Contribution of Montney Sourced Hydrocarbons to the Doig and Montney Petroleum System in Western Canada Sedimentary Basin

by

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ABSTRACT

Previously acquired biomarker analyses of oil samples and Rock-Eval analyses of cores and cutting samples have been integrated with new Rock-Eval analyses to determine the source rock potential of Montney Formation. Furthermore, the geochemical signature of Montney organic matter is used to evaluate the relative contributions of Montney-sourced hydrocarbons and Doig-sourced hydrocarbons to the Triassic petroleum system.

A source rock evaluation indicates that the Montney Formation contains intervals of good hydrocarbon source rock that generated large volumes of hydrocarbons. An empirical relationship between TOC and gamma ray (GR) values is established to determine the TOC values in Montney Formation and to quantify the thickness of Montney source rock.

There are three end members of oil families (Family A, Family B and Family C) with distinct geochemical signatures in the Triassic oil accumulations of Western Canada Sedimentary Basin (WCSB). Family A oils are characterized by low ratios of diasterane/regular sterane and Ts/Tm, high ratios of C_{24}Tetracyclic terpane over C_{26} tricyclic terpanes and C_{29}/C_{30} hopanes, a high C_{35} homohopane index and high sulfur contents. Family B oils are characterized by a moderate C_{24} tetracyclic terpane over C_{26} tricyclic terpane ratio, high abundances of hopanes, a low C_{35} homohopane index, a high diasterane/regular sterane ratio and relatively low C_{28} regular sterane. Family C oils show abundant extended tricyclic terpances and almost no hopanes.

Source rock characteristics of Montney Formation, Doig Formation and Jurassic Gordondale Member are analysed and applied for oil-to-source rock correlations.

Studies show that Family A oils are linked to a calcareous source rock and interpreted to be originated from Jurassic Gordondale Member. Family B oils are correlated with Doig source rock extracts and believed to be derived from Doig phosphate. Family C oils are interpreted to be originated from the Montney Formation.

A volumetric method (Schmoker's formula) is applied to calculate the in-place resources generated from Montney and Doig source rocks based on thermal degradation of different type of kerogens. It is inferred that the contribution of Montney sourced hydrocarbons is approximately 3.7 times that of the contribution of Doig sourced hydrocarbons in the Doig and Montney petroleum system.

PREFACE

This thesis is an original work by Wujun Feng, and this study was funded by Geoscience for New Energy Supply (GNES) program in Geological Survey of Canada (GSC) Calgary. I was primarily responsible for all the work presented in this thesis, including sampling, data interpretation, creating figures and writing. Main other contributors include Dr. Nicholas B. Harris, Dr. Zhuoheng Chen, Dr. Chongqing Jiang, Dr. Julito Reyes and Dr. Andy Mort.

Dr. Harris supervised this research and provided guidance through this study and edited the manuscripts of the thesis so many times. Dr. Zhuoheng Chen provided funding by giving me a position in GSC Calgary and supervised my work there. Dr. Chongqing Jiang provided all the gas chromatography (GC) analyses, raw data of gas chromatography-mass spectrometry (GC-MS) of oils and source rock extracts and he also performed GC-MS analyses of new samples. Dr. Julito Reyes performed the organic petrography and vitrinite reflectance analyses at Geological Survey of Canada Calgary Org-Pet laboratory. Dr. Andy Mort provided previously analyzed Rock-Eval analyses in British Columbia and helped to QC the integration of GC-MS analyses.

Previously analyzed Rock-Eval analyses were mostly performed at GSC Calgary by Riediger and released in Open File report 0308 of Geological Survey of Canada. Whole oil carbon isotope and sulfur content of various oil fractions were previously commissioned and/or completed at the Organic Geochemical Laboratories of Geological Survey of Canada (GSC) by Ejezie (2007).

No part of this thesis has been previously published.

ACKNOWLEDGEMENTS

I would like to thank my supervisor Professor Nicholas Harris, for his guidance, immense knowledge, patience and understanding. This study benefited from many helpful suggestions and discussions with Professor Harris. I am indeed grateful that several times he came to Calgary early in the morning from Edmonton and went back late in the evening to instruct me.

Dr. Zhuoheng Chen and Dr. Chunqing Jiang are thanked for their expert supervision in Geological Survey of Canada. I am really indebted to Dr. Chen for providing me with a position, for his insight and constructive criticisms, which guided me through this endeavor, reminding me not to jump to a conclusion all the time. I would like to express my sincere gratitude to Dr. Jiang for tons of data he provided, for his valuable advice and numerous discussions on biomarkers and other geochemical parameters that enlightened me.

Besides my supervisors, many people deserve thanks for assisting me in various capacities through this study. Many thanks to Dr. Andy Mort for helping me to obtain the raw data of oil samples and showing me how to use Agilent MassHunter Workstation for qualitative and quantitative analysis. Julito Reyes is thanked for the organic petrology work he has done, and I really appreciate his instructions to help me to distinguish bitumen, kerogens and different minerals in the samples. I also want to thank Noga Vaisblat for the discussions with me, the reference articles from her and her permission to use data in her research. I appreciate Devon Versnick-Brown's help for providing well log curves and teaching me how to use Geoscout. Many thanks to previous workers like

Dr. C. Riediger, Nina Ejezie, Dr. M. Fowler and others for their analyzed samples in the database of Geological Survey of Canada Calgary.

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My special thanks must go to my wife Lixia Feng and my son Eric Feng, for their love, patience, support and innumerable sacrifices, for the enduring of many nights with an absent husband or father. Without their help and encouragement, this work could not have been completed.

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CHAPTER 1: INTRODUCTION AND OBJECTIVES

The Montney Formation is one of the most prolific hydrocarbon-producing formations in Western Canada Sedimentary Basin (WCSB) (Figure 1-1). Production from this formation includes gas, natural gas liquids and oil. It has been an exploration for oil and gas since 1950s, focusing on shallow conventional Montney reservoirs in the eastern part of the play through vertical drilling. Horizontal wells were initially tested from 2004 to 2006 as exploration expanded to the west and downdip, unconventional parts of the play, and by 2007, horizontal wells had become the dominant approach to exploiting these reservoirs. (Klaas et al, 2004; McDaniel et al, 2006). Technological advances in horizontal drilling and multi-stage hydraulic fracturing for tight oil and gas in last 20 years has made it possible to develop Montney unconventional resources economically. This formation contains marketable unconventional resources of 12,719 billion m^3 (449 Tcf) of natural gas, 2,308 million m^3 (14,521 million barrels) of NGLs and 179 million m^3 (1,125 million barrels) of oil (National Energy Board, 2013).

Studies of Triassic source rock characteristics date back to the 1970s. However, these early studies only developed some geochemical data but no definitive conclusions regarding to the Lower and Middle Triassic source rock potential (Rogers et al., 1974; Gibson, 1975; Schaefer et al., 1984; Welte et al., 1984).

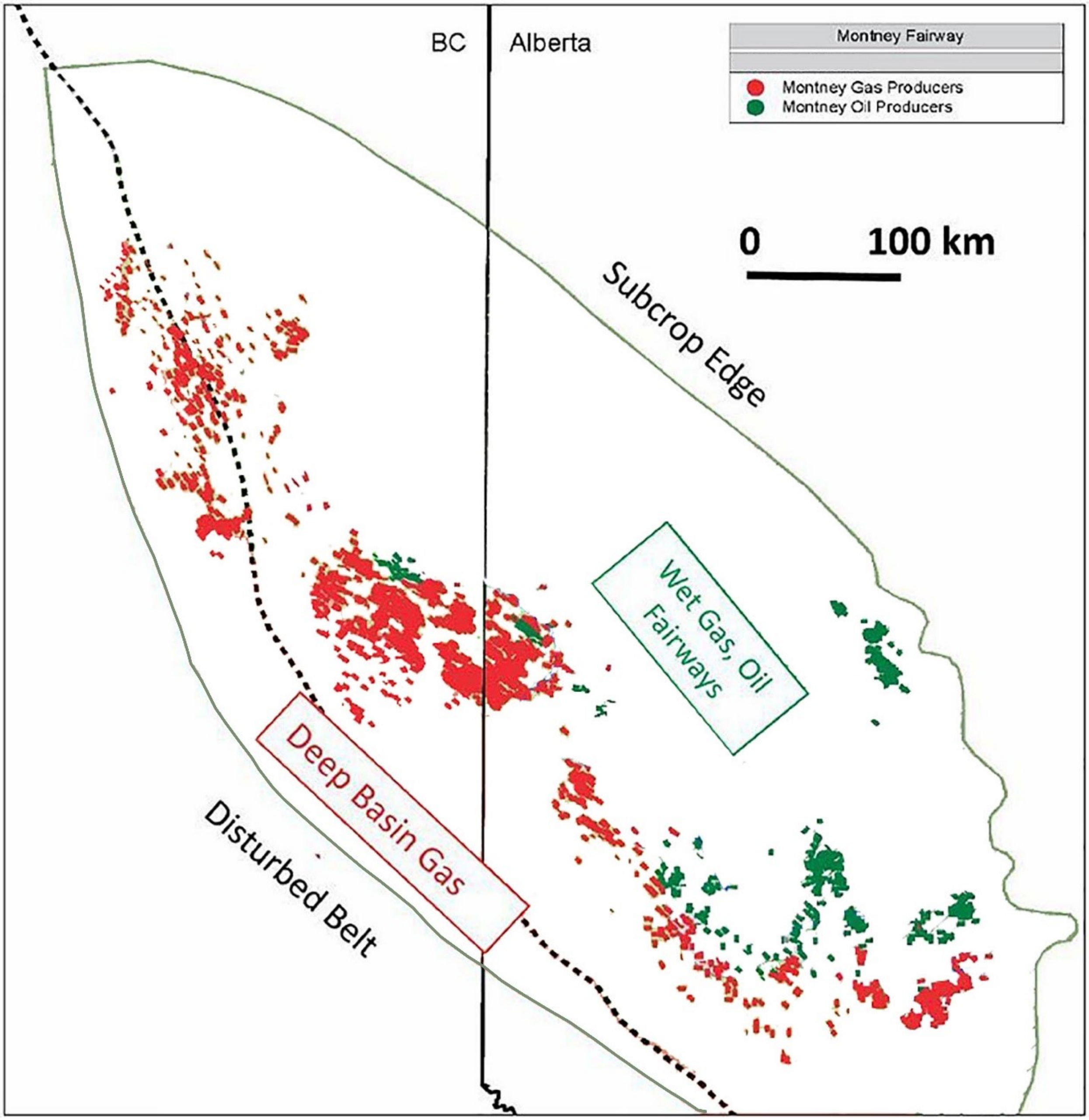

Figure 1-1 Montney play fairway, straddling the British Columbia/Alberta border. Dry gas is produced from deep areas in the west, Toward the updip northeasterly, higher liquids fractions and oil are produced. regional aquifer system with Conventional oil and gas are produced from eastern Montney (modified according to Brad Hayes, July 26, 2018, The Way Ahead.)

Riediger et al. (1990) conducted the first detailed study of Triassic oils and potential source rocks. They suggested that good to excellent source rock intervals are present within the Middle Triassic Lower Doig Formation and Lower Jurassic Gordondale Member, and possible intervals with initial source rock potential exist in the

Montney Formation in British Columbia. However, the Montney section in British Columbia is now mostly overmature, precluding detailed characterization of its organic matter content. The Triassic oils were assigned to two groups based on their biomarker characteristics and considered to have originated from either the Doig Formation or the Jurassic Gordondale Member.

Creaney and Allan (1991), in their study of Middle Devonian to Late Cretaceous source rocks in the WCSB, suggested the basal beds of Middle Triassic Doig Formation were the source of most hydrocarbons in Triassic reservoirs.

Ibrahimbas and Riediger (2004) obtained additional samples in Triassic strata and identified TOC values of up to 4.18 % in Montney Formation and considered that significant amounts of hydrocarbons may have been generated from this formation where Montney source rock is mature.

Ejezie (2007) divided oils produced from Triassic reservoirs into three different families (denoted in her paper as Family X, Family Y and Family Z). She interpreted Family X oils to have originated from the Doig phosphate, locally with a Montney contribution (Family Xi) in two oil samples. Family Y and Family Z oils were interpreted to be of Jurassic Gordondale origin.

Although source rock potential in Montney Formation has been observed (Ibrahimbas et al., 2004; Ferri et al., 2013; Romero-Sarmiento, et al., 2016; Feng et al., 2017; Egbobawaye, 2017), this stratigraphic unit has generally been considered as a reservoir rather than source bed, and the oil of this formation was considered to originated from two overlying formations that have excellent source rock characteristics, Doig basal phosphate in the deeper parts of the basin and Jurassic Fernie Group

(Gordondale Member) in the east. Ducros et al (2012) suggested that the contribution of Montney sourced hydrocarbons to the Triassic petroleum system was very small (Figure 1-2), and most studies have focused on reservoir characterization and regional sequence stratigraphy (e.g., Chalmers, et al., 2012; Wood, et al., 2015; Sanei, et al., 2015; Crombez, et al, 2016; Zonneveld and Moslow, 2018; Vaisblat et al., 2021; Vaisblat et al., 2022).

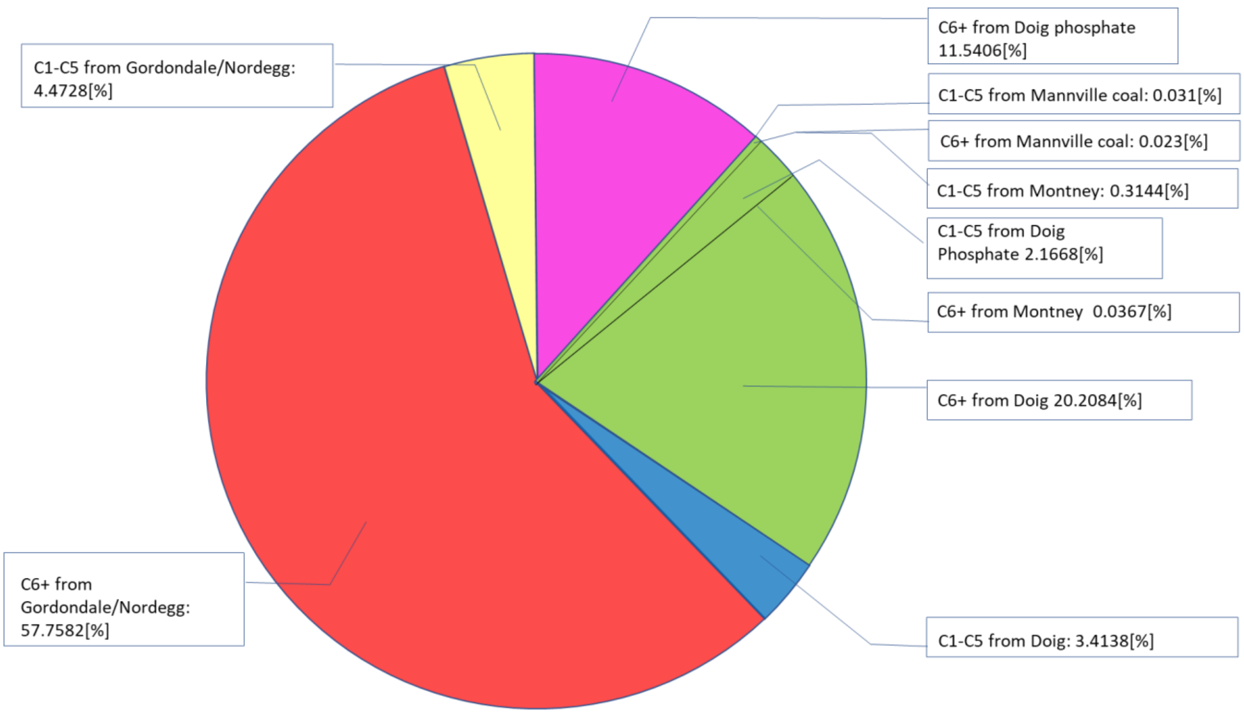

Figure 1-2 Origin of hydrocarbons of Charlie Lake and Montney formations along their subcrop edge according to the petroleum system model (Ducros et al., 2012)

With more and more oil and gas produced from Montney siltstone and Permian reservoirs in deep basin, it is unlikely that all these oil and gas resources are mostly Doig and Gordondale origin, and oil migration from Doig Formation to Montney tight reservoir in deep basin is not easy. Although more consideration has recently been given to the source potential of organic-rich intervals in the Montney Formation (Ferri et al., 2013; Romero-Sarmiento, et al., 2016; Feng et al., 2017; Egbobawaye, 2017), the following issues still need to be further addressed:

(1) There is no basin-wide comprehensive evaluation of Montney source rock in terms of source rock quality, thickness and distribution.

(2) Geochemical characteristics of Montney-sourced hydrocarbons is still unclear.

(3) The relative contribution of Montney-sourced hydrocarbons in the Doig and Montney petroleum system needs investigation.

This study investigates the source rock quality of Montney Formation, assessing the geochemical signatures of Montney-sourced hydrocarbons and interpreting the contribution of Montney-sourced hydrocarbons as compared with contributions from the overlying Doig Formation. All previously analyzed samples and new source rock extracts (Montney, Doig and Gordondale) available in Geological Survey of Canada are incorporated into the analysis, focusing on the geochemical characteristics of Triassic oil accumulations to probe the genetic relationship between the oils and potential source rocks. The availability of samples from the database of Geological Survey of Canada (Calgary) made it possible to conduct a more extensive investigation than earlier studies.

CHAPTER 2: GEOLOGICAL SETTING

The Western Canada Sedimentary Basin (WCSB) is one of the richest petroleum basins in the world. It consists of two thick stratal successions: Paleozoic carbonate rocks deposited on the paleo-Pacific miogeocline and stable platform; and the overlying Mesozoic-Cenozoic foreland basin clastic succession. These sequences formed a westward-thickening composite sedimentary wedge that is thickest in front of the western Rocky Mountains, comprising over 6,000 m of vertical section (Poter, 1982), and thins eastward gradually to its erosional edge at the margin of Canadian Shield in the Northwest Territories, Saskatchewan and Manitoba. The Montney Formation was previously believed to record deposition in a passive margin basin, deposited on the eastern edge of the Panthalassic Ocean (Gibson and Barclay, 1989; Gibson, 1993; Edwards et al., 1994). Recent work has shown that the transition to an active foreland basin (Ferri and Zonneveld, 2008; Beranek et al., 2011; Rohais et al., 2016; Zonneveld and Moslow, 2018) was much earlier than late Jurassic to earliest Cretaceous (Price, 1973; Monger, 1989). Montney basin fill is possibly a product of deposition in a collisional retro-foreland basin setting (Zonneveld and Moslow, 2018) at a latitude of approximately 30°N (Moslow and Davies, 1992). Sediments throughout the Triassic section have been affected by major erosional events (Embry, 1997) and the residual distribution area of Montney Formation is approximately 130,000 km^2.

The stratigraphic framework of Triassic formations in the WCSB has been established over several decades by outcrop mapping and subsurface work (Gibson, 1975; Price et al., 1984; Wright, 1984; Ross, 1989; Richards, 1989; Norford, 1990; McMechan, 1990; Leckie et al., 1990; Davies, 1997; Crombez et al., 2006; Zonneveld and Moslow, 2018). The Montney Formation rests unconformably on the Permian Belloy Formation and older Mississippian carbonates where the Permian section is absent. This formation is typically overlain by the Triassic Doig and Charlie Lake formations, although in the east it is truncated and overlain unconformably by Jurassic Gordondale Member of the Fernie Formation (Figure 2-1). The thickness of Montney Formation mostly ranges from 100m to 300m. It thins to zero thickness at its eastern and northeastern edges and increases near its western side near the Rocky Mountains (Figure 2-2).

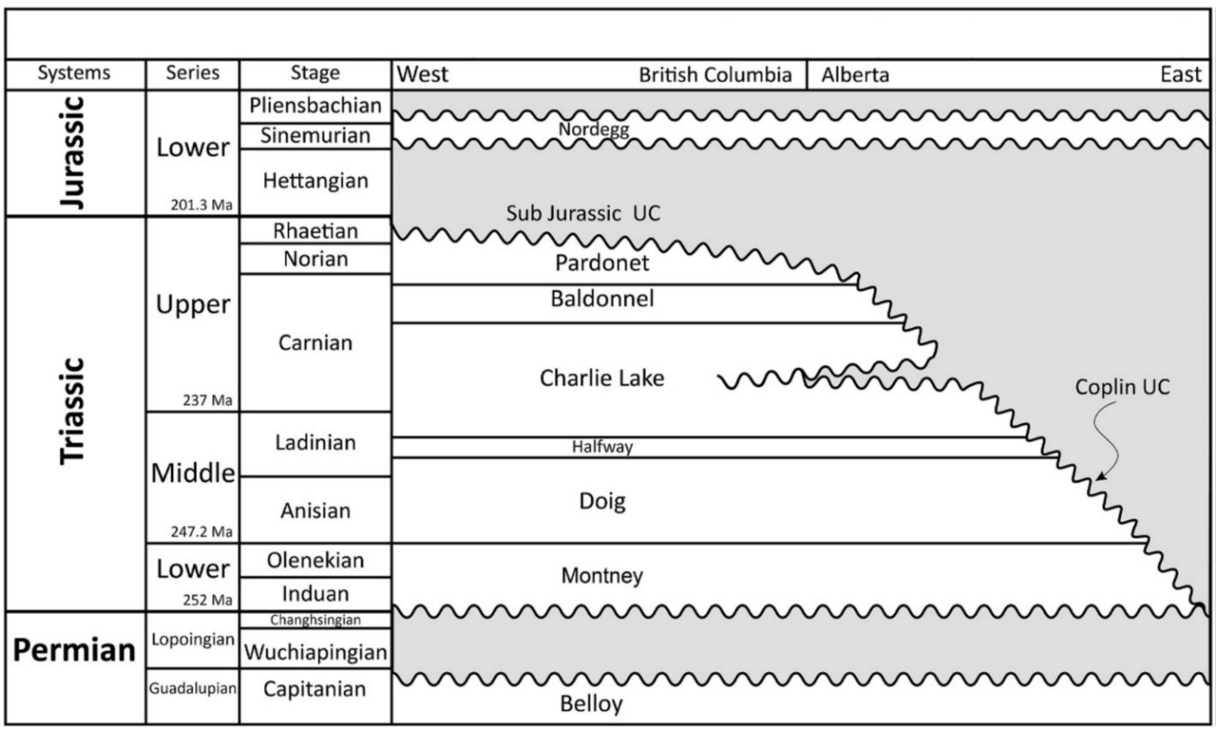

Figure 2-1 Chronostratigraphic chart for the Triassic and Lower Jurassic of subsurface in Alberta and British Columbia, UC stands for unconformity (From Vaisblat et al., 2022)

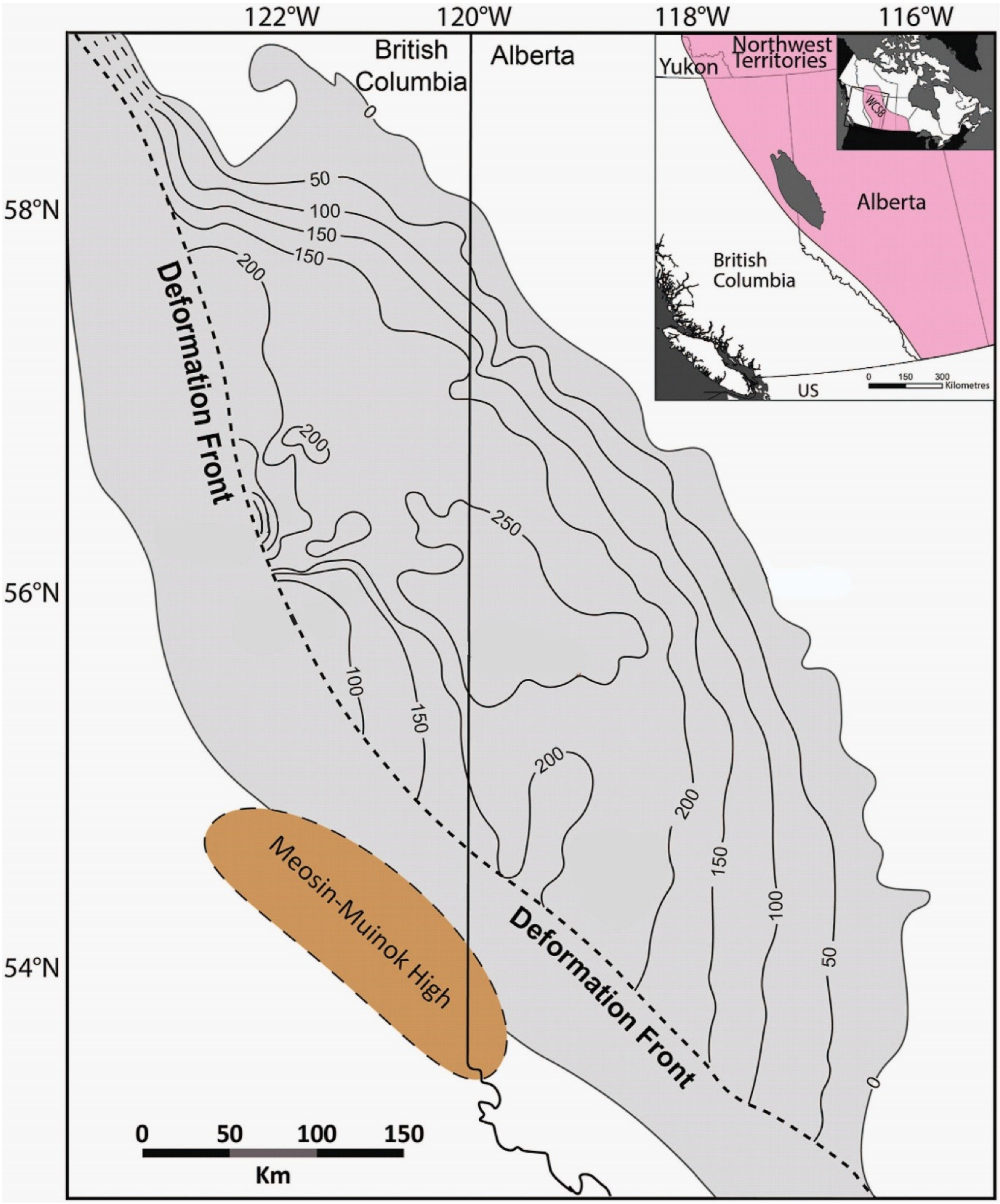

Figure 2-2 Isopach map of the Montney formation (Vaisblat et al., 2022, map after Edwards et al., 1994)

Montney deposition occurred on a low-relief clastic ramp succession and includes units deposited in a variety of shallow marine and turbidite lobe/channel settings

(Zonneveld and Moslow, 2018), including offshore, offshore transition, shoreface and turbidite facies (Davies et al., 1997, 2018; Zonneveld et al., 2011; Crombez et al., 2016; Zonneveld and Moslow, 2018). The Triassic System of the Western Canada Sedimentary Basin is divided into three major transgressive-regressive cycles: (a) Early Triassic; (b) Middle to early Late Triassic; and (c) middle Late Triassic (Podruski et al, 1988; Gibson and Barclay, 1989; Embry, 1997; Sanders, 2016). The early Triassic Montney Formation (equivalent to Grayling, Toad, Vega/Phroso Formations near the Front Ranges and Western Foothills) comprises the first major transgressive-regressive cycle and can be further subdivided into three transgressive-regressive cycles (Crombez et al., 2016).

The Montney Formation was informally subdivided into three units in early studies, a Lower member, a Coquinal Dolomite Middle member and an Upper member (Davies et al., 1997; Dixson, 2000). Since dolomite coquinas are only present along parts of the eastern subcrop, the equivalent strata in the west are subdivided into Upper Montney and Lower Montney. In recent studies, a three-unit division of the formation into the Lower Montney (Griesbachian-Dienerian age), Middle Montney (Smithian age) and Upper Montney (Spathian age) is now widely used, based on stratigraphic sequence analysis (Golding, 2014; Zonneveld et al., 2011; Duenas, 2014; Sanders, 2016; Davies et al., 2018; Zonneveld and Moslow, 2018) (Figure 2-3). The three units are consistent to the subdivided three transgressive-regressive cycles proposed by Crombez et al., (2016) in Montney Formation.

The Montney Formation is described as deposits of dark gray shale to argillaceous siltstone interbedded with shale, or monotonous succession of dark grey argillaceous siltstones and dark grey shales in early studies (Armitage, 1962; Riediger, 1999; Derder, 2012). Recent studies show Montney sediment is dominated by fine-grained siltstone, with local accumulations of very fine-grained sandstone, fine-grained sandstone and has a low overall proportion of clay; and even in fine silts with a high clay size fraction, the primarily components are quartz and feldspar rather than clay minerals (Zonneveld and Moslow, 2018; Vaisblat et al., 2021, 2022). The Lower Montney consists primarily of fine- to medium-grained and laminated bituminous dolomitic siltstone with thin (2.5 to 20 cm) very fine-grained sandstone interbeds. Between Lower Montney Member and the Middle Montney member, there is a bioclastic unit of Anten Coquina Member (formerly Coquinal Dolomite Middle member). It is characterized by densely packed sandy, dolomitic bioclastic packstone and grainstone with subordinate siltstone and silty very fine-grained sandstone interbeds, forming an extensive north to south trending belt with limited east-west distribution in the eastern subsurface of west-central Alberta (Dixon, 2000; Zonneveld and Moslow, 2018). The Middle Montney Member is characterized by interbedded bituminous siltstone and very fine-grained sandstone with, very low levels of bioturbation. The Upper Montney Member consists of a thick succession of locally bioturbated fine- to coarse-grained, sandy, bituminous, dolomitic siltstone interbedded with subordinate very fine-grained sandstone. Upper Montney is considered the deposits of Spathian age, though conodont biostratigraphy indicated the Montney-Doig boundary can be diachronous (Golding et al., 2015), ranging from Spathian to Middle Anisian in age. In this paper, the boundary of Upper Montney and Doig Formation is the bottom of Doig phosphate.

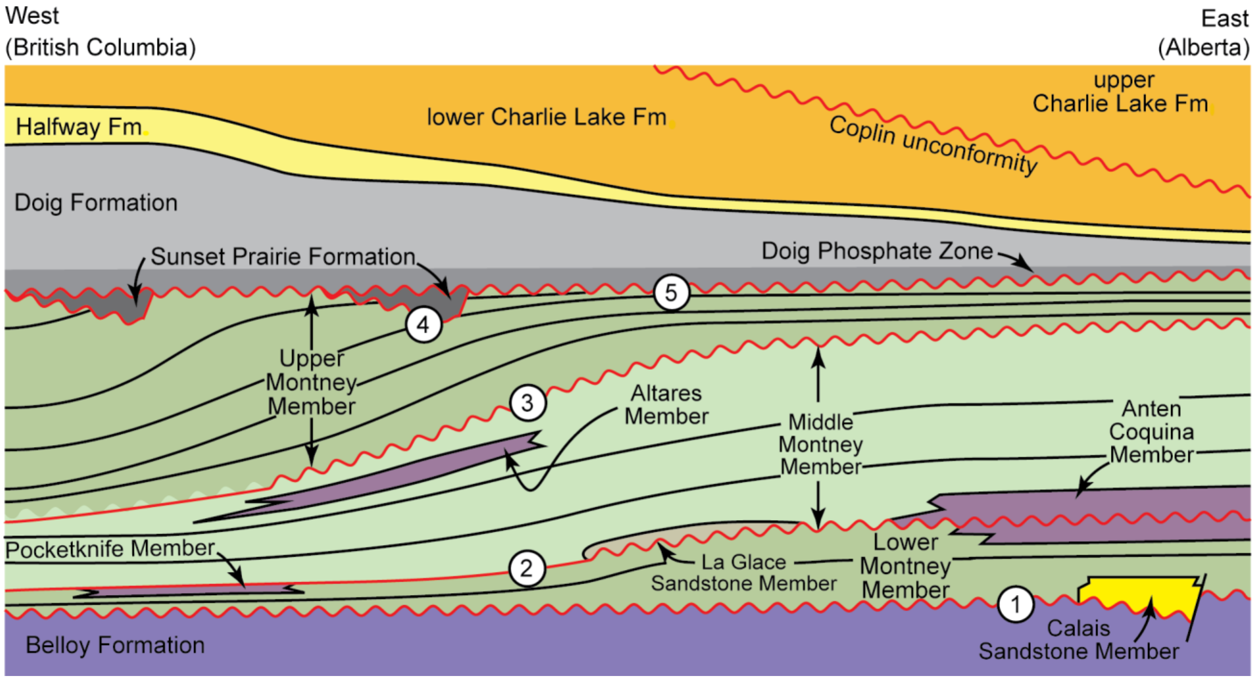

Figure 2-3 Schematic approximately west-east cross-section showing Montney stratigraphy, central Alberta to British Columbia. Intra and extraformational unconformities that separate the Lower Montney, Middle Montney and Upper Montney members (numbers 1–5). The basal Montney contact (1) is unconformable throughout most of the basin but may be conformable in the western subsurface and outcrop belt in some areas. The lowest and oldest intraformational unconformity (2) approximates the Dienerian-Smithian (= Induan-Olenekian boundary). A second, younger mid-Montney unconformity occurs at approximately the Smithian-Spathian boundary (mid Olenekian). The upper Montney contact is unconformable with overlying Middle Triassic strata of either the Sunset Prairie Formation (Furlong et al., 2018) or the Doig phosphate zone (unconformities 4 and 5) (Zonneveld and Moslow, 2018)

CHAPTER 3: MONTNEY SOURCE ROCK

Source rock potential of Montney Formation is evaluated comprehensively in this chapter, including source rock quality, thickness and distribution. The study of source rock potential mainly relies on Rock-Eval analysis of Montney cores. Organic petrology analysis is also used to demonstrate that the low maturity Montney siltstone can generate hydrocarbons. GR logs are used to quantify the TOC content in Montney Formation and then to determine the thickness of Montney source rock using a statistical method.

3.1 Data and Samples

Previously analyzed Rock-Eval analyses of 1105 Montney core samples in 128 wells (Map No.1-Map No.128 in APPENDIX 3-1) were collected from the database of Geological Survey of Canada (Calgary). An additional 142 new core samples of 12 wells (Table 3-1) were obtained at the Alberta Geological Survey core center in June of 2016 in Calgary, including 116 Montney samples, 15 Doig samples and 11 Gordondale samples. Most new selected core samples were collected from fine-grained units (siltstones, mudstones and marls), although sandstone core samples were also obtained from the Montney Formation. Locations of collected Montney samples, new samples and corresponding analyses for source rock study are shown in Figure 3-1 and Table 3-1.

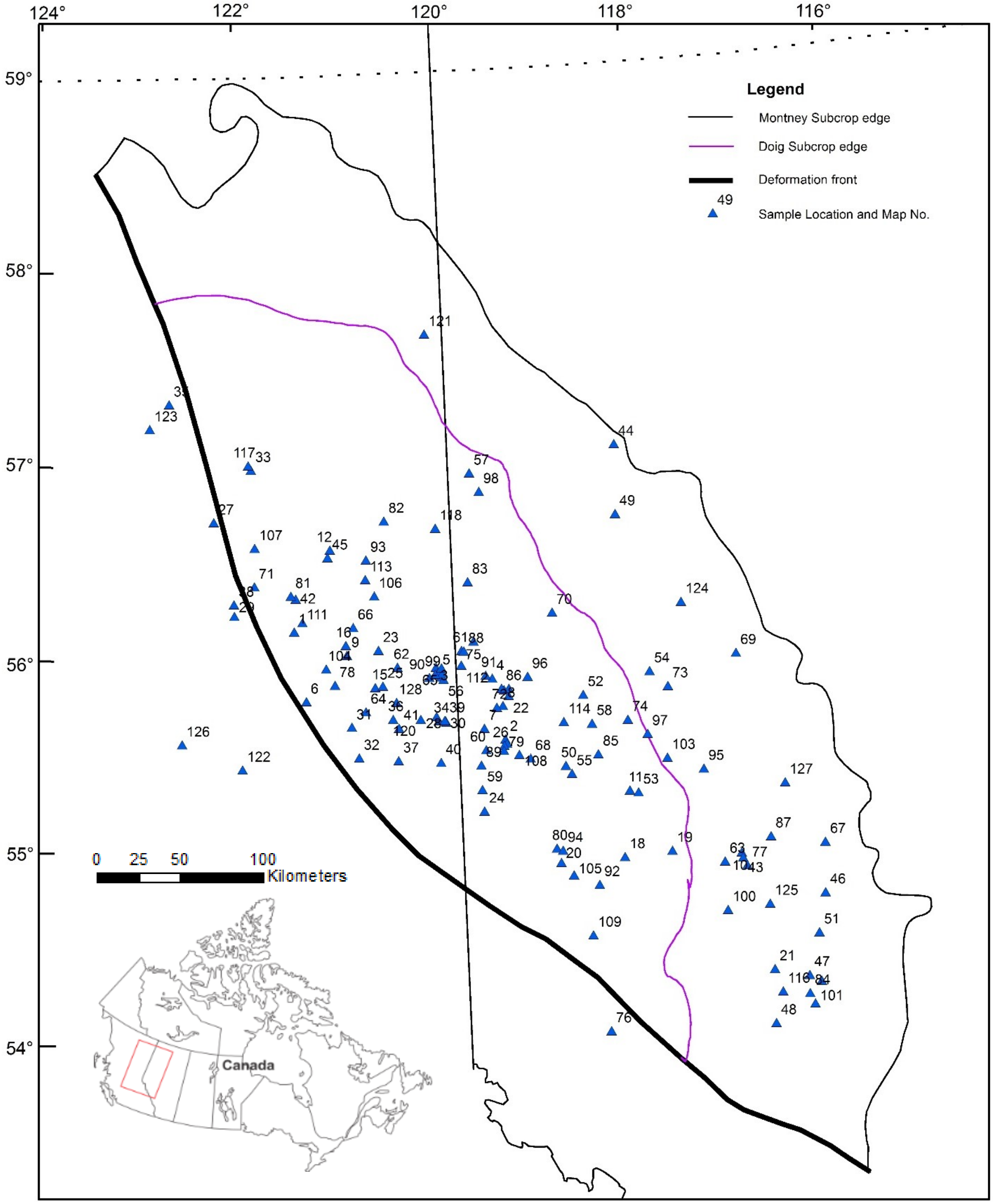

Figure 3-1 Map showing well locations of all Montney Rock-Eval samples (basemap according to Atlas Shapefiles, Edwards et al., 1994)

Table 3-1 Location of new analyzed Rock-Eval and organic petrology samples

Map No.	Well Location	Unit	Depth(m)	lithology	Rock-Eval	Organic Petrology
83	4-32-84-12W6	Montney	1581.39	dark grey siltstone	x	
	4-32-84-12W6	Montney	1581.9	dark grey siltstone	x	
	4-32-84-12W6	Montney	1583.6	dark grey siltstone	x	
	4-32-84-12W6	Montney	1591.1	dark grey siltstone	x	
	4-32-84-12W6	Montney	1591.6	dark grey siltstone	x	
	4-32-84-12W6	Montney	1593.5	dark grey siltstone	x	
11	6-36-71-4W6	Montney	1888.15	dark grey siltstone	x	
	6-36-71-4W6	Montney	1888.6	dark grey siltstone	x	
	6-36-71-4W6	Montney	1890.1	dark grey siltstone	x	
	6-36-71-4W6	Montney	1890.6	dark grey siltstone	x	
	6-36-71-4W6	Montney	1892	dark grey siltstone	x	
	6-36-71-4W6	Montney	1893.3	dark grey siltstone	x	
	6-36-71-4W6	Montney	1894.5	dark grey siltstone	x	
	6-36-71-4W6	Montney	1895.4	dark grey siltstone	x	
	6-36-71-4W6	Montney	1899	dark grey siltstone	x	
	6-36-71-4W6	Montney	1900.4	dark grey siltstone	x	
	6-36-71-4W6	Montney	1902.5	dark grey siltstone	x	
	6-36-71-4W6	Montney	1903	dark grey siltstone	x	
	6-36-71-4W6	Montney	1904.7	dark grey siltstone	x	
	6-36-71-4W6	Montney	1923.5	dark grey siltstone	x	
	6-36-71-4W6	Montney	1930.3	dark grey siltstone	x	
	6-36-71-4W6	Montney	1931.3	dark grey siltstone	x	
	6-36-71-4W6	Montney	1931.6	dark grey siltstone	x	
	6-36-71-4W6	Montney	1932.1	dark grey siltstone	x	
	6-36-71-4W6	Montney	1932.4	dark grey siltstone	x	
	6-36-71-4W6	Montney	1934.3	dark grey siltstone	x	
	6-36-71-4W6	Montney	1936.8	dark grey siltstone	x	
	6-36-71-4W6	Montney	1940	dark grey siltstone	x	
63	12-7-67-24W5	Gordondale	1904.8	Carbonaceous marlstone	x	
	12-7-67-24W5	Gordondale	1905.5	Carbonaceous marlstone	x	
	12-7-67-24W5	Gordondale	1906	Carbonaceous marlstone	x	
	12-7-67-24W5	Gordondale	1907.1	Carbonaceous marlstone	x	
	12-7-67-24W5	Gordondale	1907.7	Carbonaceous marlstone	x	
	12-7-67-24W5	Montney	1908.5	light grey sandstone	x	
	12-7-67-24W5	Montney	1910.3	light grey sandstone	x	
	12-7-67-24W5	Montney	1910.7	light grey sandstone	x	
	12-7-67-24W5	Montney	1911.5	light grey sandstone	x	
	12-7-67-24W5	Montney	1912.2	light grey sandstone	x	
	12-7-67-24W5	Montney	1912.6	light grey sandstone	x	x
	12-7-67-24W5	Montney	1913.3	light grey sandstone	x	
	12-7-67-24W5	Montney	1914	light grey sandstone	x	
	12-7-67-24W5	Montney	1914.4	dark grey siltstone	x	
	12-7-67-24W5	Montney	1915.6	light grey sandstone	x	
	12-7-67-24W5	Montney	1916.9	dark grey siltstone	x	
	12-7-67-24W5	Montney	1917.2	light grey sandstone	x	
	12-7-67-24W5	Montney	1918.55	light grey sandstone	x	
	12-7-67-24W5	Montney	1918.9	dark grey siltstone	x	

Table 3-1 Location of new analyzed Rock-Eval and organic petrology samples (continued)

Map No.	Well Location	Unit	Depth(m)	lithology	Rock-Eval	Organic Petrology
63	12-7-67-24W5	Montney	1921.1	light grey sandstone	x	
	12-7-67-24W5	Montney	1921.6	dark grey siltstone	x	x
	12-7-67-24W5	Montney	1922.2	dark grey siltstone	x	
	12-7-67-24W5	Montney	1922.7	light grey sandstone	x	
100	7-14-64-25W5	Gordondale	2288.16	Carbonaceous marlstone	x	
	7-14-64-25W5	Gordondale	2288.9	Carbonaceous marlstone	x	
	7-14-64-25W5	Gordondale	2289.5	Carbonaceous marlstone	x	
	7-14-64-25W5	Gordondale	2290.7	Carbonaceous marlstone	x	
	7-14-64-25W5	Gordondale	2290.7	Carbonaceous marlstone	x	
	7-14-64-25W5	Gordondale	2291.1	Carbonaceous marlstone	x	
	7-14-64-25W5	Montney	2291.7	light grey sandstone	x	
	7-14-64-25W5	Montney	2292.1	light grey sandstone	x	
	7-14-64-25W5	Montney	2292.88	light grey sandstone	x	
	7-14-64-25W5	Montney	2293.56	light grey sandstone	x	
	7-14-64-25W5	Montney	2294.55	light grey sandstone	x	
	7-14-64-25W5	Montney	2295.3	light grey sandstone	x	
	7-14-64-25W5	Montney	2295.65	light grey sandstone	x	
	7-14-64-25W5	Montney	2296.7	dark grey siltstone	x	
	7-14-64-25W5	Montney	2297.65	light grey sandstone	x	
	7-14-64-25W5	Montney	2298.5	dark grey siltstone	x	
	7-14-64-25W5	Montney	2298.85	light grey sandstone	x	
	7-14-64-25W5	Montney	2299.75	dark grey siltstone	x	
	7-14-64-25W5	Montney	2300.25	light grey sandstone	x	
	7-14-64-25W5	Montney	2300.75	dark grey siltstone	x	
	7-14-64-25W5	Montney	2301.9	dark grey siltstone	x	
	7-14-64-25W5	Montney	2302.45	light grey sandstone	x	
	7-14-64-25W5	Montney	2302.45	light grey sandstone	x	
	7-14-64-25W5	Montney	2302.8	light grey sandstone	x	
	7-14-64-25W5	Montney	2303.44	light grey sandstone	x	
	7-14-64-25W5	Montney	2304.32	light grey sandstone	x	
	7-14-64-25W5	Montney	2304.67	light grey sandstone	x	
	7-14-64-25W5	Montney	2305.55	light grey sandstone	x	
	7-14-64-25W5	Montney	2306.39	light grey sandstone	x	
	7-14-64-25W5	Montney	2306.7	light grey sandstone	x	
	7-14-64-25W5	Montney	2307.3	light grey sandstone	x	
55	11-3-73-7W6	Doig	2015.75	dark siltstone	x	
	11-3-73-7W6	Doig	2018.4	dark siltstone	x	
	11-3-73-7W6	Doig	2021.2	dark siltstone	x	
	11-3-73-7W6	Doig	2023.4	dark siltstone	x	
	11-3-73-7W6	Doig	2024.85	dark siltstone	x	
	11-3-73-7W6	Doig	2025.45	dark siltstone	x	
	11-3-73-7W6	Doig	2027	dark siltstone	x	
	11-3-73-7W6	Doig	2029.8	dark siltstone	x	
	11-3-73-7W6	Doig	2032.9	dark siltstone	x	x
	11-3-73-7W6	Doig	2033.8	dark siltstone	x	
	11-3-73-7W6	Doig	2037.4	dark siltstone	x	x
	11-3-73-7W6	Doig	2037.8	dark siltstone	x	

Table 3-1 Location of new analyzed Rock-Eval and organic petrology samples (continued)

Map No.	Well Location	Unit	Depth(m)	lithology	Rock-Eval	Organic Petrology
55	11-3-73-7W6	Doig	2040.03	dark siltstone	x	x
	11-3-73-7W6	Doig	2041.32	dark siltstone	x	x
	11-3-73-7W6	Doig	2043.7	dark siltstone	x	
	11-3-73-7W6	Montney	2044.35	light grey sandstone	x	
	11-3-73-7W6	Montney	2045.9	light grey sandstone	x	
	11-3-73-7W6	Montney	2047.55	dark grey siltstone	x	
	11-3-73-7W6	Montney	2048	light grey sandstone	x	
	11-3-73-7W6	Montney	2050.35	dark grey siltstone	x	x
	11-3-73-7W6	Montney	2050.95	dark grey siltstone	x	
	11-3-73-7W6	Montney	2051.3	light grey sandstone	x	
	11-3-73-7W6	Montney	2052.4	dark grey siltstone	x	x
	11-3-73-7W6	Montney	2052.9	light grey sandstone	x	
	11-3-73-7W6	Montney	2053.75	light grey sandstone	x	
	11-3-73-7W6	Montney	2054.6	light grey sandstone	x	
	11-3-73-7W6	Montney	2054.9	dark grey siltstone	x	
	11-3-73-7W6	Montney	2055.3	light grey sandstone	x	
	11-3-73-7W6	Montney	2055.8	light grey sandstone	x	
	11-3-73-7W6	Montney	2056.3	light grey sandstone	x	
	11-3-73-7W6	Montney	2057.5	light grey sandstone	x	
20	14-27-67-8W6	Montney	3014.6	dark grey siltstone	x	
	14-27-67-8W6	Montney	3018.7	dark grey siltstone	x	
	14-27-67-8W6	Montney	3024	dark grey siltstone	x	
	14-27-67-8W6	Montney	3026.8	dark grey siltstone	x	
	14-27-67-8W6	Montney	3028.3	dark grey siltstone	x	
4	2-5-79-11W6	Montney	2041.15	dark grey siltstone	x	
	2-5-79-11W6	Montney	2041.55	dark grey siltstone	x	
	2-5-79-11W6	Montney	2041.9	dark grey siltstone	x	
	2-5-79-11W6	Montney	2111.5	dark grey siltstone	x	
	2-5-79-11W6	Montney	2114	dark grey siltstone	x	x
7	6-3-76-12W6	Montney	2605	dark grey siltstone	x	
	6-3-76-12W6	Montney	2605.38	dark grey siltstone	x	
	6-3-76-12W6	Montney	2605.77	dark grey siltstone	x	
	6-3-76-12W6	Montney	2626.82	dark grey siltstone	x	
	6-3-76-12W6	Montney	2627.37	dark grey siltstone	x	
	6-3-76-12W6	Montney	2628.14	dark grey siltstone	x	
10	6-30-67-23W5	Montney	1847.1	dark grey siltstone	x	
	6-30-67-23W5	Montney	1850.1	dark grey siltstone	x	
	6-30-67-23W5	Montney	1850.7	dark grey siltstone	x	
	6-30-67-23W5	Montney	1853.8	dark grey siltstone	x	
	6-30-67-23W5	Montney	1837.2	dark grey siltstone	x	
53	11-28-71-3W6	Montney	1827.6	dark grey siltstone	x	
	11-28-71-3W6	Montney	1852.6	dark grey siltstone	x	x
	11-28-71-3W6	Montney	1853.95	dark grey siltstone	x	x
21	15-19-60-22W5	Montney	2583.1	dark grey siltstone	x	
	15-19-60-22W5	Montney	2589	dark grey siltstone	x	
	15-19-60-22W5	Montney	2596.3	dark grey siltstone	x	
24	15-5-71-12W6	Montney	3116.4	dark grey siltstone	x	x

3.2 Methods

3.2.1 Rock-Eval

All the Rock-Eval/TOC analyses (previously analyzed samples and new samples) were performed at the Geological Survey of Canada (Calgary). Riediger released most Rock-Eval/TOC data in Open File report 0308 of the Geological Survey of Canada. All the released data in the Open File report were obtained using a Delsi Rock-Eval II pyrolysis unit equipped with a Total Organic Carbon analysis module. A summary of the Rock-Eval/TOC technique follows (Riediger, 1991).

Rock-Eval pyrolysis involves heating the sample in an inert (helium carrier gas) atmosphere and measuring the evolved hydrocarbons and carbon dioxide by flame ionization and thermal conductivity detectors. Each sample was powdered, and about 100 mg of powdered rock was weighed into stainless crucibles. The initial stage of pyrolysis involves volatilization of free and adsorbed hydrocarbons at 300 ℃ for 3 minutes, recorded as the S_1 peak. Following this stage, the temperature was increased from 300℃ to 600℃ at a rate of 25℃/minute. The hydrocarbons generated during this stage are recorded as the S_2 peak, and the temperature at which the maximum amount of hydrocarbons is evolved is the Tmax value. The CO_2 released during pyrolysis is trapped and measured by a thermal conductivity detector during the last stage of the pyrolysis cycle and recorded as S_3 peak. Once the pyrolysis cycle is complete, the sample is removed from the pyrolysis oven and placed in an oxidation oven, where the residual organic matter in the sample is combusted in air at 600℃. The CO_2 generated is measured, and the amount of this carbon is added to the carbon in the S_1 and S_2 hydrocarbon peaks to determine the Total Organic Carbon (TOC).

Standard rock samples were run with the core samples, to ensure that the analytical conditions remained consistent. Standard samples were run at the beginning of each run, every fifteenth sample during the analyses, and at the end of each sample run.

All other samples, including the new samples, were analyzed on a Rock-Eval VI instrument at the Geological Survey of Canada (Calgary). Between 50-100 milligrams of pulverized rock were initially heated at 300°C for 3 minutes, in order to volatilize free and adsorbed hydrocarbons. The volatile products were swept by a helium stream to a splitter and half of the effluent sent to a CO_2 trap. The other half of the effluent was sent to a flame ionization detector which measured the volatilized hydrocarbons as S_1. The temperature of the oven was increased in a stepwise fashion from 300℃ to 650°C at a rate of 25℃/minute and the hydrocarbons generated at this stage were recorded as S_2. The temperature at which the maximum amount of S_2 hydrocarbons was released, Tmax, was recorded. The samples were then transferred to an oxidation oven and combusted in air. The produced CO_2 was measured by a thermal conductivity detector and added to the S_1 and S_2 values, to obtain the total organic carbon (TOC) (Ejezie, 2007).

3.2.2 Organic Petrology and Vitrinite Reflectance

The organic petrography and vitrinite reflectance analyses were performed by Julito Reyes at Geological Survey of Canada-Calgary Org-Pet laboratory in accordance with ASTM D2797 and ASTM D7708-11. Whole rock samples were mounted in a 1-inch mold using epoxy and then polished using five types of grinding and polishing materials with the addition of 0.5 and 0.03 alumina silica emulsions. Qualitative and quantitative analyses were performed using Zeiss Axioplan 2 microscope under LED white and ultraviolet light with blue filter in oil immersion (refractive index of 1.518 at 23oC). Organic maceral identification and characterization were made on vitrinite and solid bitumen macerals when possible, using ICCP (1995), Jacob (1989) and Potter et al., (1998) as guides. Reflectance measurements were conducted using Hilgers Technisches Büro Fossil System software. The system was calibrated using yttrium-aluminum-garnet standard with a refractive index of 0.906 %Ro.

3.2.3 Well log data and TOC Quantification

The common utilized well logs to detect and characterize source rocks are the gamma ray, resistivity, density, neutron and sonic logs, most commonly applying the Δ log R method of Passey et al., (1990). This method depends on the combination of resistivity with porosity logs and allows organic richness to be assessed in a variety of lithologies. Another method relies of the low density of OM and utilizes density logs, applying Schmoker and Hester's equation (TOC (wt.%) =(A/ρ)-B) (Schmoker et al., 1983). The constants in this equation are calculated from the linear relationship between laboratory determined TOC and the bulk density. The ΔlogR model works well for determination of TOC in Duvernay Shale (Wang et al., 2016). However, when these two techniques were applied in Montney Formation by them, the results were unsatisfactory. One possible reason is that Montney Formation is silt-rich with a low overall proportion of clay (Zonneveld and Moslow, 2018; Vaisblat et al., 2021, 2022), and it is not easy to differentiate typical source rock from the fine siltstone reservoir intervals

In this study, a third method was used, i.e. gamma ray (GR) logs to quantify TOC content. The presence of organic matter, which may be associated with uranium, resulted in an increase of GR readings (Lüning and Kolonic, 2003; Hemmesch et al., 2014; Harris et al., 2019).

Analyses of GR-TOC relationships are affected by a number of quality assurance issues. The first one is GR log selection, which may vary between logging runs even in one well. In this study, GRD (GR logs obtained during density logging) was selected for all the wells to minimize differences in GR logging environments. The second is the diameter of the borehole. The logging tool's detector's counting effectiveness depends on the borehole diameter, the position of the tool in the hole, and mud weight. In smaller-diameter holes, the reduced volume of borehole fluid attenuates fewer gamma rays transiting from the formation to the detector; larger-diameter holes contain a greater volume of fluid that attenuates more gamma rays. Thus, appropriate corrections are necessary (Kanazawa, et al., 2001). In this study, selected borehole size of the wells is between 194mm-235mm. However, some larger-diameter holes and smaller-diameter holes are also used for comparison. Third, because the core data have not been depth-shifted, we exclude the samples with GR readings varying dramatically (e.g. GR spikes). In this way, GR reading stands for a zone of the intervals rather than a specific depth.

3.3 Results and Interpretations

3.3.1 Source Rock Richness

Rock-Eval /TOC results are listed in the APPENDIX 3-1 and graphs showing Rock-Eval pyrolysis of newly analyzed samples are shown in APPENDIX 3-2. The well locations with Rock-Eval analyses are shown in Figure 3-1 and average values of TOC, Tmax, S1 and S2 in Montney Formation of different wells are shown in Table 3-2. TOC values of Montney Fm. range from 0.03% to 8.59%, S_1 0-9.02 mg HC/g rock and S_2 0-30.42 mg HC/g rock. TOC content in Montney Formation varies greatly across the basin (Figure 3-2 and Table 3-2). Based on the average TOC values in Montney Formation (Table 3-2), a southwestward increasing trend of average TOC values is evident, (Figure 3-2). Below, Montney source rock richness is assessed separately in Alberta and British Columbia to highlight differences between updip and downdip parts of the formation. In British Columbia, average Montney TOC value is 2.06% and 80% of samples have TOC values greater than 1.0. However, in Alberta, 76% of samples have TOC values less than 1.0%, with an average value of 0.83%. Based on the criteria (Peters et al., 1994) for ranking source rock richness, Montney source rock is ranked as poor- fair mostly in Alberta and good-excellent in British Columbia (Figure 3-3).

Organic matter richness of Montney Formation reported here in British Columbia is higher than described by earlier researchers. For example, Gisbon (1975) reported TOC values ranging from 0.5% to 5.5% in Vega-Phroso Siltstone, 0.9% to 2.7% in the Toad siltstone and 1.6% in the Grayling siltstone. Ibrahimbas and Riediger (2004) recorded Montney TOC values of 0- 4.18 %. The TOC values are as high as 8.59% in this paper, and the higher TOC contents identified here probably result from development of the deep Montney unconventional resource in past 10 years. Few Montney cores were available in the deep basin at the time of those earlier studies.

