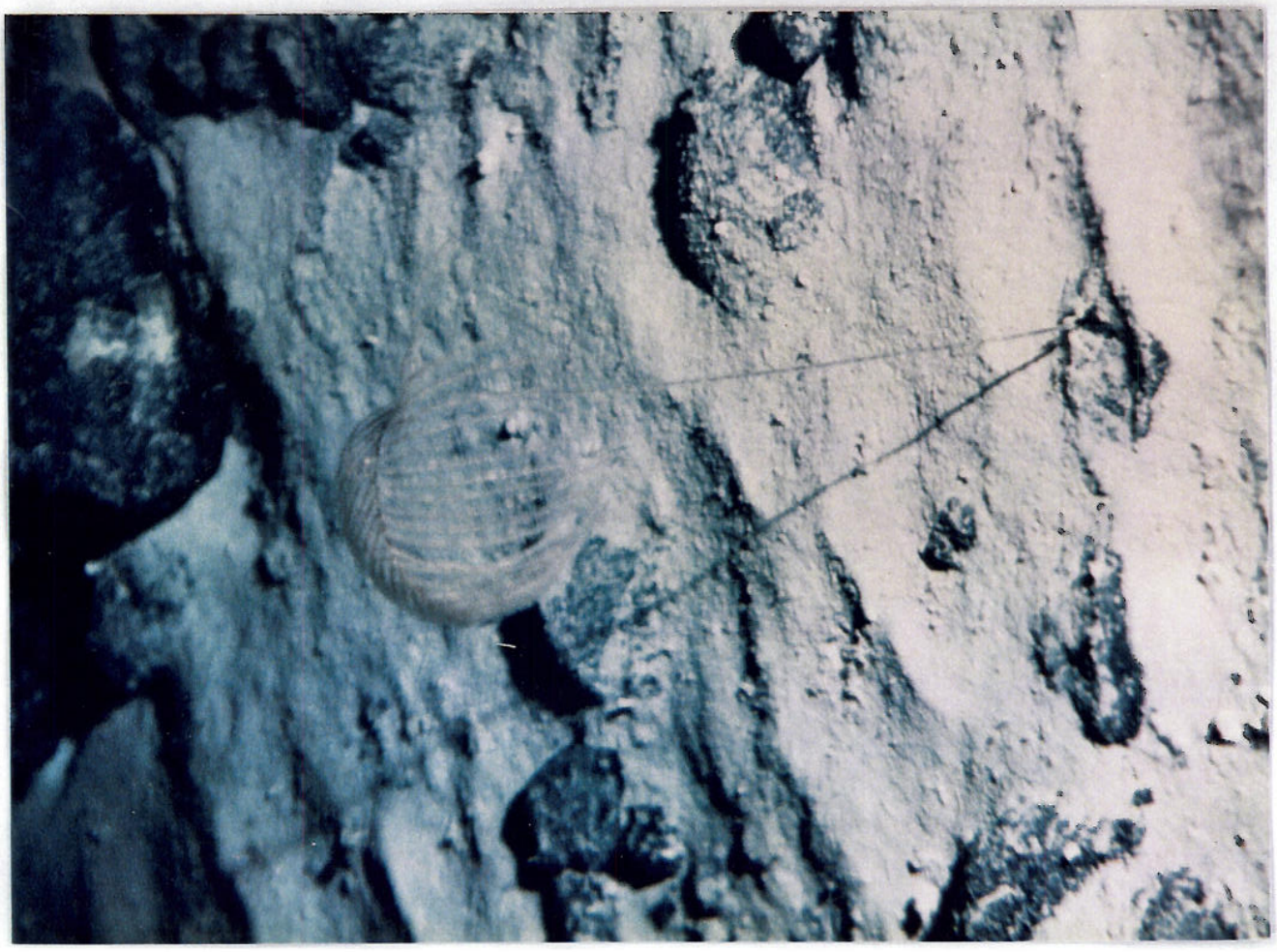
