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Geologic Studies of the
COLUMBIA PLATEAU
A Status Report

PLATE III-2 (SHEETS 1-4) STRATIGRAPHIC CORRELATION CHART

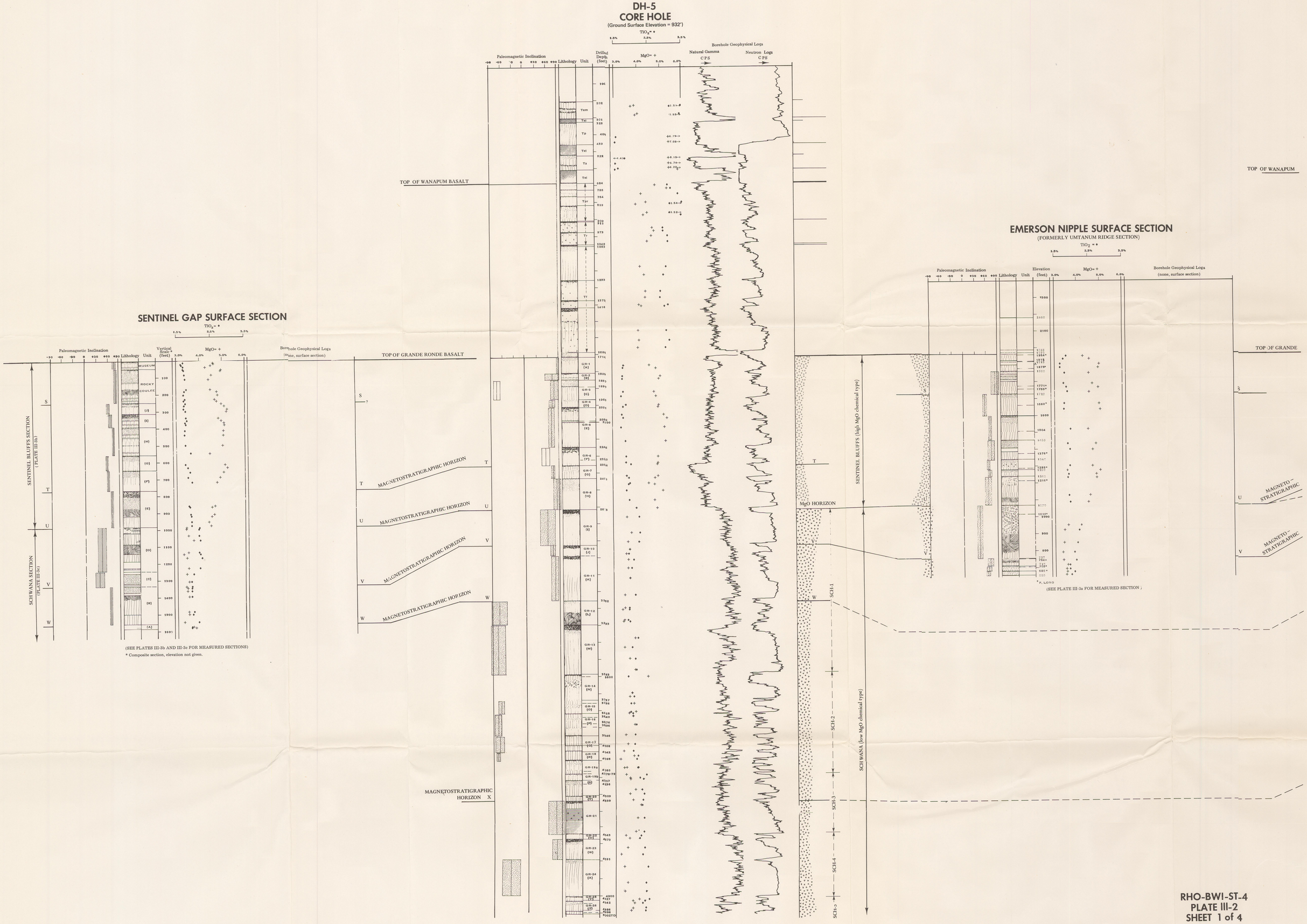

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PLATE III-2
SHEET 1 of 4

