REFERENCES

ACS Laboratories (Thailand) PTY LTD. 2001. Routine Core Analysis Final Report of LKU-E17. Songkhla: ACS Laboratories (Unpublished Manuscript)

Ainsworth, R. B. 1996. Mouthbar Reservoir Correlation Techniques and Production Implication. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Ainsworth, R. B. and Van Der Pal, R. 1997. Guidelines for GEOCAP Modelling of Thin-bedded Heterolithics in Sirikit. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Chao, L. L. 1969. Statistics: Methods and Analyses. 2 nd ed. Tokyo: Tosho Printing.

Coll C. and others. 1999. Integration of Core and Log Information To Improve the Representation of Small/Medium-scale Heterogeneity. SPE56804.

David, R. A. JR. 1983. Depositional Systems. Wellington: Whitehall Books Limited.

Flint, S., Stewart, D. J. and Riessen, E. D. 1988. Reservoir Geology of the Sirikit Oil Field, Thailand: Lacustrine-deltaic Sedimentation in a Tertiary intermontane basin, Geological Society of London Spatial Publication, 223-235.

Flint, S., and others. 1989. Aspects of The Reservoir Geology and Production Behaviour of The Sirikit Oil Field, Thailand. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Frank, J., and others.1998. Hydrocarbon Exploration and Production. Amsterdam: Elsevier Science B.V. Copyright & Permissions Department.

Fraser, G. S. 1989. Clastic Depositional Sequences. New Jersey: Prentice Hall.

Gerhard, E. 1992. Sedimentary Basin. Heidenberg: Springer-Verlag Berlin Heidelbery.

Goesten, M. J. B. G. and Coutts, S. D. 1989. Geology and Development Conditions in The Phitsanulok Basin. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Goesten, M. J. B. G. 1992. Reservoir Geological Characteristics of the Lan Krabu Formation, Eastern Flank, Sirikit Field. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Goesten, M. J. B. G. , Pieterson, R. and Sukhumpanumet, P. 1991. Review of the Sarabop Formation (P Reservoir Sirikit Field, S1 Concession. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Jahn, F. M. O., Goesten, M. J. B. G. and Riessen, E.D. 1989. Sedimentological Facies and Productivity of Lan Krabu Formation, Sirikit Field, Thailand. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Jerry, L. J.,and others. 2000. Statistics for Petroleum Engineers and Geoscientists. 2 nd ed. Amsterdam: Elsevier science B.V. Copyright & Permissions Department.

Kennaird, T. 1989. Sirikit Field; Petrophysical Core Log Correlation Study. Core laboratories Report. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Knipscheer, J. H. 1997. A Geological Re-evaluation of Cores from 13 Wells, Sirikit Oil Field, Phitsanulok Basin, Thailand. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Leeder, M. R. 1983. Sedimentology: Process and Product. 3 th ed. Sydney: George Allen & Unwin Australia Pty Ltd.

Lincoln, L. C. 1969. Statistics: Methods and Analyses. 2 nd ed. Tokyo: Tosho Printing.

Miall. A. D. 1996. The Geology of Fluvial Deposits: Sedimentary Facies, Basin Analysis, and Petroleum Geology. Italy: Springer-Verlag Berlin Heidelbery.

Miall. A. D. 1997. The Geology of Stratigraphic Sequences. Germany: Springer-Verlag Berlin Heidelbery.

Miall, A. D. 1990. Principle of Sedimentary Basin Analysis. United States of America: Springer-Verlag New Yock Inc.

Mäkel, G. and others. 1997. Sirikit Field Review 1996-1997 Part 2 Geology. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Phuthithammakul, S. 1993. Reservoir model of Yom and Pratu Tao Formation. Source of Injection Water. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

Reading, H. G. 1978. Sedimentary Environment and Facies. London: Backwell Scientific.

Rider, M. H. 1996. The Geological Interpretation of Well Logs. 2 nd ed. Malta: Whittles Publishing.

Schlumberger. 1987. Log Interpretation Principle/Application. 2 nd ed. Houston: Schlumberger Educational Services.

Selley, R.C. 1982. An Introduction to Sedimentology. London: Academic press INC. (London) LTD.

Selley, R.C. 1996. Ancient Sedimentary Environments Published by Chapman & Hall:5-6.

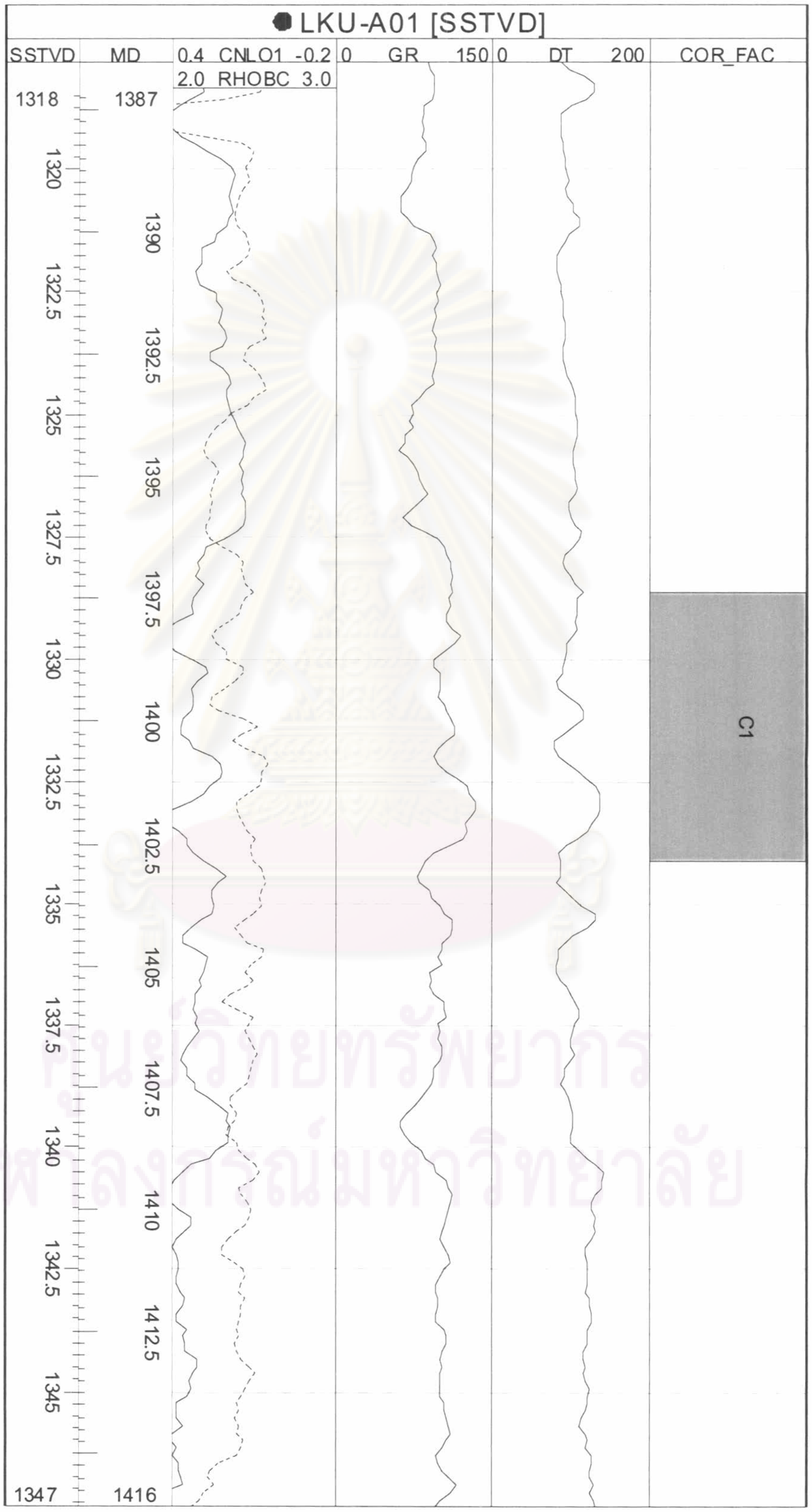
Van Genus, L. C. and Burgisser, H. M. 1982. Geological Investigation of Seven Core from Well Lan Krabu-A01, Phitsanulok Basin, Thailand. Bangkok: Thai Shell Exploration and Production. (Unpublished Manuscript)

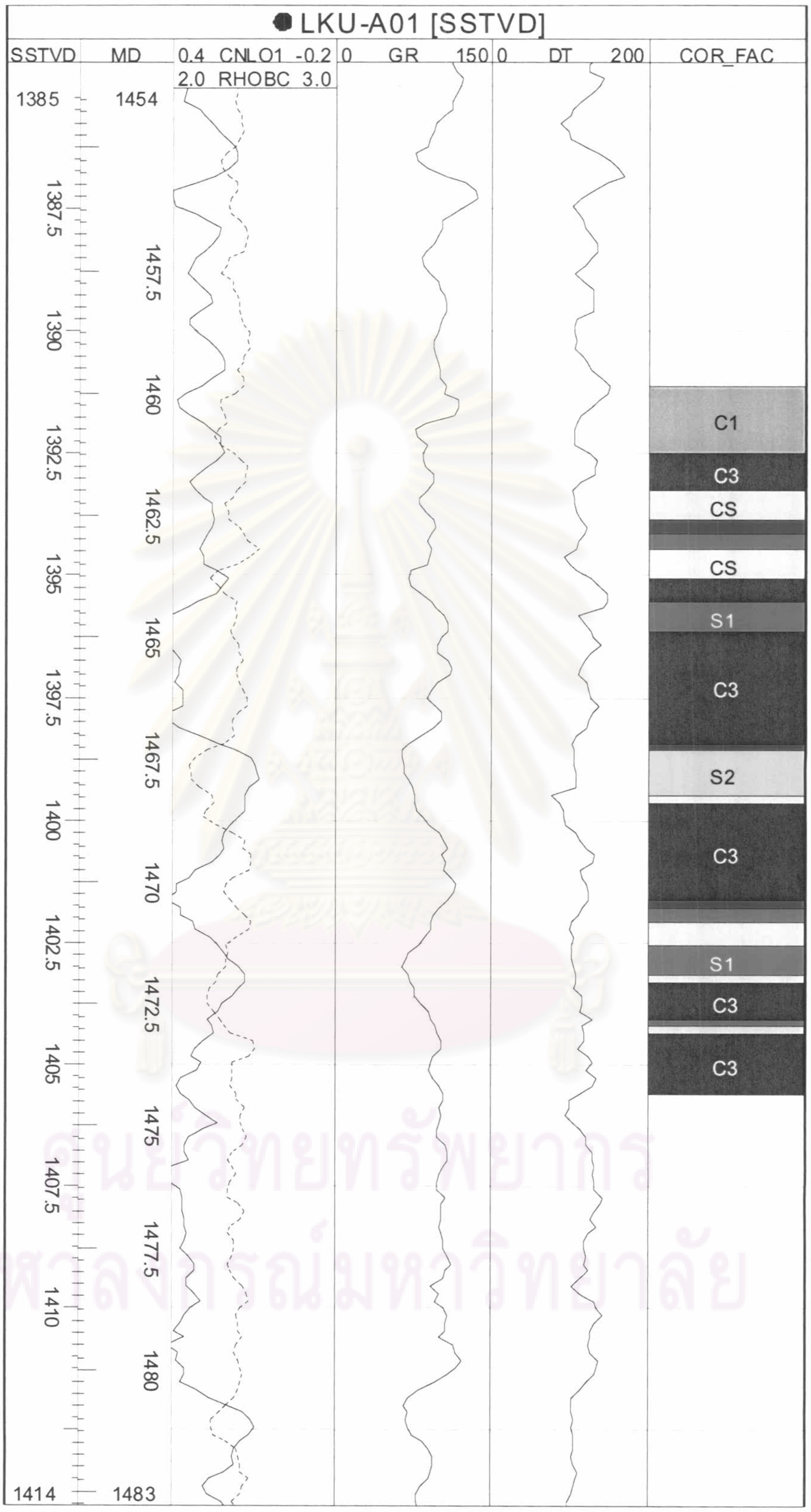
Walker, R. G. and James, N. P. 1997. Facies Models. Quebec: Love Printing Service Ltd.

White A.and others. 1995. The Application of ANN for Zone Identification in a Complex Reservoir. SPE 30977.

APPENDICES

Appendix A : Lithofacies of core samples and some geophysical log signatures used as database in this study.

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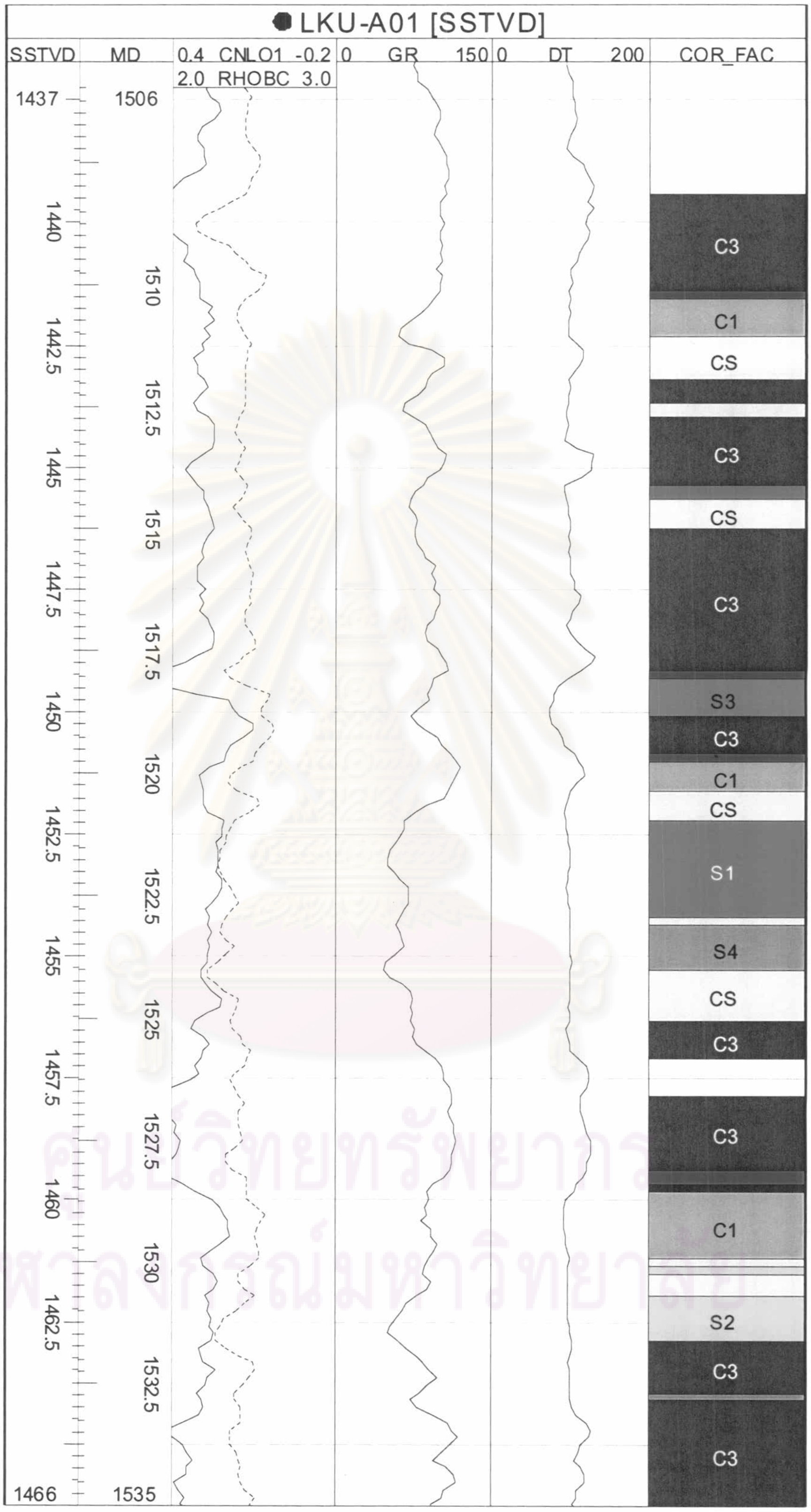
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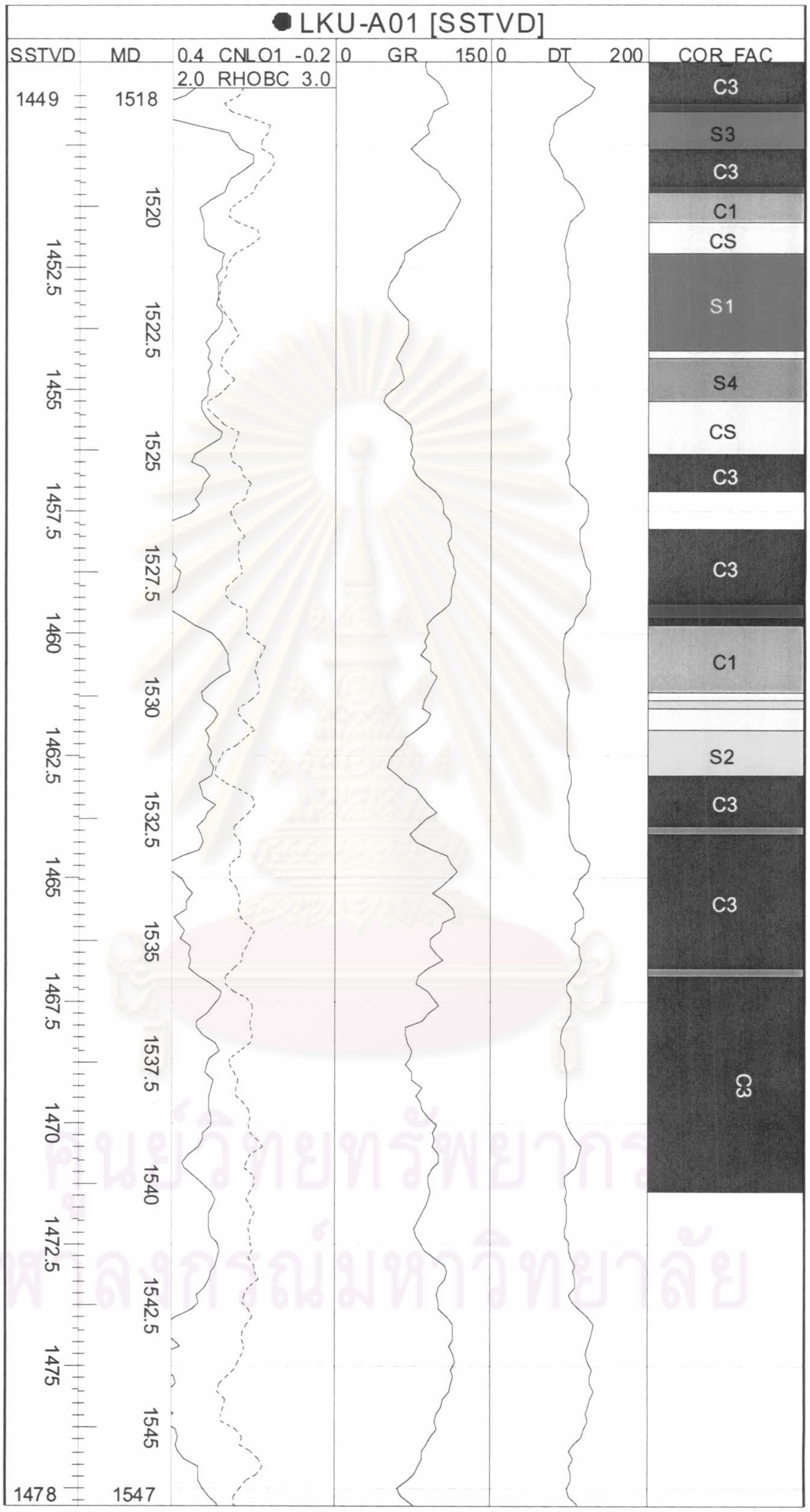
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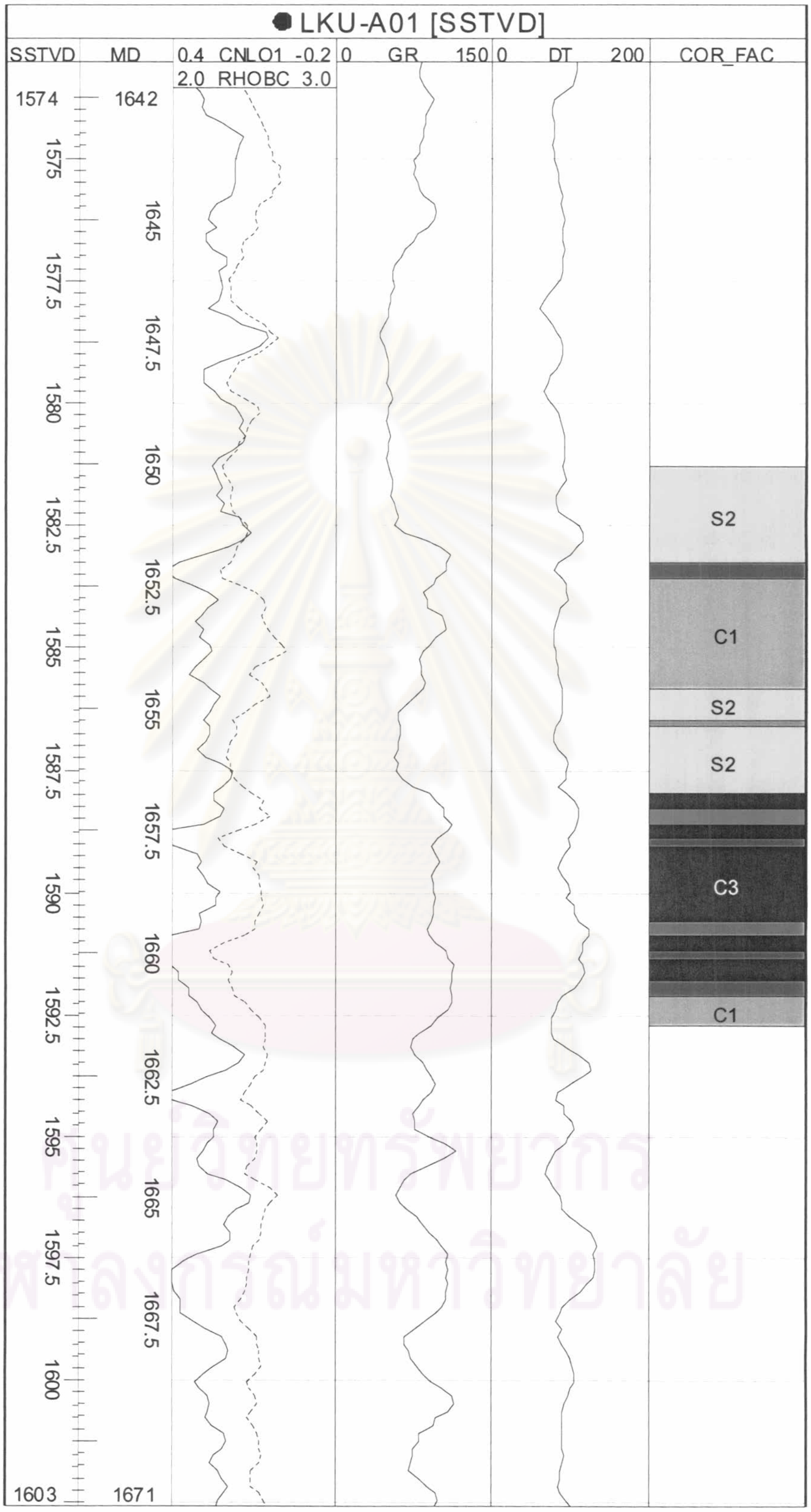

