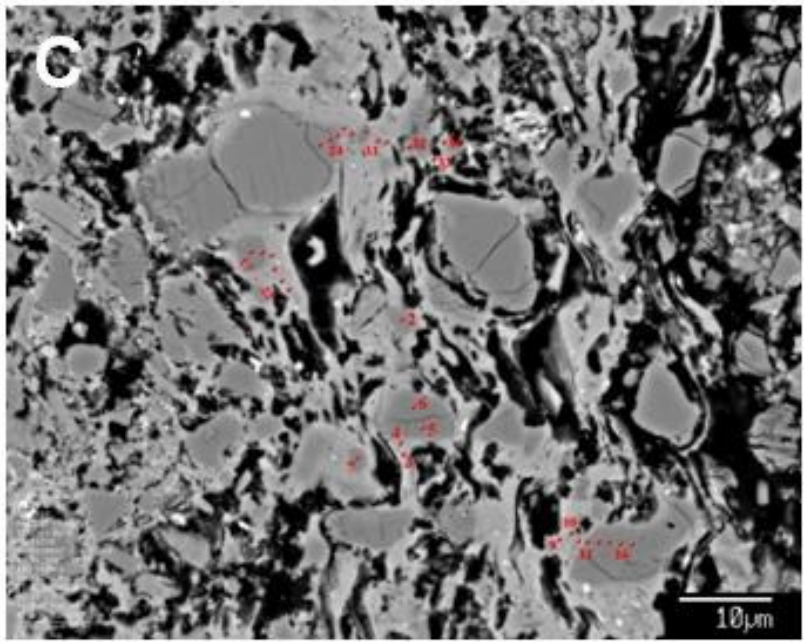
Sample KR7-35, suevite, upper impactites: sample depth = 359.33 m.



A) Part of a melt particle, with quartz clasts (indicated by arrow), vesicles (black) and an opaque phase; width of scale bar = 1 µm. Continued on next page.

Sample KR7-35, suevite, upper impactites: sample depth = 359.33 m.





B) Vesiculated melt particle (variable colour; indicated by arrow), in clastic matrix, with flow structures; width of scale bar = 100 µm.
C) Points analysed under EMPA of melt in a particle; width of scale bar = 10 µm.

Sample KR7-6, suevite, upper impactites: sample depth = 360.65 m.

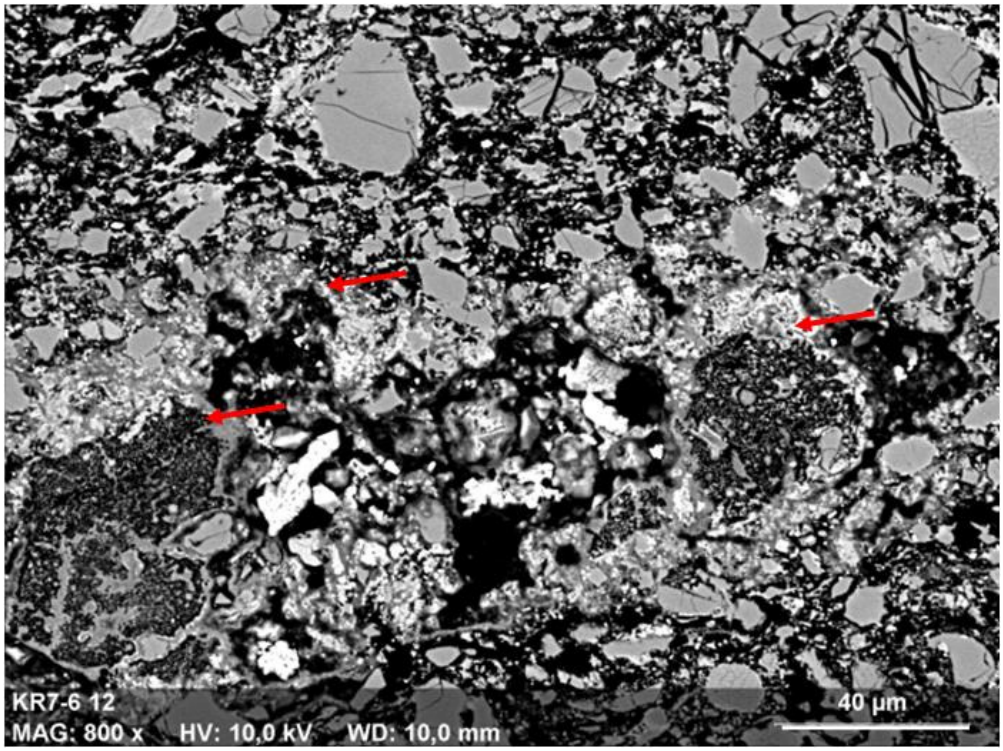
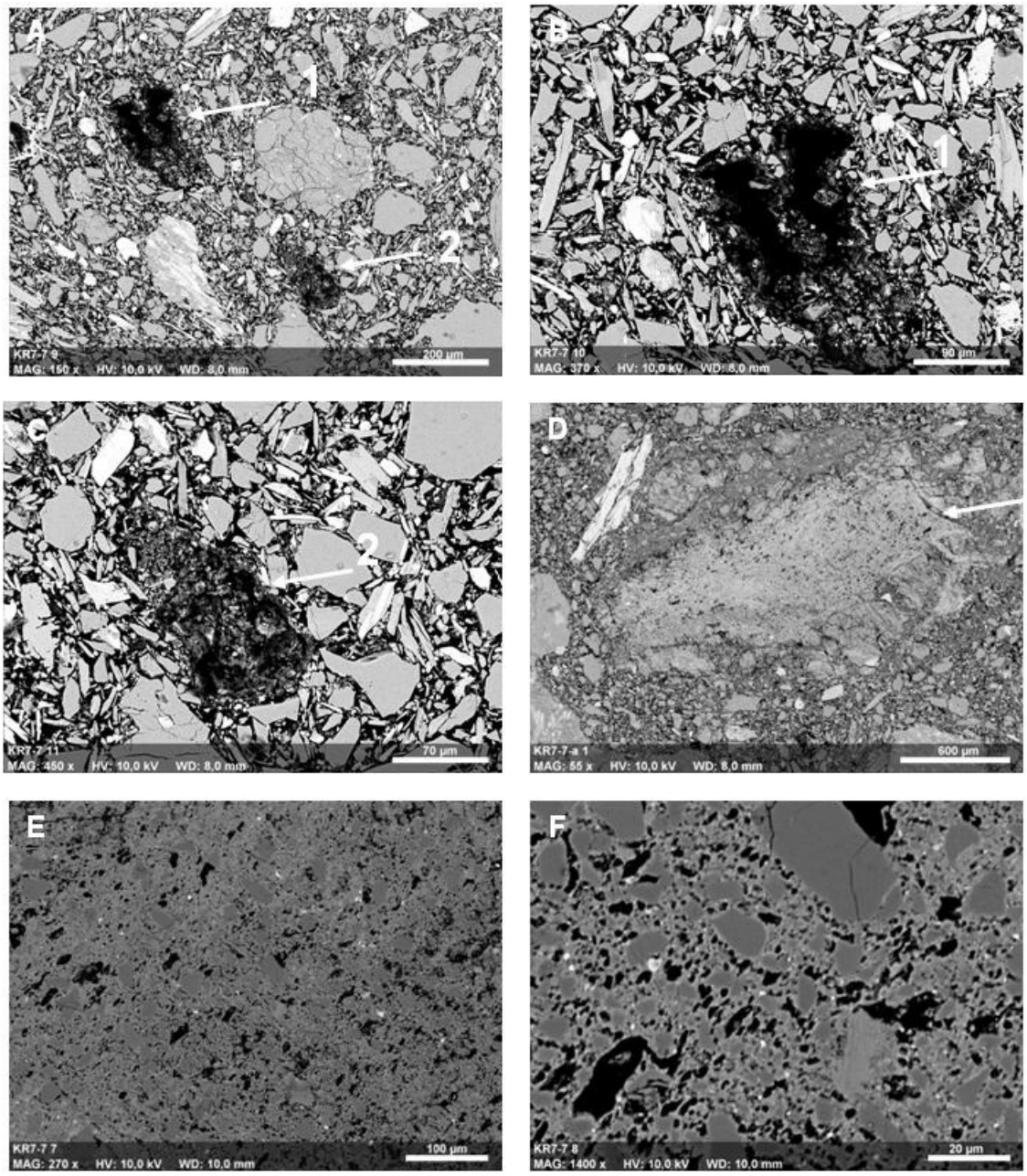


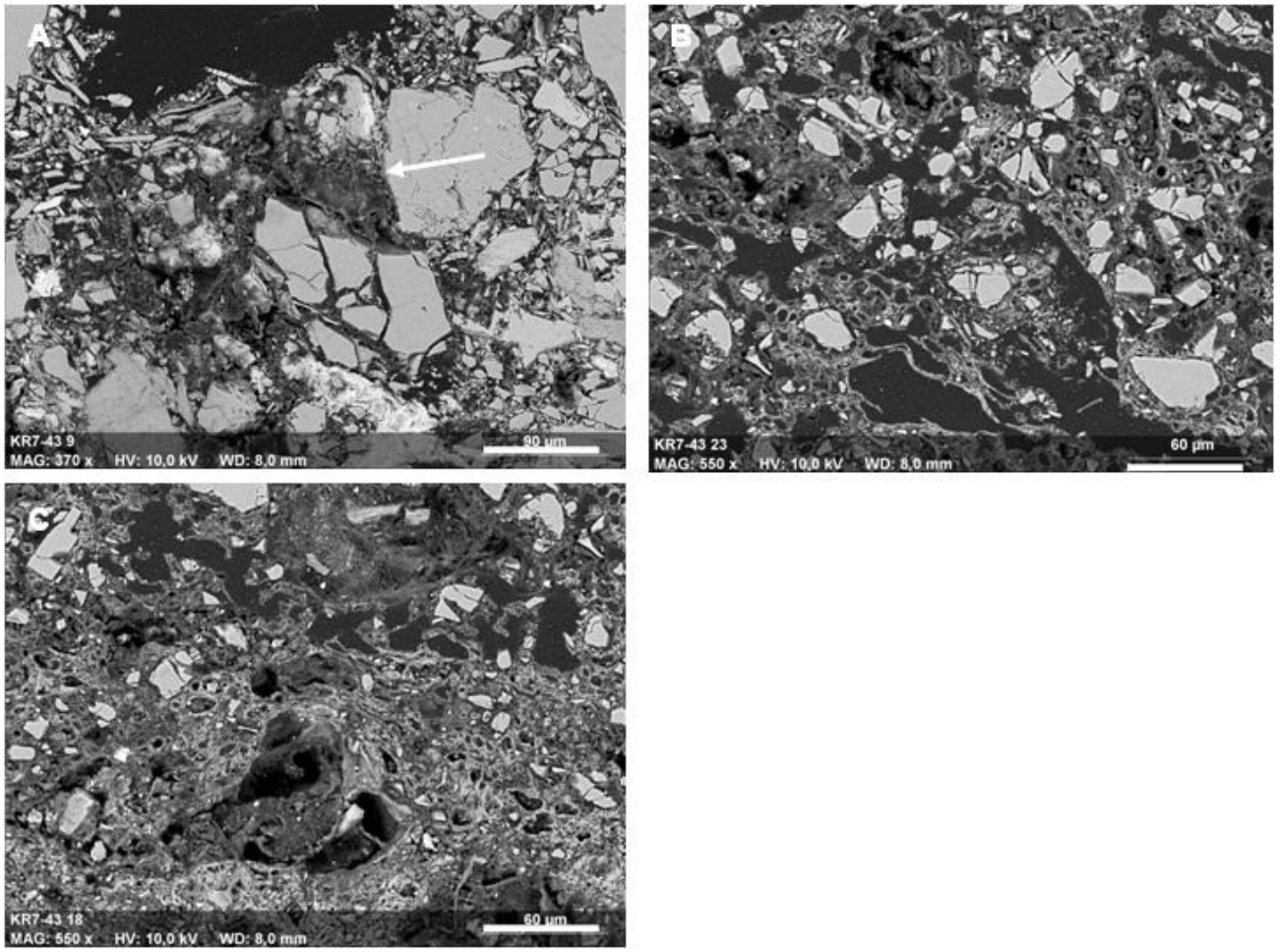
Image consists of discrete mafic melt particles (indicated with red arrows) in a clastic matrix of mostly quartz. The clasts in the matrix are highly variable in size, and most clasts are sub-rounded. Width of scale bar = 40 µm.

Sample KR7-7, suevite, upper impactites: sample depth = 363.20 m.