Table 3-2 Average values of Montney Rock-Eval pyrolysis results in different wells

Map No.	UWI	Depth(m)	TOC%	Tmax(°C)	S_1(mg/g)	S_2(mg/g)	Number of measurements
1	1-10-82-23W6	1902.1-2012.4	2.31	454	0.35	0.61	14
2	1-14-75-11W6	2477.5-2495.1	0.97	443	0.63	0.72	5
3	1-36-79-15W6	2006.2-2056.6	1.31	454	0.72	0.84	27
4	2-5-79-11W6	2041.15-2114	0.67	438	0.78	1.34	10
5	2-19-79-14W6	2038-2091.4	1.19	451	0.46	0.52	39
6	3-6-78-22W6	3345.22-3489.39	2.36	463	0.05	0.07	22
7	6-3-76-12W6	2605-2641.2	0.93	273	0.28	0.1	36
8	6-14-77-11W6	2189.1-2205.2	0.52	443	0.31	0.29	9
9	6-26-80-20W6	2385-2395	1.57	453	0.23	0.34	2
10	6-30-67-23W5	1837.2-1857.6	0.54	432	0.76	1.57	11
11	6-36-71-4W6	1888.15-1943	1.1	437	0.74	3.87	33
12	7-5-87-20W6	1941.7-1948.3	1.62	445	0.7	0.75	12
13	10-8-79-14W6	2018.5-2068.1	1.29	453	0.31	0.45	22
14	11-1-75-11W6	2487.2-2504.69	1.02	442	0.95	1.21	11
15	12-29-78-18W6	2491-2505.1	1.78	317	2.78	0.72	10
16	13-11-81-20W6	2146.39-2322.61	1.91	394	1.89	0.7	30
17	13-12-78-11W6	2196.12-2213.4	0.66	438	0.45	0.8	25
18	13-33-67-4W6	2358.2-2379.4	0.5	426	0.64	1	4
19	13-5-68-1W6	2044.4-2240.88	0.66	435	0.34	2.03	7
20	14-27-67-8W6	3014.6-3032	1.04	348	0.43	0.15	9
21	15-19-60-22W5	2583.1-2599	0.8	419	1.13	0.99	5
22	15-31-77-10W6	2006.55-2231.35	0.51	441	0.34	0.55	23
23	15-34-80-18W6	2065.05-2210.6	3.05	355	5.77	7.96	3
24	15-5-71-12W6	3116.4	2.1	295	0.65	0.11	1
25	16-27-78-18W6	2371.3-2535.2	1.97	363	2.76	0.6	12
26	16-34-74-11W6	2524.4-2583.09	0.67	437	0.4	0.37	31
27	A-10-J/94-B-9	2137.42-2328.2	2.13	477	0.15	0.35	41
28	A-20-H/93-P-9	2455-2460.57	1.36	428	0.29	0.29	3
29	B-15-I/94-B-1	2360.05-2585.3	2.1	422	0.13	0.17	14
30	B-30-H/93-P-9	2537.6-2556.9	2.14	459	0.49	0.62	15
31	C-10-E/93-P-10	3724.89-3749.69	1.59	355	0.89	0.29	28
32	C-15-L/93-P-7	3838.9-3863.52	0.89	380	0.14	0.17	16
33	C-21-L/94-A-13	1805.4-2034.4	1.86	452	0.42	0.77	22
34	C-25-G/93-P-9	2727.6-2758.72	1.11	389	0.73	0.26	10
35	C-33-B/94-G-7	1702.6-1907.7	3.15	382	0.94	0.87	9
36	C-49-H/93-P-10	2973-3028	1.72	338	2.54	1.29	4
37	C-85-H/93-P-7	3552.3-3665	1.57	344	2.14	0.72	18
38	C-85-I/94-B-1	2444.82-2465.56	2.17	455	0.31	0.33	20

Table 3-2 Average values of Montney Rock-Eval pyrolysis results in different wells (continued)

Map No.	UWI	Depth(m)	TOC%	Tmax(°C)	S_1(mg/g)	S_2(mg/g)	Number of measurements
39	D-21-G/93-P-9	2526.1-2543.4	1.06	425	0.28	0.3	18
40	D-65-G/93-P-8	3055.7-3135.8	4.11	422	1.53	0.96	37
41	D-85-A/93-P-10	2777.62-2801.98	1.25	326	1.74	0.49	12
42	1-12-84-23W6	1899.9-1905.1	1.04	450	0.89	0.39	10
43	10-18-67-23W5	1864.9	0.74	435	0.3	2.66	2
44	10-21-92-03W6	781.1-798.3	0.96	359	2.1	6.54	2
45	10-24-86-21W6	1959.9-1970.8	0.88	430	0.67	0.6	10
46	10-34-64-19W5	1768.5-1785.9	0.46	427	0.89	1.22	3
47	10-6-60-20W5	2522-2531	0.09	379	0.04	0.12	2
48	11-14-57-23W5	3013.3	0.13	352	0.02	0.08	1
49	11-17-88-03W6	2317.5	4.08	437	2.37	16.66	1
50	11-20-73-7W6	2051.4	0.41	445	0.4	0.36	1
51	11-24-62-20W5	2105.1	0.3	404	0.52	0.73	2
52	11-27-77-06W6	1741.2-1751.1	0.87	440	1.02	3.07	4
53	11-28-71-3W6	1820.5-1869.8	1.67	438	0.49	9.08	13
54	11-34-78-2W6	1770.3-1787.3	0.69	381	1.26	2.86	3
55	11-3-73-7W6	2042.01-2057.5	0.63	438	0.55	1.01	22
56	11-4-79-14W6	2051.1-2093.6	1.01	438	0.3	0.33	7
57	1-14-91-12W6	1110.8-1118.15	2.82	436	1.77	13.04	3
58	1-1-76-06W6	1697.25	0.42	437	0.26	0.7	1
59	12-17-72-12W6	2865	2.63	296	0.68	0.41	1
60	12-27-74-12W6	2567.11-2583.09	0.68	444	0.32	0.27	21
61	12-27-80-13W6	1741.1-1758	0.65	437	1.01	1.25	4
62	12-35-79-17W6	2124.43-2136.01	2.22	462	1.68	0.99	4
63	12-7-67-24W5	1908.5-1922.7	0.94	425	3.46	3.46	23
64	13-15-77-19W6	3175.59-3258.89	1.63	470	0.06	0.1	22
65	13-16-79-14W6	2015	1.63	454	0.61	0.68	1
66	13-18-82-19W6	3011	0.9	460	0.67	0.83	1
67	13-31-67-18W5	1662.1-1672.9	0.22	415	0.33	0.3	3
68	13-5-74-9W6	2260.05-2280.3	0.34	441	0.19	0.27	23
69	14-20-79-22W5	866.6-879.2	0.3	326	1.14	0.8	2
70	14-30-82-7W6	1231.2-1248.3	0.99	435	0.99	4.52	5
71	14-34-84-25W6	1992.5-2261.6	2.07	455	1.06	1.22	17
72	14-9-77-11W6	2270-2281.5	0.98	443	1.31	0.59	14
73	15-34-77-1W6	1123.5	1.53	438	1.48	2.59	2
74	15-6-76-03W6	1458.9	0.86	433	0.66	3.24	1
75	15-8-81-12W6	1827.7-1839.1	0.64	442	0.97	1.64	4
76	16-23-57-06W6	2646.5784	1.14	301	0.25	0.21	1
77	16-31-66-23W5	1708.6-1725.5	0.3	426	0.42	0.63	5
78	16-35-78-21W6	2957.6-2972.77	1.42	459	0.08	0.15	2
79	2-27-74-11W6	2567.3-2581.6	0.74	436	0.42	0.39	6
80	3-28-68-8W6	2875.05-2887.15	0.98	306	0.72	0.33	3
81	4-14-84-23W6	1733.5-2029.9	1.77	460	0.89	1.44	54
82	4-27-88-17W6	1369.2-1371	1.92	453	1.25	1.15	4
83	4-32-84-12W6	1581.3-1593.5	1.25	433	0.71	5.3	10
84	4-6-59-20W5	2656.35	0.11	421	0.02	0.09	1
85	4-8-74-05W6	2075.8-2083.3	0.69	382	1.13	0.37	12

Table 3-2 Average values of Montney Rock-Eval pyrolysis results in different wells (continued)

Map No.	UWI	Depth(m)	TOC%	Tmax(°C)	S_1(mg/g)	S_2(mg/g)	Number of measurements
86	5-14-78-11W6	2189.9-2255.5	1.02	438	1.34	1.32	6
87	5-24-68-22W5	1556.26-1568.27	0.49	396	1.05	1.52	5
88	5-26-80-13W6	1925.8-1961.5	0.7	441	1.65	0.87	17
89	5-32-73-12W6	2815.1-2832.2	1.42	321	0.57	0.28	5
90	6-10-79-15W6	2141.9-2157.6	1.62	450	0.54	0.53	2
91	6-12-79-12W6	2013.56-2028.5	0.54	437	0.87	1.13	6
92	6-14-66-6W6	3026.4-3044.1	0.99	346	0.71	0.65	6
93	6-17-86-19W6	1656.9-1835.7	0.69	442	0.52	0.53	13
94	6-23-68-8W6	2972.78	0.23	306	0.11	0.1	1
95	6-33-72-25W5	1542.5-1607.4	1.06	429	0.69	4.68	6
96	6-4-79-9W6	1760	1.37	434	0.53	2.35	1
97	6-8-75-02W6	1468.3	0.66	439	0.25	1.31	1
98	6-8-90-11W6	1361.8	2.3	450	1.21	9.16	2
99	7-13-79-15W6	2078.5-2108.6	1.51	453	0.54	0.66	5
100	7-14-64-25W5	2291.7-2307.3	0.66	433	1.03	2.08	31
101	7-18-58-20W5	2463.5	0.17	323	0.03	0.04	1
102	7-26-59-20W5	2507.59-2510.64	0.15	392	0.04	0.12	2
103	7-29-73-1W6	1481.1	1.86	446	0.7	11.82	2
104	7-33-79-21W6	2722-2727.5	6.66	487	1.24	1.36	3
105	7-5-67-7W6	3076.35-3093.72	1.12	427	0.59	0.32	7
106	8-10-84-18W6	1861.3-1878.3	0.55	349	0.26	0.11	17
107	8-11-87-25W6	1562-1954.5	1	458	0.57	0.46	16
108	8-16-74-10W6	2255.7-2262.3	4.25	452	1.17	3.98	3
109	8-18-63-06W6	3600	0.65	442	1.6	1.34	1
110	8-18-78-10W6	1925-2149	0.56	443	0.58	1.11	20
111	8-30-82-22W6	1759.52-1947.23	2.01	465	0.93	1.12	8
112	8-33-79-13W6	1815.6-1825.02	0.75	448	0.4	0.68	6
113	8-7-85-18W6	1825.26	1.14	418	6.07	2.42	1
114	8-8-76-07W6	1915-2060	0.63	440	1.24	0.82	2
115	9-29-79-14W6	1999	1.96	455	0.75	0.81	1
116	9-9-59-22W5	2886-2891.5	0.21	356	0.06	0.08	6
117	A-53-L/94-A-13	2044.4-2053.2	0.81	318	0.24	0.06	8
118	B-32-G/93-P-9	2707	1.16	424	0.4	0.27	1
119	B-57-G/93-P-9	2761.6-2766.3	1.34	404	0.33	0.31	3
120	D-39-F/93-P-9	2962.2	0.94	434	0.13	0.18	1
121	D-45-G/94-H-9	905.8-917.4	1.34	435	0.48	5.55	4
122	D-49-E/93-P-5	4135-4550	2.5	372	0.32	0.39	2
123	D-88-F/94-G-2	2130.8-2133.1	0.59	380	0.01	0.01	4
124	11-32-82-25W5	927.4-940.4	0.43	320	0.89	0.56	5
125	8-20-64-22W5	2046.5	0.5	438	0.73	1.83	1
126	A-15-A/93-O-10	1774.2	1.66	366	0.1	0.12	6
127	2-30-71-20W5	1319.6-1324.3	0.35	384	0.69	1.57	3
128	2-33-77-17W6	2693-2695	3.05	331	1.17	0.99	2

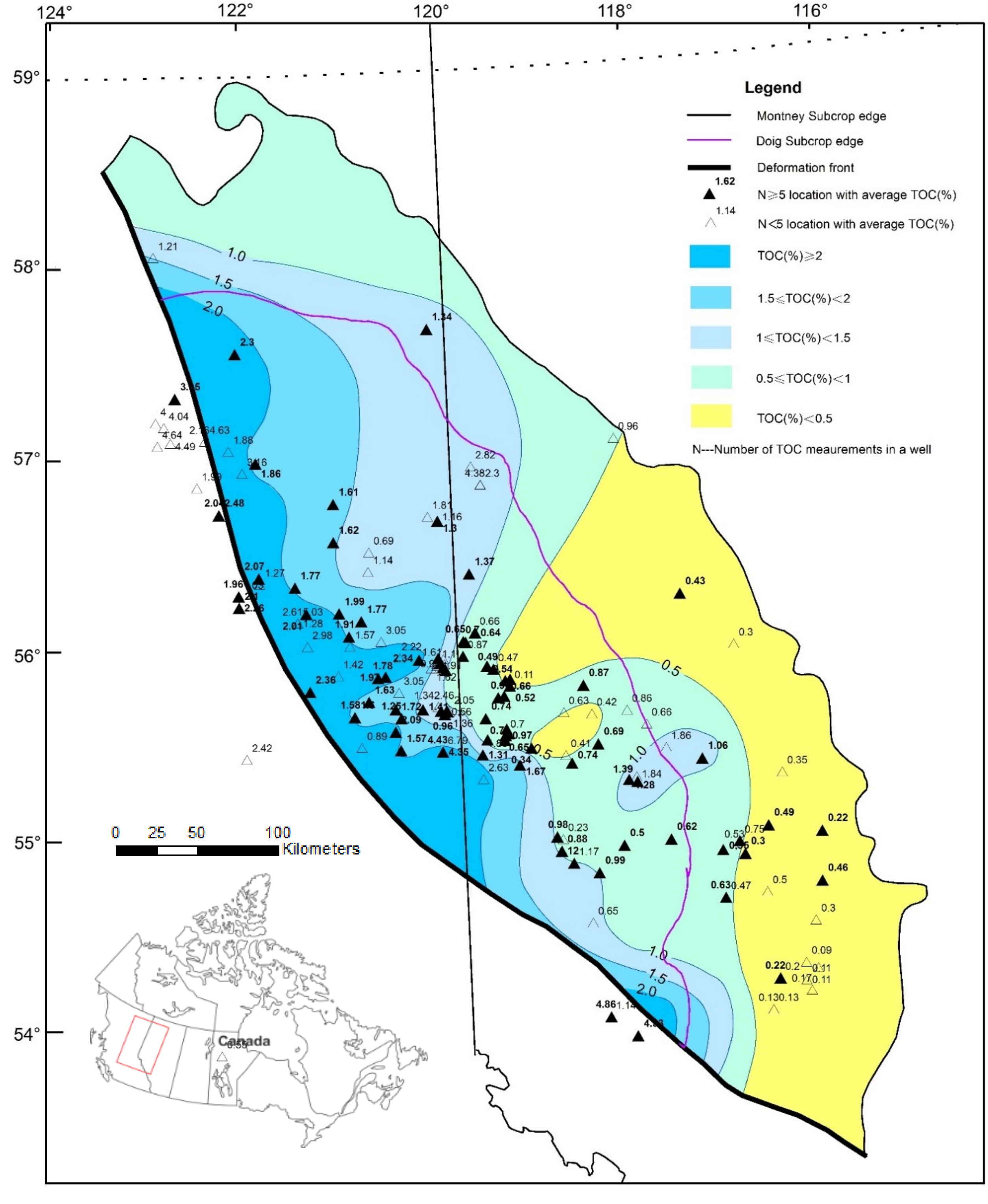

Figure 3-2 Average TOC (%) distribution in Montney Formation. contour interval=0.5, basemap according to Atlas Shapefiles, Edwards et al., 1994)

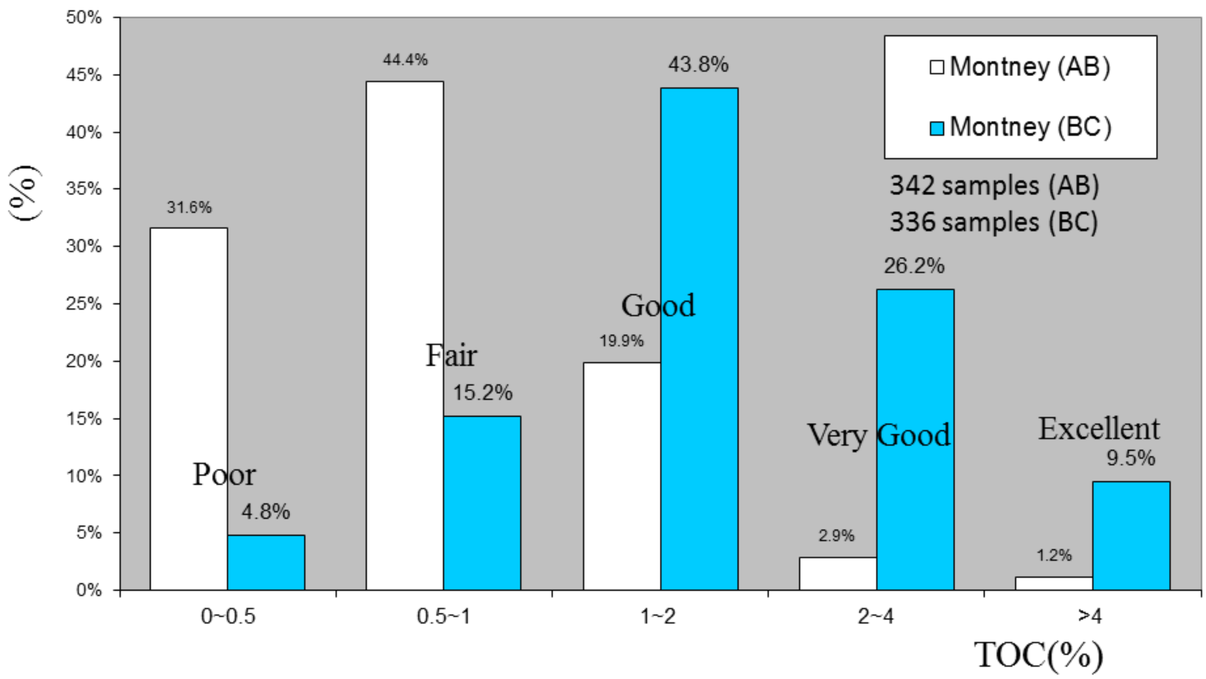

Figure 3-3 Statistical analysis of Montney TOC (%) in Alberta and British Columbia

S_1 and S_2 values suggest that Montney source rock mostly rank in the poor to fair range, according to the criteria proposed by Peters and Cassa (1994) (Figure 3-4, Figure 3-5). However, the S_1 and S_2 values in Montney source rock are greatly influenced due to oil and gas generation. As in Figure 3-6, Montney core samples with low thermal maturity (420 ºC <Tmax ≤445 ºC) have relatively higher S_2 (oil generation potential). With similar TOC contents, S_2 values of high thermal mature samples (Tmax>460 $^{\circ}$C) are much lower due to oil generation. S_1 values of the samples decrease as well when oil finally cracked to gas and migrates from the source rock. Likewise, hydrogen index values are greatly reduced with increased Tmax (oil generation results in decreased hydrogen index as shown in Figure 3-18 HI-Tmax). Therefore, due to the high thermal maturity of Montney source rock in the deep basin, S_1, S_2 and hydrogen index cannot not be used for determining the source rock richness.

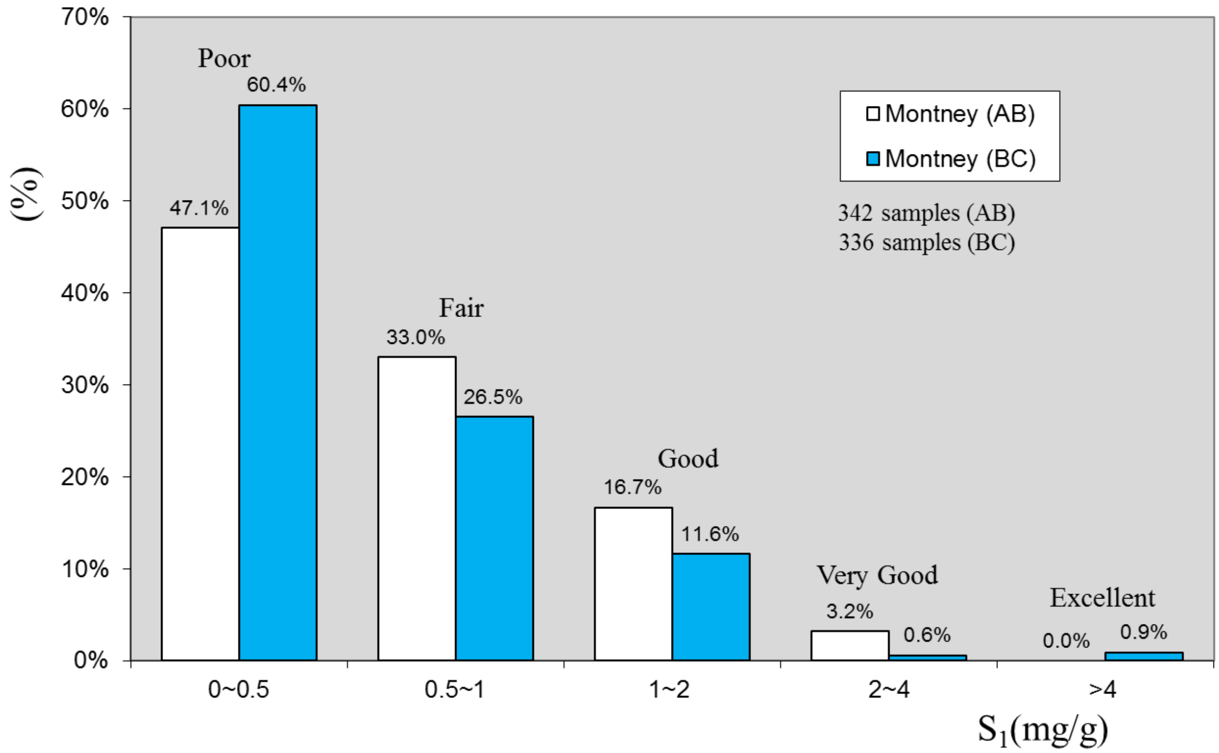

Figure 3-4 Statistical results of S_1 distribution of Montney samples

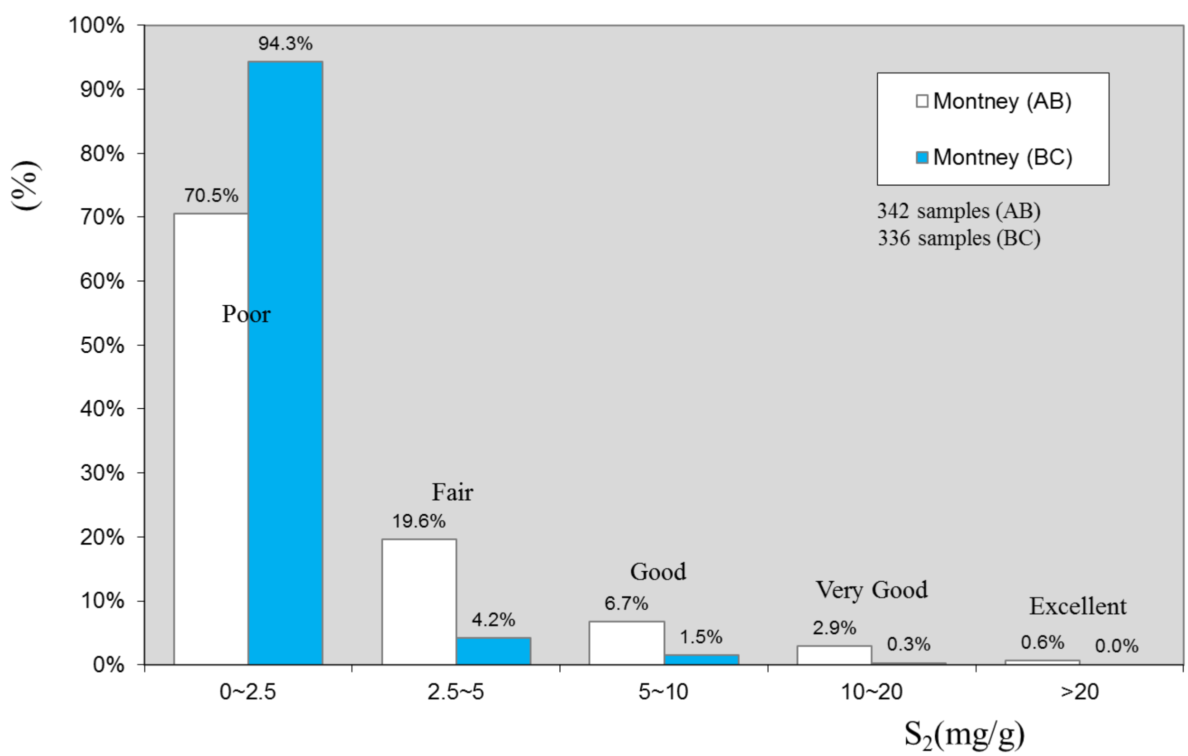

Figure 3-5 Statistical results of S_2 distribution of Montney samples

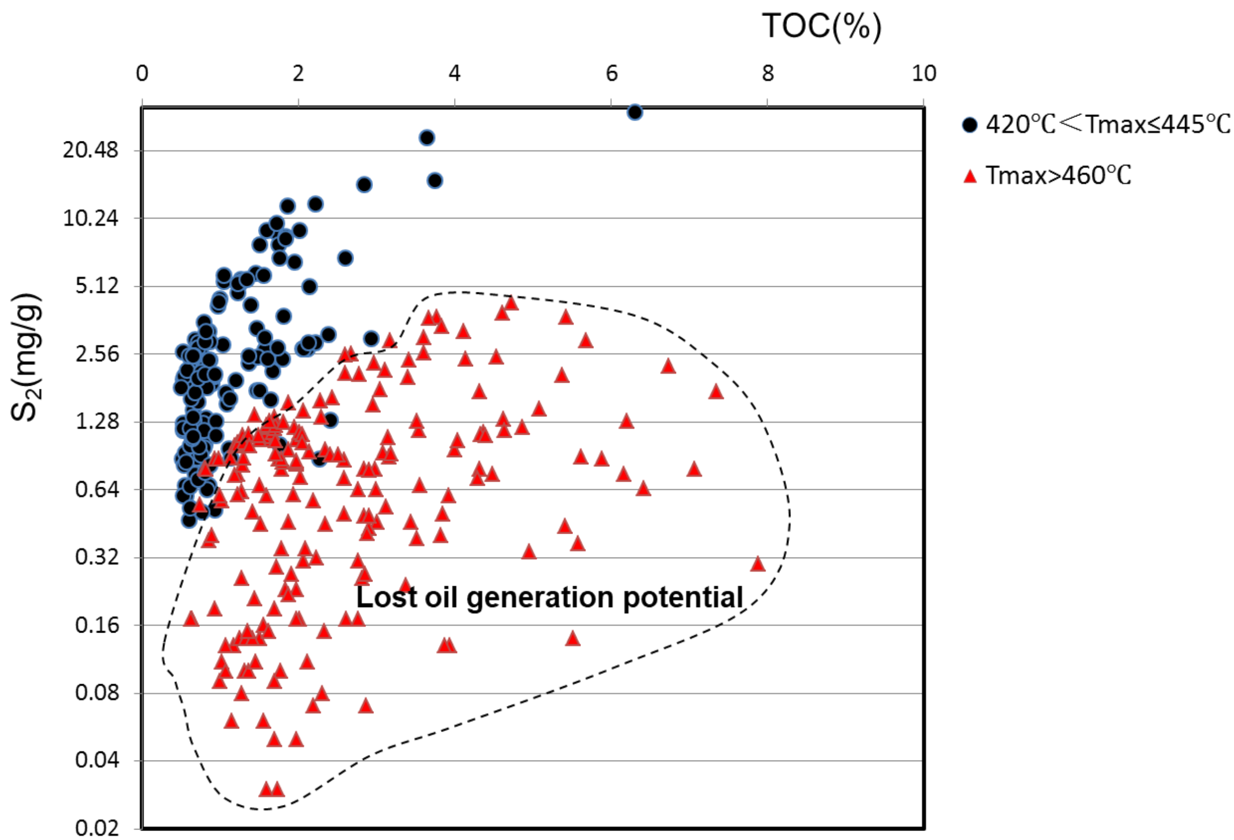

Figure 3-6 Decreased S_2 values by thermal maturation (oil generation) in Montney source rock

Oil migration within the Montney Formation may have affected source rock evaluation in terms of organic matter richness. This is potentially a significant problem particularly in eastern parts of the Montney play, where sandstone is well developed (Lee, 1999), and large-scale oil migration is possible. However, Montney source rock mainly exist in deep basin of British Columbia, where Montney sediment is dominated by fine-grained siltstone (Zonneveld and Moslow, 2018; Vaisblat et al., 2021, 2022) and without efficient migration pathways, massive oil migration among Montney Formation is unlikely.

Pore-filling solid bitumen/pyrobitumen in the coarse-grained siltstones of the Montney tight-gas and hydrocarbon liquids fairway is observed, and it has been advocated that much of organic matters in Montney Formation is migrated oil, now converted to pyrobitumen and little or no kerogen exists within the formation (Sanei et al., 2015; Wood et al., 2015; Wood et al., 2018). These studies are influenced by sampling biased toward reservoir or producing layers within the Montney Formation. For instance, almost all the samples in Sanei's article were selected from relatively permeable layers in Montney Formation (Figure 3-7). Permeability from well 03-21-080-17W6 is as high as 1.0086 MD (2140.2m), which is much higher than typical permeability of below 0.001 MD in Montney Formation siltstone (Vaisblat et al., 2022). It is possible Sanei's samples (2015) were selected from a locally developed sandstone.

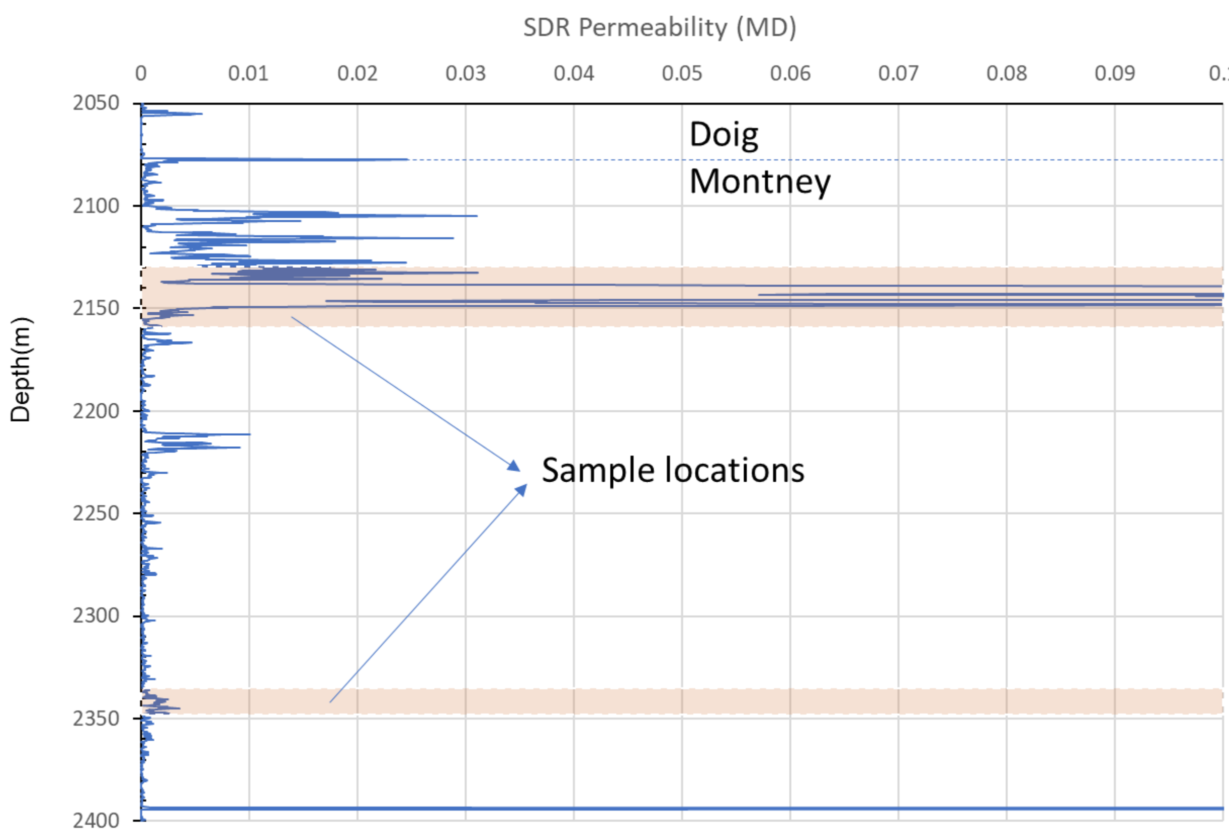

Figure 3-7 samples from well 03-21-080-17W6 in Sanei's article (2015) are selected from relatively permeable layers of Montney Formation

In theory, it is possible Doig-sourced hydrocarbons can be expelled to top Montney, though Montney Formation is known for tight reservoir in deep basin (Zonneveld and Moslow, 2018; Vaisblat et al., 2021, 2022). In this case, samples from top Montney should be excluded (about 10m), in order that Doig-sourced oil not affect the real TOC values of Montney Formation. Large scale oil migration from Doig Formation to Montney Formation in deep basin is unlikely due to its tight reservoir and well test pressures in Montney Formation are higher than that of Doig Formation (Table 3-3, Figure 3-8), displaying at least present Fluid tends to flow from Montney Formation to Doig Formation.

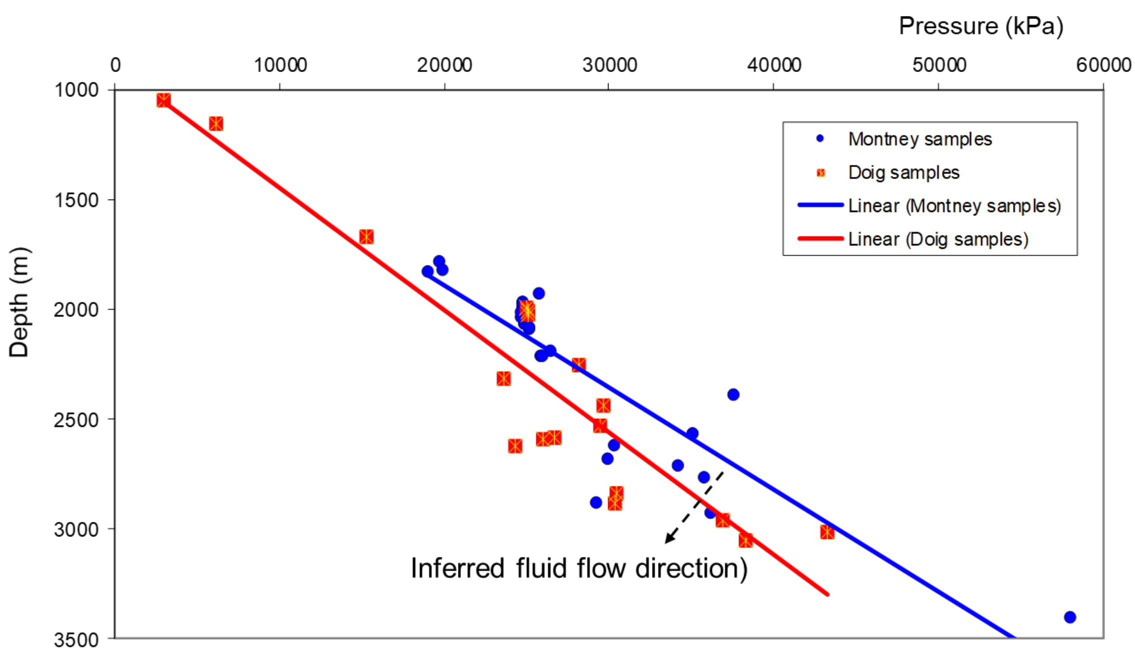

Figure 3-8 Well test pressures indicate the fluid flow direction is from Montney to Doig Formation

Table 3-3 Well test pressures in Montney to Doig Formation (Map No. same as in APPENDIX 3-1)

UWI	Map No.	Depth(m)	Formation	Test Pressure(kPa)	Pressure	Gradient
100/13-01-077-15W6/00		2620.5	Montney	30372	30372	11.59
100/16-35-078-21W6/00	78	2883.5	Montney	29262	29262	10.15
100/03-06-078-22W6/00	6	3402.3	Montney	58004	58004	17.05
100/11-04-079-14W6/00	56	2093	Montney	25242	25242	12.06
100/10-08-079-14W6/00	13	2032	Montney	25121	25121	12.36
100/13-16-079-14W6/00	65	2003	Montney	24818	24818	12.39
100/13-16-079-14W6/00	65	1994.9	Montney	24804	24804	12.43
100/02-19-079-14W6/00	5	2068.5	Montney	24881	24881	12.03
100/09-29-079-14W6/00	115	1974	Montney	24811	24811	12.57
100/09-29-079-14W6/00	115	1980.8	Montney	24826	24826	12.53
100/06-10-079-15W6/00		2195	Montney	26451	26451	12.05
100/07-13-079-15W6/00	D29	2086	Montney	25239	25239	12.10
100/01-36-079-15W6/00	3	2040.5	Montney	24749	24749	12.13
100/01-36-079-15W6/00	3	2016.5	Montney	24691	24691	12.24
100/03-15-079-19W6/00	D21	2390.5	Montney	37640	37640	15.75
100/15-34-080-18W6/00	23	2213.5	Montney	25874	25874	11.69
100/15-34-080-18W6/00	23	2213.3	Montney	26029	26029	11.76
100/08-30-082-22W6/00		1835.7	Montney	19085	19085	10.40
100/01-10-082-23W6/00	1	1934.6	Montney	25771	25771	13.32
100/04-14-084-23W6/00	81	1786.2	Montney	19743	19743	11.05
102/08-07-085-18W6/00	113	1821.7	Montney	19937	19937	10.94
200/d-039-F 093-P-09/00	120	2932.6	Montney	36236	36236	12.36
200/b-032-G 093-P-09/00	118	2712.2	Montney	34195	34195	12.61
200/b-057-G 093-P-09/00	119	2769.6	Montney	35843	35843	12.94
200/a-029-H 093-P-09/00	D39	2570	Montney	35133	35133	13.67
200/a-029-H 093-P-09/00	D39	2683.8	Montney	29957	29957	11.16
200/c-021-L 094-A-13/00	33	1926.5	Montney	32749	32749	17.00

Table 3-3 Well test pressures in Montney to Doig Formation (continued)

UWI	Map No.	Depth(m)	Formation	Test Pressure(kPa)	Pressure	Gradient
200/c-021-L 094-A-13/00	33	1926.5	Montney	26126	26126	13.56
200/c-021-L 094-A-13/00	33	1926.8	Montney	26384	26384	13.69
200/c-021-L 094-A-13/00	33	1926.8	Montney	32487	32487	16.86
200/b-015-I 094-B-01/00	D43	2423.3	Montney	25613	25613	10.57
200/c-085-I 094-B-01/00	D51	2499	Montney	43307	43307	17.33
200/c-044-L 094-B-08/00	D49	2488	Montney	31779	31779	12.77
200/c-044-L 094-B-08/00	D49	2488	Montney	36471	36471	14.66
200/a-010-J 094-B-09/00	27	2220	Montney	28946	28946	13.04
100/13-12-078-19W6/00		2685.8	Montney	37135	37135	13.83
100/11-04-079-14W6/00	56	2009.4	Doig	25080	25080	12.48
100/10-08-079-14W6/00	13	1995.6	Doig	25049	25049	12.55
100/07-13-079-15W6/00	99	2024.2	DOIG	25105	25105	12.40
100/08-06-079-20W6/00		2588	Doig	26730	26730	10.33
100/10-13-079-21W6/00	D1	2619.7	Doig ss	24298	24298	9.28
100/10-13-079-21W6/00	D1	2591	Doig ss	25950	25950	10.02
100/09-14-080-20W6/00	D35	2317.5	Doig	23623	23623	10.19
200/c-049-H 093-P-10/00	36	2880.5	Doig ss	30375	30375	10.55
200/c-049-H 093-P-10/00	36	2840	Doig ss	30420	30420	10.71
200/b-064-I 094-A-12/00	D46	1670.2	Doig	15300	15300	9.16
200/d-048-H 094-H-01/00	D57	1048.2	Doig	2985-3551	2985	2.85
200/d-004-B 094-H-02/00	D57	1156.1	Doig	6127	6127	5.30
200/d-022-F 093-P-10/00		3051.2	Doig	38302	38302	12.55
200/b-043-F 093-P-10/00		2958.7	Doig	36937	36937	12.48
100/13-12-078-19W6/02		2532.8	Doig	29508	29508	11.65
100/11-14-078-19W6/02		2437.5	Doig	29619	29619	12.15
100/05-29-077-20W6/00		3014.7	Doig	43278	43278	14.36
100/02-29-079-19W6/00		2255.5	Doig	28188	28188	12.50

Since the presence of organic matter may be associated with uranium, resulting in an increase of GR readings (Lüning and Kolonic, 2003; Hemmesch et al., 2014; Harris et al., 2019), GR curves are used to predict TOC values for organic matter richness study in Montney Formation. GR readings are less influenced by migrated oil (Figure 3-9), and TOC contents inferred by GR logs mostly stand for indigenous organic matter.

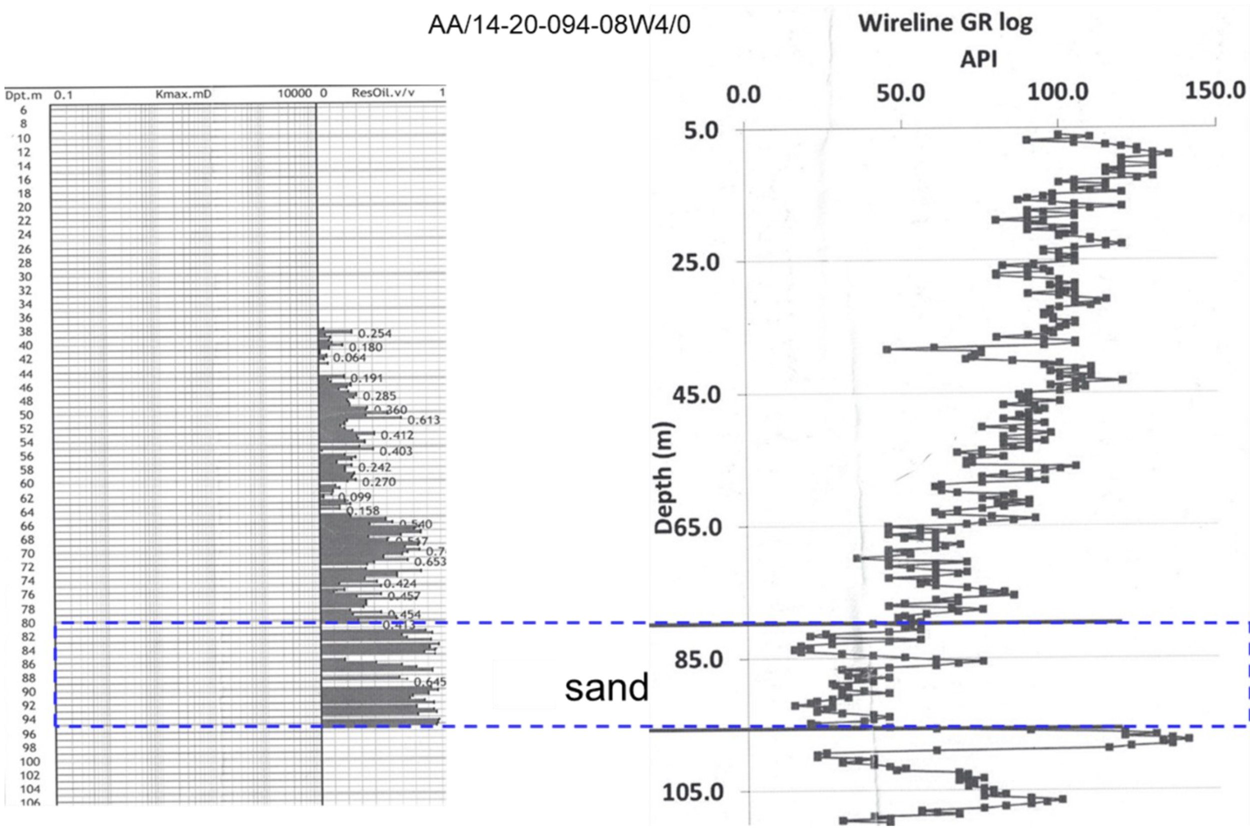

Figure 3-9 High residual oil-bearing sand and GR log of well AA/14-20-094-08W4/4 indicate the GR readings are less influenced by migration oil

Rock-Eval TOC values and corresponding GR readings from GR logs of 41 wells are shown in APPENDIX 3-1 (Map No.1- 41). TOC values usually rise with increased GR readings (Figure 3-10. It is obvious that samples from larger-diameter holes have lower GR readings (e.g. well 6-30-67-23W5 with borehole diameter of 260-265mm) than the samples from smaller-diameter (around 200mm) holes with similar TOC contents.

Some samples (not all) very close to the Doig phosphate (the distance from the sample to Doig phosphate is less than 20m) have low GR readings but high TOC values (e.g. 3055m-3073m of well D-65-G/93-P-8).

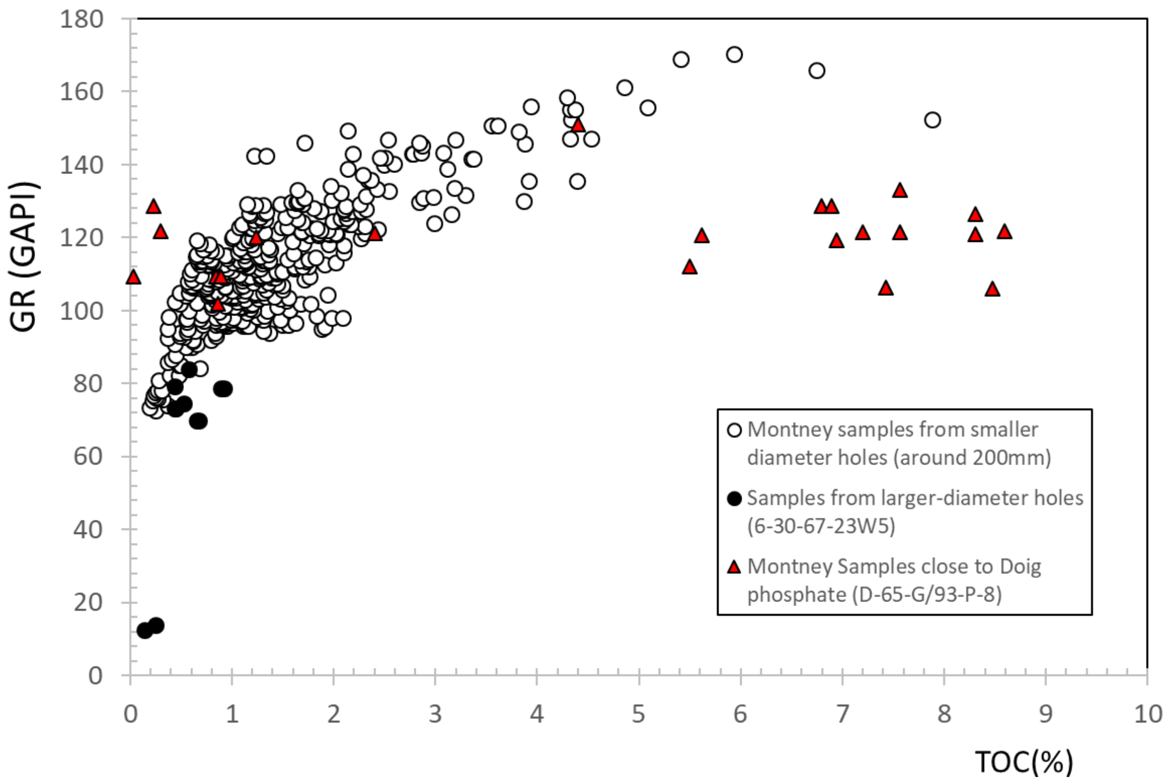

Figure 3-10 TOC values and corresponding GR readings in Montney core samples

Based on Rock-Eval TOC values of Montney cores and corresponding GR readings from available GR logs of 41 wells (Map No.1- 41 in APPENDIX 3-1), the relationship between GR readings and TOC values is not linear. GR/TOC (%) ratio decreases gradually with increased TOC values (Figure 3-11) and there is a linear relationship between GR readings and TOC values on log scale (Figure 3-12).

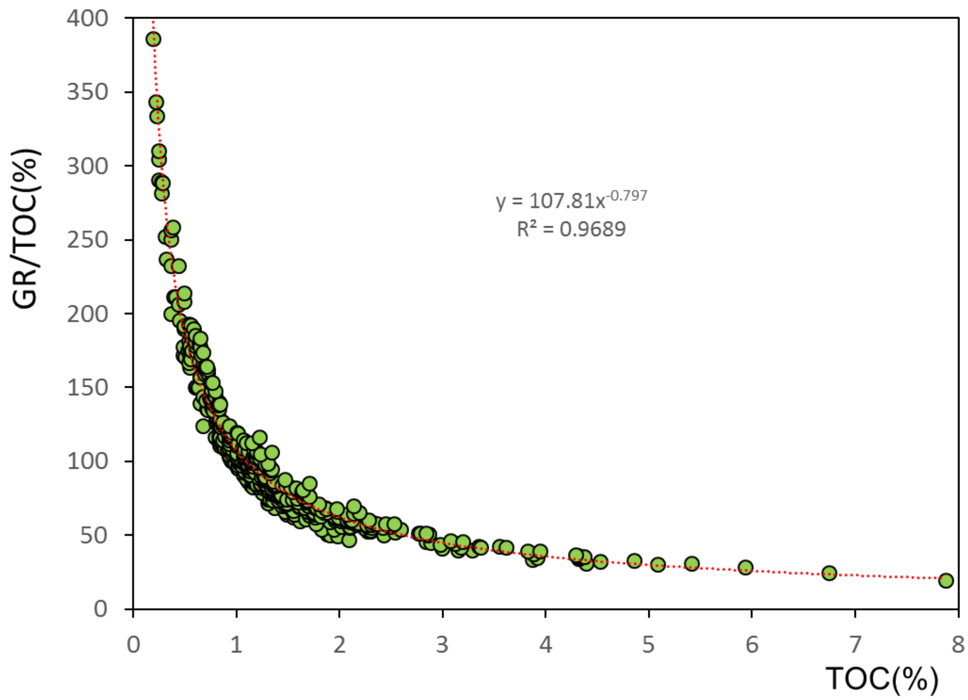

Figure 3-11 GR/TOC (%) ratio decreases with increased TOC values (high contribution from K and Th and low contribution from U at low TOC values are suspected, but no spectral gamma logs to prove it)

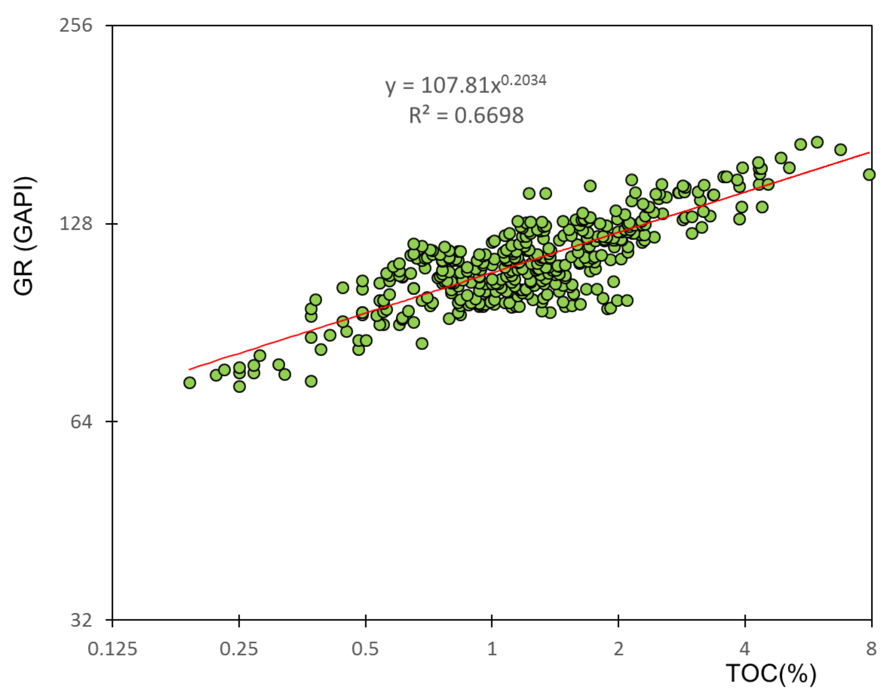

Figure 3-12 GR-TOC relationship based on Montney cores of 41 wells (Map No.1- 41 in Appendix 3-1)

APPENDIX 3-3 listed the Rock-Eval TOC values, calculated TOC values based on GR readings and sample number. Calculated TOC values are listed from low to high, so to compare with corresponding measured Rock-Eval TOC values. Comparison of Rock-Eval TOC values and calculated TOC values demonstrates the prediction of TOC in Montney Formation based on GR readings is quite reasonable (Figure 3-13).

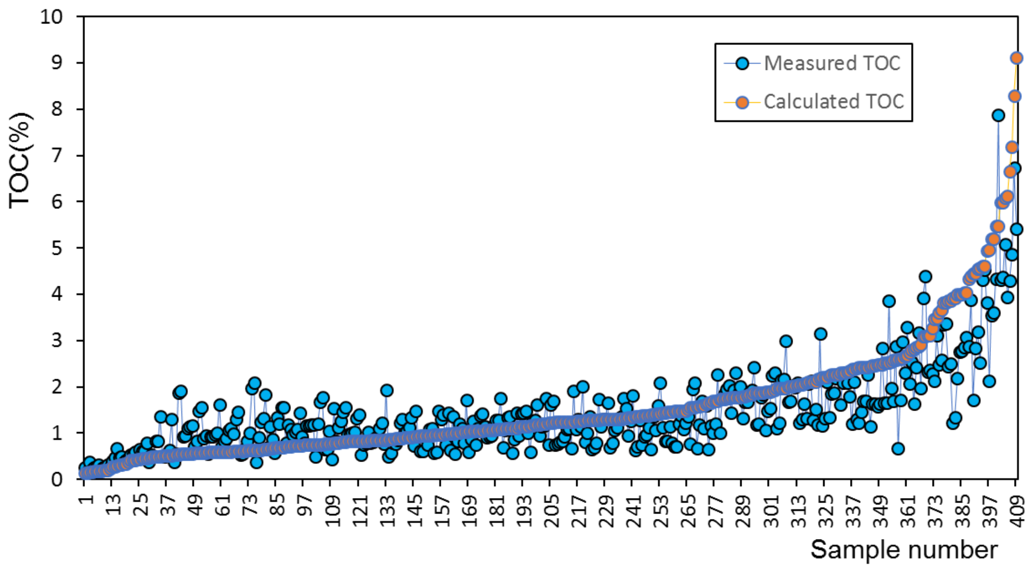

Figure 3-13 Comparison of Rock-Eval TOC values and corresponding calculated TOC values based on GR readings and GR-TOC relationship (GR= $107.81\times(TOC)^{0.2034}$), dataset and calculated results are listed in APPENDIX 3-3

It is observed that when the calculated TOC values are greater than 2%, these values are higher than corresponding Rock-Eval TOC values in Montney Formation. It is possible that because the Montney high TOC samples mainly come from British Columbia where thermal maturities are higher, oil expulsion has reduced the TOC values from their original values. Because uranium content and the resulting gamma ray response reflects original TOC content, calculated TOC values will be higher than measured TOC by an amount corresponding to the fraction of organic carbon that is expelled. When TOC values are greater than 2%, a new revised GR-TOC relationship can be established to predict present TOC values based on GR readings (Figure 3-14). Classification of source rock quality in the Montney based on GR logs is provided in Table 3-4.

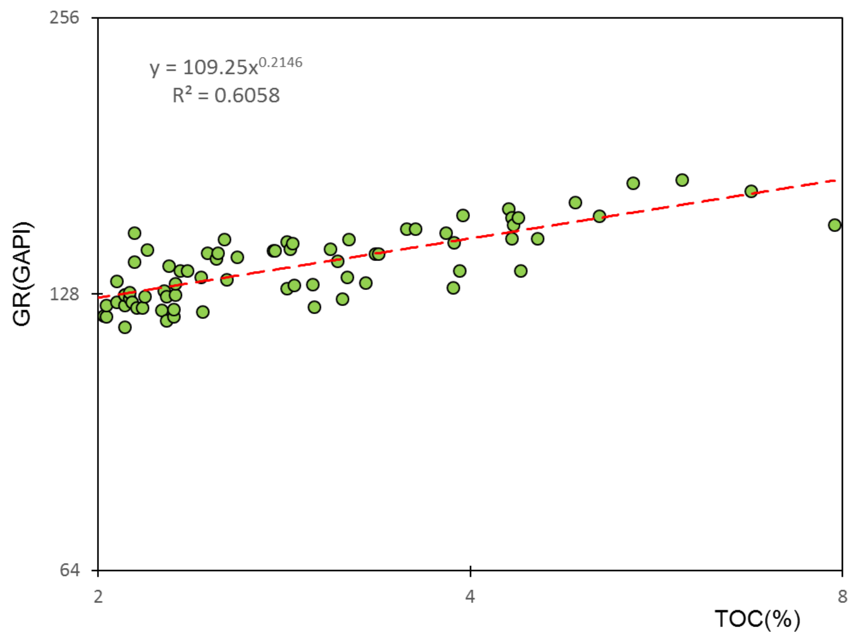

Figure 3-14 Revised GR-TOC relationship to recalculate TOC values (samples with TOC values greater than 2%, in Appendix 3-4)

Table 3-4 ranking source rock richness based on GR readings

Source rock richness	TOC (%)	GR readings (GAPI)
poor	0~0.5	0~94
fair	0.5~1	94~108
good	1~2	108~127
Very good	2~4	127~147
excellent	>4	>147

Statistical analysis is applied to determine the source rock thickness of Montney Formation with available GR logs. Specifically, the fraction of the total Montney thickness with gamma ray values corresponding to the classification in Table 3-4 is used to calculate net thickness of the formation corresponding to a specific source rock quality. Thus, if 10% of recorded GR readings from the GR log are between 108 and 127, 10% of the interval is good source rock. GR logs of 222 wells are analyzed in this study, and the indicated Montney source rock thickness based on GR-TOC relationships and calculated TOC values (present-day TOC) in Figures 3-15, 3-16 and Figure 3-17 (additional information in APPENDIX 3-4).

