Station Data

SO 37 43 DS Pinger on wire 300m from dredge

	Time (GMT)	Lat N	Lon W	Water Depth	Wire Length	Tension
Begin operation:	06:46	15° 22' 36"	169° 14' 29"	1775	—	—
Begin Lowering:	06:50	15° 32' 39"	169° 14' 20"	1767	—	—
+1 bottom contact:	07:23	15° 32' 63"	169° 14' 28"	1769	1792	2.05
Off bottom	09:10	15° 32' 15"	169° 13' 98"	1562	1516	2.4
Begin heaving	08:52	15° 32' 28"	169° 13' 82"	1459	1910	3.3
End heaving	09:41	15° 32' 21"	169° 14' 35"	1566	—	—
End operation	09:49	15° 32' 25"	169° 14' 44"	1598	—	—
		15° 32' 28 N	169° 14' 59" W			

Ship course 142.4°
total time of bottom contact: 107 min
Bottom topography: slope
Calc. mean water depth 1586 m
Ship velocity ~1 kts.
Length of dredge section: 1000 m

total recovery: 400 kg
0 recovery - nodules
total crusts recovery 100 kg.
total substrate recovery 300 kg.

100% coverage by crusts
0% nodules
~75% talus

Thicket crust - ~[illegible]5 cm
Thinnest " - ±4 mm
} avge: ~ 2 cm

Surface topography: subdued botryoidal
Internal struct: up to 4 generations, alternating dense and porous dendritic; no phosphorite hiatus
encrusting organisms: <1% tubular foraminifera
Photos ?
Substrates AOB hyaloclastite
" Volcanogenic Breccia

(composite w/ 43 DS ?)

Rock Type: Hawaiite(?), scoriaceous → -do- (?), vesicular

Color: Brownish-gray (5YR4/1) to light brown (5YR5/6) → -do-, only

Texture: Intergranular → -do-

Phenocrysts: Plagioclase, 15% ± 3 mm; Pyroxene, ± 1%, ± 1 mm → -do-

Groundmass: Plagioclase, Pyroxene, Olivine(?), Opaques (not determined) → -do-

Vesicles: ± 50%, round, coalescing, ± 1 mm dia., filled w/ porcellaneous dense phosphorite → ± 15%, irregular, flattened; ± 5 mm (range: 0.25 mm – 2 cm); lined w/ smectite & drusy phillipsite

Alteration: extensive-penultimate → -do-! → -do-

(smectitization, zeolitization, oxidation) → -do-!

Remarks: Our sample is a subangular, cobble-size talus clast completely enclosed in dendritic (internal struct.), dense, botryoidal (external struct.) ferromanganese oxide crust, ± 2 mm thick. The Hawaiite(?) substrate is scoriaceous and the interconnecting openings are filled with dense, greenish, porcellaneous phosphorite; it is a composite with 43 DS 7 a white, chalky phosphorized foram. chalk which may have been a capping material on an outcrop; the Hawaiite may be a pillow lava fragment. Seems definitely similar to such material in the next lithology, 43 DS 2

→ subrounded cobble

→ appears abraded, has no surface deposits

→ rock is vesicular, with the vesicles often large, irregular and like slugs, lined w/ phillipsite

→ (no adhering material)

→ -do-, definitely appears to be a fragment of pillow lava with palagonitized glassy (glassy) rind still attached; pc & ph phenocrysts stand out in relief on weathered surfaces

43 DS 3 (composite w/ 44 DS ?)

→ A or B Hyaloclastite ?

→ Dark orange-pink (general color) (5YR 7/4)

→ Pyroclastic

→ (Framework Grains): ± B Hyaloclastites, ± 5 o- ± 10% ± 0.2 mm; ± 10% ± 0.2 mm

→ (Cement): phillipsite(?) & (some-) phosphorized chalk, ± 30%

→ Average grain size: ± 1 mm (range: ± 0.10 mm – ± 2 mm)

→ Average grain shape: angular

→ Sorting: moderately sorted

→ Porosity: High

→ Permeability: moderately high

→ -do-, all phosphatization

→ Our sample is a subrounded talus clast cobble completely enclosed with fe-rich dendritic (internally), botryoidal (external) ferromanganese oxide deposit displaying only one (?) generation of growth and of least 5 mm thick (thickest upper crust was chipped off of this sample); the substratum is faintly-bedded, with cement & framework grains concentration ratios varying noticeably from bed to bed; remarkably well sorted as sorting in these rocks goes; very much resembles 44 DS,