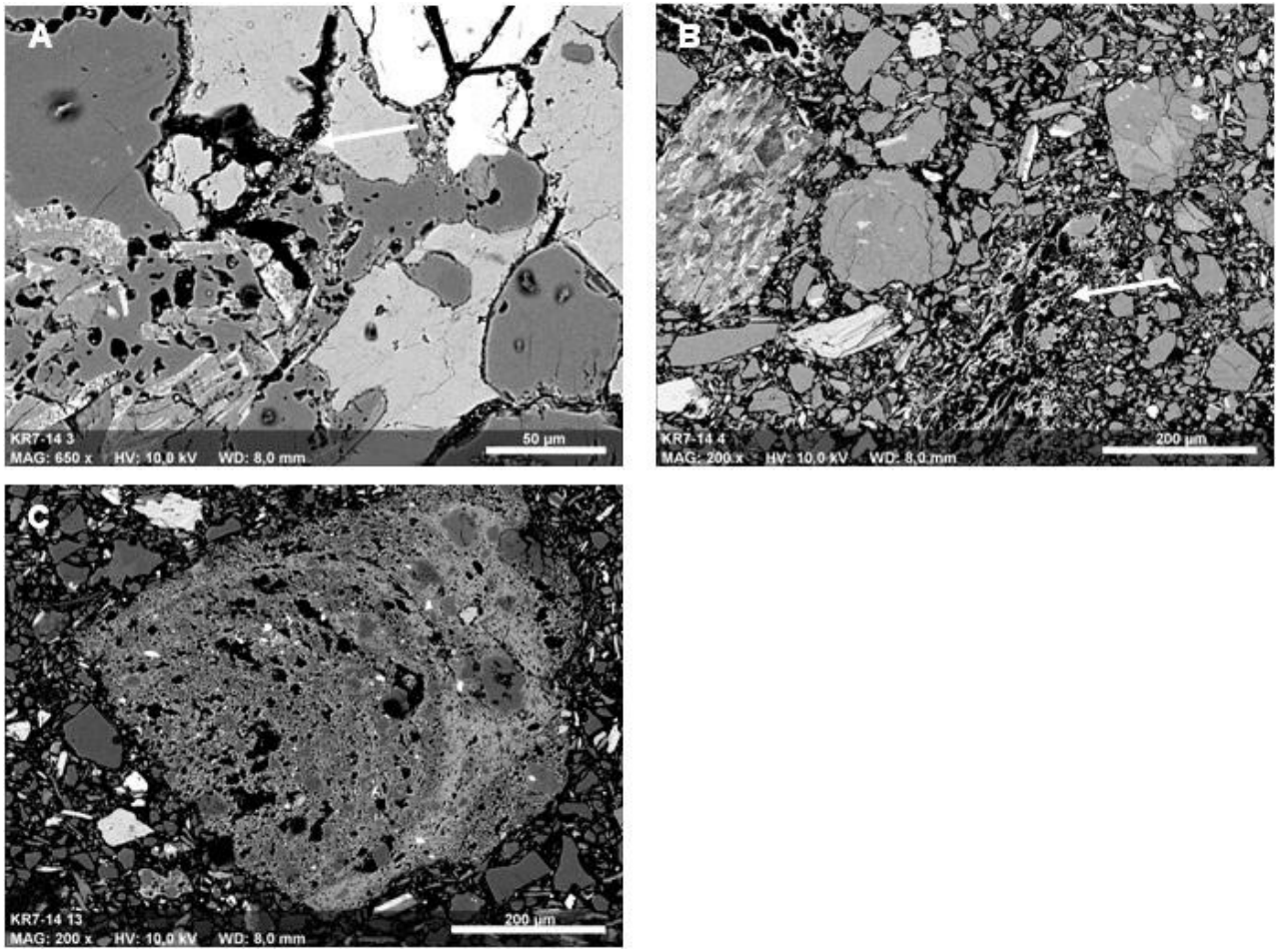
A) Two discrete melt particles (1 and 2; indicated by arrows), in clastic matrix; width of scale bar = 200 µm. B) Enlarged image of melt particle 1 (indicated by arrow). The melt is highly vesiculated on the edges, and the centre of the particle has been removed by grinding in making the thin-section; width of scale bar = 90 µm. C) Enlarged image of melt particle 2 (indicated by arrow). The particle is highly heterogeneous in composition; width of scale bar = 70 µm. D) Mafic melt particle with flow texture; width of scale bar = 600 µm. E) Enlarged area from D) - quartz inclusions are evident; width of scale bar = 100 µm. F) Enlarged area from E); width of scale bar = 20 µm.

Sample KR7-43, suevite, upper impactites: sample depth = 384.84 m.



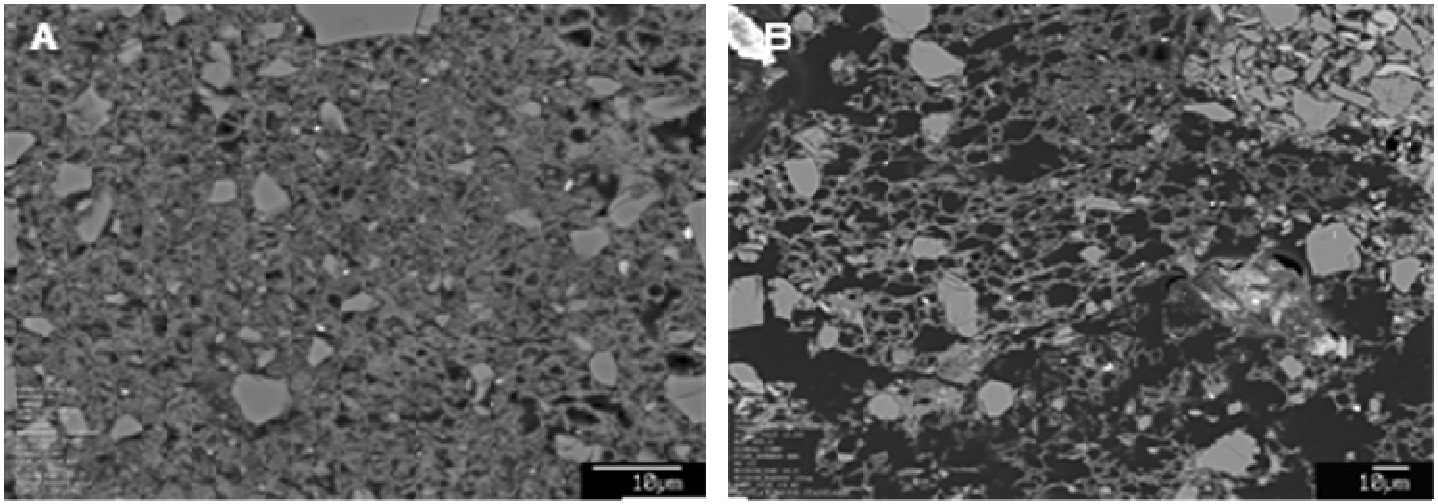
A) – C) Melt particles which display much vesiculation and flow textures. The matrices of the suevites consist of sub-rounded to angular fragments of target rock lithologies and minerals, of variable size (maximum 250 µm size). A) Width of scale bar = 90 µm. B) Entire image consists of part of a single melt particle with distinctive quartz clasts which are sub-rounded in shape and partially fractured; width of scale bar = 60 µm. C) Most of image consists of melt, which displays distinctive flow structures around the clasts. Width of scale bar = 60 µm.

Sample KR7-14, suevite, upper impactites: sample depth = 398.44 m.



A) - C) Melt particles with well-developed vesicles, of variable composition and flow texture (indicated by arrows). The melt particles are sub-rounded to highly irregular. The matrices of the suevites consist of sub-rounded to angular fragments of target rock lithologies and minerals, of variable size (maximum 250 µm size). A) Melt particle located at the boundary of a number of clastic clasts; width of scale bar = 50 µm. B) Highly vesiculated melt particle in clastic matrix; width of scale bar = 200 µm. C) Large ovoid melt particle with flow banding of different composition; width of scale bar = 200 µm.

Sample KR7-23, suevite, lower impactites: sample depth = 430.13 m.



A) and B) Entire image consists of part of a single melt particle (> 1 cm in size) with distinctive quartz clasts; width of scale bar = 10 µm.

Appendix 5c: X-Ray Diffraction Results for samples from the LB-07A core.

Diffractometer type: PW1710 BASED
Tube anode: Cu
Generator tension (kV): 40
Generator current (mA): 20
Wavelength Alpha 1 (α1; Å): 1.54056
Wavelength Alpha 2 (α2; Å): 1.54439
Intensity ratio (α2/ α1): 0.500
Divergence slit: 1°
Receiving slit: 0.1
Monochromator used: Yes

Start Angle (°2θ): 3.0
End Angle (°2θ): 70.0
Step Size (°2θ): 0.02
Maximum intensity: 1095.610
Time per step (s): 1
Type of scan: Continuous

Peak positions defined by top of smoothed peak
Minimum peak tip width: 0.01
Maximum peak tip width: 1.00
Peak base width: 2.00
Minimum significance: 0.75

Sample KR7-67: Suevite, Upper Impactites. Sample depth = 382.94 m
Number of peaks: 46

Angle (^{o}2θ)	d-value (α1; Å)	d-value (α2; Å)	Peak width (^{o}2θ)	Peak intensity (counts)	Back intensity (counts)	Relative intensity (%)	Significance
6.410	13.7775	13.8117	0.080	42	23	5.9	1.24
9.020	9.7959	9.8202	0.080	102	14	14.2	1.66
11.395	7.7590	7.7782	0.240	4	8	0.6	0.76
12.665	6.9836	7.0010	0.140	210	8	29.3	6.35
14.005	6.3183	6.3340	0.120	15	8	2.1	1.05
15.010	5.8974	5.9121	0.080	12	7	1.6	0.76
17.915	4.9472	4.9594	0.160	35	7	4.8	1.79
18.945	4.6804	4.6921	0.120	86	7	12.0	2.27
20.040	4.4271	4.4381	0.200	32	7	4.5	1.49
21.005	4.2258	4.2363	0.080	117	8	16.2	1.25
22.195	4.0019	4.0118	0.080	50	8	7.0	1.60
23.135	3.8414	3.8509	0.240	22	8	3.1	2.42
23.705	3.7503	3.7596	0.160	36	8	5.0	1.29
24.405	3.6443	3.6533	0.160	45	8	6.2	1.08
25.335	3.5126	3.5213	0.140	149	8	20.7	3.96
26.795	3.3244	3.3327	0.120	718	8	100.0	8.60
28.055	3.1779	3.1858	0.060	161	8	22.5	1.01
30.060	2.9703	2.9777	0.160	41	8	5.7	0.92
31.025	2.8801	2.8873	0.080	64	8	8.9	0.96
31.400	2.8466	2.8536	0.120	31	8	4.4	1.08
31.790	2.8125	2.8125	0.240	24	8	3.3	1.62
32.210	2.7768	2.7768	0.120	16	8	2.2	0.91
34.705	2.5827	2.58.91	0.240	25	8	3.5	1.45
35.195	2.5478	2.5542	0.200	49	8	6.8	1.83
36.730	2.4448	2.4509	0.160	59	8	8.3	1.67
37.775	2.3795	2.3854	0.480	19	8	2.7	2.00
39.640	2.2718	2.774	0.160	27	8	3.8	0.98
40.440	2.2287	2.2342	0.120	23	8	3.2	1.19
41.265	2.1860	2.1914	0.400	14	8	2.0	1.36
42.625	2.1193	2.1246	0.160	44	8	6.1	1.48
44.090	2.0523	2.0574	0.100	10	8	1.3	0.78
45.575	1.9888	1.9937	0.200	36	8	5.0	1.52
45.940	1.9738	1.9787	0.120	34	8	4.7	1.52
48.300	1.8827	1.8874	0.400	10	8	1.3	1.25
50.265	1.8137	1.8182	0.080	64	8	8.9	1.57
51.285	1.7799	1.7844	0.240	11	8	1.5	0.75
53.055	1.7247	1.7289	0.960	4	8	0.6	0.82
55.010	1.6679	1.6720	0.160	23	9	3.2	2.28
59.125	1.5613	1.5651	0.400	14	10	1.9	1.30
60.100	1.5382	1.5421	0.240	52	9	7.2	3.33
61.820	1.4995	1.5032	0.480	7	8	1.0	1.09
64.170	1.4501	1.4537	0.060	18	9	2.5	0.76
66.080	1.4128	1.4163	0.480	5	10	0.7	0.94
67.880	1.3796	1.3831	0.160	23	10	3.2	0.78
68.235	1.3733	1.3767	0.060	108	10	15.1	1.13
68.425	1.3700	1.3734	0.080	88	10	12.3	1.20

Sample KR7-23: Suevite, Lower Impactites. Sample depth = 430.13 m
Number of peaks: 56

Angle (^{o}2θ)	d-value (α1; Å)	d-value (α2; Å)	Peak width (^{o}2θ)	Peak intensity (counts)	Back intensity (counts)	Relative intensity (%)	Significance
3.240	27.2467	27.3145	0.640	12	30	1.1	0.84
6.355	13.8966	13.9311	0.200	41	23	3.7	1.97
9.015	9.8013	9.8257	0.080	79	14	7.2	1.62
12.660	6.9864	7.0037	0.100	204	7	18.7	3.50

13.970	6.3341	6.3498	0.160	19	6	1.8	0.93
17.910	4.9485	4.9608	0.140	32	5	3.0	2.10
18.960	4.6768	4.6884	0.100	64	6	5.8	1.73
20.015	4.4326	4.4436	0.200	34	6	3.1	1.62
21.000	4.2268	4.2373	0.100	237	6	21.6	3.83
22.170	4.0063	4.0163	0.080	85	6	7.7	1.01
23.175	3.8348	3.8444	0.120	25	6	2.3	1.11
23.675	3.7550	3.7643	0.080	41	6	3.7	1.69
24.410	3.6435	3.6526	0.080	58	6	5.3	0.88
25.340	3.5119	3.5206	0.120	177	6	16.1	4.15
25.605	3.4761	3.4848	0.160	41	6	3.7	0.80
26.780	3.3262	3.3345	0.140	1096	6	100.0	16.50
27.855	3.2003	3.2082	0.060	94	6	8.6	0.97
28.055	3.1779	3.1858	0.140	296	6	27.0	6.07
29.620	3.0134	3.0209	0.080	161	6	14.7	2.10
30.130	2.9636	2.9710	0.240	30	6	2.8	2.20
30.635	2.9159	2.9231	0.100	50	6	4.6	1.63
31.400	2.8466	2.8536	0.120	42	6	3.9	1.77
31.735	2.8173	2.8243	0.640	16	6	1.5	0.86
32.240	2.7743	2.7812	0.100	21	6	1.9	1.01
35.180	2.5489	2.5552	0.200	79	6	7.2	3.49
36.130	2.4840	2.4902	0.240	18	6	1.7	0.76
36.680	2.4480	2.4541	0.060	106	6	9.7	1.92
37.785	2.3789	2.3848	0.320	28	7	2.6	1.30
38.965	2.3096	2.3153	0.120	18	7	1.6	1.28
39.605	2.2737	2.2793	0.060	96	7	8.8	0.82
40.415	2.2300	2.2355	0.080	59	7	5.4	0.79
41.395	2.1794	2.1848	0.240	10	7	0.9	1.28
42.585	2.1212	2.1265	0.060	83	7	7.6	2.66
42.685	2.1165	2.1218	0.060	64	7	5.8	0.88
43.585	2.0749	2.0800	0.480	7	7	0.6	0.82
45.590	1.9882	1.9931	0.120	45	7	4.1	1.63
45.915	1.9748	1.9797	0.080	50	7	4.6	1.11
48.280	1.8835	1.8882	0.200	20	7	1.8	1.09
50.260	1.8138	1.8183	0.080	135	7	12.3	1.70
50.415	1.8086	1.8131	0.060	83	7	7.6	2.58
51.280	1.7801	1.7845	0.160	15	7	1.4	0.91
53.375	1.7151	1.7193	0.320	10	7	0.9	0.85
54.980	1.6687	1.6729	0.120	31	7	2.9	1.72
56.035	1.6398	1.6439	0.240	12	7	1.1	1.84
57.830	1.5931	1.5971	0.080	59	8	5.4	1.86
57.990	1.5891	1.5930	0.060	35	8	3.2	1.71
59.085	1.5622	1.5661	0.320	12	8	1.1	1.82
60.065	1.5391	1.5429	0.100	79	8	7.2	1.90
60.235	1.5351	1.5389	0.060	53	8	4.9	1.04
61.905	1.4976	1.5014	0.320	14	8	1.2	0.90
64.120	1.4512	1.4548	0.320	14	8	1.3	1.07
66.185	1.4108	1.4143	0.480	8	8	0.7	1.48
67.280	1.3905	1.3939	0.320	9	9	0.8	1.12
67.855	1.3801	1.3835	0.080	37	10	3.4	0.79
68.265	1.3728	1.3762	0.060	74	10	6.8	2.26
68.440	1.3697	1.3731	0.080	58	10	5.3	1.75

