DREDGE 1

Dredge Sample Summary Sheet

Sample ID	Bulk CC	Layer CC	Pt & Au	Ree	OC	DPTS/TS	XRD	35mm Photo	Paleo	Archive
D1-1										
D1-2	1	5					6			
D1-3							1			
D1-4										
D1-5							1			
D1-6										
D1-7										
D1-8										
D1-9										
D1-10					1		1			
D1-5,2,3		(1)					1			

SAMPLE DESCRIPTION

Cruise Id: 91-AV-19/2 Size (cm): 19 X 30 X 75 Location: V2-91-CP - Horizon Ridge

Sample Id: D1-1 Weight (kg): 50 kg Depth (m): 1900 - 1809

Mn Crust Description

Surface Texture: Botryoidal

D1-1

Mn Crust Thickness (mm):

Most recent Top

Min: 15 Max: 40 Ave: 25

Porous & massive

Outer to Inner Layers (mm)

Most recent Bottom

	Min	Max	Ave	Texture & Color
1	40	70	50	massive to lamin-
2				ated w/ phos.
3				partings &
4				veins
5				
6				

Comments and XRD Mineralogy:

Most recent growth surface not the thickest - Phosphorite scattered throughout the crust -

Subsampl

Substrate Description

Rock Type: hyaloclastite - yellow-brown w/ Phos. lenses -

Description:

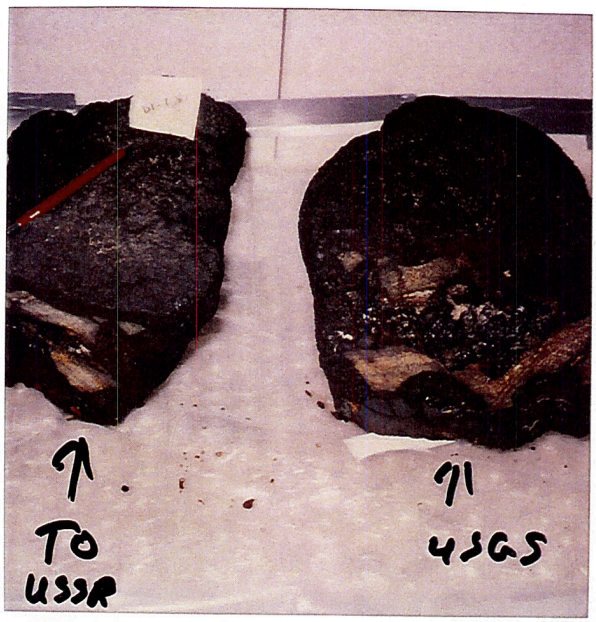
Sample at cut & Hand cut in lab - rephoto w/

Biology (?): Encrusting Forams

1/2 U.S.G.S. & 1/2 Soviet

Described by: Hein

Subsampled by:



D1-1

SAMPLE DESCRIPTION

Cruise Id: 91-AV-1912 Size (cm): 10 X 17 X 24 Location: V2-91-CP

Sample Id: D1-2 Weight (kg): 4.8 Depth (m): 1900-1809

Mn Crust Description

Surface Texture: botryoidal to subdued botryoidal

Mn Crust Thickness (mm):

Min: 45 Max: 80 Ave: 65

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1			8	massive
2			20	Porous
3			40	dense massive
4				phosphorite veins
5				+ partings
6				

D1-2

Comments and XRD Mineralogy:

Subsamp

D1-2A 0-10mm CC 12.5gm
XRD

D1-2B 10-30mm CC 19.8gm
XRD

D1-2C 30-72 mm CC 20.0gm
(Possible Fphosphate veins) XRD

D1-2D Bulk crust 0-72mm CC. 40.3gm
XRD

± USSR ± USGS

D1-2E XRD Surface Scrape

D1-5,2,3 CC Surface Scrape (5.1g)

D1-5,2,3 XRD

Substrate Description

Rock Type: Minor hyaloclastite

Description: altered to smectite + phillipsite? - yellow-green - Mn cement

Biology (?): Encrusting Forams

Described by: HEIN

Subsampled by: G.S. / J.W.