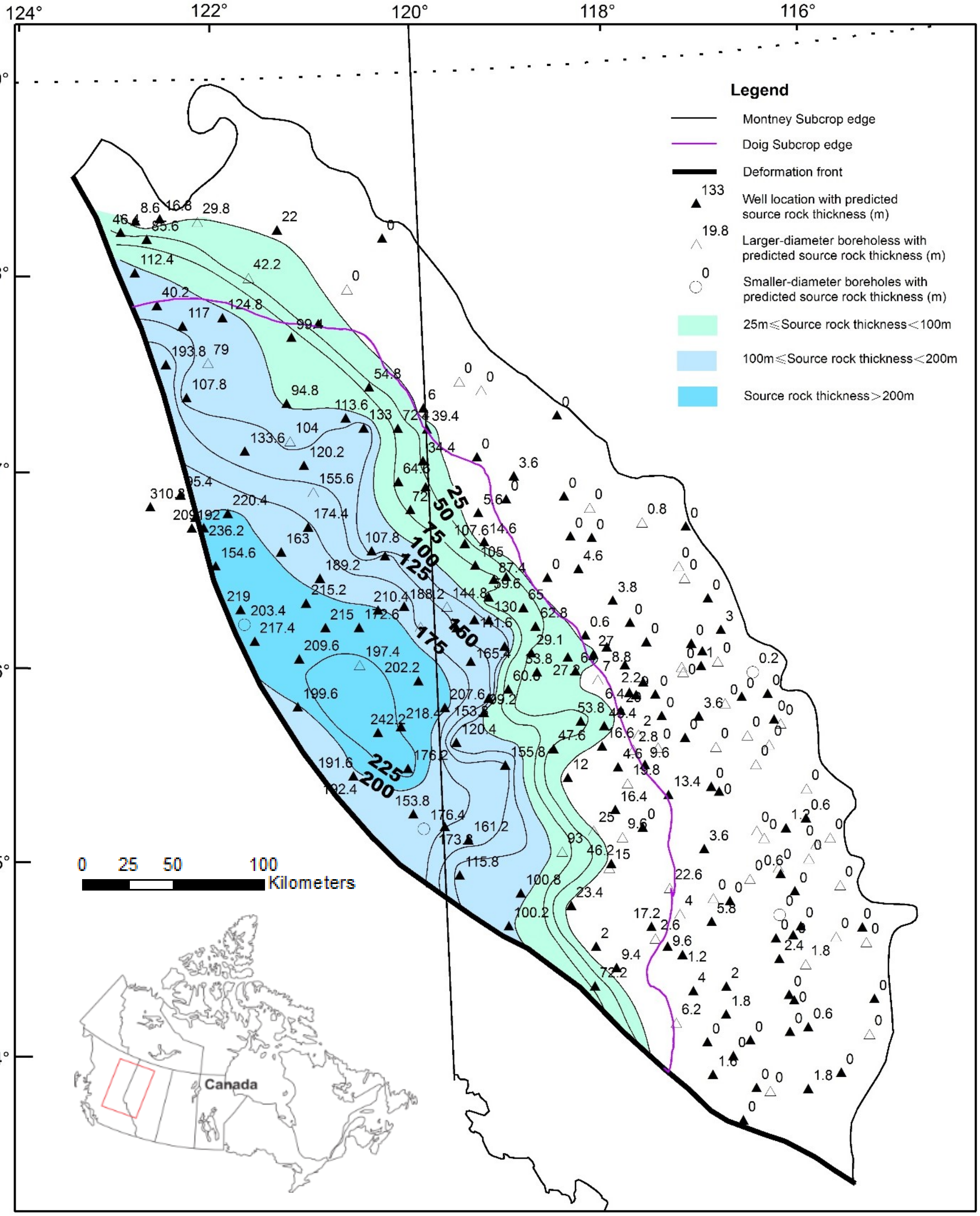

Figure 3-15 Thickness of Montney source rock with TOC>1%, based on GR log analyses and GR-TOC relationship of 222 wells (APPENDIX 3-4), basemap according to Atlas Shapefiles, Edwards et al., 1994

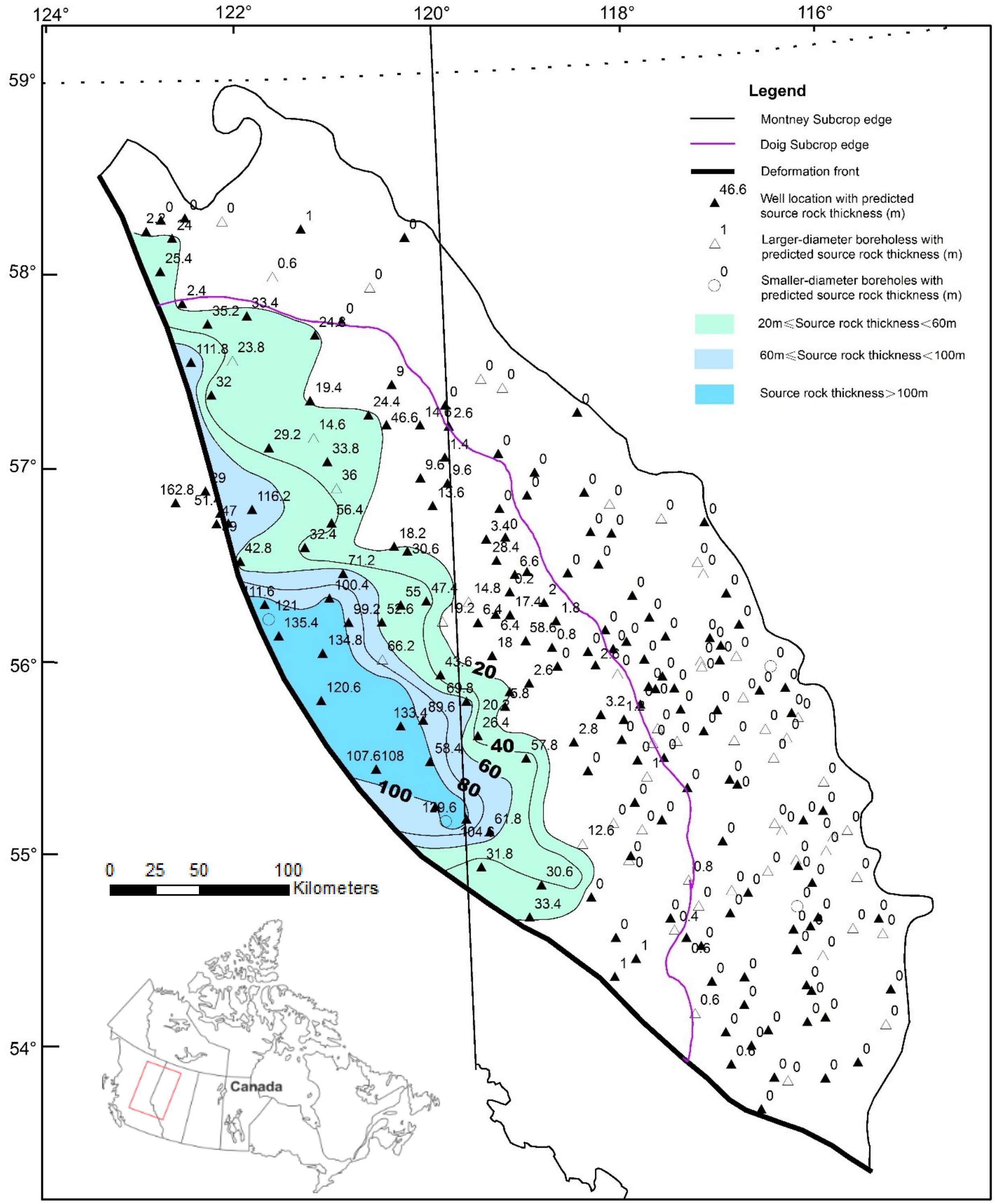

Figure 3-16 Thickness of Montney source rock with TOC>2%, based on GR log analyses and GR-TOC relationship of 222 wells (APPENDIX 3-4), basemap according to Atlas Shapefiles, Edwards et al., 1994

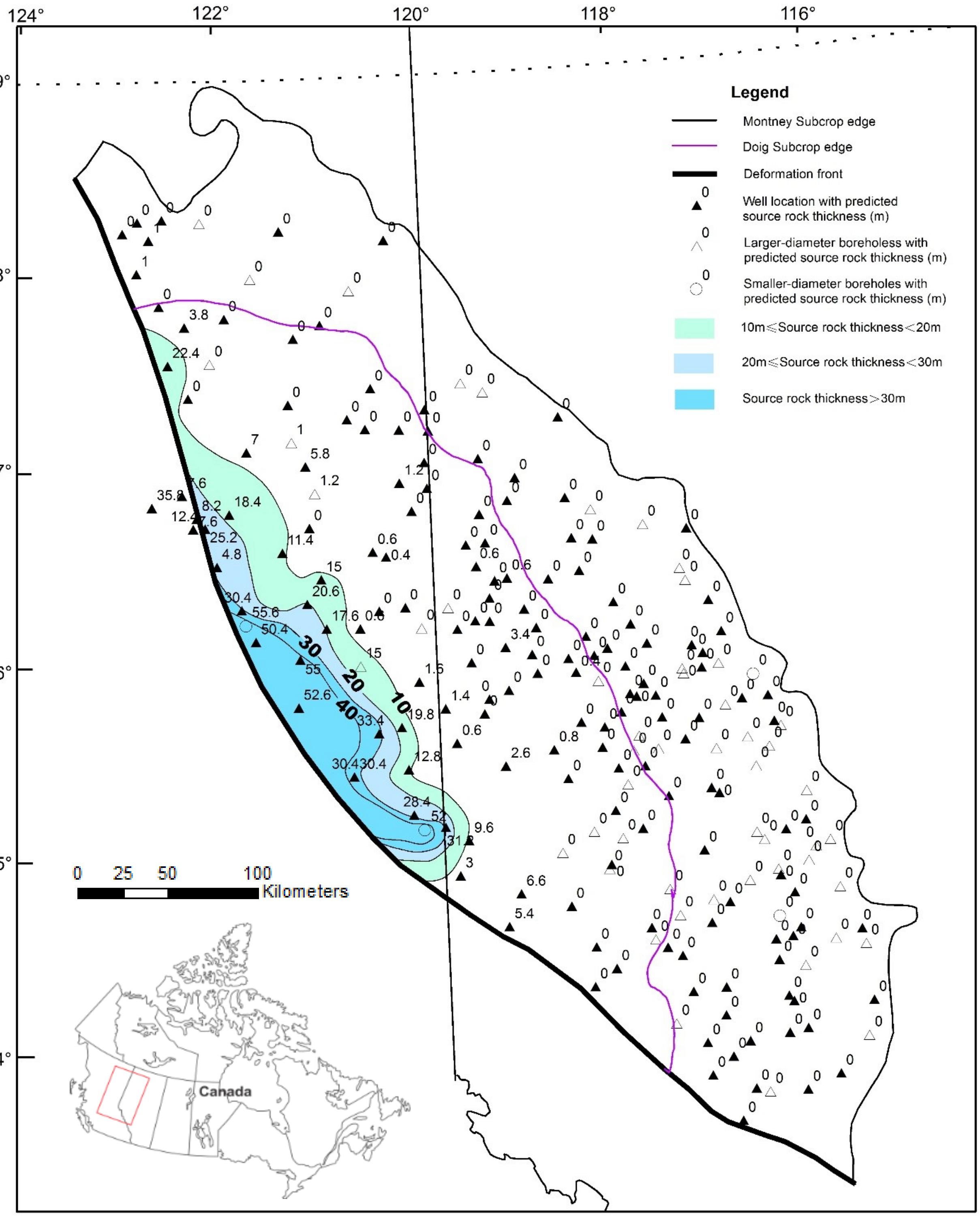

Figure 3-17 Thickness of Montney source rock with TOC>4%, based on GR log analyses and GR-TOC relationship of 222 wells (APPENDIX 3-4), basemap according to Atlas Shapefiles, Edwards et al., 1994

3.3.2 Organic matter type

Kerogen types interpreted from both Rock-Eval parameters and organic petrologic analysis are consistent with a predominance of Type II organic matter. These interpretations are similar to those of Reidiger (1991), Ibrahimbas, et al., (2004) and Egbobawaye (2017).

Interpretations of kerogen type can be made from considerations of hydrogen index (HI) versus Tmax (Figure 3-18). Similarly, pseudo-Van Krevelen plots of hydrogen index (HI) versus oxygen index (OI) are often used to determine the kerogen types in assemblages of organic matter (Figure 3-19). These diagrams indicate that Montney organic matter is dominated by Type II kerogen, but some samples are characteristic of Type I and Type III kerogens.

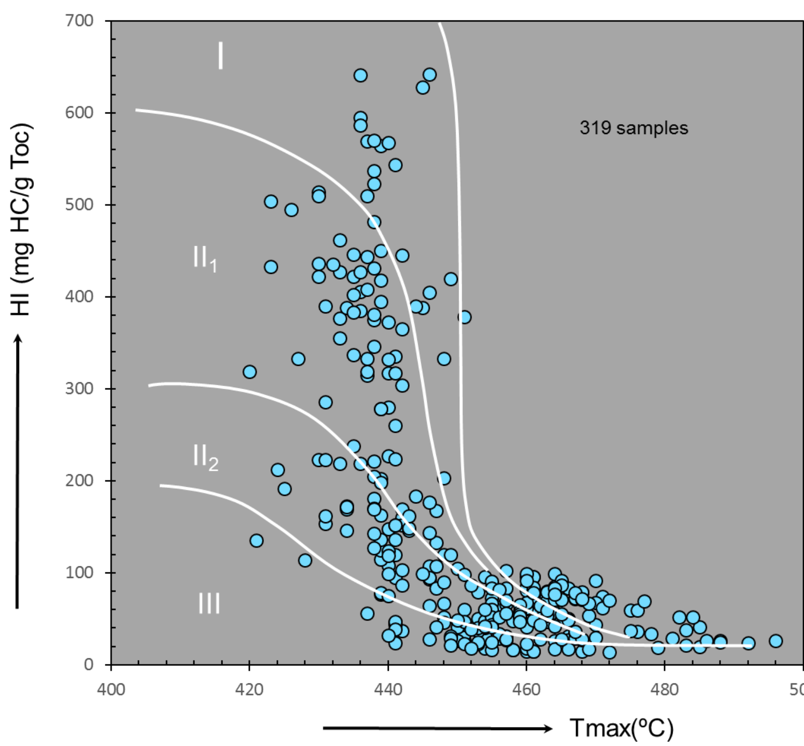

Figure 3-18 Hydrogen Index versus Tmax plot to indicate kerogen type of Montney organic matters (Samples are selected with TOC≥ 0.5%, S_2≥0.3 mg/g, S_3≥0.15mg/g, 500 °C≥Tmax≥420 °C)

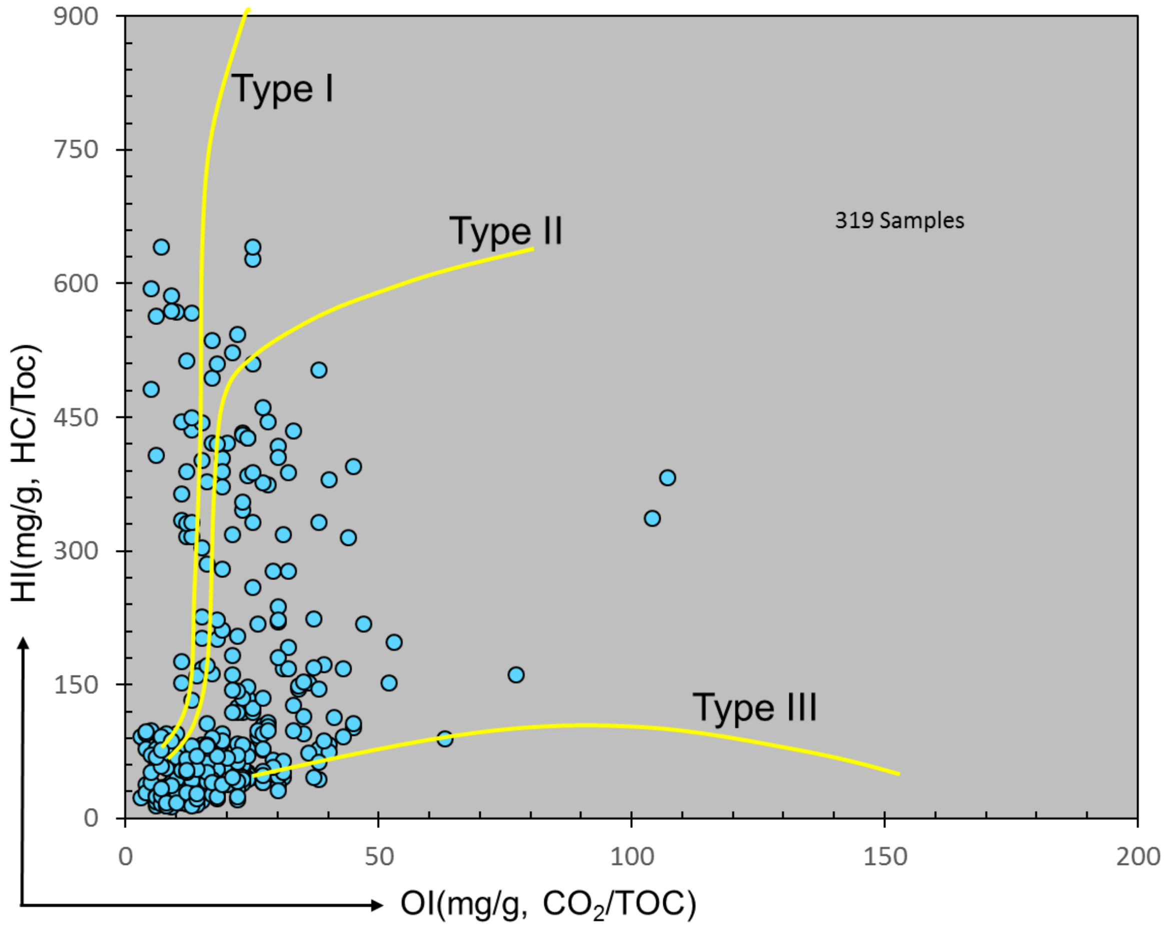

Figure 3-19 Pseudo-Van Krevelen plots of hydrogen Index versus oxygen Index to determine kerogen type of Montney organic matters

S_2/S_3 ratio can be used to evaluate kerogen type (Peters and Cassa, 1994). Samples with S_2/S_3 ratio greater than 10 are classified as oil prone kerogen (types I and II). S_2/S_3 ratios are considerably lower for Type III kerogen than for Type II and Type I because terrestrially derived organic matter contains substantially more oxygen than the other types of organic matter (Nunez-Betelu, L., and J. I. Baceta, 1994). S_2/S_3 ratio lower than 5 contain gas prone organic matter (type III kerogen) (Peters and Cassa, 1994). S_2/S_3 ratio inferred kerogen types of Montney organic matters are mixed Type I, Type II and Type III (Figure 3-20).

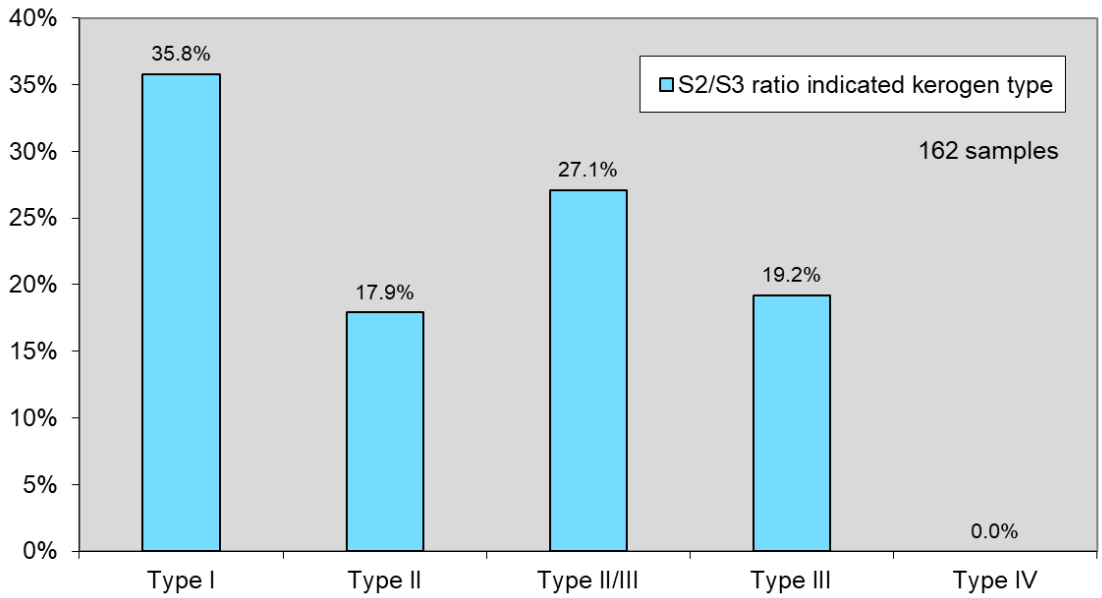

Figure 3-20 S_2/S_3 ratio inferred kerogen types of Montney organic matter (Samples select those TOC≥ 0.5%; 500 °C >Tmax>420 °C; S_2>1 mg/g and S_3≥0.15mg/g)

Organic petrology analyses are conducted to investigate the organic matter compositions or organic maceral to indicate kerogen type, as well as vitrinite reflectance study in Montney (8 samples) and Doig (4 samples) Formations (Table 3-5).

The Montney Formation core samples show diverse lithologies, which range from organically rich shaly siltstone to organic lean fine-grained siltstone (Table 3-5). Two Montney samples (PEL#193-16, 194-16) in well 12-7-67-24W5 from the east side of Montney basin are organically lean, indicating low source rock potential (sample location see Map No. 63 in Figure 3-1). One Montney sample (PEL#201-16) from well 2-5-79-11W6 (Map No. 4 in Figure 3-1) is organic-rich but this is mostly filled with solid bitumen and rare prasinophyte alginate (Figure 3-21e). This sample is very close to British Columbia, and the reddish-orange fluorescing solid bitumen observed is proximal to the thermally degraded orange fluorescing alginate (Figure 3-21f). All other Montney samples (PEL#199-16, 200-16, 202-16, 203-16, 204-16) are from Alberta in the central part of the Montney basin (Map No. 53, 55, 24 in Figure 3-1), and all these samples exhibited obvious source rocks characteristics with significantly higher amounts of fluorescing alginite macerals (Figure 3-21a- d), indicating source of Type I kerogens.

Unlike Montney samples, the dispersed organic matter (DOM) in the Doig core samples (PEL#195-16, 196-16, 197-16, 198-16) from well11-3-73-7W6 (well location see Map No. 55 in Figure 3-1) consists almost entirely of pore-filling solid bitumen, observed in the interstitial pore spaces of the siltstone rocks (Figures 3-22a-f). Most of the solid bitumen found in the rock matrix are in the form of granular thin solid bitumen lenses. Some soluble oil retained and/or adsorbed by the solid bitumen were also observed oozing onto surface of the sample upon UV light irradiation (Figure 3-22f). Yellow-orange fluorescing heavy oil between inter-granular pore spaces was also observed (Figure 3-22f). The BRo% in Doig Formation (1.02-1.11) is higher than those in underneath Montney Formation (0.8-0.81) from the same well. It is inferred by geochemical signatures (see Chapter 4), that the organic matters in these Doig samples are Montney origin. The reversed BRo% in Montney and Doig Formation indicates the organic matter in Doig Formation at this place may belong to migration oil.

Table 3-5 Results of organic petrology analysis on Montney and Doig core samples

Map No.	PEL#	C#	UWI	Depth (m)	Unit	Organic type	BR_o (%)	R_o (%) equivalent	R_o (%)	SD	N	Description
63	193-16	C-603659	12-7-67-24W5	1912.6	Montney	bitumen	0.75	0.86		0.06	17	Organically lean siltstone matrix with trace of migrabitumen in between intergrnaular pore spaces.
63	194-16	C-603670	12-7-67-24W5	1921.6	Montney	vitrinite			0.73	0.23	2	Organically lean shaley siltstone matrix with rare amount of migrabitumen in between intergrnaular pore spaces. Most of the DOM are drived from bright yellow fluorescing prisophyte alginite and acritarch.
						bitumen	0.58	0.76		0.07	30	
55	195-16	C-603710	11-3-73-7W6	2032.9	Doig	bitumen	1.04	1.04		0.06	103	Organic rich silty shale matrix showing evidence mineral diagenisis. Kerogen consist mostly of migrated solid bitumen (reddish brown to non-fluorescing alginte macerals). HCFI and fluorescing heavy oil between intergranular pore spaces can also be observed. Some of the bitumen are soluble under UV light.
55	196-16	C-603712	11-3-73-7W6	2037.4	Doig	bitumen	1.05	1.05		0.08	101	
55	197-16	C-603714	11-3-73-7W6	2040.3	Doig	bitumen	1.02	1.03		0.07	100	
55	198-16	C-603715	11-3-73-7W6	2041.35	Doig	bitumen	1.11	1.09		0.06	112	
55	199-16	C-603721	11-3-73-7W6	2050.35	Montney	bitumen	0.8	0.89		0.09	12	Oganically lean shaley silstone matrix with rare amount of migrabitumen in between intergrnaular pore spaces. Most of the DOM are derived from small yellow fluorescing prisophyte alginite (leiosphaeridia).
55	200-16	C-603724	11-3-73-7W6	2052.4	Montney	bitumen	0.81	0.9		0.1	13	
4	201-16	C-603742	2-5-79-11W6	2114	Montney	bitumen	0.83	0.91		0.1	69	Organic rich very fine siltstone matrix with mostly of migrated solid bitumen and rare prasinophyte alginite (weak orange to reddish brown to non-fluorescing). Traces of hcfi and fluorescing heavy oil between intergranular pore spaces can also be observed. Some of the bitumen are soluble under UV light.
53	202-16	C-603755	11-28-71-3W6	1852.6	Montney	vitrinite			0.64	0.06	12	Organic rich silty shale matrix with mostly greenish yellow to bright yellow fluorescing prasinophyte alginite (acritarch also observed) and trace amount of weak orange to reddish brown to non-fluorescing bituminite maceral. Traces bright fluorescing migrated bitumen observed in between intergranular pore spaces of the mineral matrix, some of which dissolves under UV light. Oil staining.
53	203-16	C-603756	11-28-71-3W6	1853.95	Montney	vitrinite			0.7	0.06	20	
24	204-16	C-603760	15-5-71-12W6	3116.4	Montney	bitumen	2.2	1.76		0.14	69	Organic rich very fine grain siltstone matrix with mostly overmature, migrated, amorphous solid bitumen with traces of anisotrophy.

Notes: BR_o (%)-solid bitumen reflectance

N-number of measurements

R_o (%) equivalent = 0.618 x BR_o (%) + 0.40 (Jacob, 1989)

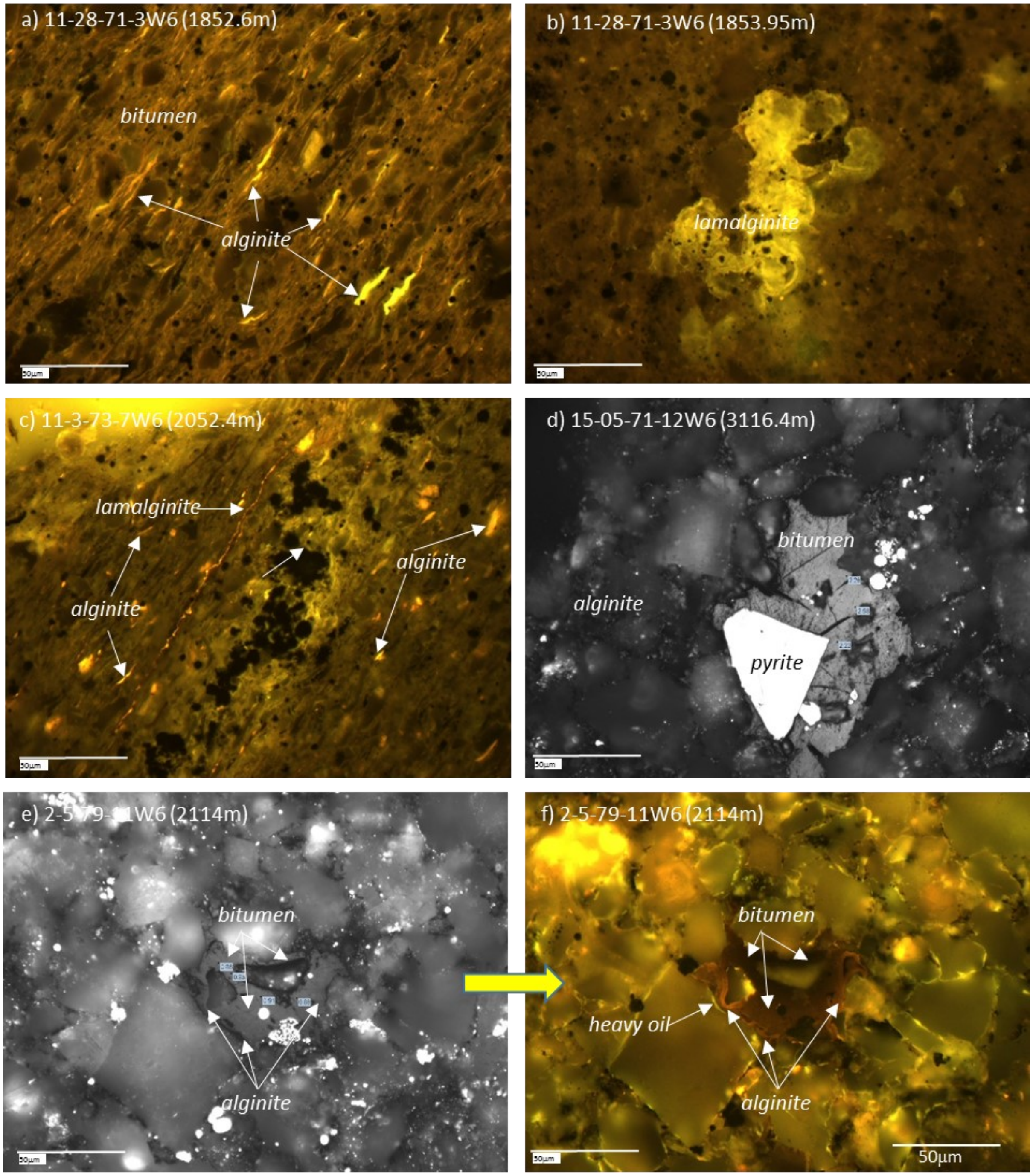

Figure 3-21. Photomicrographs taken from shale and siltstone core samples collected from Montney Formation showing its source and reservoir rock characteristics. The samples were collected from various locations and depths and different levels of thermal maturity. Fluorescing alginite (a) and lamalginite [taken perpendicular (b) and parallel (c) to the bedding] observed on silty shale signifying hydrogen-rich organic source. d-f) Siltstone core samples showing the thermally degraded weak reddish–orange fluorescing alginite source and the orange to reddish-brown fluorescing heavy oil and solid bitumen by-products.

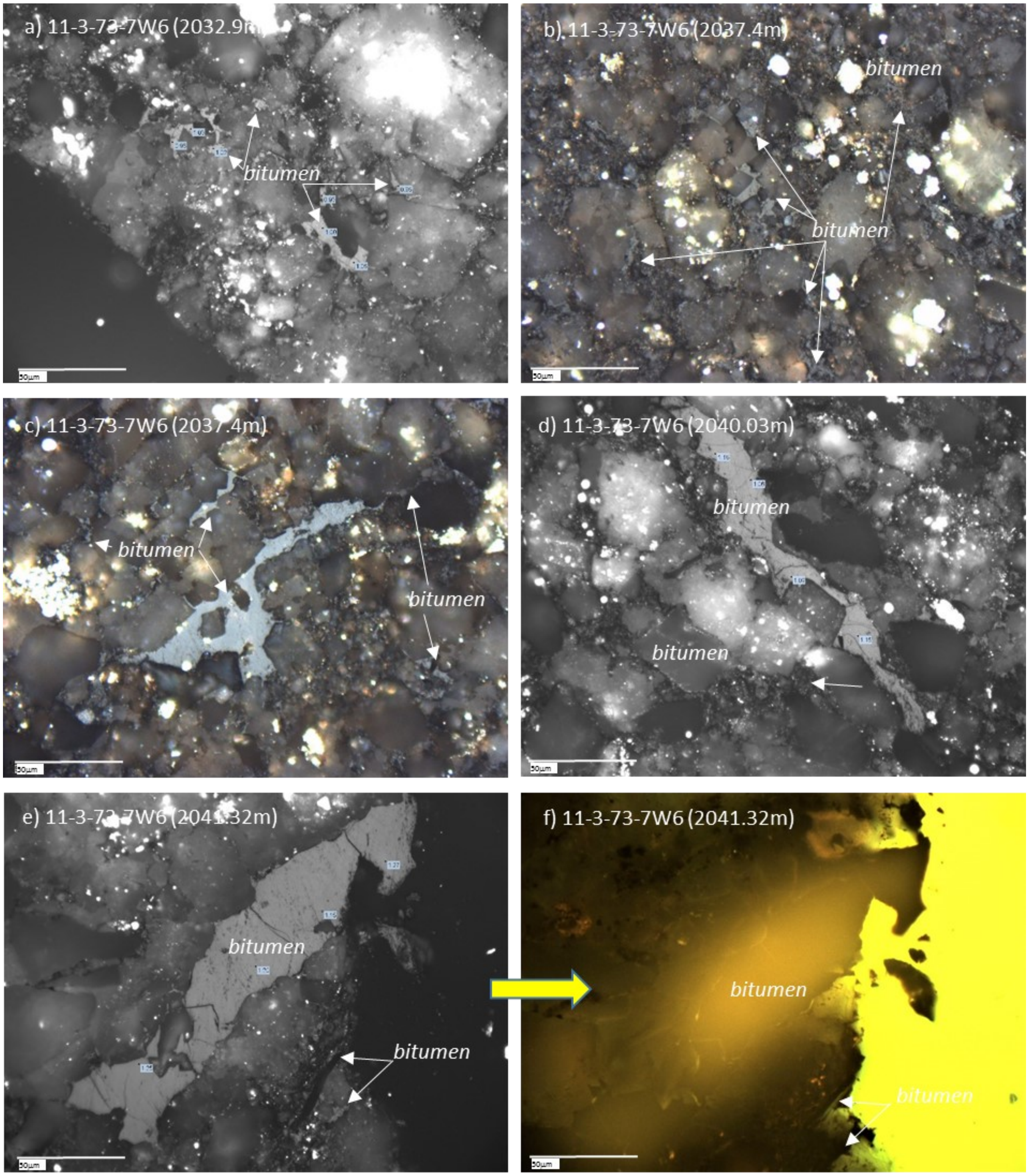

Figure 3-22 Photomicrographs taken from siltstone core samples collected from Doig Formation showing its mostly reservoir rock character. The core samples were collected from the same well from different depth intervals. a-f) All samples analyzed contains mostly migrated bitumen observed in the interstitial pore spaces. Some rock matrix retained some dissolvable solid bitumen (under UV light irradiation) illustrated by the orange fluorescing oil oozing out onto the surface of the sample (f).

3.3.3 Thermal maturity

There are many parameters for thermal maturity study, among which the most widely used ones are vitrinite reflectance (Ro%) and Tmax from Rock-Eval analysis. Other parameters include 22S/(22S+22R) homohopane isomerization, sterane isomerization C29ααα 20S/(20S+20R) and methylphenanthrene index. Due to the high maturity of Montney source rocks in the deep basin and the rare availability of extractable organic matter, the thermal maturity of organic matter in this study is mainly based on Tmax, supplemented by vitrinite reflectance (Ro%) and the reflectance of solid bitumen (Bro%), which can be converted to equivalent vitrinite reflectance using Jacob's equation (Jacob, 1989). The criteria for thermal maturity classification of source rock were proposed by Peters and Cassa, (1994). The solid bitumen in dark argillaceous siltstone is considered as indigenous (oil generated and retained in the source rock).

Tmax is defined as the maximum pyrolysis temperature at which the maximum amounts of hydrocarbons (S_2) are released from the kerogen. However, a small S_2 can affect the accuracy of Tmax value. When S_2 is too small, the S_2 peak tends to be wider, and leads to inaccurate Tmax value. Kerogen type is another factor, the variation range of Tmax is narrow for Type I kerogen, wider for Type II kerogen and much wider for Type III kerogen due to the increasing of structural complexity in the organic matter (Tissot et al., 1978).

High S_1 can also affect Tmax value. Tmax values are usually lower than normal when the samples have abnormally developed S_1 in contrast to S_2 (Figure 3-23).

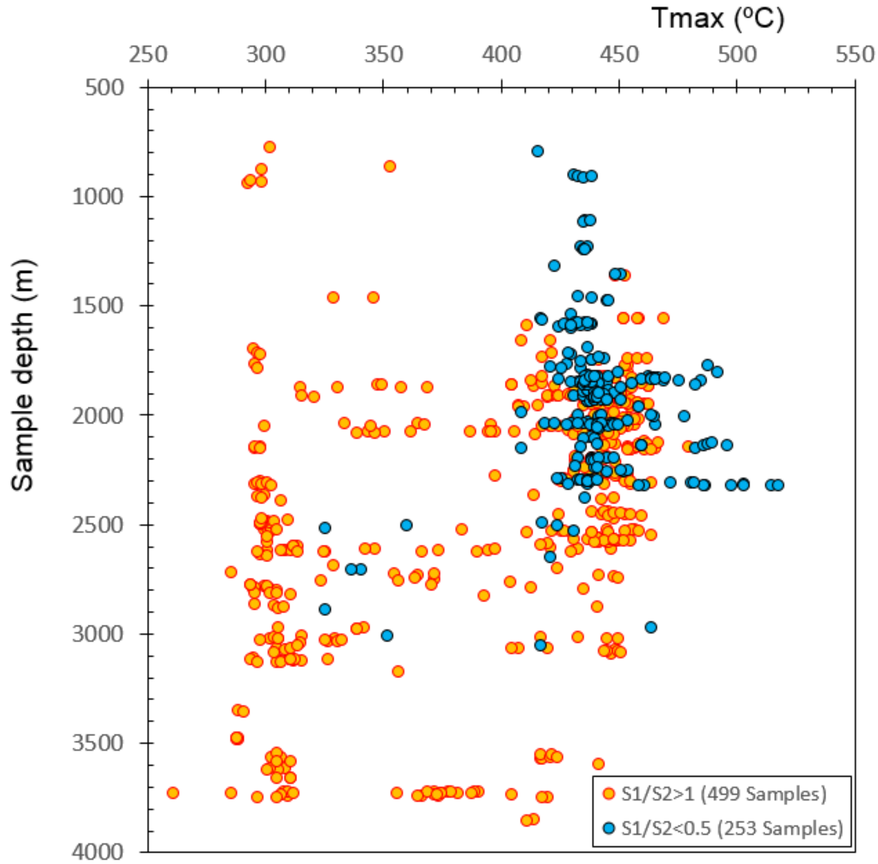

Figure 3-23 High S_1 with decreased Tmax in Rock-Eval analysis

To obtain a relatively accurate Tmax value, samples with Tmax value smaller than 410 ℃ and samples with S_2 value smaller than 1mg/g are excluded, and only those TOC ≥ 0.5% samples are selected. Relatively reliable Tmax values of Montney organic matters are shown in Table 3-6, sample locations (Map No.) are shown in Figure 3-1. With the same burial depth, Tmax values in British Columbia are usually higher than those in Alberta (Figure 3-24), displaying different burial history and maturation of Montney organic matters in these two areas. Distribution of Tmax (Figure 3-25) demonstrates a progressive southwestwardly increase of values, in which immature source rocks in the northeast (Tmax<435 ºC), are followed by oil zone (435 ºC≤

Tmax<450 ºC), wet gas zone (450 ºC ≤Tmax<460 ºC) and dry gas zone (Tmax ≥460 ºC). The thermal maturity of Montney Formation is very similar to thermal maturity of Doig Formation, determined by Riediger (1997) from Rock-Eval analysis.

Table 3-6 relatively reliable average Tmax values of Montney organic matters

Map No.	Well Location	Province	Average Depth (m)	Average Tmax (°C)	Number of samples
1	1-10-82-23W6	BC	2009	478	1
2	1-14-75-11W6	AB	2480.25	453	1
3	1-36-79-15W6	BC	2032.04	463.4	5
4	2-5-79-11W6	AB	2071.53	438.4	7
5	2-19-79-14W6	BC	2052.5	463	1
10	6-30-67-23W5	AB	1843.48	432.6	5
11	6-36-71-4W6	AB	1912.5	440.4	32
12	7-5-87-20W6	BC	1943.15	461.3	4
15	12-29-78-18W6	BC	2493.4	475	1
16	13-11-81-20W6	BC	2309.39	467	1
17	13-12-78-11W6	AB	2205.66	438	7
19	13-5-68-1W6	AB	2163.75	437.4	5
27	A-10-J/94-B-9	BC	2140.89	490	3
30	B-30-H/93-P-9	BC	2556.9	467	1
33	C-21-L/94-A-13	BC	1852.64	483.2	5
35	C-33-B/94-G-7	BC	1791.1	490	2
40	D-65-G/93-P-8	BC	3071.87	490	7
43	10-18-67-23W5	AB	1864.9	435	2
44	10-21-92-3W6	AB	798.3	416	1
46	10-34-64-19W5	AB	1776.2	420	1
52	11-27-77-6W6	AB	1747.28	439.8	4
53	11-28-71-3W6	AB	1844.14	437.5	11
55	11-3-73-7W6	AB	2049.19	446.4	7
57	1-14-91-12W6	AB	1115.27	436.3	3
61	12-27-80-13W6	AB	1743.9	444	1
63	12-7-67-24W5	AB	1916.81	434.6	11
70	14-30-82-7W6	AB	1239.5	435.7	3
71	14-34-84-25W6	BC	2080.19	466.6	9
74	15-6-76-3W6	AB	1458.9	433	1
75	15-8-81-12W6	AB	1829.5	441.7	3
81	4-14-84-23W6	BC	1820.78	463.9	31
82	4-27-88-17W6	BC	1371	455.5	2

Table 3-6 relatively reliable average Tmax values of Montney organic matters (continued)

Map No.	Well Location	Province	Average Depth (m)	Average Tmax (°C)	Number of samples
83	4-32-84-12W6	AB	1586.27	435.2	9
86	5-14-78-11W6	AB	2203.95	438	2
87	5-24-68-22W5	AB	1557.74	418	2
88	5-26-80-13W6	AB	1945.65	442	2
91	6-12-79-12W6	AB	2018.54	439.7	3
95	6-33-72-25W5	AB	1585.54	429.4	5
96	6-4-79-9W6	AB	1760	434	1
97	6-8-75-2W6	AB	1468.3	439	1
98	6-8-90-11W6	AB	1361.8	450	2
99	7-13-79-15W6	BC	2108.6	465	1
100	7-14-64-25W5	AB	2301.39	434.5	20
103	7-29-73-1W6	AB	1481.1	445.5	2
104	7-33-79-21W6	BC	2722	595	1
108	8-16-74-10W6	AB	2257.9	452.3	3
110	8-18-78-10W6	AB	2066.99	438.8	9
111	8-30-82-22W6	BC	1814.81	472.8	4
112	8-33-79-13W6	AB	1817.63	451	2
121	D-45-G/94-H-9	BC	911.73	434.5	4
124	11-32-82-25W5	AB	927.4	413	1
125	8-20-64-22W5	AB	2046.5	438	1
127	2-30-71-20W5	AB	1324.3	423	1

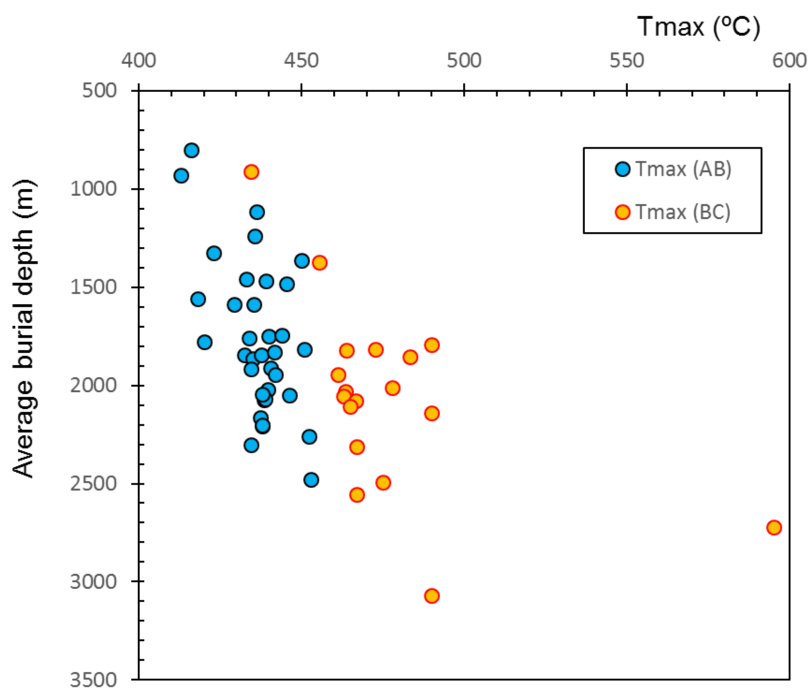

Figure 3-24 Thermal maturity of Montney organic matters in British Columbia is usually higher than that of Montney organic matters in Alberta

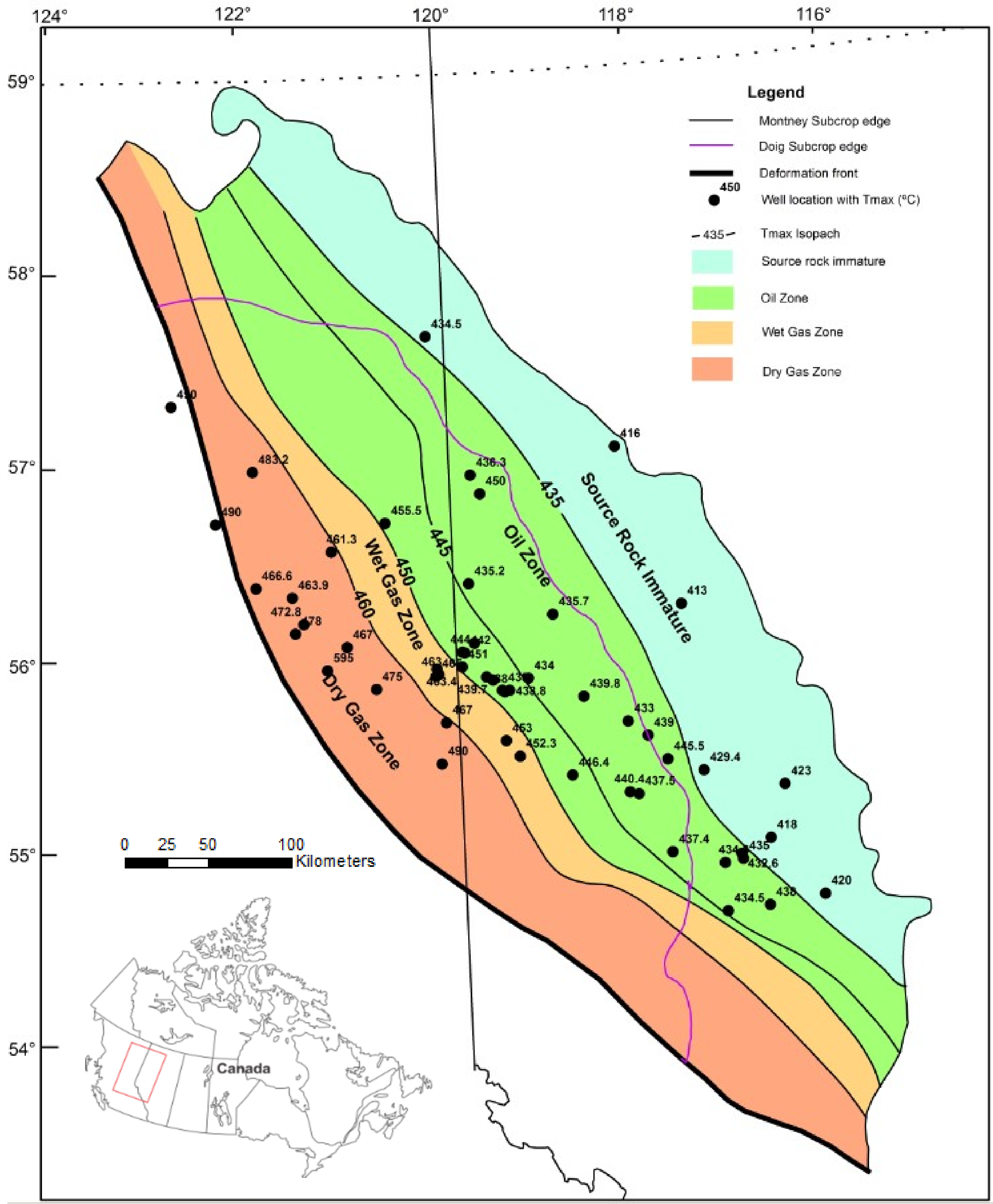

Figure 3-25 Tmax to indicate the thermal maturity of Montney organic matters, basemap according to Atlas Shapefiles, Edwards et al., 1994

Vitrinite reflectance data are collected from GSC Calgary and shown in APPENDIX 3-5. Since core samples at certain depth ina well can be examined several times by different researchers in different equipment, the vitrinite reflectance at the depth may vary dramatically. Mean value in some cases may not make sense. If there are multiple vitrinite reflectance data at certain depth of a well, the following principles are applied to choose a relatively reliable one. Firstly, there should be enough test points (>5) for a sample, and low level vitrinite particles in the organic matter will result in unreliable Ro%. Secondly, if the Ro% values obtained by different researchers are consistent, a mean value of vitrinite reflectance data will be used. Finally, other thermal maturity parameter like reliable Tmax value at the same place will be used to make sure the selected Ro% is reasonable. The Ro% values marked in green are considered as reasonable in APPENDIX 3-5.

Although there are limited Ro% values across the basin, some samples have both Ro% and Rock-Eval analysis with reliable Tmax values (Table 3-7). These Tmax and Ro% values show positive correlation, and Tmax values can be used for Ro% prediction (Figure 3-24). The predicted Ro% by Tmax values are in APPENDIX 3-5. The geographic distribution of Ro% values is similar to Tmax distribution, displaying a progressive southwestwardly increase in thermal maturity (Figure 3-25). Ro% of some samples in southeast part of the Montney Formation are abnormally high and does not agree with the thermal maturity inferred by Tmax values. This region is known for well-developed sandstone, and an oxidizing sedimentary setting may create reworked vitrinite.

Table 3-7 Montney samples with relatively reliable Ro% (or Ro% equivalent) and Tmax value

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	Tmax (°C)	Organic matter
C-439671	100020609711W600	Cuttings	AB	930	0.59	430	Vitrinite/Huminite
C-475606	100100807914W600	Core	BC	2018.5	0.92	454	Vitrinite/Huminite
C-475607	100100807914W600	Core	BC	2021	1.14	458	Vitrinite/Huminite
C-475608	100100807914W600	Core	BC	2021.9	0.97	455	Vitrinite/Huminite
C-475609	100100807914W600	Core	BC	2023.3	1.1	457	Vitrinite/Huminite
C-475610	100100807914W600	Core	BC	2026.3	1.18	460	Bitumen (Jacob, 1985)
C-475611	100100807914W600	Core	BC	2029.2	1.18	460	Bitumen (Jacob, 1985)
C-475612	100100807914W600	Core	BC	2031	1.16	459	Bitumen (Jacob, 1985)
C-475614	100100807914W600	Core	BC	2035.9	1.1	457	Vitrinite/Huminite
C-475615	100100807914W600	Core	BC	2040.4	1.13	458	Bitumen (Jacob, 1985)
C-475616	100100807914W600	Core	BC	2048	1.14	458	Vitrinite/Huminite
C-475617	100100807914W600	Core	BC	2048.7	1.17	459	Vitrinite/Huminite
C-475619	100100807914W600	Core	BC	2052	1.3	462	Bitumen (Jacob, 1985)
C-475620	100100807914W600	Core	BC	2054	1.04	456	Vitrinite/Huminite
C-475621	100100807914W600	Core	BC	2056.4	1.36	465	Bitumen (Jacob, 1985)
C-475624	100100807914W600	Core	BC	2061.5	1.27	461	Bitumen (Jacob, 1985)
C-485170	100133306704W600	Core	AB	2379.4	0.8	448	Bitumen (Jacob, 1985)
C-533132	100122708013W600	Core	AB	1743.9	0.88	444	Bitumen (Jacob, 1985)
C-533939	100140907711W600	Core	AB	2276	0.94	452	Vitrinite/Huminite
C-533942	100112707706W600	Core	AB	1741.2	0.84	440	Bitumen (Jacob, 1985)
C-533950	100051407811W600	Core	AB	2220.85	0.85	442	Bitumen (Jacob, 1985)
C-533959	100063607104W600	Core	AB	1922.6	0.72	438	Bitumen (Jacob, 1985)
C-533962	100063607104W600	Core	AB	1943	0.76	442	Bitumen (Jacob, 1985)
C-533964	100053207312W600	Core	AB	2817.9	1.36	468	Bitumen (Jacob, 1985)
C-533970	102113406119W500	Core	AB	2166.3	1	450	Bitumen (Jacob, 1985)
C-533973	100070506707W600	Core	AB	3076.35	1.12	460	Bitumen (Jacob, 1985)
C-533976	100070506707W600	Core	AB	3084.48	1.07	460	Vitrinite/Huminite
C-533984	100112807103W600	Core	AB	1845.8	0.74	438	Vitrinite/Huminite
C-533995	100130506801W600	Core	AB	2057.35	0.75	439	Vitrinite/Huminite
C-533997	100130506801W600	Core	AB	2240.88	0.7	439	Bitumen (Jacob, 1985)
C-533998	100130506801W600	Core	AB	2245.75	0.81	439	Bitumen (Jacob, 1985)
C-534009	100040605920W500	Core	AB	2656.35	0.95	452	Bitumen (Jacob, 1985)
C-534131	100063307225W500	Core	AB	1595.5	0.5	430	Vitrinite/Huminite
C-534135	100063407225W500	Core	AB	1542.5	0.55	430	Vitrinite/Huminite
C-534161	100150607603W600	Core	AB	1458.9	0.74	442	Vitrinite/Huminite
C-534178	100071406425W500	Core	AB	2304	0.67	436	Bitumen (Jacob, 1985)

Table 3-7 Montney samples with relatively reliable Ro%(or Ro% equivalent) and Tmax value (continued)

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	Tmax (°C)	Organic matter
C-534188	102011409112W600	Core	AB	1118.15	0.65	436	Bitumen (Jacob, 1985)
C-534189	100043208412W600	Core	AB	1581.3	0.61	438	Bitumen (Jacob, 1985)
C-534197	100143008207W600	Core	AB	1245.7	0.65	435	Bitumen (Jacob, 1985)
C-534200	100150808112W600	Core	AB	1833.1	0.73	442	Bitumen (Jacob, 1985)
C-534214	100142706708W600	Core	AB	3032	1.12	460	Bitumen (Jacob, 1985)
C-534219	100061207912W600	Core	AB	2013.56	0.76	440	Bitumen (Jacob, 1985)
C-534223	100061207912W600	Core	AB	2028.5	0.74	438	Bitumen (Jacob, 1985)
C-537215	100052608013W600	Core	AB	1938.1	0.86	444	Bitumen (Jacob, 1985)

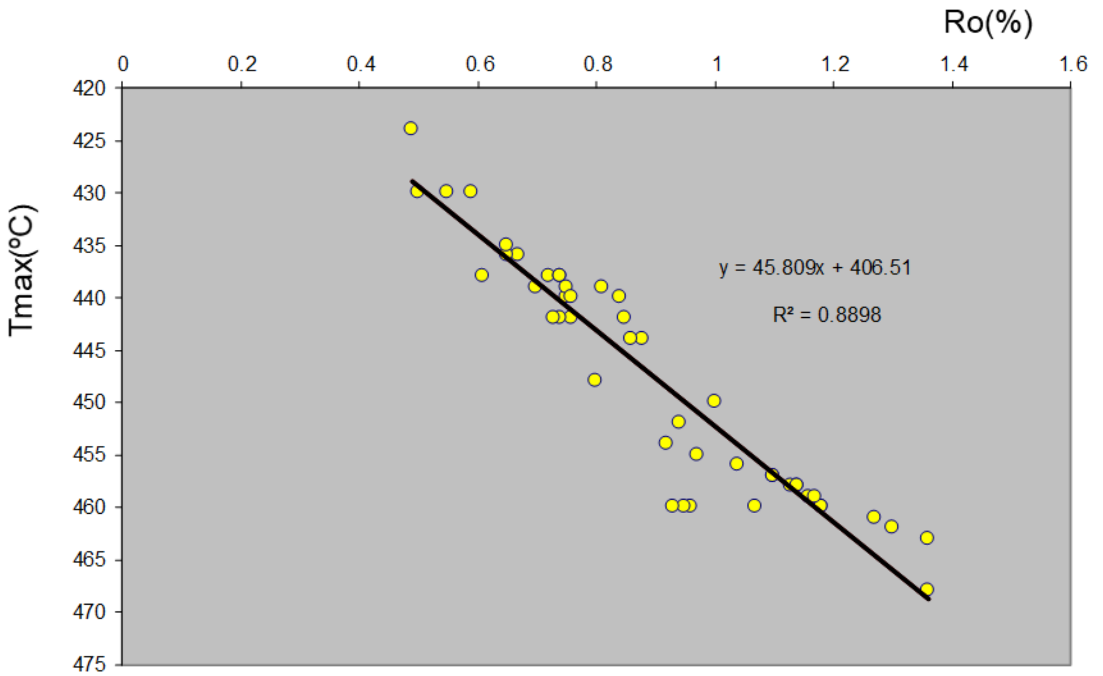

Figure 3-26 Figure Tmax(ºC) values and Ro% of Montney samples show positive correlation

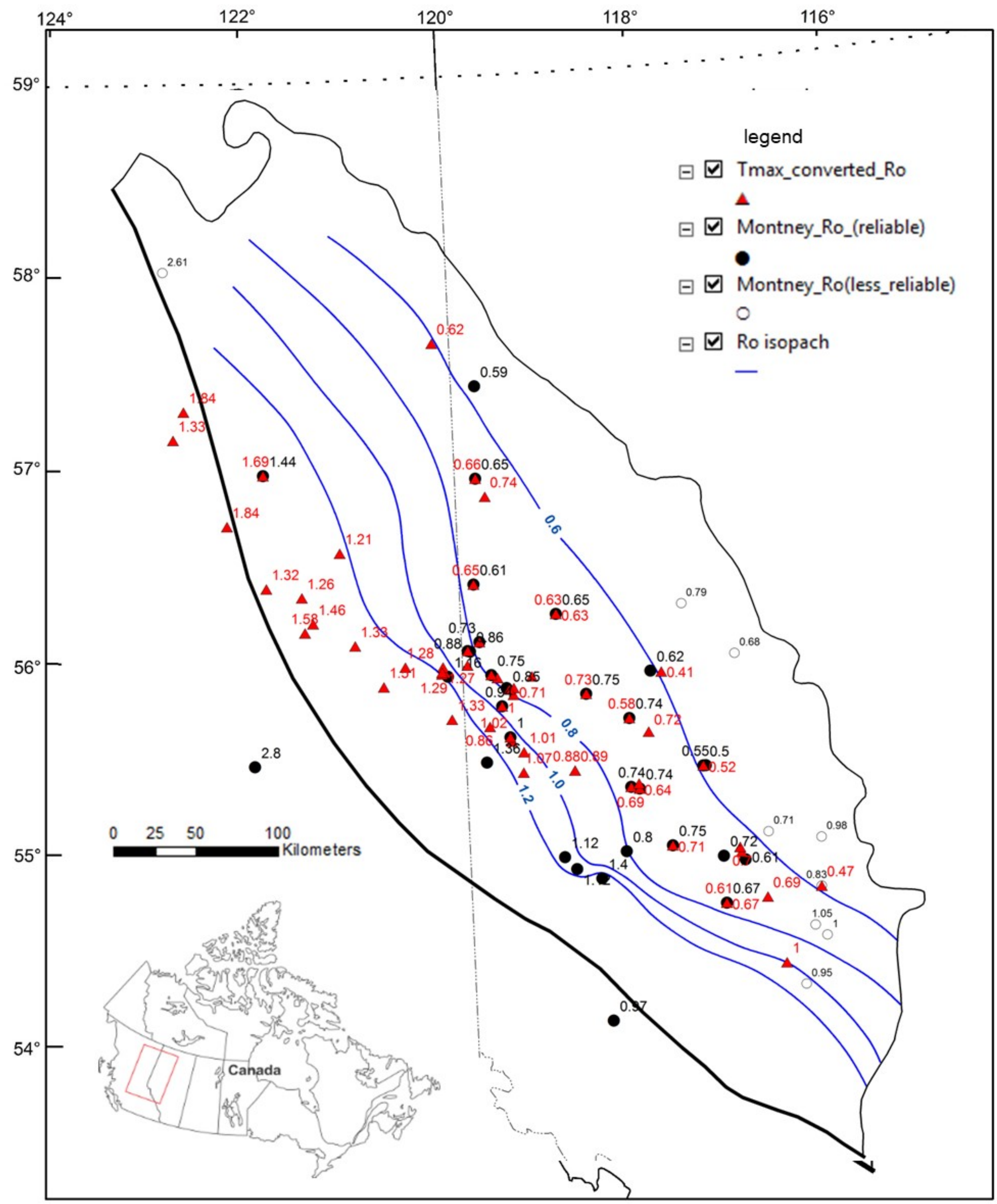

Figure 3-27 Vitrinite reflectance (Ro%) indicates a progressive southwestwardly increase trend of thermal maturity Montney organic matter, basemap according to Atlas Shapefiles, Edwards et al., 1994

CHAPTER 4: ORGANIC GEOCHEMISTRY, OIL FAMILIES AND OIL SOURCE CORRELATION

This chapter focuses on oil family classification and origins of different oil families in Triassic petroleum system. The geochemical signatures of possible source rock extracts relevant to the Montney hydrocarbon accumulations are analyzed to investigate probable oil family characteristics. The geochemical signatures of 75 crude oil samples from Triassic strata of WCSB are analyzed and compared to those of source rock extracts to elucidate the oil-oil and oil-source relationship. Bulk properties like oil sulfur content, composition and oil carbon isotope are incorporated for oil family classification. Based on oil family classification and oil-oil correlation, spatial distribution of different oil families is also attempted.