Sample KR7-81: Suevite, Basement Metasediments. Sample depth = 483.00 m
Number of peaks: 51

Angle (^{o}2θ)	d-value (α1; Å)	d-value (α2; Å)	Peak width (^{o}2θ)	Peak intensity (counts)	Back intensity (counts)	Relative intensity (%)	Significance
6.305	14.0067	14.0415	0.100	42	22	3.7	0.77
8.940	9.8834	9.9079	0.080	66	14	5.7	1.55
12.590	7.0251	7.0425	0.120	156	8	13.6	3.88

13.925	6.3544	6.3702	0.240	12	8	1.0	2.60
17.840	4.9678	4.9801	0.160	32	7	2.8	1.90
18.910	4.6890	4.7007	0.080	52	7	4.5	1.11
19.915	4.4546	4.4657	0.280	44	7	3.8	4.30
20.920	4.2428	4.2534	0.140	182	7	15.9	6.88
22.125	4.0144	4.0244	0.160	64	7	5.6	2.54
23.055	3.8545	3.8641	0.280	24	6	2.1	2.86
23.605	3.7659	3.7753	0.100	52	6	4.5	1.18
24.365	3.6502	3.6592	0.100	45	6	3.9	1.33
25.280	3.5201	3.5288	0.140	114	6	10.0	4.51
25.595	3.4775	3.4861	0.120	41	6	3.6	1.98
26.710	3.3348	3.3431	0.140	1149	6	100.0	16.51
27.990	3.1851	3.1930	0.140	188	6	16.3	4.55
30.590	2.9201	2.9273	0.120	24	6	2.1	1.41
30.915	2.8901	2.8973	0.120	25	6	2.2	1.28
31.330	2.8528	2.8599	0.160	30	6	2.6	1.21
31.710	2.8194	2.8264	0.120	24	6	2.1	1.17
32.165	2.7806	2.7875	0.160	19	6	1.7	1.03
34.630	2.5881	2.5945	0.240	23	6	2.0	1.08
35.085	2.5556	2.5619	0.240	71	6	6.1	4.62
36.620	2.4519	2.4580	0.140	94	6	8.2	2.19
37.705	2.3838	2.3897	0.480	24	6	2.1	3.26
38.875	2.3147	2.3204	0.200	12	6	1.0	1.20
39.520	2.2784	2.2841	0.100	64	6	5.6	1.16
40.355	2.2332	2.2387	0.060	44	6	3.8	0.80
41.185	2.1900	2.1955	0.320	10	6	0.8	1.60
42.550	2.1229	2.1282	0.180	67	6	5.9	3.59
45.535	1.9904	1.9954	0.160	37	6	3.2	1.45
45.845	1.9777	1.9826	0.160	46	6	4.0	2.29
48.220	1.8857	1.8904	0.320	14	6	1.3	1.68
49.270	1.8479	1.8525	0.160	11	7	0.9	0.75
50.215	1.8153	1.8198	0.080	135	7	11.7	1.17
50.350	1.8108	1.8153	0.040	72	7	6.3	1.13
51.180	1.7834	1.7878	0.280	13	7	1.1	2.52
53.335	1.7163	1.7205	0.240	12	7	1.1	1.77
54.925	1.6703	1.6744	0.080	30	8	2.6	1.21
55.385	1.6575	1.6616	0.160	26	8	2.3	1.18
58.890	1.5669	1.5708	0.240	9	8	0.8	0.98
59.985	1.5409	1.5447	0.080	85	8	7.4	1.38
61.840	1.4991	1.5028	0.480	19	8	1.7	2.57
64.080	1.4520	1.4556	0.060	25	8	2.2	1.00
66.000	1.4143	1.4178	0.480	6	8	0.5	1.25
67.270	1.3906	1.3941	0.320	8	8	0.7	0.78
67.795	1.3812	1.3846	0.060	42	8	3.7	1.12
68.185	1.3742	1.3776	0.080	62	8	5.4	0.89
68.350	1.3713	1.3747	0.060	64	8	5.6	1.77
69.580	1.3500	1.3534	0.240	13	8	1.1	0.96

Sample KR7-83: Suevite, Basement Metasediments. Sample depth = 513.90 m
Number of peaks: 53

Angle ($^{o}2\theta$)	d-value (α1; Å)	d-value (α2; Å)	Peak width ($^{o}2\theta$)	Peak intensity (counts)	Back intensity (counts)	Relative intensity (%)	Significance
3.450	25.5887	25.6523	0.960	29	9	1.1	1.02
6.260	14.1073	14.1423	0.100	62	9	2.3	1.71
8.875	9.9556	9.9803	0.080	216	9	8.1	2.65
12.530	7.0586	7.0761	0.100	222	8	8.3	4.14
17.790	4.9816	4.9940	0.100	142	6	5.3	3.29
18.835	4.7075	4.7192	0.080	85	5	3.2	1.21
19.885	4.4613	4.4724	0.160	15	5	0.6	1.04
20.880	4.2509	4.2614	0.100	538	5	20.2	6.59

22.070	4.0243	4.0343	0.060	22	5	0.8	1.20
22.945	3.8728	3.8824	0.120	18	5	0.7	1.49
23.595	3.7675	3.7769	0.120	11	5	0.4	0.98
25.205	3.5304	3.5392	0.120	185	5	6.9	5.38
25.525	3.4869	3.4955	0.160	14	5	0.5	0.76
26.630	3.3446	3.3529	0.140	2663	5	100.0	26.51
26.855	3.3171	3.3253	0.100	396	5	14.9	1.49
27.925	3.1924	3.2003	0.160	31	5	1.2	1.03
29.930	2.9829	2.9904	0.200	20	5	0.8	1.39
30.855	2.8956	2.9028	0.180	104	5	3.9	5.96
31.285	2.8568	2.8639	0.060	24	5	0.9	0.77
31.660	2.8238	2.8308	0.160	27	5	1.0	1.33
32.075	2.7882	2.7951	0.160	11	4	0.4	0.93
33.420	2.6790	2.6856	0.100	10	4	0.4	0.79
35.025	2.5598	2.5662	0.240	25	4	0.9	2.02
36.045	2.4897	2.4959	0.160	31	4	1.2	1.46
36.535	2.4574	2.4635	0.080	128	4	4.8	1.19
36.580	2.4545	2.4606	0.060	159	4	6.0	1.65
37.550	2.3933	2.3992	0.480	9	4	0.3	0.78
39.485	2.2803	2.2860	0.100	139	4	5.2	2.98
40.295	2.2363	2.2419	0.060	76	4	2.8	2.74
41.040	2.1974	2.2029	0.160	25	4	0.9	1.06
42.455	2.1274	2.1327	0.060	240	4	9.0	1.15
42.585	2.1212	2.1265	0.060	94	4	3.5	1.30
44.845	2.0194	2.0245	0.120	20	4	0.8	1.09
45.485	1.9925	1.9975	0.100	190	4	7.2	2.83
45.775	1.9805	1.9855	0.060	77	4	2.9	0.92
48.315	1.8822	1.8869	0.480	5	4	0.2	1.29
50.130	1.8182	1.8227	0.060	317	4	11.9	1.37
50.270	1.8135	1.8180	0.040	172	4	6.4	3.35
51.035	1.7881	1.7925	0.200	10	4	0.4	0.75
52.855	1.7307	1.7350	0.640	2	5	0.1	0.95
54.855	1.6722	1.6764	0.080	50	5	1.9	1.06
55.310	1.6596	1.6637	0.080	36	5	1.4	1.04
59.940	1.5420	1.5458	0.080	219	7	8.2	2.60
60.105	1.5381	1.5419	0.080	135	7	5.1	1.43
63.265	1.4687	1.4723	0.240	4	6	0.2	0.77
64.030	1.4530	1.4566	0.140	28	6	1.1	1.19
65.825	1.4176	1.4212	0.640	8	6	0.3	1.87
67.245	1.3911	1.3946	0.240	9	6	0.3	0.86
67.730	1.3823	1.3858	0.080	117	7	4.4	1.66
67.925	1.3788	1.3823	0.060	66	7	2.5	1.06
68.120	1.3754	1.3788	0.080	222	7	8.3	2.24
68.300	1.3722	1.3756	0.080	161	7	6.1	1.80
68.500	1.3686	1.3720	0.060	36	7	1.4	0.76

Appendix 5d: Microprobe data for melt particles from suevites from the LB-07A core and from the out-of-crater suevites; MP# = Melt particle number.

Upper impactites

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
KR7-17	55.50	0.36	19.78	3.61	2.65	1.65	0.97	6.42	0.06	91.01	M1
KR7-17	52.12	0.17	25.45	1.07	2.46	1.40	1.91	6.18	0.05	90.81	M1
KR7-17	57.97	0.12	22.17	0.21	0.36	4.68	3.14	0.68	0.00	89.33	M1
KR7-17	42.79	0.11	20.54	0.22	4.91	3.75	2.23	11.63	0.04	86.22	M1
KR7-17	55.68	0.04	17.84	0.21	1.45	2.37	6.63	4.11	0.05	88.38	M1
KR7-17	49.37	0.20	29.25	0.14	1.18	6.69	1.82	2.07	0.00	90.72	M2
KR7-17	51.90	0.23	29.25	0.05	0.88	6.99	3.34	1.47	0.00	94.11	M2
KR7-17	48.77	0.23	29.84	0.06	1.11	7.94	1.15	1.95	0.00	91.04	M2
KR7-17	52.71	0.18	29.75	0.17	0.59	7.44	0.81	1.29	0.00	92.93	M3
KR7-17	47.50	0.09	22.01	0.31	4.14	4.50	0.80	10.17	0.07	89.59	M3
KR7-17	55.50	0.36	19.78	3.61	2.65	1.65	0.97	6.42	0.06	91.01	M3
KR7-17	46.25	0.20	28.93	0.12	1.62	8.62	1.65	2.37	0.00	89.76	M3
KR7-17	44.42	0.24	28.32	0.58	0.94	1.85	1.76	2.33	0.00	80.44	M3
KR7-17	52.12	0.17	25.45	1.07	2.46	1.38	1.91	6.18	0.05	90.81	M3
KR7-17	57.97	0.12	22.17	0.21	0.36	4.68	3.14	0.68	0.00	89.33	M3
KR7-17	42.79	0.11	20.54	0.22	4.91	3.75	2.23	11.63	0.04	86.22	M3
KR7-17	55.68	0.04	17.84	0.21	1.45	2.37	6.63	4.11	0.05	88.38	M3

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
KR7-7	62.94	0.21	13.80	1.64	2.33	1.72	1.80	5.60	0.05	90.10	M1
KR7-7	51.23	0.33	18.14	2.15	2.70	1.94	3.19	5.90	0.02	85.59	M1
KR7-7	49.23	0.33	18.78	2.28	3.32	2.19	2.22	7.43	0.06	85.82	M1
KR7-7	57.06	0.27	17.44	2.14	2.68	2.04	3.34	6.34	0.05	91.36	M1
KR7-7	51.64	0.24	18.57	2.07	2.76	1.99	3.09	6.19	0.03	86.57	M1
KR7-7	60.75	0.20	14.62	1.75	2.23	1.47	2.95	4.99	0.06	89.01	M1
KR7-7	51.07	0.29	19.20	2.24	3.05	2.01	3.83	6.13	0.07	87.88	M1
KR7-7	48.17	1.83	19.89	2.75	2.47	2.75	2.89	5.10	0.01	85.86	M1
KR7-7	51.39	0.39	15.79	2.05	3.06	1.84	2.55	6.95	0.06	84.07	M1
KR7-7	46.87	0.16	18.47	1.82	3.88	2.38	1.78	9.43	0.07	84.85	M1
KR7-7	59.24	0.22	19.29	1.24	1.71	1.37	7.11	3.19	0.03	93.39	M1

