DATE: 24 August 1984 SAMPLE: 68 GTV
CRUISE ID: SO 33
LOC: VIII
AREA: F

	time (GMT)	LAT (N)	LON (W)	water depth (m)	wire ov
ON BOTTOM =	0822	20°08.66	170°36.88	1108	
OFF BOTTOM = + SAMPLE →	1308	20°01.62	170°38.29	1913	

RECOVERY WEIGHT = total 4 kg crust < .5 kg

CRUST THICKNESS = veneer, some chips of crust < 1cm

SUBSTRATE = subangular pebbles + cobbles (2 - up to 3 cm) of fresh basalt, with little or no Mn-veneer
Also, chalk + phosphorite pebbles

COMMENTS:

68 GTV

ANSCHLUSSBLATT:

PROTOKOLL KAMERA-EINSATZ

So 33

Kontin. Protokoll

Datum Zeit (von-bis)	Position Lat. Long.	Wassertiefe m (Korr.)	Seillänge m	V-Schiff	Kurs rw	Boden-photos M	Boden-photos Nr.	Filmtyp	Blende	Kamera-Entfer.	Bemerkungen
1004	20 04.70 170 37.34	1221	1236								Crust-fred (90°) knobby, block
1006	20 04.69 170 37.39	1227	1236								Encrusted (90°) FRACTURE small
1008	20 04.67 170 37.43	1234	1239								Crust-fred (90°) FRAGS small block
1010	20 04.66 170 37.46	1236	1242								Crust-fred (90°) fractured
1012	20 04.64 170 37.50	1230	1245								Encrusted (90°) FRACTURE block
1014	20 04.62 170 37.53	1230	1250								Encrusted (90°) COVERED
1016	20 04.62 170 37.58	1226	1254								Crust-fred (90°) small fragments with seds.
1018	20 04.60 170 37.62	1230	1256								Sediments
1020	20 04.59 170 37.65	1233	1256								Sediments with encrust rock frags 10-40% encrust
1022	20 04.57 170 37.71	1239	1254								Crust covered large rock small frags 50-60% with
1024	20 04.56 170 37.73	1237	1255								Sediments
1026	20 04.54 170 37.78	1252	1256								Encrusted (90°) Large encrusted rock frags, Sed
1028	20 04.53 170 37.81	1245	1256								Crust-fred (90°) Frags small block sed
1030	20 04.51 170 37.85	1242	1261								Sediments with occasional blocks
1032	20 04.49 170 37.90	1242	1267								Sediments with Frags encrusted blocks 50-50
1034	20 04.46 170 37.94	1244	1267								Sediments
1036	20 04.44 170 37.99	1250	1273								Encrusted (60°) Frag Sed. Blocks mark
1038	20 04.41 170 38.04	1245	1271								Encrusted (90°) Sediments with occasional rock-f
1040	20 04.43 170 38.09	1249	1272								Fragments blocks, with encrusted (60%) and sed
1042	20 04.47 170 38.10	1262	1274								Bioturbated sediment with occasional block.
1044	20 04.40 170 38.15	1257	1272								50-50 Seds + Frags encrusted
1046	20 04.37 170 38.18	1259	1273								50-50 Seds + ENCRUST ROCK FRAGMENTS

weitere Bemerkungen vgl. Anlageprotokoll

Anschlußblatt

AMR - Dr.

15.2.197

ANSCHLUSSBLATT

So 33

PROTOKOLL KAMERA-EINSATZ

(SET)

Kontin. Protokoll Hribnak/Cornell/Pitt

Datum Zeit (von-bis)	Position Lat. Long.	Wassertiefe m (Korr.)	Seilläge m	V-Schiff	Kurs rw	Boden-photos I	Boden-photos Nr.	Filmtyp	Blende	Kamera-Entfer.	Bemerkungen
1048	20 04,37 170 38.23	1259	1279								Sediments - Looks like crust, encrust frags underneath
1050	20 04,36 170 38.27	1260	1280								Encrusted Rock frags (30%) with seds
1052	20 04,35 170 38,32	1262	1279								Encrusted rock frags (25%) with seds - crusts underneath
1054	20 04,32 170 38.37	1273	1282								Encrusted rock frags (30%) with Seds
1056	20 04.29 170 38,40	1270	1284								Crust field (60%) frags + blocks - sediments
1058	20 04,25 170 38.45	1269	1292								Crust field (60%) frags + blocks - sediments
1100	20 04,21 170 38.49	1276	1299								Crust frags + blocks (20% in sediments
1102	20 04,19 170 38.52	1279	1301								Pillow Lava, good crust (50%) - sediments
1104	20 04.19 170 37.80	1279	1309								Sediments
1106	20 04.15 170 37.85	1285	1301								Sediments
1108	20 04.12 170 37.87	1293	1307								Crust frags, Pillow Lava (60%) with sediments
1110	20 04.07 170 37.89	1290	1309								Crust frags (30%) with sediments
1112	20 04.02 170 37.93	1293	1321								Crust field (40%) frags blocks - seds
1114	20 03.97 170 37.96	1298	1327								Crust field (30%) frags + blocks - sediments
1116	20 03.92 170 37.98	1299	1330								Sediments, Large ripple marks - a few blocks
1118	20 03.92 170 37.99	1308	1324								Sediments, a few small fragments
1120	20 03.87 170 38.02	1309	1340								Crust (30%), Seds,
1122	20 03.82 170 38.05	1318	134[illegible]								Crust (50%), Seds,
1124	20 03.77 170 38.08	1311	1350								Crust field (50%), Seds
1126	20 03.73 170 38.10	1306	1334								Crust field (95%) Knobby terrain - Sediments
1127 1128	20 03.69 170 38.13	1315	1361								Crust field (50%) frags + Blocks, Sediments
1129											START TAPE TWO

Satellite Update?