4.1 Data and Materials

Forty-five new rock samples analyzed for Rock-Eval/TOC were subsequently extracted using a Soxhlet apparatus and fractionated by liquid chromatography for purposes of oil-source correlation. Seven were sandstone samples (E_{43}-E_{49}) and not considered as source rock (Table 4-1). In addition, analyses of 17 source rock extracts were collected from GSC Calgary database, including 14 Doig extracts (E_{19}-E_{32}) and 3 Gordondale extracts (E_7-E_9). Locations and performed analyses of the extracts are shown in Table 4-1 and Figure 4-1.

The data set includes gas chromatography (GC), gas chromatography-mass spectrometry (GC-MS), bulk carbon isotope composition and sulfur content of various oil fractions were previously commissioned and/or completed at the Organic Geochemical Laboratories of Geological Survey of Canada (GSC) through numerous research projects. Specifically, results of 22 whole oil GC, 20 saturated fraction GC, 45 saturated fraction GC-MS, 63 sulfur content and 43 whole oil stable carbon isotopes form the basis of the geochemical interpretation and discussion below. Locations of the oil samples are shown in Figure 4-1 and Table 4-2.

Table 4-1 Analyses and performed analyses of collected and new analyzed rock extracts

Map No.	sample No.	UWI	Unit	depth(m)	rock extract	Saturate fraction		Date source
						GC	GC-MS	
E_1	X11858	12-7-67-24W5	Gordondale	1904.8	X	X	X	New Analyzed
E_2	X11859	12-7-67-24W5	Gordondale	1906	X	X	X	New Analyzed
E_3	X11860	12-7-67-24W5	Gordondale	1907.7	X	X	X	New Analyzed
E_4	X11861	7-14-64-25W5	Gordondale	2288.16	X	X	X	New Analyzed
E_5	X11862	7-14-64-25W5	Gordondale	2289.5	X	X	X	New Analyzed
E_6	X11863	7-14-64-25W5	Gordondale	2291.1	X	X	X	New Analyzed
E_7	X07383	14-11-84-22W5	Gordondale	1140.2	X			GSC Calgary
E_8	X07384	10-17-84-22W5	Gordondale	717.5	X			GSC Calgary
E_9	X07388	2-14-82-2W6	Gordondale	1005.84	X			GSC Calgary
E_{10}	X11864	11-3-73-7W6	Doig	2015.75	X	X		New Analyzed
E_{11}	X11865	11-3-73-7W6	Doig	2021.2	X	X		New Analyzed
E_{12}	X11866	11-3-73-7W6	Doig	2024.85	X	X		New Analyzed
E_{13}	X11867	11-3-73-7W6	Doig	2027	X	X		New Analyzed
E_{14}	X11868	11-3-73-7W6	Doig	2032.9	X	X		New Analyzed
E_{15}	X11869	11-3-73-7W6	Doig	2037.4	X	X		New Analyzed
E_{16}	X11881	11-3-73-7W6	Doig	2040.03	X	X	X	New Analyzed
E_{17}	X11882	11-3-73-7W6	Doig	2041.32	X	X	X	New Analyzed
E_{18}	X11883	11-3-73-7W6	Doig	2043.7	X	X	X	New Analyzed
E_{19}	X07255	A-59-G/94-A-16	Doig	1150.2	X	X	X	GSC Calgary
E_{20}	X07256	A-59-G/94-A-16	Doig	1159.2	X	X	X	GSC Calgary
E_{21}	X07257	D-69-J/94-A-15	Doig	1225.4	X	X	X	GSC Calgary
E_{22}	X07258	D-69-J/94-A-15	Doig	1237.2	X	X	X	GSC Calgary
E_{23}	X07259	D-81-E/94-H-1	Doig	1068.3	X	X	X	GSC Calgary
E_{24}	X07263	11-3-73-7W6	Doig	2018.3	X			GSC Calgary
E_{25}	X07265	10-15-76-4W6	Doig	1482.5	X	X	X	GSC Calgary
E_{26}	X07266	3-22-78-10W6	Doig	1833.2	X	X	X	GSC Calgary
E_{27}	X07268	10-5-84-11W6	Doig	1231.6	X	X	X	GSC Calgary
E_{28}	X07269	6-8-90-11W6	Doig	1354.7	X	X	X	GSC Calgary
E_{29}	X07270	15-7-74-8W6	Doig	2060.3	X	X	X	GSC Calgary
E_{30}	X07374	10-5-84-11W6	Doig	1230.6	X	X	X	GSC Calgary
E_{31}	X07376	8-16-74-10W6	Doig	2254.7	X			GSC Calgary

Table 4-1 Analyses and performed analyses of collected and new analyzed rock extracts (continued)

Map No.	sample No.	UWI	Unit	depth(m)	rock extract	Saturate fraction		Date source
						GC	GC-MS	
E_{32}	X07377	8-16-74-10W6	Doig	2261.6	X			GSC Calgary
E_{33}	X11852	4-32-84-12W6	Montney	1581.39	X	X	X	New Analyzed
E_{34}	X11853	4-32-84-12W6	Montney	1581.9	X	X	X	New Analyzed
E_{35}	X11854	4-32-84-12W6	Montney	1593.5	X	X	X	New Analyzed
E_{36}	X11855	6-36-71-4W6	Montney	1888.15	X	X	X	New Analyzed
E_{37}	X11856	6-36-71-4W6	Montney	1890.1	X	X	X	New Analyzed
E_{38}	X11857	6-36-71-4W6	Montney	1895.4	X	X	X	New Analyzed
E_{39}	X11870	6-36-71-4W6	Montney	1900.4	X	X	X	New Analyzed
E_{40}	X11871	6-36-71-4W6	Montney	1903	X	X	X	New Analyzed
E_{41}	X11872	6-36-71-4W6	Montney	1923.5	X	X	X	New Analyzed
E_{42}	X11873	6-36-71-4W6	Montney	1934.3	X	X		New Analyzed
E_{43}	X11874	12-7-67-24W5	Montney	1910.3	X	X		New Analyzed
E_{44}	X11875	12-7-67-24W5	Montney	1912.6	X	X		New Analyzed
E_{45}	X11876	12-7-67-24W5	Montney	1921.6	X	X		New Analyzed
E_{46}	X11877	12-7-67-24W5	Montney	1922.2	X	X		New Analyzed
E_{47}	X11878	7-14-64-25W5	Montney	2292.1	X	X		New Analyzed
E_{48}	X11879	7-14-64-25W5	Montney	2300.75	X	X		New Analyzed
E_{49}	X11880	7-14-64-25W5	Montney	2307.3	X	X		New Analyzed
E_{50}	X11884	11-3-73-7W6	Montney	2045.9	X	X	X	New Analyzed
E_{51}	X11885	11-3-73-7W6	Montney	2047.55	X	X	X	New Analyzed
E_{52}	X11886	11-3-73-7W6	Montney	2050.35	X	X	X	New Analyzed
E_{53}	X11887	11-3-73-7W6	Montney	2051.3	X	X	X	New Analyzed
E_{54}	X11888	11-3-73-7W6	Montney	2052.4	X	X	X	New Analyzed
E_{55}	X11889	11-3-73-7W6	Montney	2053.75	X	X	X	New Analyzed
E_{56}	X11890	11-3-73-7W6	Montney	2054.9	X	X	X	New Analyzed
E_{57}	X11891	11-3-73-7W6	Montney	2056.3	X	X		New Analyzed
E_{58}	X11892	11-3-73-7W6	Montney	2057.5	X	X		New Analyzed
E_{59}	X11893	2-5-79-11W6	Montney	2114	X	X	X	New Analyzed
E_{60}	X11894	11-28-71-3W6	Montney	1827.6	X	X	X	New Analyzed
E_{61}	X11895	11-28-71-3W6	Montney	1852.6	X	X	X	New Analyzed
E_{62}	X11896	11-28-71-3W6	Montney	1853.95	X	X	X	New Analyzed

Table 4-2 collected oil samples and geochemical analyses

Map No.	Lab Id	UWI	depth(m)	unit	sulfur	carbon isotope	whole oil GC	Saturate fraction		API
								GC	GC-MS	
O_{1}	L00803	6-15-84-8W6	1138-1152	Charlie Lake	X		X	X	X	X
O_{2}	L00810	8-5-86-20W6	1656-1661.5	Doig	X	X	X	X	X	X
O_{3}	L00926	6-8-77-5W6	1418.5-1423	Charlie Lake	X		X	X	X	X
O_{4}	L00927	6-6-85-17W6	1213-1246.6	Charlie Lake					X	
O_{5}	L00930	8-19-73-8W6	2106-2113.5	Halfway					X	
O_{6}	L00931	16-8-77-5W5	1383-1386	Charlie Lake				X	X	X
O_{7}	L01141	7-6-86-13W6	1307-1311.3	Charlie Lake	X	X	X	X	X	X
O_{8}	L01142	10-20-62-20W5	2100.7-2106.8	Montney	X				X	X
O_{9}	L01155	16-31-72-8W6	2141.5-2155	Halfway	X				X	X
O_{10}	L01156	16-31-72-8W6	2145.5-2155	Charlie Lake	X				X	X
O_{11}	L01157	16-20-72-8W6	2128-2159	Charlie Lake					X	
O_{12}	L01158	14-32-72-8W6	2133-2144.8	Halfway					X	X
O_{13}	L01185	14-22-72-8W6	2152-2170.7	Halfway					X	
O_{14}	L01186	16-28-72-8W6	2128.5-2165	Doig	X	X			X	X
O_{15}	L01187	8-6-73-8W6	2121-2130.6	Charlie Lake					X	X
O_{16}	L01188	16-8-73-8W6	2053.5-2148.2	Halfway					X	
O_{17}	L01189	7-22-78-9W6	1695.5-1700	Halfway					X	X
O_{18}	L01190	7-25-81-11W6	1466.5-1481.5	Doig	X		X	X	X	X
O_{19}	L01281	4-6-85-17W6	1263-1265.5	Cecil	X				X	X
O_{20}	L01287	8-15-72-3W6	1674-1684	Charlie Lake					X	X
O_{21}	L02867	4-27-75-9W6	2244.5-2251.5	Montney	X	X	X	X	X	X
O_{22}	L02868	14-34-75-9W6	2160-2165	Montney	X	X	X	X	X	X
O_{23}	L03258	6-23-84-8W6	908-914	Charlie Lake	X	X				X
O_{24}	L03266	6-15-84-8W6	1142-1147	Charlie Lake	X	X				X
O_{25}	L03273	6-33-87-23W6	1641.5-1644.5	Charlie Lake	X					
O_{26}	L03339	10-30-68-6W6	2376-2389	Charlie Lake	X	X	X	X	X	X
O_{27}	L03342	3-14-83-18W6	1142.7-1150	Charlie Lake	X					
O_{28}	L03343	10-2-69-5W6	2140-2157	Doig	X				X	X
O_{29}	L03393	15-35-87-7W6	1112.8-1125	Charlie Lake	X					X
O_{30}	L03426	4-11-63-25W5	2402-2419	Gordondale	X	X				X
O_{31}	L03453	1-23-68-4W6	2184-2187	Charlie Lake	X	X			X	X
O_{32}	L03456	5-30-71-6W6	2049-2050	Charlie Lake	X					X
O_{33}	L03468	6-28-71-9W6	2341-2347	Charlie Lake	X	X	X	X	X	X
O_{34}	L03542	7-16-84-20W6	1461.9-1463.7	Charlie Lake	X					
O_{35}	L03545	7-16-72-7W6	2026-2027	Charlie Lake	X					X
O_{36}	L03556	1-3-63-25W5	2548-2992	Gordondale	X	X				X
O_{37}	L03560	1-3-63-25W5	2555-2985	Gordondale	X	X				X
O_{38}	L04057	16-6-86-1W6	870-873	Montney	X	X			X	X

Note: API gravity stands for American Petroleum Institute gravity, and it is a measure of oil density relative to water.

Table 4-2 collected oil samples and geochemical analyses (continued)

Map No.	Lab Id	UWI	depth(m)	unit	sulfur	carbon isotope	whole oil GC	Saturate fraction		API
								GC	GC-MS	
O_{39}	L04065	14-12-75-3W6	1426-1428	Charlie Lake	X				X	X
O_{40}	L04066	1-13-75-3W6	1416-1418	Montney	X				X	X
O_{41}	L04069	2-21-72-3W6	1692-1693.5	Charlie Lake	X				X	X
O_{42}	L04070	6-11-72-3W6	1665-1675	Montney	X				X	X
O_{43}	L04071	14-15-72-3W6	1674-1684	Charlie Lake	X				X	X
O_{44}	L04073	1-8-89-6W6	1166-1174	Triassic					X	
O_{45}	L04077	5-17-89-6W6	1254-1266	Triassic	X		X	X	X	
O_{46}	L04081	14-4-79-22W5	958	Montney	X	X		X	X	X
O_{47}	L04086	9-6-76-20W5	1040-1043	Montney	X	X	X	X	X	X
O_{48}	L04091	4-20-75-10W6	2423-2429	Montney	X	X				
O_{49}	L04092	16-13-73-10W6	2140-2160	Charlie Lake	X	X	X	X	X	X
O_{50}	L04362	4-35-74-8W6	2125.5-2129.5	Montney	X	X	X	X		
O_{51}	L04363	13-22-73-9W6	2397-2400	Montney	X	X				
O_{52}	L04364	11-33-73-9W6	2348.5-2351.5	Montney	X	X				
O_{53}	L04366	11-1-75-11W6	2499-2504.5	Montney	X	X				
O_{54}	L04367	2-27-74-11W6	2567.5-2574.5	Montney	X	X				
O_{55}	L04879	8-30-77-7W6	1714-1716	Montney	X	X	X	X	X	
O_{56}	L04880	2-21-78-6W6	1417-1421	Halfway	X	X	X	X	X	
O_{57}	L04881	7-17-77-7W6	1689-1730	Charlie Lake	X	X	X	X	X	
O_{58}	L04882	9-28-77-7W6	1516-1520	Charlie Lake	X	X	X	X	X	
O_{59}	L04883	6-4-78-7W6	1495-1499	Charlie Lake	X	X	X	X	X	
O_{60}	L04885	16-33-77-7W6	1499-1614	Charlie Lake	X	X	X	X	X	
O_{61}	L04886	3-3-78-7W6	1473-1477	Charlie Lake	X	X	X	X	X	
O_{62}	L04960	16-3-78-11W6	2336	Montney	X	X				
O_{63}	L04981	8-1-60-20W5	-1	Montney	X	X				
O_{64}	L04982	15-26-59-20W5	-1	Montney	X	X				
O_{65}	L05026	13-3-80-17W6	2203-4030	Montney	X	X				
O_{66}	L05027	8-9-80-17W6	2421-5026.5	Montney	X	X				
O_{67}	L05028	4-10-80-17W6	2300-4918.05	Montney	X	X				
O_{68}	L05029	12-3-80-17W6	2421-4710.17	Montney	X	X				
O_{69}	L05038	2-14-78-11W6		Montney	X	X				
O_{70}	L05039	13-20-78-12W6		Montney	X	X				
O_{71}	L05040	14-34-78-12W6		Montney	X	X				
O_{72}	L05041	2-13-78-12W6		Montney	X	X				
O_{73}	L05042	11-35-78-12W6		Montney	X	X				
O_{74}	L05043	4-9-70-8W6		Montney	X	X				
O_{75}	L00952	6-14-49-6W5	715	Gordondale					X	

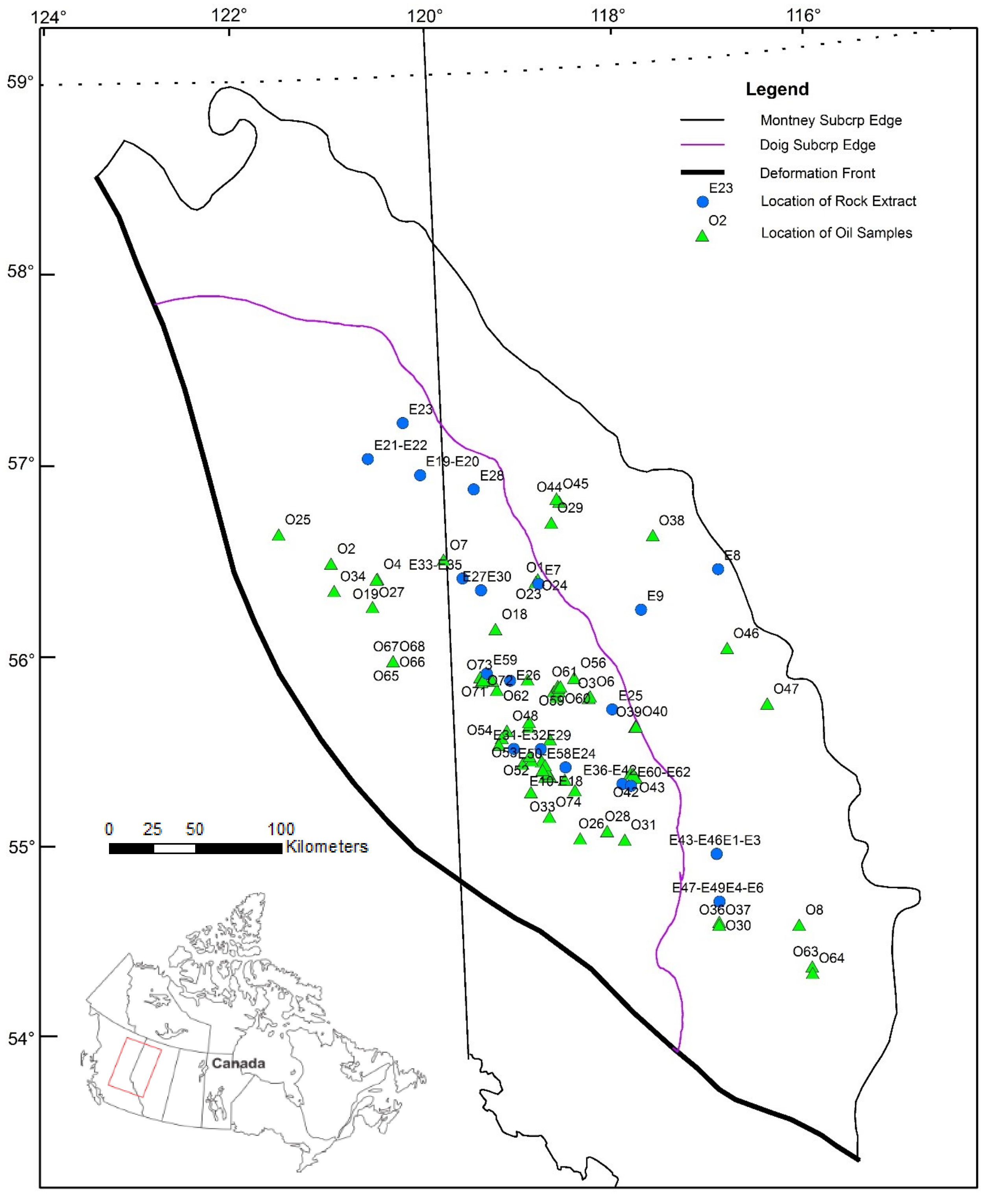

Figure 4-1 Map showing locations of Triassic oil samples and rock extracts, basemap according to Atlas Shapefiles, Edwards et al., 1994

4.2 Methods

4.2.1 Solvent Extraction

The source rock extracts from Geological Survey of Canada (GSC) Calgary were collected using a Soxhlet apparatus. Approximately 100-200 g of the whole rock sample was pulverized to about 150μm using the Beuhler Swing mill. An amount of the crushed samples was weighed into a cellulose extraction thimble and then placed in the extraction tube of the Soxhlet apparatus and extracted for 24 hours using approximately 350 ml of 87:13 distilled chloroform/methanol mixture. After extraction, the solvent was removed using a rotary evaporator. The dry extract was then dissolved in chloroform and treated with colloidal copper to remove sulfur and then filtered (to remove the excess copper, copper sulphide and any other inorganic salts precipitated by the chloroform/methanol) (Ejezie, 2007).

For new samples, about 5 to 20 grams (depending on organic richness and sample availability) of each powdered rock sample was subjected to Soxhlet extraction for 72 hours using dichloromethane (DCM) as solvent. Activated copper grains were added to the extract content at the end of extraction or during solvent removal to remove any elemental sulfur. After removing most of solvent using a rotary evaporator, the extract contents were filtered to remove copper, copper sulfide and any inorganic salts that were extracted by the solvent. The residue was retained and weighed as extract after removal of the remaining solvent using a gentle stream of nitrogen.

4.2.2 Column Chromatography Fractionation

The collected oils and source rock extracts were de-asphalted using 25 ml of distilled pentane before fractionation. The de-asphalted extract and oils were collected, dried, weighed and subsequently fractionated by open-column liquid chromatography on a silica gel/alumina support (1/4 by weight 28-200 mesh silica gel (MCB) and 3/4 by weight, 80 -200 mesh alumina). One gram of support per 10mg of samples was used for the fractionation column, which consisted of a glass wool plug at the bottom, a 1 cm thick layer of sand and the measured column support on top. The fractions were eluted successively into saturated hydrocarbons, aromatic hydrocarbons and NSO compounds, using pentane, 1:1 volume of distilled pentane/dichloromethane mixture, methanol and finally chloroform for any remaining asphaltenes. The fractions were evaporated, transferred to weighed vials and dried in stream of nitrogen (Ejezie, 2007).

The new rock extracts were de-asphaltened with n-pentane and then separated into aliphatic, aromatic and polar fractions by column chromatography using a mixture of silica gel (28-200 mesh) and alumina (80-200 mesh) (1:3 by weight) as support. Activated support (400°C overnight) in the amount of 1 g per 10 mg of de-asphaltened extract was added slowly into a glass column filled with n-pentane while tapping the column to release the air bubbles and to settle the support material. n-Pentane (3.5 ml per gram of support) was used to elute the aliphatic fraction, followed by n-pentane/dichloromethane (1:1 by volume and 4 mL per gram of support) to isolate the aromatic fraction. Methanol (4 ml per gram of support) and chloroform (6 ml per gram of support) were finally used to obtain the polar fraction. All fractions were weighed after removal of solvent using rotary evaporator followed by slow stream of nitrogen. A mixture of admantane-d16, naphthalene-d8, phenanthrene-d10, dibenzothiophene-d8 and 1,1-binaphthyl was added to the aromatic fractions, and cholestane-d4 added to the saturated fractions of the extracts in appropriate amounts as internal standards before

GC and GC-MS analyses. The purpose of the use of internal standards is to compare the concentrations of selected compounds among samples but not for absolute quantification.

4.2.3 Gas Chromatography

The same method for GC analysis of the saturated and aromatic hydrocarbon fractions was applied to both collected oils and source rock extracts and to the new rock extracts. GC analysis of saturated fractions was completed on a Varian 3700 GC equipped with a FID. A 30m $\times$0.25mm $\times$0.25mm DB-1 fused silica capillary column was used with helium as carrier gas. The samples were injected using a split injector heated at 320°C. The temperature program was as follows: started at 60°C (no hold), then increased to 300°C at 6°C/min and held for 30min. The FID detector temperature was maintained at 320°C.

4.2.4 Gas Chromatography-Mass Spectrometry

The gas chromatography-mass spectrometry (GCMS) analysis of collected oil samples and source rock extracts for the saturate biomarkers was performed on an HP 5973 MSD with a HP 5890 GC. A J & W DB-5 MS column with dimensions of 30m $\times$ 0.32 mm i.d and 0.25µm film thickness was used. The oven temperature program started at 100º C and was held for 2 minutes. The temperature was then raised to 180ºC at the rate of 40ºC per minute and then to 320ºC at the rate of 4ºC per minute and held for 7 minutes. The total run time was 46 minutes. All the aromatic hydrocarbon fractions were analyzed on an HP 5973 GC/MSD with a J & W DB-5 MS column (30m, 0.32 mm I.D and 0.25µm film thickness). The oven temperature program started at 100 ºC (no hold), was increased to 300 ºC at the rate of 3 ºC/min and held at 10 minutes (Ejezie, 2007).

GC-MS analysis of aliphatic fractions of new source rock extracts was carried out on an Agilent Triple Quad MS system in selected ion monitoring (SIM) mode. Split injection (1:10) was employed into a HP5MS 30m×0.25mm×0.25mm capillary column with helium as carrier gas at a flow rate of 1.2ml/min. Mass spectrometer ion source was operated at 70 eV ionization voltage.

4.2.5 Stable Carbon Isotope and Sulfur Analysis

Stable carbon isotope and sulfur analyses were performed by Ejezie (2007) at GSC Calgary. The methods to obtain the data are as described in her thesis.

Stable carbon isotope analysis was performed in the isotope laboratory of the Physics Department, University of Calgary by Steve Taylor. The whole oil, as well as the saturated and aromatic hydrocarbon fraction of the oil samples were examined using Continuous-Flow- Elemental Analysis Isotope Ratio Mass Spectrometry (CF-EA-IRMS) technology. A Finnigan Mat Delta+XL mass spectrometer was interfaced with a Carlo Erba NA elemental analyzer. Samples were placed in tin cups and dropped by the auto sampler onto a quartz tube combustion column. The temperature of the column was maintained at 1020°C and the samples were flash-combusted by injecting a pulse of oxygen gas at the same time as the sample drop. The gases produced were carried in a helium stream to a reduction furnace where NOx species were reduced to nitrogen gas. The reduced nitrogen gas was separated from carbon dioxide by gas chromatographic separation and the gas stream was leaked through an open split into the ion source of the mass analyzer. The $\delta\ ^{13}C$ values were obtained by a comparison of the sample peaks to reference gas peaks also leaked through the open split. The results are reported in parts per million relative to the PDB standard.

Sulfur analysis was performed in the GSC (Calgary) by Sneh Achal. The sulfur content of the oil samples was determined using a LECO SC 444 sulfur analyzer. The ceramic combustion boat of the LECO SC 444 was filled with 0.5 mg of LECO ComAid. Approximately 0.1-0.2 g of undistilled oil was added to the combustion ceramic boat and burned within the combustion oven of the LECO SC 32 in the presence of oxygen at 1350°C. The gases produced during combustion were filtered through reagent tubes containing anhydrous magnesium perchlorate ($MgClO_4$), to remove moisture and dust. The sulfur present in the oils was oxidized to sulfur dioxide (SO_2) during combustion and measured by a solid-state infrared detector.

4.2.6 Data Processing and Compound Assignment

The raw data of GC analyses and GC-MS saturate fraction biomarkers (m/z 191 fragmentograms for hopanes and tricyclic terpanes; m/z 217 for fragmentograms of steranes and diasteranes) from collected oil samples and source rock extracts were obtained from GSC Calgary database. These raw data, as well as the raw data of GC and GC-MS of new analyzed source rock extracts were processed, and the compound peaks of chromatograms reinterpreted manually in Agilent MassHunter Workstation for quantitative analyses. Peak area was selected to determine the relative abundance of each compound. Compound peaks were identified by a comparison of their relative retention times with those reported in literature, historical data in the GSC-Calgary organic geochemical laboratories, as well as pattern recognition from a known standard (Figure 4-2, Figure 4-3, Table 4-3, and Table 4-4).

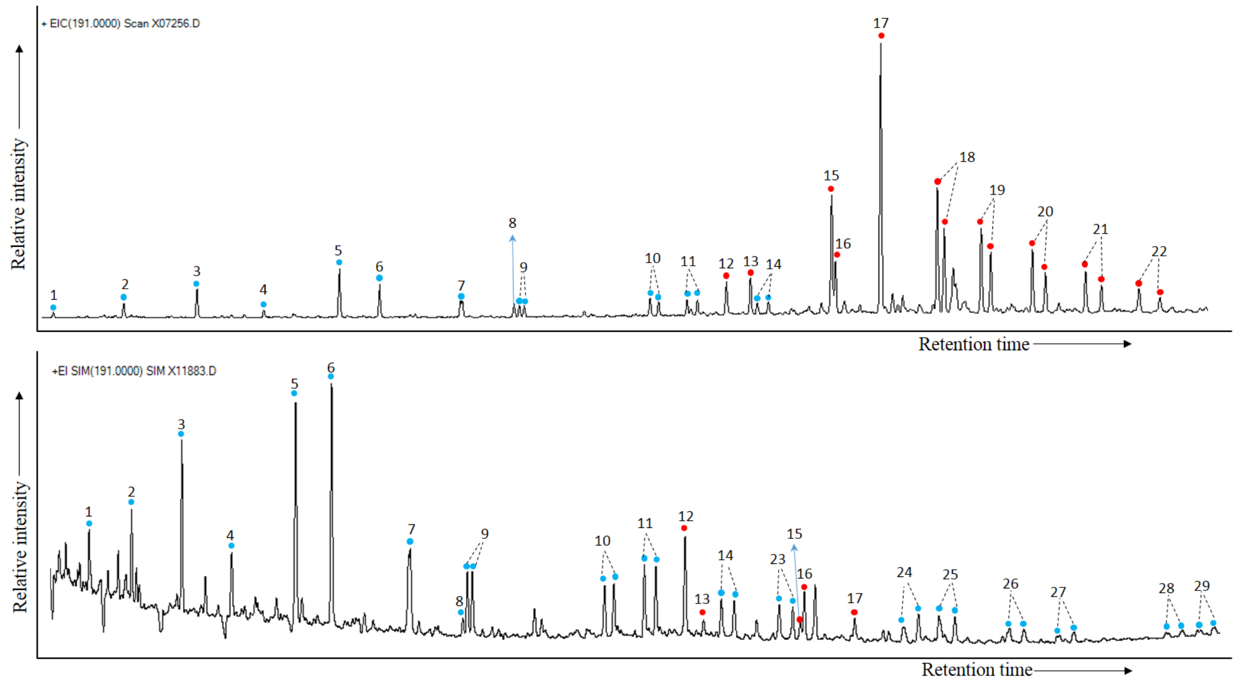

Figure 4-2 Compound assignments of GC-MS saturate fraction biomarkers of oil and source rock extracts for tricyclic terpanes and hopanes (m/z 191 fragments). See Table 4-3 for peak identification

Table 4-3 tricyclic terpane and hopane identification

peak No.	compound name	peak No.	compound name
1	C_{19} Tricyclic Terpane	16	C_{29}-18α(H) norneohopane (C_{29}Ts)
2	C_{20} Tricyclic Terpane	17	C_{30}-17α(H), 21β(H)-hopane (C_{30} hopane)
3	C_{21} Tricyclic Terpane	18	C_{31}-17α(H), 21β(H)-30 homohopne (22S+22R)
4	C_{22} Tricyclic Terpane	19	C_{32}-17α(H), 21β(H)-30 bishomohopne (22S+22R)
5	C_{23} Tricyclic Terpane	20	C_{33}-17α(H), 21β(H)-30 trishomohopne (22S+22R)
6	C_{24} Tricyclic Terpane	21	C_{34}-17α(H), 21β(H)-30 tetrahomohopne (22S+22R)
7	C_{25} Tricyclic Terpane (R + S)	22	C_{35}-17α(H), 21β(H)-30 pentahomohopne (22S+22R)
8	C_{24} Tetracyclic Terpane	23	C_{31}Tricyclic Terpane (22R+22S)
9	C_{26}Tricyclic Terpane (22R+22S)	24	C_{33}Tricyclic Terpane (22R+22S)
10	C_{28}Tricyclic Terpane (22R+22S)	25	C_{34}Tricyclic Terpane (22R+22S)
11	C_{29}Tricyclic Terpane (22R+22S)	26	C_{35}Tricyclic Terpane (22R+22S)
12	C_{27} 18α(H)-22, 29, 30-trisnorneohopane (Ts)	27	C_{36}Tricyclic Terpane (22R+22S)
13	C_{27} 17α(H)-22, 29, 30-trisnorneohopane (Tm)	28	C_{38}Tricyclic Terpane (22R+22S)
14	C_{30}Tricyclic Terpane (22R+22S)	29	C_{39}Tricyclic Terpane (22R+22S)
15	17α(H),21β(H)-30-norhopane (C_{29} hopane)		

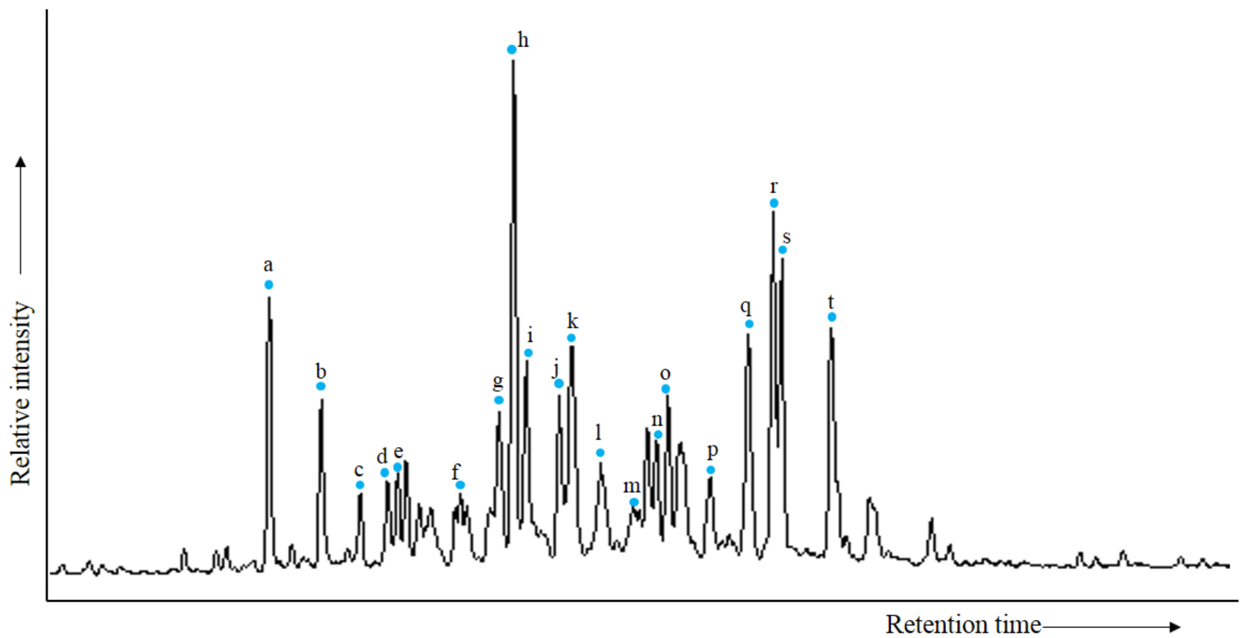

Figure 4-3 Compound assignments of GC-MS saturate fraction biomarkers of oil and source rock extracts for steranes (m/z 217 fragments). See Table 4-4 for peak identification

Table 4-4 Sterane compound identification

Peak No.	Abbreviation	Compound name
a	C_{27} βα(20S)	C_{27} 13β(H) 17α(H) Diacholestane (20S)
b	C_{27} βα(20R)	C_{27} 13β(H) 17α(H) Diacholestane (20R)
c	C_{27} αβ(20S)	C_{27} 13α(H) 17β(H) Diacholestane (20S)
d	C_{27} αβ(20R)	C_{27} 13α(H) 17β(H) Diacholestane (20R)
e	C_{28} βα(20S)	C_{28} 13β(H) 17α(H) Diacholestane (20S)
f	C_{28} βα(20R)	C_{28} 13β(H) 17α(H) Diacholestane (20R)
g	C_{27} ααα(20S) +C_{28} αβ(20S)	C_{27} 5α(H) 14α(H) 17α(H) cholestane (20S) +C_{28} 13α(H) 17β(H) Diacholestane (20S)
h	C_{29} βα(20S) +C_{27} αββ(20R)	C_{29} 13β(H) 17α(H) Diacholestane (20S) +C_{27} 5α(H) 14β(H) 17β(H) cholestane (20R)
i	C_{27} αββ(20S) +C_{28} αβ(20R)	C_{27} 5α(H) 14β(H) 17β(H) cholestane (20S) +C_{28} 13α(H) 17β(H) Diacholestane (20R)
j	C_{27} ααα(20R)	C_{27} 5α(H) 14α(H) 17α(H) cholestane (20R)
k	C_{29} βα(20R)	C_{29} 13β(H) 17α(H) Diacholestane (20R)
l	C_{29} αβ(20S)	C_{29} 13α(H) 17β(H) Diacholestane (20S)
m	C_{28} ααα(20S)	C_{28} 5α(H) 14α(H) 17α(H) ergostane (20S)
n	C_{28} αββ(20R)	C_{28} 5α(H) 14β(H) 17β(H) cholestane (20R)
o	C_{28} αββ(20S)	C_{28} 5α(H) 14β(H) 17β(H) cholestane (20S)
p	C_{28} ααα(20R)	C_{28} 5α(H) 14α(H) 17α(H) ergostane (20R)
q	C_{29} ααα(20S)	C_{29} 5α(H) 14α(H) 17α(H) stigmastane (20S)
r	C_{29} αββ(20R)	C_{29} 5α(H) 14β(H) 17β(H) stigmastane (20R)
s	C_{29} αββ(20S)	C_{29} 5α(H) 14β(H) 17β(H) stigmastane (20S)
t	C_{29} ααα(20R)	C_{29} 5α(H) 14α(H) 17α(H) stigmastane (20R)

4.3 Results

4.3.1 Rock Extracts

4.3.1.1 Rock extract properties

The TOC values of selected new samples range from 0.2% to 19.38%, with TOC of Gordondale samples significantly higher than the rest of the sample set. Montney samples show variability in organic content with TOC values from 0.2% to 3.27%. Extract yields from all the rock samples are in the range of 61.88-1101.85 mg ext/g TOC (Table 4-5). Extract yields from sandstone samples (X11874-X11880) are very high (218.35-1101.85 mg ext/g TOC) and contains mainly migrated hydrocarbons. The fractions of saturates (SAT), aromatics (AROM), resins and asphaltenes (RES_ASPH) from rock extracts are shown in Figure 4-4.

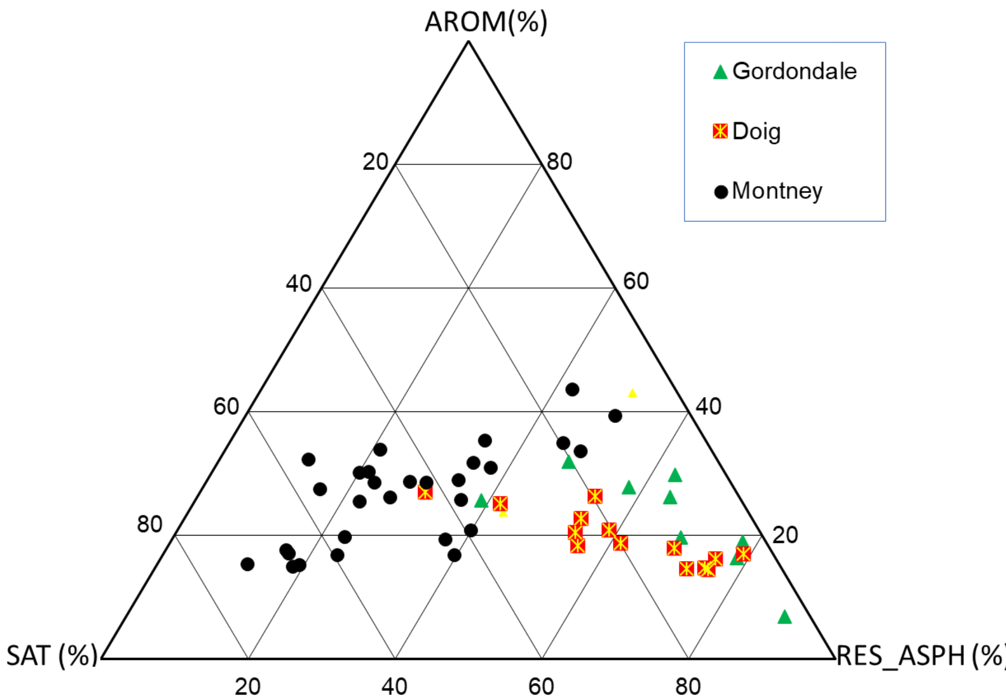

Figure 4-4 composition of rock extracts of Montney, Doig and Gordondale source rock (Doig samples of well 11-3-73-7W6 are excluded due to migration oil features, as described in 3.3.2)

The saturated hydrocarbon to aromatic hydrocarbon ratios (SAT/AROM) within the rock extracts range from 0.15 to 4.67(Table 4-5). SAT/AROM in the Gordondale extracts is the lowest with observed values of 0.15-0.59. SAT/AROM ratios in Doig extracts of well 11-3-73-7W6 are very high (0.95-3.43), and 77.8% of the ratios are greater than 1.5. The ratios in Doig extracts of other wells are lower (0.23-1.44). The SAT/AROM ratios range from 0.23-4.67 in Montney extracts (Table 4-5), 50% of which are greater than 1.5(Figure 4-5).

Table 4-5 Bulk properties of rock extracts

Map No.	Lab ID	UWI	TOC (%)	Unit	Extract Yield	Pr/Ph	%RES_ASPH	%SAT	%AROM	SAT/AROM
E_1	X11858	12-7-67-24W5	15.06	Gordondale	174.51	0.83	57.98	10.02	27.84	0.36
E_2	X11859	12-7-67-24W5	15.8	Gordondale	123.28	0.93	63.18	6.33	29.86	0.21
E_3	X11860	12-7-67-24W5	14.28	Gordondale	219.89	0.87	77.82	2.84	19.05	0.15
E_4	X11861	7-14-64-25W5	8.89	Gordondale	90.29	1.06	47.63	18.97	31.96	0.59
E_5	X11862	7-14-64-25W5	10.34	Gordondale	135.32	0.71	64.37	8.83	26.3	0.34
E_6	X11863	7-14-64-25W5	11.12	Gordondale	23.38	1.5	38.82	6.94	25.78	0.27
E_7	X07383	14-11-84-22W5	19.38	Gordondale	101.9	0.88	89.64	1.07	6.98	0.15
E_8	X07384	10-17-84-22W5	18.53	Gordondale	79	1.34	69.08	3.75	19.68	0.19
E_9	X07388	2-14-82-2W6	15.79	Gordondale	125.3	0.82	78.35	2.53	16.37	0.15
E_{10}	X11864	11-3-73-7W6	2.05	Doig	160.28	1.29	18.67	60.71	17.69	3.43
E_{11}	X11865	11-3-73-7W6	4.43	Doig	95.85	1.59	28.05	48.23	22.29	2.16
E_{12}	X11866	11-3-73-7W6	5.27	Doig	78.75	1.45	36.81	36.34	23.67	1.54
E_{13}	X11867	11-3-73-7W6	3.37	Doig	112.5	1.01	24.14	52.2	21.33	2.45
E_{14}	X11868	11-3-73-7W6	5.1	Doig	88.35	1.44	39.12	36.97	22.34	1.66
E_{15}	X11869	11-3-73-7W6	8.41	Doig	61.88	1.4	54.36	23.18	22.37	1.04
E_{16}	X11881	11-3-73-7W6	2.92	Doig	118.74	1.15	25.29	53.38	20.21	2.64
E_{17}	X11882	11-3-73-7W6	3.45	Doig	74.37	1.29	41.44	35.65	21.39	1.67
E_{18}	X11883	11-3-73-7W6	3.85	Doig	76.63	1.65	52.42	20.35	21.35	0.95
E_{19}	X07255	A-59-G/94-A-16	2.63	Doig	213.1	1.21	54.32	24.41	20.53	1.19
E_{20}	X07256	A-59-G/94-A-16	3.14	Doig	169.1	1.08	58.73	18.95	20.95	0.9
E_{21}	X07257	D-69-J/94-A-15	2.12	Doig	287.9	1.5	30.59	38.94	27.06	1.44
E_{22}	X07258	D-69-J/94-A-15	3.25	Doig	156.8	1.4	61.28	18.83	18.83	1
E_{23}	X07259	D-81-E/94-H-1	2.12	Doig	185.2	1.3	69.07	10.86	17.96	0.6
E_{24}	X07263	11-3-73-7W6	5.48	Doig	105.5	1.45	55.73	23.63	18.34	1.29
E_{25}	X07265	10-15-76-4W6	4.27	Doig	181.6	0.8	79.02	3.89	16.99	0.23
E_{26}	X07266	3-22-78-10W6	8.91	Doig	77.6	1.26	75.37	6.43	14.46	0.44

Table 4-5 Bulk properties of rock extracts (continued)

Map No.	Lab ID	UWI	TOC (%)	Unit	Extract Yield	Pr/Ph	%RES_ASPH	%SAT	%AROM	SAT/AROM
E_{27}	X07268	10-5-84-11W6	5.13	Doig	158	1.1	74.74	8.25	14.79	0.56
E_{28}	X07269	6-8-90-11W6	4.38	Doig	238.7	0.87	75.52	6.61	16.19	0.41
E_{29}	X07270	15-7-74-8W6	4.29	Doig	99.1	1.5	53.88	21.92	22.83	0.96
E_{30}	X07374	10-5-84-11W6	4.99	Doig	233.2	1	72.42	12.91	14.67	0.88
E_{31}	X07376	8-16-74-10W6	6.91	Doig	75.4	1.12	54.08	19.54	26.38	0.74
E_{32}	X07377	8-16-74-10W6	4.02	Doig	22.3	1.19	41.73	29.5	25.18	1.17
E_{33}	X11852	4-32-84-12W6	1.35	Montney	215.55	0.99	37.18	42.22	19.36	2.18
E_{34}	X11853	4-32-84-12W6	1.67	Montney	160.99	0.99	39.96	37.58	20.86	1.8
E_{35}	X11854	4-32-84-12W6	1.18	Montney	146.99	1.04	39.73	37.16	16.79	2.21
E_{36}	X11855	6-36-71-4W6	0.61	Montney	348.84	0.74	27.73	41.09	28.7	1.43
E_{37}	X11856	6-36-71-4W6	0.91	Montney	304.89	0.78	34.16	36.49	28.96	1.26
E_{38}	X11857	6-36-71-4W6	1.41	Montney	166.43	0.86	37.52	28.42	30.99	0.92
E_{39}	X11870	6-36-71-4W6	1.27	Montney	265.4	0.89	34.61	28.57	35.37	0.81
E_{40}	X11871	6-36-71-4W6	1.49	Montney	201.16	1.1	48.48	17.57	33.69	0.52
E_{41}	X11872	6-36-71-4W6	2.07	Montney	119.49	1.36	45.39	17.53	35	0.5
E_{42}	X11873	6-36-71-4W6	0.7	Montney	336.99	1.21	22.46	49.34	25.47	1.94
E_{43}	X11874	12-7-67-24W5	0.77	Montney	724.07	0.52	20.09	48.52	30.13	1.61
E_{44}	X11875	12-7-67-24W5	1	Montney	1101.85	0.61	12.01	53.65	32.37	1.66
E_{45}	X11876	12-7-67-24W5	0.78	Montney	438.88	0.44	29.97	37.44	28.63	1.31
E_{46}	X11877	12-7-67-24W5	0.83	Montney	490.79	0.43	26.32	46.85	26.14	1.79
E_{47}	X11878	7-14-64-25W5	0.64	Montney	218.35	1.19	22.92	47.77	28.52	1.68
E_{48}	X11879	7-14-64-25W5	0.77	Montney	385.2	0.27	21.03	44.76	33.89	1.32
E_{49}	X11880	7-14-64-25W5	0.78	Montney	570.6	0.48	21.26	44.21	30.38	1.46
E_{50}	X11884	11-3-73-7W6	0.34	Montney	341.95	1.06	16.44	64.24	17.63	3.64
E_{51}	X11885	11-3-73-7W6	1.19	Montney	82.95	1.1	34.79	33.28	31.77	1.05
E_{52}	X11886	11-3-73-7W6	1.44	Montney	96.03	1.3	36.17	37.31	25.77	1.45
E_{53}	X11887	11-3-73-7W6	0.43	Montney	267.51	0.96	18.65	60.99	14.93	4.08
E_{54}	X11888	11-3-73-7W6	1.48	Montney	94.58	1.14	23.31	52.07	19.8	2.63
E_{55}	X11889	11-3-73-7W6	0.41	Montney	380.44	1.02	19.42	63.05	15.21	4.14
E_{56}	X11890	11-3-73-7W6	0.91	Montney	92.64	0.92	16.05	37.75	27.5	1.37
E_{57}	X11891	11-3-73-7W6	0.41	Montney	277.27	1.33	12.3	71.58	15.34	4.67
E_{58}	X11892	11-3-73-7W6	0.2	Montney	392.12	1.25	17.06	65.24	17.06	3.82
E_{59}	X11893	2-5-79-11W6	1.23	Montney	173.91	1.26	23.74	57.33	16.9	3.39
E_{60}	X11894	11-28-71-3W6	1.94	Montney	123.6	0.53	50.27	9.65	39.39	0.24
E_{61}	X11895	11-28-71-3W6	2.56	Montney	70.13	1.02	42.33	13.96	43.68	0.32
E_{62}	X11896	11-28-71-3W6	3.27	Montney	84.16	1.01	66.26	9.4	40.13	0.23

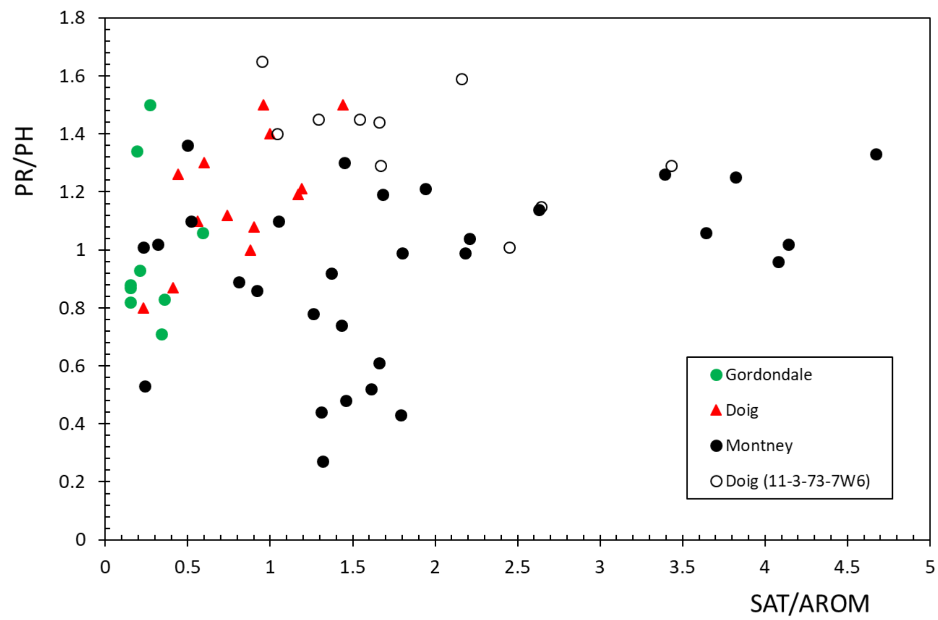

Figure 4-5 Cross-plotting of Pr/Ph ratios against SAT/AROM of different source rock extracts (rock extracts in Doig Formation of well 11-3-73-7W6 are considered migration oil as described in 3.3.2)

4.3.1.2 Normal alkanes

The relative abundance of n-alkane compounds within the Gordondale and Doig rock extracts typically decreases with increasing molecular weight or displays a bimodal distribution (Figure 4-6, Figure 4-7). The maximum n-alkane abundance for Gordondale and Doig extracts is usually around nC_{15}, except for some Doig samples from well 11-3-73-7W6 that show a symmetrical distribution with highest peak of nC_{21} (X11867, X11881, X11882 in APPENDIX 4-1). Montney extracts show a wider, symmetrical distribution with a maximum between nC_{19} and nC_{23}. The Montney extracts usually show an abrupt decrease in n-alkane abundance at around nC_{30} (Figure 4-8) (APPENDIX 4-1).

Pristane/phytane ratios for the extracts range from 0.27 to 1.65. This ratio in most Gordondale rock samples is smaller than 1. The Doig pristane/phytane ratio is in the range of 0.8 to 1.65, with most values greater than 1. The Montney samples show varied ratio of 0.27 to 1.36(Table 4-5, Figure 4-5).