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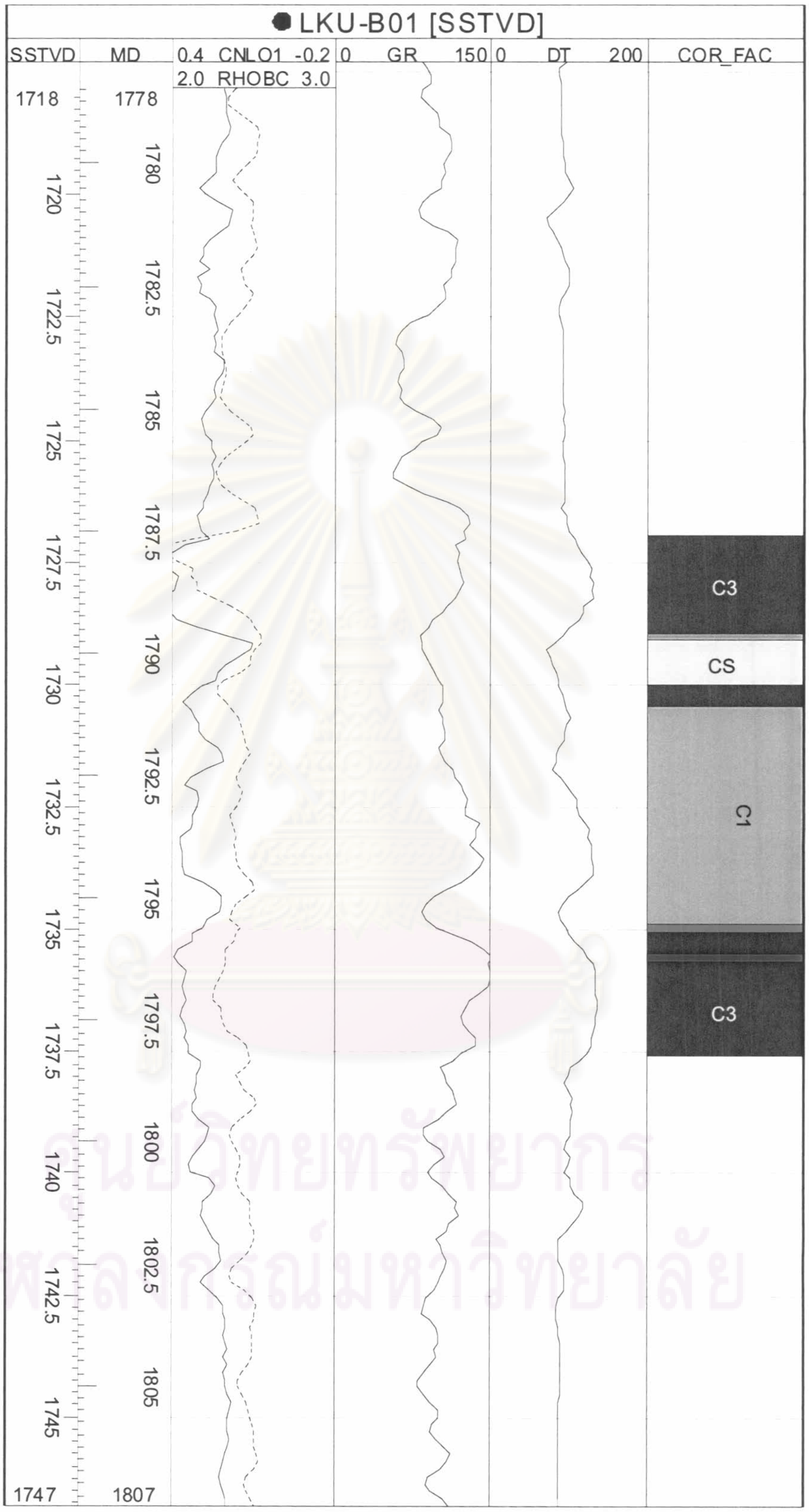
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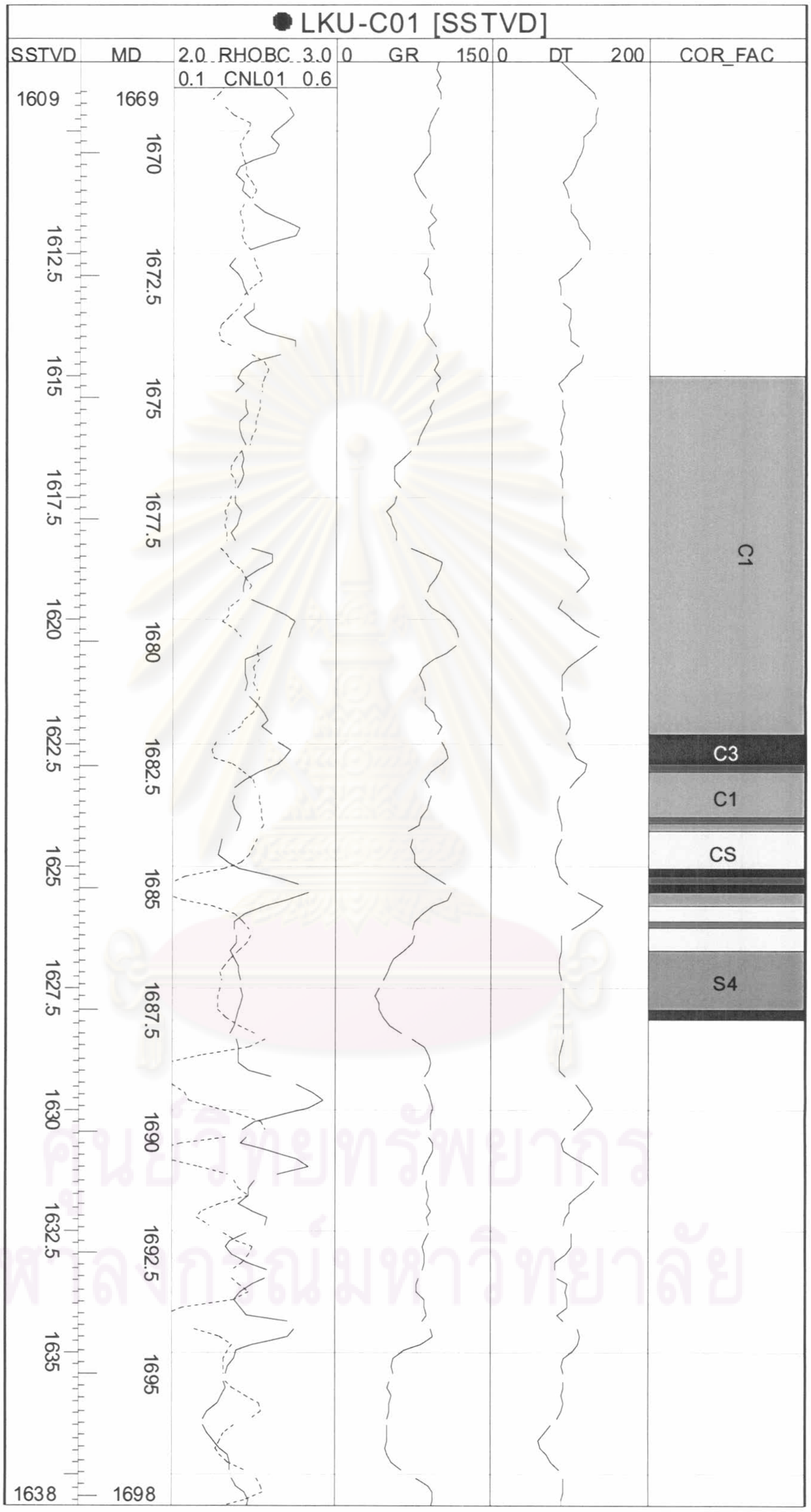
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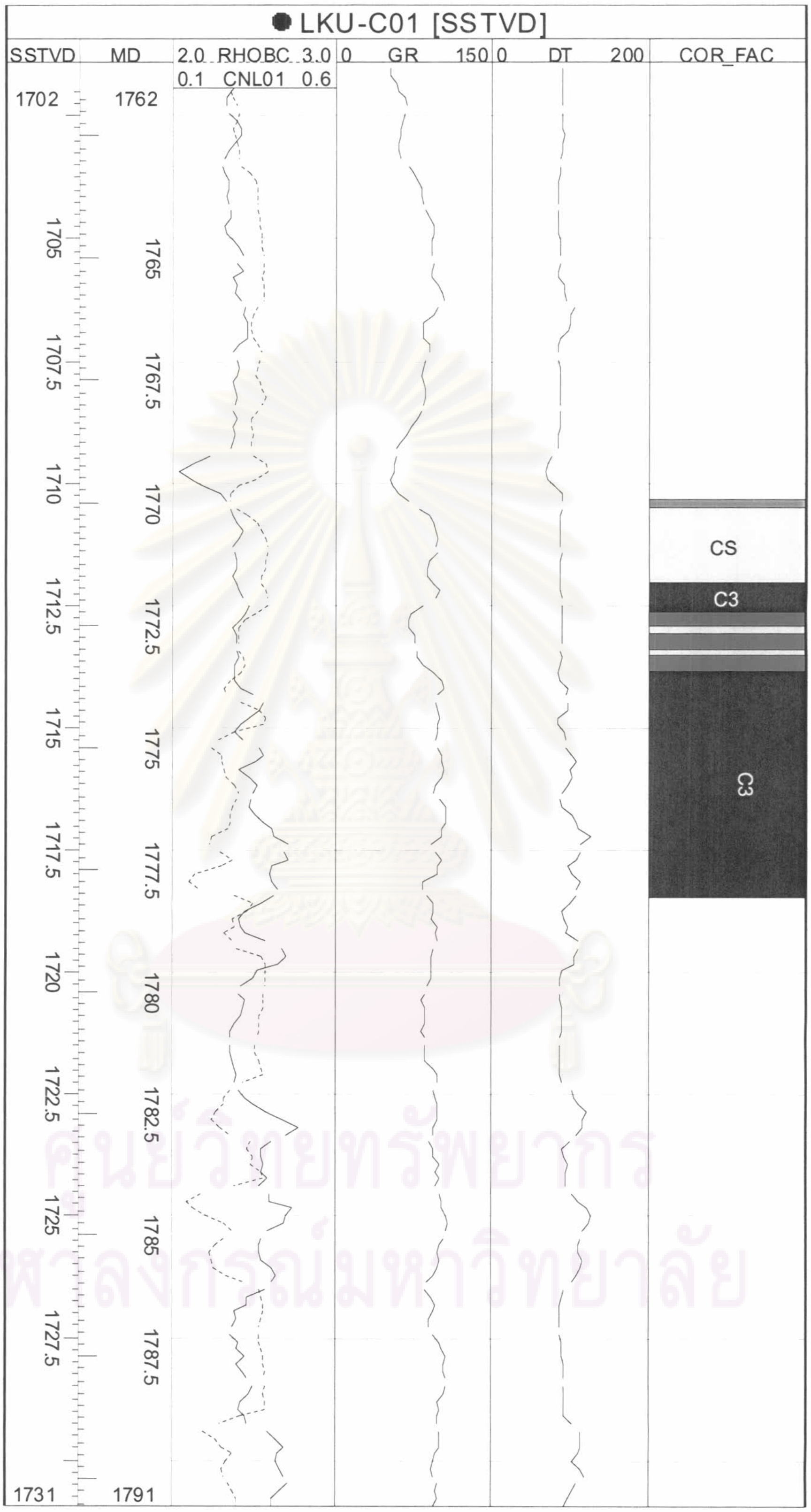
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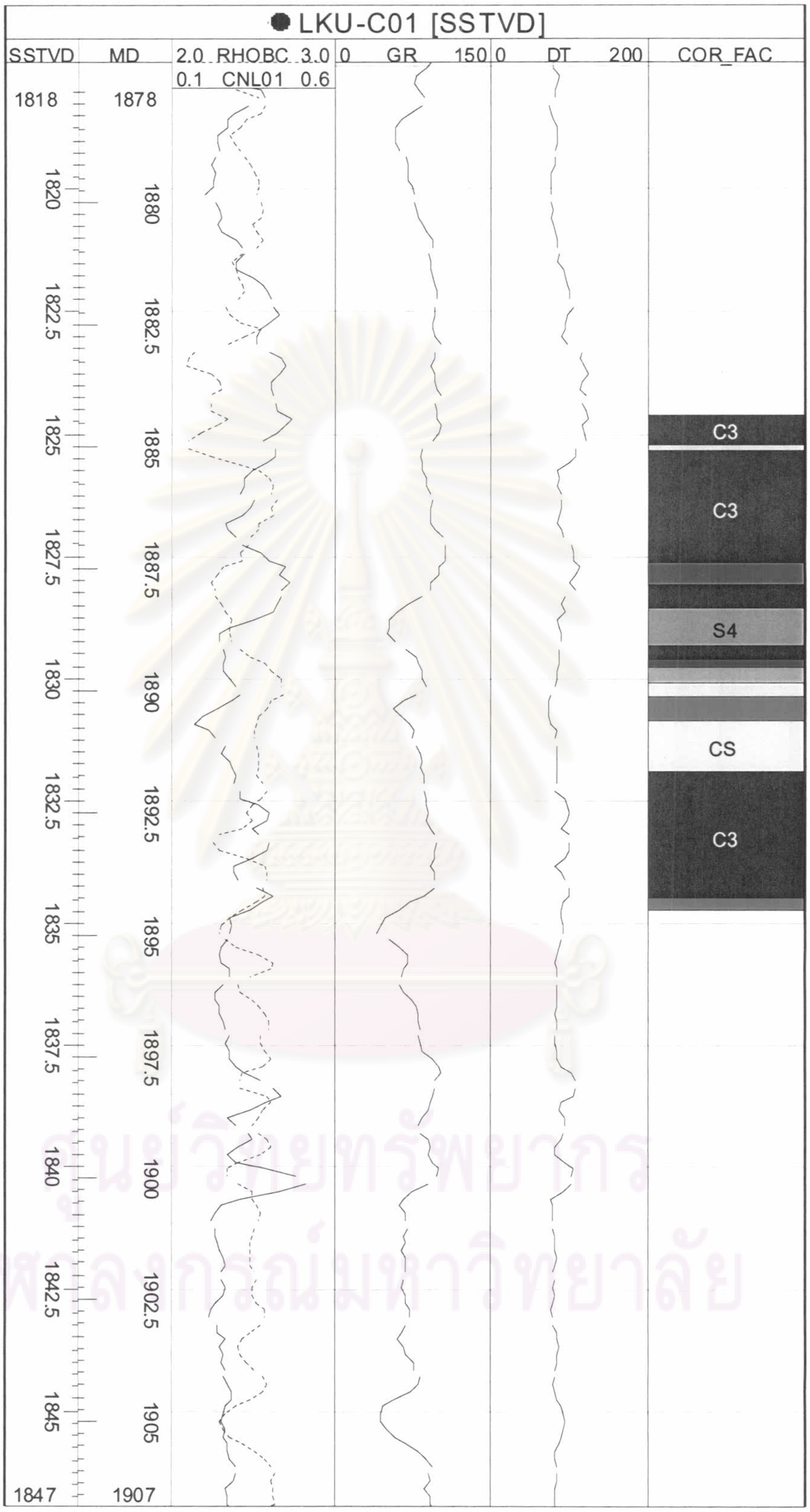
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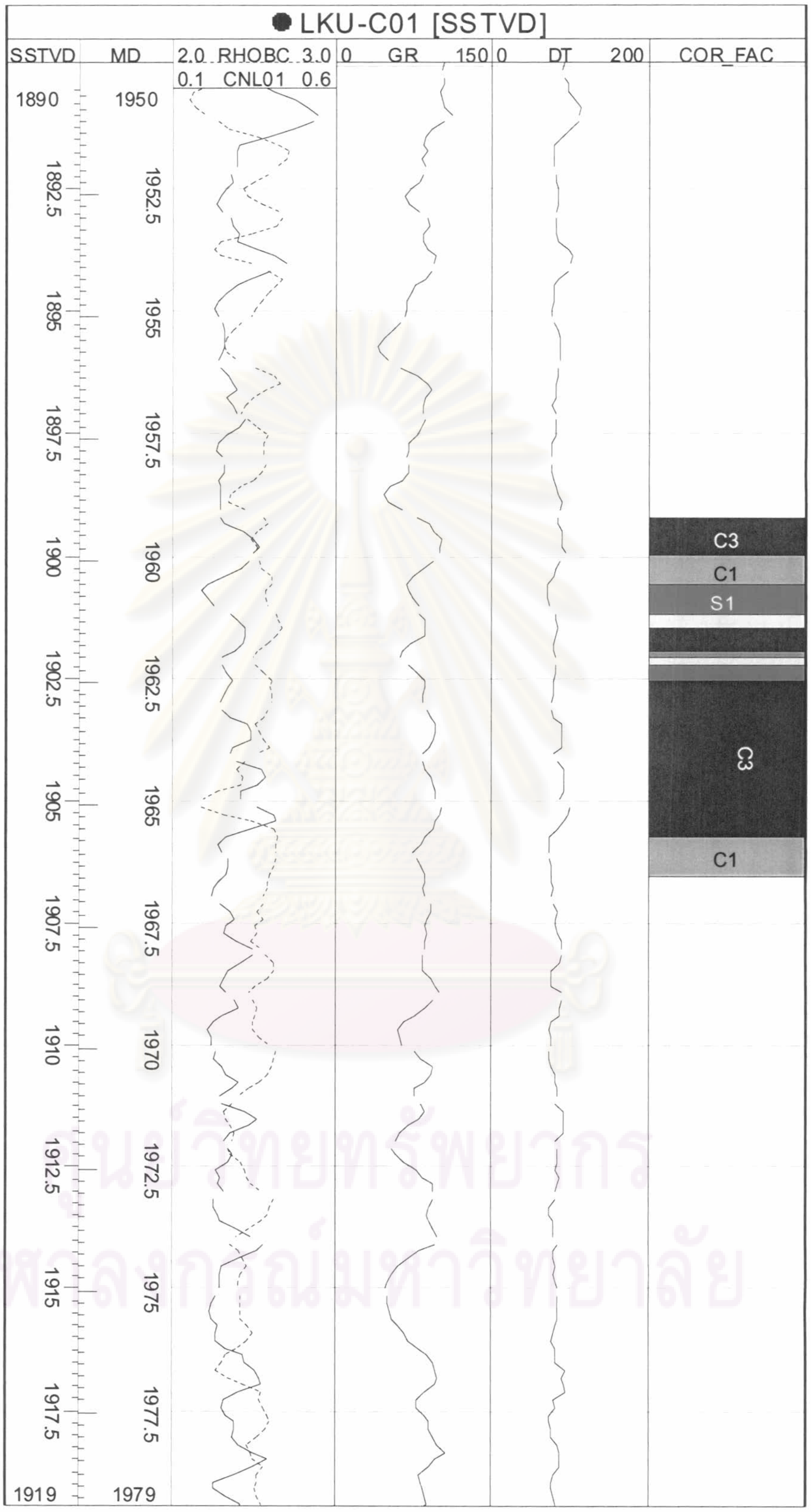
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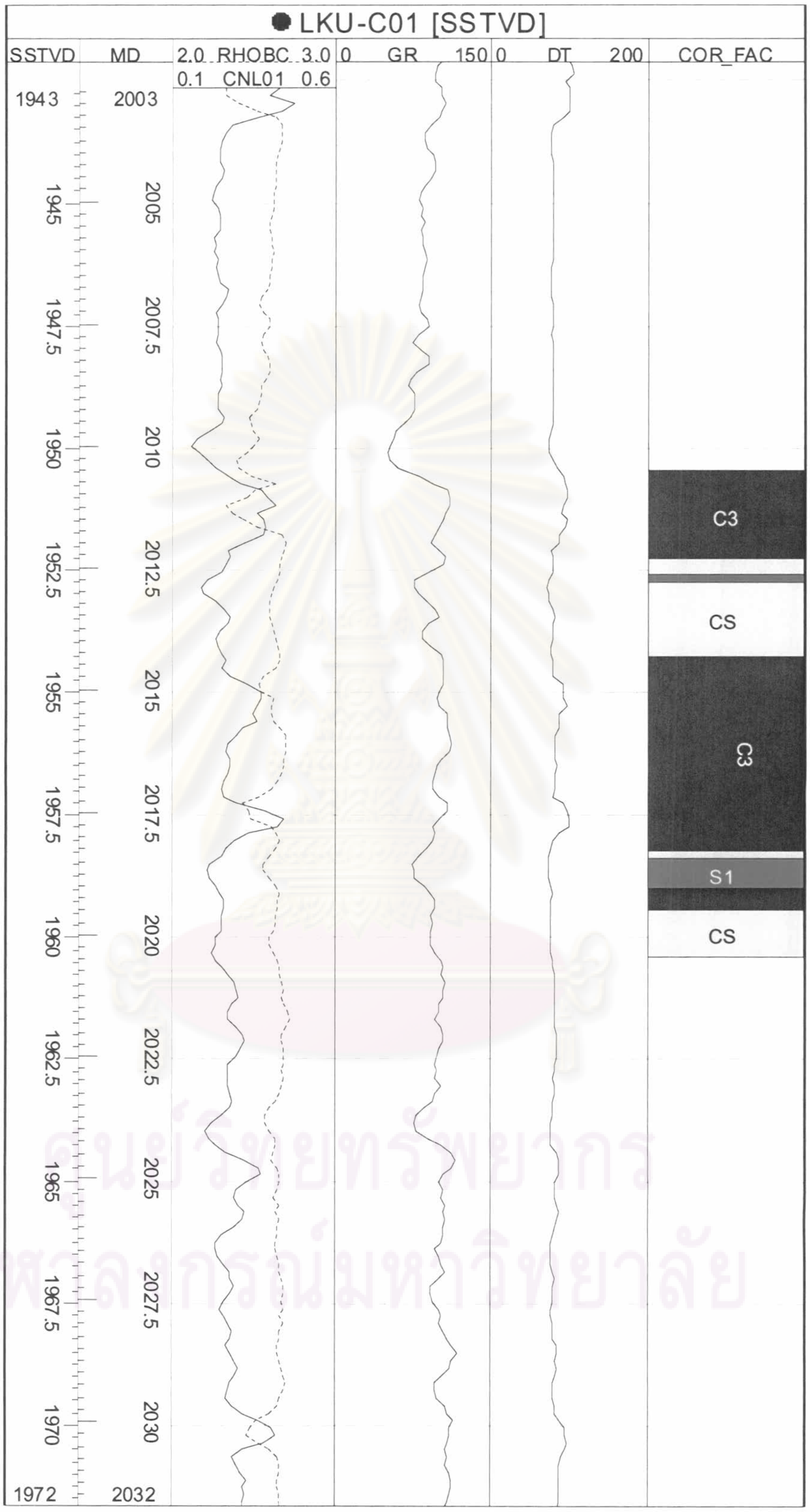
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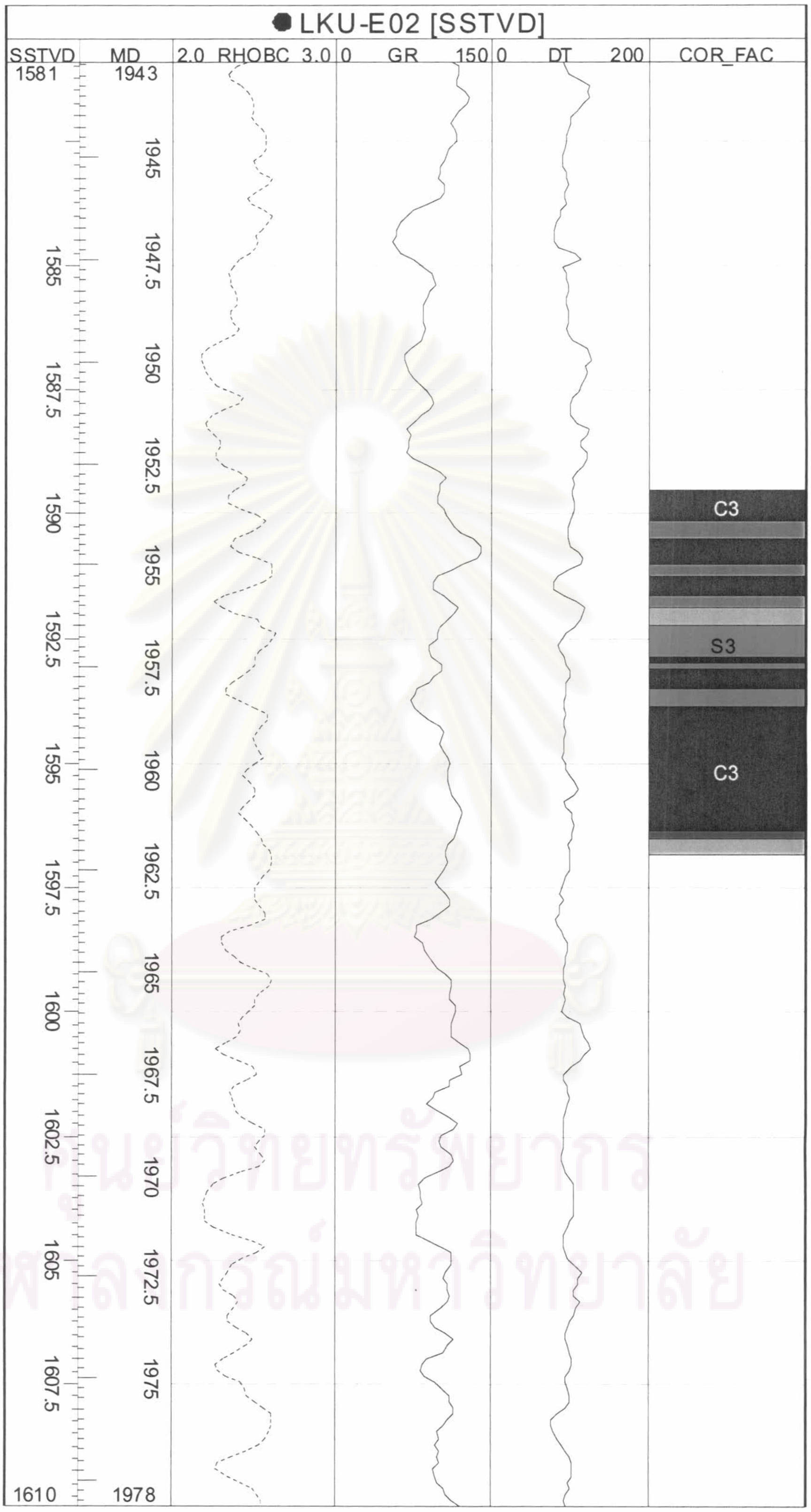
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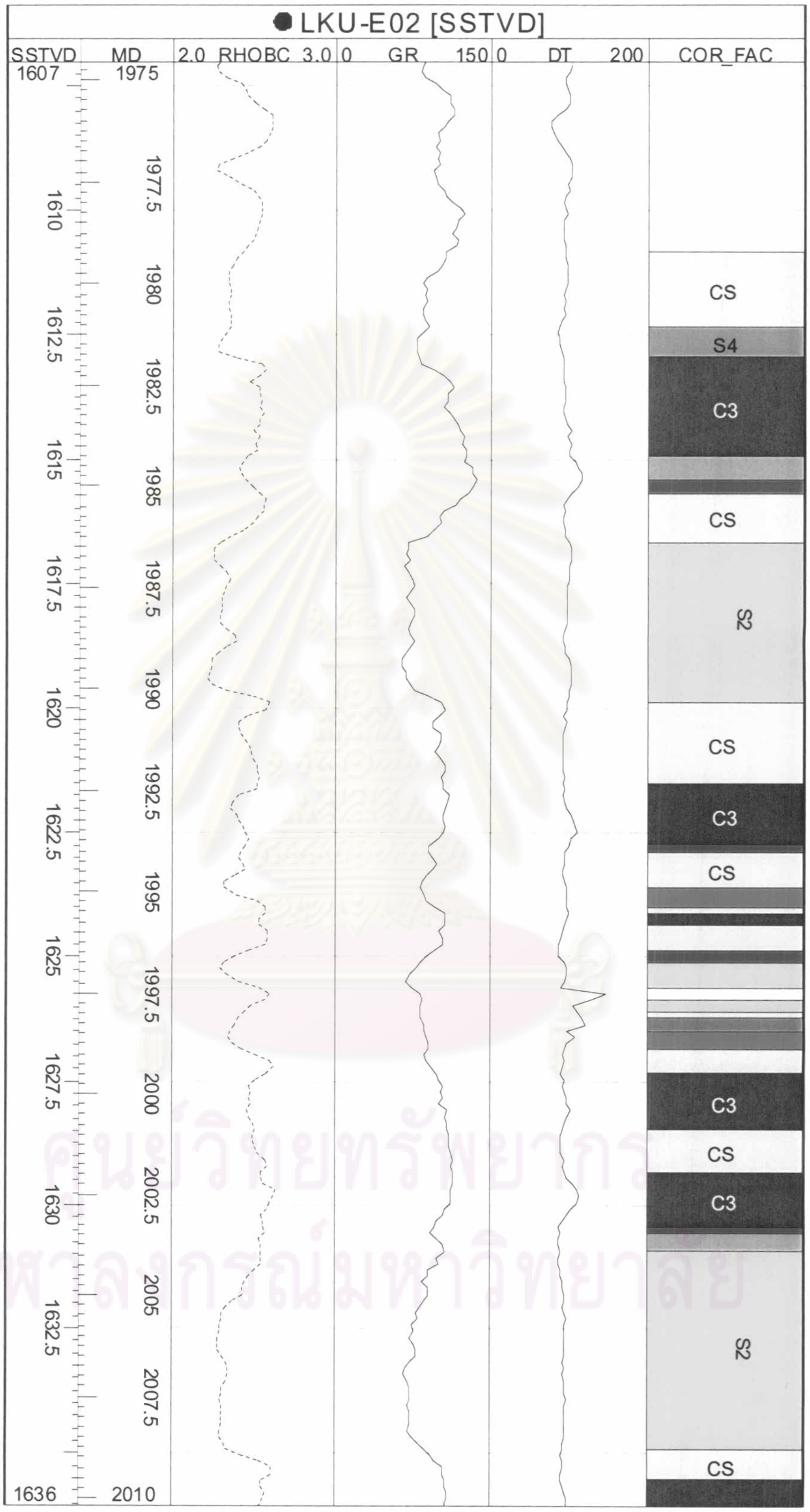
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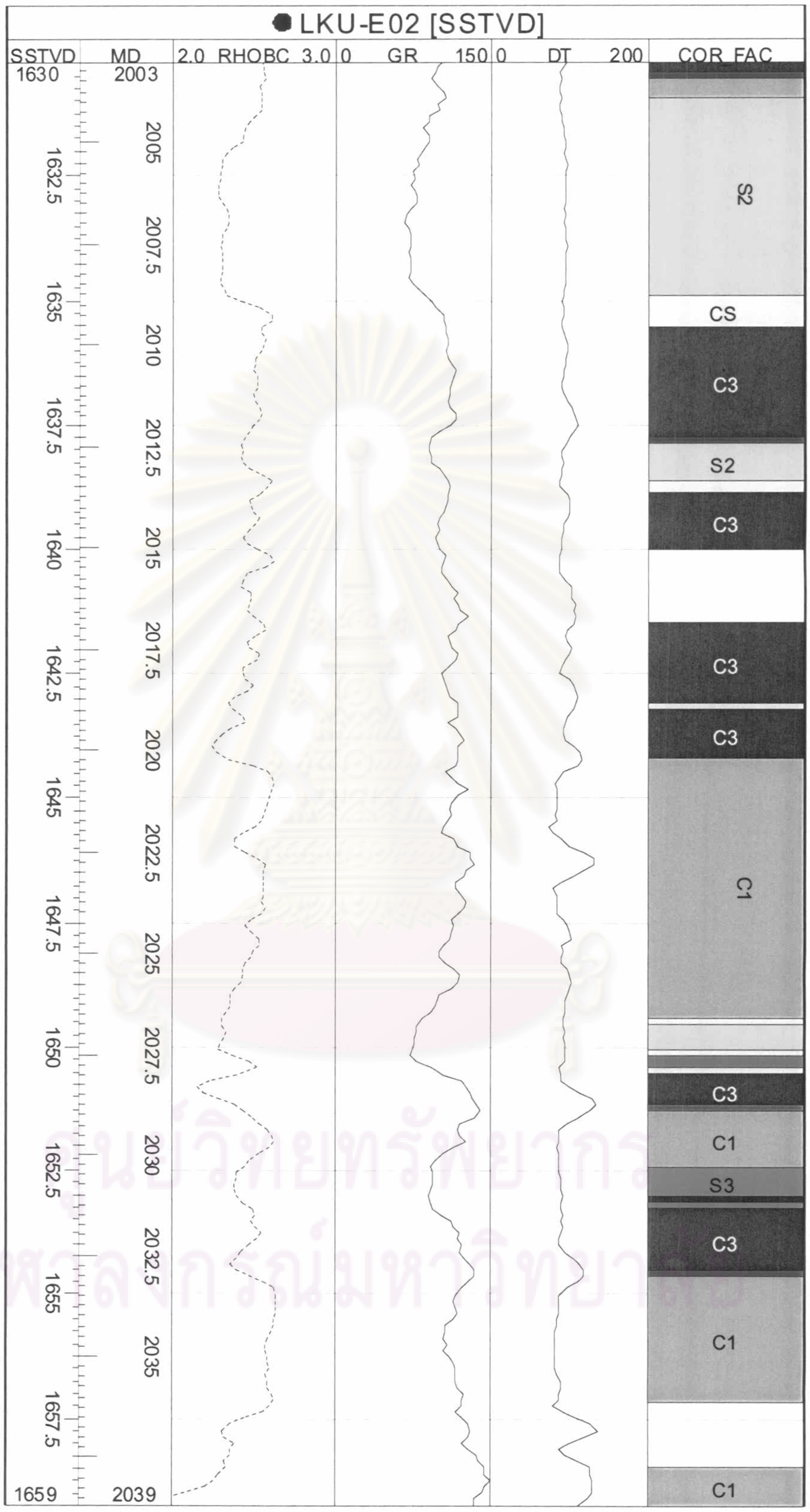