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
KR7-35	87.76	0.09	2.95	0.6	0.29	0.58	0.18	0.49	0.02	92.96	M1
KR7-35	50.27	0.5	20.52	5.44	2.02	2.29	1.41	5.14	0.12	87.71	M1
KR7-35	63.40	0.42	16.62	3.86	1.89	2.11	1.25	5.34	0.12	95.01	M1
KR7-35	89.07	0.03	2.49	0.64	0.31	0.41	0.17	0.60	0.02	93.74	M1
KR7-35	87.15	0.11	4.69	0.99	0.58	0.8	0.43	0.71	0.02	95.48	M1
KR7-35	54.44	0.6	22.00	5.62	2.34	2.42	0.96	5.96	0.09	94.43	M2
KR7-35	53.34	0.47	20.94	4.29	2.49	2.88	1.89	6.37	0.02	92.69	M2
KR7-35	52.80	0.51	19.80	4.54	2.61	2.79	1.27	6.33	0.11	90.76	M2
KR7-35	84.34	0.15	4.08	0.65	0.44	0.89	0.32	0.94	0.05	91.86	M2
KR7-35	85.52	0.02	4.79	0.90	0.40	0.89	0.36	1.11	0.00	93.99	M2
KR7-35	91.26	0.03	3.05	0.57	0.38	0.53	0.19	0.55	0.03	96.59	M2
KR7-35	65.87	0.49	17.29	4.00	1.91	2.37	1.16	5.51	0.09	98.69	M2

KR7-35	56.63	0.58	20.24	4.89	2.42	2.97	1.33	5.8	0.11	94.97	M2
KR7-35	52.09	0.62	23.32	7.12	2.15	2.52	1.95	5.6	0.11	95.48	M2
KR7-35	50.84	0.59	21.29	5.38	2.78	3.08	1.55	6.79	0.08	92.38	M2
KR7-35	91.52	0.13	3.69	0.67	0.42	0.71	0.38	0.95	0.00	98.47	M2
KR7-35	65.96	0.35	13.83	3.50	1.80	1.85	0.69	3.98	0.04	92.00	M2
KR7-35	53.65	0.64	19.69	5.62	2.56	2.87	1.23	5.96	0.18	92.40	M2
KR7-35	71.48	0.29	10.10	2.61	1.22	1.46	0.42	2.72	0.00	90.30	M2
KR7-35	63.53	0.42	16.14	4.10	2.08	2.15	1.03	5.48	0.08	95.01	M2
KR7-35	53.54	0.42	21.06	5.57	2.60	2.88	1.46	6.06	0.12	93.71	M2
KR7-35	51.64	0.45	17.17	4.27	2.48	2.62	1.30	5.93	0.10	85.96	M2
KR7-35	54.46	0.57	19.98	4.23	2.95	2.98	1.35	6.73	0.08	93.33	M2

Lower impactites

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
KR7-45	46.77	0.22	6.05	0.56	1.40	1.01	1.14	4.72	0.02	61.90	M1
KR7-45	48.22	0.25	8.11	0.61	1.35	0.76	2.71	3.76	0.06	65.84	M1
KR7-45	64.84	0.13	2.23	0.37	0.37	0.36	0.50	1.57	0.01	70.38	M1
KR7-45	55.83	0.17	4.34	0.33	1.03	0.61	1.02	2.74	0.00	66.06	M2
KR7-45	49.36	0.47	6.21	0.98	1.37	0.50	1.23	3.55	0.04	63.71	M2
KR7-45	37.57	0.25	12.58	1.26	2.26	1.26	2.99	5.65	0.00	63.82	M2
KR7-45	56.41	0.27	4.25	0.71	0.89	0.86	1.55	2.83	0.02	67.79	M2
KR7-45	44.77	0.25	8.21	0.60	1.86	1.09	3.13	6.43	0.06	66.41	M2
KR7-45	58.42	0.32	3.49	0.56	0.86	0.36	1.34	2.61	0.03	67.99	M3
KR7-45	69.54	0.11	2.72	0.43	0.46	0.29	0.88	1.56	0.02	75.99	M4
KR7-45	55.74	0.09	2.86	0.62	0.58	0.27	0.63	3.17	0.02	63.96	M4
KR7-45	41.63	0.14	14.14	0.53	1.48	1.83	4.72	4.14	0.02	68.60	M4

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
KR7-23	66.64	0.12	4.62	0.34	1.36	0.67	0.62	2.80	0.05	77.21	M1
KR7-23	59.59	0.19	8.24	0.86	2.50	1.11	0.68	5.34	0.05	78.56	M1
KR7-23	85.86	0.02	1.18	0.68	0.26	0.25	0.61	0.87	0.02	89.73	M1
KR7-23	79.63	0.09	1.88	0.27	0.61	0.33	0.56	1.37	0.00	84.74	M1
KR7-23	61.82	0.13	6.56	0.84	2.10	0.98	0.73	3.32	0.01	76.49	M1
KR7-23	64.51	0.14	5.65	0.59	2.06	0.78	0.59	4.83	0.01	79.17	M1
KR7-23	76.71	0.07	2.20	0.33	0.54	0.32	0.47	1.53	0.03	82.20	M2
KR7-23	45.80	0.15	22.22	0.21	3.62	4.43	1.42	6.62	0.07	84.53	M2
KR7-23	59.82	0.13	10.63	0.46	2.61	1.50	2.83	4.10	0.00	82.08	M2
KR7-23	56.23	0.20	9.37	0.51	3.10	2.02	1.16	5.51	0.00	78.11	M3
KR7-23	59.33	0.16	10.79	0.33	2.40	2.72	0.82	4.31	0.00	80.86	M3
KR7-23	38.55	0.29	16.11	0.46	4.36	4.02	2.87	8.78	0.05	75.48	M3
KR7-23	47.72	0.41	13.43	0.58	4.09	2.53	1.72	7.09	0.04	77.61	M3
KR7-23	71.27	0.32	7.51	0.60	1.88	1.73	1.28	3.77	0.04	88.39	M3
KR7-23	66.58	0.00	19.99	1.11	0.00	0.05	11.1	0.14	0.00	98.92	M3
KR7-23	45.80	0.25	15.06	0.98	4.74	1.98	1.31	6.98	0.02	77.11	M3
KR7-23	39.60	0.23	23.41	0.50	2.37	5.87	1.46	4.45	0.00	77.88	M4
KR7-23	39.82	0.33	21.99	0.64	3.98	3.90	2.42	6.12	0.00	79.19	M4
KR7-23	43.38	0.29	29.17	0.26	1.41	8.04	1.13	2.32	0.02	86.02	M4
KR7-23	41.47	0.39	23.79	0.86	5.84	3.33	1.78	11.28	0.02	88.75	M4

Basement metasediments

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
KR7-81	48.23	0.20	14.57	1.72	1.40	0.95	1.89	3.91	0.04	72.91	M1
KR7-81	42.33	0.22	14.53	5.56	1.93	0.80	1.13	5.18	0.03	71.71	M1
KR7-81	44.97	0.39	12.90	0.89	1.71	0.63	0.87	5.24	0.01	67.61	M1
KR7-81	44.99	0.18	12.49	0.78	1.52	0.74	1.22	3.55	0.01	65.48	M1

Suevites from north of the crater: textural differences are indicated – meso = mesostasis; micr. = microlites

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#	Texture
BS16B	61.82	0.41	17.24	2.42	0.40	2.85	3.40	2.36	0.03	90.92	M1	Meso+Micr
BS16B	43.48	0.18	29.83	0.40	4.82	3.11	1.40	12.4	0.09	95.73	M1	Meso+Micr
BS16B	64.29	0.50	19.45	4.08	0.51	2.44	4.59	2.21	0.04	98.12	M1	Meso+Micr
BS16B	55.98	0.35	22.07	4.35	1.01	1.08	5.11	4.92	0.04	94.91	M1	Meso+Micr
BS16B	59.61	0.54	20.01	4.44	0.08	1.24	5.08	1.14	0.00	92.14	M1	Meso+Micr
BS16B	60.14	0.38	19.08	3.81	0.16	1.72	4.74	1.94	0.02	92.00	M1	Meso+Micr
BS16B	58.97	0.51	18.34	2.53	0.65	2.61	3.15	3.42	0.00	90.18	M1	Meso+Micr
BS16B	59.24	0.40	19.15	2.52	0.55	2.46	3.41	3.52	0.05	91.30	M1	Meso+Micr
BS16B	62.61	0.54	18.28	1.32	0.75	3.88	2.09	4.60	0.01	94.09	M1	Meso+Micr
BS16B	65.57	0.46	18.66	3.08	0.69	2.20	4.87	2.31	0.00	97.84	M1	Meso+Micr
BS16B	61.85	0.28	20.73	4.11	0.31	1.87	4.35	2.41	0.00	95.92	M1	Meso>Micr
BS16B	59.86	0.39	19.04	2.74	0.68	2.37	3.56	3.38	0.00	92.03	M1	Meso>Micr
BS16B	57.86	0.42	19.45	3.11	0.47	2.19	3.74	2.72	0.07	90.03	M1	Meso>Micr
BS16B	57.54	0.38	20.29	4.38	0.32	1.09	5.40	2.10	0.06	91.55	M1	Meso>Micr
BS16B	58.08	0.38	20.58	4.37	0.31	1.49	4.65	2.25	0.06	92.18	M1	Meso
BS16B	56.06	0.30	19.88	3.49	0.28	1.24	5.46	5.97	0.02	92.71	M1	Meso
BS16B	60.60	0.32	19.18	4.28	0.78	1.42	4.73	3.38	0.00	94.69	M1	Meso
BS16B	60.07	0.36	19.72	3.68	0.47	1.73	4.97	2.30	0.00	93.30	M1	Meso

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#	Texture
BS8	88.19	0.10	6.52	0.51	0.05	0.17	3.11	0.59	0.01	99.24	M1	Meso
BS8	66.35	0.02	20.03	2.24	0.12	0.46	8.07	1.19	0.00	98.48	M1	Meso
BS8	69.23	0.05	19.58	3.35	0.00	0.19	7.13	0.16	0.01	99.71	M1	Meso
BS8	54.20	0.08	24.96	1.70	1.32	0.33	7.04	4.58	0.07	94.28	M1	Meso+Micr
BS8	63.23	4.34	19.86	1.38	0.28	0.34	8.62	4.92	0.00	102.9	M1	Meso
BS8	57.59	0.03	24.35	2.42	1.11	0.48	7.81	3.19	0.02	97.01	M1	Meso
BS8	62.26	0.02	20.79	2.38	0.25	0.67	6.80	3.03	0.05	96.25	M1	Meso
BS8	56.95	0.04	27.56	1.73	1.67	0.53	8.08	3.88	0.00	100.5	M1	Meso
BS8	60.90	0.00	23.13	1.63	0.51	0.52	8.50	2.23	0.03	97.45	M1	Meso
BS8	63.81	0.01	19.00	1.59	0.24	0.52	7.14	1.83	0.00	94.14	M1	Meso
BS8	58.51	0.07	24.62	1.60	1.04	0.65	7.54	3.47	0.00	97.49	M1	Meso
BS8	53.33	0.06	25.64	2.36	1.43	0.39	7.43	4.69	0.08	95.40	M1	Meso
BS8	52.23	0.19	31.05	1.63	2.19	0.46	7.40	6.48	0.01	101.6	M1	Meso
BS8	68.10	0.05	19.84	2.62	0.67	0.34	5.44	2.57	0.01	99.65	M1	Meso
BS8	56.03	0.05	23.23	2.28	1.07	0.46	6.69	5.62	0.00	95.44	M1	Meso
BS8	61.46	0.01	18.60	1.78	0.01	0.72	7.66	0.20	0.00	90.43	M1	Meso
BS8	78.68	0.01	8.46	0.66	0.12	0.21	3.98	0.75	0.01	92.88	M1	Meso
BS8	58.73	0.05	20.82	1.56	0.50	0.43	7.18	4.52	0.05	93.84	M1	Meso+Micr
BS8	57.63	0.05	22.70	2.13	0.66	0.40	7.16	3.56	0.00	94.28	M1	Meso+Micr

BS8	59.51	0.08	19.81	1.53	0.34	0.48	8.18	3.37	0.03	93.32	M1	Meso
BS8	71.89	0.01	16.65	0.88	0.11	0.43	7.93	0.70	0.01	98.63	M1	Meso
BS8	61.43	0.01	23.58	1.93	0.79	0.33	7.04	3.20	0.01	98.31	M1	Meso

Sample #	**SiO_2**	**TiO_2**	**Al_2O_3**	**CaO**	**MgO**	**K_2O**	**Na_2O**	**FeO**	**MnO**	**Total**	**MP#**	**Texture**
BS14B	63.16	0.54	18.15	3.89	0.08	2.26	3.68	1.34	0.03	93.13	M1	Meso>Micr
BS14B	64.41	0.36	19.51	3.72	0.04	2.10	3.84	0.50	0.06	94.55	M1	Meso+Micr
BS14B	63.69	0.50	18.04	3.20	0.04	2.09	3.01	0.89	0.04	91.49	M1	Meso+Micr
BS14B	65.62	0.43	16.60	2.84	0.06	2.33	3.19	0.33	0.01	91.40	M1	Meso+Micr
BS14B	64.68	0.59	17.79	2.51	0.13	1.89	3.05	2.27	0.00	92.89	M1	Meso+Micr
BS14B	64.39	0.40	18.90	3.33	0.12	2.39	4.34	0.84	0.00	94.71	M1	Meso+Micr
BS14B	61.21	0.50	19.01	4.41	0.16	1.11	4.22	1.59	0.01	92.23	M1	Meso+Micr
BS14B	57.84	0.45	19.35	3.97	0.15	1.34	3.87	3.82	0.00	90.79	M1	Meso+Micr
BS14B	60.07	0.62	21.72	5.37	0.45	1.09	5.31	2.45	0.00	97.08	M1	Meso+Micr
BS14B	67.00	0.51	17.26	3.40	0.04	2.34	3.35	0.74	0.04	94.68	M1	Meso+Micr
BS14B	79.80	0.38	8.63	2.04	0.05	0.59	2.32	0.58	0.03	94.42	M1	Meso+Micr
BS14B	63.47	0.60	16.64	2.76	0.07	2.53	2.90	1.80	0.00	90.76	M1	Meso+Micr
BS14B	66.86	0.48	18.12	3.86	0.07	2.77	4.10	0.68	0.00	96.95	M1	Meso+Micr
BS14B	65.43	0.51	15.36	2.05	0.09	3.17	2.76	2.32	0.00	91.69	M1	Meso
BS14B	66.31	0.24	16.86	3.91	0.07	0.73	4.01	1.64	0.00	93.76	M1	Meso
BS14B	64.72	1.07	16.92	2.85	0.07	2.77	2.74	3.82	0.00	94.96	M1	Meso
BS14B	66.71	0.44	17.66	3.44	0.03	2.48	4.18	0.36	0.00	95.29	M1	Meso
BS14B	66.13	0.43	18.11	3.46	0.04	2.66	4.23	0.66	0.00	95.72	M1	Meso
BS14B	65.00	0.37	18.13	3.71	0.06	2.07	4.19	2.59	0.03	96.14	M1	Meso
BS14B	62.48	0.33	16.25	2.17	0.22	3.09	3.64	3.57	0.02	91.77	M1	Meso
BS14B	64.50	0.46	16.25	2.70	0.11	2.81	2.95	3.25	0.00	93.02	M1	Meso
BS14B	66.00	0.47	16.55	3.55	0.03	2.52	3.56	0.49	0.00	93.17	M1	Meso
BS14B	61.24	0.43	17.85	4.00	0.03	2.06	3.73	0.69	0.02	90.05	M1	Meso