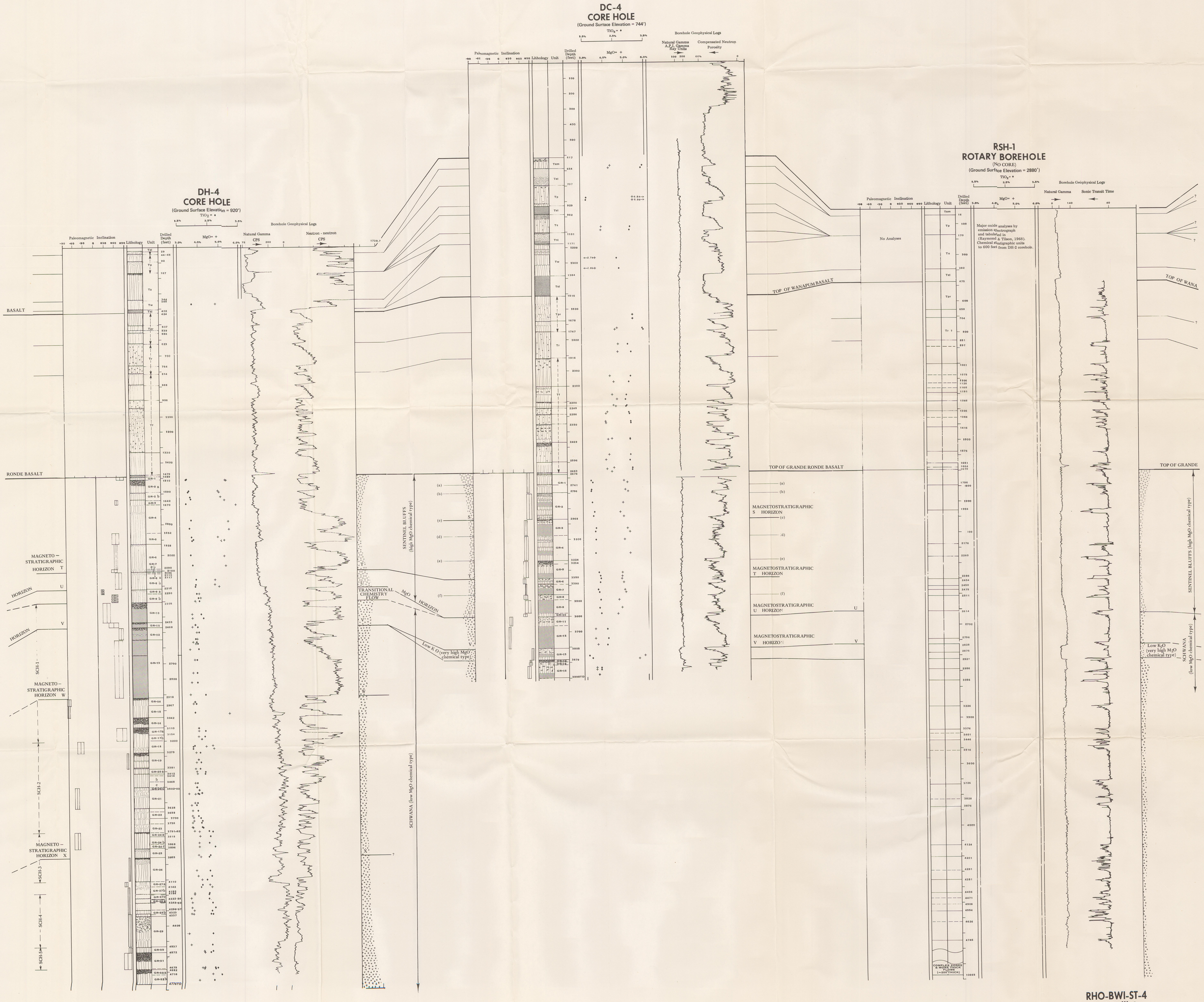

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PLATE III-2
SHEET 2 of 4