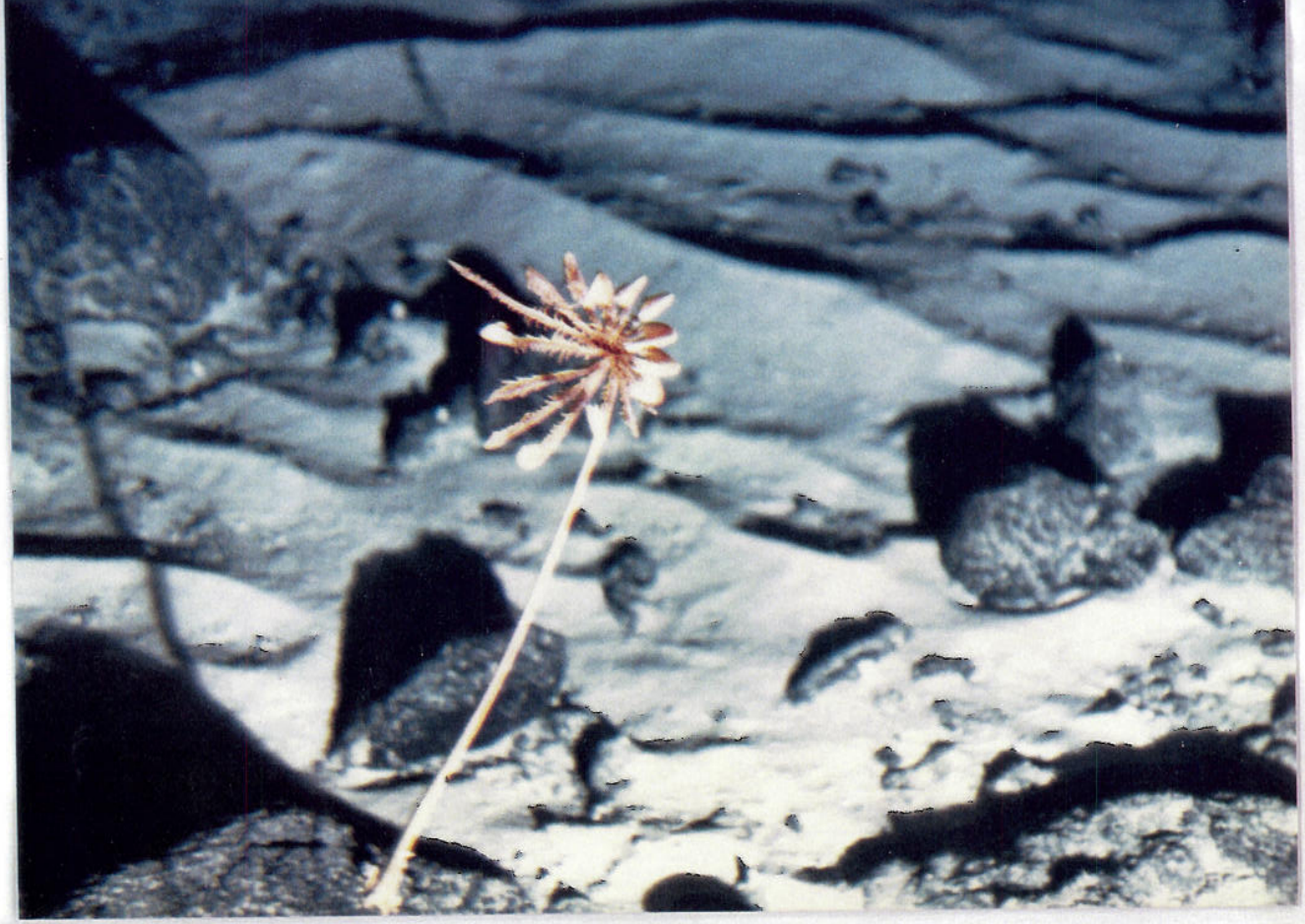
Atlantis II - Alvin 3/87