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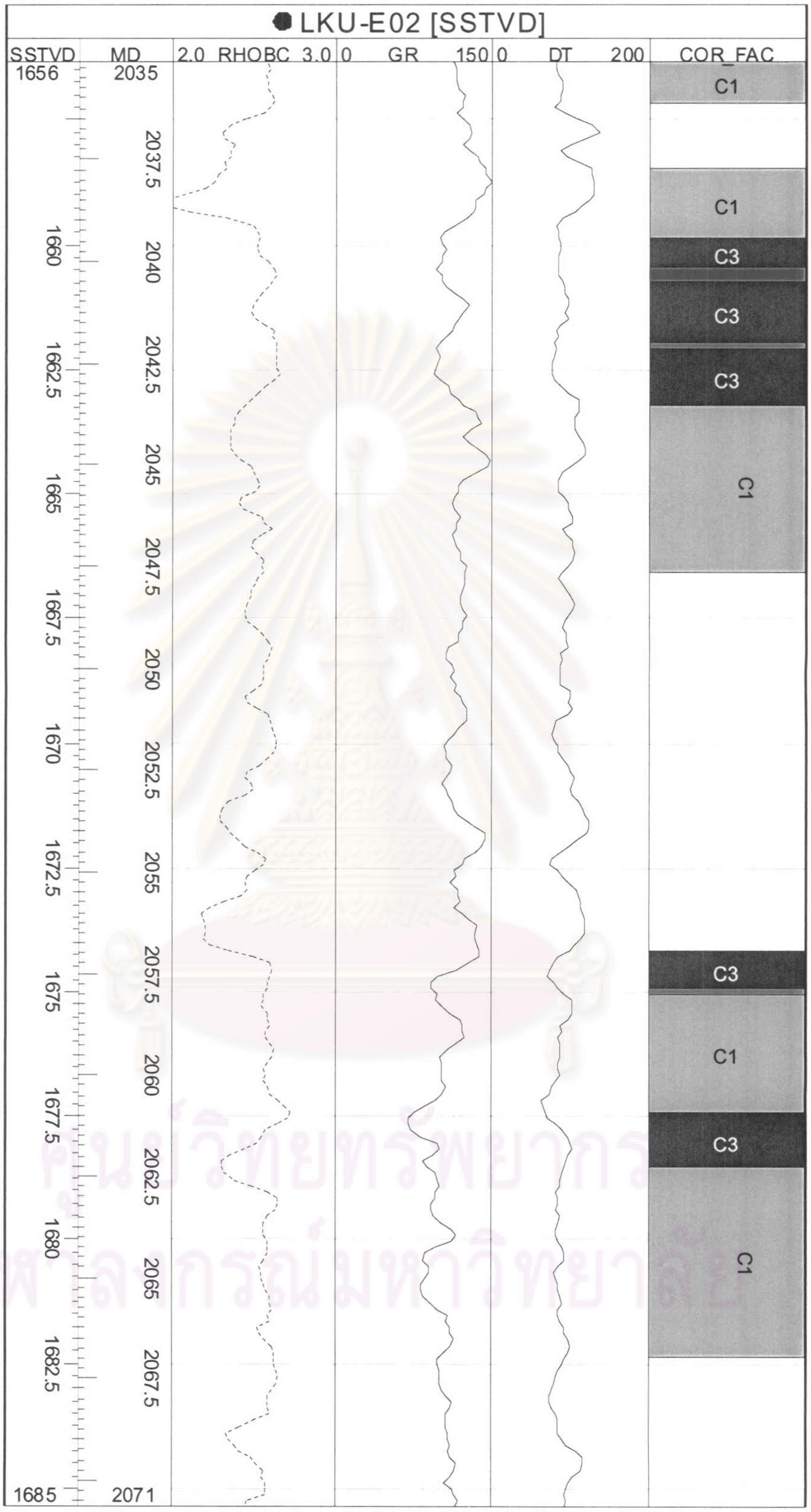
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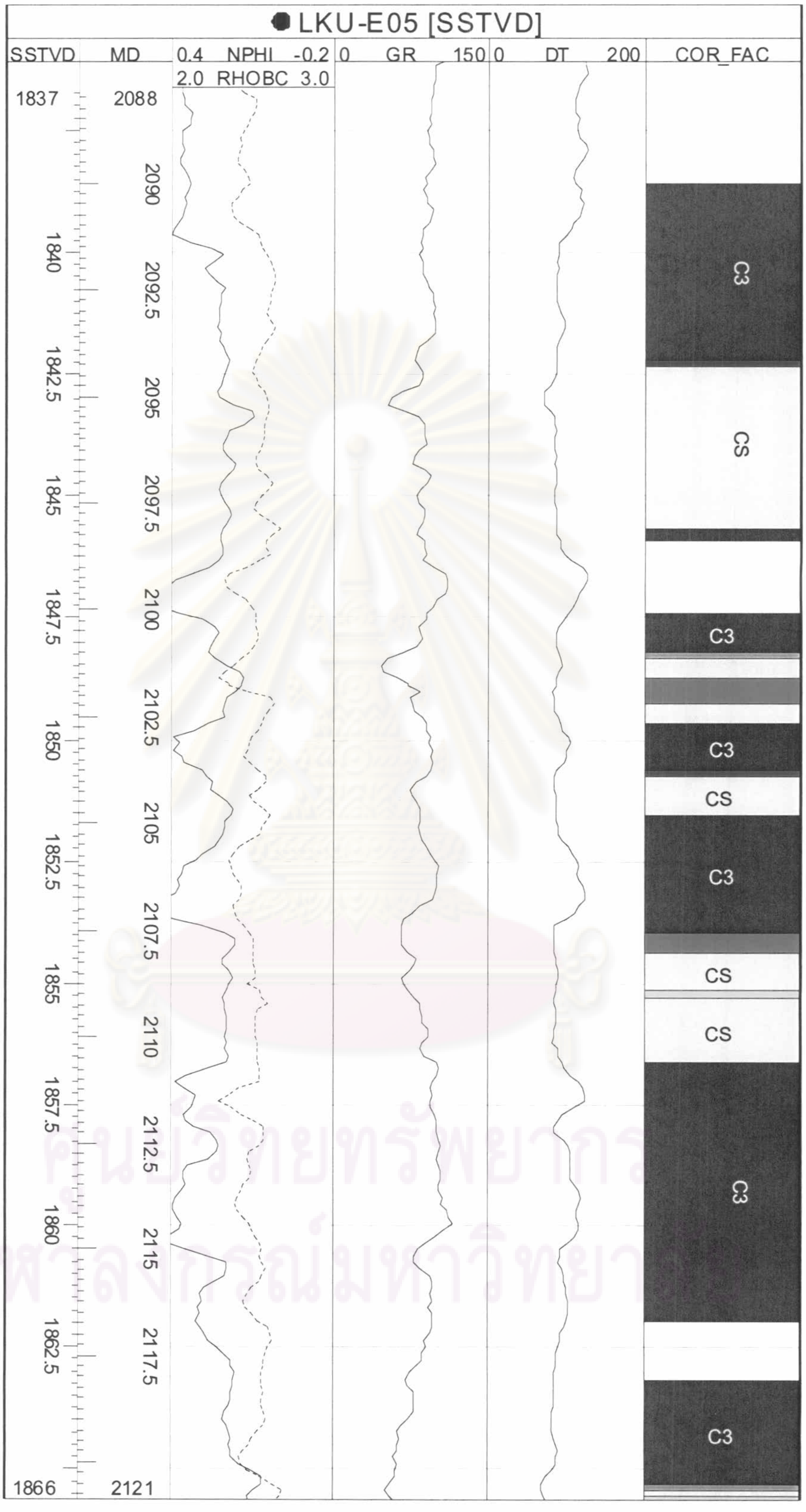
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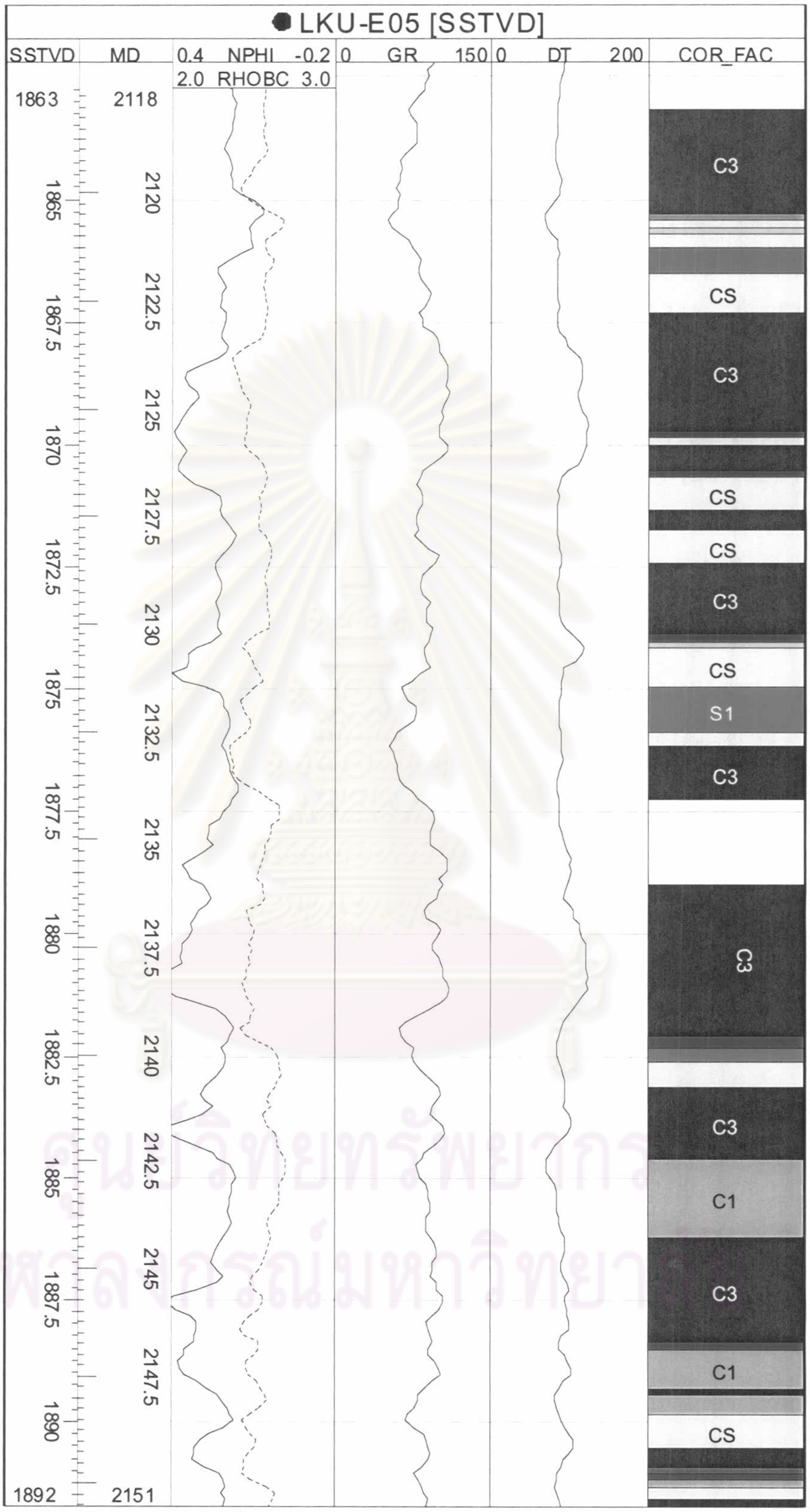
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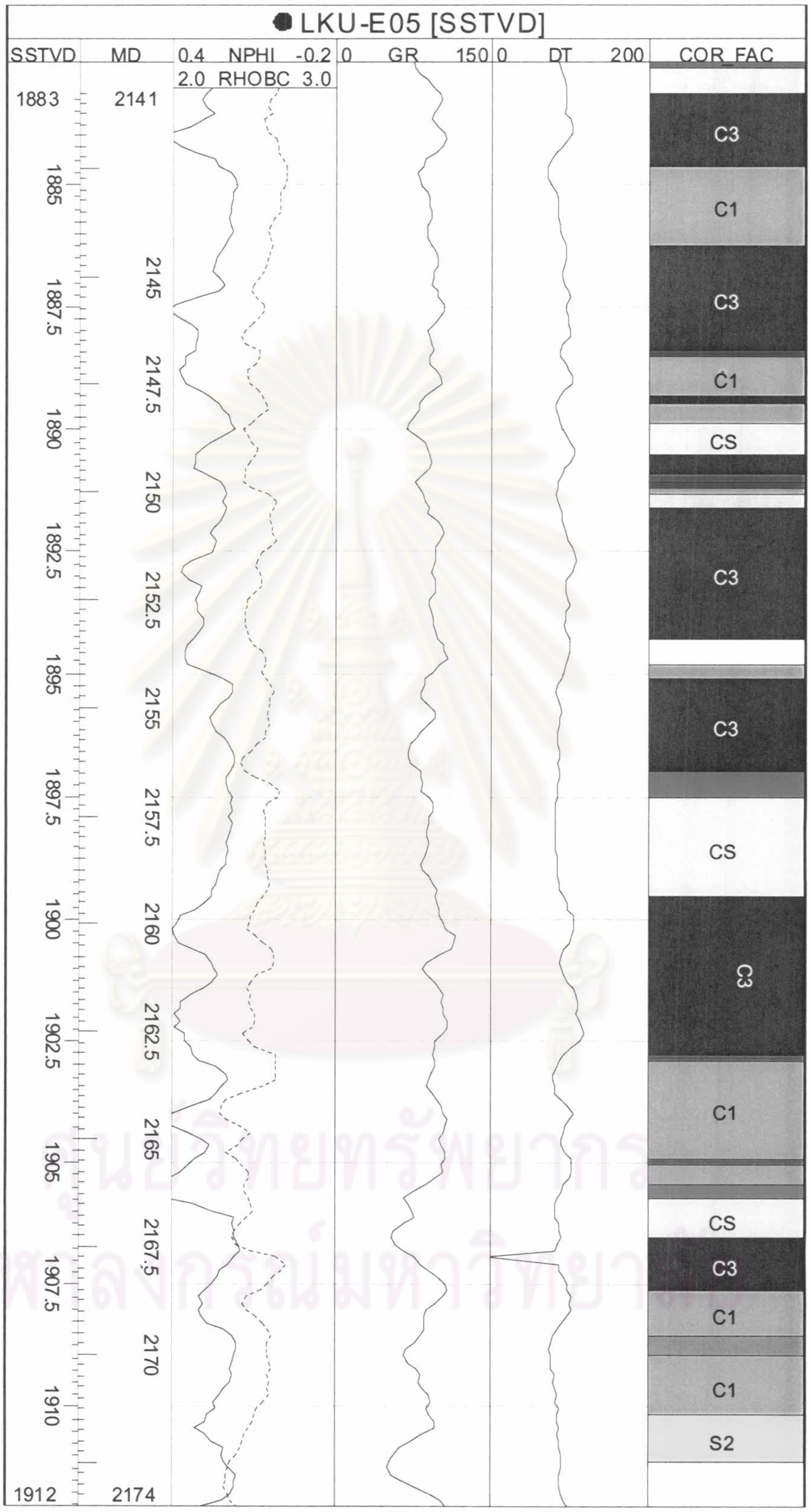
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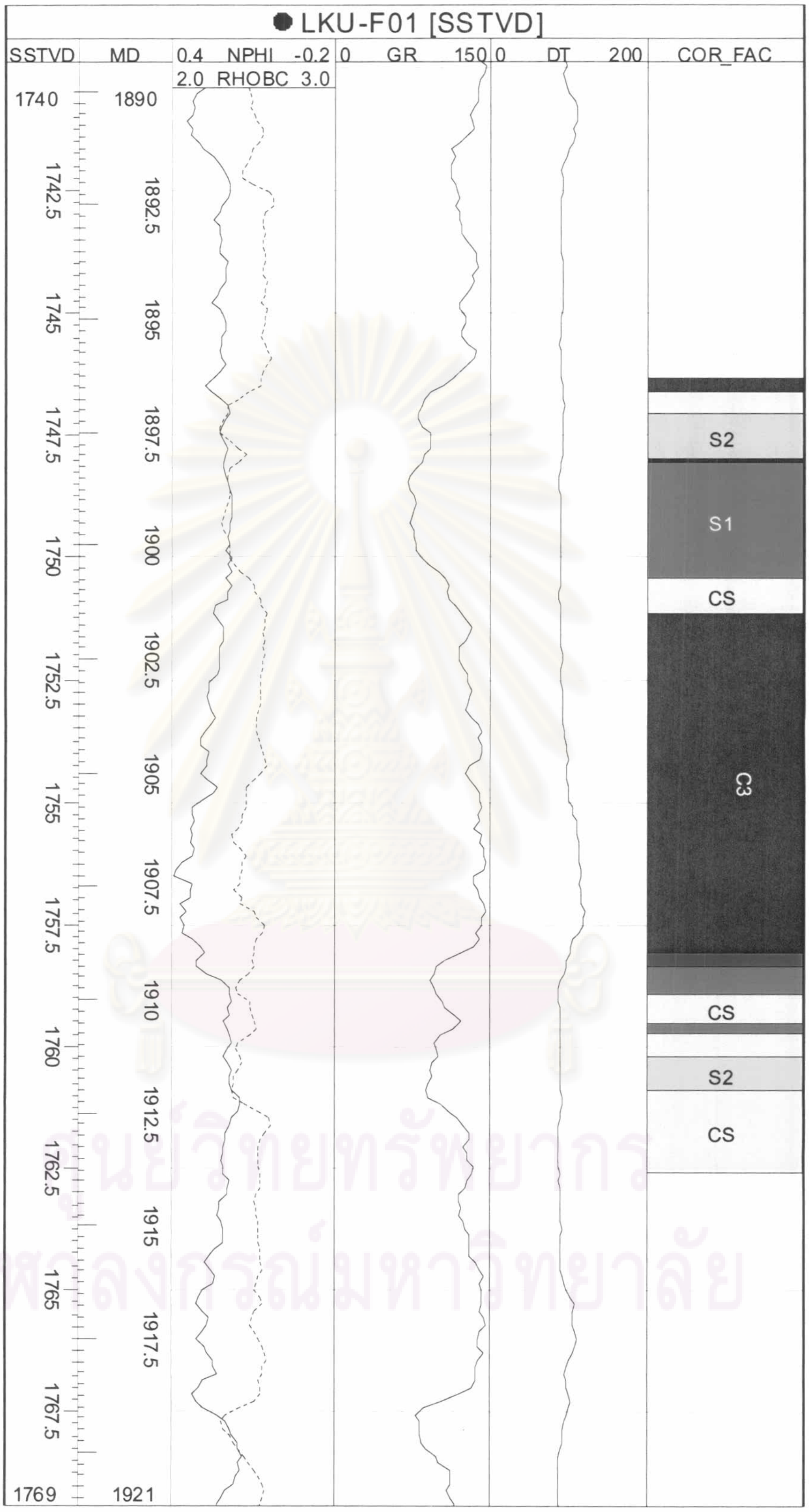
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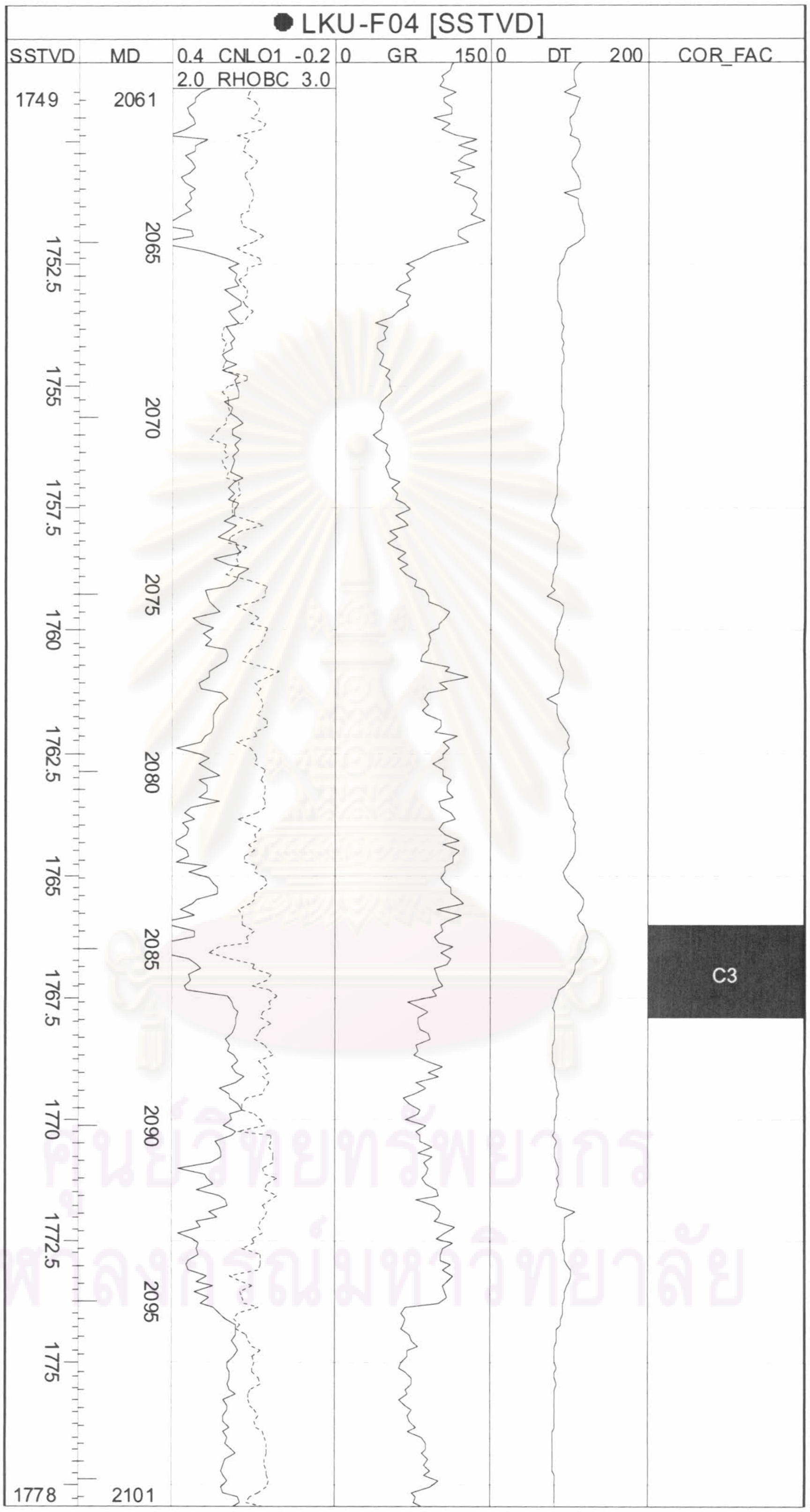
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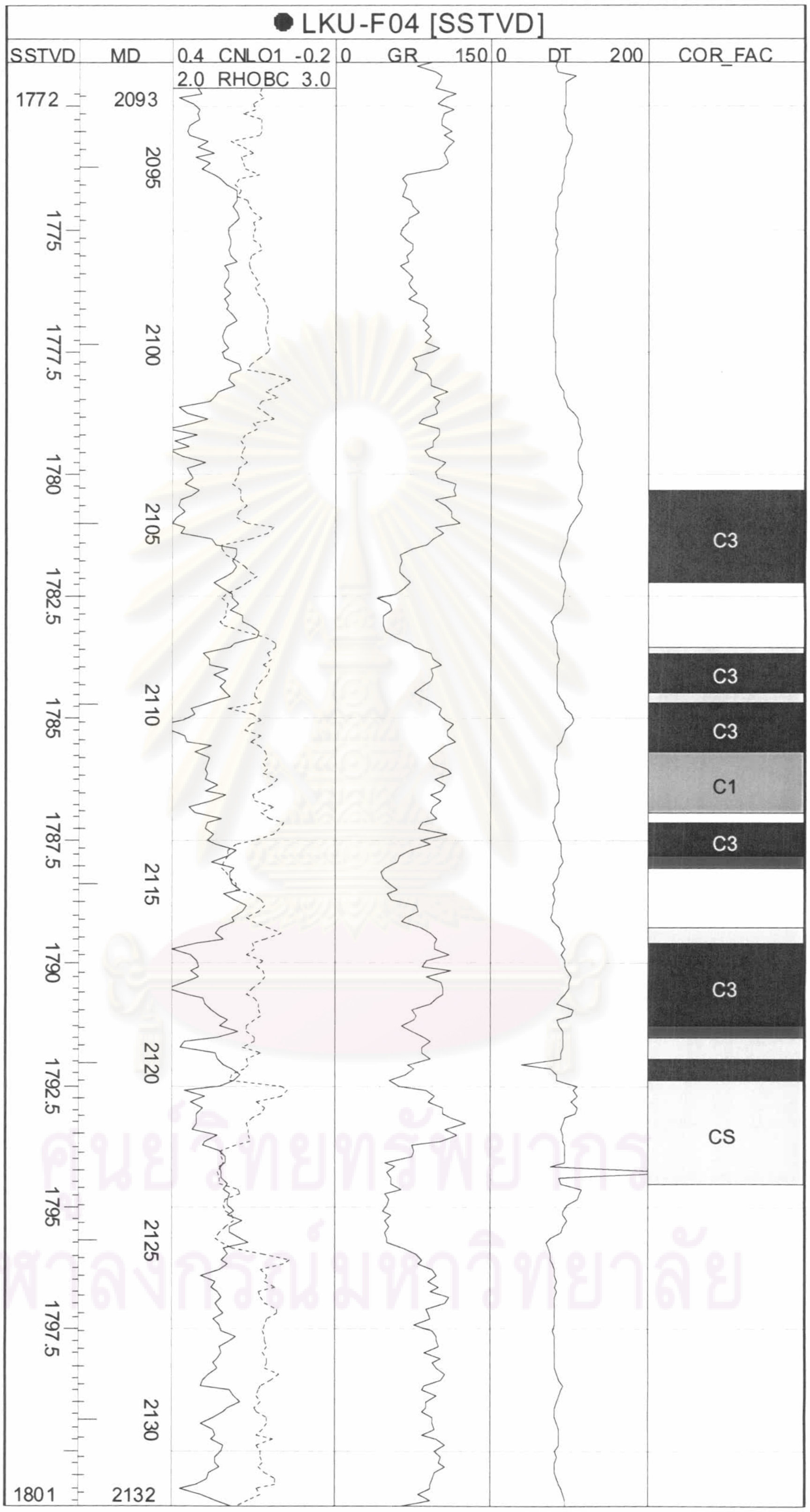
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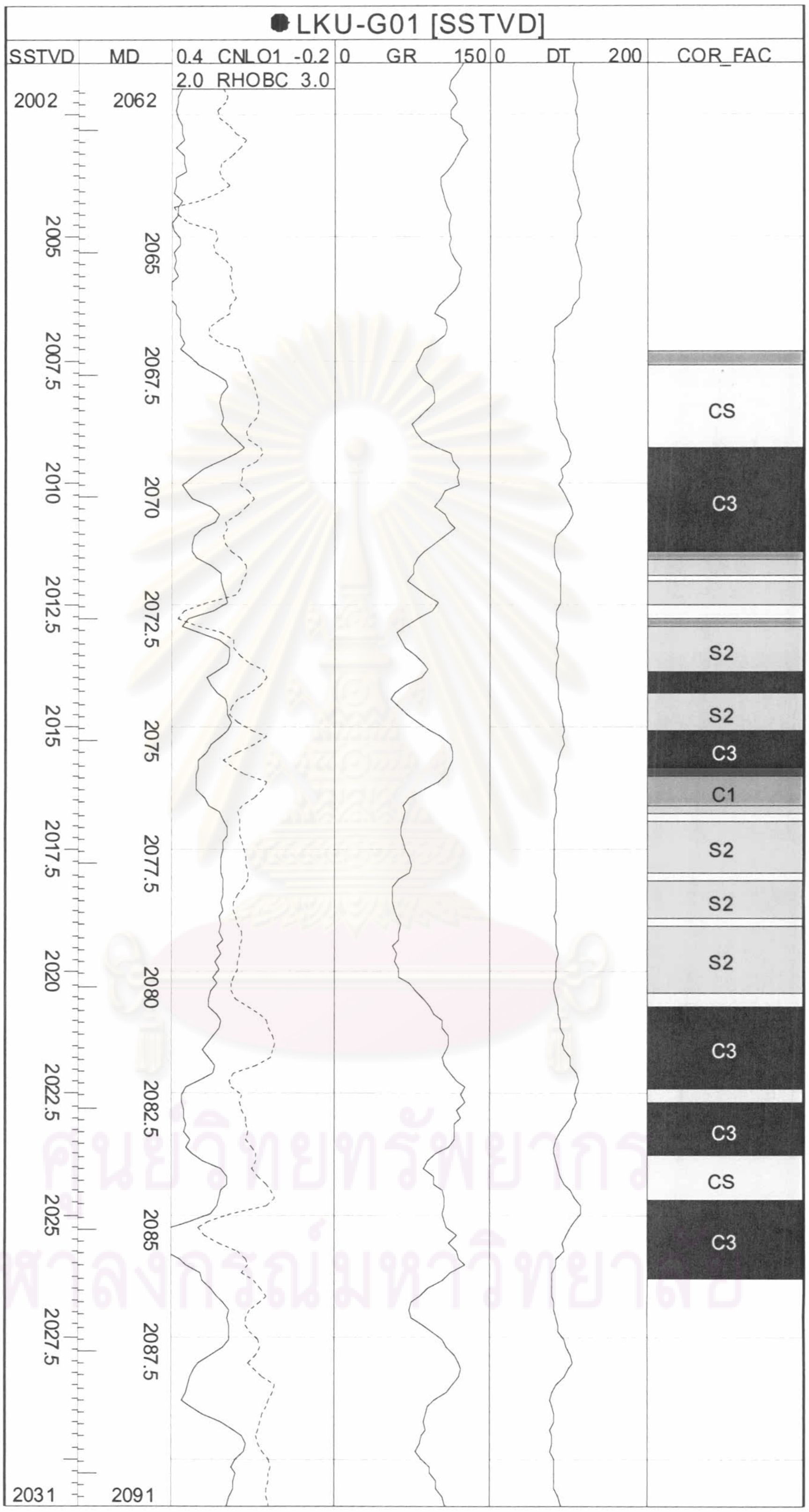
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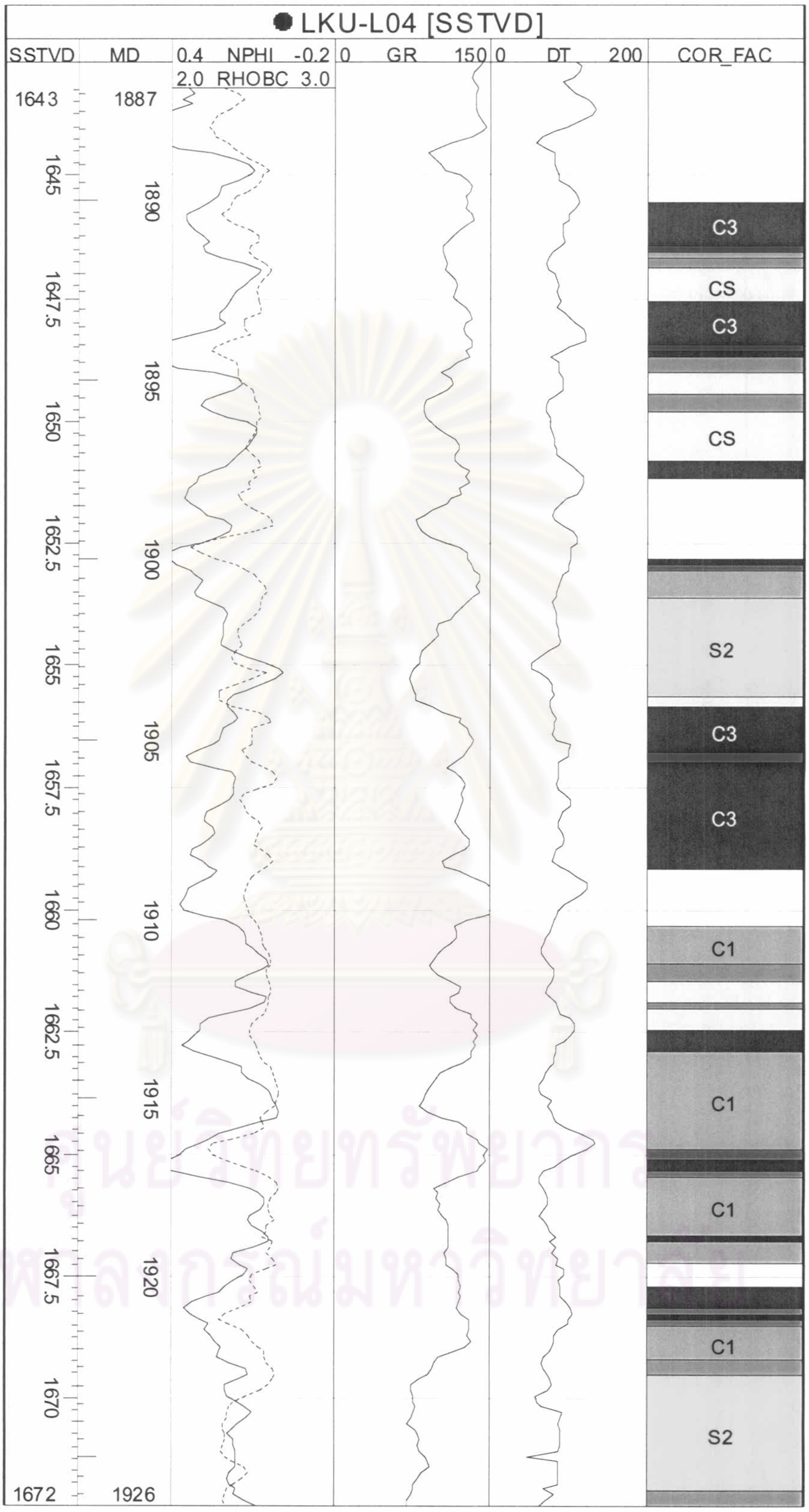