→ spotted appearance due to isolated Mn O, oxide dendrites

Rock Type	A or B Hyaloclastite	Hawaiite? Volcanogenic Breccia	- do -
Color:	Grayish-yellow (5Y 8/4)	- do - w large hyaloclasts which are Dark yellowish-orange (10YR 6/6)	Light Brown (5YR 5/6) (framework grains) & Very pale yellowish-orange (10YR 9/6) ("cement")
Texture:	Pyroclastic	- do -	- do -
Framework grains:	A or B Hyaloclasts ±65%, ±0.5 mm	- do - but ±43%, ±	- do - but ±35%
	Open space (filled w dendritic Mn(OH)?), ±10%, ±0.5 mm	Hawaiite? rock fragments, ±2%,	±10%
		- do - plagioclase (?) crystals, ±20%	(absent)
Cement:	Smectite (montronite?) & phillipsite?), ±25%	- do -, but ±35%,	- do -, but ±55%
Average grain size:	±0.5 mm	±2 mm	(enormous variation.)
	(range: ±0.10 mm – ±1.0 mm)	(range: ±0.20 mm – ±10 mm)	(range: ≤1 mm – ±4 cm)
Average grain shape:	angular	Subrounded	Subangular
Sorting:	moderately well-sorted	poorly sorted	very poorly-sorted
Porosity:	Very high	- do -	extreme
Permeability:	high	moderate	very high
Alteration	Total/Smectitization (montronite) Zeolitization (phillipsite?)	- do - to penultimate (& oxidation in large A or B hyaloclasts)	- do -
Remarks:	Our sample is a large pebble-size Subangular, rhomb-shaped, joint-controlled outcrop(?) clast with traces of ferromanganese(?) oxide on two sides (may be a vein-filling, not an encrustation); substratum material is faintly bedded in a swell- and swale- or undulatory pattern, highlighted in some places by distribution of Mn(OH)? "cement" (in fillings of open space). This lithology was recovered from several adjacent dredge sites	Our samples are angular cobble-size fragments broken from outcrop and capped with a dendritic (internally), botryoidal (externally) one-generation, dense, Fe-rich ferromanganese crust at least 2 cm thick; the substrate seems composed of bimodal Hawaiite(?) hyaloclasts: larger ones (multi-millimeter-size) are orangeish crowded with plagioclase laths and plates (weathering out - may not be too altered!) (the whole rock is crowded with semi-loose plagioclase laths & plates), smaller hyaloclasts are pale yellow and more "bleached" than oxidized also rich in plagioclase crystals; bedding is lacking	- do - (no manganese encrustation) In this material, the hyaloclasts and rock fragments are related to basalt of 430 S2 (plagioclase-phyric); textural changes are rampant over the space of a few centimeters; unbedded.

(composite w/ 43DS3) — volcanogenic

Rock Type: Phosphorized Chalk ⇒ Phosphorite (Pebbly stone)

Color: White (N9) ⇒ Darky yellowish-brown (10YR4/4)

Texture: granular/spongy ⇒ microgranular/clastic

Framework grains:

Matrix: foraminiferal tests, ± 55%, ± 0.20 mm; open space, ± 20%, ± 0.20 mm ⇒ AOB Hyaloclasts, ± 10%, ± 5 mm l.; Hematitic clasts, ± 1%, ± 7 mm d.; Phosphorite clasts ± 2%, ± 3 mm d.; Ferromang. crust clasts ± 1%, ± 3 mm; openings, ± 3%, ± 1 mm dia

Cement: apatite, ± 25% ⇒ -do-, but ± 80%

Average grain size: ± 0.20 mm ⇒ ± 4 mm (matrix)

range: ? ← ± 0.50 mm) (range ? ← ± 10 mm

Average grain shape: round ⇒ sub round

Sorting: well-sorted ⇒ very poorly-sorted

Porosity: moderately high ⇒ low

Permeability: moderately low ⇒ ± impermeable

Alteration: moderate (phosphorization of original calcite/aragonite test material recrystallizations, Solution) ⇒ Total (phosphorization of original chalk cement oxidation, silicification, zeolitization of matrix components)

Works: Our sample is a thin (± 4 mm) bed capping 43DS3 bedded AOB hyaloclastite; it, like its substrate, is capped with dendritic ferromanganese oxide encrustation; the boundary between chalk & hyaloclastite is sharp, slightly undulatory (eroded surface on hyaloclastite); phosphorization is only partial, the chalk still yielding quite a bit of effervescence with HCl Sola; apparently, phosphorization and calcite recrystallization (lithification) followed a sequence of leaching which left a sponge of partially dissolved chalk

Our sample is a tabular, large-pebble-size talus clast entirely encrusted with a two-generation dendritic ferromanganese deposit (lowest: dense, ± 3 mm thick, upper: spongy, Fe-rich, > 1 cm thick) most of which was removed before we could sample; the substratum appears to have received materials related to 43DS2 which were admixed with the original foram chalk prior to lithification & diagenesis.