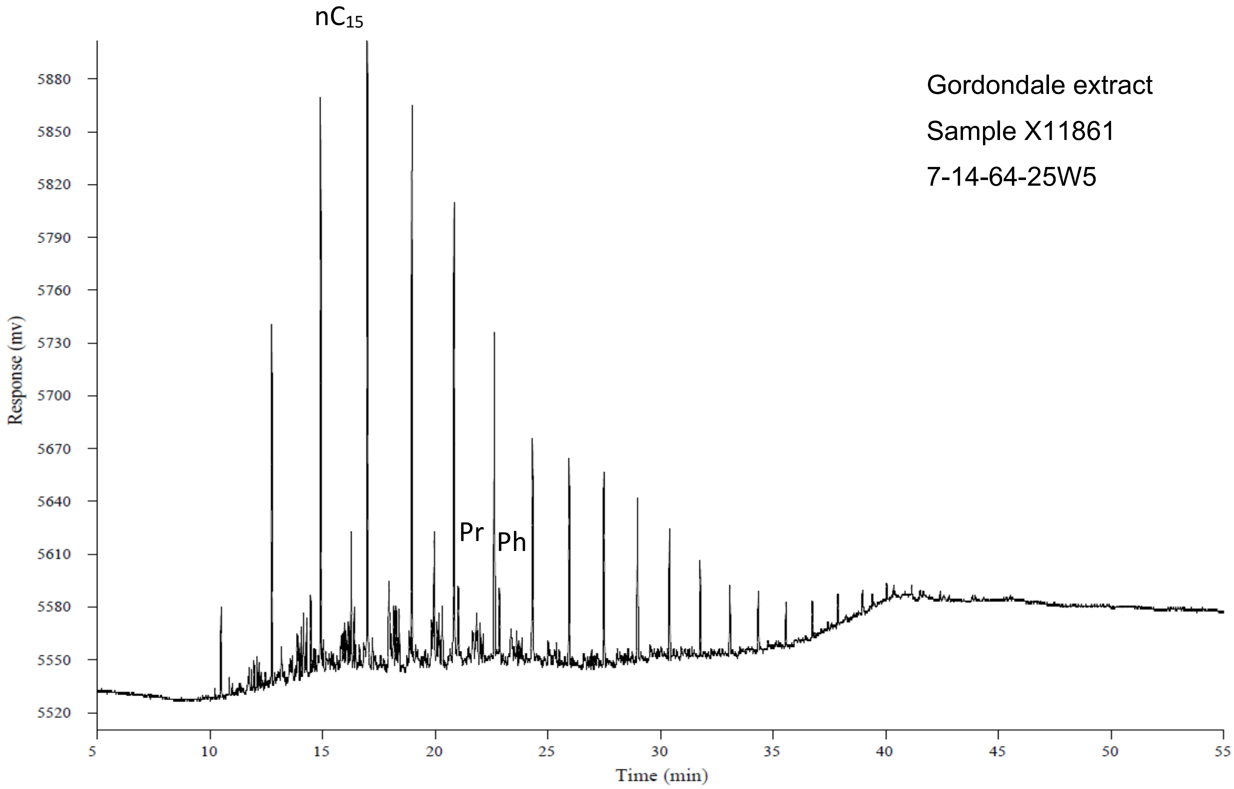

Figure 4-6 saturate fraction gas chromatograms of Gordondale source rock extract

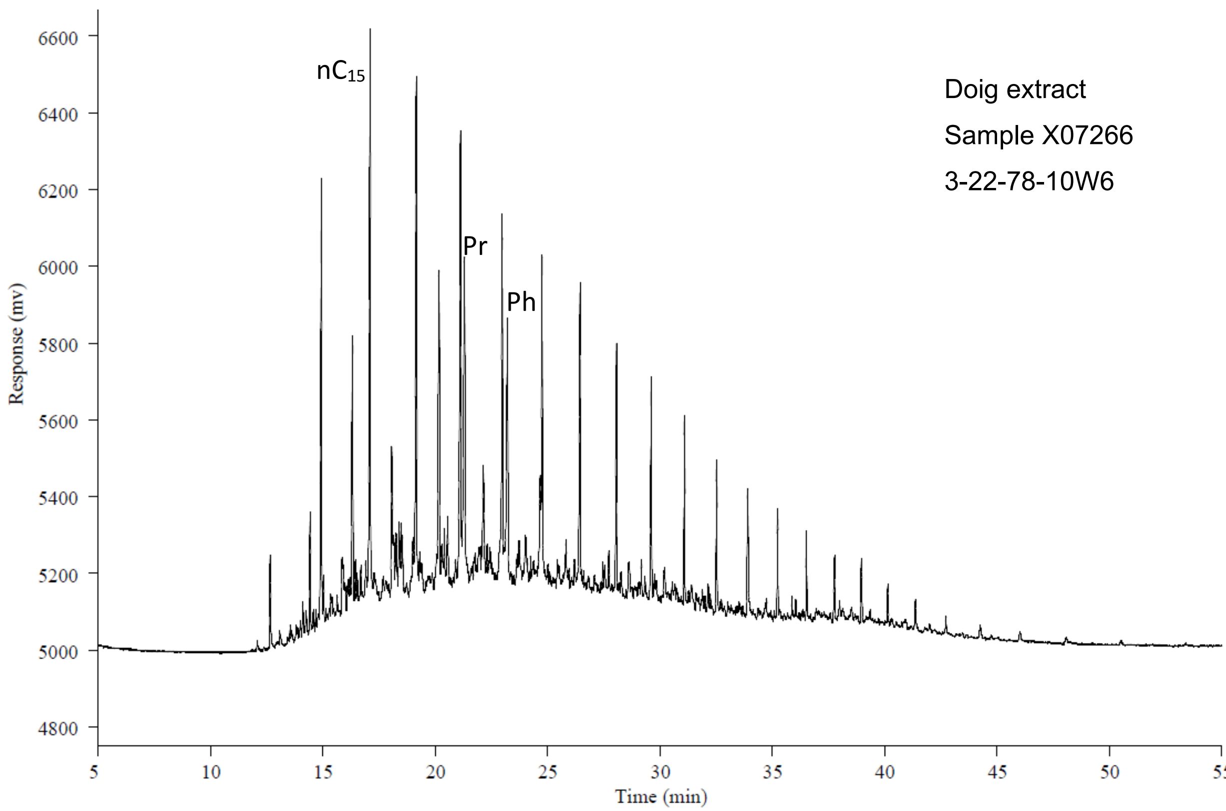

Figure 4-7 saturate fraction gas chromatograms of Doig source rock extract

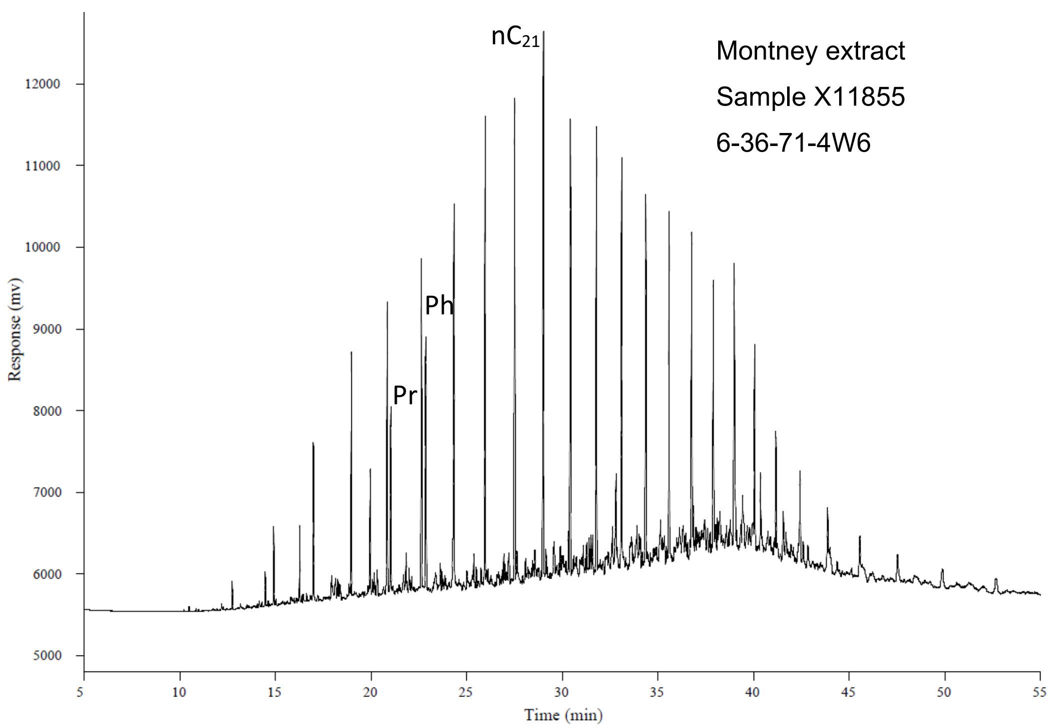

Figure 4-8 saturate fraction gas chromatograms of Montney source rock extract

4.3.1.3 Biomarker characteristics of source rock extracts

The biomarker compounds such as hopanes, steranes, tricyclic terpanes and the parameters associated with these biomarker compounds are used to characterize different type of organic matters and indicate their depositional environments as well as study their thermal maturities. Table 4-6 displayed the biomarker compounds, the biomarker parameters and the geological meanings behind them. These biomarker compounds have been identified from m/z 191 and m/z 217 fragmentograms, and the names of some biomarker compounds are marked in Figure 4-2, Figure 4-3 and listed in Tables 4-3 and 4-4.

Table 4-6 biomarkers and biomarker parameters used to indicate the precursors of organic matter for correlation and thermal maturity study

Biomarkers and parameters	origin	Depositional settings	Abundance		Geological meaning and implication	references
			shale	carbonate		
Hopane	bacteria	Reduce hypoxic			The dominance of C_{30} hopane is an indicator of clay-rich source rocks	Gürgey K.., 1999
sterane	algae		C_{27}<C_{29}	C_{27}>C_{29}	C_{27} sterane, marine phytoplankton C_{29} sterane, terrestrial environment	Huang et al., 1979. Volkman, 1989
Tricyclic terpane	Bacteria, algae	Non-exclusive			better thermal stability than hopane	Farrimond et al., 1999
C_{29} Hopane	Multiple origins	Carbonate, evaporate			Indicate carbonate environment	Clark, Philp, 1989
C_{28} regular sterane	Algae (diatoms)				indicate an intense contribution lacustrine alga	Huang et al., 1979 Rampen et al., 2010
C_{24} tetracyclic terpane	bacteria	hypersaline			microbial sources in a carbonate	Lu et al., 2009
Extended tricyclic terpane	unknown	Upwelling, high salinity			Low concentration in carbonate	Hao et al., 2009. Huang et al., 2017
H/STER	Bacteria/algae		low	high	Reflect relative input of bacterial versus eukaryotic biomass	Peters et al., 2005 Ourisson et al., 1992
H/T					Reflect bacteria versus algae and bacteria input, source input index	Aquino Neto et al., 1982
DIA/REG			High	low	Often used to distinguish clastic or carbonate source rock	Mello, 1986; Rubinstein, 1975
S/(S+R)					Indicate maturity	Seifert et al., 1986
ββ/(ββ+αα)					Indicate maturity	Peters et al., 2005
$C_{29}H/C_{30}H$			low	High>1	To indicate source rock type	ten Haven et al., 1988
$C_{23}T/C_{30}H$					Bacterial and algae input versus different prokaryotes	Aquino Neto et al., 1982
$C_{24}Te/C_{26}T$			Low-medium	Medium -high	High C_{24}Te often indicate carbonate source rock	Connan et al., 1986 Clark, Philp, 1989
$C_{35}H/C_{34}H$		>1, highly reducing	low	high	Low Eh marine deposition, often connected to carbonate source rock	Philp, 1986
Ts/Tm			high	low	Reliable thermal maturity index within certain source rock	Rullkötter et al., 1988

Notes:H/STER=hopane/sterane; H/T=hopane/tricyclic terpane; DIA/REG=C_{27} diasterane/C_{29} regular sterane; S/(S+R) =C_{29} ααα(20S)/(20S+20R); ββ/(ββ+αα)= C_{29} αββ/(αββ+ααα); $C_{29}H/C_{30}H$=C_{29} hopane/C_{30} hopane; $C_{23}T/C_{30}H$=C_{23} tricyclic terpane/C_{30} hopane; Ts/Tm=18α(H)-/17α(H)-trinorhopane; $C_{24}Te/C_{26}T$=C_{24} tetracyclic terpane/C_{26} tricyclic terpane; $C_{35}H/C_{34}H$=C_{35} homohopane/C_{34} homohopane; ETR= (C_{28} tricyclic terpane+C_{29} tricyclic terpane)/Ts

Hopane/sterane ratios of Gordondale extracts are in the range of 1.37 to 7.09 and hopane/tricyclic terpane ratios of 0.95 to 3.49 (Figure 4-9). Doig extracts are also dominated by hopanes, with hopane/sterane ratio in the range of 0.73 to 3.97 and hopane/tricyclic terpane ratios from 0.7 to 8.85. Montney extracts are dominated by tricyclic terpanes with hopane/sterane ratio in range of 0.15 to 2.08 and hopane/tricyclic terpane ratio of 0.06 to 1.57.

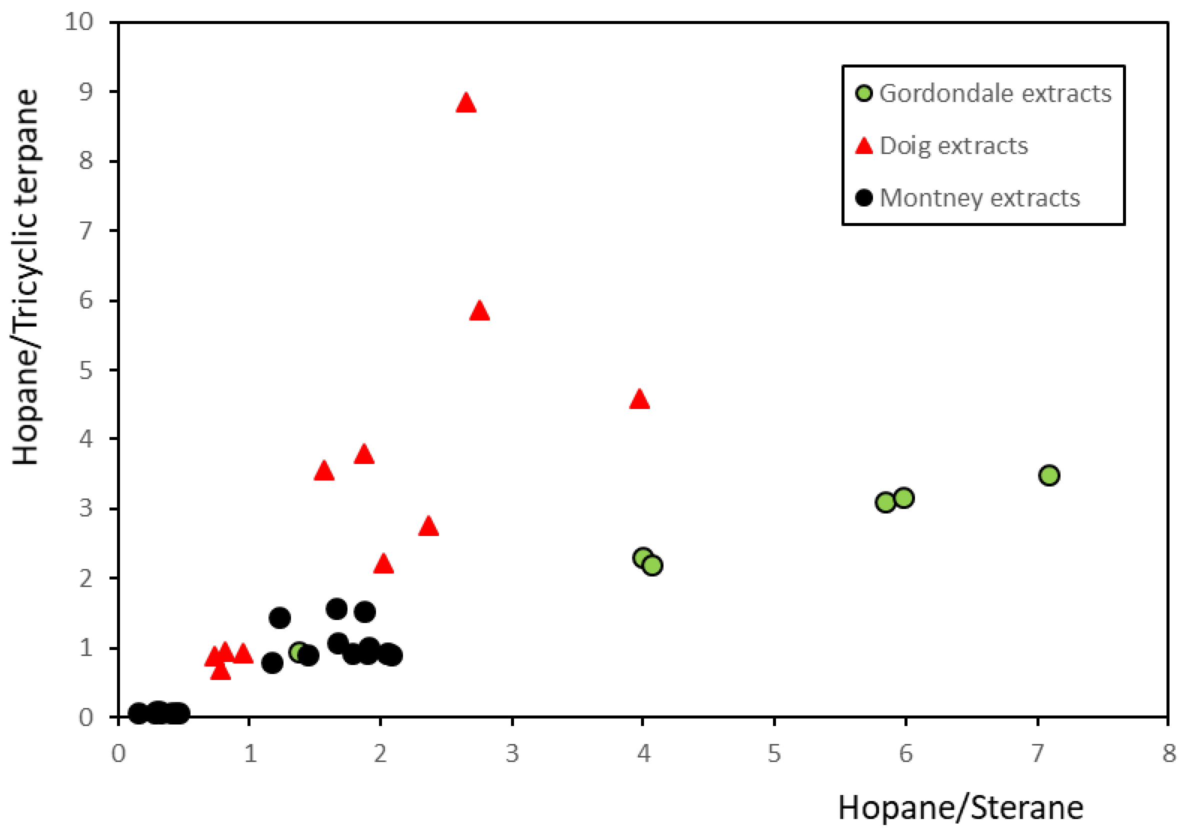

Figure 4-9 Crossplot of Hopane/sterane ratio and hopane/Tricyclic terpane ratio of Godondale, Doig and Montney extracts

Gordondale extracts also show high C_{35} hopane/C_{34} hopane ratios of 1.18 to 1.37 (Figure 4-10, Table 4-7). The C_{23} tricyclic terpane/C_{30} hopane ratio in Gordondale extracts vary from 0.42 to 1.48. Doig extracts have C_{35} hopane/C_{34} hopane ratios of 0.45 to 1.33 and the C_{23} tricyclic terpane/C_{30} hopane ratios range from 0.21 to 1.68. In

Montney extracts, the range of C_{35} hopane/C_{34} hopane ratio is between 0.73 to 1.12, and this ratio cannot be calculated in some samples due to homohopane depletion. C_{23} tricyclic terpane/C_{30} hopane ratio in Montney extracts is between 0.41 and 12.94.

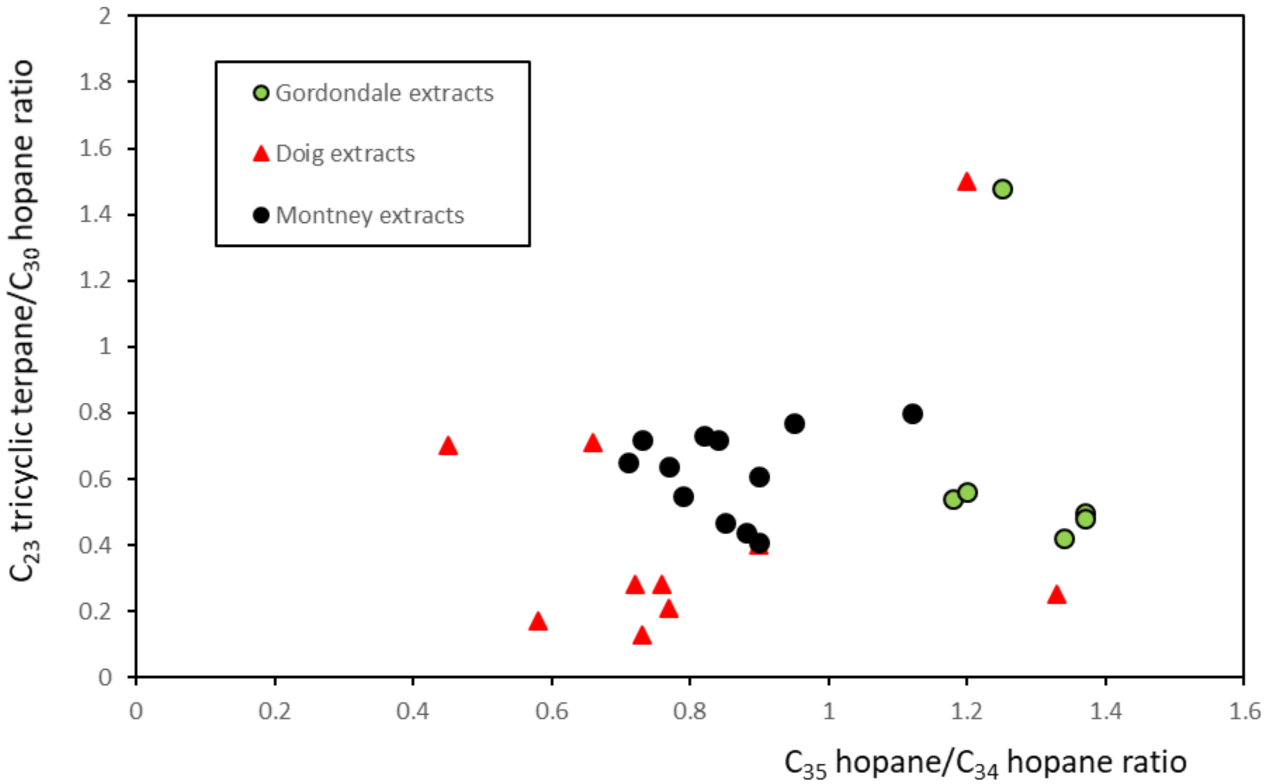

Figure 4-10 Crossplot of C_{35} hopane/C_{34} hopane ratio and C_{23} tricyclic terpane/C_{30} hopane ratio of Godondale, Doig and Montney extracts (samples with C_{23} tricyclic terpane/C_{30} hopane ratios greater than 2 in Montney extracts do not show up in this diagram due the depletion of homohopane in these samples)

Gordondale extracts show high C_{29} hopane/C_{30} hopane ratios of 0.94 to 1.14 and high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios between 1.27 and 3.22. In Doig extracts, C_{29} hopane/C_{30} hopane ratios are in the range of 0.31 to 1.74 and C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios are between 0.71 and 1.57. The Montney extracts show relatively lower C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio of 0.14 to 0.64 and C_{29} hopane/C_{30} hopane ratios are in the range of 0.3 to 0.65(Figure 4-11).

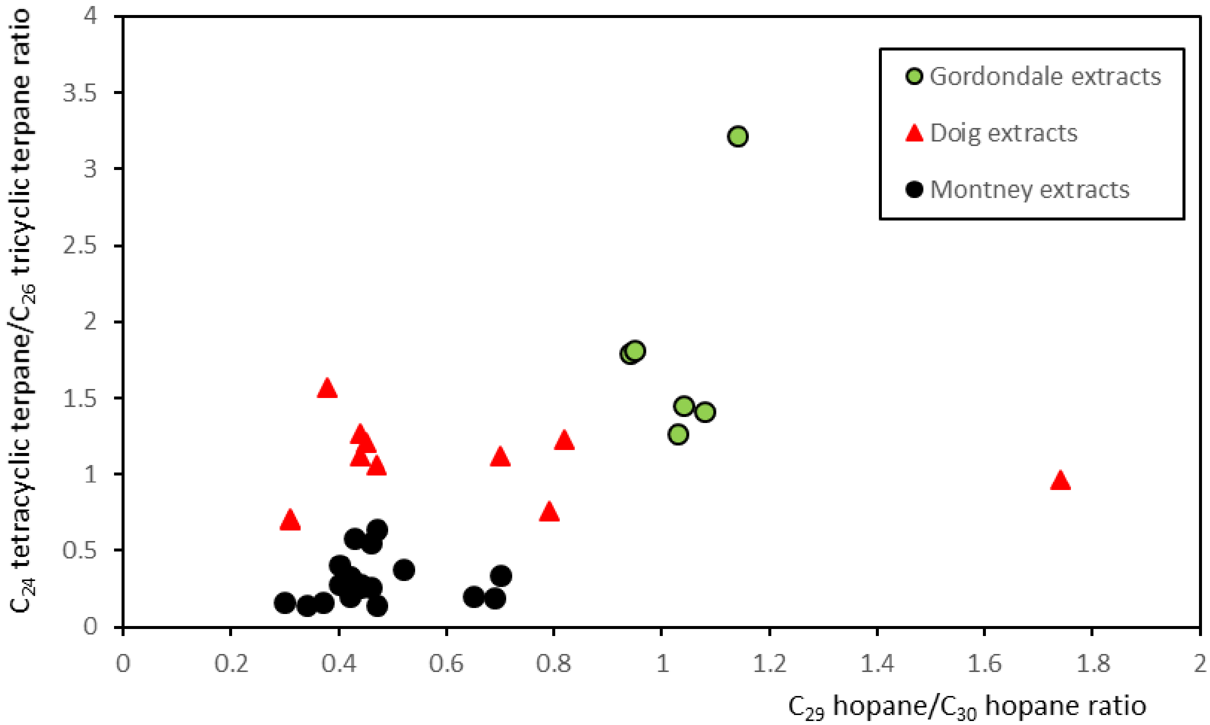

Figure 4-11 Crossplot of C_{29} hopane/C_{30} hopane ratio and C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio of Godondale, Doig and Montney extracts

The extended terpane ratios (ETR) in Gordondale extracts are typically less than 2. These extracts also show a low abundance of diasteranes with diasterane/regular sterane ratio of 0 to 0.52. Extended terpane ratios in Doig extracts are also usually smaller than 2, but the diasterane/regular sterane ratios are mostly higher, in the range of 0.28 to 3.57. Montney extracts have the highest extended terpane ratios (ETR) of 2.17 to 7.68 and the diasterane/regular sterane ratios of Montney extracts are in the range of 0.12 to 3.03(Figure 4-12).

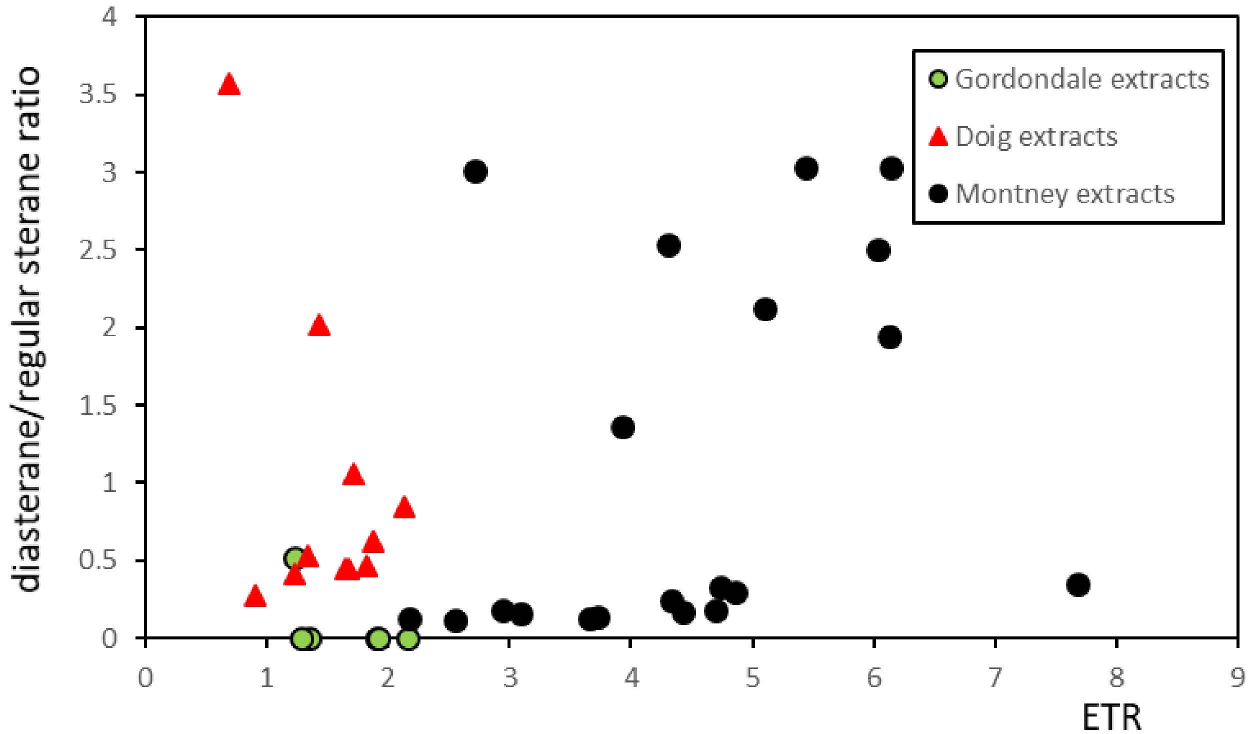

Figure 4-12 Crossplot of Extended terpane ratios (ETR) and diasterane/regular sterane ratio of Godondale, Doig and Montney extracts

The C_{29} ααα (20S)/(20S+20R) and C_{29} αββ/(αββ+ααα) of Gordondale, Doig and Montney extracts are in the range of 0.41-0.62 and 0.32-0.57 respectively. The abundance C_{28} regular sterane (C_{28}%) in Doig extracts (<0.2) is smaller than that of most Gordondale and Montney extracts (>0.2) (Table 4-7).

Doig extracts in well 11-3-73-7W6 are not incorporated in Figures 4-9, 4-10, 4-11, 4-12, because the thermal maturity of organic matter is much higher (Ro% equivalent 1.03-1.09) than thermal maturity of Montney Formation (Ro% 0.89-0.9) in the same well (section 3.3.2), suggesting not generated from local source rock. Typical geochemical characteristics (hopanes, tricyclic terpanes and steranes) of Gordondale, Doig and Montney extracts are shown in Figure 4-13, 4-14 and 4-15.

Table 4-7 saturate biomarker parameters of rock extracts

Map No.	Lab No.	UWI	Unit	TOC %	Tmax (°C)	Pr/Ph	H/STER	H/T	DIA /REG	S /(S+R)	ββ /(ββ+αα)	$C_{29}H$ /$C_{30}H$	$C_{23}T$ /$C_{30}H$	$C_{24}Te$ /$C_{26}T$	$C_{35}H$ /$C_{34}H$	C_{28}%	Ts/Tm	ETR
E1	X11858	12-7-67-24W5	Gordondale	15.06	430	0.83	5.84	3.11	0	0.44	0.56	1.03	0.5	1.27	1.37	0.23	0.44	2.16
E2	X11859	12-7-67-24W5	Gordondale	15.8	438	0.93	5.98	3.17	0	0.42	0.54	1.04	0.48	1.45	1.37	0.22	0.38	1.9
E3	X11860	12-7-67-24W5	Gordondale	14.28	441	0.87	7.09	3.49	0	0.41	0.54	1.08	0.42	1.41	1.34	0.22	0.39	1.92
E4	X11861	7-14-64-25W5	Gordondale	8.89	438	1.06	4	2.3	0	0.47	0.55	0.94	0.54	1.79	1.18	0.22	0.79	1.35
E5	X11862	7-14-64-25W5	Gordondale	10.34	440	0.71	4.06	2.21	0	0.46	0.55	0.95	0.56	1.81	1.2	0.22	0.73	1.28
E6	X11863	7-14-64-25W5	Gordondale	11.12	443	1.5	1.37	0.95	0.52	0.43	0.53	1.14	1.48	3.22	1.25	0.24	0.66	1.23
E10	X11864	11-3-73-7W6	Doig	2.05	441	1.29	0.18	0.1	2.77	0.56	0.53	0.53	7.89	0.22		0.15	4.56	2.89
E11	X11865	11-3-73-7W6	Doig	4.43	447	1.59	0.18	0.11	2.85	0.56	0.51	0.53	9.61	0.26		0.13	5.77	2.28
E12	X11866	11-3-73-7W6	Doig	5.27	448	1.45	0.21	0.13	2.75	0.62	0.47	0.62	10.13	0.28		0.16	5.39	2.04
E13	X11867	11-3-73-7W6	Doig	3.37	444	1.01	0.18	0.09	2.71	0.61	0.51	0.68	9.56	0.19		0.18	4.83	3.16
E14	X11868	11-3-73-7W6	Doig	5.1	448	1.44	0.19	0.09	2.59	0.56	0.53	0.66	10.89	0.21		0.2	5.48	3.14
E15	X11869	11-3-73-7W6	Doig	8.41	450	1.4	0.24	0.1	1.98	0.57	0.53	1.2	5.09	0.17		0.2	6.96	3.44
E16	X11881	11-3-73-7W6	Doig	2.92	446	1.15	0.18	0.06	1.93	0.6	0.52	0.65	10.54	0.13		0.19	5.13	5.26
E17	X11882	11-3-73-7W6	Doig	3.45	449	1.29	0.22	0.08	1.89	0.58	0.54	0.6	11.76	0.16		0.19	5.87	3.8
E18	X11883	11-3-73-7W6	Doig	3.85	452	1.65	0.3	0.12	1.83	0.57	0.49	0.7	8.29	0.27		0.17	6.37	2.36
E19	X07255	A-59-G/94-A-16	Doig	2.63	444	1.21	1.57	3.55	0.47	0.49	0.52	0.7	0.28	1.12	0.76	0.18	0.92	1.82
E20	X07256	A-59-G/94-A-16	Doig	3.14	440	1.08	1.88	3.8	0.45	0.5	0.52	0.44	0.17	1.12	0.58	0.2	0.93	1.68
E21	X07257	D-69-J/94-A-15	Doig	2.12	444	1.5	0.73	0.89	3.57	0.62	0.52	1.74	1.68	0.96		0.14	9.4	0.69
E22	X07258	D-69-J/94-A-15	Doig	3.25	454	1.4	0.78	0.7	2.02	0.52	0.53	0.79	1.5	0.76	1.2	0.17	12.25	1.43
E23	X07259	D-81-E/94-H-1	Doig	2.12	452	1.3	2.02	2.22	0.62	0.47	0.52	0.47	0.4	1.06	0.9	0.19	1.1	1.88
E25	X07265	10-15-76-4W6	Doig	4.27	440	0.8	3.97	4.59	0.28	0.45	0.53	0.82	0.25	1.23	1.33	0.16	0.77	0.9
E26	X07266	3-22-78-10W6	Doig	8.91	445	1.26	0.82	0.95	0.85	0.5	0.5	0.31	0.71	0.7	0.66	0.21	3.13	2.13
E27	X07268	10-5-84-11W6	Doig	5.13	441	1.1	2.75	5.86	0.45	0.46	0.53	0.45	0.21	1.21	0.77	0.18	0.41	1.65
E28	X07269	6-8-90-11W6	Doig	4.38	448	0.87	2.37	2.76	0.53	0.46	0.54	0.38	0.28	1.57	0.72	0.18	1.09	1.33
E29	X07270	15-7-74-8W6	Doig	4.29	447	1.5	0.95	0.94	1.06	0.56	0.54	0.31	0.7	0.71	0.45	0.19	6.36	1.72
E30	X07374	10-5-84-11W6	Doig	4.99	440	1	2.65	8.85	0.41	0.5	0.53	0.44	0.13	1.27	0.73	0.19	0.44	1.23

Table 4-7 saturate biomarker parameters of rock extracts (Continued)

Map No.	Lab No.	UWI	Unit	TOC %	Tmax (°C)	Pr/Ph	H/STER	H/T	DIA /REG	S /(S+R)	ββ /(ββ+αα)	$C_{29}H$ /$C_{30}H$	$C_{23}T$ /$C_{30}H$	$C_{24}Te$ /$C_{26}T$	$C_{35}H$ /$C_{34}H$	C_{28}%	Ts/Tm	ETR
E33	X11852	4-32-84-12W6	Montney	1.35	432	0.99	1.23	1.45	0.33	0.44	0.32	0.42	0.47	0.33	0.85	0.31	0.79	4.73
E34	X11853	4-32-84-12W6	Montney	1.67	433	0.99	1.88	1.54	0.3	0.44	0.32	0.42	0.44	0.33	0.88	0.3	0.86	4.86
E35	X11854	4-32-84-12W6	Montney	1.18	434	1.04	1.66	1.57	0.24	0.44	0.29	0.4	0.41	0.41	0.9	0.27	0.7	4.33
E36	X11855	6-36-71-4W6	Montney	0.61	437	0.74	1.67	1.09	0.18	0.52	0.55	0.42	0.55	0.29	0.79	0.27	1.52	4.7
E37	X11856	6-36-71-4W6	Montney	0.91	437	0.78	1.91	1.01	0.17	0.51	0.55	0.4	0.61	0.28	0.9	0.28	1.44	4.42
E38	X11857	6-36-71-4W6	Montney	1.41	440	0.86	2.06	0.93	0.13	0.51	0.55	0.44	0.64	0.28	0.77	0.26	1.45	3.65
E39	X11870	6-36-71-4W6	Montney	1.27	440	0.89	2.05	0.94	0.14	0.51	0.54	0.44	0.65	0.26	0.71	0.26	1.7	3.72
E40	X11871	6-36-71-4W6	Montney	1.49	441	1.1	2.08	0.91	0.12	0.48	0.54	0.52	0.72	0.38	0.73	0.27	1.44	2.55
E42	X11873	6-36-71-4W6	Montney	0.7	439	1.21	1.17	0.81	0.35	0.5	0.56	0.42	0.8	0.2	1.12	0.25	2.46	7.68
E50	X11884	11-3-73-7W6	Montney	0.34	436	1.06	0.15	0.06	3.03	0.56	0.48	0.69	8.2	0.19		0.2	5.1	5.43
E51	X11885	11-3-73-7W6	Montney	1.19	448	1.1	0.31	0.08	3.01	0.52	0.55	0.7	12.94	0.34		0.23	20.33	2.71
E52	X11886	11-3-73-7W6	Montney	1.44	450	1.3	0.46	0.06	2.12	0.58	0.57	0.34	12.21	0.14		0.24	10.46	5.1
E53	X11887	11-3-73-7W6	Montney	0.43	436	0.96	0.32	0.07	2.5	0.62	0.56	0.3	5.07	0.16		0.19	7.42	6.03
E54	X11888	11-3-73-7W6	Montney	1.48	446	1.14	0.44	0.06	3.03	0.59	0.54	0.47	10.69	0.14		0.19	4.63	6.14
E55	X11889	11-3-73-7W6	Montney	0.41	433	1.02	0.28	0.07	1.95	0.61	0.57	0.37	5.63	0.16		0.22	10.15	6.13
E56	X11890	11-3-73-7W6	Montney	0.91	443	0.92	0.41	0.06	2.54	0.53	0.55	0.65	9.1	0.2		0.26	5	4.3
E59	X11893	2-5-79-11W6	Montney	1.23	443	1.26	0.29	0.1	1.36	0.54	0.52	0.46	3.09	0.26		0.25	12.03	3.93
E60	X11894	11-28-71-3W6	Montney	1.94	438	0.53	1.44	0.91	0.13	0.47	0.53	0.47	0.72	0.64	0.84	0.26	0.78	2.17
E61	X11895	11-28-71-3W6	Montney	2.56	439	1.02	1.78	0.92	0.18	0.49	0.53	0.46	0.77	0.55	0.95	0.26	0.55	2.94
E62	X11896	11-28-71-3W6	Montney	3.27	436	1.01	1.9	0.93	0.16	0.5	0.53	0.43	0.73	0.58	0.82	0.27	0.58	3.09

Notes:H/STER=hopane/sterane; H/T=hopane/tricyclic terpane; DIA/REG=C_{27} diasterane/C_{29} regular sterane; S/(S+R)=C_{29} ααα(20S)/(20S+20R); ββ/(ββ+αα)= C_{29} αββ/(αββ+ααα); $C_{29}H/C_{30}H$=C_{29} hopane/C_{30} hopane; $C_{23}T/C_{30}H$=C_{23} tricyclic terpane/C_{30} hopane; $C_{24}Te/C_{26}T$=C_{24} tetracyclic terpane/C_{26} tricyclic terpane; $C_{35}H/C_{34}H$=C_{35} homohopane/C_{34} homohopane; Ts/Tm=18α(H)-/17α(H)-trinorhopane; C_{28}%=C_{28} ααα(20R)/(C_{27} ααα(20R)+C_{28} ααα(20R)+ C_{29} ααα(20R)); ETR=(C_{28} tricyclic terpane+C_{29} tricyclic terpane)/Ts

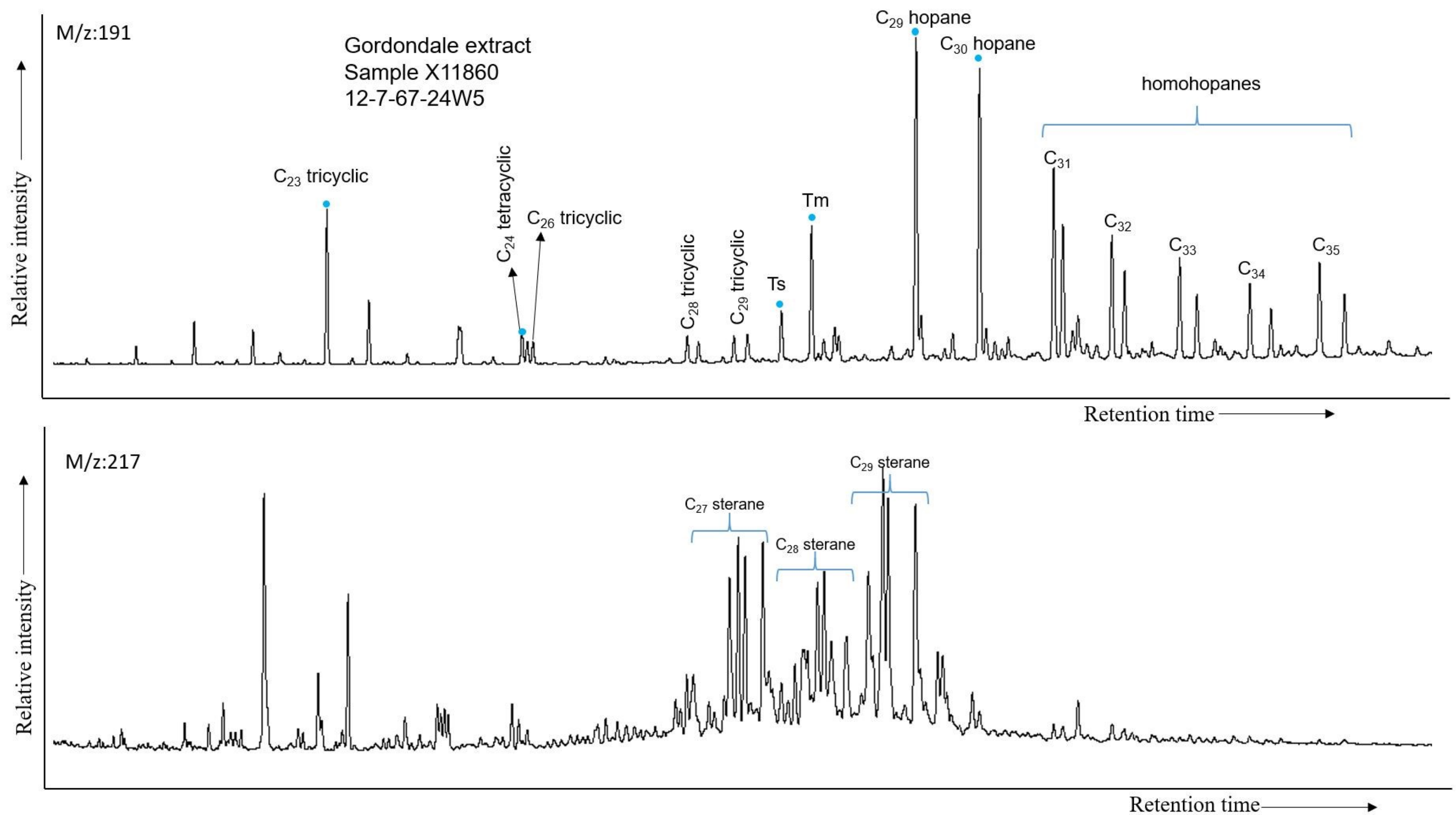

Figure 4-13 M/z 191 and M/z 217 mass fragmentograms for the Gordondale source rock extracts

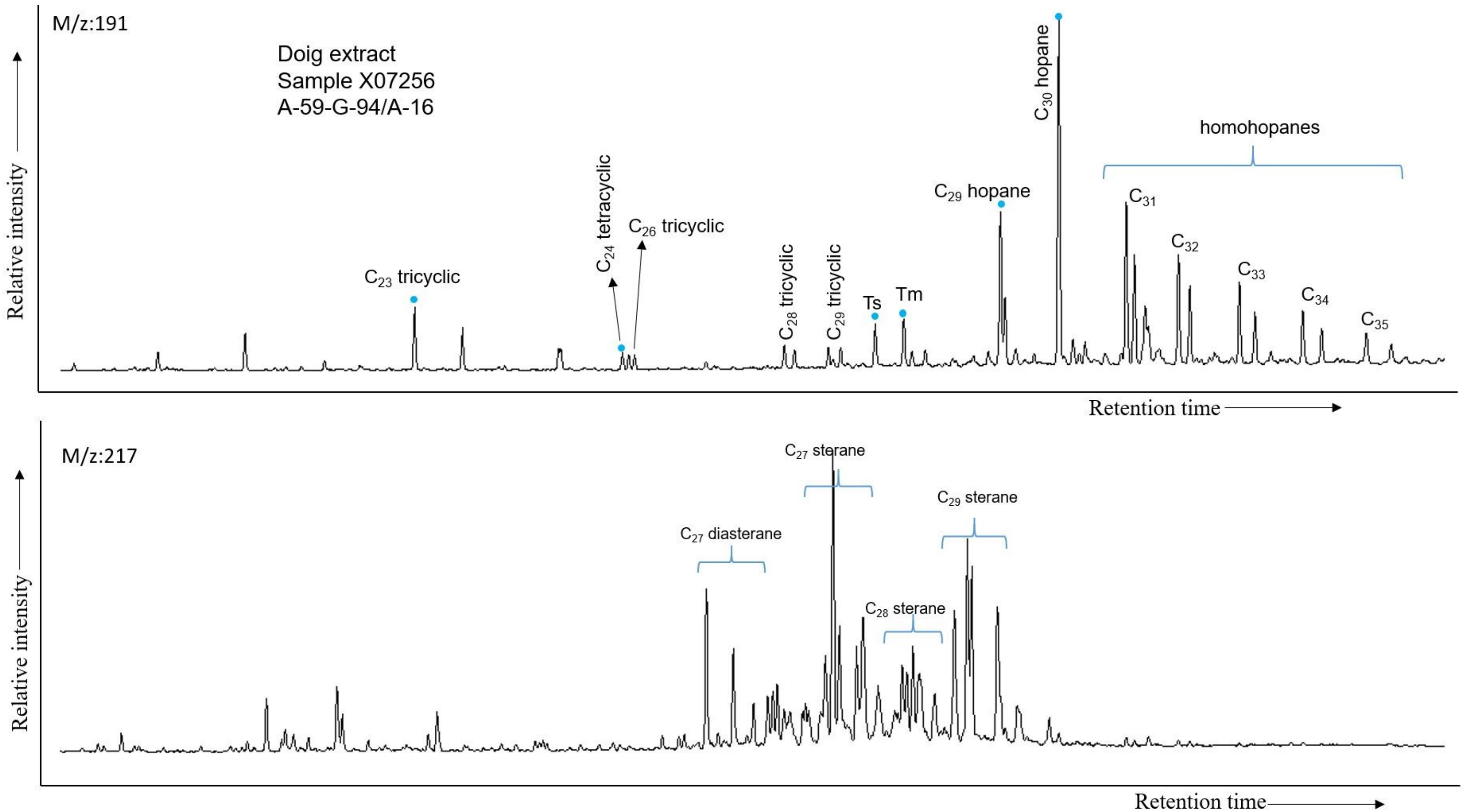

Figure 4-14 M/z 191 and M/z 217 mass fragmentograms for the Doig source rock extracts

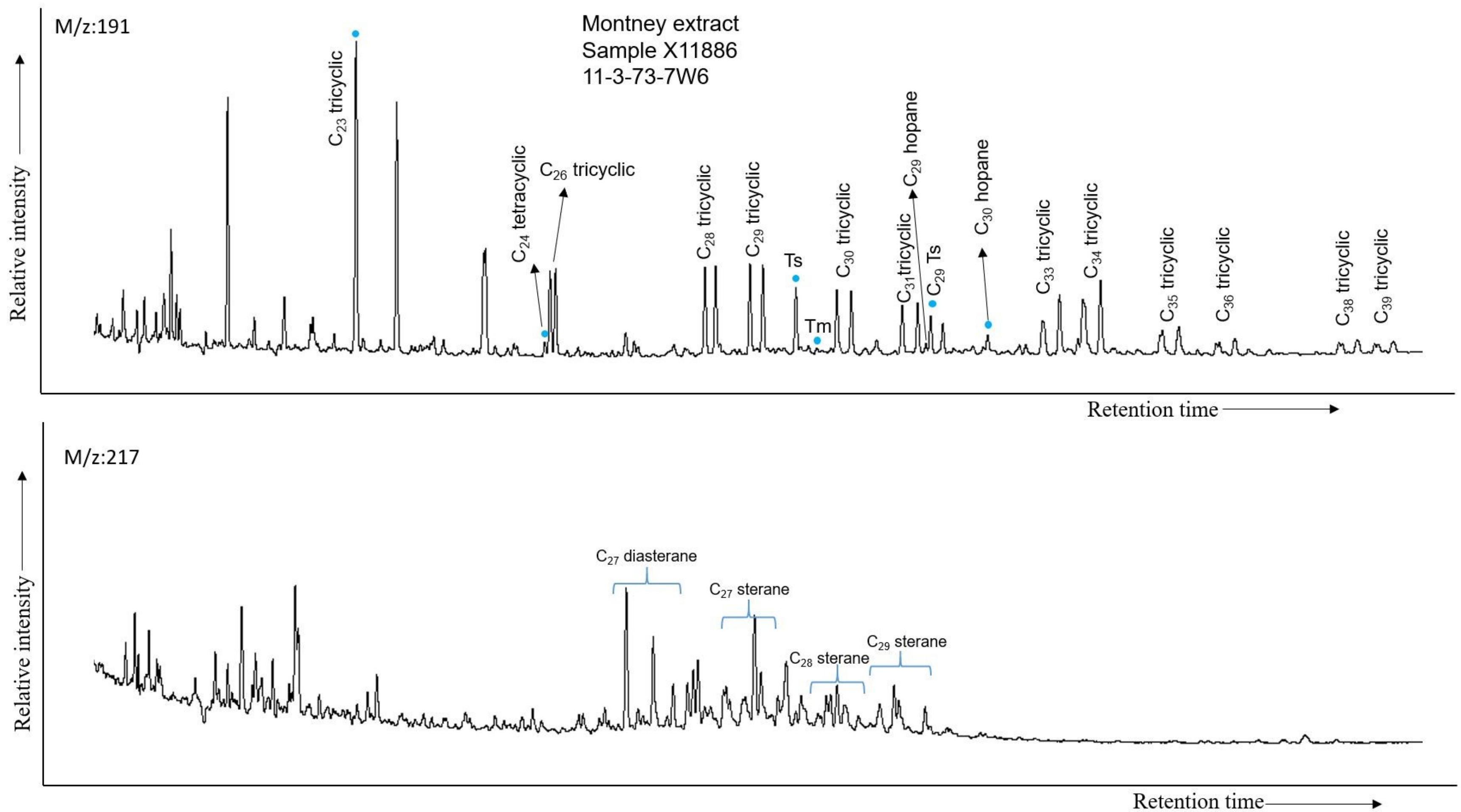

Figure 4-15 M/z 191 and M/z 217 mass fragmentograms for the Montney source rock extracts

4.3.2 Oil Samples

4.3.2.1 Oil bulk properties

The bulk properties of Triassic crude oils, including sulfur content, stable carbon isotope of saturate fraction, percent of saturate and aromatic composition and API gravity are presented in Table 4-8.

The sulfur content of oils produced from the Charlie Lake Formation oils is in the range of 0.17% to 4.67% (Figure 4-16). $\delta^{13}C$ of saturate fraction of Charlie Lake oils is between -30 ‰ and -31.3‰. Doig and Halfway crude oils have sulfur contents ranging from 0.25% to 0.71%, and the $\delta^{13}C$ of the saturate fraction is between -31.5‰ and -31.7‰. There are three type of oils in Montney Formation, including high sulfur oils, low sulfur oils and extremely low sulfur condensate. Sulfur content of high sulfur oils is ranges from 1.16% to 4.69%, with $\delta^{13}C$ of -29.4‰ to -30.7‰ for saturate fraction. Sulfur content of low sulfur oils is between 0.01% and 0.23%, with the heaviest $\delta^{13}C$ in the range of -30.7‰ to -28.3‰. Sulfur content of three samples from the Nordegg Member is in the range of 2.03% to 2.28% and $\delta^{13}C$ of saturate fraction is between -29.9‰ and -30.2‰.

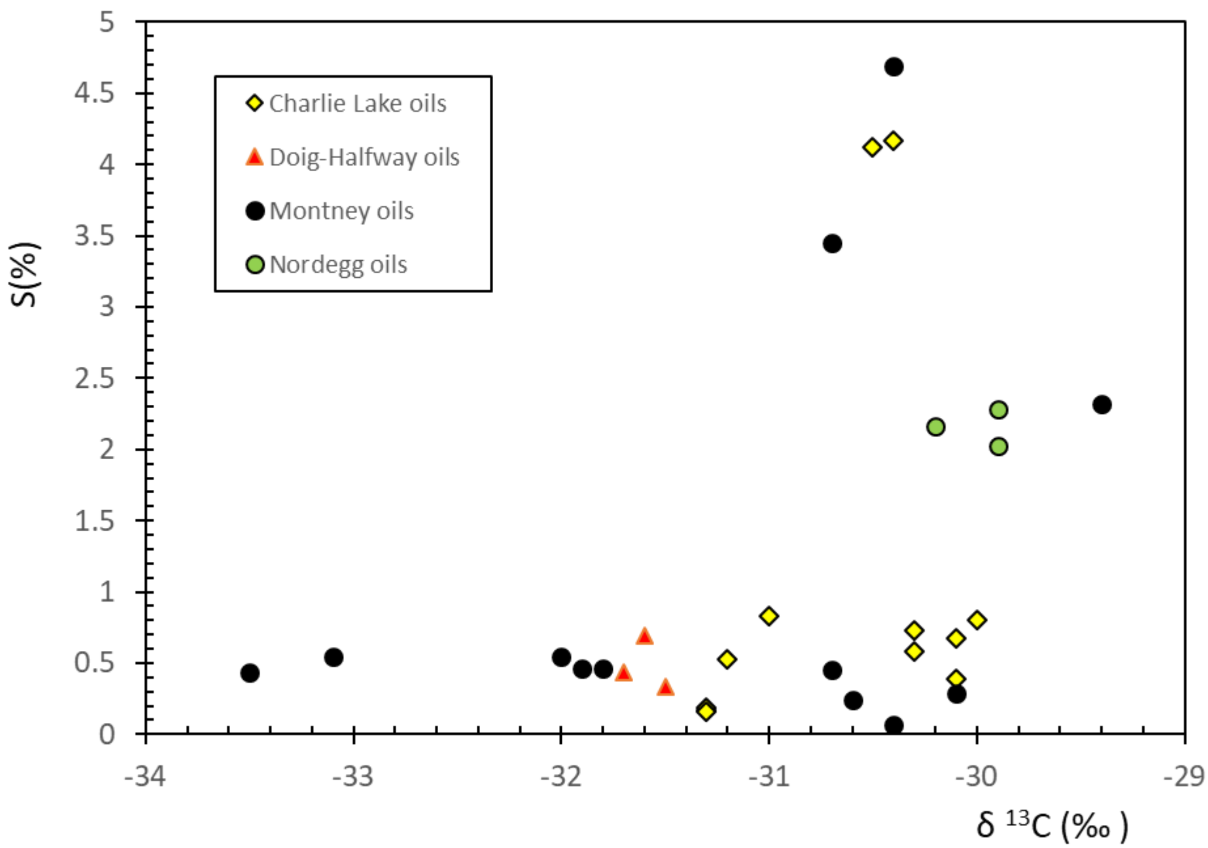

Figure 4-16 Crossplot of sulfur content and carbon isotope of saturate fraction of Triassic oils

The saturated hydrocarbon to aromatic hydrocarbon ratio (SAT/AROM) of Charlie Lake oils ranges from 0.15 to 4.88 and Pr/Ph is in the range of 0.51-1.31. For Doig and Halfway oils, SAT/AROM ratios of 1.39-3.44 and the Pr/Ph ratio is in the range of 0.91-1.28. SAT/AROM ratio of the oils in Montney Formation ranges from 0.45 to 3.59 and the Pr/Ph ratio is in the range of 0.7 to 1.45(Figure 4-17). Two oils from Triassic formations (specific formation undetermined) have SAT/AROM of 1.16 to 1.22 with Pr/Ph ratio in the range of 1.27 to 1.44.

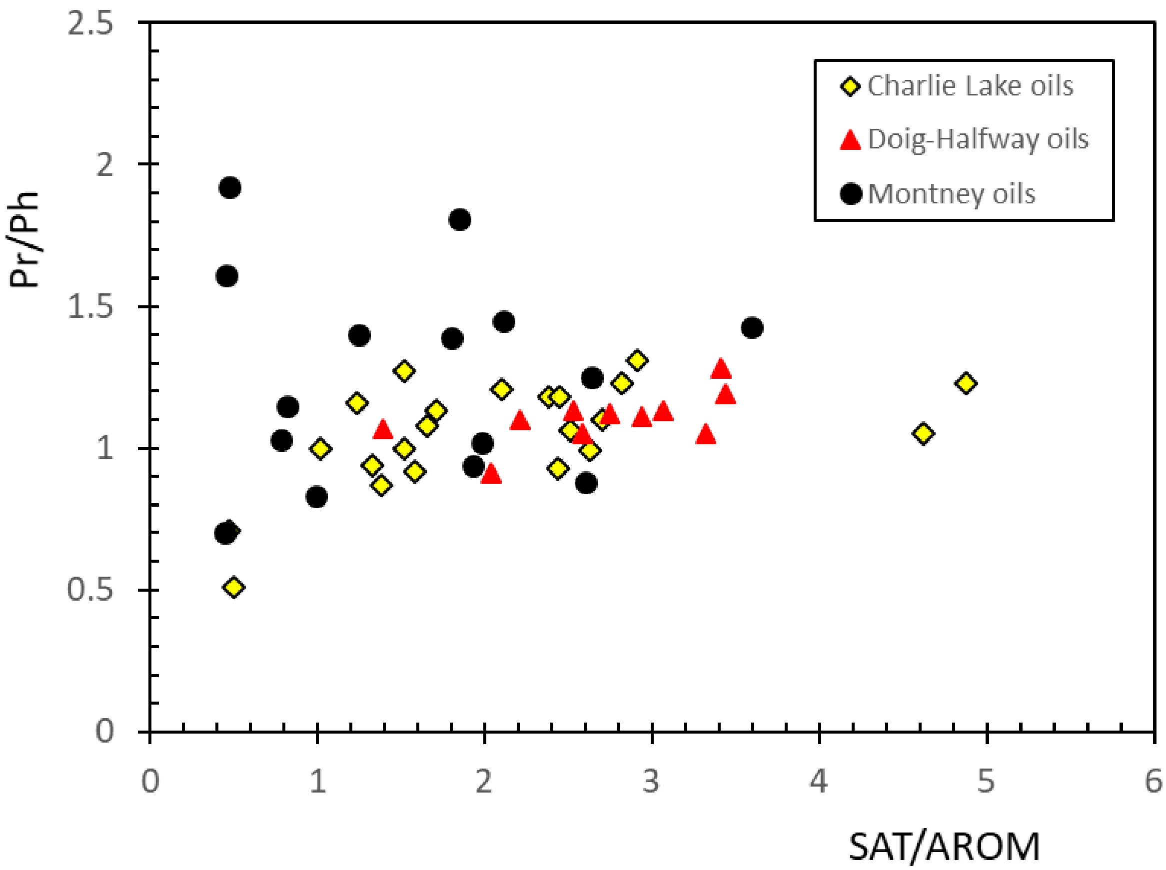

Figure 4-17 Pr/Ph against saturated hydrocarbon to aromatic hydrocarbon ratio of Triassic oils

The API gravity of crude oils in Charlie Lake Formation samples ranges from 24.51° to 46.49° (Table 4-7), while crude oils in Doig and Halfway Formation have relatively high API gravities of 38.6° to 44.93° (Figure 4-18). The API gravity of the crude oils is in the range of 28.9° to 42.12° in Montney Formation and is 25.37° in average in Nordegg Member. All these samples are classified as medium-light oils. It is observed that the sulfur content in the crude oils increases with decreasing oil API gravity.