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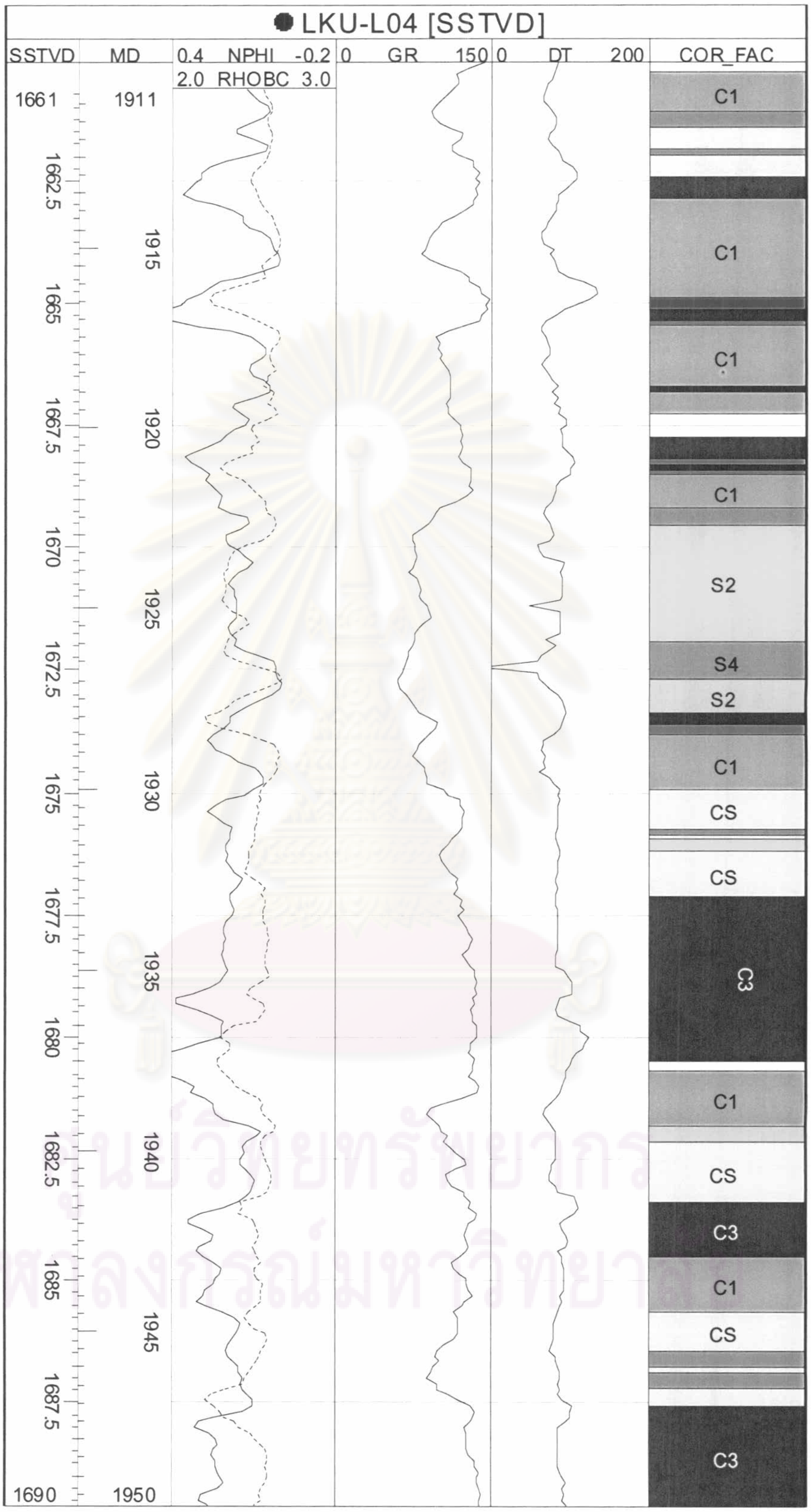
1926
C3
CS
C3
CS
S2
C3
C3
C1
C1
C1
C1
S2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1662.5
1915
1665
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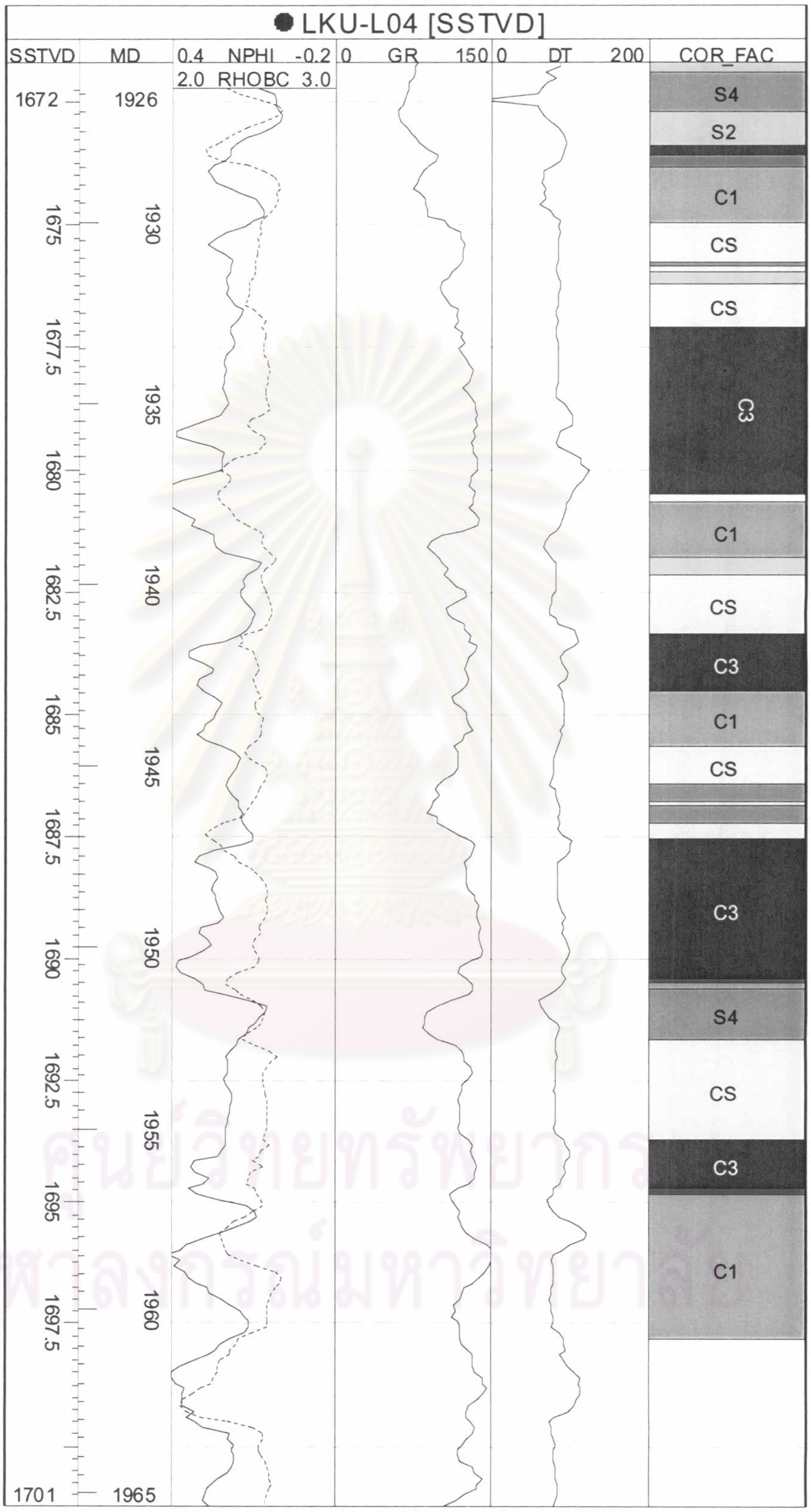
1920
1670
1925
1672.5
1675
1930
1677.5
1935
1680
1682.5
1940
1685
1945
1687.5
1690
1950
C1
C1
C1
C1
S2
S4
S2
C1
CS
CS
C3
C1
CS
C3
C1
CS
C3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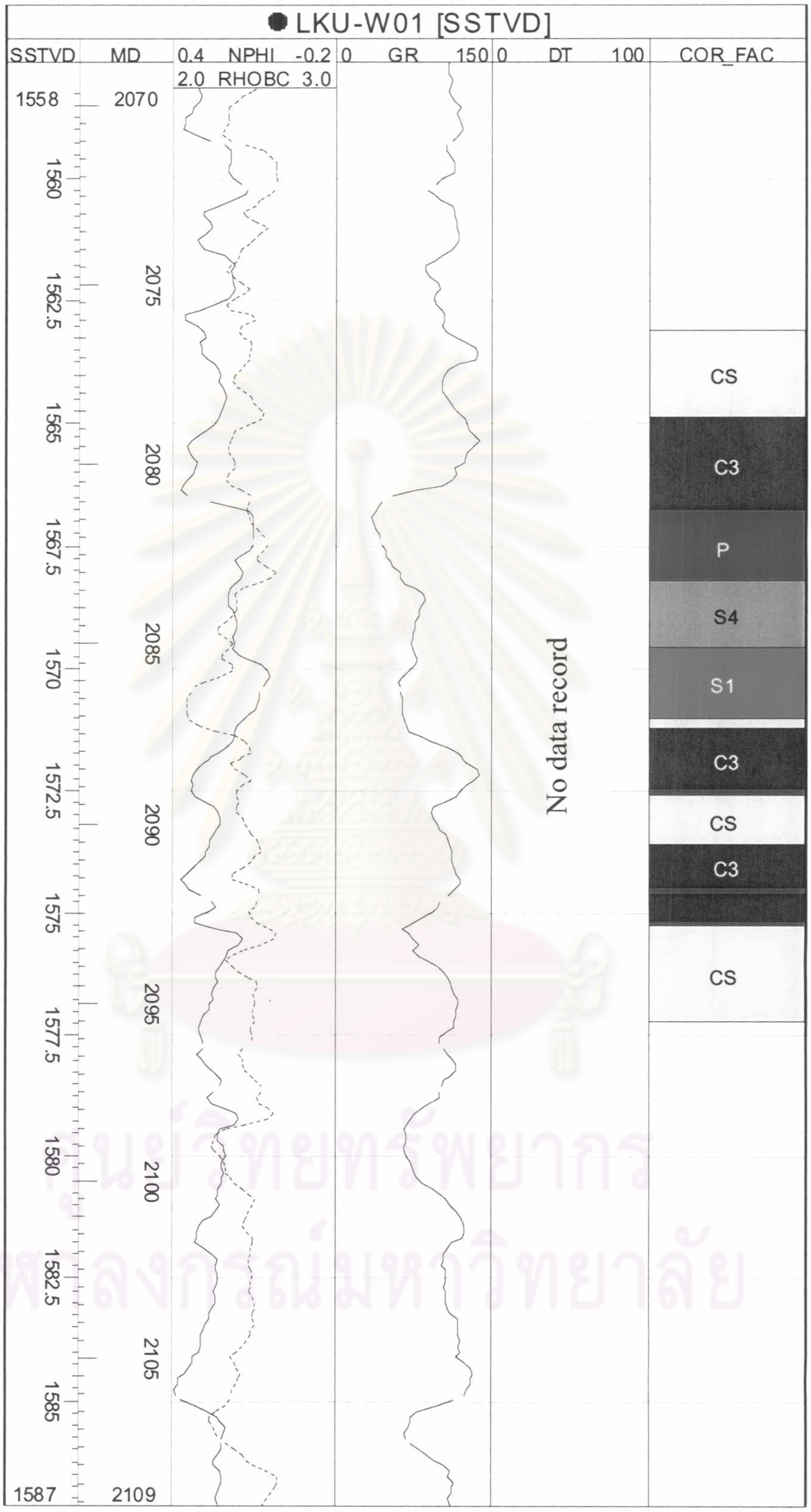
1672
1926
1675
1930
1677.5
1935
1680
1682.5
1940
1685
1945
1687.5
1690
1950
1692.5
1955
1695
1697.5
1960
1701
1965
S4
S2
C1
CS
CS
C3
C1
CS
C3
C1
CS
C3
S4
CS
C3
C1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2070
1560
1562.5
2075
1565
2080
1567.5