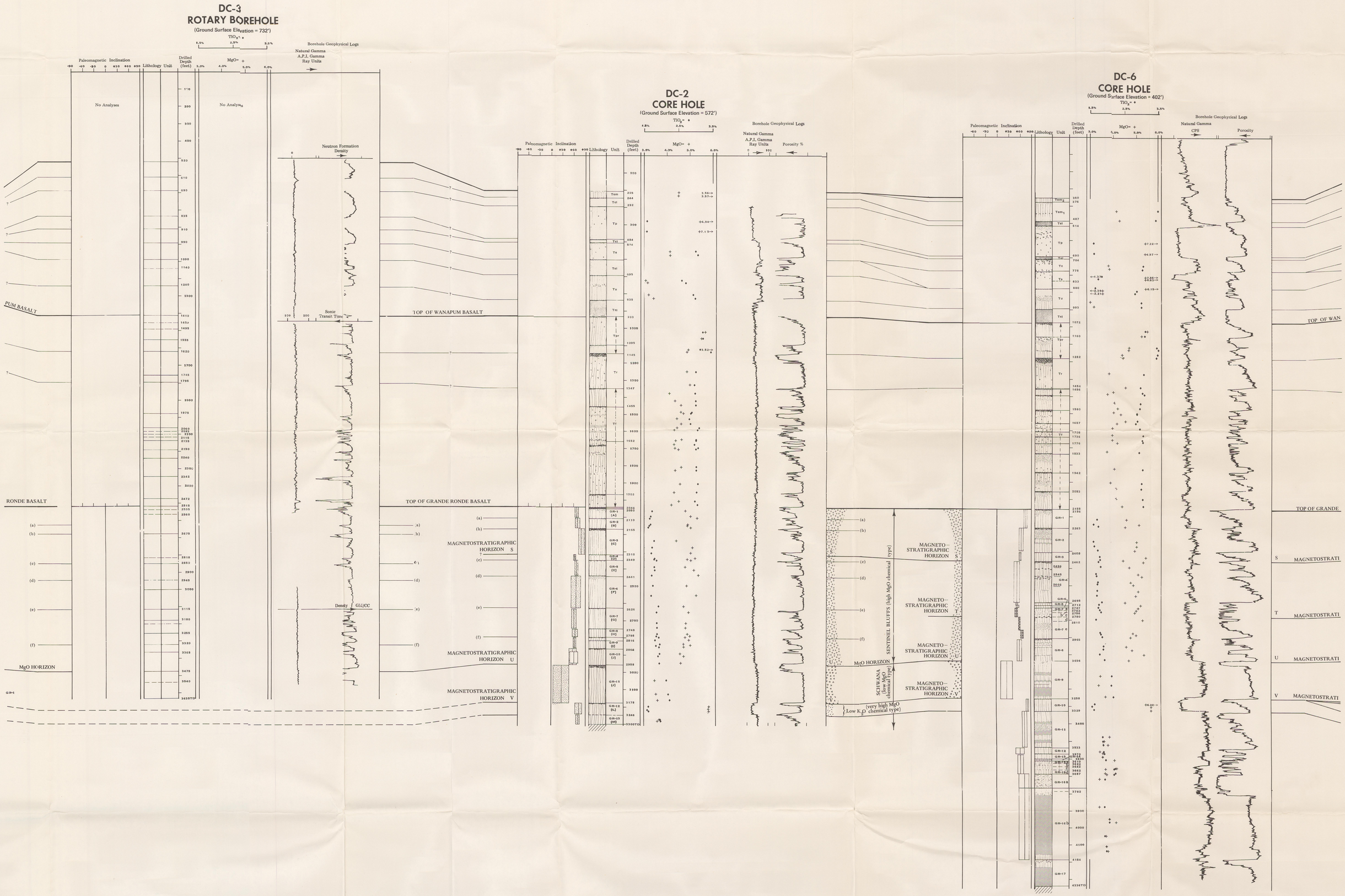

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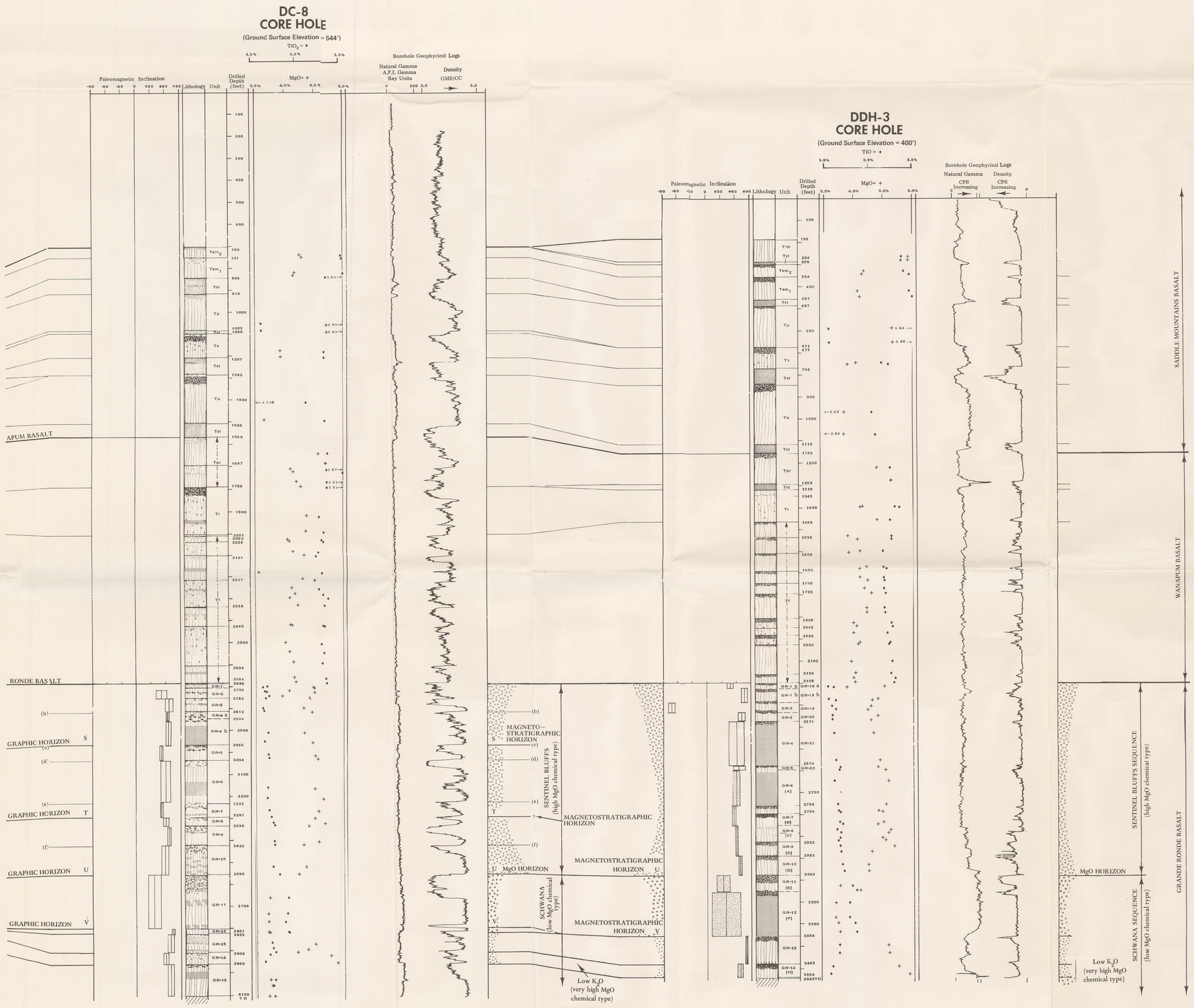
PLATE III-2
SHEET 3 of 4