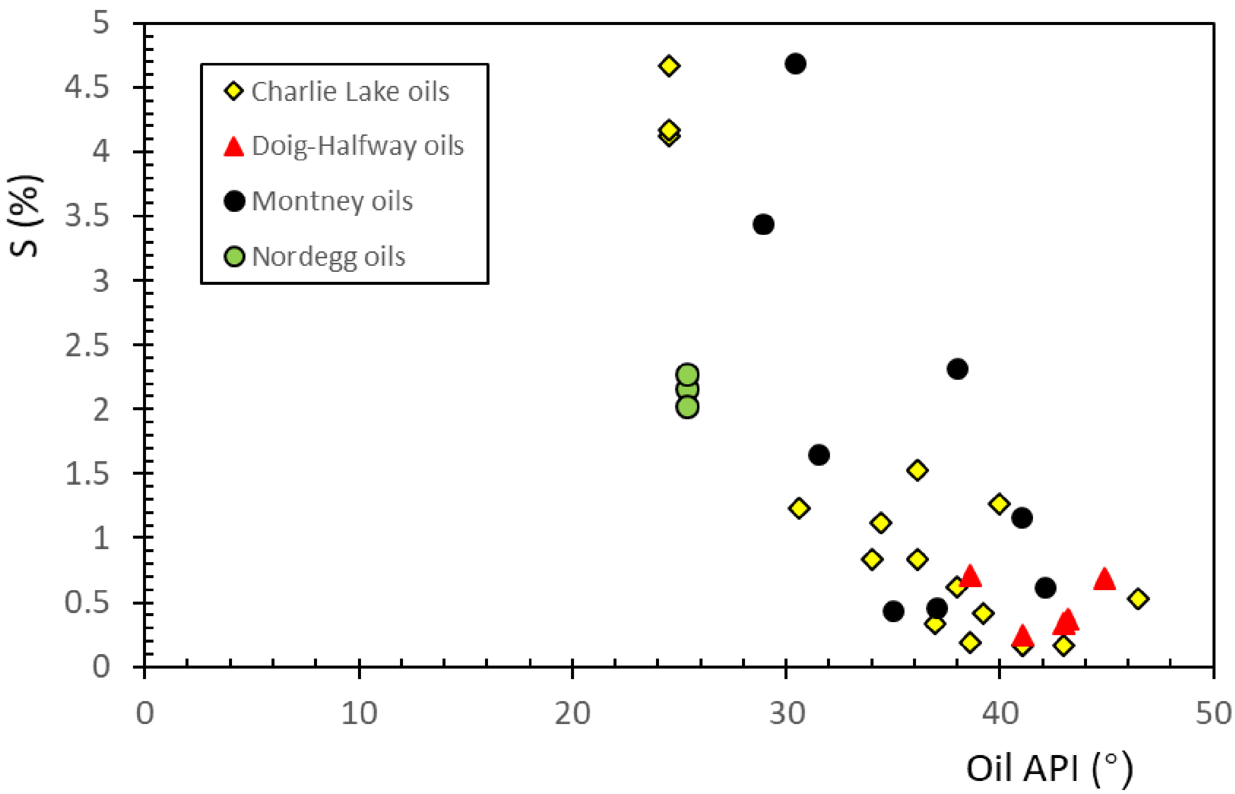

Figure 4-18 Crossplot of Oil API and sulfur content shows the lower oil API gravity, the higher the sulfur content for Triassic oils

Table 4-8 Bulk properties of Triassic oils

Map No.	Lab Id	UWI	Unit	Sulfur (%)	δ ^{13}C (saturate)	API	Pr/Ph	RES_ASPH %	SAT %	AROM %	SAT /AROM
O_{19}	L01281	4-6-85-17W6	Charlie Lake	0.84		34	0.92	6.08	56.76	36.01	1.58
O_{1}	L00803	6-15-84-8W6	Charlie Lake	4.67		24.51	0.71	16.49	21.25	45.42	0.47
O_{3}	L00926	6-8-77-5W6	Charlie Lake	0.62		37.96	1.08	6.87	57.23	34.39	1.66
O_{4}	L00927	6-6-85-17W6	Charlie Lake				1.27	8.34	53.89	35.51	1.52
O_{6}	L00931	16-8-77-5W5	Charlie Lake			36.15	0.51	17.33	26.64	53.68	0.5
O_{7}	L01141	7-6-86-13W6	Charlie Lake	0.83	-31	36.15	1	13.23	52.24	34.33	1.52
O_{10}	L01156	16-31-72-8W6	Charlie Lake	0.42		39.2	1.06	5.78	66.28	26.38	2.51
O_{11}	L01157	16-20-72-8W6	Charlie Lake				1.31	2.98	69.42	23.82	2.91
O_{15}	L01187	8-6-73-8W6	Charlie Lake			38.37	1.18	5.49	65.6	27.62	2.38
O_{20}	L01287	8-15-72-3W6	Charlie Lake			30.58	0.87	5.33	43.47	31.46	1.38
O_{23}	L03258	6-23-84-8W6	Charlie Lake	4.12	-30.5	24.51					
O_{24}	L03266	6-15-84-8W6	Charlie Lake	4.17	-30.4	24.51					
O_{25}	L03273	6-33-87-23W6	Charlie Lake	0.69							
O_{26}	L03339	10-30-68-6W6	Charlie Lake	0.17	-31.3	41.06	1.23	3.89	79.35	16.24	4.88
O_{27}	L03342	3-14-83-18W6	Charlie Lake	0.34							
O_{29}	L03393	15-35-87-7W6	Charlie Lake	1.53		36.15					
O_{31}	L03453	1-23-68-4W6	Charlie Lake	0.53	-31.2	46.49	1.05	3.23	79.22	17.13	4.62
O_{32}	L03456	5-30-71-6W6	Charlie Lake	0.17		41.06					
O_{33}	L03468	6-28-71-9W6	Charlie Lake	0.19	-31.3	38.57	0.93	7.25	65.56	26.88	2.44
O_{34}	L03542	7-16-84-20W6	Charlie Lake	0.21							
O_{35}	L03545	7-16-72-7W6	Charlie Lake	0.34		36.95					
O_{39}	L04065	14-12-75-3W6	Charlie Lake	1.27		40	1.16	12.8	46.35	37.52	1.24
O_{41}	L04069	2-21-72-3W6	Charlie Lake	1.23		30.6	0.94	8.09	50.83	38.22	1.33
O_{43}	L04071	14-15-72-3W6	Charlie Lake	1.12		34.4	1	12.89	41.93	41.23	1.02
O_{49}	L04092	16-6-73-0W6	Charlie Lake	0.16	-31.3	43	1.13	6.5	57.91	33.94	1.71
O_{57}	L04881	7-17-77-7W6	Charlie Lake	0.39	-30.1		1.21	3.71	62.42	29.71	2.1
O_{58}	L04882	9-28-77-7W6	Charlie Lake	0.8	-30		1.18	3.42	66.43	27.08	2.45
O_{59}	L04883	6-4-78-7W6	Charlie Lake	0.58	-30.3		1.23	2.95	65.96	23.36	2.82
O_{60}	L04885	16-33-77-7W6	Charlie Lake	0.67	-30.1		0.99	6.76	67.03	25.5	2.63
O_{61}	L04886	3-3-78-7W6	Charlie Lake	0.73	-30.3		1.1	3.36	70.49	26.12	2.7
O_{2}	L00810	8-5-86-20W6	Doig	0.69	-31.6	44.9	1.05	1.09	57.16	17.23	3.32
O_{14}	L01186	16-28-72-8W6	Doig	0.33	-31.5	43	1.13	2.12	72.34	23.57	3.07
O_{18}	L01190	7-25-81-11W6	Doig	0.71		38.6	1.07	7.64	53.33	38.46	1.39
O_{28}	L03343	10-2-69-5W6	Doig	0.25		41.06	1.05	3.72	69.42	26.86	2.58
O_{5}	L00930	8-19-73-8W6	Halfway				1.28	2.21	74.16	21.72	3.41
O_{9}	L01155	16-31-72-8W6	Halfway	0.37		43.2	1.12	3.86	70.31	25.58	2.75
O_{12}	L01158	14-32-72-8W6	Halfway			44.93	1.13	3.31	67.29	26.6	2.53
O_{13}	L01185	14-22-72-8W6	Halfway				1.11	4	69.62	23.72	2.94
O_{16}	L01188	16-8-73-8W6	Halfway				1.19	2.11	73.66	21.43	3.44
O_{17}	L01189	7-22-78-9W6	Halfway			40.22	1.1	3.86	65.35	29.59	2.21
O_{56}	L04880	2-21-78-6W6	Halfway	0.44	-31.7		0.91	6.77	54.77	26.89	2.04

Table 4-8 Bulk properties of Triassic oils (continued)

Map No.	Lab Id	UWI	Unit	Sulfur	δ ^{13}C (saturate)	API	Pr/Ph	RES_ASPH %	SAT %	AROM %	SAT /AROM
O_8	L01142	10-20-62-20W5	Montney	0.62		42.12	0.88	2.91	69.11	26.62	2.6
O_{21}	L02867	4-27-75-9W6	Montney	0.46	-31.9	37	1.02	3.78	63.46	32.01	1.98
O_{22}	L02868	14-34-75-9W6	Montney	0.44	-33.5	35	0.94	3.32	62.2	32.29	1.93
O_{48}	L04091	4-20-75-10W6	Montney	0.46	-31.8		1.45	6.82	63.13	29.91	2.11
O_{50}	L04362	4-35-74-8W6	Montney	0.55	-33.1		1.25	2.11	64.03	24.22	2.64
O_{38}	L04057	16-6-86-1W6	Montney	3.45	-30.7	28.9	1.15	22.24	34.88	42.51	0.82
O_{40}	L04066	1-13-75-3W6	Montney	1.16		41	1.39	7.8	53.58	29.73	1.8
O_{42}	L04070	6-11-72-3W6	Montney	1.65		31.5	0.83	15.49	41.16	41.65	0.99
O_{46}	L04081	14-4-79-22W5	Montney	2.32	-29.4	38	1.4	20.14	42.04	33.62	1.25
O_{47}	L04086	9-6-76-20W5	Montney	4.69	-30.4	30.4	0.7	19.7	24.49	54.73	0.45
O_{51}	L04363	13-22-73-9W6	Montney	0.24	-30.6		1.61	9.88	17.59	38	0.46
O_{52}	L04364	11-33-73-9W6	Montney	0.45	-30.7		1.81	44.27	27.48	14.89	1.85
O_{53}	L04366	11-1-75-11W6	Montney	0.07	-30.4		1.03	37.34	26.58	34.18	0.78
O_{54}	L04367	2-27-74-11W6	Montney	0.29	-30.1		1.92	20.56	4.88	10.45	0.47
O_{55}	L04879	8-30-77-7W6	Montney	0.55	-32		1.43	2.3	70.66	19.69	3.59
O_{62}	L04960	16-3-78-11W6	Montney	0.13	-29.6						
O_{63}	L04981	8-1-60-20W5	Montney	0.23	-28.3						
O_{64}	L04982	15-26-59-20W5	Montney	0.21	-28.4						
O_{65}	L05026	13-3-80-17W6	Montney	0.01	-30.2						
O_{66}	L05027	8-9-80-17W6	Montney	0.01	-29.9						
O_{67}	L05028	4-10-80-17W6	Montney	0.01	-29.8						
O_{68}	L05029	12-3-80-17W6	Montney	0.01	-30.2						
O_{69}	L05038	2-14-78-11W6	Montney	0.06	-29.5						
O_{70}	L05039	13-20-78-12W6	Montney	0.15	-29.8						
O_{71}	L05040	14-34-78-12W6	Montney	0.04	-29.9						
O_{72}	L05041	2-13-78-12W6	Montney	0.13	-29.3						
O_{73}	L05042	11-35-78-12W6	Montney	0.11	-29.4						
O_{74}	L05043	4-9-70-8W6	Montney	0.33	-31.6						
O_{30}	L03426	4-11-63-25W5	Nordegg	2.16	-30.2	25.37					
O_{36}	L03556	1-3-63-25W5	Nordegg	2.03	-29.9	25.37					
O_{37}	L03560	1-3-63-25W5	Nordegg	2.28	-29.9	25.37					
O_{44}	L04073	1-8-89-6W6	Triassic				1.27	11.74	45.9	37.48	1.22
O_{45}	L04077	5-17-89-6W6	Triassic	2.78			1.44	13.43	43.12	37.04	1.16

4.3.2.2 Normal alkanes of oil samples

Whole-oil gas chromatograms show a full spectrum of n-alkanes from nC_{10} to nC_{30}^{+} for all samples (APPENDIX 4-1). The maximum peak heights for most of the samples based on whole oil chromatograms are in the range of nC_{10} to nC_{11} with high abundance of gasoline range hydrocarbons (nC_4-nC_8). The exceptions are sample L00803 whose highest peak is nC_{17} with depleted volatile components and sample L04077, which shows bimodal distribution and nC_{13} as its highest peak (Figure 4-19). In most samples, n-alkane abundance gradually decreases from nC_{11} to nC_{30}^{+} (Figure 4-20); however, in samples L02867, L02868, L04086 and L04092, abundances from nC_{10} to nC_{20} are similar (Figure 4-21).

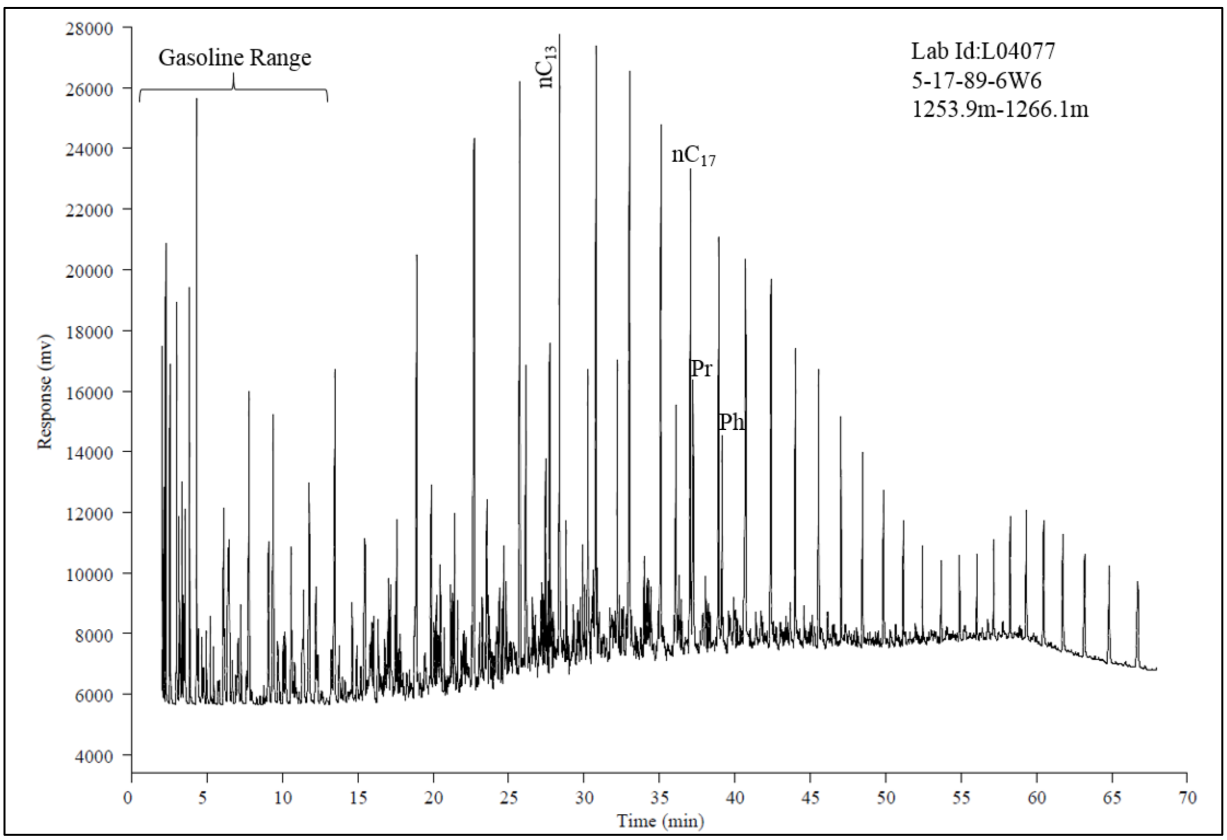

Figure 4-19 whole oil chromatogram of sample L04077 showing bimodal distribution and nC_{13} as its highest peak

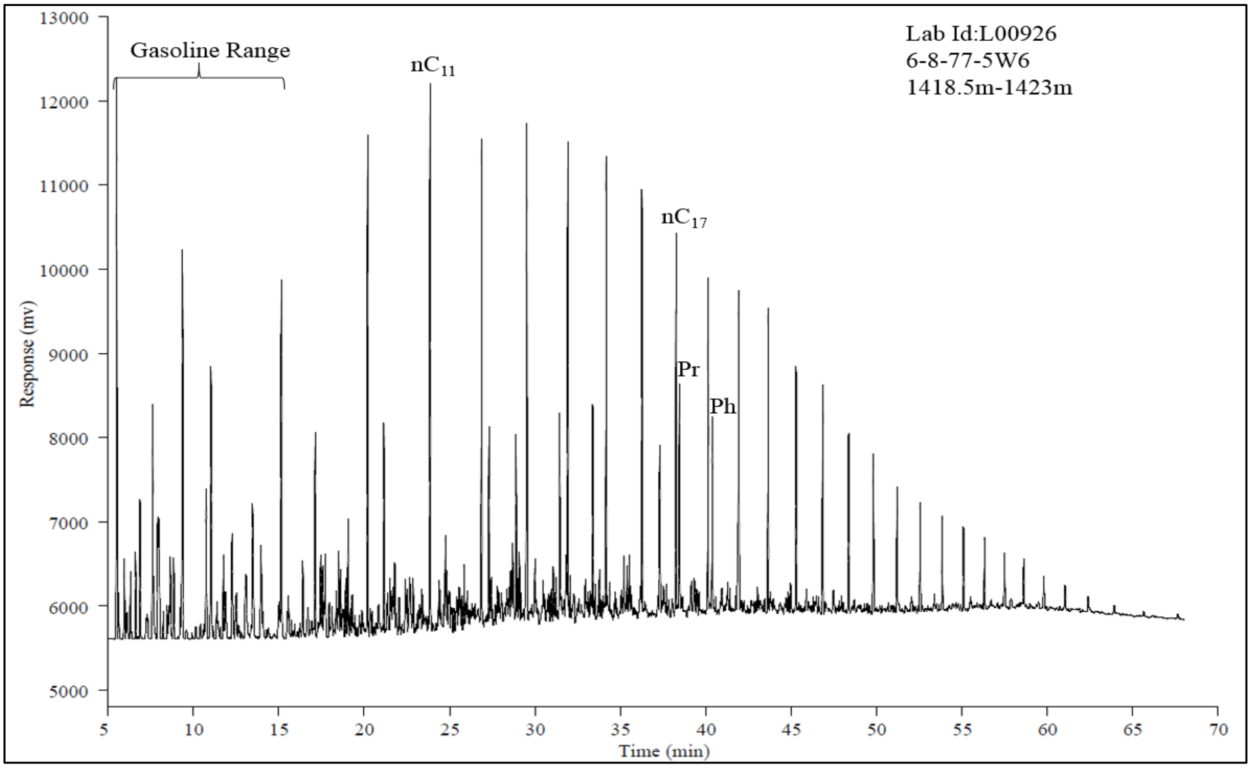

Figure 4-20 whole oil chromatogram of sample L00926 showing gradual decreasing abundance from nC_{11} to nC_{30}^{+}

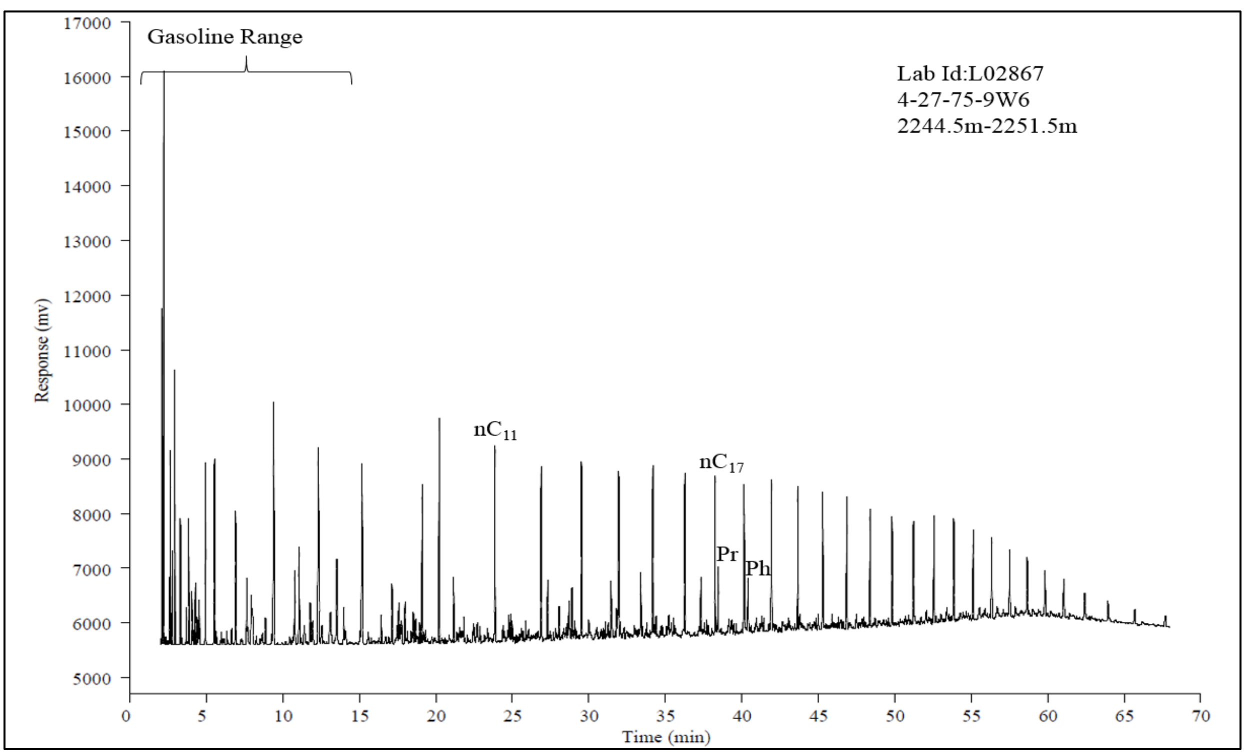

Figure 4-21 whole oil chromatogram of sample L02867 showing nC_{10} to nC_{20} tends to level off

Gas chromatograms of oil samples (saturate fraction) show a broad range of n-alkanes in the range of nC_{10}-nC_{30}^{+}. The abundance of compounds generally decreases from nC_{13}-$nC1_{6}$ to nC_{30}^{+}, with highest peak around nC_{13} (Figure 4-22), though the saturate fraction chromatogram of some samples (like sample L02868) shows symmetrical n-alkane distributions (Figure 4-23), and with highest peaks in the range of nC_{19}-nC_{21}.

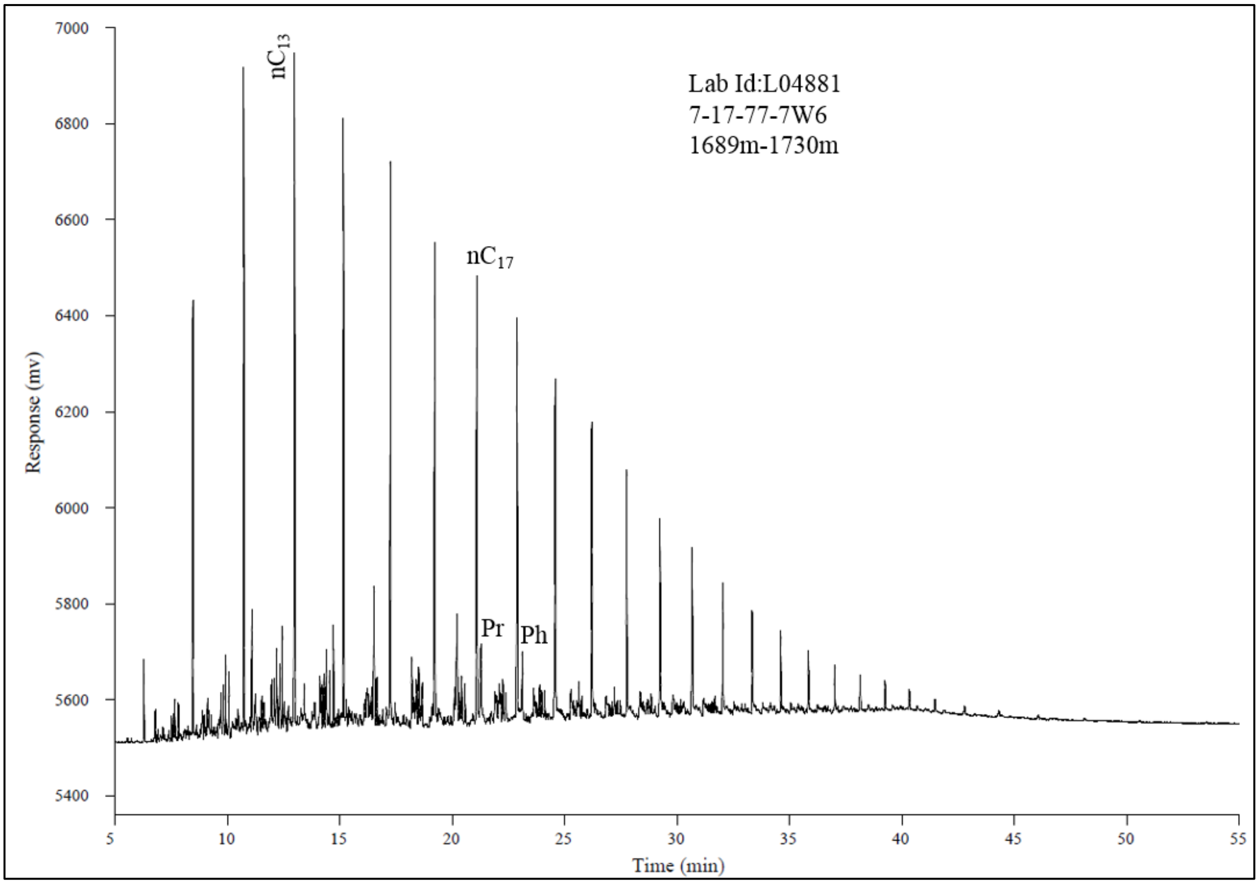

Figure 4-22 Gas chromatogram sample L04881 (saturate fraction) showing general abundance decrease from nC_{13} to nC_{30}^{+}, with highest peak around nC_{13}

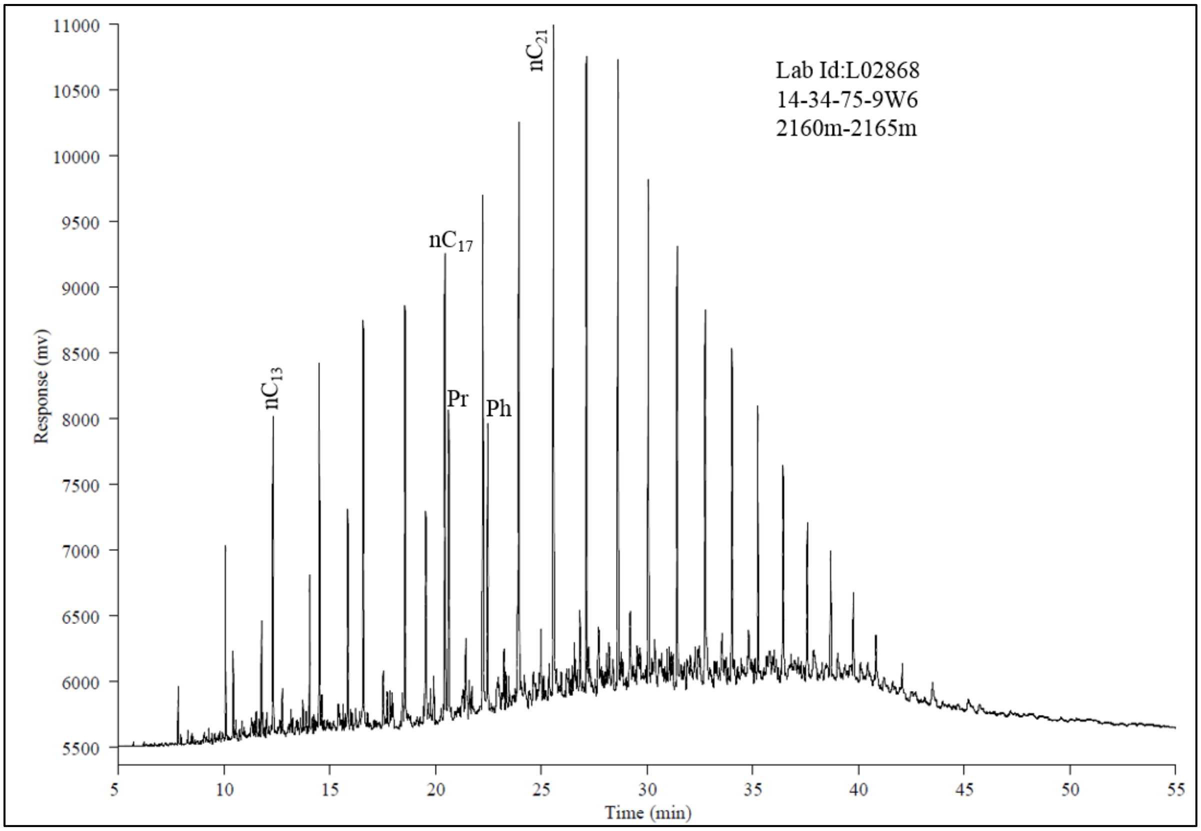

Figure 4-23 Gas chromatogram sample L02868 (saturate fraction) showing symmetrical n-alkane distribution with highest peak of nC_{21}

4.3.2.3 Biomarker composition of oil samples

Biomarker analyses of the oil samples are similar to biomarker analyses of source rock extracts. Procedures for identification of biomarker compounds is identical to that described in 4.2.6, and biomarker parameters are listed in Table 4-7.

Twenty samples show a predominance of tricyclic terpanes versus regular hopanes (Figure 4-24), including 8 samples from Charlie Lake Formation (L03339, L03468, L04092, L01156, L01157, L01187, L01281, L03453), 8 samples from Doig-Halfway Formation (L00810, L01155, L01158, L01185, L01186, L01188, L00930, L03343) and 4 samples from Montney Formation (L02867, L02868, L04879, L01142). Sample locations are in Figure 4-1 and Table 4-2.

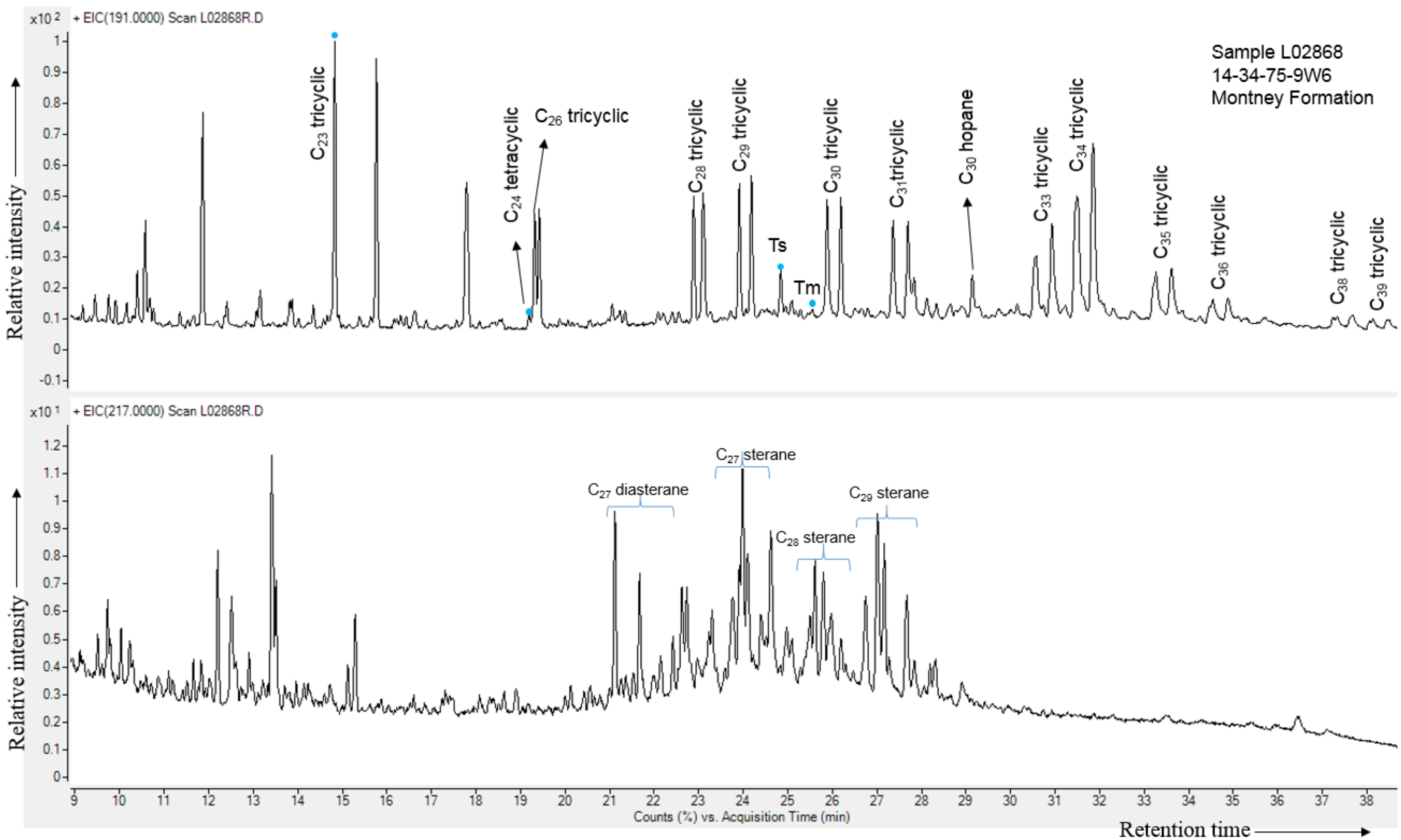

Figure 4-24 M/z 191 and M/z 217 mass framentograms showing a relative dominance of tricyclic terpanes in comparison to the regular hopanes with relatively a high Diasterane/sterane ratio with low hopane/tricyclic terpane ratio and C_{35}/C_{34} homohopane ratio of less than 1

The hopane/sterane ratio for these samples is in the range of 0.11 to 1.15, with hopane/tricyclic terpane ratio of 0.05 to 0.45 (Figure 4-25). C_{35}/C_{34} homohopane ratios are between 0.18 and 1.98, but cannot be determined in sample L00810, L02867, L02868, L03339, L03468, L04092, L04879, L01157, L01185, L01186, L01188, L03343 and L03453 due to depletion of homohopanes. C_{23} tricyclic terpane/C_{30} hopane ratios are between 0.63 and 11.51 (Figure 4-26). The C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios are between 0.09 and 1.45. C_{29} hopane/C_{30} hopane ratios are in the range of 0.31-1.2, but the ratio cannot be determined in sample L00810, L02867, L02868, L03339, L03468, L04879 and L03343 due to low abundance of C_{29} hopanes (Figure 4-27). ETR are in the range of 3.16 to 12.29 and diasterane/regular sterane ratios are in the range of 0.39 to 1.76 (Figure 4-28), except for 20.34 in sample L00810. Ts/Tm ratios are in the range of 0.78 to 10.27.

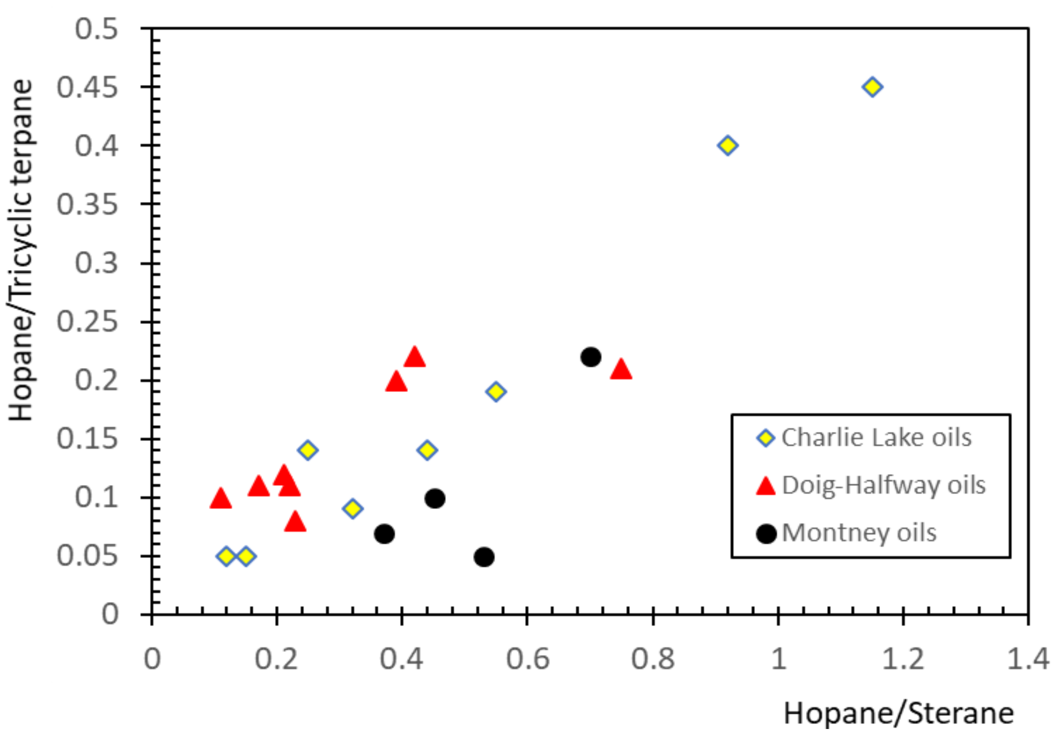

Figure 4-25 Crossplot of hopane/sterane ratio and hopane/ tricyclic terpane ratio for oil with predominance of tricyclic terpanes

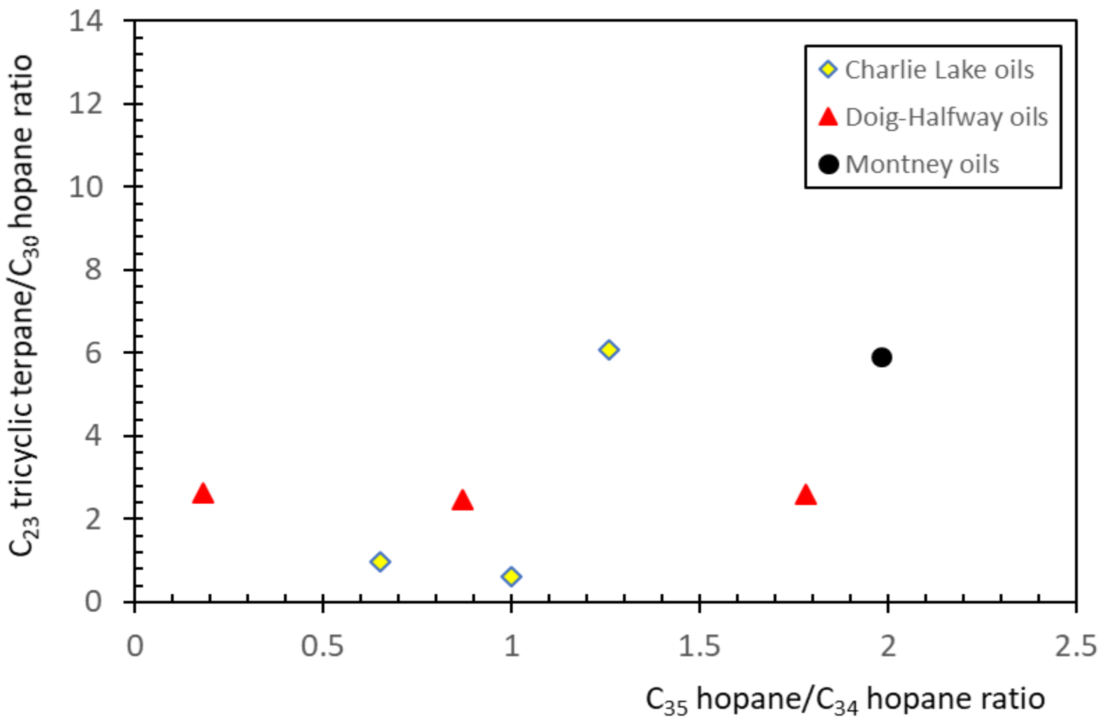

Figure 4-26 Crossplot of C_{35}/C_{34} homohopane ratios and C_{23} tricyclic terpane/C_{30} hopane ratios for oil with predominance of tricyclic terpanes

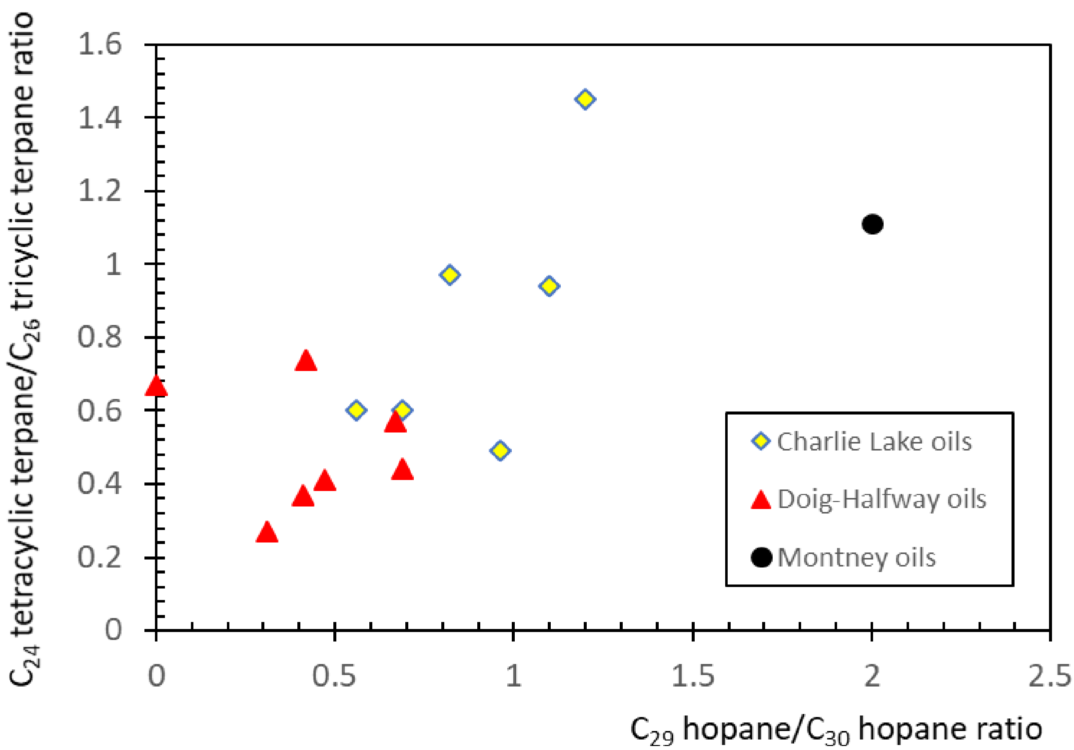

Figure 4-27 Crossplot of C_{29} hopane/C_{30} hopane ratios and C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios for oils with predominance of tricyclic terpanes

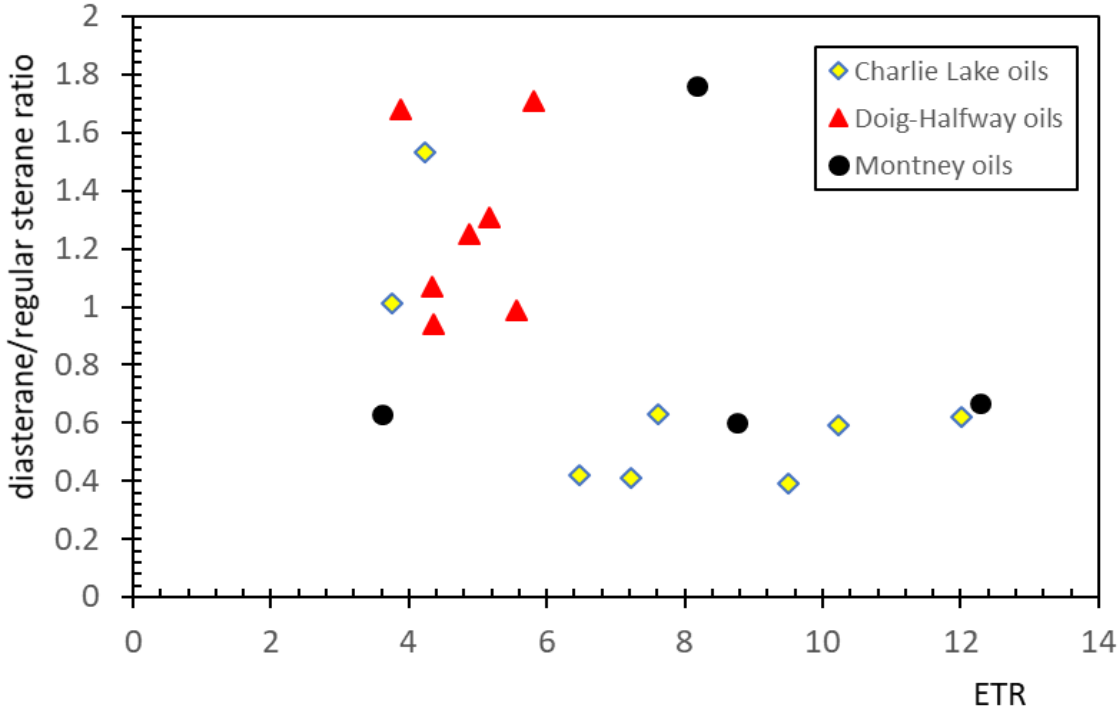

Figure 4-28 Crossplot of ETR and Diasterane/regular sterane ratios for oils with predominance of tricyclic terpanes

Eleven oil samples show a dominance or equivalent abundance of tricyclic terpanes in comparison to the regular hopanes (Figure 4-29), in which 8 samples are from Charlie Lake Formation (L00926, L00927, L01141, L04881-04883, L04885, L04886) and 3 samples are from Doig-Halfway Formation (L01189, L01190, L04880). Sample locations are in Figure 4-1 and Table 4-2.

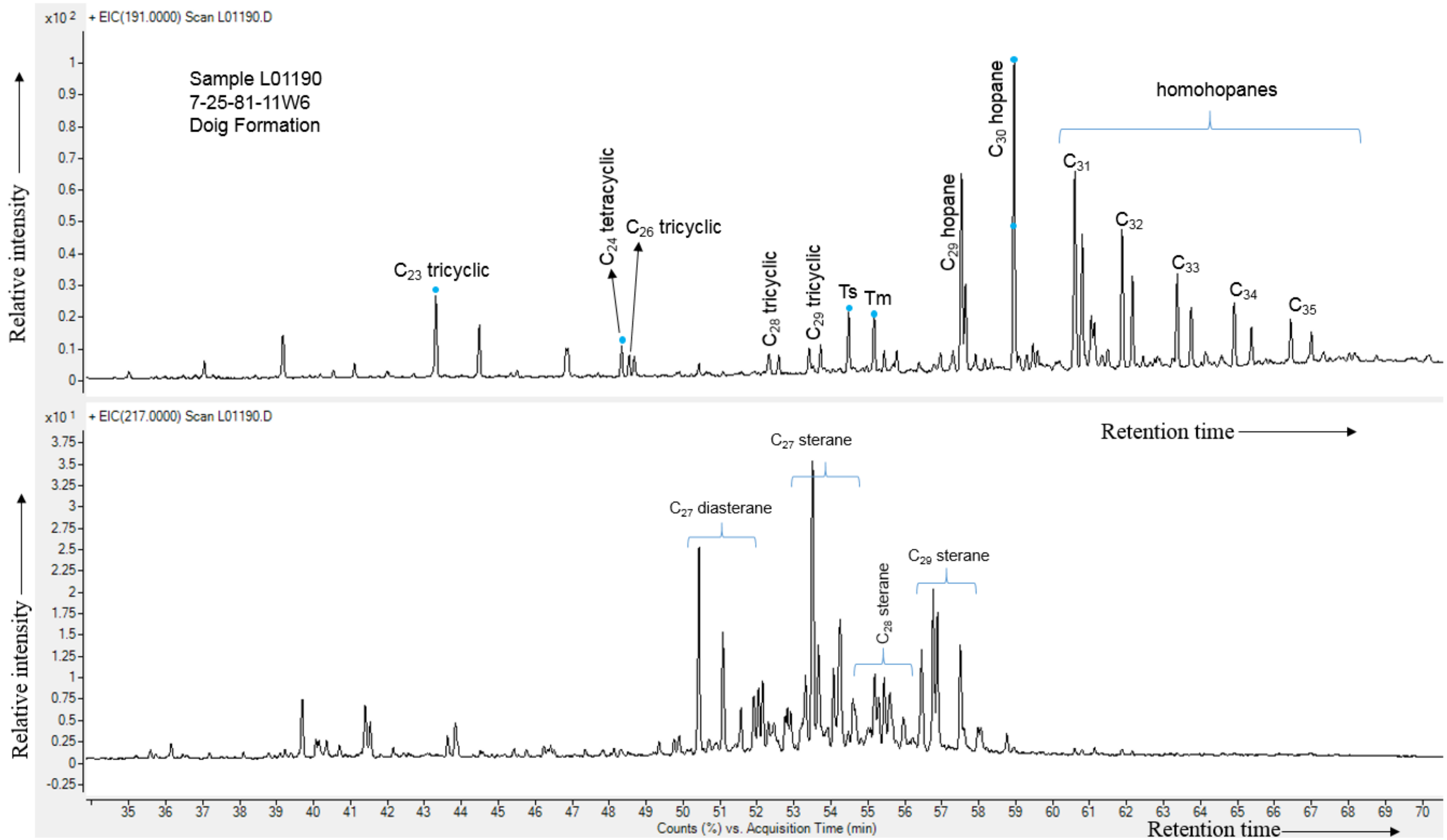

Figure 4-29 M/z 191 and M/z 217 mass framentograms showing a dominance of hopanes in comparison to the tricyclic terpanes with a relatively high Diasterane/sterane ratio and C_{35}/C_{34} homohopane ratio of less than1

Hopane/sterane ratio for these samples is in the range of 0.97 to 3.97, with hopane/tricyclic terpane ratio of 0.58 to 4.2 (Figure 4-30). C_{35}/C_{34} homohopane ratios are between 0.59 and 1.01, and C_{23} tricyclic terpane/C_{30} hopane ratios are between 0.2 and 1.03(Figure 4-31). The C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios are between 0.75 and 2.2. C_{29} hopane/C_{30} hopane ratios are in the range of 0.33-1.79(Figure 4-32). ETRs are in the range of 1.26 to 4.32, and diasterane/regular sterane ratios are in the range of 0.23 to 1.14 (Figure 4-33). Ts/Tm ratios are in the range of 0.47 to 2.55.

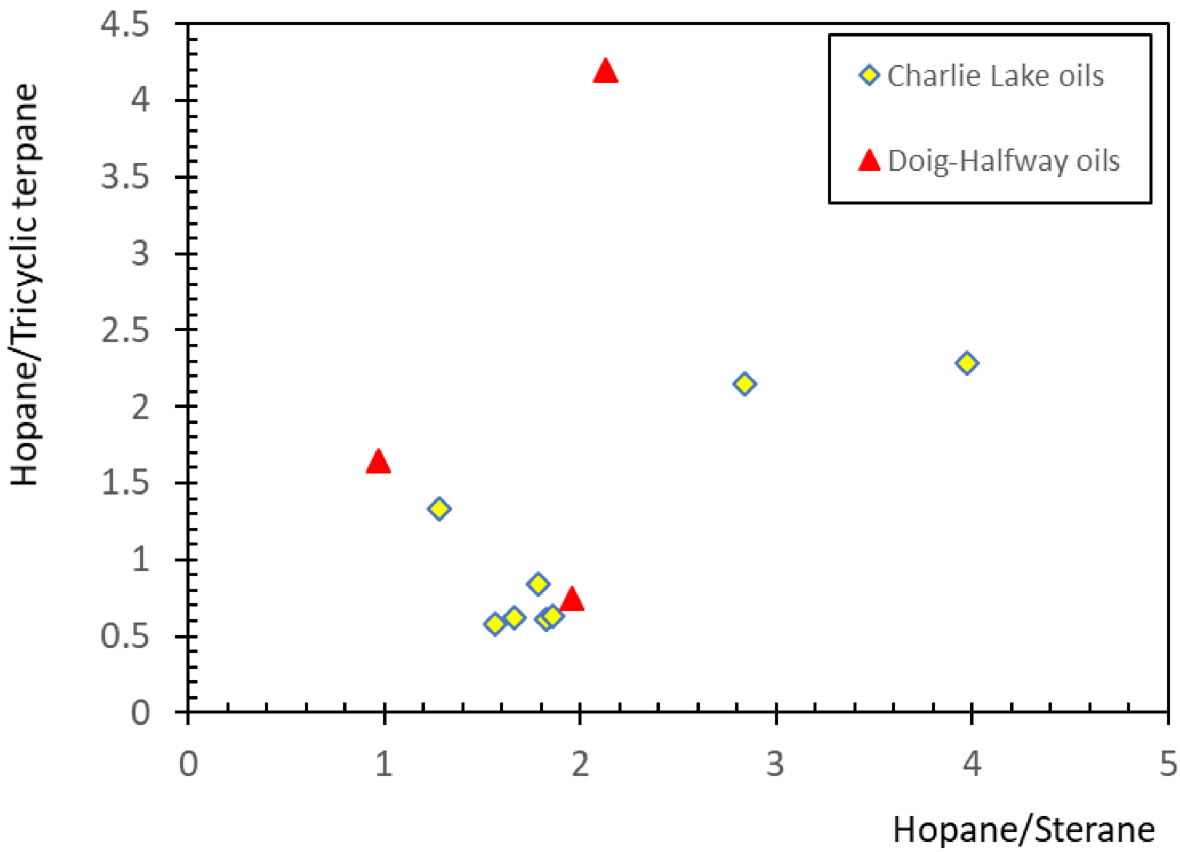

Figure 4-30 Crossplot of hopane/sterane ratio and hopane/ tricyclic terpane ratio for oil show a dominance or equivalent abundance of tricyclic terpanes in comparison to the regular hopanes

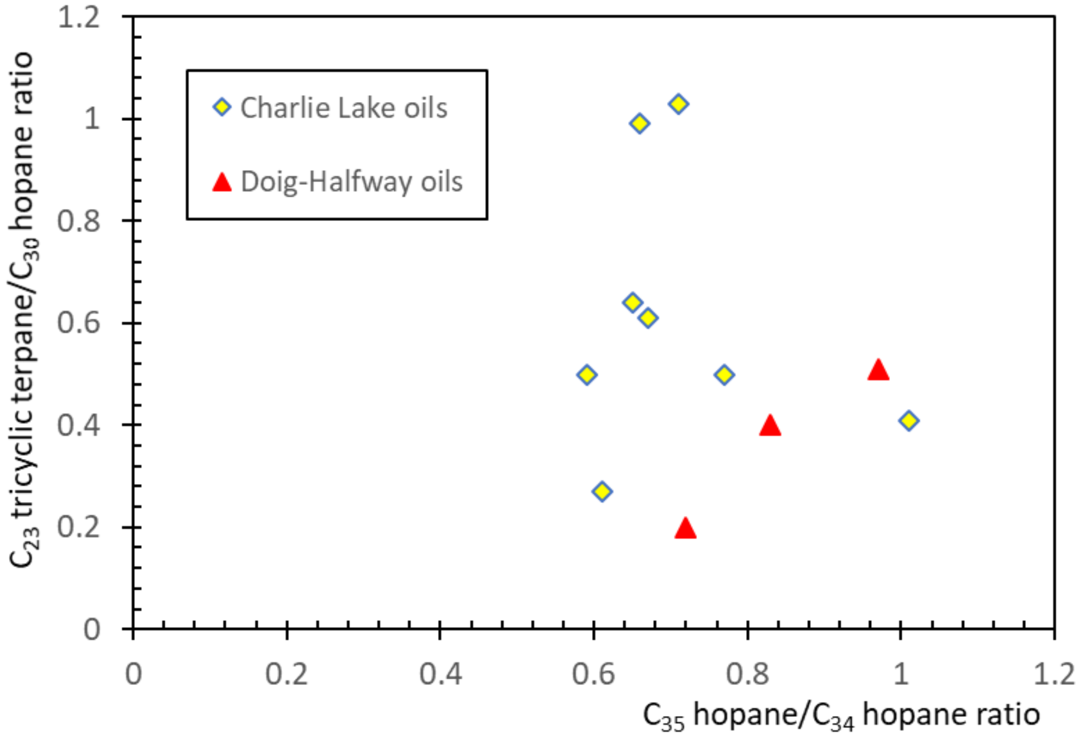

Figure 4-31 Crossplot of C_{35}/C_{34} homohopane ratios and C_{23} tricyclic terpane/C_{30} hopane ratios for oils show a dominance or equivalent abundance of tricyclic terpanes in comparison to the regular hopanes

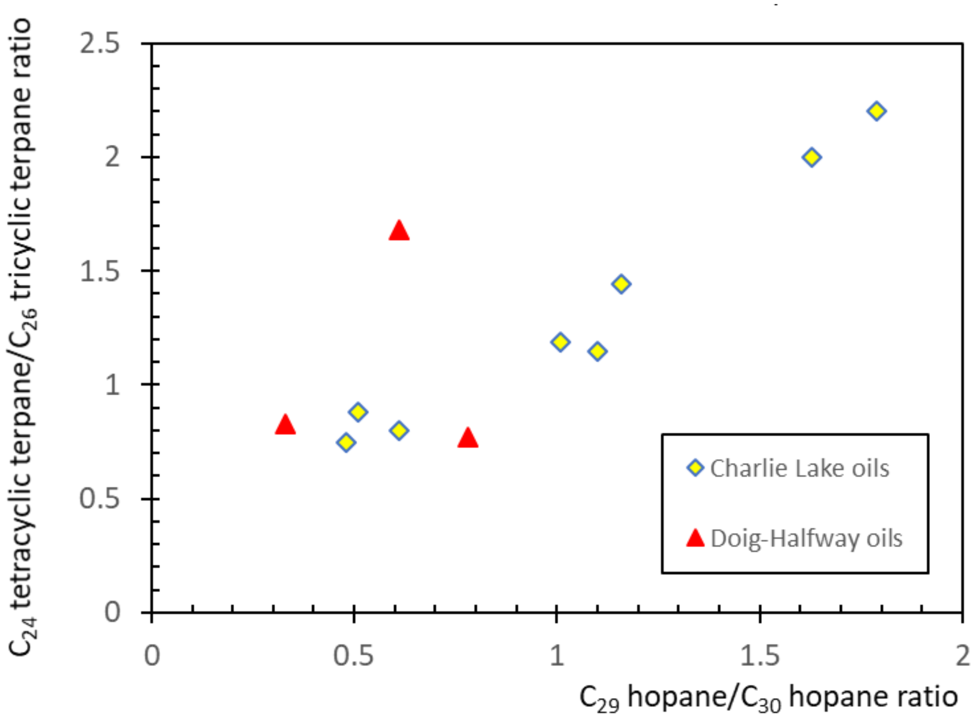

Figure 4-32 Crossplot of C_{29} hopane/C_{30} hopane ratios and C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios for oils show a dominance or equivalent abundance of tricyclic terpanes to the regular hopanes

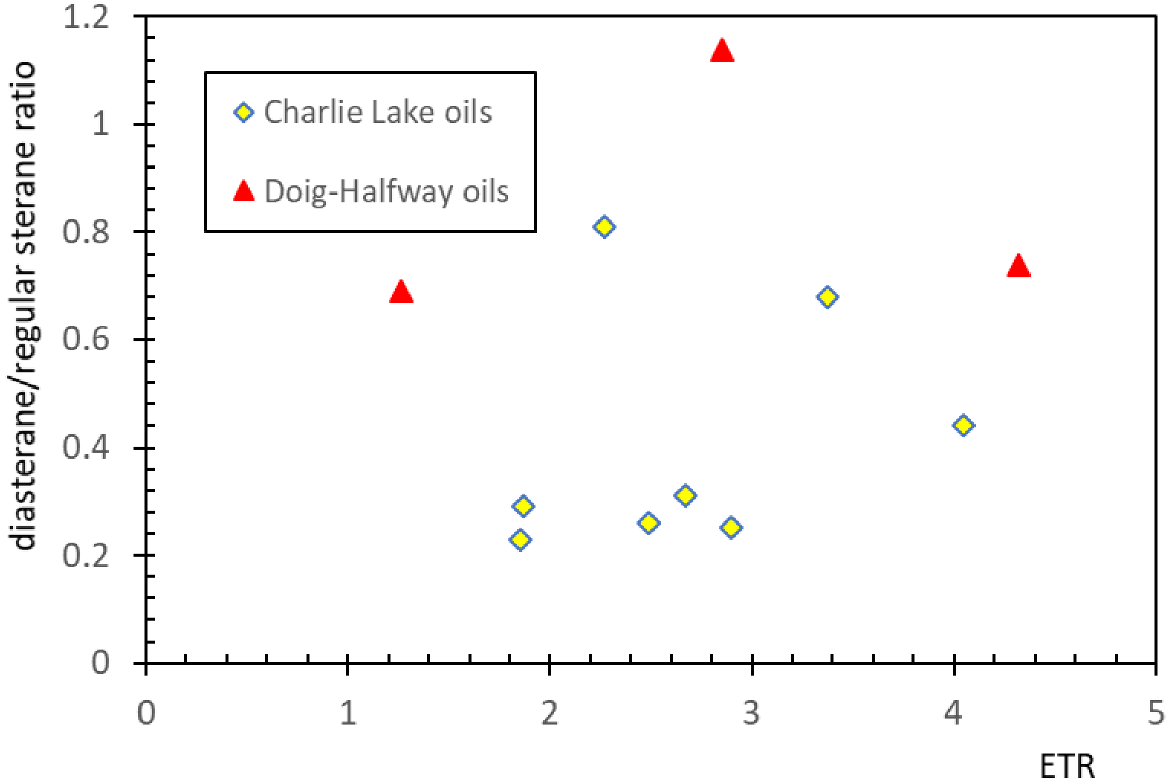

Figure 4-33 Crossplot of ETR and Diasterane/regular sterane ratios for oils show a dominance or equivalent abundance of tricyclic terpanes to the regular hopanes

Fourteen samples show a high homohopane index (usually C_{35}/C_{34} homohopane greater than 1) and lower diasterane/regular sterane ratio (Figure 4-34), in which 6 samples are from Charlie Lake Formation (L00803, L00931, L01287, L04065, L04069, L04071), 5 samples are from Montney Formation (L04081, L04086, L04057, L04066, L04070), 1 sample from Nordegg Member (L00952) and 2 samples from Triassic formations (specific formation undetermined) (L04073, L04077). Sample locations are in Figure 4-1 and Table 4-2.