D1-2,3,5

SAMPLE DESCRIPTION

Cruise Id: V2-91-CP 91-AV-19/2 Size (cm): 21 x 16.3 x 12.5 Location: ~~V2-91-CP~~ S. Karin Ridge

Sample Id: D1-3 Weight (kg): 5 Depth (m): 1809-1900

Mn Crust Description

Surface Texture: Talus botryoidal smooth

Mn Crust Thickness (mm):

Min: 15 Max: 45 Ave: 32

Outer to Inner Layers (mm)

		Min	Max	Ave	Texture & Color
2/3 layer	1	2	11	18	Dense
	2	2	11	8	Vuggy to Porous some POy
	3	3	32	16	Dense some fractures & thin POy veins
	~~4~~				
1/3 layer	5	2	13	7	Vuggy to porous some POy oxidized
	~~6~~ 7	2	38	25	Dense some fractures & thin POy veins

91-AV-19/2
D1-3

Comments and XRD Mineralogy:

Thickness of Mn Layers varies throughout 2/3 of Rock has a top layer & 1/3 top surface has been eroded

Subsamples

D1-5, 2, 3 cc Surface Scrapes 5.1g

D1-3 XRD Surface Scrapes

Substrate Description

Rock Type: Yellow-Brown Hyaloclastite

Description: Phosphatized Hyaloclastite impregnated with Mn + bedded

50% U.S.G.S.
50% Soviet

Biology (?): Encrusting foram

Described by: J.W.

Subsampled by:

91-AV-19/2
D1-3

SAMPLE DESCRIPTION

Cruise Id: 91-AV-19/2 Size (cm): 5.5 x 12.0 x 17.0 Location: V2-91-CP

Sample Id: D1-4 Weight (kg): 3 Depth (m): 1900 - 1809

Mn Crust Description

Surface Texture: granular mostly surface layer is missing -

Mn Crust Thickness (mm):

Min: 12 Max: 22 Ave: 20

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1				massive phos
2				lenses
3				
4				
5				
6				

Comments and XRD Mineralogy:

at least upper 5 mm is missing from mostof sample

Sul

Substrate Description

Rock Type: Hyaloclastite w/ phosphorite

Description: yellow-green hyaloclastite clast in Phosph. Cement - dense, cherty, maybe layered

½ USSR ½ USGS

Biology (?): encrusting Foram

Described by: HEIN

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: 91-AV-1912 Size (cm): 70 x 110 x 122 Location: V2-91-CP

Sample Id: D1-5 Weight (kg): 3 Depth (m): 1900 - 1809

Mn Crust Description

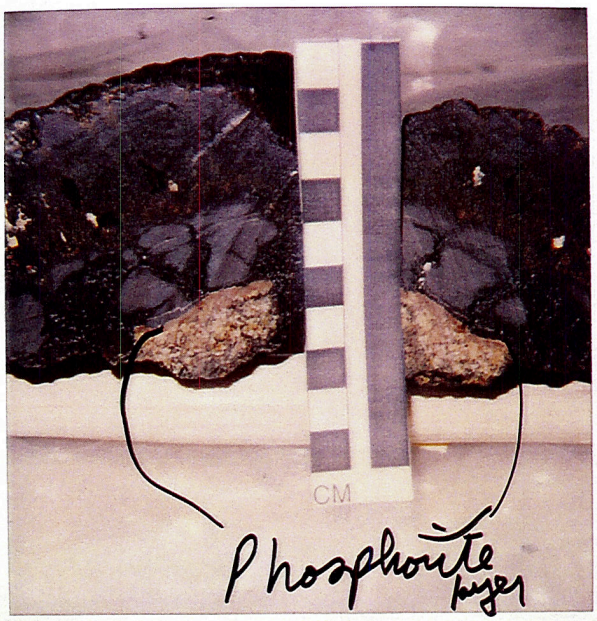
Surface Texture: Deep botryoidal smoothed on edges

Mn Crust Thickness (mm):

Min: 40 Max: 55 Ave: 50

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1			8	massive
2			20	porous & vuggy
3			22	massive but
4				fractured
5				
6				