Suevite from south of the crater
Sample BS1:

Sample #	**SiO_2**	**TiO_2**	**Al_2O_3**	**CaO**	**MgO**	**K_2O**	**Na_2O**	**FeO**	**MnO**	**Total**	**MP#**
BS1-A (1)	61.91	0.52	17.92	0.77	3.92	0.58	0.28	7.66	0.00	93.57	M1
BS1-A (2)	81.45	0.17	9.41	0.26	1.02	0.38	0.27	2.13	0.06	95.15	M1
BS1-A (4)	62.67	0.56	16.68	2.47	3.49	1.61	2.16	6.21	0.04	95.89	M1
BS1-A (6)	85.40	0.23	4.30	0.30	1.16	0.84	0.84	1.99	0.05	95.10	M1
BS1-A (7)	81.67	0.30	7.01	0.39	0.67	0.94	0.80	1.88	0.00	93.66	M1
BS1-A (8)	88.83	0.16	3.58	0.14	0.49	0.68	0.88	0.85	0.00	95.61	M1
BS1-A (9)	77.52	0.33	9.43	0.80	1.55	0.96	1.08	3.95	0.00	95.62	M1
BS1-A (11)	89.86	0.17	2.08	0.08	0.85	0.51	0.96	1.63	0.06	96.18	M1
BS1-A (12)	64.02	0.63	16.88	0.86	3.64	1.28	1.79	5.81	0.12	95.01	M1
BS1-A (14)	87.44	0.07	3.71	0.08	0.71	0.67	0.83	1.19	0.00	94.68	M1
BS1-A (21)	68.83	0.34	14.26	0.39	1.93	0.47	1.17	4.12	0.19	91.70	M2
BS1-A (22)	87.89	0.02	4.20	0.08	0.14	1.26	0.59	0.00	0.00	94.17	M2
BS1-A (24)	79.80	0.05	8.18	0.54	1.02	1.81	1.23	1.42	0.12	94.17	M2
BS1-A (25)	75.90	0.04	11.13	1.03	1.50	2.26	1.46	1.88	0.05	95.23	M2
BS1-A (39)	60.75	0.67	17.19	4.25	4.94	0.81	2.00	7.17	0.00	97.78	M2
BS1-A (40)	57.72	0.76	18.03	4.66	6.44	1.06	3.34	7.11	0.19	99.30	M2
BS1-A (41)	56.39	0.81	17.75	4.61	6.61	1.11	3.38	7.32	0.04	98.01	M2

BS1-A (42)	56.92	0.79	17.73	4.59	6.27	1.09	3.61	8.00	0.02	99.02	M2
BS1-A (43)	56.04	0.82	18.35	4.52	6.22	1.06	3.34	7.84	0.13	98.30	M2
BS1-A (45)	54.24	0.93	18.32	4.70	6.71	0.91	3.58	7.68	0.00	97.07	M2
BS1-A (46)	54.64	0.99	18.51	4.79	6.80	0.98	3.37	7.34	0.14	97.55	M2
BS1-A (48)	80.80	0.04	8.59	0.30	0.46	1.92	1.01	0.89	0.00	94.01	M2
BS1-A (49)	84.11	0.34	5.15	0.21	0.51	0.99	0.78	1.04	0.00	93.14	M2
BS1-A (55)	91.32	0.04	0.55	0.12	0.32	0.01	0.05	1.62	0.00	94.03	M3
BS1-A (56)	80.44	0.11	0.09	0.12	0.05	0.02	0.06	20.16	0.04	101.10	M3
BS1-A (57)	62.40	0.57	14.88	2.97	3.39	1.67	1.52	6.22	0.26	93.88	M3
BS1-A (58)	64.81	0.48	12.91	2.60	2.53	1.61	1.39	5.94	0.14	92.40	M3
BS1-A (66)	88.73	0.06	1.98	0.01	1.22	1.06	0.58	2.54	0.00	96.18	M4
BS1-A (67)	76.27	0.06	8.22	0.84	2.32	2.51	1.12	3.80	0.00	95.13	M4
BS1-A (68)	66.08	0.01	12.77	0.83	3.74	2.82	1.68	4.75	0.22	92.91	M4
BS1-A (69)	68.55	0.00	10.08	0.29	4.15	2.55	1.58	5.61	0.00	92.79	M4
BS1-A (70)	71.13	0.03	8.56	0.15	4.85	2.52	1.52	6.57	0.00	95.31	M4
BS1-A (71)	74.10	0.12	7.48	0.18	3.35	2.35	1.31	3.97	0.03	92.89	M4
BS1-A (72)	73.72	0.10	8.26	0.47	3.64	2.55	1.51	5.33	0.03	95.60	M4
BS1-A (73)	65.71	0.06	10.55	0.58	6.08	2.42	1.78	7.29	0.46	94.92	M4
BS1-A (75)	88.15	0.02	1.64	0.02	2.43	0.21	0.12	2.83	0.13	95.54	M4
BS1-A (76)	83.30	0.00	3.13	0.02	2.07	1.67	0.79	2.63	0.00	93.61	M4
BS1-A (81)	87.69	0.03	1.60	0.05	0.93	0.86	0.34	0.92	0.13	92.53	M4
BS1-A (82)	66.96	0.08	11.21	2.08	4.13	2.34	1.64	6.05	0.39	94.88	M4
BS1-A (83)	88.93	0.16	1.43	0.07	1.00	0.95	0.52	1.48	0.00	94.53	M4
BS1-A (100)	83.48	0.04	3.23	0.05	2.31	2.05	0.59	3.63	0.00	95.39	M4
BS1-A (101)	78.46	0.00	4.45	0.09	2.72	2.36	0.97	3.90	0.04	92.98	M4
BS1-A (106)	82.47	0.08	4.02	0.00	1.76	1.92	0.48	2.89	0.06	93.68	M4
BS1-A (107)	74.87	0.05	6.79	0.23	3.61	2.64	1.34	5.63	0.00	95.16	M4
BS1-A (108)	80.93	0.08	4.98	0.07	2.04	2.08	0.87	1.80	0.00	92.85	M4
BS1-A (109)	82.74	0.00	3.91	0.12	1.93	1.92	0.73	3.30	0.06	94.70	M4
BS1-A (110)	82.98	0.02	2.98	0.06	1.83	1.93	0.66	2.10	0.25	92.81	M4

Sample BS1:

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
BS1-B-a1 (4)	86.01	0.05	3.08	0.11	0.84	0.82	1.19	2.20	0.03	94.33	M1
BS1-B-a1 (7)	79.59	2.80	5.31	0.20	0.81	0.92	1.15	1.71	0.00	92.49	M1
BS1-B-a2 (1)	83.97	0.06	3.71	0.10	1.40	1.21	0.61	3.25	0.02	94.33	M2
BS1-B-a2 (2)	52.48	1.16	18.88	5.04	6.32	1.96	3.37	9.01	0.15	98.37	M2
BS1-B-a2 (5)	49.26	0.99	24.76	0.77	0.89	0.35	0.15	12.84	0.00	90.01	M2
BS1-B-a2 (9)	56.47	0.84	18.91	4.64	4.02	2.05	3.46	6.86	0.12	97.37	M2
BS1-B-a3 (6)	88.28	0.35	1.44	0.23	0.32	0.92	0.33	0.94	0.02	92.83	M3

Sample: BS2: (area 2, analytical points in brackets)

Sample #	SiO_2	TiO_2	Al_2O_3	CaO	MgO	K_2O	Na_2O	FeO	MnO	Total	MP#
BS2-2 (1)	64.37	0.71	17.81	2.53	3.44	1.96	3.41	6.86	0.05	101.14	M1
BS2-2 (3)	63.72	0.80	18.37	2.55	3.44	1.99	3.44	6.74	0.08	101.15	M1
BS2-2 (6)	64.04	0.66	18.00	2.61	3.56	1.97	3.38	6.89	0.06	101.21	M1
BS2-2 (7)	63.16	0.72	18.02	2.41	3.48	1.90	3.42	7.07	0.10	100.28	M1
BS2-2 (8)	63.26	0.74	18.05	2.56	3.43	1.95	3.30	6.74	0.10	100.15	M1
BS2-2 (10)	63.70	0.70	18.14	2.57	3.43	1.93	3.24	7.19	0.12	101.05	M1

BS2-2 (11)	63.81	0.65	17.64	2.59	3.57	2.04	3.28	6.02	0.16	99.76	M1
BS2-2 (12)	63.41	0.60	18.31	2.60	3.52	1.95	3.28	6.70	0.11	100.51	M1
BS2-2 (13)	62.57	0.62	18.19	2.81	3.78	1.91	3.43	7.12	0.09	100.57	M1
BS2-2 (14)	65.44	0.58	17.21	2.46	3.13	2.02	3.32	6.06	0.10	100.32	M1
BS2-2 (15)	64.59	0.71	17.62	2.47	3.57	1.96	3.09	6.88	0.11	101.00	M1
BS2-2 (16)	64.37	0.73	17.87	2.62	3.34	1.94	3.23	6.88	0.09	101.07	M1
BS2-2 (18)	63.82	0.72	17.99	2.54	3.56	2.00	3.20	6.69	0.10	100.62	M1
BS2-2 (19)	64.44	0.65	17.86	2.66	3.58	1.97	3.39	6.36	0.10	101.09	M1
BS2-2 (20)	62.36	0.70	18.12	2.63	3.88	1.89	3.38	7.38	0.18	100.51	M1
BS2-2 (21)	62.92	0.72	18.25	2.57	3.50	1.91	3.28	7.11	0.08	100.36	M1
BS2-2 (22)	63.69	0.69	17.36	2.56	3.42	2.00	3.01	6.06	0.04	98.83	M1
BS2-2 (23)	63.42	0.65	17.96	2.52	3.50	1.97	3.46	6.77	0.09	100.33	M1
BS2-2 (24)	63.65	0.61	18.19	2.66	3.59	1.94	3.22	6.92	0.15	100.97	M1
BS2-2 (27)	63.49	0.71	17.56	2.62	3.30	2.00	3.16	6.66	0.01	99.55	M1
BS2-2 (28)	63.51	0.80	17.96	2.64	3.67	1.93	3.41	6.81	0.08	100.79	M1
BS2-2 (29)	64.40	0.68	18.16	2.68	3.60	1.89	3.38	6.96	0.11	101.94	M1
BS2-2 (30)	64.63	0.77	17.96	2.50	3.59	1.95	3.19	6.10	0.09	100.77	M1
BS2-2 (33)	64.37	0.70	18.29	2.58	3.63	1.92	3.27	7.40	0.09	102.25	M1
BS2-2 (35)	62.85	0.86	18.57	2.60	3.86	1.94	3.29	7.57	0.08	101.62	M2
BS2-2 (38)	63.15	0.73	17.97	2.58	3.55	1.96	3.19	7.19	0.12	100.49	M2
BS2-2 (40)	63.23	0.82	18.11	2.74	3.62	1.86	3.18	7.22	0.07	100.90	M2
BS2-2 (42)	62.99	0.69	17.99	2.60	3.61	1.88	3.36	6.83	0.07	100.03	M2
BS2-2 (43)	63.10	0.76	18.22	2.62	3.69	1.91	3.29	6.65	0.08	100.35	M2
BS2-2 (44)	64.79	0.63	17.48	2.34	3.36	1.95	3.16	6.13	0.11	100.00	M3
BS2-2 (45)	65.18	0.76	17.08	2.40	3.07	1.92	3.11	6.31	0.07	99.96	M3
BS2-2 (46)	65.14	0.56	17.14	2.32	3.08	2.07	3.27	6.39	0.14	100.13	M3
BS2-2 (47)	65.13	0.71	17.25	2.60	3.26	1.91	3.37	6.35	0.16	100.74	M3
BS2-2 (48)	63.16	0.67	18.18	2.62	3.56	1.86	3.25	7.06	0.06	100.42	M3
BS2-2 (49)	65.35	0.59	17.75	2.50	3.26	1.95	3.23	6.84	0.10	101.55	M3
BS2-2 (50)	63.67	0.76	17.65	2.49	3.47	1.93	3.14	6.46	0.09	99.69	M3
BS2-2 (51)	64.48	0.64	17.58	2.57	3.22	1.96	3.19	6.60	0.14	100.38	M3
BS2-2 (52)	63.99	0.67	17.41	2.48	3.35	1.87	3.33	6.81	0.01	99.91	M3
BS2-2 (54)	63.81	0.65	17.64	2.59	3.57	2.04	3.28	6.02	0.16	99.76	M3
BS2-2 (55)	63.41	0.60	18.31	2.60	3.52	1.95	3.28	6.70	0.11	100.51	M3
BS2-2 (56)	62.57	0.62	18.19	2.81	3.78	1.91	3.43	7.12	0.09	100.57	M3
BS2-2 (57)	65.44	0.58	17.21	2.46	3.13	2.02	3.32	6.06	0.10	100.32	M3
BS2-2 (58)	64.59	0.71	17.62	2.47	3.57	1.96	3.09	6.88	0.11	101.00	M3
BS2-2 (59)	64.37	0.73	17.87	2.62	3.34	1.94	3.23	6.88	0.09	101.07	M3
BS2-2 (61)	63.82	0.72	17.99	2.54	3.56	2.00	3.20	6.69	0.10	100.62	M3
BS2-2 (62)	64.44	0.65	17.86	2.66	3.58	1.97	3.39	6.36	0.10	101.09	M3
BS2-2 (63)	62.36	0.70	18.12	2.63	3.88	1.89	3.38	7.38	0.18	100.51	M3
BS2-2 (64)	62.92	0.72	18.25	2.57	3.50	1.91	3.28	7.11	0.08	100.36	M3
BS2-2 (65)	63.69	0.69	17.36	2.56	3.42	2.00	3.01	6.06	0.04	98.83	M3
BS2-2 (66)	63.42	0.65	17.96	2.52	3.50	1.97	3.46	6.77	0.09	100.33	M3
BS2-2 (67)	63.65	0.61	18.19	2.66	3.59	1.94	3.22	6.92	0.15	100.97	M3
BS2-2 (70)	63.49	0.71	17.56	2.62	3.30	2.00	3.16	6.66	0.01	99.55	M3
BS2-2 (71)	63.51	0.80	17.96	2.64	3.67	1.93	3.41	6.81	0.08	100.79	M3
BS2-2 (72)	64.40	0.68	18.16	2.68	3.60	1.89	3.38	6.96	0.11	101.94	M3
BS2-2 (73)	64.63	0.77	17.96	2.50	3.59	1.95	3.19	6.10	0.09	100.77	M3
BS2-2 (76)	64.37	0.70	18.29	2.58	3.63	1.92	3.27	7.40	0.09	102.25	M3