The C_{29} ααα (20S)/(20S+20R) and C_{29} αββ/(αββ+ααα) for all the oil samples are in the range of 0.32-.0.66 and 0.44-0.66 respectively.

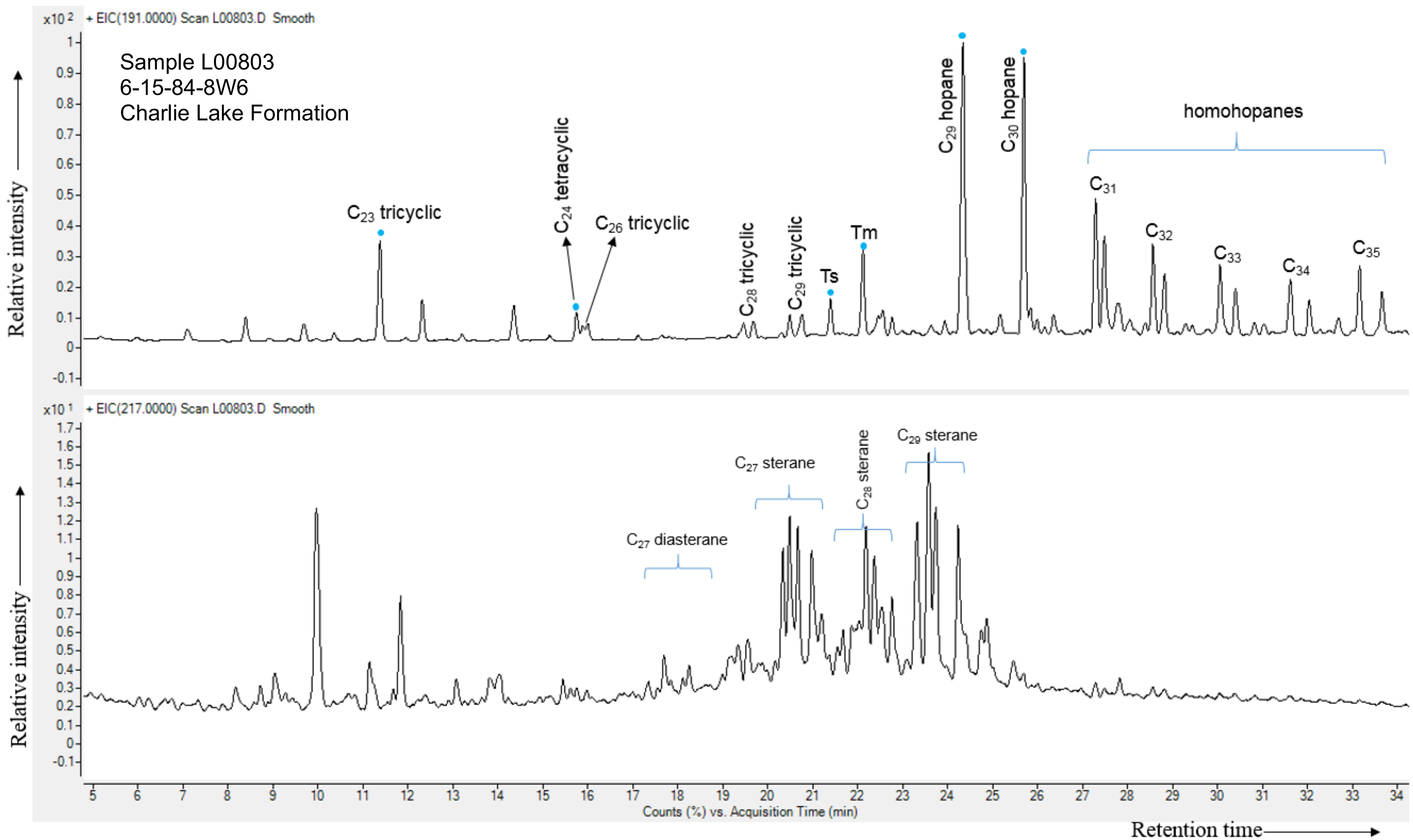

Figure 4-34 M/z 191 and M/z 217 mass framentograms showing a dominance of hopanes in comparison to the tricyclic terpanes with a relatively low diasterane/sterane ratio, a high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35}/C_{34} homohopane ratio of greater than1

Hopane/sterane ratio for these samples is in the range of 1.75 to 4.73, with hopane/tricyclic terpane ratio of 1.07 to 4.36 (Figure 4-35). C_{35}/C_{34} homohopane ratios are between 0.9 and 1.66, and C_{23} tricyclic terpane/C_{30} hopane ratios are between 0.16 and 0.75 (Figure 4-36). The C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios are between 0.53 and 2.33. C_{29} hopane/C_{30} hopane ratios are in the range of 0.75-1.56 (Figure 4-37). ETRs are in the range of 1.73 to 5.66, and diasterane/regular sterane ratios are in the range of 0 to 0.62 (Figure 4-38). Ts/Tm ratios are in the range of 0.32 to 0.83.

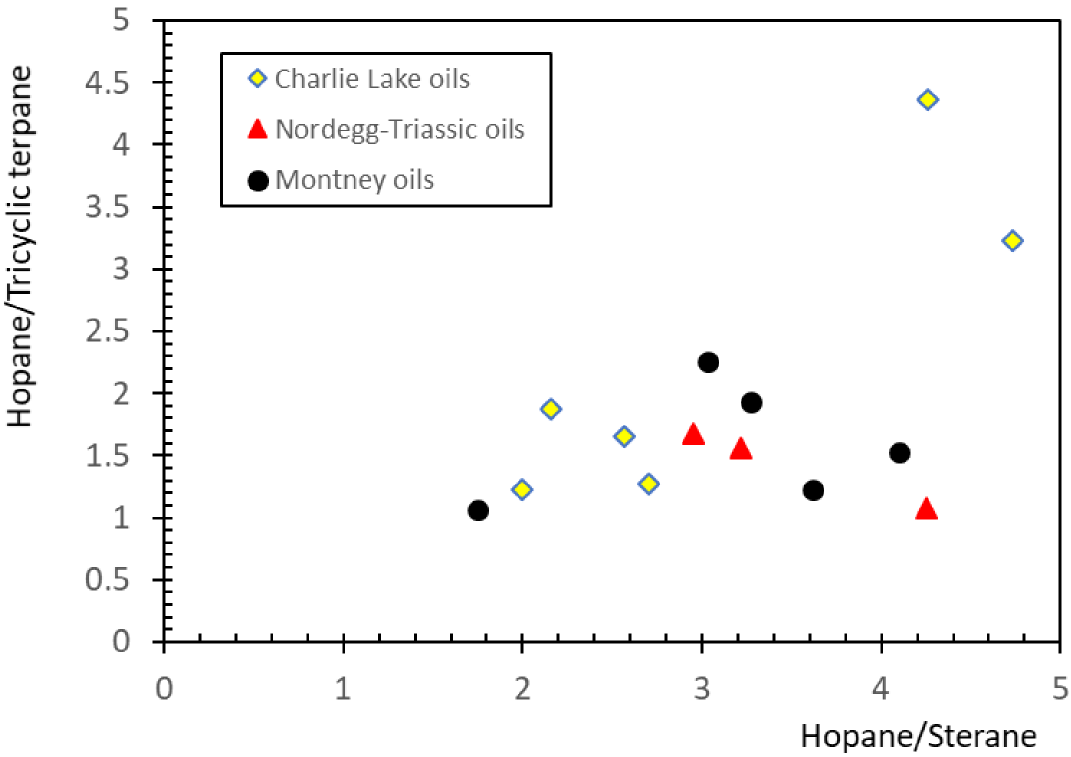

Figure 4-35 Crossplot of hopane/sterane ratio and hopane/ tricyclic terpane ratio for oils showing a dominance of hopanes in comparison to the tricyclic terpanes with a relatively low Diasterane/sterane ratio, a high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35}/C_{34} homohopane ratio of greater than1

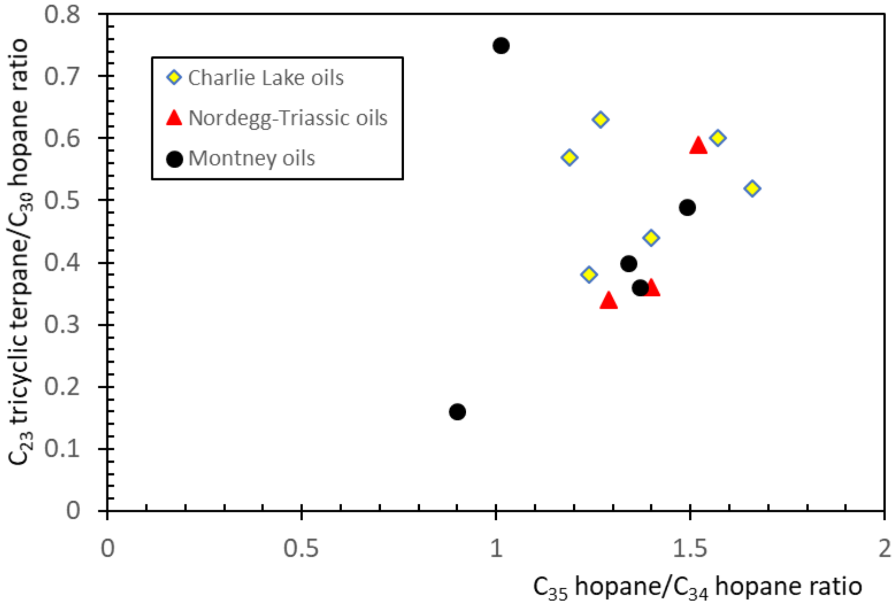

Figure 4-36 Crossplot of C_{35}/C_{34} homohopane ratios and C_{23} tricyclic terpane/C_{30} hopane ratios for oils showing a dominance of hopanes in comparison to the tricyclic terpanes with a relatively low Diasterane/sterane ratio, a high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35}/C_{34} homohopane ratio of greater than1

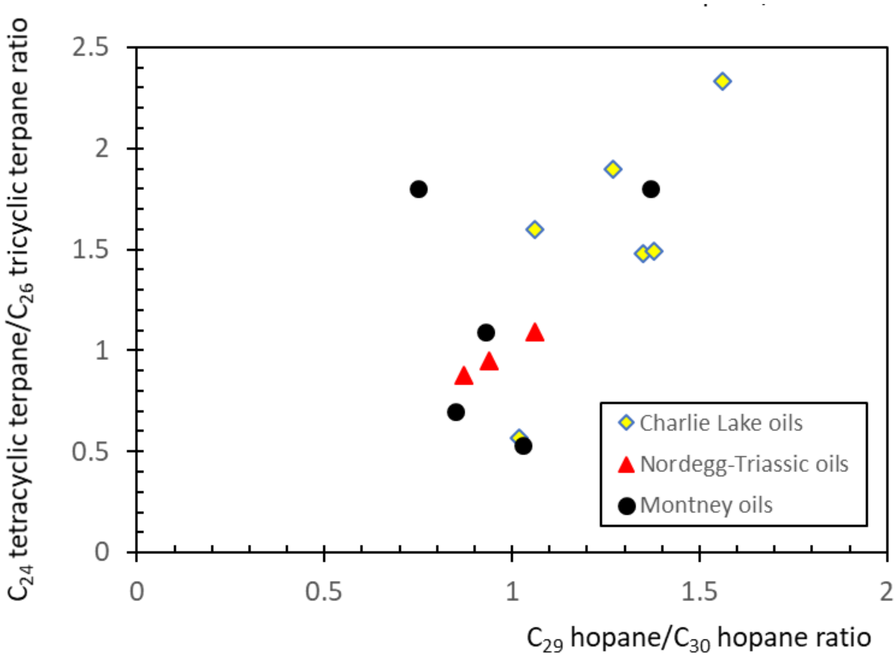

Figure 4-37 Crossplot of C_{29} hopane/C_{30} hopane ratios and C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios for oils showing a dominance of hopanes in comparison to the tricyclic terpanes with a relatively low Diasterane/sterane ratio, a high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35}/C_{34} homohopane ratio of greater than1

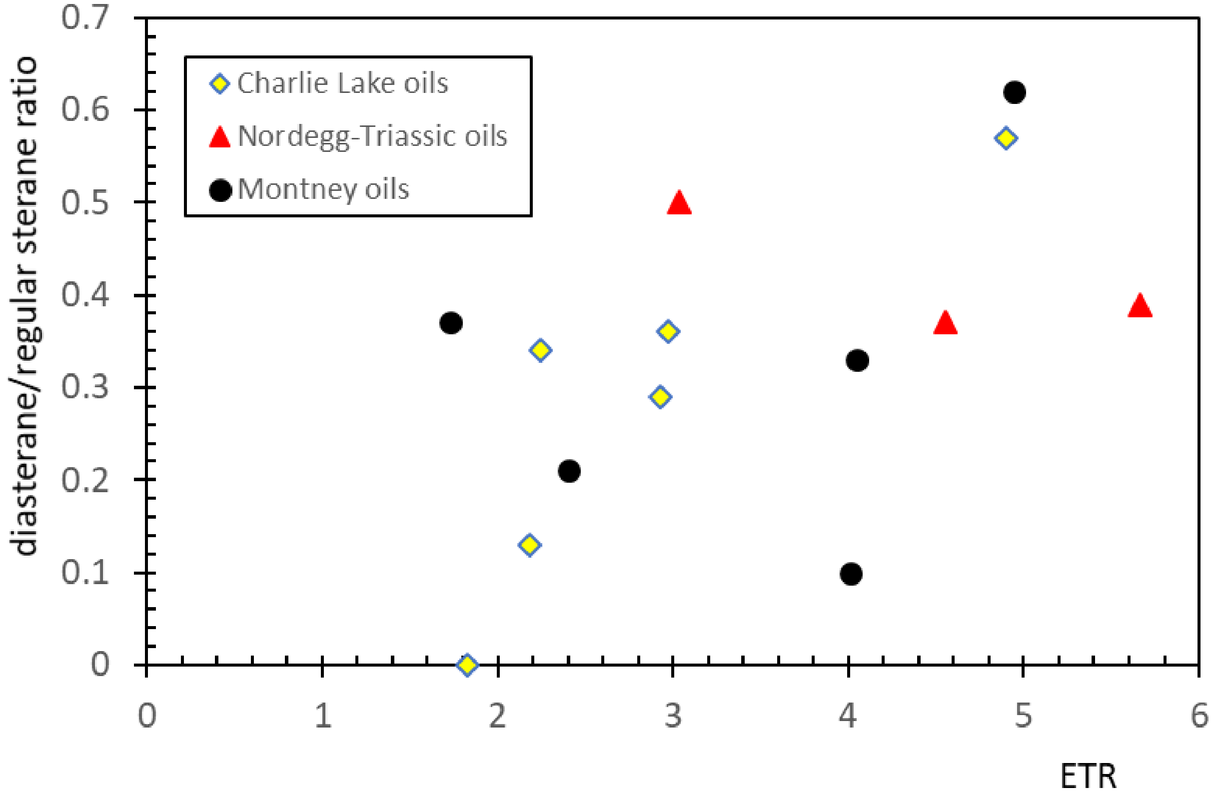

Figure 4-38 Crossplot of ETR and Diasterane/regular sterane ratios for oils showing a dominance of hopanes in comparison to the tricyclic terpanes with a relatively low Diasterane/sterane ratio, a high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35}/C_{34} homohopane ratio of greater than1

Table 4-9 saturate biomarker parameters of Triassic oils in WCSB

Map No.	Lab ID	UWI	Unit	H/STER	H/T	DIA /REG	S /(S+R)	Bβ /(ββ+αα)	$C_{29}H$ /$C_{30}H$	$C_{23}T$ /$C_{30}H$	$C_{24}Te$ /$C_{26}T$	$C_{35}H$ /$C_{34}H$	C_{28}%	Ts/Tm	ETR
O_{19}	L01281	4-6-85-17W6	Charlie Lake	0.44	0.14	0.39	0.45	0.57	1.1	6.07	0.94	1.26	0.21	1.51	9.5
O_1	L00803	6-15-84-8W6	Charlie Lake	4.73	3.23	0.13	0.55	0.54	1.27	0.38	1.9	1.24	0.2	0.41	2.18
O_3	L00926	6-8-77-5W6	Charlie Lake	1.28	1.33	0.81	0.49	0.54	0.48	0.5	0.75	0.77	0.21	1.25	2.27
O_4	L00927	6-6-85-17W6	Charlie Lake	3.97	2.29	0.68	0.44	0.55	0.61	0.41	0.8	1.01	0.18	0.77	3.37
O_6	L00931	16-8-77-5W5	Charlie Lake	4.26	4.36	0	0.42	0.49	1.56	0.44	2.33	1.4	0.18	0.32	1.83
O_7	L01141	7-6-86-13W6	Charlie Lake	2.84	2.15	0.44	0.48	0.51	0.51	0.27	0.88	0.61	0.21	0.47	4.05
O_{10}	L01156	16-31-72-8W6	Charlie Lake	0.92	0.4	0.41	0.48	0.53	0.69	0.96	0.6	0.65	0.15	0.78	7.23
O_{11}	L01157	16-20-72-8W6	Charlie Lake	0.32	0.09	1.53	0.53	0.55	1.2	7.52	1.45		0.18	7.41	4.24
O_{15}	L01187	8-6-73-8W6	Charlie Lake	1.15	0.45	0.42	0.47	0.55	0.56	0.63	0.6	1	0.16	0.95	6.47
O_{20}	L01287	8-15-72-3W6	Charlie Lake	2.16	1.88	0.34	0.53	0.56	1.06	0.57	1.6	1.19	0.25	0.79	2.24
O_{26}	L03339	10-30-68-6W6	Charlie Lake	0.15	0.05	0.59	0.54	0.59		7.58	0.36		0.24	2.17	10.23
O_{31}	L03453	1-23-68-4W6	Charlie Lake	0.55	0.19	1.01	0.56	0.56	0.82	2.52	0.97		0.2	3.66	3.76
O_{33}	L03468	6-28-71-9W6	Charlie Lake	0.12	0.05	0.62	0.55	0.57		6.08	0.37		0.19	2.2	12.02
O_{39}	L04065	14-12-75-3W6	Charlie Lake	2	1.23	0.57	0.54	0.56	1.02	0.63	0.57	1.27	0.18	0.69	4.9
O_{41}	L04069	2-21-72-3W6	Charlie Lake	2.57	1.66	0.29	0.54	0.57	1.35	0.6	1.48	1.57	0.1	0.83	2.93
O_{43}	L04071	14-15-72-3W6	Charlie Lake	2.7	1.27	0.36	0.54	0.54	1.38	0.52	1.49	1.66	0.18	0.83	2.97
O_{49}	L04092	16-13-73-10W6	Charlie Lake	0.25	0.14	0.63	0.54	0.59	0.96	2.02	0.49		0.14	1.06	7.62
O_{57}	L04881	7-17-77-7W6	Charlie Lake	1.79	0.84	0.23	0.53	0.57	1.63	0.99	2	0.66	0.19	2.55	1.85
O_{58}	L04882	9-28-77-7W6	Charlie Lake	1.57	0.58	0.29	0.52	0.57	1.79	1.03	2.2	0.71	0.15	2.28	1.87
O_{59}	L04883	6-4-78-7W6	Charlie Lake	1.66	0.62	0.31	0.43	0.54	1.1	0.61	1.15	0.67	0.13	1.12	2.67
O_{60}	L04885	16-33-77-7W6	Charlie Lake	1.83	0.61	0.26	0.49	0.58	1.16	0.64	1.44	0.65	0.15	1.45	2.49
O_{61}	L04886	3-3-78-7W6	Charlie Lake	1.86	0.63	0.25	0.49	0.56	1.01	0.5	1.19	0.59	0.19	1.01	2.9
O_2	L00810	8-5-86-20W6	Doig	0.11	0.1	20.34	0.63	0.44		11.51	0.37		0.26	3.92	5.8
O_{14}	L01186	16-28-72-8W6	Doig	0.17	0.11	1.71	0.5	0.58	0.31	4.59	0.27		0.16	10.27	3.87
O_{18}	L01190	7-25-81-11W6	Doig	2.13	4.2	0.69	0.44	0.58	0.61	0.2	1.68	0.72	0.18	1.23	1.26
O_{28}	L03343	10-2-69-5W6	Doig	0.23	0.08	1.68	0.56	0.54	0	5.82	0.67		0.13	6.33	5.16

Table 4-9 saturate biomarker parameters of Triassic oils in WCSB (continued)

Map No.	Lab ID	UWI	Unit	H/STER	H/T	DIA /REG	S /(S+R)	Bβ /(ββ+αα)	$C_{29}H$ /$C_{30}H$	$C_{23}T$ /$C_{30}H$	$C_{24}Te$ /$C_{26}T$	$C_{35}H$ /$C_{34}H$	C_{28}%	Ts/Tm	ETR
O_{5}	L00930	8-19-73-8W6	Halfway	0.75	0.21	1.31	0.53	0.6	0.47	2.64	0.41	0.18	0.19	5.08	5.56
O_{9}	L01155	16-31-72-8W6	Halfway	0.39	0.2	0.99	0.51	0.58	0.69	2.61	0.44	1.78	0.16	3.55	4.36
O_{12}	L01158	14-32-72-8W6	Halfway	0.42	0.22	0.94	0.48	0.53	0.67	2.47	0.57	0.87	0.24	3.72	4.33
O_{13}	L01185	14-22-72-8W6	Halfway	0.22	0.11	1.07	0.53	0.59	0.41	2.47	0.37		0.15	6.23	4.88
O_{16}	L01188	16-8-73-8W6	Halfway	0.21	0.12	1.25	0.5	0.57	0.42	2.09	0.74		0.12	5.31	4.96
O_{17}	L01189	7-22-78-9W6	Halfway	0.97	1.65	1.14	0.32	0.66	0.33	0.4	0.83	0.83	0.08	2.52	2.85
O_{56}	L04880	2-21-78-6W6	Halfway	1.96	0.75	0.74	0.48	0.51	0.78	0.51	0.77	0.97	0.15	0.71	4.32
O_{8}	L01142	10-20-62-20W5	Montney	0.7	0.22	0.63	0.45	0.6	2	5.92	1.11	1.98	0.19		3.62
O_{21}	L02867	4-27-75-9W6	Montney	0.45	0.1	1.76	0.59	0.58		5.98	0.16		0.15	11.2	8.17
O_{22}	L02868	14-34-75-9W6	Montney	0.53	0.05	0.67	0.57	0.6		4.39	0.11		0.24	7.57	12.29
O_{38}	L04057	16-6-86-1W6	Montney	3.27	1.93	0.33	0.51	0.53	0.85	0.4	0.7	1.34	0.14	0.59	4.05
O_{40}	L04066	1-13-75-3W6	Montney	1.75	1.07	0.62	0.54	0.58	1.03	0.75	0.53	1.01	0.18	0.75	4.94
O_{42}	L04070	6-11-72-3W6	Montney	3.03	2.26	0.21	0.51	0.55	1.37	0.49	1.8	1.49	0.1	0.64	2.4
O_{46}	L04081	14-4-79-22W5	Montney	4.1	1.53	0.37	0.51	0.52	0.75	0.16	1.8	0.9	0.13	0.71	1.73
O_{47}	L04086	9-6-76-20W5	Montney	3.62	1.23	0.1	0.66	0.63	0.93	0.36	1.09	1.37	0.14	0.32	4.01
O_{55}	L04879	8-30-77-7W6	Montney	0.37	0.07	0.6	0.53	0.61		1.84	0.09		0.19	3.06	8.75
O_{75}	L00952	6-14-49-6W5	Nordegg	3.22	1.56	0.39	0.46	0.59	1.06	0.59	1.09	1.52	0.2	0.45	5.66
O_{44}	L04073	1-8-89-6W6	Triassic	2.95	1.68	0.5	0.52	0.58	0.94	0.34	0.95	1.29	0.15	0.72	3.03
O_{45}	L04077	5-17-89-6W6	Triassic	4.25	1.08	0.37	0.53	0.56	0.87	0.36	0.88	1.4	0.18	0.44	4.55

Notes: H/STER=hopane/sterane; H/T=hopane/tricyclic terpane; DIA/REG=C_{27} diasterane/C_{29} regular sterane; S/(S+R)=C_{29} ααα(20S)/(20S+20R); ββ/(ββ+αα)= C_{29} αββ/(αββ+ααα); $C_{29}H/C_{30}H$=C_{29} hopane/C_{30} hopane; $C_{23}T/C_{30}H$=C_{23} tricyclic terpane/C_{30} hopane; $C_{24}Te/C_{26}T$=C_{24} tetracyclic terpane/C_{26} tricyclic terpane; $C_{35}H/C_{34}H$=C_{35} homohopane/C_{34} homohopane; Ts/Tm=18α(H)-/17α(H)-trinorhopane; C_{28}%=C_{28} ααα(20R)/(C_{27} ααα(20R)+C_{28} ααα(20R)+ C_{29} ααα(20R)); ETR=(C_{28} tricyclic terpane+C_{29} tricyclic terpane)/Ts

4.4 Discussion

4.4.1 Organic Geochemistry of Source Rock Extracts

By visual inspection (Figure 4-4), the composition of source rock extracts from the Gordondale, Doig and Montney source rocks are distinctive. Source rock extracts of Montney Formation, Doig Formation and Gordondale Member can be distinguished by parameters including hopane/tricyclic terpane ratio (see Figure 4-9), C_{35} hopane/C_{34} hopane ratio (see Figure 4-10), C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio (see Figure 4-11) and extended terpane ratio (Figure 4-12). It is possible to study the rock extracts to learn the distinctive geochemical signatures of oils within the Triassic petroleum system.

4.4.1.1 Geochemical Signatures of Gordondale Source Rock Extracts

Gordondale extracts are named as Family A extracts and are characterized by a C_{35} homohopane index (C_{35}/C_{34} hopane ratio) greater than 1 (see Figure 4-10). In m/z 191 mass fragmentograms, C_{29} hopane is usually the highest peak and C_{24} tetracyclic terpane is higher than C_{26} tricyclic terpane peaks (see Figure 4-11), indicating more bacterial input (Peters et al., 2005). In m/z 217 mass fragmentograms, diasteranes are relatively low in comparison to regular steranes, with a diasterane/sterane ratio much less than 0.6 (Figure 4-12). All the above biomarker features indicate these hydrocarbons to be linked to anoxic depositional environment and carbonate source (Table 4-6, Hughes, 1984; Mello et al.,1986; ten Haven et al., 1988 Marynowski et al, 2000; Lu et al., 2009).

4.4.1.2 Geochemical Signatures of Doig Source Rock Extracts

Doig extracts are named as Family B extracts. These extracts display high abundances of diasteranes and relatively low C_{28} regular sterane (See Figure 4-12, 4-14). The abundance of C_{24} tetracyclic terpane is equivalent to that of C_{26} tricyclic terpane, and C_{30} hopane is usually the highest peak in m/z 191 mass framentograms. C_{35} homohopane index in Family B extracts is smaller than 1. Tricyclic terpane/ hopane ratio is usually low (see Figure 4-9), indicating more bacterial than algal input (Table 4-6), even for relatively high maturity extracts (X07258 with Tmax of 454°C). Doig belong to normal marine sediments with less algae input (Azzam et al., 2021), which partly explains lower abundance of C_{28} regular sterane in Doig extracts.

4.4.1.3 Geochemical Signatures of Montney Source Rock Extracts

Montney extracts are named as Family C extracts. These extracts have very low C_{24} tetracyclic terpane relative to C_{26} tricyclic terpane. Family C extracts, especially relatively high thermal maturity ones, contain a series of extended tricyclic terpanes from C_{30} to C_{44} and also no hopanes (see Figure 4-12, 4-15). The abundances of diasteranes in Family C extracts and Family B extracts are similar. Low abundance of C_{24} tetracyclic terpane and high abundance of extended tricyclic terpances indicates a clastic marine high-salinity and reducing depositional environment, possibly in a setting with marine upwelling (Huang et al., 2017; Hao et al., 2009; Azzam et al., 2021).

Low thermal maturity Montney extracts also contains hopanes, though their abundance is lower than that of Doig extracts. In this study, Ts/Tm ratio is used to indicate thermal maturity, though Ts/Tm ratio depends on both source and maturity (Moldwan et al., 1986; Farrimond et al., 1996, 1998). This ratio is most reliable as a maturity indicator when evaluating oils from a common source of consistent organic facies (Peters et al., 2005). It is observed, with increased thermal maturity (Ts/Tm), hopane/tricyclic terpane ratios decrease more rapidly in Montney extracts than in Doig extracts (Figure 4-39), and this answered why hopanes are depleted from Montney source hydrocarbons, at least in part. Studies show that both C_{24} tetracyclic terpane and hopanes are considered bacteria origin (Moldowan et al., 1986; Peters et al., 2005; Marynowski et al, 2000; Lu et al., 2009). Since the abundance of both C_{24} tetracyclic terpane and hopanes is very low in Montney deep basin, it is possible that Montney Formation is lack of source that can generate horpane series there, rather than depleted due to thermal maturation. The dominance of C_{30} hopane is an indicator of clay-rich source rocks (GÜRGEY, K., 1999), but the Montney Formation is mostly composed by fine siltstone with relatively little clay content (Vaisblat et al., 2021, 2022; Zonneveld and Moslow, 2018), which may also account for the depleted hopanes.

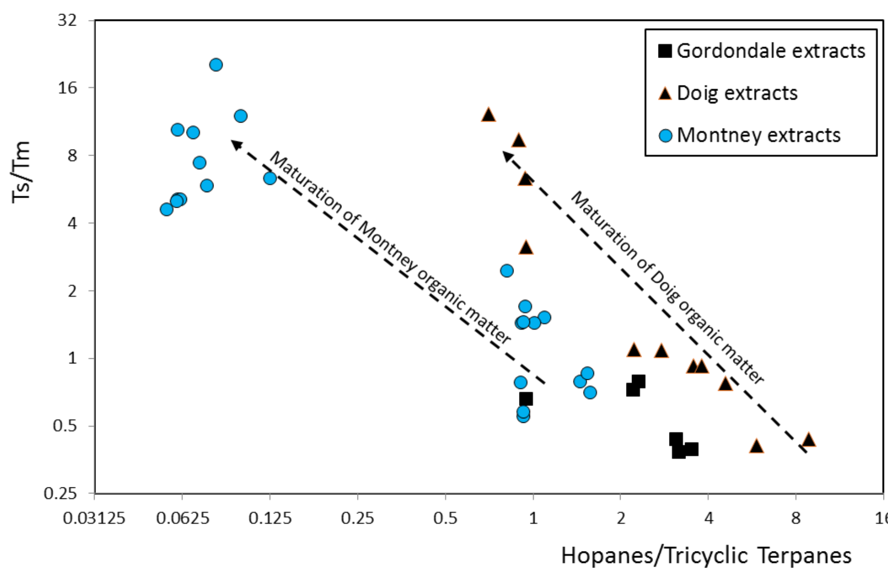

Figure 4-39 hopane/tricyclic terpane ratios decrease more rapidly in Montney extracts than in Doig extracts with increased thermal maturity

Low thermal mature Montney extracts can still be easily differentiated from Doig extracts by relatively higher extended tricyclic terpane ratios (Figure 4-40) and lower C_{24}

tetracyclic terpane/C_{26} tricyclic terpane ratio (Figure 4-41) in Montney extracts, regardless of the thermal maturity (Ts/Tm) of the extracts. The highest abundance of normal alkanes in Montney extracts (based on gas chromatograms of the saturated fraction) ranges from nC_{19}-nC_{23}, which is different from distribution in Doig and Gordondale extracts that peak in the range of nC_{12}-nC_{17} (Figure 4-42). The saturated fraction to aromatic fraction ratios (SAT/AROM) in most Montney extracts tends to be higher than that of Doig extracts, although the ratios of some Montney extracts are also as low as those in Doig extracts (Figure 4-43).

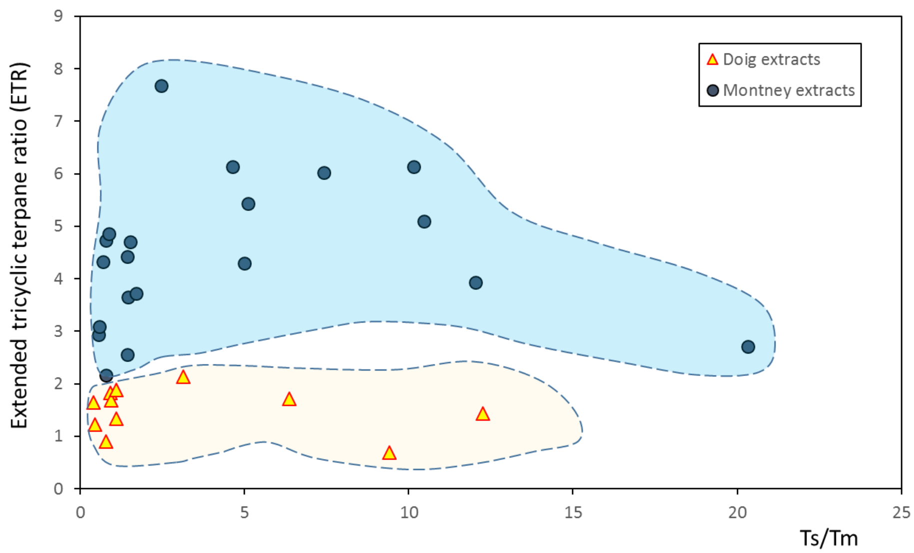

Figure 4-40 Montney extracts show higher extended tricyclic terpane ratio than that of Doig extracts regardless of thermal maturity of the extracts

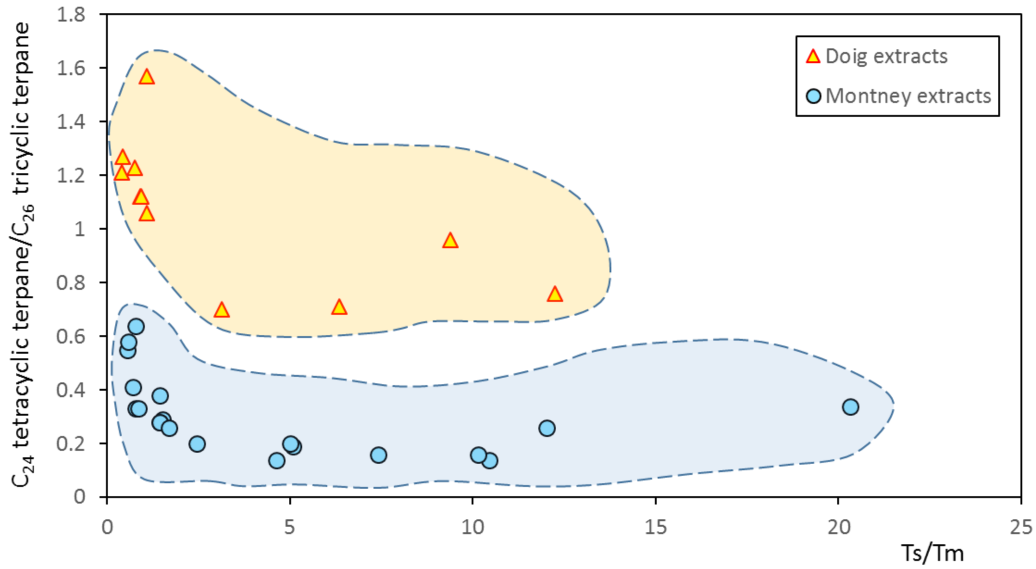

Figure 4-41 Montney extracts show lower C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio than that of Doig extracts regardless of thermal maturity of the extracts

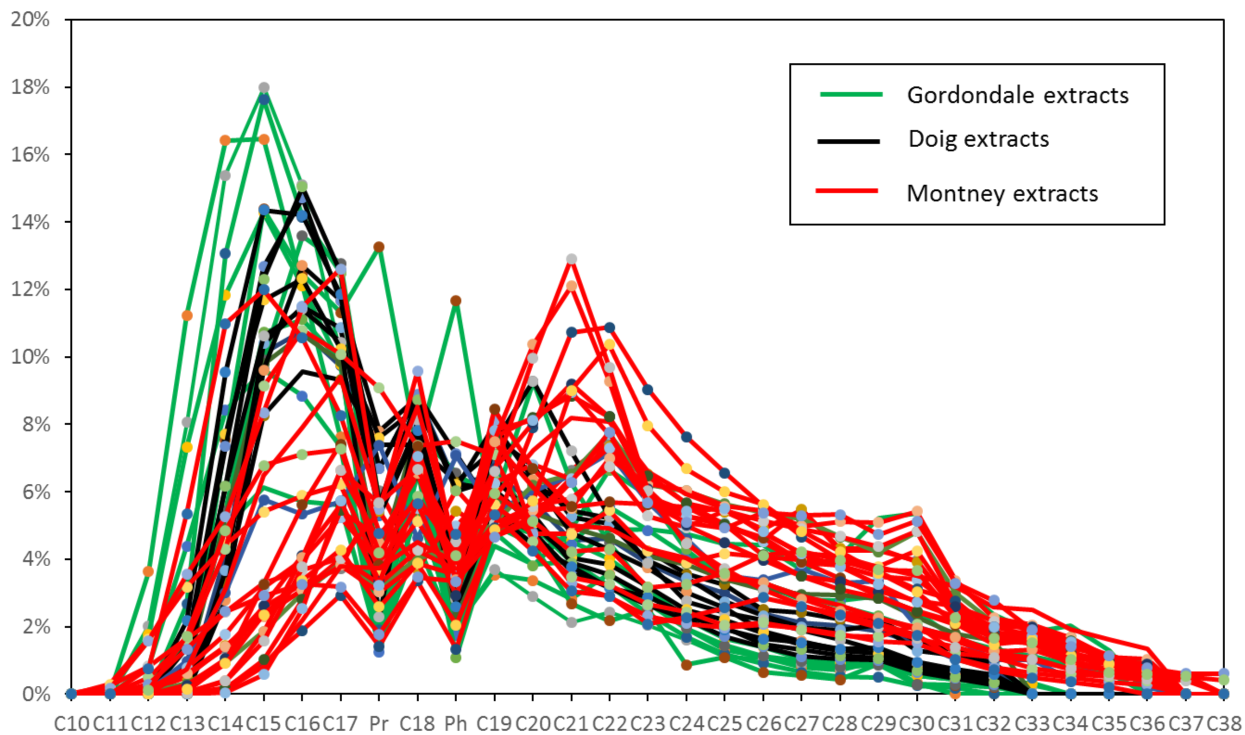

Figure 4-42 Gas chromatograms of saturated fraction suggest more high molecular normal alkanes in Montney extracts than in Doig or Gordondale extracts

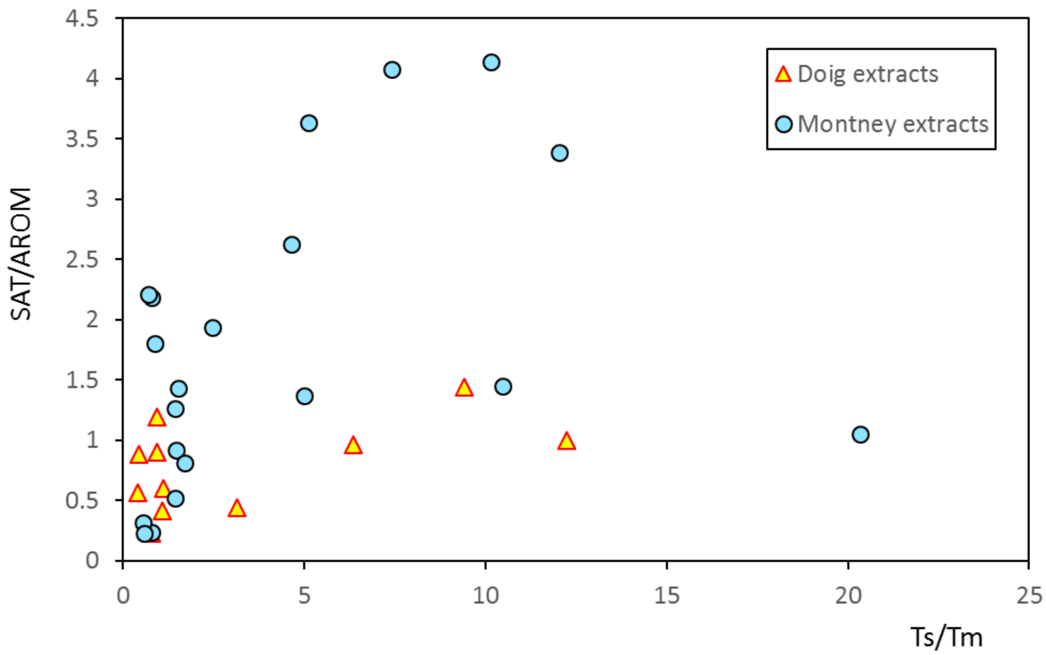

Figure 4-43 the saturated fraction to aromatic fraction ratios (SAT/AROM) in Montney extracts tend to be higher than that of Doig extracts

Hopane/tricyclic terpane ratio of Doig-sourced hydrocarbons decreases similarly to that of Montney-sourced hydrocarbons (Figure 4-39). However, it is unlikely that Doig-sourced oils would be depleted of all hopanes during thermal maturation. Study of the Doig-sourced extracts shows that the thermal maturity of Doig extracts is mostly past oil generation peak (Tmax>445°C), with some samples in wet gas zone, whereas the hydrocarbons still show a dominance of hopanes in comparison to the tricyclic terpanes (see Table 4-7).

The diagnostic features of source rock extracts of Gordondale Member, Doig Formation and Montney Formation (termed as Family A extract, Family B extract and Family C extract respectively) are shown in Table 4-10.

Table 4-10 Summary of diagnostic characteristics of different source rock extracts

Parameters	Family A extract (Gordondale)	Family B extract (Doig)	Family C extract (Montney)
Pr/Ph	Low (mostly<1.0)	High (mostly>1.0)	Variable (0.53-1.21)
Peak n-alkane values	nC_{14}-nC_{16}	nC_{14}-nC_{16}	nC_{19}-nC_{23}
Saturates/Aromatics (SAT/AROM)	Low (mostly<0.5)	Medium (mostly 0.5-1.0)	High (mostly>1.0)
Ts/Tm	Low (<1)	Medium-high (mostly>1)	Medium-high (mostly>1)
C_{24} tetracyclic /C_{26} Tricyclic terpane	High(mostly>1)	≈1	Low (mostly<0.5)
C_{29} hopane/C_{30} hopane	High (mostly>1)	Low (mostly<1)	Low (mostly<1)
C_{35}/C_{34} hopane ratio	High (mostly>1)	Low (mostly <1)	Low (mostly<1)
C_{23} tricyclic terpane/C_{30} hopane	Low (mostly<1)	Low (mostly<1)	High (mostly>2)
C_{27}- C_{29} sterane distribution	C_{28}%>0.2	mostly C_{28}%<0.2	mostly C_{28}%>0.2
Diasterane/regular sterane	Low (<0.6)	High (>0.6)	Variable (0.12-3.03)
Extended Tricyclic terpane (>nC_{33})	no	no	high
ETR	Low (<2.5)	Low (<2.5)	High (Mostly>4)

4.4.2 Oil Families

Oil family classification for Triassic oils in WCSB have been previously attempted by several workers (Riediger et al., 1990; Allan and Creaney, 1991; Ejezie, 2007).

Studies by Riediger (1990) and Allan and Creaney (1991) identified two oil groups in Triassic strata and related most of the Triassic oils to the Doig Phosphate Zone as a source. The basis of grouping is similarity of geochemical signatures of oil and source rock extract. Due to the unavailable Montney source rock extracts at that time, only two oil groups are identified. Oils with abundant tricyclic terpanes and extended tricyclic terpanes were observed and not considered to have a Montney origin but linked to Doig source rock and attributed to “sporadic salinity enhancements” during deposition of the Doig Formation (Allan and Creaney, 1991).

Ejezie's categorization of oil samples into families is based on relationships apparent in their bulk and molecular composition and divided Triassic oils into three families (Family X, Family Y and Family Z), one from the Doig phosphate zone and two from Jurassic Gordondale Member. Two oil samples (L02867, L02868) were considered likely to be of Montney origin (Ejezie, 2007). In her categorization, oil migration and mixing feature were not considered.

In this study, a larger set of source rock extracts has been utilized to identify groupings; and those groupings are then applied to classify oils into families. The Triassic oils are classified as Family A oils, Family B oils and Family C oils, corresponding to the three source rock extracts of Family A, Family B and Family C based on different geochemical signatures (Figure 4-44), noting that some samples may be interpreted as mixtures of different families.

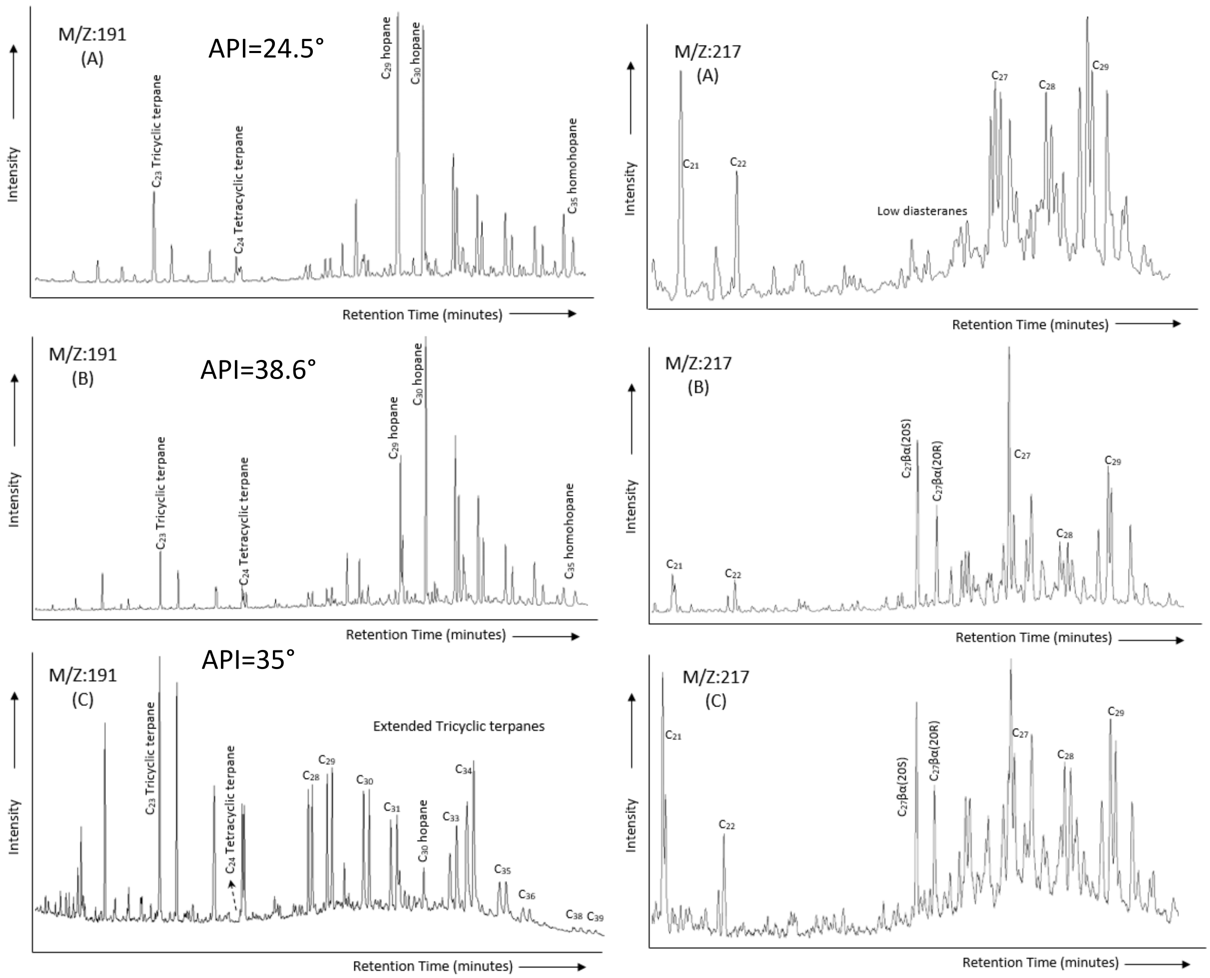

Figure 4-44 Mass chromatograms m/z 217 and 191 showing the distribution of steranes and hopanes for the end members of oil families: (A) Family A oil of sample L00803; (B) Family B oil sample L01190; (C) Family C oil sample L02868

One set of oils is similar to the Gordondale extracts (Family A extracts) and is characterized by a C_{35} homohopane index (C_{35}/C_{34} hopane ratio) greater than 1. In these oils, C_{29} hopane is usually the highest peak on the m/z 191 mass chromatograms, and C_{24} tetracyclic terpane is much higher than either of C_{26} tricyclic terpane peaks. Diasteranes are relatively low in comparison to regular steranes in m/z 217 mass chromatograms (Figure 4-45 top). This group of oils is designated as Family A.

A second set of oils is similar to the Doig extracts (Family B extracts). These oils display high abundances of diasteranes and relatively low C_{28} regular sterane (Fig 4-45 middle). On m/z 191 mass chromatograms, C_{24} tetracyclic terpanes are similar in abundance to both C_{26} tricyclic terpane peaks, and C_{30} hopane is usually the highest peak. Tricyclic terpane/ hopane ratios are low, even for some relatively high maturity oils (e.g. sample L01189 with an API gravity of 40.22°). C_{35}/C_{34} hopane ratios are smaller than 1. This group of oils is designated Family B.

A third group of oils is similar to extracts from relatively high thermal maturity Montney samples. These oils have very low C_{24} tetracyclic terpane relative to C_{26} tricyclic terpanes. The relative abundances of diasterane in Family C oils and Family B oils are similar. Family C oils contain a series of extended tricyclic terpanes from C_{30} to C_{44} and C_{30} hopane and Ts are usually the only detectable hopanes and are similar in abundance to the extended tricyclic terpanes (Fig 4-45 bottom). Hao et al., (2009) have proposed elsewhere that the origin of extended tricyclic terpanes is be caused by upwelling high-salinity and highly reducing environments. It is suggested maturity is probably the most significant driving force (Philp et al., 2021) for the depletion of hopanes and the domination of tricyclic terpanes or extended tricyclic terpanes in the Family C oils.

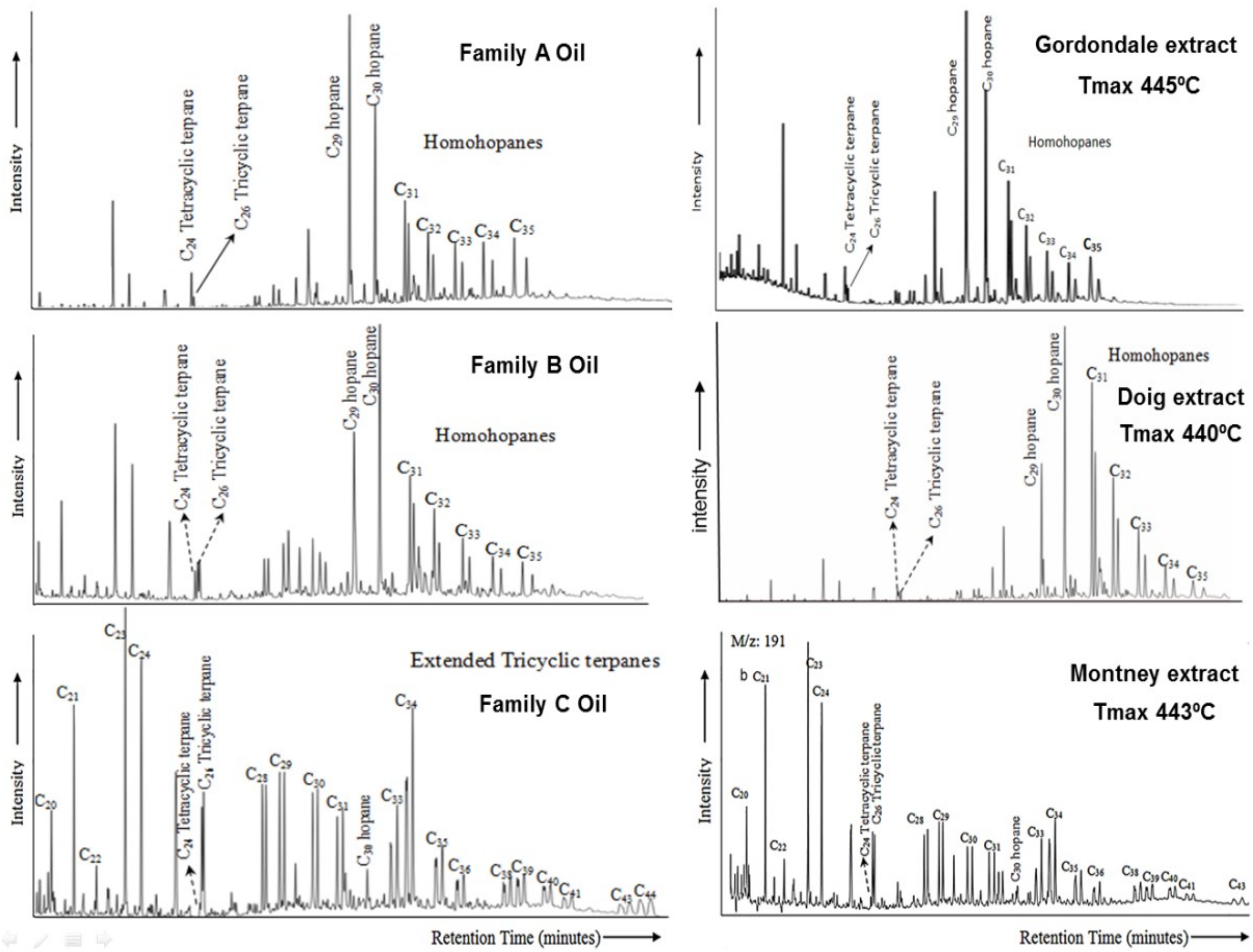

Figure 4-45 mass chromatogram-191 m/z of different oil families and source rock extracts (Family A oil sample L00931, Family B oil sample L04880, and Family C oil sample L02868; Gordondale extract X07615, Doig extract X07374, and Montney extract X11890)

4.4.3 Oil-Source Correlation

Bulk properties of oils and the diagnostic features (distinctive geochemical signatures) of different oils and source rock extracts are used for oil-source correlations.

Whole oils from different oil families show varied bulk properties like sulfur content and stable carbon isotope (see Table 4-8) that make it straightforward to differentiate them (Figure 4-45). Family A oils show sulfur content of greater than 1% and can be as high as 4.69%. The high sulfur content in Family A oils is consistent with reported high sulfur content in Gordondale source rock (Adams, et al., 2013) (Table 4-11). Family B oils have moderate sulfur content in the range of 0.39% to 0.83%. Sulfur content in Family C oils is usually lower than 0.5%. Family C oils are also distinctive in terms of carbon isotopic composition for the whole oils, displaying the most negative values of the three different oil families (Figure 4-46).

Table 4-11 sulfur content in source rocks of WCSB (Adams, 2013)

Age	Source rock	Max Toc	Type	Oil API	Oil S%	Oil Fields (examples)
Lower Jurassic	Gordondale	30%	I, II	<30	Up to 4%	Kaybob, Rycroft
Middle Triassic	Doig Phosphate	12%	II	35-40	low	Boundary Lake, Wembley
Lower Triassic	Montney	7%	II	?	?	Valhalla; La Glace?
Mississippian	Debolt	9.5%	II/III	33-39	0.7%	Dunvegan, Girouxville East
Devonian-Mississippian	Exshaw	24%	II	>30	0.5-4%	Twining, Provost, Little Bow
Upper Devonian	Duvernay	17%	II	>32	<0.2%	Swan Hills, Red water

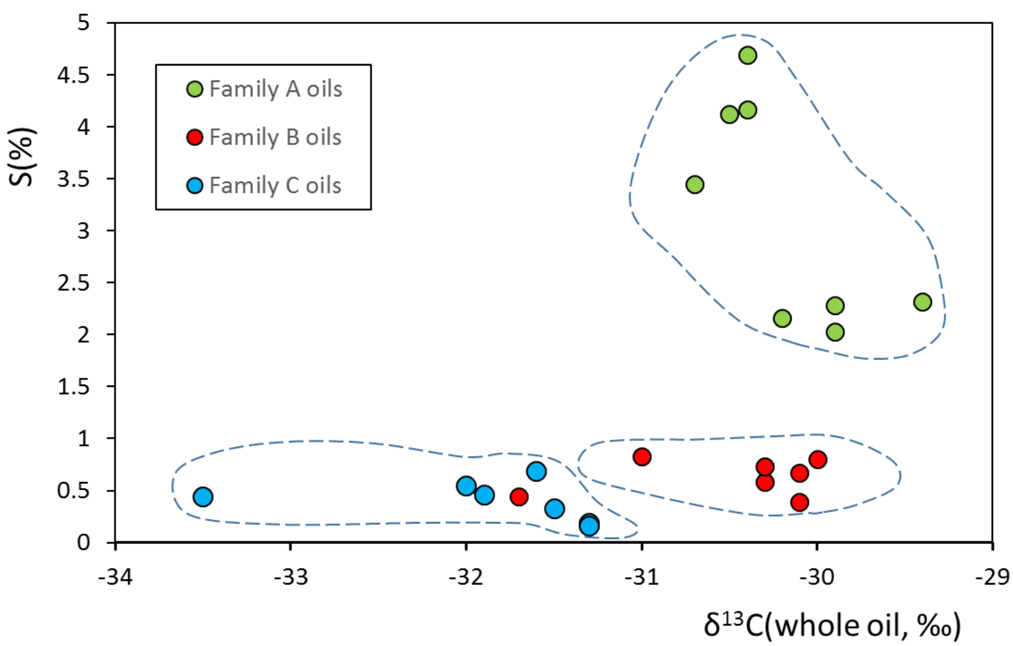

Figure 4-46 sulfur and stable carbon isotope of different oil families

Three different oil families and source rock extracts show distinctive geochemical signatures based on GC-MS analyses of saturate fraction. The diagnostic features of three different source rock extracts (see Table 4-10) provide guidance for differentiating three oil families. Pr/Ph and saturate/aromatics ratio in Table 4-10 are not used, due to variable values of Pr/Ph in Family C extracts and saturates/aromatics ratios that are affected by thermal maturity are also not used (Hou et al., 1995). Parameters (diagnostic features) for oil-source correlation of three different oil families and source rocks are shown in following Table 4-12.