Comments and XRD Mineralogy:

Subs

D1-5, 2, 3 CC Surface Scrape (5.1g

D1-5 XRD surface scrape

Substrate Description

Rock Type: hyaloclastite, phosphorite layer

Description: Phos. layer separates crust & substrate; hyal. yellow-green

50% U.S.G.S. / 50% Soviet

Biology (?): Encrusting Forams

Described by: HEIN

Subsampled by: JW | LEV

SAMPLE DESCRIPTION

Cruise Id: 91-AV-19/2 Size (cm): 11 x 8 x 5 Location: ~~V2 91-CP~~ S. Kurile Ri

Sample Id: D1-6 Weight (kg): 0.4 Depth (m): 1809-1900

Mn Crust Description

Surface Texture: Smooth botryoidal

Mn Crust Thickness (mm):

Min: 40 Max: 70 Ave: 62

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	4	10	8	Porous some oxidized
2	36	60	54	Dense, vuggy filled with PO4, some PO4 veins and microfractures
3				
4				
5				
6				

91-AV-19/2
D1-6

Comments and XRD Mineralogy:

An end n side part - rest missing

Subsam

50% U.S.G.S.
50% Soviet

Substrate Description

Rock Type: No substrate but phosphorite lens in crust

Description:

Biology (?):

Described by: J.W.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: 91-AV-19/2 Size (cm): 50×72×8 Location: ~~V2-91-CP~~ S. Karin Ridge

Sample Id: D1-7 Weight (kg): 2.7 Depth (m): 1900-1809m

Mn Crust Description

Surface Texture: Granular with current eroded botryoids 1mx6x2mm Average. Bot.

Talus granular on bot.

Mn Crust Thickness (mm):

Min: ½ Max: 32 Ave: 26

broken surface

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1				
2				
3				
4				
5				
6				

91-AV-19/2

D1-7

Comments and XRD Mineralogy:

Sawed on surface the texture is dense. On fractured surface it appears shinny with laminea. The broken surface is a "bedding" plane of the laminea?

Subsa

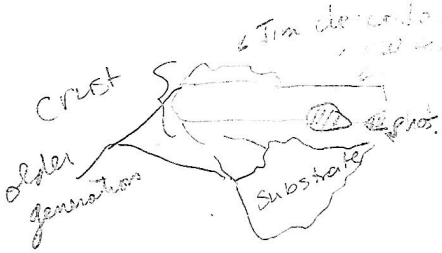
Substrate Description

Rock Type: hyloclastic Breccia

Description: older green hyloclastite clast with younger similar hyloclastite Mn crust in Mn impregnation. Several episodes of Phosphatization. Phos. in crust - vugs + stringers ½ to 1 s

Biology (?): encrusting forams ½ in crust

Described by: G.S. Subsampled by:



SAMPLE DESCRIPTION

42 pieces

Cruise Id: 91-AV-19/2 Size (cm): 28-65 length 15-65 Width Location: ~~V2-91-CP~~ South Karin Ridge

Sample Id: D1-8 Weight (kg): _____ Depth (m): 1900-1809

Mn Crust Description

Surface Texture: Varies: Granular with low botryods. or Med. botryoids with gradular + pourous surfaces

2x7mm Current controled? 5x10mm

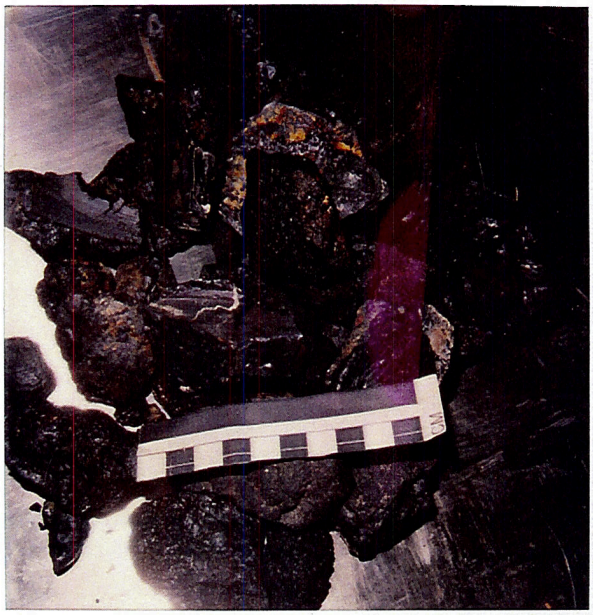
Mn Crust Thickness (mm):