2085
1570
1572.5
2090
1575
2095
1577.5
1580
2100
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1585
1587
2109
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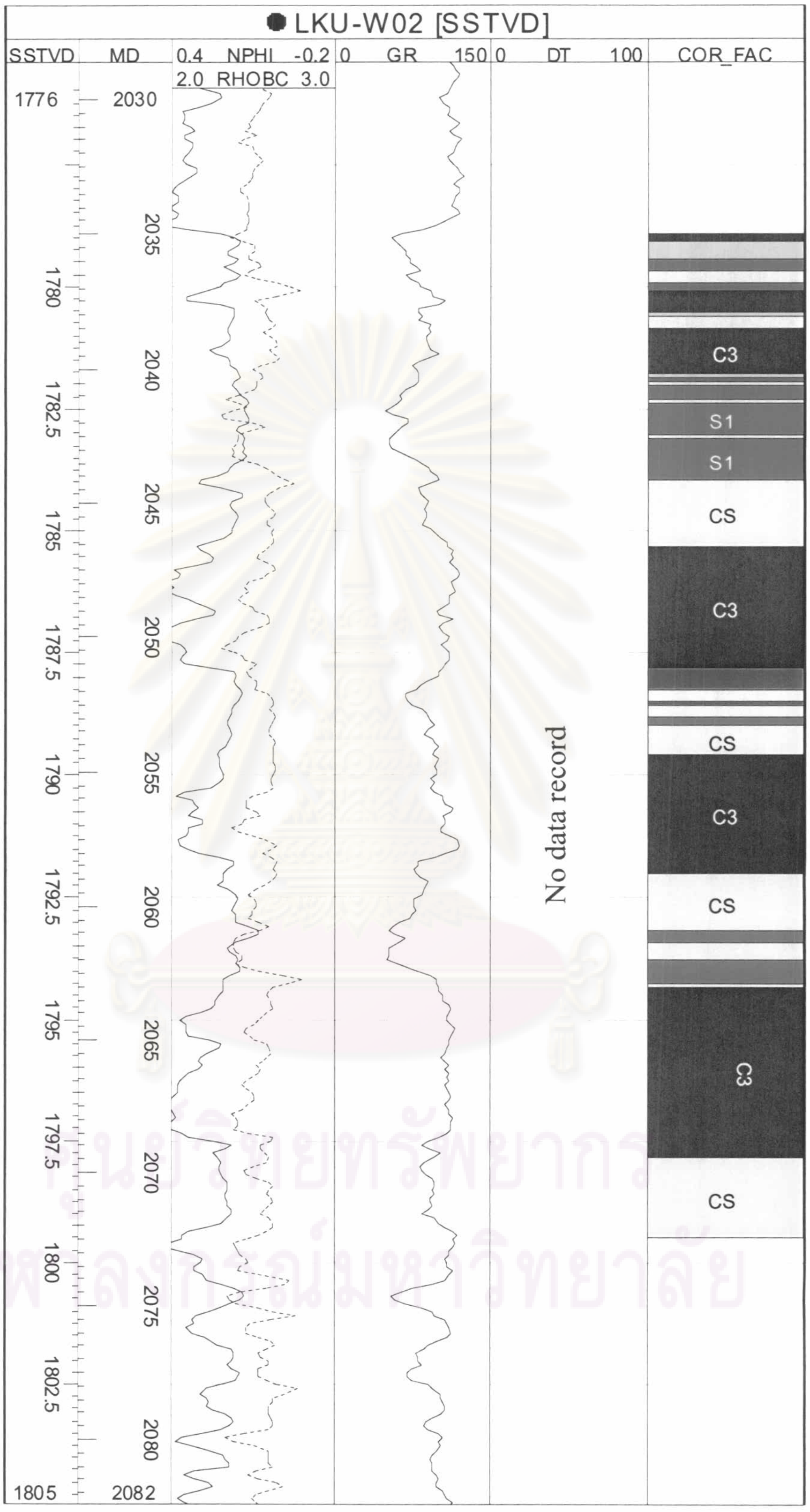
C3
P
S4
S1
C3
CS
C3
CS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0 DT 100
COR_FAC
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2030
2035
1780
2040
1782.5
2045
1785
2050
1787.5
2055
1790
2060
1792.5
2065
1795
2070
1797.5
1800
2075
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1805
2082
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C3
S1
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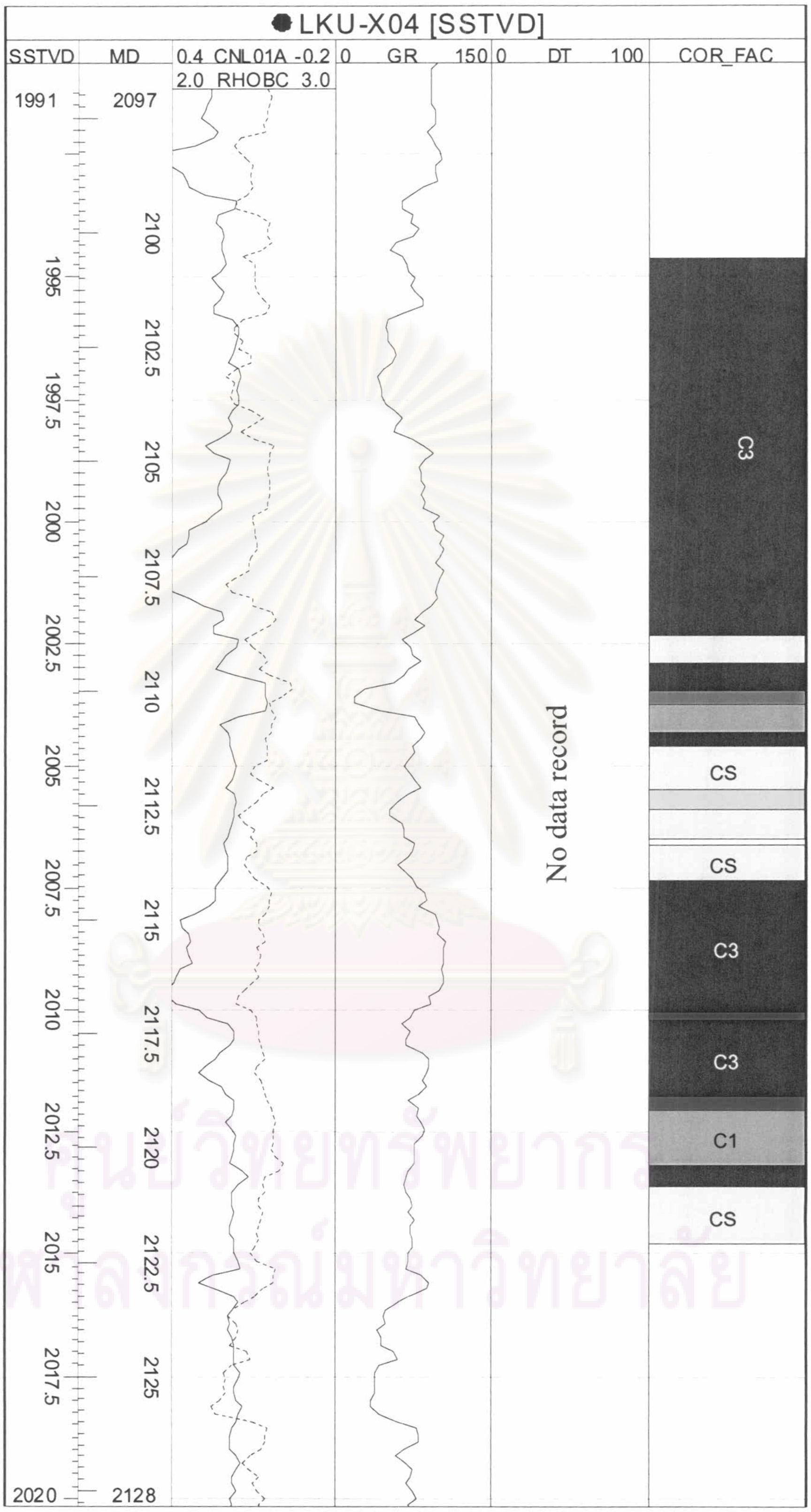
C3
CS
C3
CS
C3
CS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2.0 RHOBC 3.0
0 GR 150
0 DT 100
COR_FAC
No data record
C3
CS
CS
C3
C3
C1
CS