End of Video Tape One

weitere Bemerkungen vgl. Anlageprotokoll

Anschlußblatt

AMR - Dr.F
15.2.1971

ANSCHLUSSBLATT:

PROTOKOLL KAMERA-EINSATZ

68GTV
So 33
Area F, Loc 2

Kontin. Protokoll Halbach/Commer/Rath

Datum Zeit (von-bis)	Position Lat. Long.	Wassertiefe m (Korr.)	Seilänge m	V-Schiff	Kurs rw	Boden-photos I	Boden-photos M	Boden-photos Nr.	Filmtyp	Blende	Kamera-Entfer.	Bemerkungen
1130	20 03.65 170 38.15	1312	1366									Crustfield (90%) frags. + Sediment
1132	20 03.61 170 38.17	1322	1369									Crustfield (70%) frags. + Sediment
1134	20 03.58 170 38.19	1332	1367									Crustfield (70%) frags. + Sediment
1136	20 03.53 170 38.22	1339	1371									Crustfield (90%) + Sediment
1138	20 03.49 170 38.25	1338	1375									Crustfield (90%) + Sediment
1140	20 03.45 170 38.27	1345	1379									Crustfield (95%) + Knobby Sediments
1142	20 03.42 170 38.29	1346	1388									Sediments with crust frags (30% frags)
1144	20 03.36 170 38.32	1351	1395									Sed: With crust frags (40%)
1146	20 03.31 170 38.34	1358	1399									Crustfield (80%) frags + blocks - Sed
1148	20 03.29 170 38.35	1359	1404									Crustfield (75%) Pillow Lava - Sediments
1150	20 03.24 170 38.38	1361	1416									Nodules in Sediment
1152	20 03.20 170 38.40	1361	1412									Crustfield (95%) Pillow Lava - Sediment
1154	20 03.15 170 38.42	1368	1419									Crustfield (90%) frags + blocks, Nodules - Seds
1156	20 03.11 170 38.45	1371	1428									Crust frags, Pillow Lava (90%) - Sediments
1158	20 03.07 170 38.46	1372	1432									Encrusted Rock frags, Nodules - Sediments
1200	20 03.04 170 38.48	1374	1435									Nodules (50%) in Sed
1202	20 02.98 170 38.49	1378	1439									Nodules (25%) in Sed Crust beneath Seds
1204	20 02.93 170 38.49	1377	1444									11 11
1206	20 02.88 170 38.49	1378	1447									11 11
1208	20 02.83 170 38.49	1384	1449									Nodules + encrusted frags (40%) in Seds
1210	20 02.77 170 38.46	1391	1455									Sediment-A few nodules or frags
1212	20 02.70 170 38.45	1394	1457									Nodules (25%) in Sed

weitere Bemerkungen vgl. Anlageprotokoll

Anschlußblatt AHR - Dr.Fe
15.2.1973

ANSCHLUSSBLATT:

PROTOKOLL KAMERA-EINSATZ

So 33
Anlage Loc 8

Kontin. Protokoll

Datum Zeit (von-bis)	Position Lat. Long.	Wassertiefe m (Korr.)	Seillänge m	V-Schiff	Kurs rw	Boden-photos I	Boden-photos II	Boden-photos Nr.	Film-typ	Blende	Kamera-Entfer.	Bemerkungen
1214	20 02.72 170 38.44	1395	1460									Nodules + Rock frags (25%) in Sediments
1216	20 02.67 170 38.41	1400	1456									Nodules (30%) in Seds Ripple Marks
1218	20 02.34 170 38.60	1404	1463									Encrusted Rock frags + Blocks (30%) in Seds
1220	20 02.28 170 38.59	1414	1482									Encrusted Rocks + Nodules (25%) in Seds
1222	20 02.24 170 38.59	1418	1481									Pillow Lava, frags (25%) in Seds.
1224	20 02.21 170 38.56	1427	1476									Encrusted Rock frags, Pillow Lava (30%) in Seds
1226	20 02.18 170 38.54	1539	1465									Encrusted Pillow Lava, frags (30%) in Seds
1228	20 02.15 170 38.52	1548	1469									" "
1230	20 02.11 170 38.51	1628	1479									Nodules + Encrusted Rocks (50%) - in Seds
1232	20 02.08 170 38.49	1677	1482									Encrusted Pillow Lava (40%) in Seds
1234	20 02.06 170 38.45	1674	1477									Crusts (90%) Pillow Lava Seds
1236	20 02.06 170 38.44	1674	1503									Proceeding down cliff face.
1238	20 02.04 170 38.42	1696	1570									Encrusted Basalt (95%) with a little Sediment
1240	20 02.03 170 38.40	1719	1610									Encrusted Basalt (90%) continuing down cliff face
1242	20 02.00 170 38.37	1732	1633									" "
1244	20 01.99 170 38.35	1737	1656									Encrusted Basalt + Pillow Lava (90%) - Seds
1246	20 01.97 170 38.33	1750	1670									Crusts (90%) - Seds
1248	20 01.96 170 38.32	1773	1691									Encrusted Rock frags + Nodules (50%) in Seds
1250	20 01.92 170 38.27	1770	1719									" "
1252	20 01.90 170 38.24	1770	1730									Rock frags (30%) in Seds
1254	20 01.86 170 38.22	1790	1756									Sediments
1256	20 01.76 170 38.19	1834	1786									Sediments