AII 118-12



Atlantis II
Alvin
3-87



SAMPLE DESCRIPTION

Cruise Id: Atlantis II-Alvin (3/87) Size: 71 x 21 x 3.5 cm + broken into 3 pieces. Location: Horizon Guyot

Sample Id: H-1763 Weight: 9.4 kg Depth: 1763 m

Mn Crust Description

Surface Texture: smooth

Mn Crust Thickness:

Min: <1 mm Max: <1 mm Ave: <1 mm

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.	—	—	—	
2.				
3.				
4.				
5.				
6.				

Atlantis II-Alvin cruise (3/87) H-1763

Horizon Guyot

webbed appearance due to moisture. Difficult to tell, but this appears to be top surface

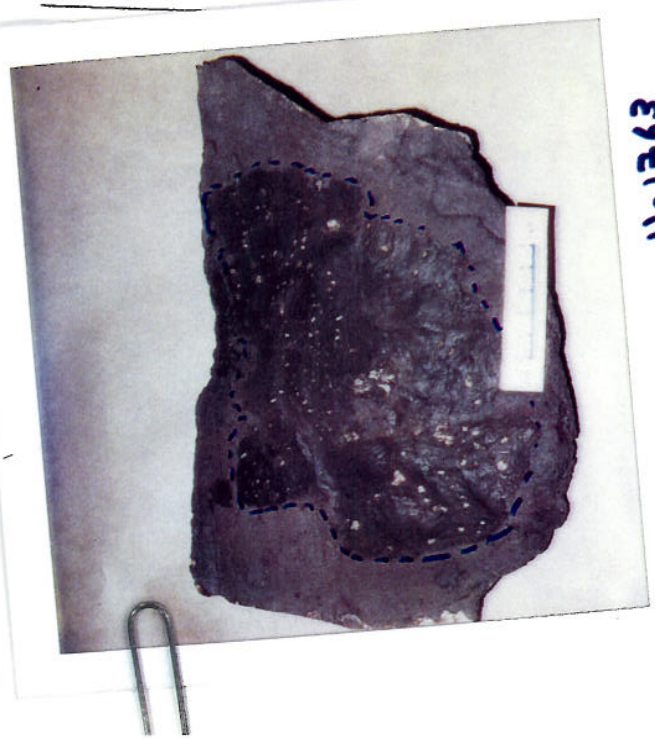
photo 1

Comments and XRD Mineralogy:

Note: Used hand drill to sample for CC. Drilled outer (top) surface of piece 2.

ANALYSE

Subsample & Type	Thickness ~~Analysis~~	Analysis + wt. ~~Weight~~
H-1763A Bulk crust	<1 mm	CC (5.05 g), XRD
H-1763B sil. chalk	—	XRD
H-1763C chert	—	XRD



H-1763 piece 2 showing area sampled photo 6

Atlantis II-Alvin cruise (3/87) Horizon Guyot

Substrate Description

Rock Type: brown chert surrounded by siliceous chalk

Description:

brown chert w/ tiny white speckles, + rare sections of sil. chalk (round areas ~5 mm diam). Layer of white sil. chalk completely surrounds chert + forms contact w/ mn.

Described By: Subsampled By:

Atlantis II - Alvin cruise (3/87)
Horizon Guyot

H-1763
piece 1+2
photo 2

Atlantis II - Alvin cruise (3/87)
Horizon Guyot

H-1763
piece 3
photo 3

Atlantis II - Alvin (3/87)
Horizon Guyot

H-1763
flip side of photo 1
photo 4

Atlantis II - Alvin (3/87)
Horizon Guyot

H-1763
piece 1
photo 5

SAMPLE DESCRIPTION

Cruise Id: Atlantis II - Alvin 3/87 Size: 24 x 22 x 10.5 cm Location: Horizon Guyot

Sample Id: H-1839 Weight: 6.31 kg Depth: 1839 m

Mn Crust Description

Surface Texture: mixture of smooth and botryoidal on top, botryoidal x granular on sides, granular on bottom. Whitish sediment (calcite) imbedded in crust surface

Mn Crust Thickness:

Min: 1 mm Max: 2 mm Ave: 2 mm (top)
1 " 2 " 1 " (bottom)
2 " 6 " 3 " (sides)

Layers (Outer to Inner): none

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				
6.				