Appendix B
Description of Geophysical Log types

Geophysical log name : Gamma ray log (Simple gamma ray log)

Generalities : The gamma ray log is a record of a formation 's radioactivity. The radiation emanates from naturally-occurring uranium, thorium and potassium.

Principle of measurement : The natural gamma radiation in the formation originates from radioactive decay of potassium, thorium and uranium isotopes. Figure B-1 shows the energy spectra associated with these isotopes series. The standard gamma log counts all incoming gamma rays and thus measures the total radioactivity of the formation.

Interpretation : Most common minerals show distinct levels of natural radiation. This radiation originates mainly from potassium, as this is the most abundant of the three radioactive elements. There is a general trend for reservoir rock to have low radiation levels, whereas shale has a high potassium content and a high level of radioactivity. The gamma ray is useful for discriminating between reservoir and non-reservoir rock, particularly in sand and shale sequence (Figure B-2). In carbonate and evaporite sequences, the gamma ray is usually less suitable for reservoir identification, because non-reservoir rock such as salt or anhydrite also has a low radiation level.

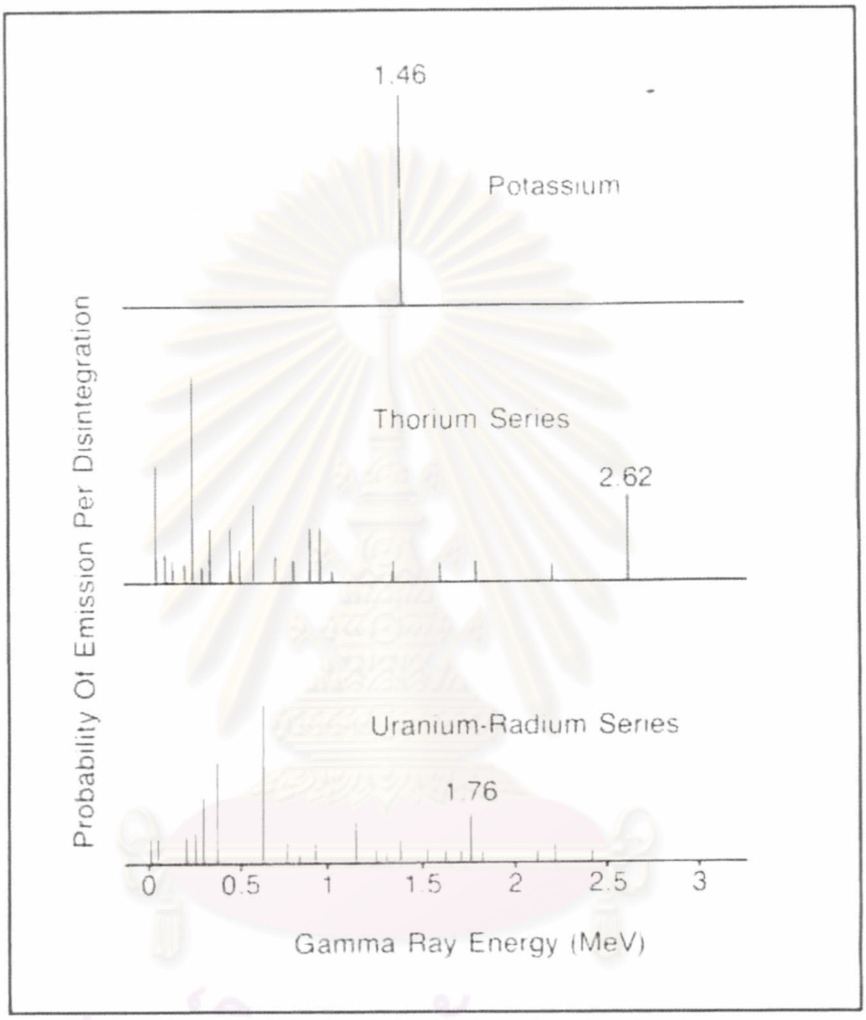


Figure B-1 Presentation of gamma ray emission spectra of radioactive minerals (Log interpretation [Schlumberger], 1997: 57).

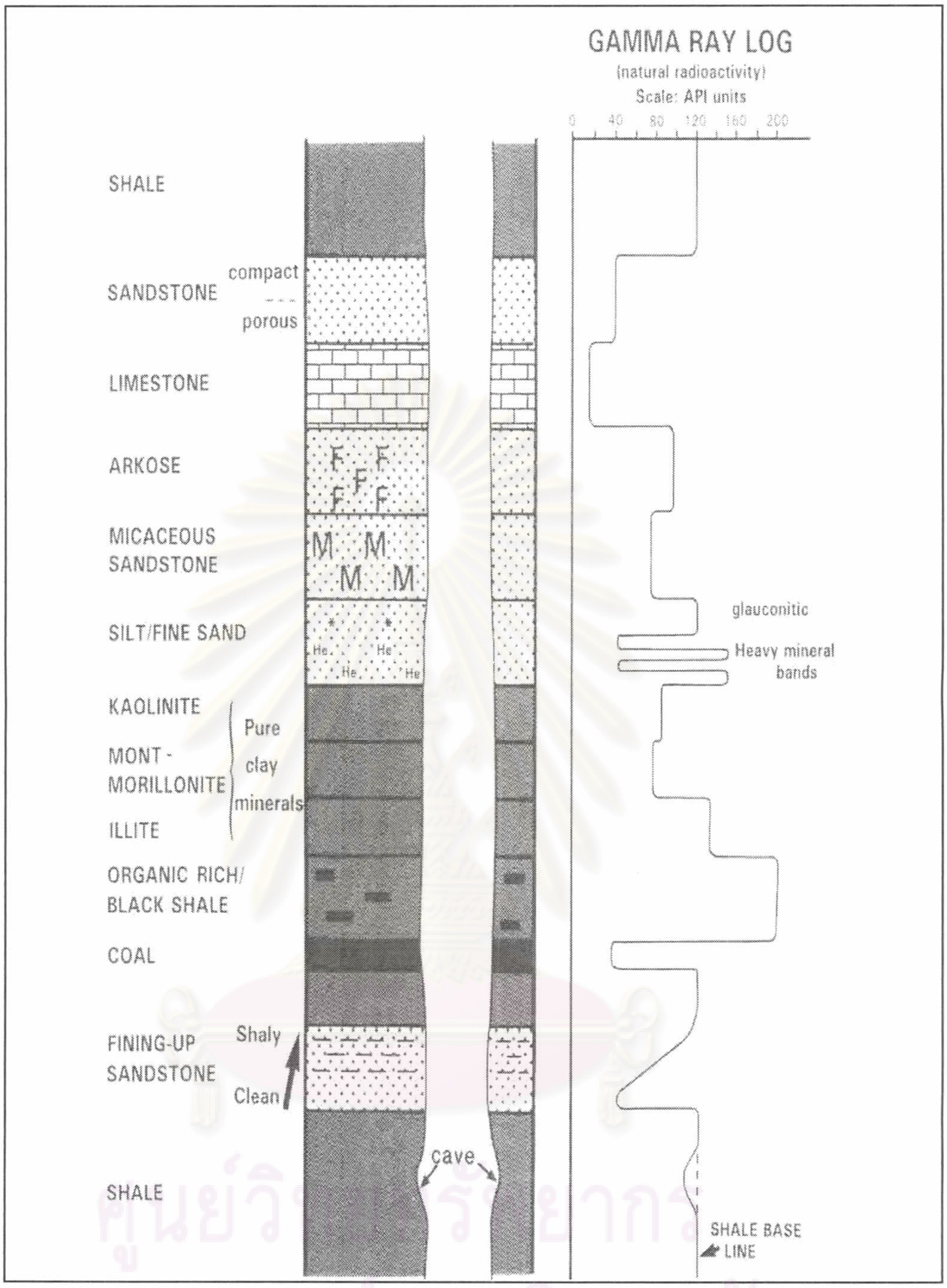


Figure B-2 The gamma ray log shows natural radioactivity and some interpretation of each rock type (Rider,1996: 67).

Geophysical log name : Density log

Generalities : The density log is a continuous record of formation's bulk density. This is the overall density of a rock including solid matrix and the fluid enclosed in the pore. Geologically bulk density is a function of the density of the minerals forming a rock and the volume of free fluids which it encloses. For example, a sandstone with no porosity will have a bulk density of 2.62 g/cm^3 , the density of pure quartz. At 10% porosity the bluk density is only 2.49 g/cm^3 being the sum of 90% quartz grains (density 2.65 g/cm^3) and10% water (density 1.0 g/cm^3)

Principles of measurement : A radioactive source emits gamma rays of medium energy (0.5 to 2 MeV) into the formation. These medium energy gamma rays interact with the electrons of the atoms in the formation by a process known as Compton scattering. In this process an electron is knocked out of its orbit, while the gamma ray loses some of its energy and is deflected. These scattered gamma rays are picked up and counted by a detector. The amount of scattered gamma rays counted at the detector is a measure of the amount of Compton scattering that has taken place which depends on the number of electrons present per unit volume of the formation. This electron " density" is directly related to the bulk density of the formation.

Interpretation : Density logs are primarily used as a porosity logs. Other uses include identification of minerals in evaporite deposits, detection of gas, determination of hydrocarbon density, evaluation of shaly sands and complex lithologies, determination oil-shale yield, calculation of overburden pressure and rock mechanical properties.The measured bulk density is displayed on an increasing linear scale in units of grams per cubic centimeter (Figure B-3)

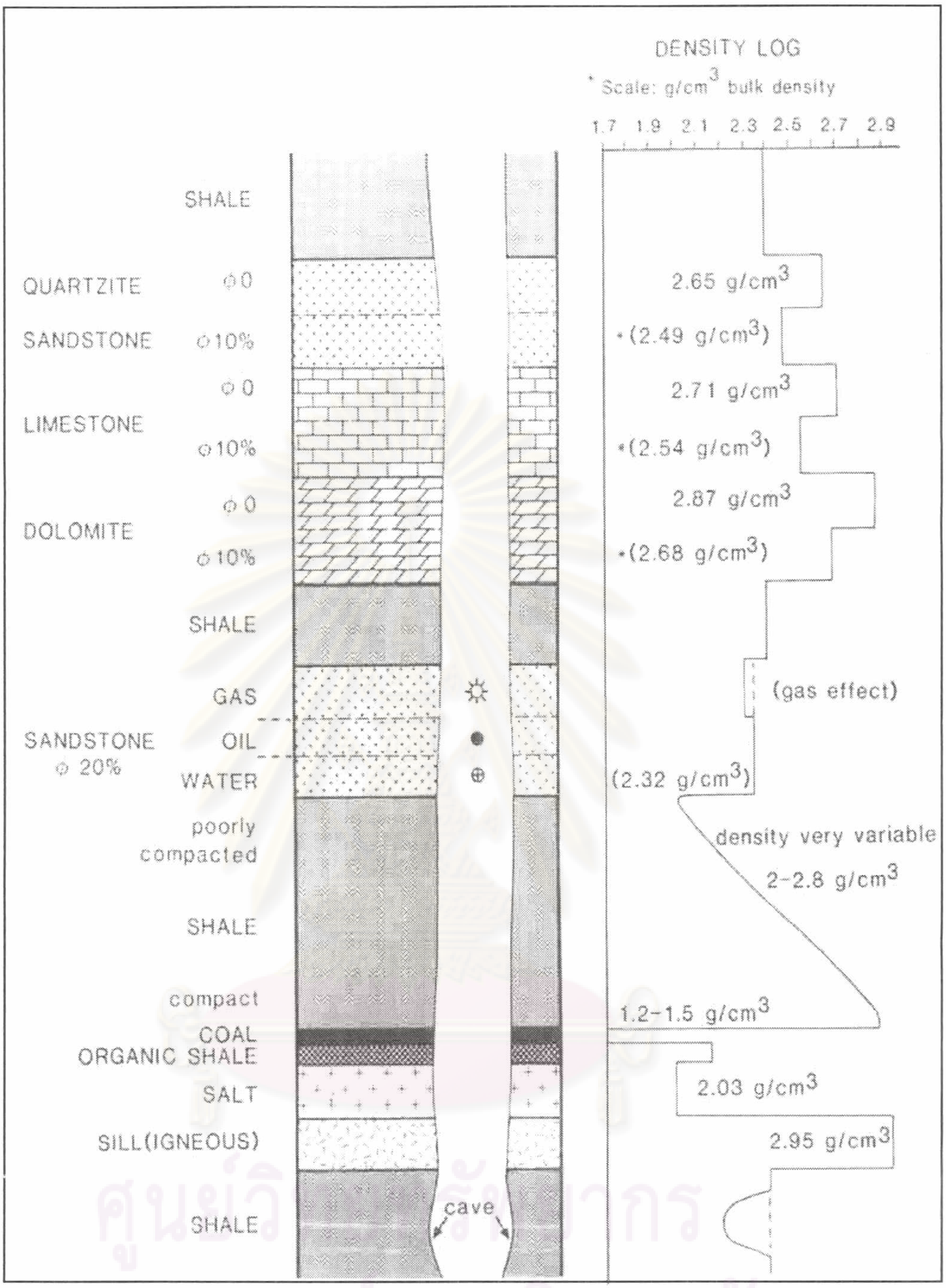


Figure B-3 The density log shows bulk density of some typical responses (Rider,1996: 115).