BS2-2 (78)	62.85	0.86	18.57	2.60	3.86	1.94	3.29	7.57	0.08	101.62	M3
BS2-2 (80)	63.15	0.73	17.97	2.58	3.55	1.96	3.19	7.19	0.12	100.49	M3
BS2-2 (83)	63.23	0.82	18.11	2.74	3.62	1.86	3.18	7.22	0.07	100.90	M3
BS2-2 (85)	62.99	0.69	17.99	2.60	3.61	1.88	3.36	6.83	0.07	100.03	M3
BS2-2 (86)	63.10	0.76	18.22	2.62	3.69	1.91	3.29	6.65	0.08	100.35	M3
BS2-2 (87)	64.79	0.63	17.48	2.34	3.36	1.95	3.16	6.13	0.11	100.00	M3
BS2-2 (88)	65.18	0.76	17.08	2.40	3.07	1.92	3.11	6.31	0.07	99.96	M3
BS2-2 (89)	65.14	0.56	17.14	2.32	3.08	2.07	3.27	6.39	0.14	100.13	M3
BS2-2 (90)	65.13	0.71	17.25	2.60	3.26	1.91	3.37	6.35	0.16	100.74	M3
BS2-2 (91)	63.16	0.67	18.18	2.62	3.56	1.86	3.25	7.06	0.06	100.42	M3
BS2-2 (92)	65.35	0.59	17.75	2.50	3.26	1.95	3.23	6.84	0.10	101.55	M3
BS2-2 (93)	63.67	0.76	17.65	2.49	3.47	1.93	3.14	6.46	0.09	99.69	M3
BS2-2 (94)	64.48	0.64	17.58	2.57	3.22	1.96	3.19	6.60	0.14	100.38	M3
BS2-2 (95)	63.99	0.67	17.41	2.48	3.35	1.87	3.33	6.81	0.01	99.91	M3

Sample: BS2: (area 4, analytical points in brackets)

Sample #	**SiO_2**	**TiO_2**	**Al_2O_3**	**CaO**	**MgO**	**K_2O**	**Na_2O**	**FeO**	**MnO**	**Total**	**MP#**
BS2-4 (1)	59.02	0.99	14.70	5.38	8.94	1.45	3.63	7.93	0.33	102.36	M1
BS2-4 (2)	58.65	0.91	14.69	5.23	8.56	1.38	3.16	7.81	0.13	100.50	M1
BS2-4 (3)	58.22	0.91	15.14	5.31	8.61	1.43	3.34	7.06	0.17	100.19	M1
BS2-4 (4)	57.77	0.89	14.50	5.54	9.31	1.38	3.52	8.93	0.20	102.04	M1
BS2-4 (5)	59.13	0.87	14.86	5.41	8.59	1.44	3.51	8.41	0.09	102.31	M1
BS2-4 (11)	57.66	1.03	14.39	5.50	7.59	1.33	2.58	8.76	0.11	99.05	M1
BS2-4 (12)	58.80	0.84	14.69	5.19	8.46	1.41	2.84	7.59	0.14	100.09	M1
BS2-4 (13)	58.89	0.94	14.56	5.16	8.12	1.38	2.77	8.11	0.11	100.10	M1
BS2-4 (14)	59.11	1.02	14.32	5.50	8.65	1.29	2.75	8.68	0.11	101.52	M1
BS2-4 (15)	59.19	1.01	14.55	5.10	8.30	1.29	2.89	8.12	0.15	100.69	M1
BS2-4 (16)	59.11	0.84	14.57	5.24	8.31	1.32	2.74	8.04	0.12	100.41	M1
BS2-4 (17)	57.88	0.98	14.32	5.78	9.03	1.25	2.61	7.74	0.10	99.76	M1
BS2-4 (18)	57.58	0.97	14.37	5.38	8.83	1.20	1.90	8.73	0.21	99.26	M1
BS2-4 (19)	58.58	0.94	14.34	5.67	8.64	1.31	2.90	8.45	0.08	100.97	M1
BS2-4 (20)	58.62	0.80	14.49	5.45	8.47	1.32	2.85	8.10	0.08	100.23	M1
BS2-4 (21)	57.66	1.03	14.39	5.50	7.59	1.33	2.58	8.76	0.11	99.05	M1
BS2-4 (22)	58.80	0.84	14.69	5.19	8.46	1.41	2.84	7.59	0.14	100.09	M1
BS2-4 (23)	58.89	0.94	14.56	5.16	8.12	1.38	2.77	8.11	0.11	100.10	M1
BS2-4 (24)	59.11	1.02	14.32	5.50	8.65	1.29	2.75	8.68	0.11	101.50	M1
BS2-4 (25)	59.19	1.01	14.55	5.10	8.30	1.29	2.89	8.12	0.15	100.70	M1
BS2-4 (26)	59.11	0.84	14.57	5.24	8.31	1.32	2.74	8.04	0.12	100.40	M1
BS2-4 (27)	57.88	0.98	14.32	5.78	9.03	1.25	2.61	7.74	0.10	99.76	M1
BS2-4 (28)	57.58	0.97	14.37	5.38	8.83	1.20	1.90	8.73	0.21	99.26	M1
BS2-4 (29)	58.58	0.94	14.34	5.67	8.64	1.31	2.90	8.45	0.08	100.97	M1
BS2-4 (30)	58.62	0.80	14.49	5.45	8.47	1.32	2.85	8.10	0.08	100.23	M1
BS2-4 (31)	58.18	0.88	14.32	5.28	8.65	1.32	2.67	8.14	0.11	99.62	M1
BS2-4 (32)	58.47	0.89	14.47	5.38	8.49	1.32	2.67	8.01	0.13	99.89	M1
BS2-4 (33)	59.35	0.84	14.66	5.13	8.10	1.32	2.86	7.83	0.15	100.30	M1
BS2-4 (34)	58.98	0.94	14.89	5.22	7.17	1.29	2.60	8.25	0.05	99.43	M1

Appendix 6a: Geochemical data: Major (wt%) and trace element (ppm) data for the out-of-crater suevites collected in this study, determined by XRF and ICP-MS.

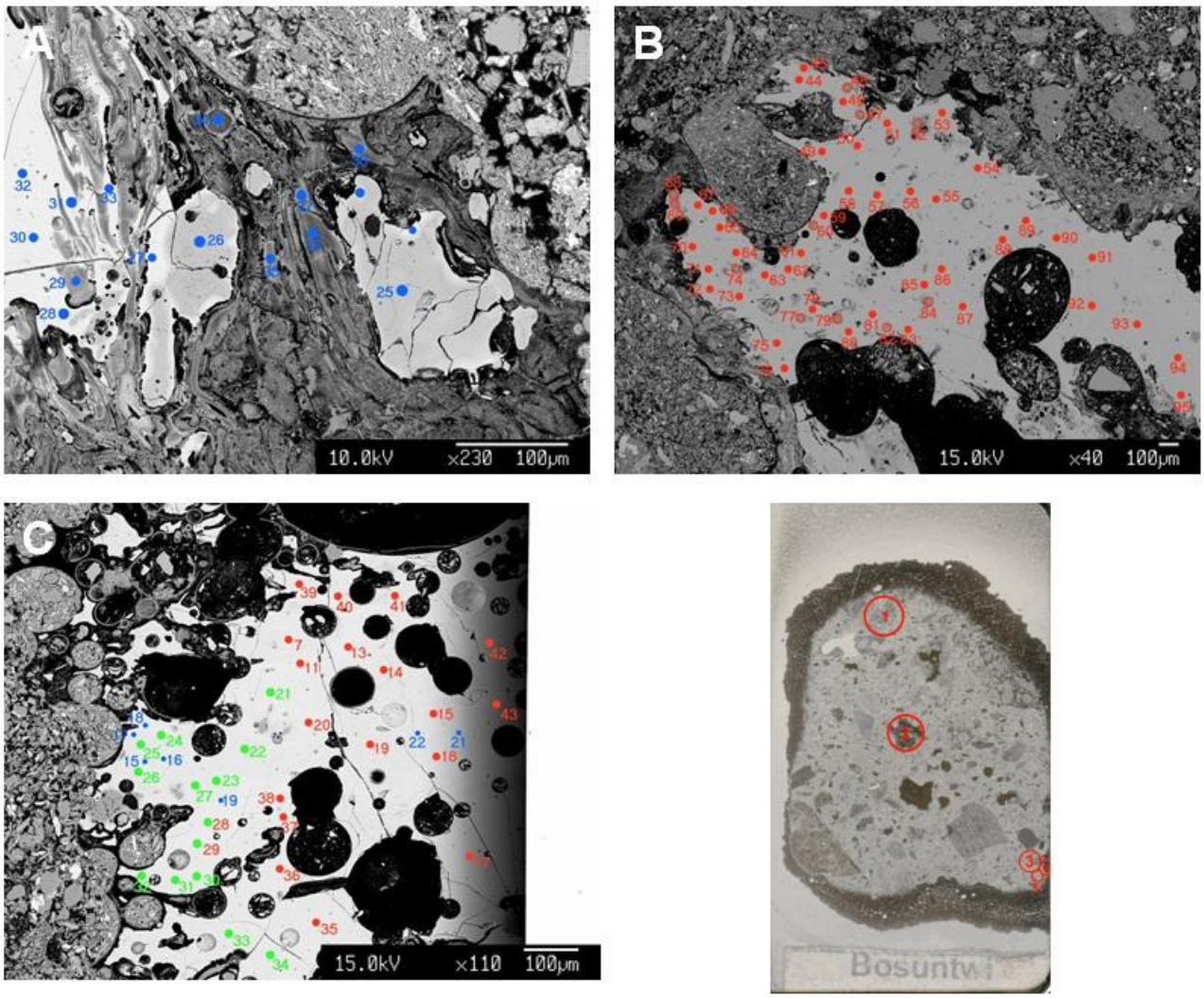
Sample #	BS-01	BS-02	BS-03	BS-04	BS-05	BS-06	BS-08	BS-11	BS-14
Location	SS	SS	SS	NS	NS	NS	NS	NS	NS
SiO_2	62.9	66.8	63.6	63.2	67.2	63.5	65.0	63.2	67.2
TiO_2	0.68	0.56	0.66	0.71	0.52	0.66	0.71	0.77	0.65
Al_2O_3	16.3	15.0	16.3	18.7	16.3	17.1	17.3	17.5	16.9
Fe_2O_3	7.84	6.24	6.89	6.73	4.72	7.02	6.67	8.17	4.80
MnO	0.08	0.12	0.10	0.04	0.03	0.06	0.03	0.04	0.02
MgO	2.80	2.13	2.45	0.90	0.81	0.97	0.98	1.03	0.62
CaO	0.79	0.53	0.92	1.95	2.15	2.45	1.48	1.40	2.11
Na_2O	1.97	2.66	1.96	2.44	2.87	2.89	3.57	2.30	2.60
K_2O	1.68	1.28	1.66	1.33	2.14	1.72	0.44	1.04	1.78
P_2O_5	0.13	0.09	0.11	0.05	0.10	0.07	0.09	0.04	0.07
LOI	4.5	3.8	4.7	3.6	2.6	2.9	3.4	4.1	3.1
SO_3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total	99.67	99.21	99.35	99.65	99.44	99.34	99.67	99.59	99.85
Sc	10.7	6.69	5.92	17.0	13.8	16.6	15.7	15.1	12.0
V	142.8	114.8	126.0	116.9	82.6	100.1	118.3	122.8	103.4
Cr	155.2	136.5	145.5	172.6	101.1	132.1	134.9	169.5	173.7
Co	25.5	20.8	31.0	24.9	16.0	24.0	18.6	24.8	16.7
Ni	60.1	56.0	64.7	62.4	41.2	59.9	37.5	56.9	50.2
Cu	51.0	35.7	46.5	44.8	39.9	45.2	42.3	53.5	34.4
Zn	80.2	87	86.7	88.4	81.9	83.5	121.6	91.0	64.8
As	2.46	2.07	1.52	1.76	2.09	2.81	1.22	2.13	1.46
Rb	54.8	38.1	41.9	39.7	75.0	48.4	20	30	64.8
Sr	188.9	187.4	176.7	313.7	423.8	378.0	414.3	229.6	313.8
Y	14.6	7.16	13.7	11.3	12.9	9.49	12.9	6.34	11.2
Zr	137.5	116.3	138.3	122.3	112.5	120.4	111.5	161.5	135.6
Nb	6.13	5.31	6.10	6.50	5.28	6.14	6.42	7.16	6.26
Mo	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ba	453.0	324.3	379.9	644.7	898.7	693.7	1411	436.6	621.3
La	14.8	11.8	11.1	22.5	20.6	16.1	10.7	9.86	18.4
Ce	45.3	44.5	54.7	54.7	45.9	41.7	38.5	35.0	47.6
Pr	4.10	2.96	2.86	5.75	5.34	4.28	2.82	2.63	5.03
Nd	15.8	10.9	11.1	22.0	20.3	16.7	11.5	10.4	19.8
Sm	2.95	1.92	2.01	4.33	4.21	3.52	3.20	2.03	3.94
Eu	0.91	0.56	0.57	1.48	1.45	1.37	1.56	0.91	1.26
Gd	2.40	1.77	2.02	3.23	2.99	2.42	2.41	1.90	3.49
Tb	0.36	0.23	0.28	0.49	0.48	0.37	0.31	0.21	0.44
Dy	2.02	1.20	1.58	2.45	2.41	1.81	1.85	1.09	2.22
Ho	0.40	0.23	0.33	0.43	0.44	0.33	0.39	0.21	0.40
Er	1.18	0.69	0.99	1.16	1.20	0.89	1.22	0.62	1.08
Tm	0.19	0.11	0.16	0.16	0.17	0.12	0.20	0.10	0.15
Yb	1.25	0.75	1.08	1.05	1.11	0.81	1.39	0.63	0.97
Lu	0.19	0.12	0.16	0.15	0.16	0.11	0.21	0.10	0.13
Hf	3.55	2.95	3.53	2.19	1.96	1.99	1.58	2.83	2.86
Ta	0.41	0.36	0.41	0.44	0.35	0.41	0.44	0.46	0.41
W	1.15	0.91	1.10	1.03	0.91	0.69	0.54	0.57	1.19
Pb	9.47	7.38	9.00	11.0	11.2	11.4	9.77	8.68	8.51
Th	1.77	1.18	1.12	2.70	2.83	2.78	2.62	2.09	2.66
U	1.36	0.97	1.35	1.02	1.21	1.04	0.84	0.89	1.39