H-1839
Atlantis II - Alvin
3/87 Horizon Guyot

Comments and XRD Mineralogy:

When sampling crust scraped off orangish coating on underside, where it attaches to substrate. This coating is also along fractures in crust in a few places. So cleaned it off, too. Sampled top of Half 1 Massive internal structures

Substrate Description

Rock Type: Basalt

Description:

Fairly fresh gray basalt. Phenocrysts all replaced/weathered to orange on sides. Phenocrysts were amphibole + px +/or feldspar. A few large vesicles filled w/ whitish to beige mud. (not calcite)

ANALYS

Subsample & Type	Thickness of crust ~~Analysis~~ sampled	Analysis (+ wt.) ~~Weight~~
H-1839 - bulk crust	2-3 mm	"mn crust chem" (10.2 g) and XRD

Described By: Lisa Gein Subsampled By: Lisa Gein

All II
118+12

~~KarinRidge~~
~~Johnston Is~~

Sample Description

Cruise I.D: Atlantis II - Alvin dives (3/87) **Sample I.D: Sta:** H-1830 **Location:** Horizon Guyot

Size: 27x17x13 cm **Weight:** 7.74 kg (wet after slabbing in half)

water Depth = 1830 m

crust thickness:

measured on top of crust

Total: min: 24 mm max: 35 mm ave: 30 mm

Inner crust: min: ____ max: ____ ave: ____

Outer crust: most min: 6 mm max: 12 mm ave: 10 mm

Surface texture: botryoidal

Internal structure: layered, at least 5 layers

layered: ____
laminated: ____
massive: X
porous: ____
dendritic: ____
other: one layer near bottom of crust has lt. orangish-tan layer <½ mm thick separating it from layer above (phosphorite? Fe-oxide) that pinches out.

Mineralogy (XRD): ____

H-1830
Atlantis II - Alvin dives
3/87 Horizon Guyot photo 1

sociated alteration, phosphorite, or drothermal deposits: ____

Substratum:

Rock type: Basalt

Description: Several scattered large vesicles. Fairly fresh gray. Some plag-coclase phenocrysts. Manganese dendrites along crack, + near "top" etc. w/ crust

Mineralogy (XRD): ____

Analyses and subsamples:

analysis: (See back)	analyst:
Chemistry: Crust only was sampled "Mn Crust pkg", Pt group, Au sent to Floyd Brown's lab	Lisa Gein
RGE Thkness sampled	sent to USGS A-labs
A = outer crust (3-12 mm)	0-10
B = middle crust (5-12 mm)	10-20
C = inner crust (8-12 mm)	20-34
D = bulk crust (24-34 mm)	0-34
X-ray mineralogy	Lisa Gein
A = outer crust	
B = middle "	
C = inner "	
D = not sampled	
Bulk RFE not submitted	
3.5 MM slide	G. Smith
Li isotopes → 55 gm	Yeh

H-1830
Atlantis II - Alvin Dives
3/87 Horizon Guyot
Half1
photo 2

H-1830
Atlantis II - Alvin dives
3/87, Horizon Guyot
Half1
photo 3

CRUST (see photos 4-7)
Can sample 3 layers of crust for chemistry: uppermost (measured on front), middle (which in places is multilayered), bottom (which is bounded by an orangish tan layer of sediment (not the layer you see in photos 2+3, but a layer just above [see other photos]). Samples are from Half2.

A = uppermost layer: Thickness sent for chem. 6-12 mm, wt. sent 46.1g (11.7g RGE, 34.9g others). Orange Fe-oxide in pore spaces common.

B = middle layer: Thickness sent for chem 8-12mm. wt. sent 45.9 (7.8g RGE, 38.1 others). Bounded w/ layer C by whitish sediment (calcite? phosphorite?). Composed of at least 3 layers. whitish sediment cleaned off before sending. A few minute areas of orange in crust

C = Innermost layer: Thickness sent for chem 8-12mm wt. sent 57.2g (11.9g RGE, 45.3g others). See starred (*) note on photo 5 (p.2). Composed of at least 3 layers. Cleaned out most of the orange. There also a little phosphate between layers

D = Bulk crust: Thickness sent for chem 24-34mm. wt. sent 95.1g (25.1g RGE, 70.0g others).