EXPLANATIONS

This plate is a stratigraphic section showing correlations of chemical stratigraphic units, magnetostratigraphic units, and borehole log stratigraphic units among boreholes and surface sections in the Pasco Basin with emphasis on the Grande Ronde Basalt.
A summary strip log for each borehole gives magnetic inclination values, TiO_2 and MgO percentages, selected borehole geophysical log tracings, and a lithologic summary with unit designated and depth of key contacts. No magnetic inclination values are given for DC-3 and RSH-1 because they are rotary holes and no continuous core sections were taken. Borehole geophysical logs for DH-4, DH-5 and DDH-3 are from Washington State University; those from other boreholes are from oil field service companies. The Vantage Member horizon was selected as datum because of its continuity and ease of identification.

CORRELATIONS

SADDLE MOUNTAINS BASALT AND WANAPUM BASALT

Rock unit identification symbols are shown in the unit column for each borehole. Symbols are the same as those used for the geologic maps (Plate III-1.)

GRANDE RONDE BASALT

CHEMICAL STRATIGRAPHIC UNITS

- High MgO chemical type basalt
- Low MgO chemical type basalt
- Low K_2O (very high MgO) chemical type basalt

MAGNETOSTRATIGRAPHIC UNITS

S, T, U, V, W N_2, R_2, X N_2?, R_2? — Horizons and polarity reversals

BOREHOLE GEOPHYSICAL LOG STRATIGRAPHIC UNITS

(a), (b), (c), (d), (e), (f)

NOTE:
Borehole geophysical log tracings shown on the plate are manual and optical reductions of original logs. Some tracing segments are slightly distorted and cause poor depth registration. The tracings shown are for illustration purposes only. All borehole geophysical log correlations were made with original logs or same-scale copies of original logs.

KEY TO ROCK UNIT SYMBOLS

- Tp — Symbols for Saddle Mountain Basalt and Wanapum Basalt
- GR-1 (A) — 3200 Depth (feet); Interval Designation; Former Designation; Probable Contact Between Flows
- Possible Contact (between flow units or interflow structural units in some flows)
- Bottom of Borehole

KEY TO PALEOMAGNETIC INCLINATION PLOT

- Mean
- Data From Packer & Petty, 1979
- Data from Packer & Petty, 1979 which have been treated in a different statistical manner (see Packer & Petty, 1979 for details)
- Data from Beck & Others, 1978 (see Packer & Petty, 1979 for details)
- Data from Coe & Others, 1978 (see Packer & Petty, 1979 for details)
- Standard Deviation

All paleomagnetic inclination values are after alternating field cleaning.

KEY TO LITHOLOGIC SYMBOLS

- Rubble
- Flow interior (colonnade and entablature not differentiated)
- Interbed (undifferentiated)
- Vesicular basalt
- x = Porphyritic
- Breccia
- High-angle fracturing
- Low-angle fracturing
- Extensive discing
- ∞ = Vugs
- Scoria
- Conglomeratic interbed
- Sandy interbed
- Silty interbed
- Intermittent discing
- Fanning entablature (recognized in surface sections only)
- Pillowed basalt