Min: 15 Max: 31 Ave: 22

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1				
2				
3				
4				
5				
6				

misc. pieces



D1-8

Comments and XRD Mineralogy:

Mostly Black dense. Some minor pourous layers. A few layers are shinny like coal Possible stringers of Phos.

Subsample No.

100% Sarnet

Substrate Description

Rock Type:

Mostly inner massive layer fragments some side crust fragments & few Tops

Description:

Biology (?): Moderate encrusting forams

Described by: G.S.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: 91-AV-19/Z Size (cm): 4 pieces 38-40mm length 23-40mm width Location: ~~V2-91-CP~~ South Kanin Ridge

Sample Id: D1-9 Weight (kg): 168.3 g Depth (m): 1900-1809m

Mn Crust Description

Surface Texture: Granular Black very pourous

Mn Crust Thickness (mm):

Min: petina Max: 24mm Ave: 6mm

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1	SA	me	as	above, 1 layer
2				
3				
4				
5				
6				

D1-9

Comments and XRD Mineralogy:

Subsam

100% Soviet

Substrate Description

Rock Type: Highly altered hyloclastite

Description: Green to yellowish green clasts, dark brown cement - minor phosphatization

Biology (?): 1% encrusting forams

Described by: G.S.

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: V2-91-CP 91-AV-19 Size (cm): 4 pieces 25-35 mm width 33-55 mm length Location: ~~V2-91-CP~~ Southern Karin Ridge

Sample Id: D1-10 Weight (kg): 108.3 g Depth (m): 1900-1809 m

Mn Crust Description

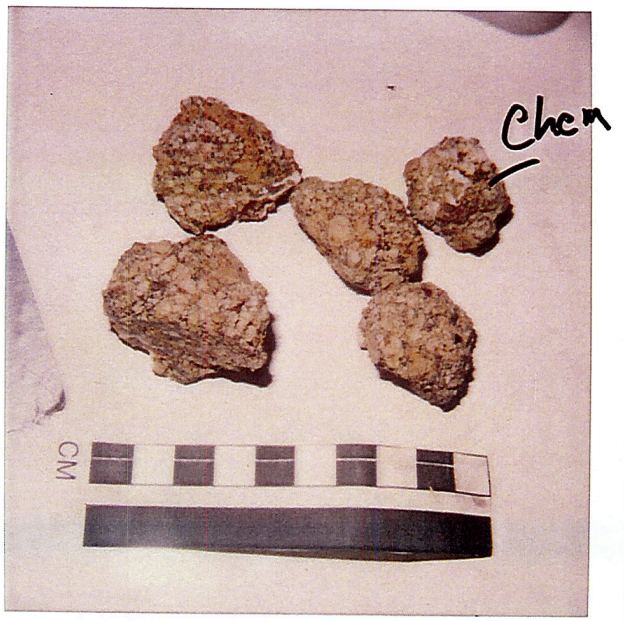
Surface Texture: None

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1				
2				
3				
4				
5				
6				



91-AV-1912

D1-120

Comments and XRD Mineralogy:

Subs

50% U.S.G.S.

50% Soviet

Substrate Description

Rock Type: Hyloclastite (Volcanic)

Phosphatized

D1-10

OC 11.3 gm

XRD

Description: yellowish green volcanic clastic clasts with dark brown cement + white viens of P_2O_5 + light brown

3 Kinds of Phosphate ① ② ③

Biology (?): None

Described by: G.S.

Subsampled by:

$n(2)$, MgO_{24} + Al_2O_3

More the yellow the more phosphate <10 P_2O_5

91-AV-19/2

D1-1[illegible]0