*SS = suevite from south of the crater; NS = suevite from north of the crater. LOI = loss on ignition. All Fe as Fe_2O_3. Trace elements reported from XRF and ICP-MS data.

Appendix 6b: Selected SEM (backscattered electron) imagery, element maps and thin section images of melt particles obtained in this study for the out-of-crater suevites.

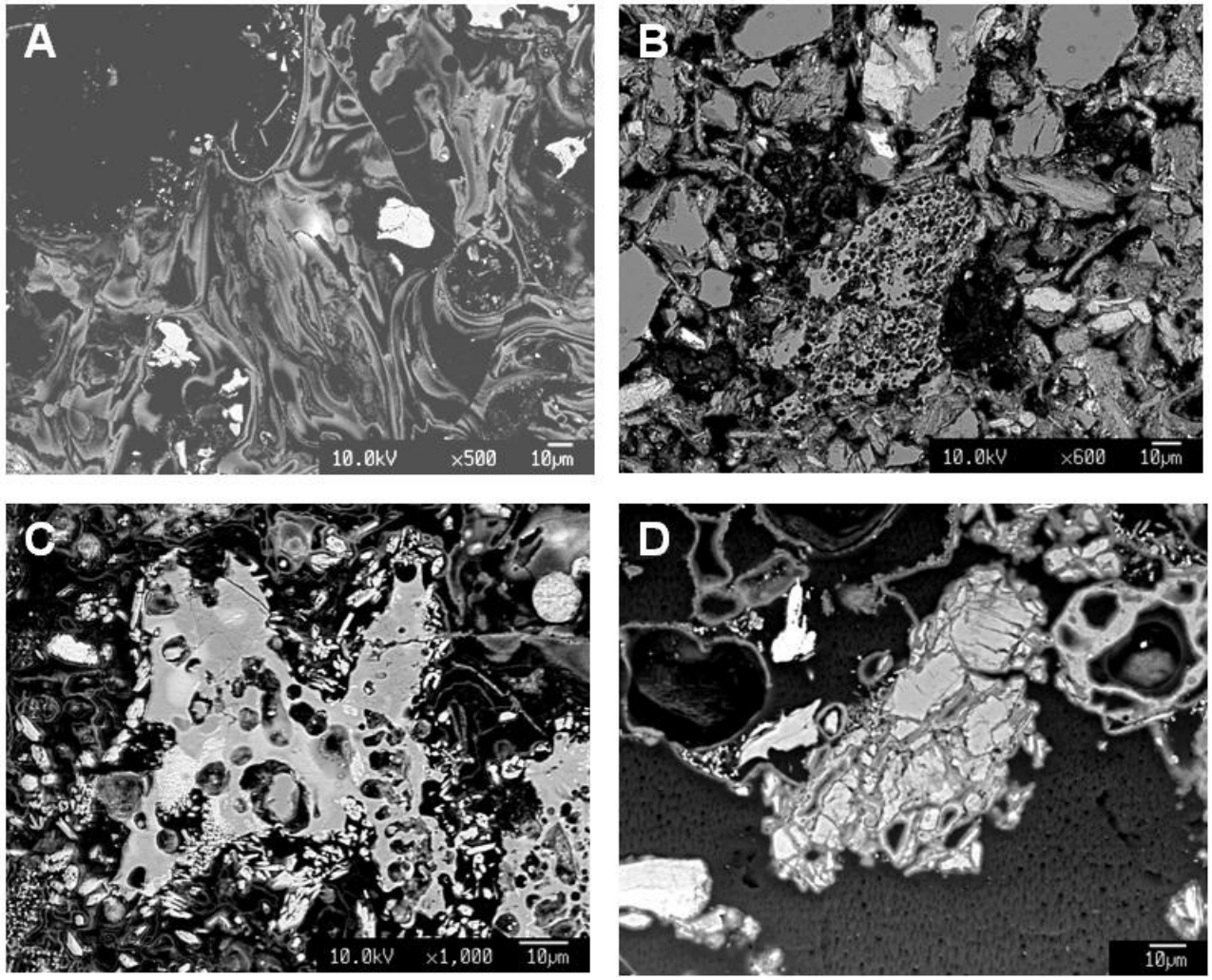
Backscattered electron images: The lightest fragments correspond to rutile, the grey fragments correspond to quartz (moderately grey indicates silica-rich lithologies), with darker grey indicating the mixed matrix, black indicates cracks in the thin section.

Sample BS-2A, suevite from south of the crater.



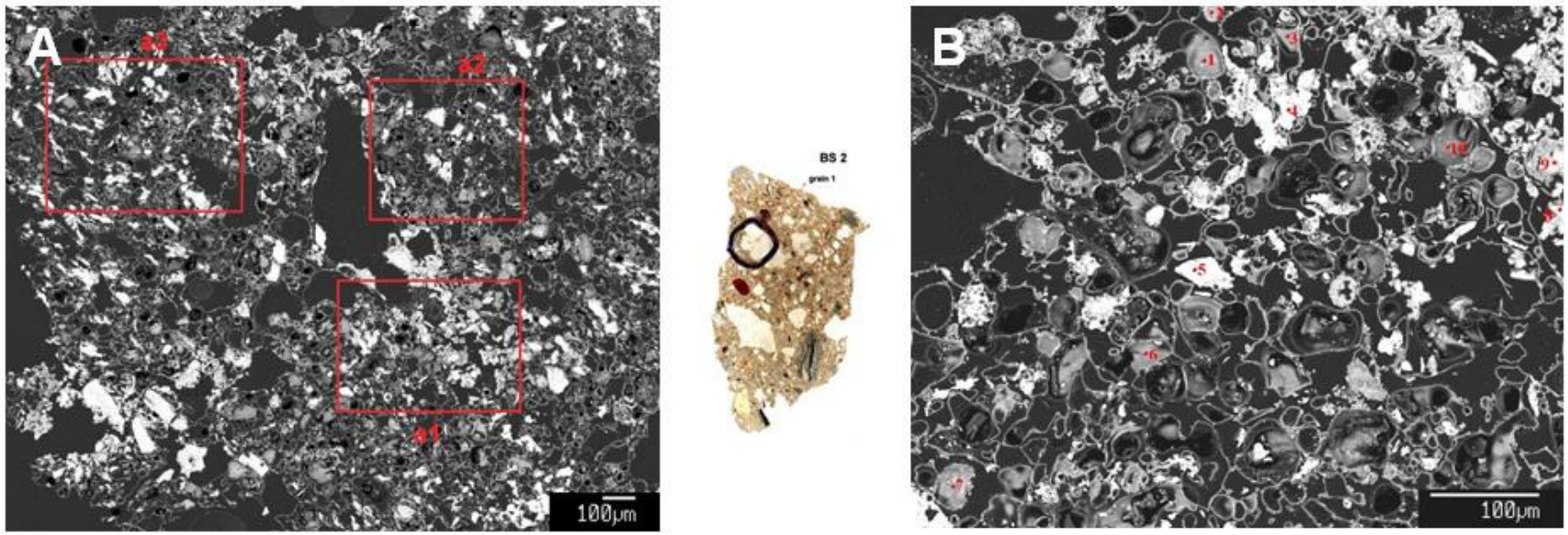
Images showing measuring points. A) Particle 2 from BS-2A at 10 kV. B) Particle 2 from BS-2A at 15 kV. C) Particle 4 from BS-2A at 15 kV. Thin-section image included to show particles from BS-2A that were examined.

Sample BS-2A and -2B, suevite from south of the crater.

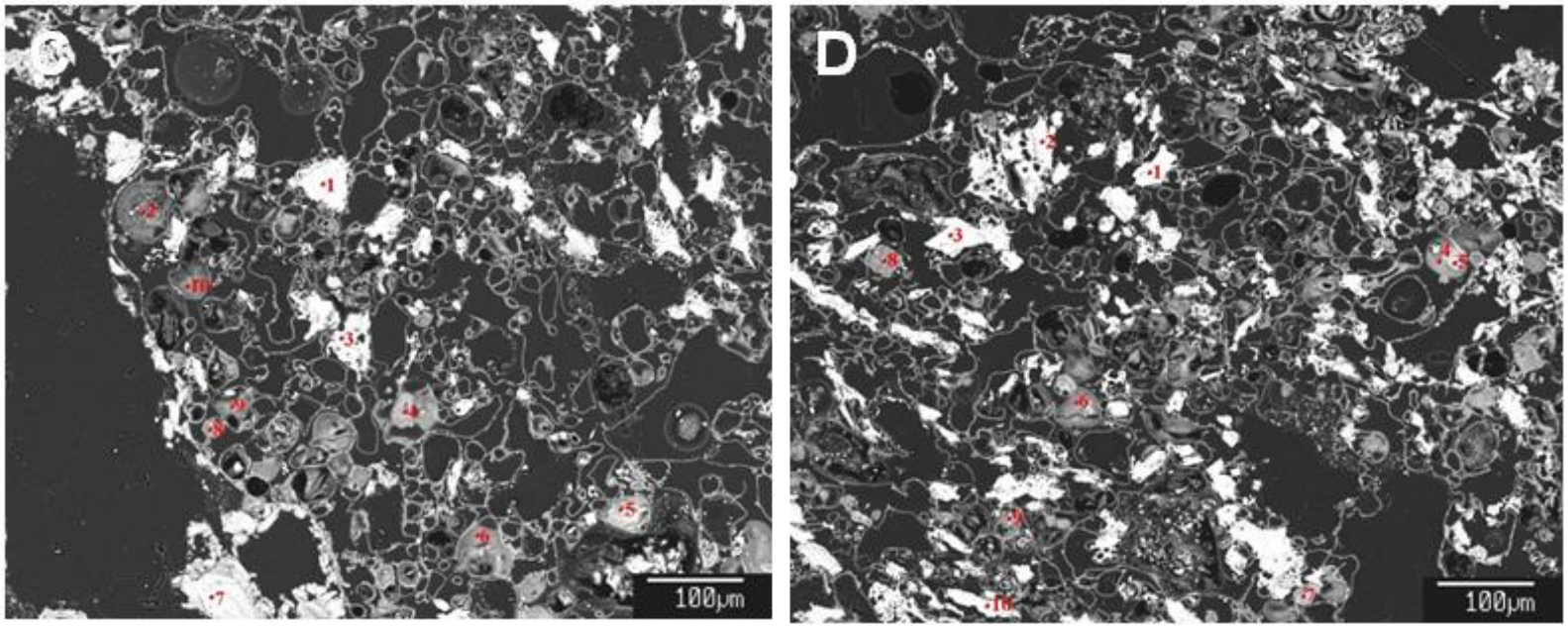


A) Melt particle composed of two distinct composition, defined by flow banding; width of scale bar = 10 µm. B) Highly vesicular melt particle in clastic matrix (dominated by quartz); width of scale bar = 10 µm. C) Melt particle with distinct areas of variable composition; width of scale bar = 10 µm. D) Sample BS-2B; highly vesiculated, compositionally variable melt with a mafic clast, which is shattered; width of scale bar = 10 µm.

Sample BS-2B, suevite from south of the crater.