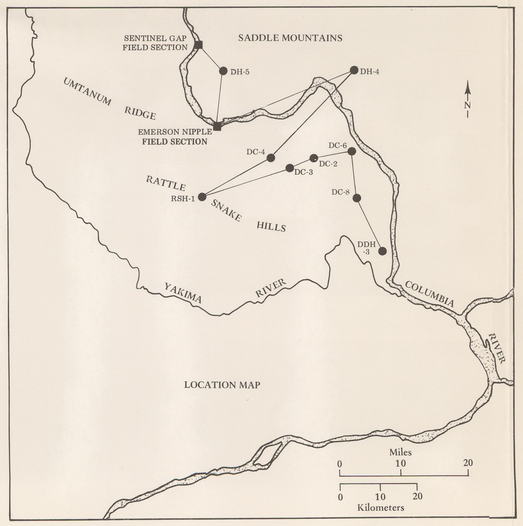


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PLATE III-2
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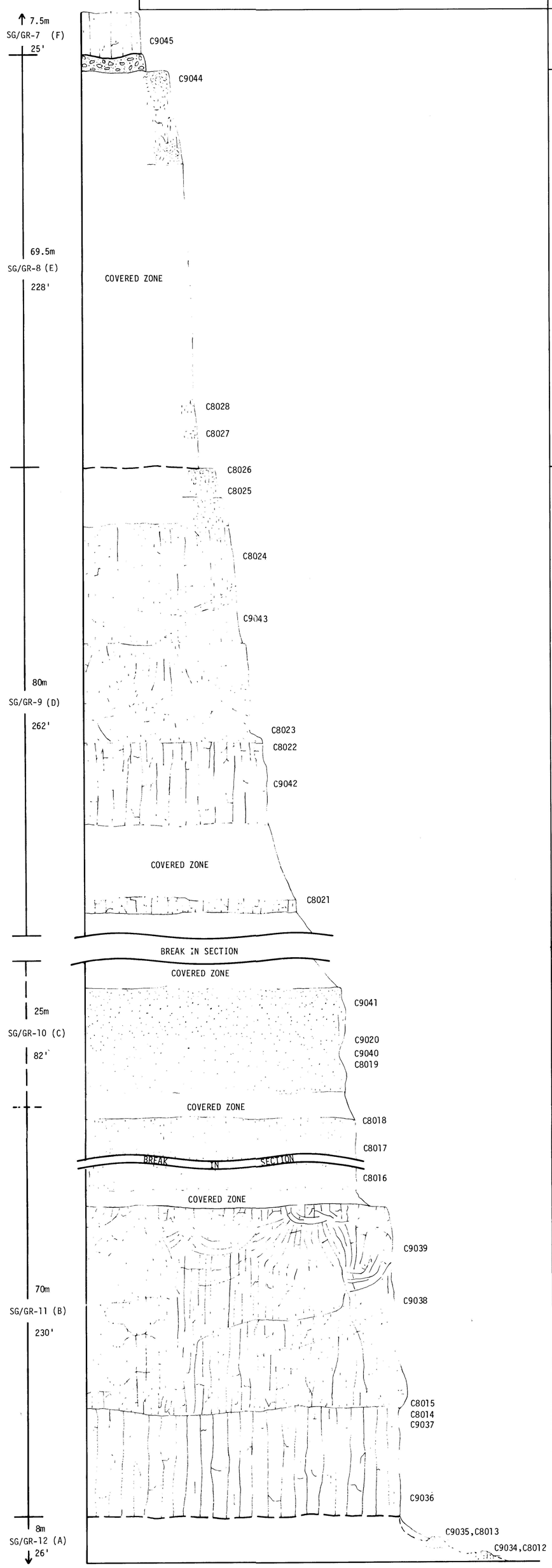
STRATIGRAPHIC SECTIONS OF THE COLUMBIA RIVER BASALT GROUP PASCO BASIN WASHINGTON