Geophysical log name : Neutron log

Generalities : The neutron log provides a continuous record of formation's reaction to fast neutron bombardment. It is quoted in terms of neutron porosity units, which are related to a formation's hydrocarbon index, and indication of its richness in hydrogen.

Principles of measurement : A neutron source emits fast neutrons into the formation. These neutrons loose energy in collisions with nuclei of the atoms in the formation. This process continues until the energy of the neutrons has declined to the thermal energy. A peak in the distribution of thermal neutrons will be created at a shorter or longer distance from the source, depending on the effectiveness of the formation to slow the neutrons.

The ability of the formation to slow down neutrons is determined largely by the amount of hydrogen present. This is because the nucleus of a hydrogen atom, i.e. a proton, has approximately the same mass as a neutron which causes the maximum amount of energy to be lost by the neutron in each collision. Two neutron detectors locate the position of the peak in the thermal neutron distribution. The distance of this peak from the neutron source is interpreted in terms of the amount of the amount of hydrogen present in the formation. This is translated into the amount of water present, and the result is recorded as porosity. This interpretation assumes that the rock matrix is limestone and the pre fluid is fresh water.

Interpretation : The porosity that is measured by the tool is displayed on a linear scale of decreasing porosity. The tool is calibrated in such a way that it records the correct porosity in fresh water bearing limestone. In other lithologies a correlation has to be applied to take into account the different neutron showing down characteristics of the rock (Figure B- 4).

In the presence of pore fluids other than fresh water, a correction for the different hydrogen content of these fluids has to be applied. This is done by defining the hydrogen index (HI) of a fluid which is a measure of the relative amount of hydrogen pre unit volume of the fluid compared with fresh water.

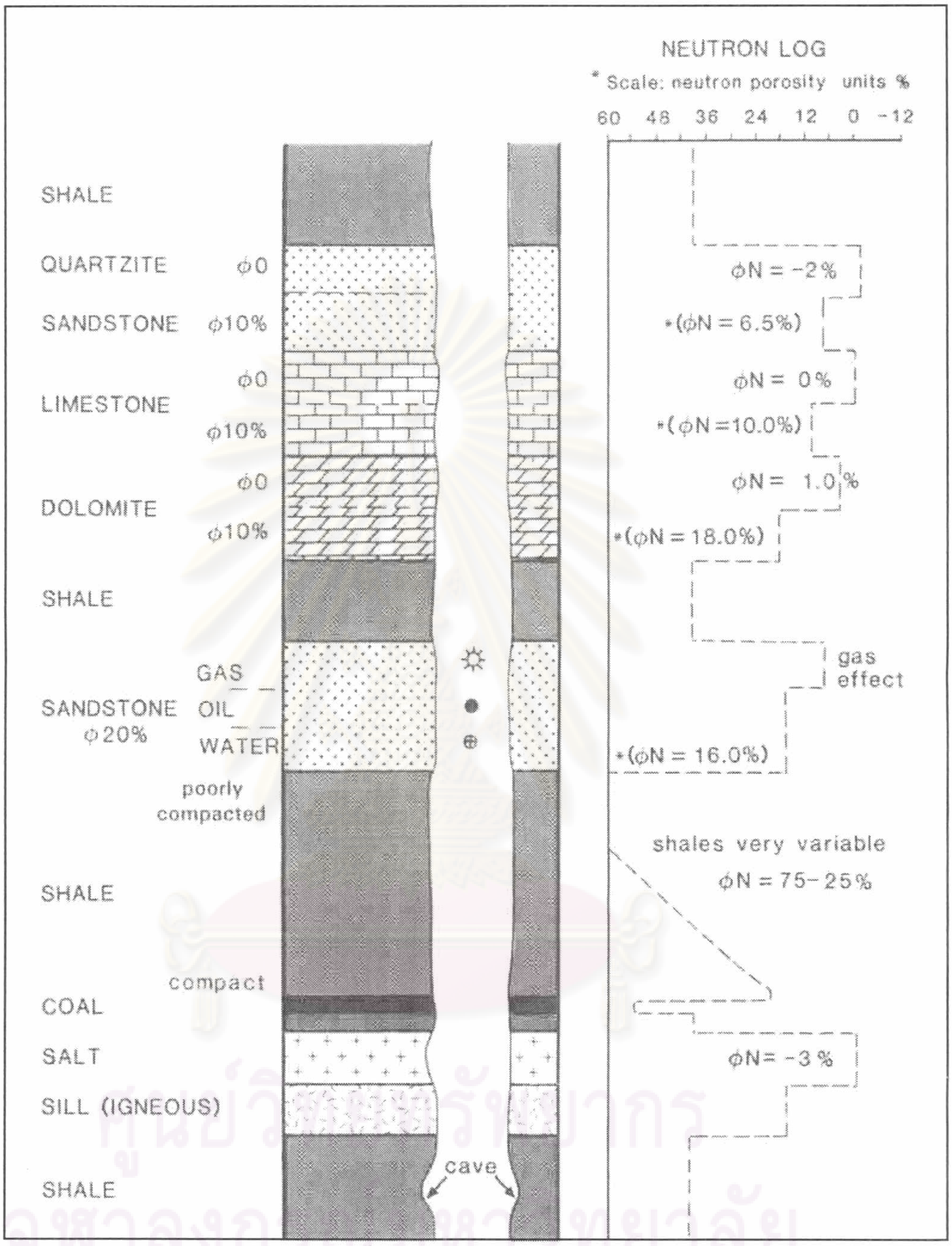


Figure B-4 The neutron log shows hydrogen index which is converted to neutron porosity units (Rider,1996: 133).

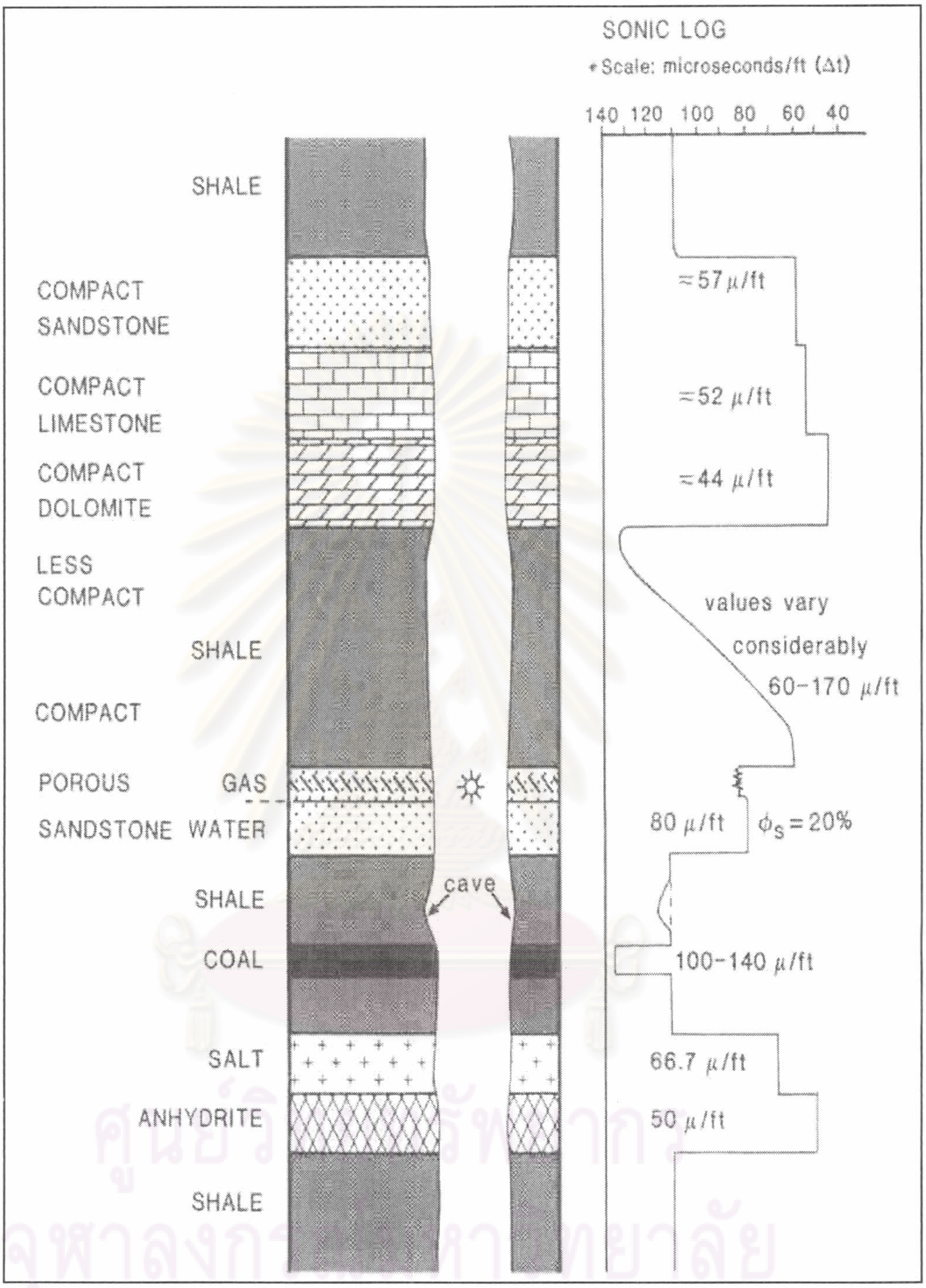
Geophysical log name : Sonic log

Generalities : The sonic log provides a formation's interval transit time, designate Δt (delta-t, the reciprocal of the velocity). It is a measure of the formation's capacity to transmit sound waves. Geologically this capacity varies with lithology and rock texture.

Principles of measurement : Neutron logs are used principally for delineation of porous formations and determination of their porosity. They respond primarily to the amount of hydrogen in the formation. Thus, in clean formations whose pores are filled with water or oil, the neutron log reflects the amount of liquid-filled porosity.Gas zones can often be identified by comparing the neutron log with another porosity log or a core analysis. A combination of the neutron log with one or more other porosity logs yields even more accurate porosity values and lithology identification even and evaluation of shale content.

The tool measures the travel time of a sound wave through the formation, by transmitting sound pulses and detecting their arrival at a receiver some distance away on the tool.

Interpretation : The measured values of Δt are displayed on a decreasing linear scale of travel time, in units of microseconds per foot or per meter (Figure B-5).



FigureB- 5 The sonic log shows a formation's ability to transmit sound waves. It is expressed as interval transit time, Δt.*($1x10^6$)/ Δt = sonic velocity;ft/sec (Rider,1996: 91).

Appendix C : Geophysical log values recorded from each lithofacies

Lithofacies C1

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.228	2.271	84.8	107.1
	0.313	2.344	83.3	99.6
	0.351	2.303	115.8	119.7
	0.275	2.475	97.5	96.5
	0.345	2.528	104.8	80.3
	0.331	2.457	104.0	79.7
LKU-B01	0.416	2.344	134.1	125.0
LKU-C01	0.450	2.354	118.8	127.4
	0.272	2.485	90.9	86.2
	0.248	2.577	83.5	84.8
	0.252	2.582	-	76.2
LKU-E02	-	2.403	111.2	115.2
	-	2.501	109.6	101.1
	-	2.365	120.1	110.3
	-	2.487	98.3	86.7
	-	2.516	132.5	132.2
	-	2.548	115.8	85.9
	-	2.545	104.3	82.5
	-	1.841	135.1	126.6
	-	2.423	145.9	102.3
	-	2.538	101.7	85.8
	-	2.524	113.1	83.1
LKU-E05	0.239	2.600	91.0	85.2
	0.422	2.407	97.8	100.7
	0.322	2.501	93.8	91.3
	0.483	2.278	106.9	100.5
	0.403	2.395	103.1	102.9
	0.348	2.427	87.2	101.6
	0.239	2.548	-	79.6
LKU-F04	0.321	2.540	105.9	83.2
LKU-G01	0.358	2.505	83.9	82.7

Lithofacies C1 (cont.)

	NEUTRON	DENSITY	GR	SONIC
LKU-L04	0.341	2.505	138.1	88.6
	0.162	2.519	107.7	67.0
	0.122	2.602	95.0	64.4
	0.137	2.555	102.4	66.0
	0.169	2.549	108.7	83.1
	0.291	2.453	131.4	81.4
	0.292	2.594	-	64.8
	0.373	2.378	137.0	88.0
	0.300	2.505	126.6	91.9
	0.421	2.382	148.9	77.8
LKU-W02	0.367	2.425	102.3	-
	0.274	2.419	83.0	-
	0.411	2.410	116.4	-
	0.380	2.417	101.7	-
	0.263	2.471	88.2	-
	0.229	2.436	84.4	-
	0.221	2.571	85.4	-
	0.277	2.523	92.9	-
	0.290	2.441	83.4	-
LKU-X04	0.277	2.556	-	-
	0.235	2.575	84.3	-

Lithofacies C2

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.472	2.251	106.3	80.5
	0.454	2.265	93.2	99.3
	0.536	2.187	105.9	114.6
	0.395	2.317	109.5	105.8
LKU-C01	0.418	2.309	101.7	120.5
	0.291	2.499	-	89.1
	0.511	1.890	111.1	112.9
	0.431	2.221	96.6	105.3
	0.334	2.459	100.1	94.4
LKU-E02	-	2.416	134.4	114.9
	-	2.347	136.9	133.7
	-	2.587	101.2	86.3
LKU-E05	0.309	2.390	-	89.0
	0.367	2.582	94.6	89.9
	0.384	2.369	103.1	102.4
LKU-L04	0.388	2.399	133.4	101.3
	0.420	2.206	145.2	104.7
LKU-W02	0.332	2.426	104.2	-
	0.302	2.465	108.2	-
	0.439	2.271	-	-

Lithofacies C3

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.357	2.398	94.3	-
	0.271	2.343	-	-
	0.424	2.346	111.4	112.2
	0.436	2.277	114.7	121.1
	0.247	2.170	-	117.0
	0.343	2.324	91.1	129.1
	0.408	2.251	100.5	119.3
	0.329	2.394	-	99.0
	0.356	2.361	104.4	127.8
	0.344	2.424	98.2	112.9
	0.201	2.537	99.0	90.2
	0.317	2.385	-	99.3
	0.431	2.397	114.3	124.9
	0.314	2.423	96.3	100.4
	0.419	2.362	114.1	118.7
	0.407	2.357	113.4	119.3
	0.338	2.481	95.1	111.7
	0.295	2.509	96.6	107.4
	0.277	2.493	94.2	98.6
LKU-B01	0.442	2.120	119.7	129.0
	0.381	2.241	103.3	93.0
	0.407	2.213	-	136.0
LKU-C01	0.454	2.191	106.0	102.7
	0.287	2.520	99.8	87.6
	0.363	2.286	100.2	101.2
	0.333	2.575	92.3	89.9
	0.249	2.437	-	87.0
	0.386	2.212	97.5	99.6
	0.314	2.454	97.0	90.2
	0.329	2.478	95.9	89.8
	0.403	2.281	110.0	92.4
	0.292	2.635	108.6	84.3
	0.238	2.604	95.2	-
LKU-E02S1	-	2.346	101.5	104.9
	-	2.340	109.8	106.5
	-	2.405	118.2	94.2
	-	2.484	110.5	96.3
	-	2.302	106.7	98.3
	-	2.487	106.5	98.1
	-	2.428	102.8	95.6
	-	2.541	111.4	109.2
	-	2.452	114.7	92.8
	-	2.443	104.6	100.6

Lithofacies C3 (cont.)

	NEUTRON	DENSITY	GR	SONIC
LKU-E02	-	2.473	116.2	96.6
	-	2.229	122.5	94.6
	-	2.165	129.4	118.4
	-	2.408	121.5	90.2
	-	2.486	103.5	85.5
	-	2.446	126.8	98.4
	-	2.571	100.4	-
	-	2.555	108.3	-
	-	2.442	98.5	101.6
LKU-E05	0.274	2.545	97.1	94.4
	0.269	2.576	-	87.8
	0.278	2.482	-	86.0
	0.438	2.420	96.6	101.5
	0.423	2.355	99.9	117.0
	0.438	2.347	106.1	114.6
	0.235	2.510	-	84.0
	0.385	2.368	106.5	113.2
	0.397	2.438	106.1	118.7
	0.260	2.486	-	85.0
	0.278	2.533	-	86.2
	0.212	2.378	-	85.4
	0.479	2.404	104.2	123.5
	0.560	2.568	105.4	99.5
	0.439	2.492	102.3	97.8
	0.370	2.402	90.1	93.9
	0.418	2.489	91.6	101.6
	0.310	2.531	95.2	88.3
	0.425	2.512	114.2	97.7
LKU-F01	0.343	2.492	-	96.7
LKU-F04	0.410	2.282	110.2	114.9
	0.441	2.383	117.1	104.8
	0.277	2.531	97.0	84.2
	0.470	2.418	111.0	101.1
	0.300	2.550	102.8	85.8
	0.438	2.428	104.4	97.6
LKU-G01	0.402	2.372	119.2	87.0
	0.314	2.526	-	85.0
	0.322	2.361	113.8	90.4
	0.298	2.571	109.2	94.9
	0.400	2.414	115.2	94.5
	0.402	2.415	123.5	84.2

Lithofacies C3 (cont.)

	NEUTRON	DENSITY	GR	SONIC
LKU-L04	0.300	2.303	131.0	97.9
	0.260	2.496	129.2	93.6
	0.263	2.477	124.6	106.2
	0.267	2.445	130.5	80.9
	0.232	2.395	124.0	101.0
LKU-W01	0.389	2.298	-	-
	0.356	2.335	-	-
	0.308	2.389	112.8	-
	0.308	2.430	95.6	-
LKU-W02	0.446	2.291	97.5	-
	0.377	2.499	98.5	-
	0.218	2.563	-	-
	0.412	2.511	-	-
	0.390	2.358	101.3	-
LKU-X04	0.444	2.443	100.9	-
	0.275	2.517	-	-
	0.411	2.459	101.5	-
	0.319	2.481	89.9	-
	0.171	2.534	-	-

Lithofacies CS

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.305	2.285	82.5	-
	0.334	2.357	87.6	100.0
	0.345	2.390	89.8	102.3
	0.334	2.415	87.1	114.9
	0.355	2.840	64.4	96.2
	0.300	2.385	77.2	100.2
	0.337	2.482	91.8	95.1
	0.277	2.346	72.5	98.3
	0.288	2.376	89.9	97.5
LKU-B01	0.252	2.431	92.5	80.0
LKU-E02	0.227	2.445	71.5	85.3
	0.279	2.409	74.4	89.3
	0.280	2.522	88.8	88.0
	0.244	2.474	78.1	84.3
	0.286	2.604	86.6	82.7
	0.227	2.574	83.4	78.6
	0.216	2.553	91.5	77.0
LKU-E05	0.218	2.483	87.3	86.2
	0.254	2.525	85.6	88.5
	0.267	2.444	77.8	86.1
	0.236	2.476	73.1	89.4
	0.241	2.467	92.0	85.2
	0.265	2.526	88.6	85.2
	0.323	2.509	80.8	86.0
	0.238	2.558	88.0	87.9
	0.400	2.459	90.8	92.0
	0.272	2.616	85.3	91.2
	0.302	2.427	84.2	100.3
	0.244	2.515	88.4	82.6
	0.222	2.412	75.6	82.7
LKU-F01	0.253	2.326	84.7	93.9
	0.254	2.493	111.5	78.8
	0.240	2.439	110.4	89.4
	0.232	2.358	98.7	89.2
	0.232	2.555	120.8	88.4
LKU-F04	0.408	2.389	84.7	92.0
	0.328	2.439	102.2	91.3

Lithofacies P

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.302	2.357	95.2	122.2
	0.244	2.209	-	104.7
	0.438	2.327	102.5	119.3
	0.349	2.433	96.4	99.3
	0.521	2.294	98.9	103.8
	0.258	2.447	114.7	110.1
	0.456	2.393	104.6	117.0
LKU-B01	0.435	2.280	-	127.0
LKU-E02	-	2.375	90.2	97.3
	-	2.351	90.0	86.3
	-	2.379	89.6	95.7
LKU-E05	0.316	2.530	89.7	84.8
	0.244	2.455	82.4	88.1
	0.429	2.396	101.4	120.6
	0.295	2.421	89.7	110.7
	0.246	2.476	-	84.7
	0.262	2.420	-	83.8
LKU-F01	0.356	2.446	103.3	99.1
	0.231	2.405	-	90.6
LKU-L04	0.306	2.438	104.6	76.4
	0.507	2.201	125.2	90.3
	0.382	2.402	125.6	100.3
	0.345	2.284	129.4	91.7
LKU-W01	0.180	2.497	-	-
	0.350	2.350	112.8	-
	0.411	2.360	119.7	-
	0.305	2.530	-	-
LKU-W02	0.169	2.531	-	-
	0.386	2.444	93.5	-
	0.314	2.467	90.5	-
	0.298	2.569	75.4	-
	0.298	2.498	74.1	-
	0.269	2.494	96.6	-

Lithofacies P (cont.)