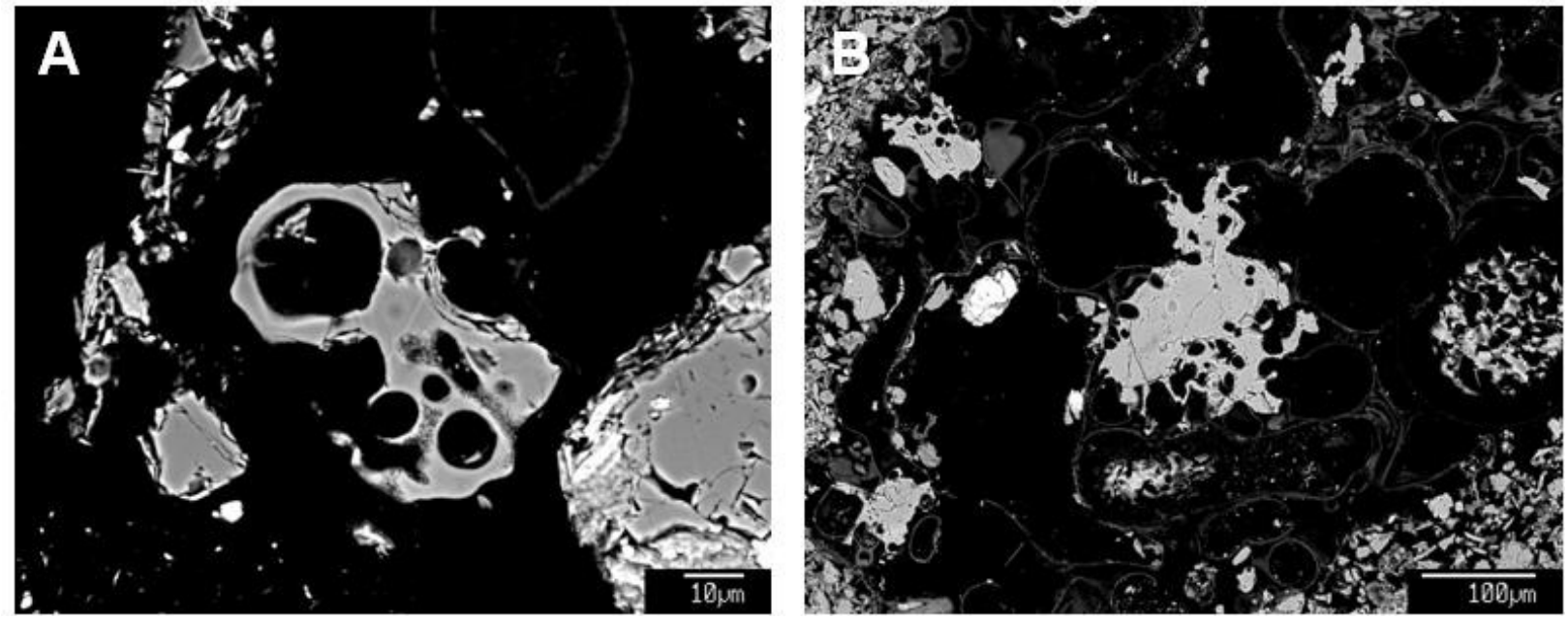


Thin section and backscattered electron images of melt particles analysed from sample BS-2B, suevite from south of the crater. A) All areas analysed in blocks. B) Area 1. Continued on next page.



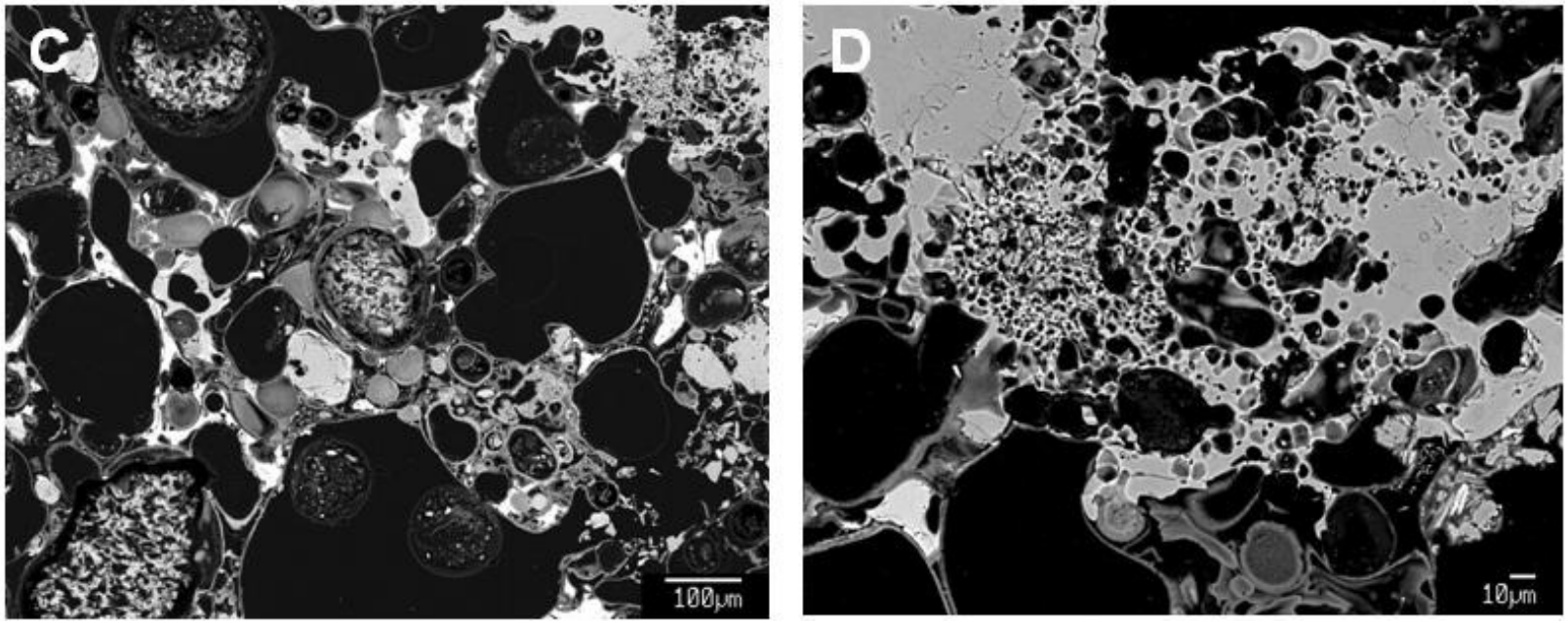
Backscattered electron images of melt particles analysed from sample BS-2B, suevite from south of the crater. C) Area 2. D) Area 3. The points analysed are indicated in red. All particles contain quartz clasts and are strongly vesiculated, which yield low totals. Width of scale bar = 100 µm.

Sample BS1-B, suevite from south of the crater.



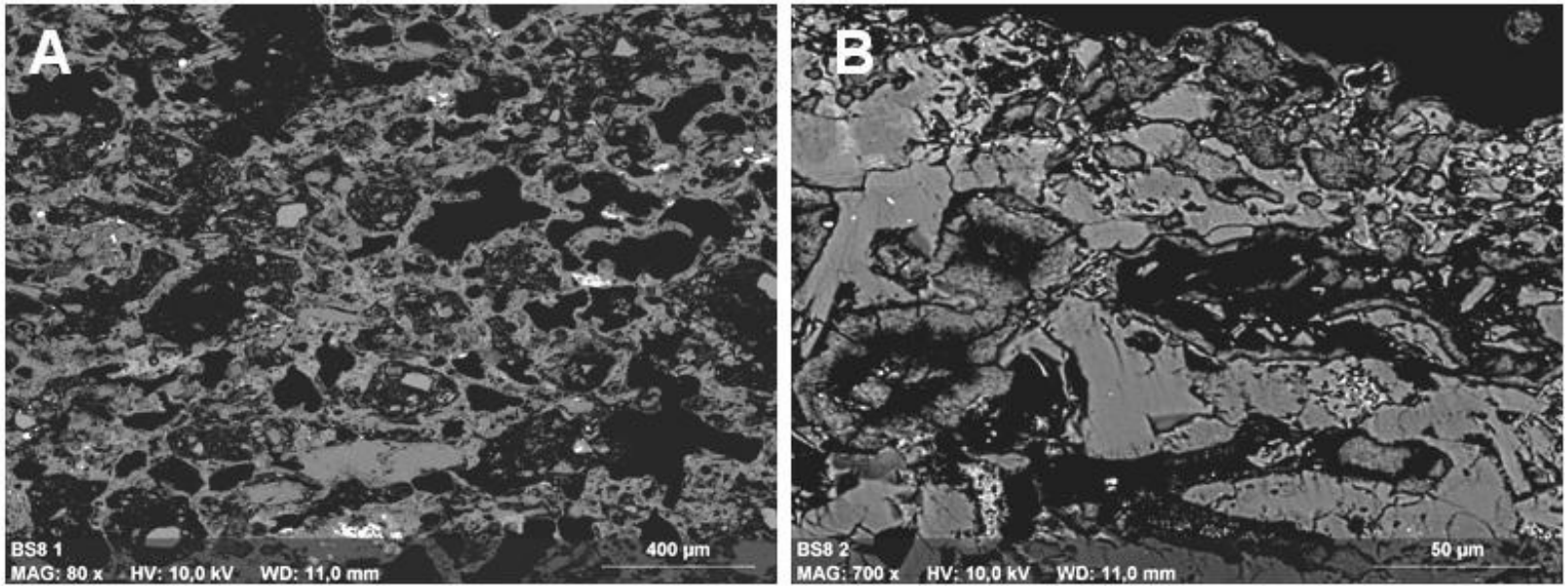
Various particles in sample BS1-B. All particles are highly vesiculated and compose mixed melts. A) Width of scale bar = 10 µm. B) Width of scale bar = 100 µm. Continued on next page.

Sample BS1-B, suevite from south of the crater.



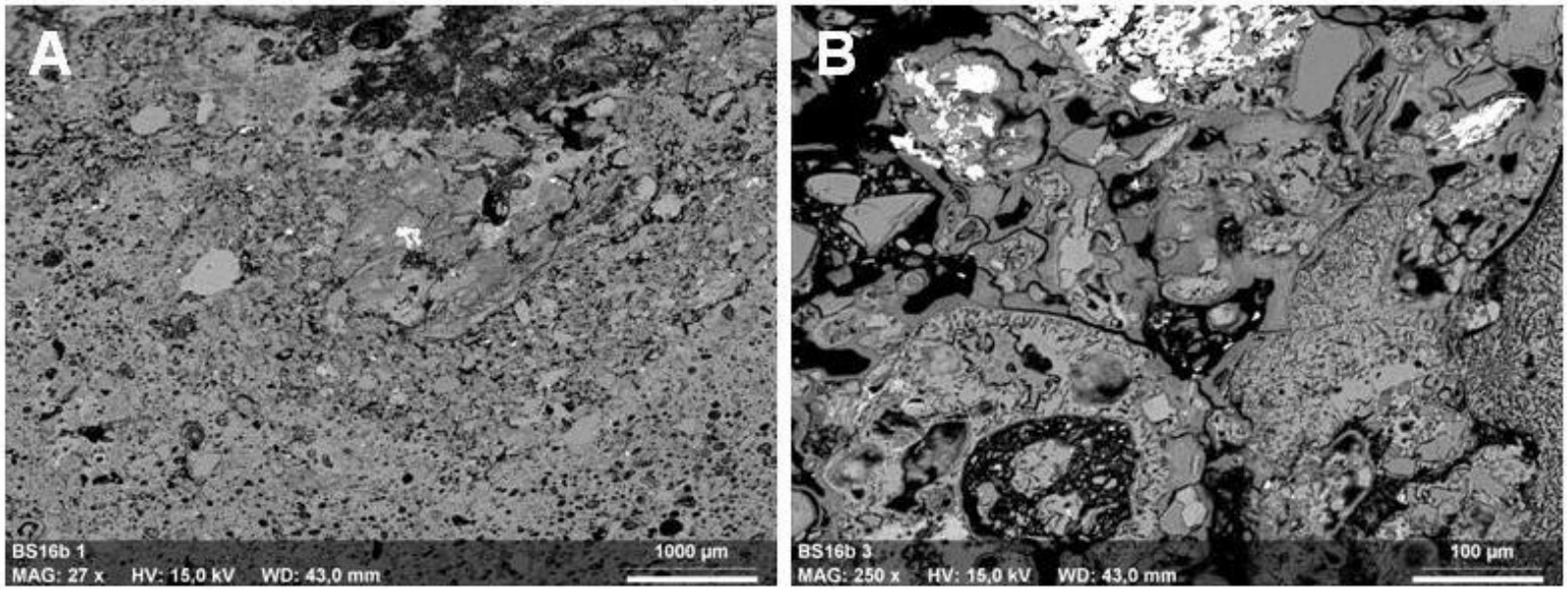
Various particles in sample BS1-B. All particles are highly vesiculated and compose mixed melts. C) Width of scale bar = 100 µm. D) Width of scale bar = 10 µm.

Sample BS-8, suevite from north of the crater.



A) Melt agglomerate (see text for details; melt particles that are apparently fused together) with equal proportions of melt and vesicles; width of scale bar = 400 µm. B) Melt agglomerate with large quartz clasts. The melts have been partially replaced by phyllosilicates; width of scale bar = 50 µm.

Sample BS-16, suevite from north of the crater.



A) Melt particle in lower part of the image, with much vesiculation; two distinct compositional varieties are apparent in terms of colour variation; width of scale bar = 1000 µm. B) Melt agglomerate with micolites, vesicules; width of scale bar = 100 µm.

Appendix 7: Peer-reviewed papers.

Coney, L., Gibson, R.L., Reimold, W.U., Koeberl, C. (2007). Lithostratigaphic and Petrographic Analysis of ICDP Drill Core LB-07A, Bosumtwi impact structure, Ghana. Meteoritics and Planetary Science, **42**, 569-590.

Coney, L., Reimold, W.U., Gibson, R.L., Koeberl, C. (2007). Geochemistry of impactites and basement lithologies from ICDP Borehole LB-07A, Bosumtwi Impact Structure, Ghana. Meteoritics and Planetary Science, **42**, 667-688.

McDonald, I., Peucker-Ehrenbrink, B., **Coney, L.**, Ferrière, L., Reimold, W.U., and Koeberl, C. (2007) Search for a meteoritic component in drill cores from the Bosumtwi impact structure, Ghana: Platinum-group element contents and osmium isotopic characteristics. Meteoritics and Planetary Science, **42**, 743-754.