SCHWANA STRATIGRAPHIC SECTION



SAMPLE NUMBER	LITHOLOGY	CHEMISTRY SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Number of Analyses	MAGNETIC POLARITY
C9045, C9044	Aphyric to slightly phyric basalt. Basal columns 0.2 to 0.5m diameter. Type 3 intraflow structure. (Long, 1978 and this report)	52.78	1.92	14.77	2.00	10.53	.22	4.93	9.03	2.26	1.25	.30	1	N
COVERED ZONE; C8028, C8027	Covered except for vesicular flow top with pillowed carapace (see Sentinel Bluffs section). Abrupt changes in vesicle abundance suggest flow lobes in upper part of flow. Pillows at top are 0.5 to 1.5m diameter. Interstices are palagonite and pillow margins are distinctly more vesicular than pillow interiors. Petrified wood occurs as float near the contact between flows E and F. Type 3 intraflow structure.	53.34 * .04	1.92 .02	14.77 .07	2.00	10.71 .19	.22 .00	4.59 .01	8.52 .04	2.35 .07	1.29 .02	.29 .01	3	N
C8026, C8025, C8024, C9043, C8023, C8022, C9042, COVERED ZONE, C8021	Aphyric basalt. Irregular, undulatory columns at base with near-horizontal and near-vertical tectonic fractures superimposed across cooling joints. Sharp to slightly gradational contact between entablature and colonnade. Entablature shows hackly jointing with localized tectonic fractures concentrated in zones of intense brittle deformation. Fractures are typically stained with hematite and limonite. Isolated exposures at the extreme base of Flow D may or may not be part of Flow D. They could represent a separate flow but no positive evidence to this effect has been found. Type 3 intraflow structure.	54.50 .25	2.16 .03	14.43 .17	2.00	11.26 .14	.22 .00	3.47 .14	7.28 .11	2.51 .16	1.82 .11	.35 .01	8	N
BREAK IN SECTION; COVERED ZONE; C9041, C9020, C9040, C8019, COVERED ZONE, C8018, C8017, BREAK IN SECTION, C8016	Vesicular, aphyric basalt with irregular fracture distribution. Some large columns typical of upper colonnade. Vesicle abundance increases at top of exposure suggesting an eroded flow top. Base of best exposure is a narrow (~15cm) tectonic breccia zone but no evidence of a flow base is exposed. Stratigraphic relationship of Flow C to Flow B is uncertain. Lithology is consistent with its being the top of Flow B but magnetic inclination suggests this may not be the case. Type 3 intraflow structure.	55.58 .32	1.95 .03	14.88 .12	2.00	9.94 .47	.20 .01	3.49 .09	7.25 .28	2.53 .16	1.97 .09	.31 .01	3	N
COVERED ZONE; C9039, C9038, C8015, C8014, C9037, C9036	Aphyric basalt. Basal columns are 0.5 to 0.8m in diameter. Entablature and colonnade both show tectonic fractures with local preferred orientation as conjugate joint sets which transect cooling joints. The contact between entablature and colonnade is sharp, and fanning columns are common in the upper entablature which grades upward to discontinuously exposed vesicular basalt. This part of the flow is aphyric and contains abundant vesicles with white siliceous fillings lithologically very similar to Taylor's (1976) Flow C. Type 3 intraflow structure.	55.41 .19	1.95 .07	14.82 .27	2.00	10.32 .25	.21 .01	3.43 .08	7.20 .14	2.40 .07	1.96 .08	.31 .02	7	N
C9035, C8013; C9034, C8012	Aphyric basalt. Poorly exposed vesicular flow top suggestive of upper colonnade. Vesicles are filled or partly filled with white siliceous material.	55.33 .03	1.92 .01	14.95 .12	2.00	10.10 .01	.22 .01	3.62 .08	7.57 .01	2.18 .23	1.86 .08	.28 .01	2	R

SG denotes Sentinel Gap section designation for a composite of the Sentinel Bluffs and Schwana stratigraphic sections.

Letter designations in parentheses and as referred to under LITHOLOGY part of this diagram are from Taylor (1976).

vertical scale: 1 inch equals 32.8 feet (10 meters)

*One standard deviation values are given below the entry for each oxide. All analyses by X-ray fluorescence on a volatile free basis. Fe_2O_3 is arbitrarily set at 2.00 weight percent.

Stratigraphic nomenclature after Mackin (1961) and Taylor (1976).

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PLATE III-3c