	NEUTRON	DENSITY	GR	SONIC
LKU-X04	0.331 0.221	2.454 2.554	72.9 76.1	- -

Lithofacies SC

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.350	2.462	87.5	-
LKU-E02	-	2.451	116.6	98.0
	-	2.564	109.8	95.3
	-	2.219	110.5	110.3
	-	2.335	84.6	120.5
	-	2.580	97.6	79.8
	-	2.522	94.8	88.0
LKU-L04	0.380	2.295	121.6	104.9
	0.274	2.311	93.4	84.8
LKU-X04	0.106	2.608	81.6	-

Lithofacies S1

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.330	2.401	90.0	114.8
	0.456	2.339	-	112.0
	0.415	2.386	-	111.4
	0.225	2.284	65.5	104.5
	0.334	2.390	75.3	93.8
	0.285	2.233	52.7	98.6
LKU-C01	0.275	2.404	74.7	110.1
	0.300	2.423	70.0	90.3
	0.281	2.354	75.7	87.9
	0.280	2.387	81.1	88.2
	0.218	2.529	56.1	73.1
	0.000	2.522	71.1	71.1
	0.245	2.501	76.0	80.8
	0.194	2.602	77.5	74.2
	0.187	2.514	75.7	74.6
LKU-E02		2.355	85.3	97.5
		2.313	89.9	100.1
		2.403	76.0	94.0
LKU-E05	0.198	2.284	48.9	90.4
	0.227	2.447	65.6	84.8
	0.233	2.562	80.8	85.3
	0.250	2.393	59.6	89.9
	0.254	2.592	74.6	85.5
	0.219	2.390	69.5	87.1
LKU-F01	0.230	2.305	70.8	89.1
	0.255	2.362	-	89.7
LKU-W01	0.000	0.000	64.5	
LKU-W02	0.209	2.358	68.6	

Lithofacies S2

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.133	2.063	68.2	-
	0.326	2.415	-	98.7
	0.311	2.246	53.5	100.6
	0.277	2.315	52.7	84.8
	0.299	2.433	64.4	90.0
	0.341	2.305	59.7	81.9
LKU-B01	-	2.247	75.9	97.1
	-	2.265	74.0	98.9
	-	2.247	71.6	96.9
	-	2.375	-	90.9
	-	2.273	77.0	93.5
LKU-E05	0.255	2.502	76.1	85.7
	0.152	2.605	57.2	-
	0.267	2.342	55.9	89.4
LKU-F01	0.249	2.268	-	92.5
	0.233	2.337	-	90.3
LKU-G01	0.298	2.413	75.8	85.7
	0.262	2.385	71.5	89.5
	0.289	2.316	63.0	87.4
	0.259	2.382	55.9	86.1
	0.248	2.370	63.9	81.5
	0.262	2.359	55.5	83.7
	0.272	2.369	59.2	85.6
LKU-L04	0.130	2.332	74.7	79.0
	0.192	2.278	71.4	88.5
	0.000	2.464	64.5	79.6
	0.253	2.421	-	86.1
	0.130	2.537	-	81.7
LKU-W02	0.235	2.290	69.7	-
	0.247	2.258	57.6	-
	0.222	2.269	57.9	-
	0.168	2.388	43.1	-
	0.130	2.337	41.9	-
LKU-X04	0.214	2.454	58.1	-

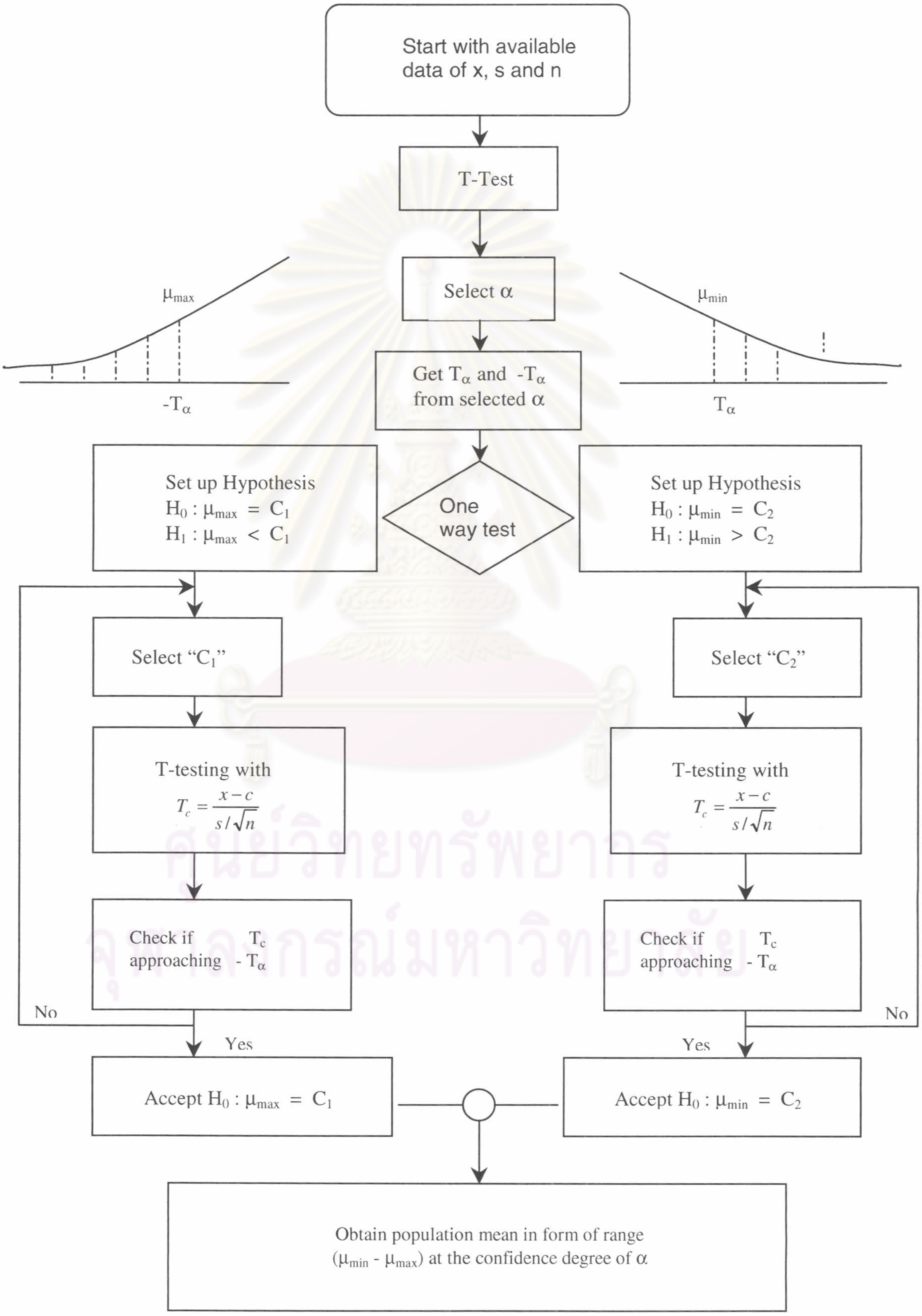
Lithofacies S3

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.240 0.273	2.518 2.545	85.3 -	76.4 110.2
LKU-B01	0.314	2.313	87.3	91.0
LKU-E02	- - -	2.551 2.310 2.331	- 74.2 -	88.0 93.9 90.4
LKU-E05	- -	2.400 2.409	77.2 70.3	89.6 86.5

Lithofacies S4

	NEUTRON	DENSITY	GR	SONIC
LKU-A01	0.314	2.306	64.5	100.0
	0.344	2.328	74.1	100.9
	0.359	2.292	81.6	107.3
	0.328	2.328	60.2	86.5
LKU-C01	0.300	2.236	-	92.3
	0.251	2.304	51.8	87.7
	0.249	2.452	62.6	80.3
LKU-E02	-	2.234	79.2	86.6
LKU-E05	0.123	2.583	52.6	68.8
	0.213	2.531	69.8	75.1
LKU-L04	0.140	2.542	-	73.1
	0.352	2.358	-	87.1
	0.336	2.473	87.1	71.9
	0.156	2.530	-	82.2
	0.104	2.551	-	83.8
	0.192	2.562	-	68.0
	0.107	2.317	68.5	60.8
	0.237	2.470	-	80.3
	0.185	2.388	-	84.8
	0.118	2.517	87.0	70.5
LKU-W01	0.219	2.318	78.8	-

Appendix D: T-Testing flow chart and results analyzed from each lithofacies



Lithfacies C1

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.304	2.460	106.1	92.6
Sample STD	0.084	0.122	18.3	17.4
Sample size	41.000	52.000	48.0	41.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 2.704	± 2.680	± 2.7	± 2.7

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	-2.704	-2.680	-2.7	-2.7
C_1	0.339	2.504	113.2	99.9
T_{cal}	-2.689	-2.622	-2.7	-2.7
$\mu_{max} = C1$	0.339	2.504	113.2	99.9

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	2.704	2.680	2.7	2.7
C_2	0.269	2.415	99.0	85.2
T_{cal}	2.630	2.631	2.7	2.7
$\mu_{min} = C2$	0.269	2.415	99.0	85.2

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ	
NEUTRON	0.339	0.269	0.3 ±	0.0
DENSITY	2.504	2.415	2.5 ±	0.0
GR	113.210	98.977	106.1 ±	7.1
SONIC	99.910	85.207	92.6 ±	7.4

Lithofacies C2

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.399	2.343	110.9	102.6
Sample STD	0.072	0.158	16.1	13.9
Sample size	17.000	20.000	17.0	17.0

At data confidence of 99% (α=.01)

	NEUTRON	DENSITY	GR	SONIC
T α=.01	± 2.921	± 2.861	± 2.9	± 2.9

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.01	-2.921	-2.861	-2.9	-2.9
C_1	0.449	2.443	122.3	112.4
T_{cal}	-2.873	-2.842	-2.9	-2.9
$\mu_{max} = C1$	0.449	2.443	122.3	112.4

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.01	2.921	2.861	2.9	2.9
C_2	0.349	2.242	99.5	92.8
T_{cal}	2.873	2.859	2.9	2.9
$\mu_{min} = C2$	0.349	2.242	99.5	92.8

Population Mean at 99% Confidence

	μ max	μ min	μ	
NEUTRON	0.449	0.349	0.4 ±	0.1
DENSITY	2.443	2.242	2.3 ±	0.1
GR	122.329	99.507	110.9 ±	11.4
SONIC	112.442	92.805	102.6 ±	9.8

Lithofacies C3

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.348	2.420	106.7	100.6
Sample STD	0.077	0.107	10.4	12.9
Sample size	84.000	103.000	83.0	84.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
$T\alpha$=.0 1	± 2.644	± 2.630	± 2.6	± 2.6

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
$T\ \alpha$=.0 1	-2.644	-2.630	-2.6	-2.6
C_1	0.370	2.447	109.7	104.3
T_{cal}	-2.604	-2.549	-2.6	-2.6
$\mu_{max} = C1$	0.370	2.447	109.7	104.3

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
$T\ \alpha$=.0 1	2.644	2.630	2.6	2.6
C_2	0.326	2.393	103.6	96.9
T_{cal}	2.635	2.596	2.6	2.6
$\mu_{min} = C2$	0.326	2.393	103.6	96.9

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ		
NEUTRON	0.370	0.326	0.3	±	0.0
DENSITY	2.447	2.393	2.4	±	0.0
GR	109.680	103.643	106.7	±	3.0
SONIC	104.307	96.889	100.6	±	3.7

Lithofacies CS

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.264	2.464	92.2	88.7
Sample STD	0.050	0.096	16.0	8.2
Sample size	59.000	59.000	56.0	46.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 2.664	± 2.664	± 2.7	± 2.7

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	-2.664	-2.664	-2.7	-2.7
C_1	0.281	2.497	97.9	91.9
T_{cal}	-2.579	-2.633	-2.7	-2.7
$\mu_{max} = C1$	0.281	2.497	97.9	91.9

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	2.664	2.664	2.7	2.7
C_2	0.248	2.431	86.4	85.4
T_{cal}	2.529	2.663	2.7	2.7
$\mu_{min} = C2$	0.248	2.431	86.4	85.4

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ	
NEUTRON	0.281	0.248	0.3 ±	0.0
DENSITY	2.497	2.431	2.5 ±	0.0
GR	97.867	86.440	92.2 ±	5.7
SONIC	91.924	85.415	88.7 ±	3.3

Lithofacies P

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.327	2.413	98.0	100.2
Sample STD	0.088	0.091	15.8	14.2
Sample size	32.000	35.000	27.0	23.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 2.745	± 2.732	± 2.8	± 2.8

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	-2.745	-2.732	-2.8	-2.8
C_1	0.369	2.455	106.4	108.5
T_{cal}	-2.714	-2.712	-2.8	-2.8
$\mu_{max} = C1$	0.369	2.455	106.4	108.5

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	2.745	2.732	2.8	2.8
C_2	0.284	2.372	89.5	91.8
T_{cal}	2.738	2.692	2.8	2.8
$\mu_{min} = C2$	0.284	2.372	89.5	91.8

Population Mean at 99% Confidence

	μ max	μ min	μ	
NEUTRON	0.369	0.284	0.3 ±	0.0
DENSITY	2.455	2.372	2.4 ±	0.0
GR	106.394	89.532	98.0 ±	8.4
SONIC	108.527	91.803	100.2 ±	8.4

Lithofacies SC

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.278	2.435	99.8	97.7
Sample STD	0.123	0.137	14.0	13.7
Sample size	4.000	10.000	10.0	8.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 5.841	± 3.250	± 3.3	± 3.5

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	-5.841	-3.250	-3.3	-3.5
C_1	0.635	2.575	114.2	114.7
T_{cal}	-5.826	-3.249	-3.2	-3.5
$\mu_{max} = C1$	0.635	2.575	114.2	114.7

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	5.841	3.250	3.3	3.5
C_2	-0.080	2.293	85.4	80.7
T_{cal}	5.826	3.282	3.2	3.5
$\mu_{min} = C2$	-0.080	2.293	85.4	80.7

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ	
NEUTRON	0.635	-0.080	0.3 ±	0.4
DENSITY	2.575	2.293	2.4 ±	0.1
GR	114.157	85.443	99.8 ±	14.4
SONIC	114.670	80.730	97.7 ±	17.0

Lithofacies S1

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.244	2.323	71.8	91.5
Sample STD	0.098	0.465	10.4	12.1
Sample size	25.000	28.000	25.0	26.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 2.797	± 2.787	± 2.8	± 2.8

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α = .01	-2.797	-2.787	-2.8	-2.8
C_1	0.298	2.567	77.6	98.1
T_{cal}	-2.765	-2.781	-2.8	-2.8
$\mu_{max} = C1$	0.298	2.567	77.6	98.1

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	2.797	2.787	2.797	2.787
Guide	0.189	2.078	66.030	84.864
C_2	0.190	2.078	66.040	84.864
T_{cal}	2.765	2.784	2.792	2.787
$\mu_{min} = C2$	0.190	2.078	66.040	84.864

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ	
NEUTRON	0.298	0.190	0.244 ±	0.054
DENSITY	2.567	2.078	2.323 ±	0.245
GR	77.610	66.040	71.820 ±	5.785
SONIC	98.121	84.864	91.492 ±	6.629

Lithofacies S2

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.229	2.349	63.2	88.7
Sample STD	0.074	0.101	9.8	6.1
Sample size	29.000	34.000	28.0	26.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 2.763	± 2.726	± 2.8	± 2.8

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	-2.763	-2.726	-2.8	-2.8
C_1	0.267	2.395	68.3	92.0
T_{cal}	-2.715	-2.671	-2.8	-2.8
$\mu_{max} = C1$	0.267	2.395	68.3	92.0

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	2.763	2.726	2.8	2.8
C_2	0.192	2.302	58.1	85.3
T_{cal}	2.707	2.708	2.8	2.8
$\mu_{min} = C2$	0.192	2.302	58.1	85.3

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ
NEUTRON	0.267	0.192	0.2 ± 0.0
DENSITY	2.395	2.302	2.3 ± 0.0
GR	68.331	58.091	63.2 ± 5.1
SONIC	92.025	85.329	88.7 ± 3.3

Lithofacies S3

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.276	2.424	81.0	91.4
Sample STD	0.037	0.103	7.3	9.4
Sample size	3.000	7.000	4.0	7.0

At data confidence of 99% (α=.0 1)

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	± 9.925	± 3.707	± 5.8	± 3.7

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	-9.925	-3.707	-5.8	-3.7
C_1	0.488	2.568	102.2	104.6
T_{cal}	-9.920	-3.697	-5.8	-3.7
$\mu_{max} = C1$	0.488	2.568	102.2	104.6

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.0 1	9.925	3.707	5.8	3.7
C_2	0.064	2.280	59.8	78.2
T_{cal}	9.889	3.697	5.8	3.7
$\mu_{min} = C2$	0.064	2.280	59.8	78.2

Population Mean at 99% Confidence

	μ max	μ min	μ
NEUTRON	0.488	0.064	0.3 ± 0.2
DENSITY	2.568	2.280	2.4 ± 0.1
GR	102.184	59.816	81.0 ± 21.2
SONIC	104.557	78.157	91.4 ± 13.2

Lithofacies S4

POPULATION MEAN ANALYSIS

	NEUTRON	DENSITY	GR	SONIC
Sample mean	0.231	2.410	70.6	82.4
Sample STD	0.091	0.117	12.2	12.0
Sample size	20.000	21.000	13.0	20.0

At data confidence of 99% (α=.01)

	NEUTRON	DENSITY	GR	SONIC
$T_{\alpha=.01}$	± 2.861	± 2.845	± 3.1	± 2.9

MAXIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.01	-2.861	-2.845	-3.1	-2.9
C_1	0.289	2.483	80.9	90.1
T_{cal}	-2.820	-2.829	-3.1	-2.9
$\mu_{max} = C1$	0.289	2.483	80.9	90.1

MINIMUM Population Mean Determination

	NEUTRON	DENSITY	GR	SONIC
T α=.01	2.861	2.845	3.1	2.9
C_2	0.173	2.338	60.3	74.7
T_{cal}	2.855	2.828	3.1	2.9
$\mu_{min} = C2$	0.173	2.338	60.3	74.7

Population Mean at 99% Confidence

	μ_{max}	μ_{min}	μ	
NEUTRON	0.289	0.173	0.2 ±	0.1
DENSITY	2.483	2.338	2.4 ±	0.1
GR	80.929	60.271	70.6 ±	10.3
SONIC	90.057	74.743	82.4 ±	7.7

BIOGRAPHY

Ms. Rucharee Wanapisarn was born in Bangkok on 24 February 1974. She studied at Benjamaracharai School in Bangkok for her pre-university education. In 1997, She graduated with the first degree B.Sc. (Geology), from Chulalongkorn University. After her graduation, she started working as a geologist at Thai Shell Exploration and Production Company.