Cruise: Atlantis II - Alvin

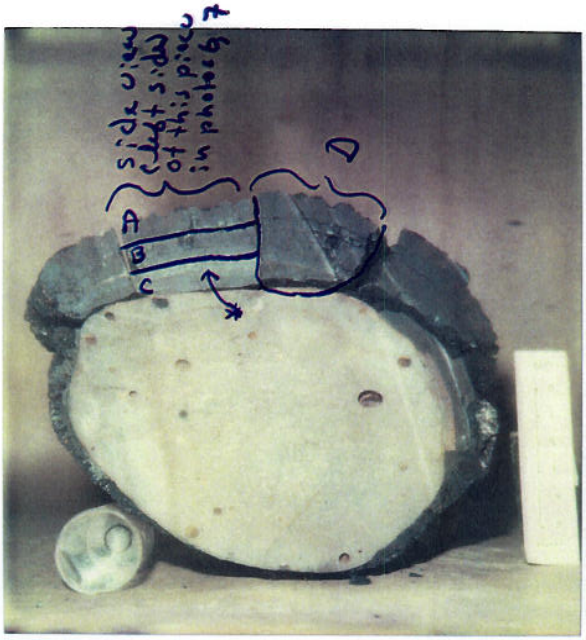
Sample I.D. H-1830

Location Horizon Guyot

* This orangish layer with C corresponds to the one in Half 1 (photos 2 & 3).

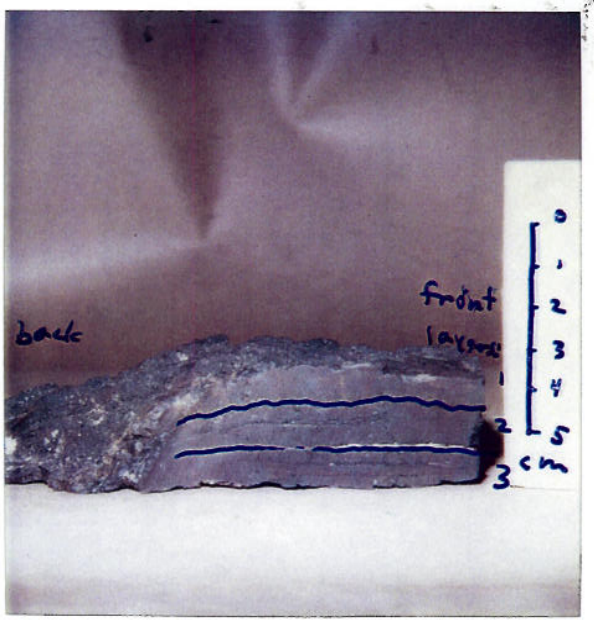
H-1830
Atlantis II - Alvin
3/87 Horizon Guyot

Half 2
photo 4



H-1830
Atlantis II - Alvin
3/87 Horizon Guyot

Half 2
photo 5



H-1830
Atlantis II - Alvin Dives
3/87 Horizon Guyot

side view of labelled section in photo 5

Half 2
photo 6

H-1830
Atlantis II - Alvin dives
3/87 Horizon Guyot

side view of labelled section in photo 5

Half 2
photo 7

SAMPLE DESCRIPTION

Cruise Id: Atlantis II - Alvin (3/87) Size: 17 x 17.5 x 11.5 cm Location: Horizon Guyot

Sample Id: H-1799 Weight: 4.3 kg Depth: 1799 m

Mn Crust Description

Surface Texture: botryoidal on top. mostly granular + botryoidal on sides. Granular to smooth on bottom

Mn Crust Thickness:

Min: 6 mm Max: 9 mm Ave: 7 mm (top)
1 " 5 " 2 " (bottom)

Layers (Outer to Inner):

	Min	Max	Ave	Texture
1.				
2.				
3.				
4.				
5.				
6.				

H-1799

Atlantis II - Alvin
3/87

Comments and XRD Mineralogy:

Crust on top of sample is porous. In the middle filled in w/ light brown mud. So cleaned mud out for chem, XRD

Substrate Description

Rock Type: Chert w/ chalk rim

Description:

Brown chert nodule w/ siliceous chalk nucleus + layer of same completely surrounding chert. Tan to off white porcelanous rim in contact with chert and s. chalk along bottom and one side. Contact between chert porcelanite rim + s. chalk very sharp. Porcelanous rim has brown flecks in it and one large brown patch on one side is now chert. White chalk has Mn grains in it (fine sand-sized)

ANALYSES

Subsample & Type	Thickness of crust ~~Analysis~~ sampled	Analysis and (weight s ~~Weight~~
A - bulk crust	6-8 mm	"Mn crust chem" (15.6g) + XRD
B - white sil. chalk	—	XRD
C - brown chert	—	"
D - porcelanous rim	—	"

Described By: Lisa Gein Subsampled By: Lisa Gein