weitere Bemerkungen vgl. Anlageprotokoll

Anschlußblatt

AMR - Dr.
15.2.197

Tape #2 Ended at 1600 → 1258 GMT

(OVER)

GMT	Latitude	Depth(m)	Wire(m)	Comments
1300	20 01.69 170 38.21	1871	1852	Nodules(10%) in Sed.
1307	20 01.67 170 38.73	1881	1858	Sediment
1308	20 01.66 170 38.77	1913	1862	Encrusted Rock(20%) in Sed.
⇒ 1308	20 01.62 170 38.29	1913		Took Grab Sample

1

Rock Type: Alkalic Basalt Trachytic (?) Flow

Color: Dark gray (N3) (fresher) to light brown (5YR 5/6) (altered)

Texture: Aphyric-Subaphyric; subtrachytic

Phenocrysts: Sanidine (?) (plag) ±2%, ±1mm dia.
Hornblende? (cpx) ( ) ±1%, ±1mm dia.

Groundmass: Sanidine? (pag.) Hornblende? (cpx) glass? Opaques? (not determined)

Vesicles: absent (dense)

Alteration: superficial to extensive (oxidation, hydration, smectitization)

Remarks: angular to rounded pebble-size clasts of mainly very altered trachyte? (basalt) flow with highly directed, layered texture; relative abundance of hornblende? (cpx) xenocrysts and phenocrysts; sometimes glomerophyric with the feldspar phenocrysts, dark color of the less altered rock;

rounding of the clasts suggests considerable reworking by water currents (wave-action?); altered condition of the rocks probably a result of sub aerial weathering (more altered peripheries, less altered cores); serves as substrate for thin (<1mm thick) encrustions of Mn oxide.

2

Alkali? Basaltic Trachytic? Hyaloclastite Breccia

Light Brown (5YR 5/6) (matrix) & Pale yellowish-brown (10YR 6/2) Clastic

(matrix:) Trachytic? (basaltic) glass fragments ±25%
rock fragments ±20%

(Cement:) Calcite, Zeolites, ±20%

(Open space; ±25%)

(Average grain size:) ±2mm (extremes [illegible]) (range; fine sand to coarse gravel)

Average grain shape: angular to subrounded

Sorting: very poorly sorted

porosity: 80±%

permeability: 60±%

Alteration: ± Complete (oxidation, hydration, Zeolitization, smectitization)

Remarks: angular pebble-size clasts probably dislodged from outcrop or dredge, rounding of grains suggests a period of reworking prior to final deposition, cementation, and induration. Zeolitization probably took place. A result of hydrothermal activity; no manganese or [illegible] deposition except dendritic, observed.

	3	4
Rock Type:	Phosphorite breccia	Chalk
Color:	Dark yellowish brown (10YR 4/2)	White (N9) to very light gray (N8)
Texture:	Clastic	granular
Matrix:	basaltic volcanic rock clasts ± 30% phosphorite clasts ± 20%	calcareous foraminifera
Cement:	phosphorite (francolite ?) 50+%	calcite
Average grain size: (range:	± 10 mm fine gravel to pebble size)	± 0.5 mm
" grain shape:	angular to subrounded	rounded
Sorting:	very poorly-sorted	moderately well-sorted
porosity:	± 15%	80+%
permeability:	± 5%	80+%
Alteration:	complete (phosphorization of original chalk cement, hydrothermal, ambient alteration of matrix components)	superficial (recrystallization of calcite in foraminifera test)
Remarks:	angular to subangular pebble-size clasts composed mostly of yellowish-brown very fine-grained, dense phosphorite with incorporated smaller clasts of basaltic volcanic rocks and lighter-colored, fine-grained dense- to porous phosphorite; probably represents the most recent deposit recovered by the dredge at this site because it incorporates fragments of all other rocks recovered; serves as substrate for encrustation by thin (<1 mm dia) ferromanganese oxide	Pure pebble-size angular clasts of bioturbated burrowed foraminifera chalk; very soft, scarcely (if at all) cemented, generally quite pure $CaCO_3$, not much (if any) clastic or chemical contaminants observed, faint ferromanganese deposits noted on inside of worm tubes.

69 DK