Table 4-12 Diagnostic characteristics to differentiate three oil families

Parameters	Family A oil	Family B oil	Family C oil
Peak n-alkane values	nC_{14}-nC_{16}	nC_{14}-nC_{16}	nC_{19}-nC_{23}
Ts/Tm	Low	Medium-high	Medium-high
C_{24} tetracyclic /C_{26} Tricyclic terpane	High(mostly>1)	≈1	Low (mostly<0.5)
C_{29} hopane/C_{30} hopane	High (mostly>1)	Low (mostly<1)	Low (mostly<1)
C_{35}/C_{34} hopane ratio	High (mostly>1)	Low (mostly <1)	/
C_{23} tricyclic terpane/C_{30} hopane	Low (mostly<1)	Low (mostly<1)	High (mostly>2)
C_{27}- C_{29} sterane distribution	C_{28}%>0.2	mostly C_{28}%<0.2	mostly C_{28}%>0.2
Diasterane/regular sterane	Low	High	High
Extended Tricyclic terpane (>nC_{33})	no	no	high
ETR	Low (mostly<3)	Low (mostly<3)	High (mostly>5)

High values of C_{24} tetracyclic terpane /C_{26} tricyclic terpane, C_{29} hopane/C_{30} hopane and C_{35}/C_{34} hopane ratios are usually linked to anoxic carbonate source rocks or evaporate depositional environment (Hughes, 1984; Mello et al., 1988; ten Haven et al., 1988S; Marynowski et al, 2000; Lu et al., 2009). Relative abundances of C_{27}, C_{28}, and C_{29} steranes largely reflect the type of original source input. The diasterane/regular sterane ratio in crude oil can be used to indicate relative amount of clays in the related source rock, but this ratio can also be affected by high maturity (Rubinstein, et al., 1975). Extended tricyclic terpanes may be an age-related parameter; Triassic marine-sourced oils from around the world are rich in extended tricyclic terpanes relative to hopanes, including oils from the Alaskan North Slope, Sverdrup Basin and Alberta Basin of Canada, Barents Sea of Norway, Perth Basin of Australia and a few low paleo-latitude basins (Holba et al., 2001). In contrast, Upper and Late Jurassic-sourced marine oils worldwide are very low in these tricyclic terpanes (e.g., oils from the North Sea, Middle East, Gulf of Mexico, and Australia) (Holba et al., 2001). The sharp drop of extended tricyclic terpane ratio (ETR) at the end of Triassic period indicate ETR can be used to distinguish Triassic oils from Jurassic oils.

A crossplot of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios and Ts/Tm can effectively differentiate the three different oil families and their source rocks (Figure 4-47), as does a crossplot of C_{23} tricyclic terpane/C_{30} hopane ratio and Ts/Tm ratio (Figure 4-48). Based on these crossplots, Family A oils display close relationship with Gordondale extracts, and Family B oils are similar to Doig source rock extracts. Family C oils populate in the same area with mature Montney source rock extracts in both crossplots.

A crossplot of extended tricyclic terpane ratios (ETR) and Ts/Tm also differentiates the three different oil families and relates them individually to the same specific source rocks as above (Figure 4-49). Oil ETRs for different oil families appear higher than that of their corresponding extracts, possibly because the thermal maturity of the oils is higher than that of the extracts, or some oil samples are from two or even three sources, and in-reservoir oil mixing and evaporative fractionation can alter ETR values (Huang et al., 2017).

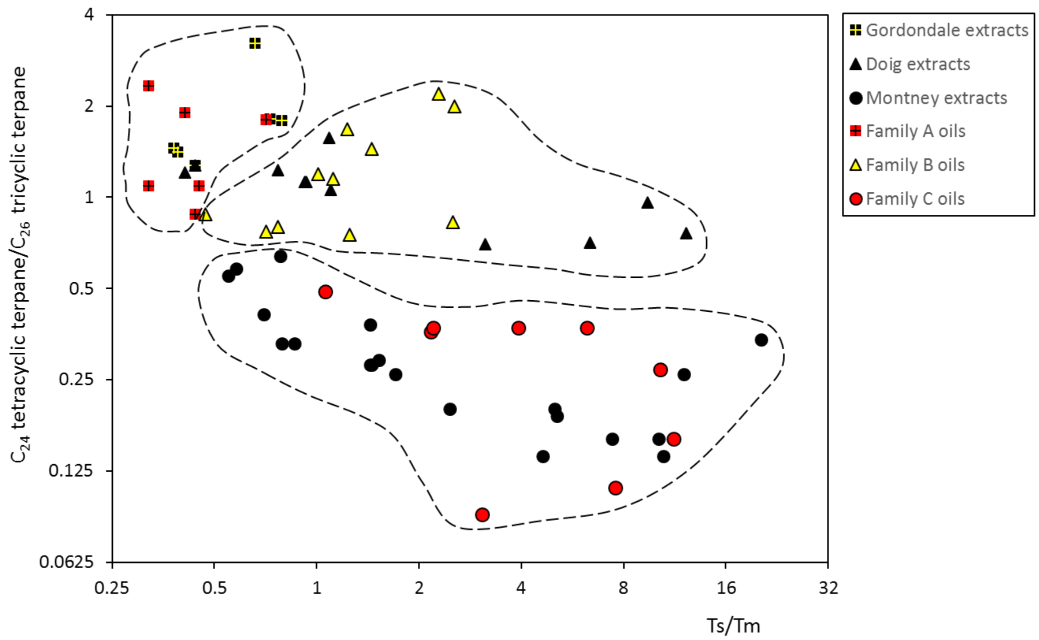

Figure 4-47 C_{24} tetracyclic terpane/C_{26} Tricyclic terpane ratio and Ts/Tm to differentiate oil families

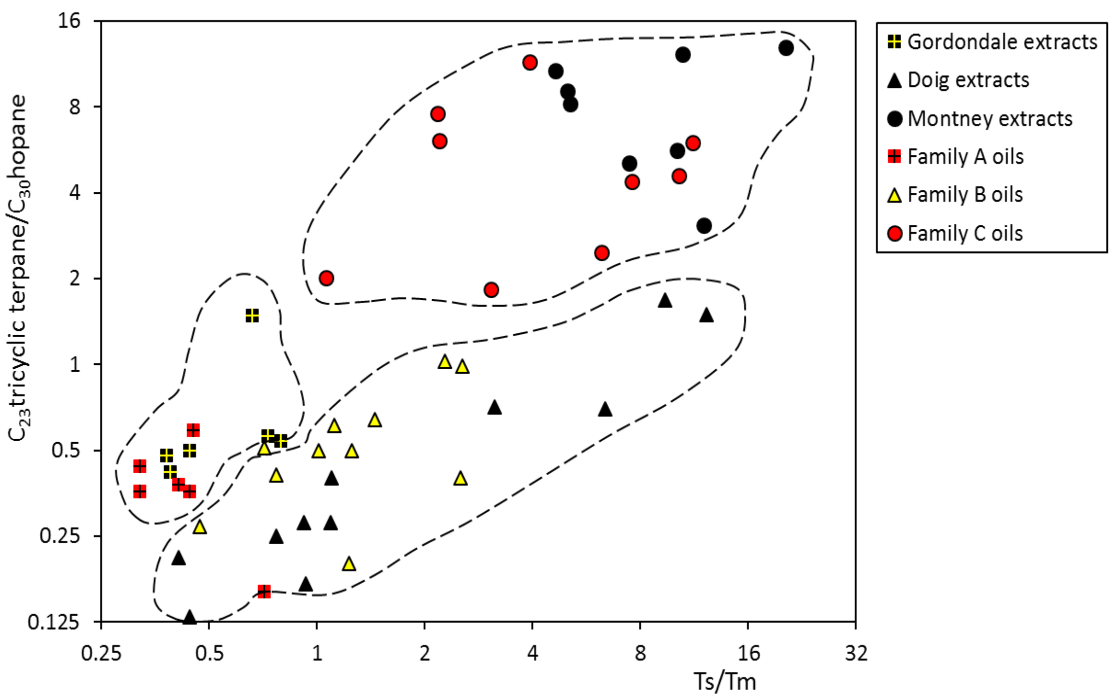

Figure 4-48 C_{23} tricyclic terpane/C_{30} hopane ratio and Ts/Tm to differentiate oil families

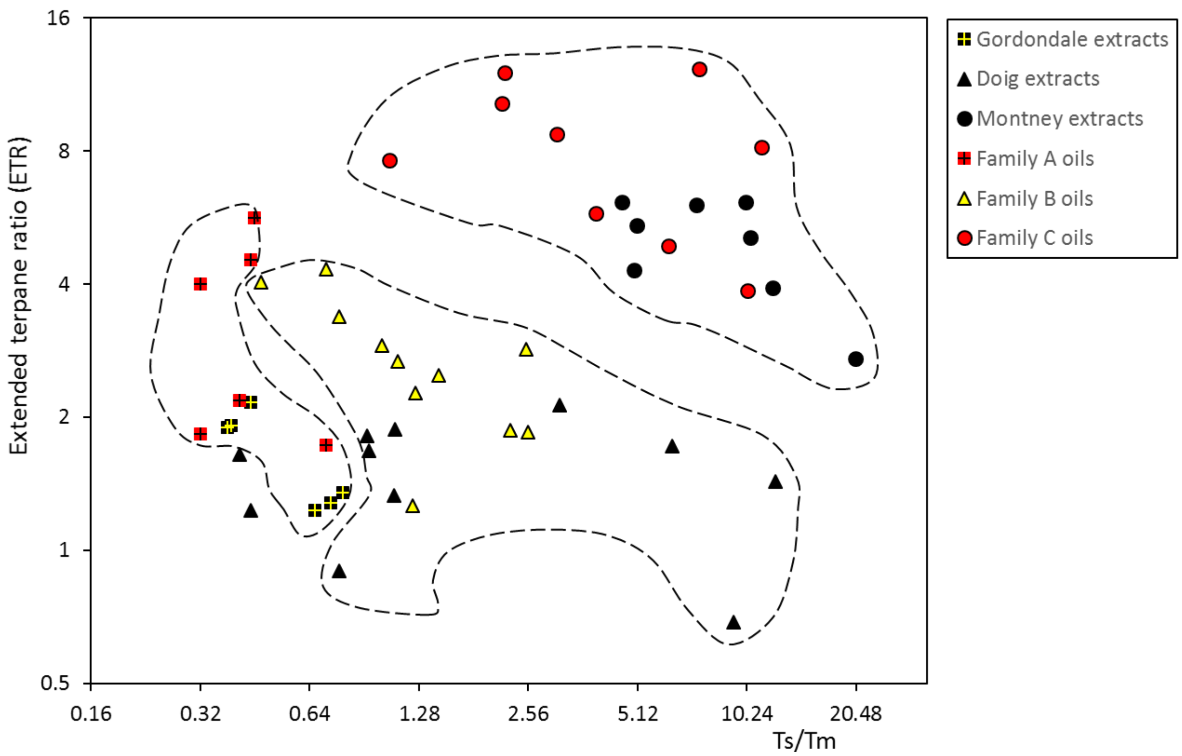

Figure 4-49 extended tricyclic terpane ratio (ETR) and Ts/Tm to differentiate oil families, showing relatively higher oil ETR than extract ETR

Family C oils are observed to contain relatively more isoalkanes according to whole oil GC analysis (Figure 4-50), reflected in relatively higher Pr/nC_{17} and Ph/nC_{18} ratios (Figure 4-51). The peaks of Family C oils are in the range of nC_{15}-nC_{25} alkanes (Figure 4-52) based on GC trace of saturated fractions, which is very similar the n-alkane distribution of Montney extracts (see Figure 4-42). This suggests a similar origin of the Family C oils and Montney extracts. Family A or Family B oils are much lighter in the range of nC_{12}-nC_{17}(see Figure 4-52), which is consistent with much lighter n-alkane distribution in Gordondale extracts and Doig extracts (see Figure 4-42).

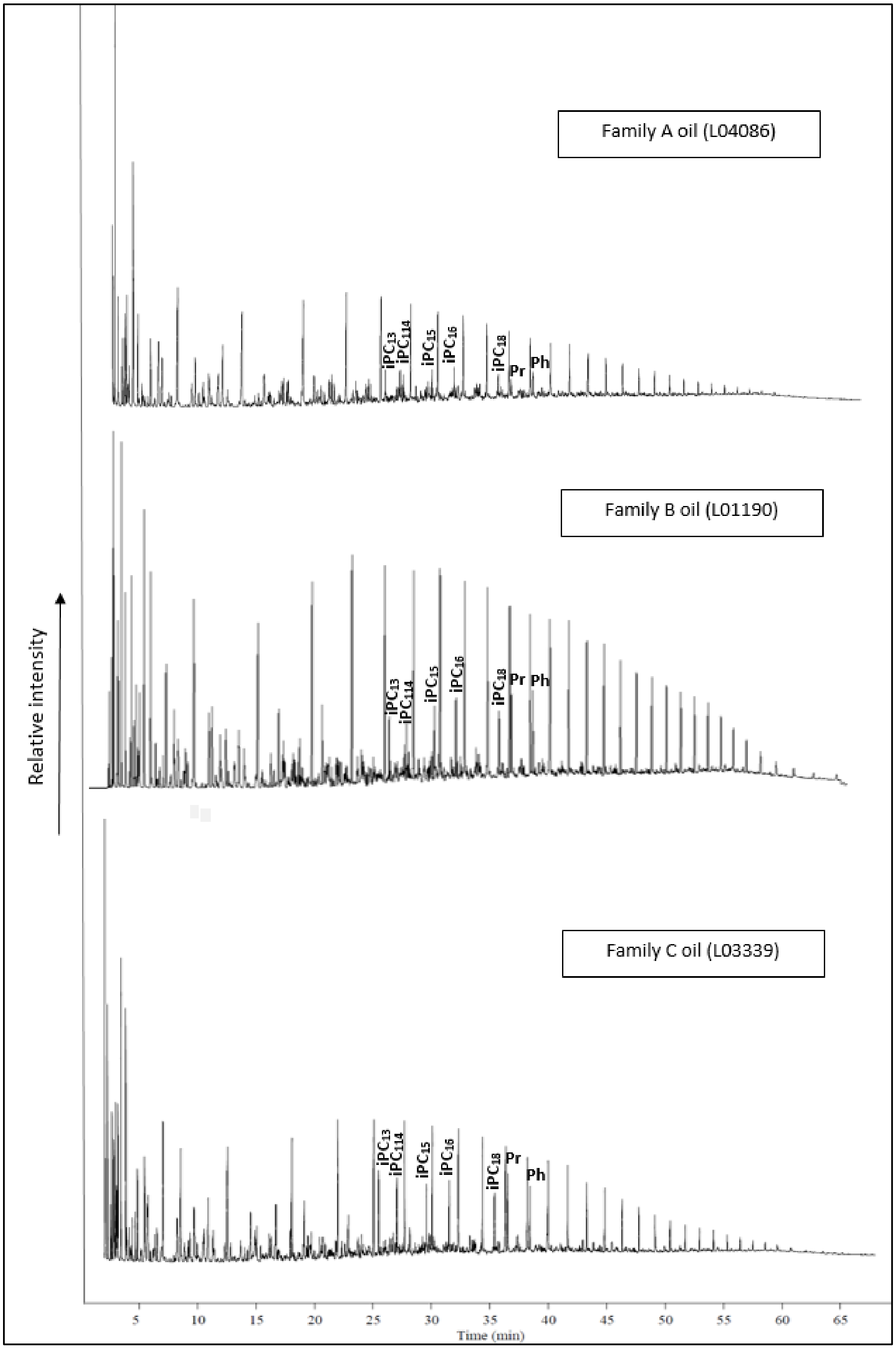

Figure 4-50 whole oil GC of different oil families, Family A oil, 9-6-76-20W5, 1040-1043m (B) Family B oil, 7-25-81-11W6, 1466.5-1481.5m; Family C oil, 10-30-68-6W6, 2376-2389m.

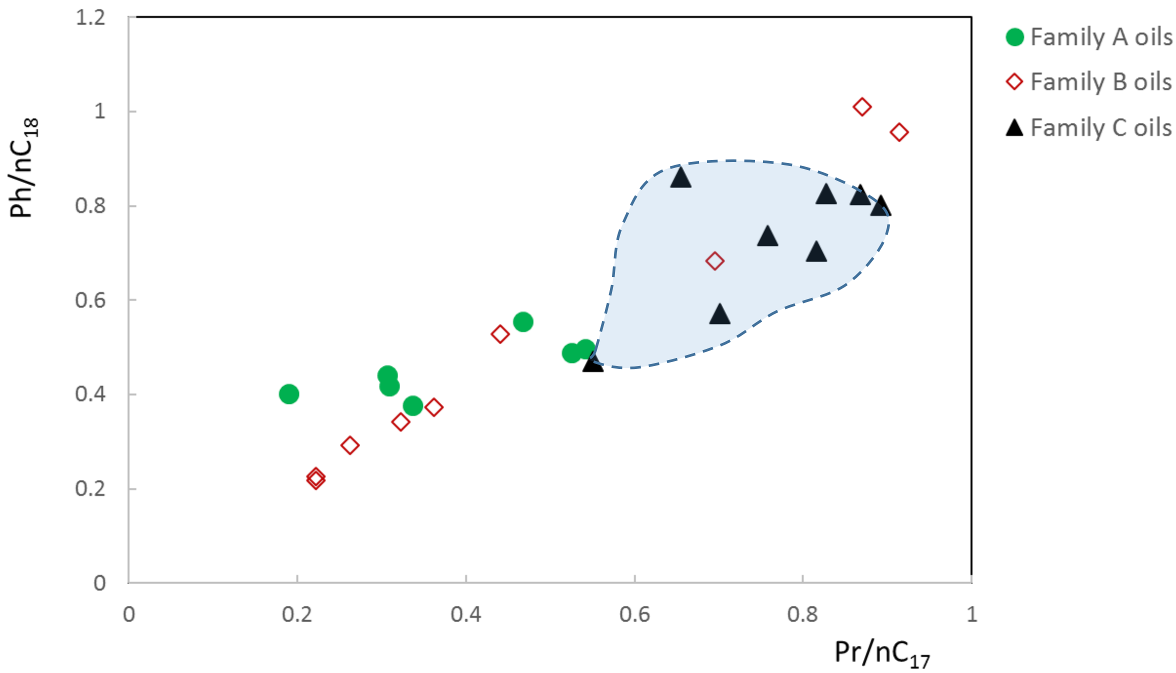

Figure 4-51 Pr/nC17 and Ph/nC18 show relatively more isoalkanes in Family C oils

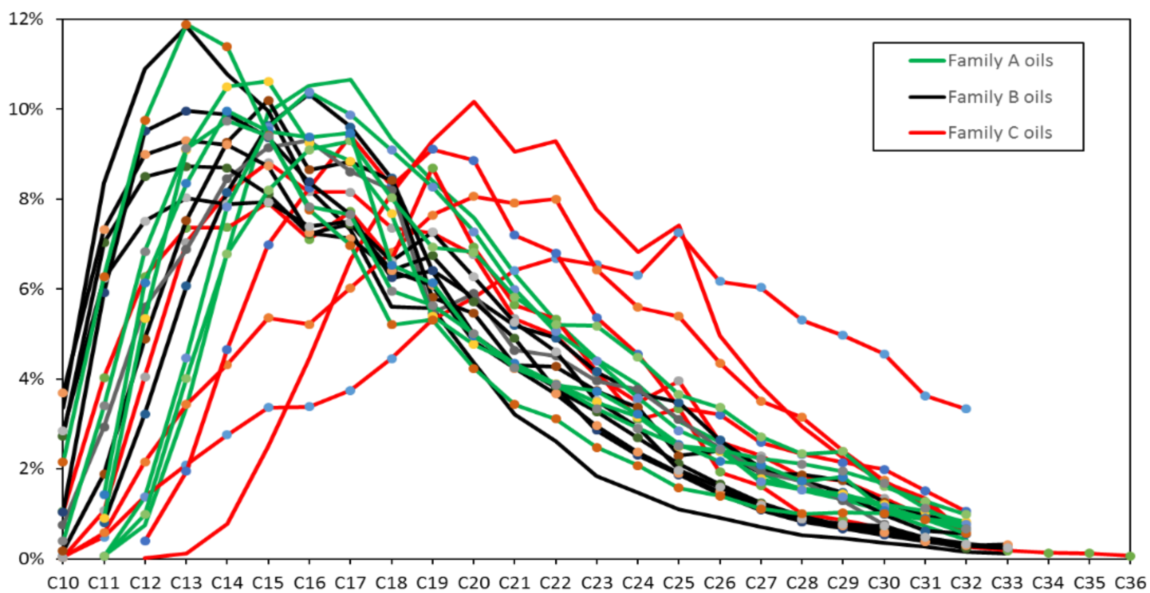

Figure 4-52 n-alkane distribution as revealed by GC analysis of saturate fractions of different oils families

Given that the Gordondale Member, Charlie Lake Formation, Doig Formation and Montney Formation are in direct contact in some areas, mixing of different oil families is possible. Mixing of oil types among Triassic strata has not been previously reported but does exist in some oils, for these oils show mixing diagnostic features of two different oil families (Figure 4-53), resulting in geochemical signatures of mixed oils that differ from that of one single oil family.

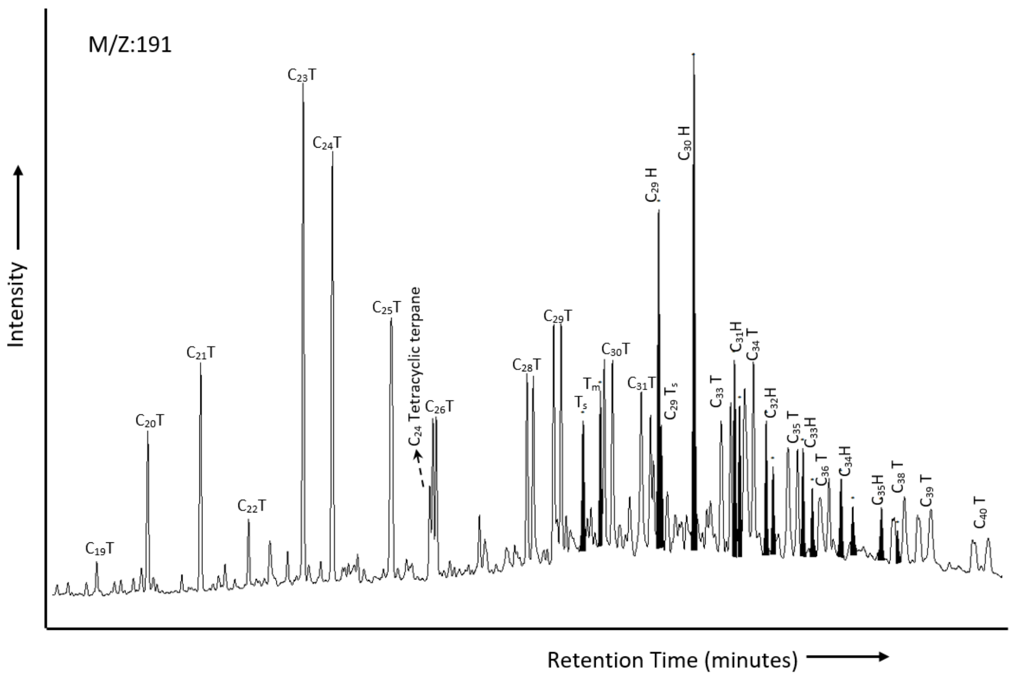

Figure 4-53 Mass chromatography/m/z 191 of sample L01156 (16-31-72-8, 2145.5m-2155m) showing Mixing diagnostic features of Family B oil and Family C oil (T: tricyclic terpane; H: hopane)

Mixing of different oil families can be identified through diagnostic features of the oils as follows:

Geochemical signatures Montney sourced extracts are used to indicate whether Family C oils are mixed with Family A or Family B oils. Montney sourced hydrocarbons (oils) are characterized by depleted hopanes, with abundant tricyclic terpanes and very low abundance of C_{24} tetracyclic terpane. A crossplot of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{23} tricyclic terpane/C_{30} hopane ratio (Figure 4-54) shows, even the low thermally mature Montney source rock extracts (Tmax<445°C, see Table 4-7) have the C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratios smaller than 0.35 and C_{23} tricyclic terpane/C_{30} hopane ratios greater than 3.0. Therefore, for Family C oils, if the C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio>0.35, oils are considered to have mixed with oils from other oil family (this ratio in Gordondale and Doig sourced hydrocarbons is usually greater than 1). Likewise, for Family C oils, if the C_{23} tricyclic terpane/C_{30} hopane ratios<3.0, oils are also considered to have mixed with oils from other oil family (this ratio in Gordondale and Doig sourced hydrocarbons is mostly smaller than 0.5, with maximum value of 1.68, see Table 4-7).

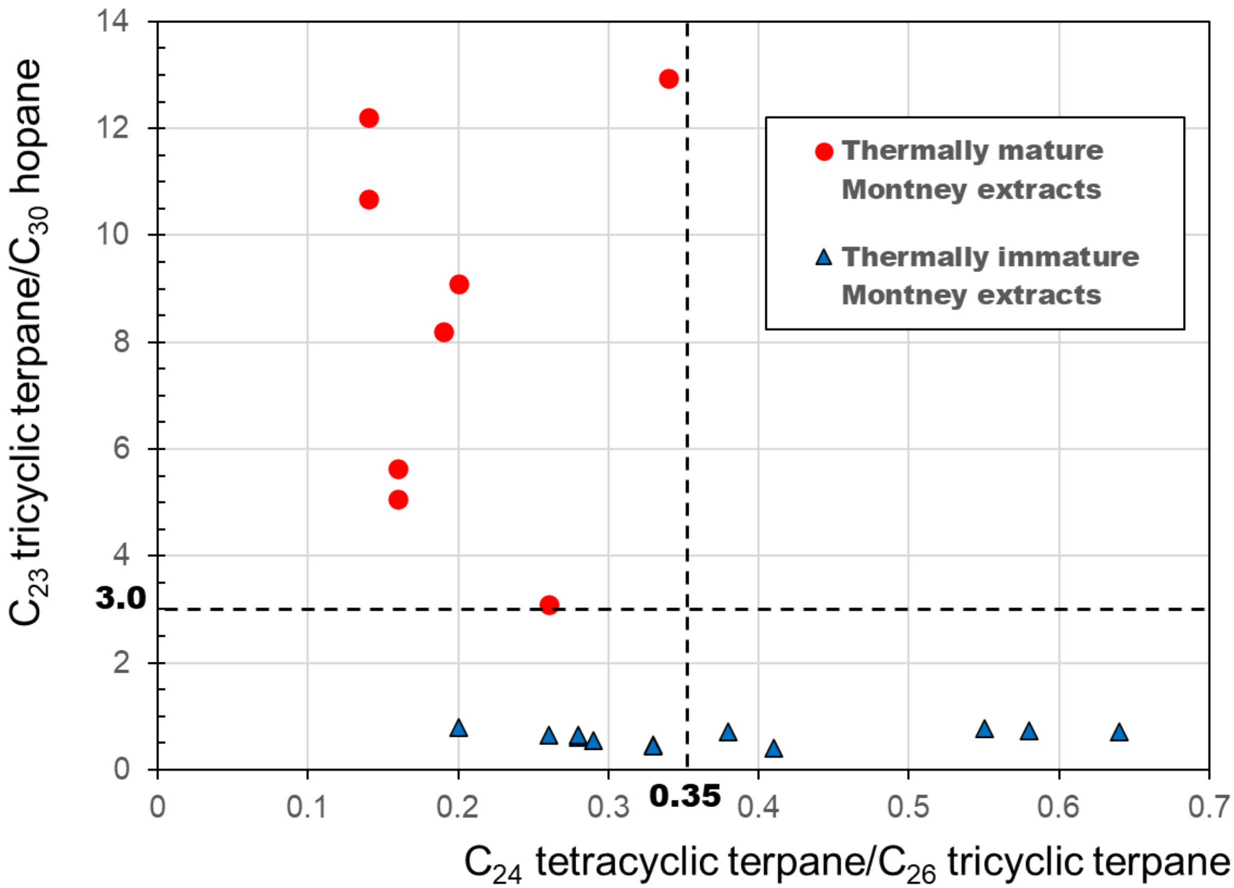

Figure 4-54 Crossplot of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{23} tricyclic terpane/C_{30} hopane ratio in Montney extracts showing their threshold of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio (<0.35) and C_{23} tricyclic terpane/C_{30} hopane ratio (>3) in Family C oils

Oil mixtures with Family A oil is studied by analyses of geochemical signatures in Gordondale rock extracts. Gordondale-sourced hydrocarbons (oils) are recognized by a high C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and high C_{35} hopane/C_{34} hopane ratio. The available Gordondale sourced extracts have relatively low thermal maturity (430℃≤Tmax<445°C) and high thermal maturity geochemical signatures are unknown for Family A oils. Crossplot of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35} hopane/C_{34} hopane ratio in Gordondale extracts indicate the threshold of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio (>1.27) and C_{35} hopane/C_{34} hopane ratio (>1.18) for end member of Family A oils (Figure 4-55). If observed oil ratios are smaller than the above values, it is interpreted that Family A oils are mixed with oils from different oil families.

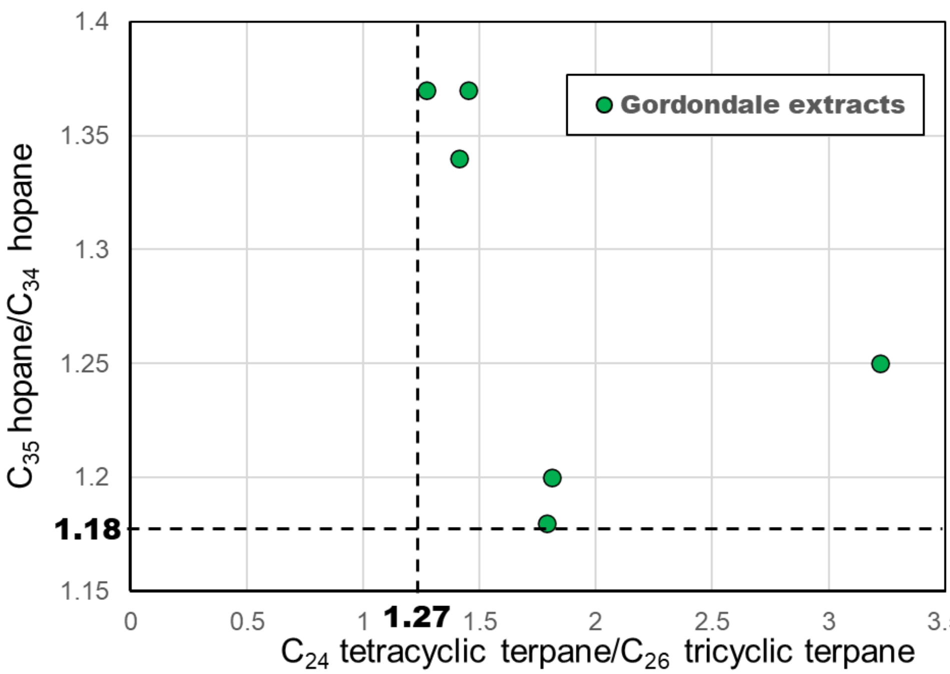

Figure 4-55 Crossplot of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio and C_{35} hopane/C_{34} hopane ratio ratio in Montney extracts showing their threshold of C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio (>1.27) and C_{35} hopane/C_{34} hopane ratio (>1.18)) in Family A oils

These studies are based on source rock extracts analyses, and oil migration and accumulation may change the threshold of these ratios. The effects of oil migration and in-reservoir alteration of oils are unknown and need further investigation. Other parameters such as sulfur content, extended tricyclic terpane, carbon isotope and composition of the oils should be integrated to study the mixture of different oil families comprehensively. For example, oil sample L04086 (See Table 4-8), though C_{24} tetracyclic terpane/C_{26} tricyclic terpane ratio is 1.09 (<1.27), due to its high sulfur content (4.69%), it is still considered as Family A oil and not mixed with other oils from different oil families.

Oil-source correlation results and mixing features of Triassic oils are shown in Table 4-13.

Table 4-13 Oil and source correlation results and mixing features of Triassic oils

Map No.	Lab ID	Reservoir Unit	DIA /REG	$C_{23}T$ $/C_{30}H$	$C_{24}Te$ $/C_{26}T$	$C_{35}H$ $/C_{34}H$	ETR	Sulfur (%)	$\delta^{13}C$ (saturate)	API	Correlation Results	Reasons
O_1	L00803	Charlie Lake	0.13	0.38	1.9	1.24	2.18	4.67		24.51	Family A	$C_{24}Te/C_{26}T>1.27$; $C_{35}H/C_{34}H>1.18$; high sulfur
O_6	L00931	Charlie Lake	0	0.44	2.33	1.4	1.83			36.15	Family A	$C_{24}Te/C_{26}T>1.27$; $C_{35}H/C_{34}H>1.18$
O_{75}	L00952	Nordegg	0.39	0.59	1.09	1.52	5.66				Family A	$C_{24}Te/C_{26}T>1$; $C_{35}H/C_{34}H>1.18$
O_{45}	L04077	Triassic	0.37	0.16	0.88	1.4	4.55	2.78			Family A	$C_{35}H/C_{34}H>1.18$; high sulfur
O_{46}	L04081	Montney	0.37	0.36	1.8	0.9	1.73	2.32	-29.4	38	Family A	$C_{24}Te/C_{26}T>1.27$; high sulfur
O_{47}	L04086	Montney	0.1	0.36	1.09	1.37	4.01	4.69	-30.4	30.4	Family A	$C_{35}H/C_{34}H>1.18$; high sulfur
O_3	L00926	Charlie Lake	0.81	0.5	0.75	0.77	2.27	0.62		37.96	Family B	correlated with Doig extracts
O_4	L00927	Charlie Lake	0.68	0.41	0.8	1.01	3.37				Family B	correlated with Doig extracts
O_7	L01141	Charlie Lake	0.44	0.27	0.88	0.61	4.05	0.83	-31	36.15	Family B	correlated with Doig extracts
O_{17}	L01189	Halfway	1.14	0.4	0.83	0.83	2.85			40.22	Family B	correlated with Doig extracts
O_{18}	L01190	Doig	0.69	0.2	1.68	0.72	1.26	0.71		38.6	Family B	correlated with Doig extracts
O_{56}	L04880	Halfway	0.74	0.51	0.77	0.97	4.32	0.44	-31.7		Family B	correlated with Doig extracts
O_{57}	L04881	Charlie Lake	0.23	0.99	2	0.66	1.85	0.39	-30.1		Family B	correlated with Doig extracts
O_{58}	L04882	Charlie Lake	0.29	1.03	2.2	0.71	1.87	0.8	-30		Family B	correlated with Doig extracts
O_{59}	L04883	Charlie Lake	0.31	0.61	1.15	0.67	2.67	0.58	-30.3		Family B	correlated with Doig extracts
O_{60}	L04885	Charlie Lake	0.26	0.64	1.44	0.65	2.49	0.67	-30.1		Family B	correlated with Doig extracts
O_{61}	L04886	Charlie Lake	0.25	0.5	1.19	0.59	2.9	0.73	-30.3		Family B	correlated with Doig extracts
O_2	L00810	Doig	20.34	11.51	0.37		5.8	0.69	-31.6	44.9	Family C	$C_{23}T/C_{30}H>3$; No hopanes; ETR high
O_{13}	L01185	Halfway	1.07	2.47	0.37		4.88				Family C	$C_{23}T/C_{30}H>3$; No hopanes; ETR high
O_{14}	L01186	Doig	1.71	4.59	0.27		3.87	0.33	-31.5	43	Family C	$C_{23}T/C_{30}H>3$; ETR high; $C_{24}Te/C_{26}T<0.35$
O_{21}	L02867	Montney	1.76	5.98	0.16		8.17	0.46	-31.9	37	Family C	$C_{23}T/C_{30}H>3$; ETR high; $C_{24}Te/C_{26}T<0.35$
O_{22}	L02868	Montney	0.67	4.39	0.11		12.29	0.44	-33.5	35	Family C	$C_{23}T/C_{30}H>3$; ETR high; $C_{24}Te/C_{26}T<0.35$
O_{26}	L03339	Charlie Lake	0.59	7.58	0.36		10.23	0.17	-31.3	41.06	Family C	$C_{23}T/C_{30}H>3$; No hopanes; ETR high
O_{33}	L03468	Charlie Lake	0.62	6.08	0.37		12.02	0.19	-31.3	38.57	Family C	$C_{23}T/C_{30}H>3$; No hopanes; ETR high
O_{49}	L04092	Charlie Lake	0.63	2.02	0.49		7.62	0.16	-31.3	43	Family C	No hopanes; ETR high; $\delta^{13}C$ low
O_{55}	L04879	Montney	0.6	1.84	0.09		8.75	0.55	-32		Family C	No hopanes; ETR high; $\delta^{13}C$ low

Table 4-13 Oil and source correlation results and mixing features of Triassic oils (continued)

Map No.	Lab ID	Reservoir Unit	DIA /REG	$C_{23}T$ $/C_{30}H$	$C_{24}Te$ $/C_{26}T$	$C_{35}H$ $/C_{34}H$	ETR	Sulfur (%)	$\delta^{13}C$ (saturate)	API	Correlation Results	Reasons
O_8	L01142	Montney	0.63	5.92	1.11	1.98	3.62	0.62		42.12	Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_9	L01155	Halfway	0.99	2.61	0.44	1.78	4.36	0.37		43.2	Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_{10}	L01156	Charlie Lake	0.41	0.96	0.6	0.65	7.23	0.42		39.2	Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_{11}	L01157	Charlie Lake	1.53	7.52	1.45		4.24				Mixed	ETR high; No hopane; $C_{24}Te/C_{26}T>0.35$
O_{12}	L01158	Halfway	0.94	2.47	0.57	0.87	4.33			44.93	Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_{16}	L01188	Halfway	1.25	2.09	0.74		4.96				Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_{15}	L01187	Charlie Lake	0.42	0.63	0.6	1	6.47			38.37	Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_5	L00930	Halfway	1.31	2.64	0.41	0.18	5.56				Mixed	$C_{23}T/C_{30}H<3$; ETR high; $C_{24}Te/C_{26}T>0.35$
O_{19}	L01281	Cecil	0.39	6.07	0.94	1.26	9.5	0.84		34	Mixed	ETR high; No hopane; $C_{24}Te/C_{26}T>0.35$
O_{28}	L03343	Doig	1.68	5.82	0.67		5.16	0.25		41.06	Mixed	ETR high; No hopane; $C_{24}Te/C_{26}T>0.35$
O_{31}	L03453	Charlie Lake	1.01	2.52	0.97		3.76	0.53	-31.2	46.49	Mixed	$C_{23}T/C_{30}H<3$; No hopane; $C_{24}Te/C_{26}T>0.35$
O_{38}	L04057	Montney	0.33	0.4	0.7	1.34	4.05	3.45	-30.7	28.9	Mixed	High sulfur content; $C_{24}Te/C_{26}T<1$;ETR high
O_{39}	L04065	Charlie Lake	0.57	0.63	0.57	1.27	4.9	1.27		40	Mixed	High sulfur content; $C_{24}Te/C_{26}T<1$;ETR high
O_{40}	L04066	Montney	0.62	0.75	0.53	1.01	4.94	1.16		41	Mixed	High sulfur content; $C_{24}Te/C_{26}T<1$;ETR high
O_{41}	L04069	Charlie Lake	0.29	0.6	1.48	1.57	2.93	1.23		30.6	Mixed	High sulfur content; presence of extended tricyclic terpane
O_{42}	L04070	Montney	0.21	0.42	1.8	1.49	2.4	1.65		31.5	Mixed	High sulfur content; presence of extended tricyclic terpane
O_{43}	L04071	Charlie Lake	0.36	0.52	1.49	1.66	2.97	1.12		34.4	Mixed	High sulfur content; presence of extended tricyclic terpane
O_{44}	L04073	Triassic	0.5	0.34	0.95	1.29	3.03				Mixed	C_{35}/C_{34} hopane>1.2, presence of extended tricyclic terpane
O_{20}	L01287	Charlie Lake	0.34	0.57	1.6	1.19	2.24			30.58	Mixed	$C_{24}Te/C_{26}T>1.27$, presence of extended tricyclic terpane

Notes: DIA/REG=C_{27} diasterane/C_{29} regular sterane; $C_{24}Te/C_{26}T$=C_{24} tetracyclic terpane/C_{26} tricyclic terpane; $C_{35}H/C_{34}H$=C_{35} homohopane/C_{34} homohopane; ETR= (C_{28} tricyclic terpane+C_{29} tricyclic terpane)/Ts; $C_{23}T/C_{30}H$=C_{23} tricyclic terpane/C_{30} hopane ratio

4.4.4 Spatial distribution of different oil families

Family A oils are mainly distributed in the northeast of the basin near the Montney subcrop edge, where Doig and Charlie Lake Formations are absent and Montney reservoirs are directly overlain by the Gordondale source rock (Figure 4-56). The abrupt increase of sulfur content in oil accumulations in this area is likely due to the contribution of Family A oils, as illustrated in Figure 4-57. Thermal maturity cannot the primary reason for the sharp increase of sulfur content from southwest to northeast, because some oil samples with high API gravity also have high sulfur content (e.g. sulfur content of sample L04081 is 2.32% but API gravity is 38º). Family B oils are located near Doig Formation subcrop edge, where hydrocarbon migration in the Triassic units followed an up-dip path toward the northeast, and the overlying unconformity and Gordondale Member function as lateral and vertical seals (Ejezie, 2007). Family C oils are mainly distributed in deep basin, where high TOC intervals in Montney Formation were deposited (see Figure 3-2, 3-15, 3-16, 3-17).

Based on available samples from both central Alberta and British Columbia, the geochemical signatures of the of Doig extracts do not vary greatly. It is unlikely Doig Formation can generate both Family B and Family C oils due to changed depositional settings.

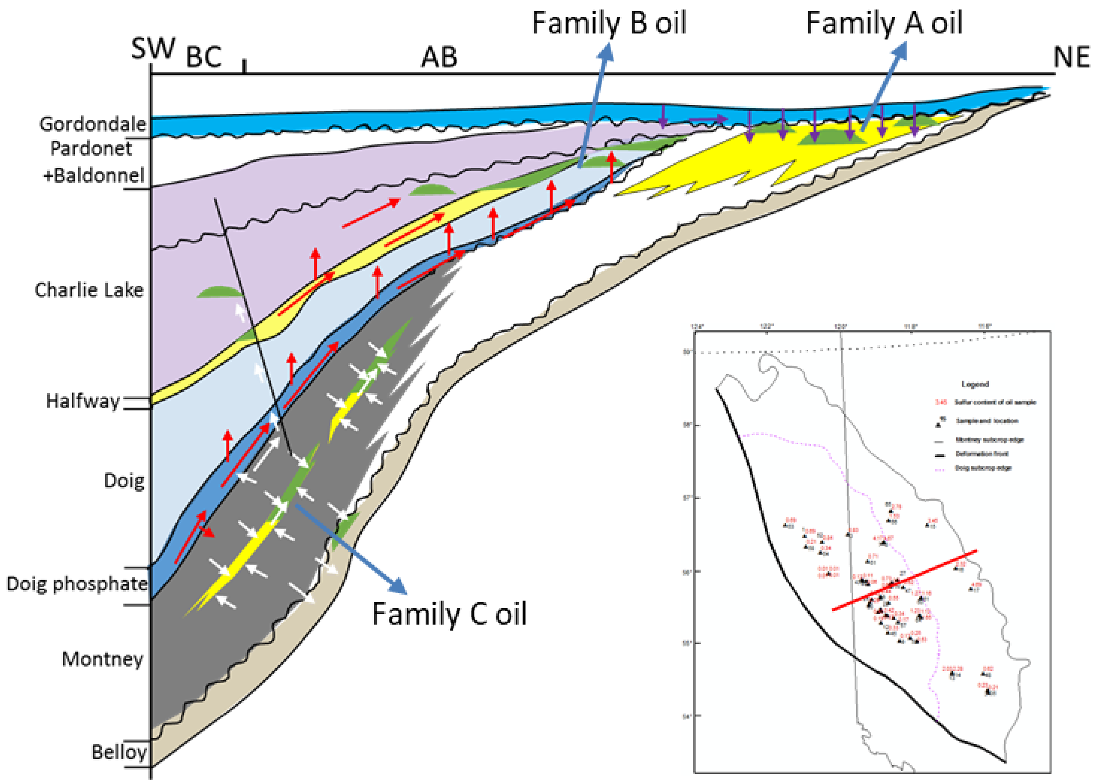

Figure 4-56 Schematic cross section showing potential spatial accumulations of different oil families

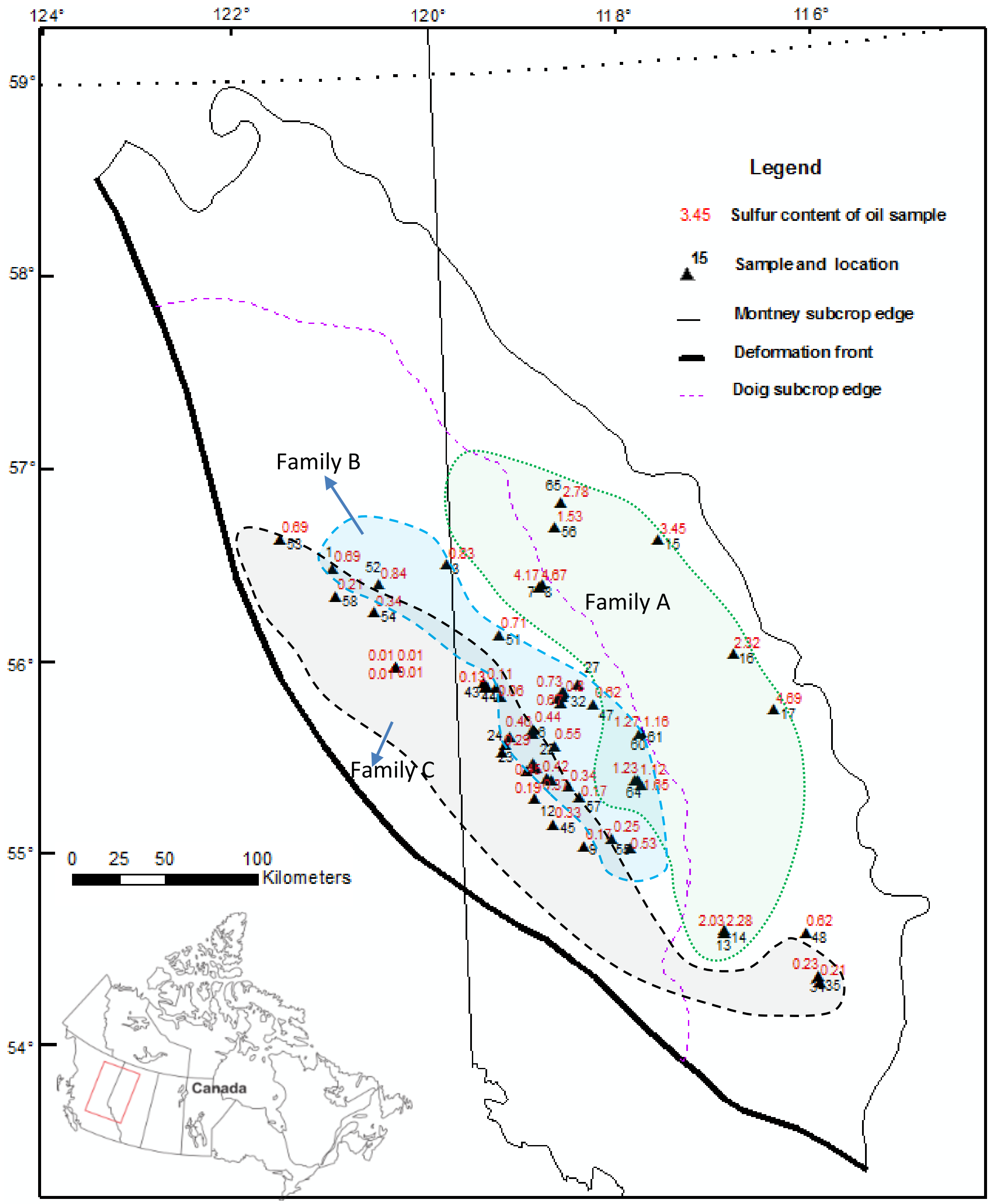

Figure 4-57 Map showing sulfur content of samples and distribution of different oil families, basemap according to Atlas Shapefiles, Edwards et al., 1994

CHAPTER 5: CONTRIBUTION OF MONTNEY SOURCED OILS

Earlier studies have proposed that oils from Triassic strata are mainly sourced by Doig phosphate and Gordondale Member (Reidiger et al., 1990; Allan and Creaney, 1991; Ejezie, 2007). This research, however, suggests that the Montney Formation was also an effective source rock, with stratigraphic thickness of potentially significant generation capability greater than 100m in some areas of WCSB (see Figure 3-15). In addition, a group of oil samples, designated here as Family C oils from Triassic strata, is interpreted to be of Montney origin based on compositional similarities between those oil and extracts of Montney source rock samples. It is necessary to determine how much oil was generated from a Montney source rock as compared with that generated from Doig phosphate or Gordondale Member.

5.1 Methods

A volumetric method was applied to calculate the in-place oil generated from Montney Formation and Doig phosphate to evaluate their relative contributions to the Doig and Montney petroleum system. The mass of generated hydrocarbon per cubic centimeter is calculated using Schmoker's formula as expressed by following equation (1), (2) and (3) (Schmoker, 1994; Magoon et al., 1999).

$$\text{HCG (kg HC)} = \text{R (mg HC/g TOC)} \times \text{M (g TOC)} \times 10^{-6}\text{ (kg/mg)} \qquad (1)$$

$$\text{M (g TOC)} = [\text{TOC (\%)}/100] \times \rho\text{ (g/cm}^3) \times \text{V (cm}^3) \qquad (2)$$

$$\text{R (mg HC/ g TOC)} = \text{HI}_o\text{ (mg HC/ g TOC)} - \text{HI}_p\text{ (mg HC/ g TOC)} \qquad (3)$$

HCG (kg HC) is total mass of hydrocarbons generated in each rock unit (cm^3), which is obtained by multiplication of M (g TOC) and R (mg HC/ g TOC). M (g TOC) is the mass of organic carbon. The data needed to calculate M are the average TOC (%), average formation density ρ (g/cm3), and volume V (cm^3) of the unit as shown in equation (2). R (mg HC/ g TOC) is the mass of hydrocarbons generated per unit mass of organic carbon. The data needed to calculate R are the present-day hydrogen index, HI_p (mg HC/g TOC), and the original hydrogen index HI_o (mg HC/g TOC) of the source rock prior to any petroleum generation. The difference between these two indices approximates the mass of hydrocarbons generated per gram TOC as shown in equation (3).

The volume of the source rock per square kilometer with the source rock thickness of h (m) is $h\times10^{12}cm^3$. Therefore, the hydrocarbons generated q (kg HC) per square kilometer with source rock of h (m) can be calculated from following equation (4).

$$q\ (\text{Kg HC}) = R\ (\text{mg HC/g TOC}) \times M\ (\text{g TOC}) \times 10^{-6}\ (\text{kg/mg}) \times h\times10^{12}$$

$$= [HI_o - HI_p] \times [\text{TOC}\ (\%)/100] \times \rho \times h\times10^{6} \qquad (4)$$

Where: HI_o--- original hydrogen index (mg HC/g TOC) of the source rock

HI_p--- present-day hydrogen index, (mg HC/g TOC)

TOC---Total organic carbon (%)

ρ--- average source rock density (g/cm^3)

h---source rock thickness (m)

Since different kerogen types have different original hydrogen index and follow a different degradation route during maturation, Type I, Type II and Type III kerogens within Montney and Doig organic matters are analyzed separately. Source rock densities (ρ) are usually available from density logs.

5.2 Calculation Parameters

5.2.1 Source Rock Thickness, Kerogen Types and Residual TOC

Source rock thickness and TOC in Montney Formation were quantified in section 3.4.4 based on GR-TOC relationship and the results are shown in Figure 3-20-Figure 3-22 and APPENDIX 3-4. Kerogen types are shown in Figure 3-10 based on S_2/S_3 ratio.

The Doig source rock is known for strong radioactivity, which is correlatable throughout the subsurface and can be used to approximate the Doig-Montney contact (Edwards et al., 1994). The high gamma ray response is mainly due to the presence of uranium, with a relatively minor effect due to the presence of potassium and thorium (Riediger, 1990). Source rock thickness determined from high GR interval of Doig phosphate mostly ranges from 10m to 60m (APPENDIX 3-4). To determine TOC values of Doig phosphate of a well, I use average data of Rock-Eval TOC values based on core measurements (APPENDIX 3-1) of phosphate zone in this well. TOC values of Doig phosphate are shown in following Figure 5-1.

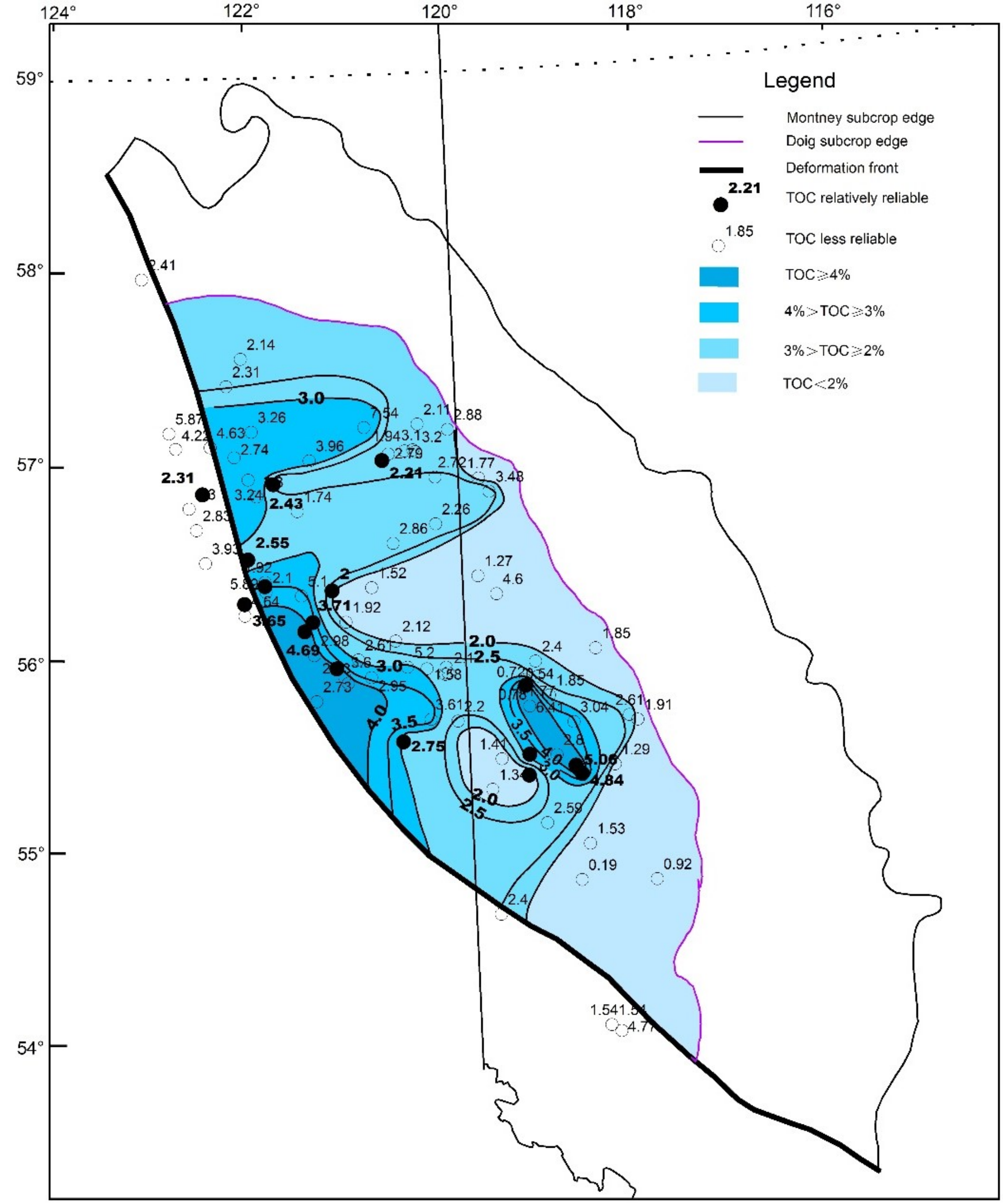

Figure 5-1 distribution of average residual TOC (%) in Doig Phosphate, basemap according to Atlas Shapefiles, Edwards et al., 1994

Based on Rock-Eval analysis of Doig core samples (APPENDIX 3-1), Doig organic matters is dominated by Type I and Type II kerogens (Table 5-1) according to S_2/S_3 ratio and proposed criteria (Peters et al, 1994).

Table 5-1 Kerogen type classification of Doig organic matters

Kerogen type	S_2/S_3	Ratios	Main Expelled Product at peak maturity
Type I	>15	41.8%	oil
Type II	10~15	18%	oil
Type II/III	5~10	23%	Mixed oil and gas
Type III	1~5	17.2%	gas
Type IV	<1	0%	No oil and gas

5.2.2 HI_o and HI_p Determination

Original hydrogen index (HI_o) and present-day hydrogen index (HI_p) of the source rock are of great significance to calculate the in-place resource using equation (4). Original hydrogen index (HI_o) can be obtained from extrapolation of hydrogen index vs Tmax plot (only utilizing samples with S_2>1 mg/g to ensure the Tmax is reliable). Original hydrogen index (HI_o) of different kerogen types (kerogen type is determined according to S_2/S_3 ratios) for Montney and Doig organic matter are shown in Figure 5-2 and Figure 5-3.

Original hydrogen index values for Type I, Type II and Type III kerogen of Montney organic matter is 600 mg HC/g TOC, 460 mg HC/g TOC and 260 mg HC/g TOC respectively (Figure 5-2). Original hydrogen index for Type I, Type II and Type III kerogen of Doig organic matter is 600 mg HC/g TOC, 470 mg HC/g TOC and 300 mg HC/g TOC respectively (Figure 5-3).

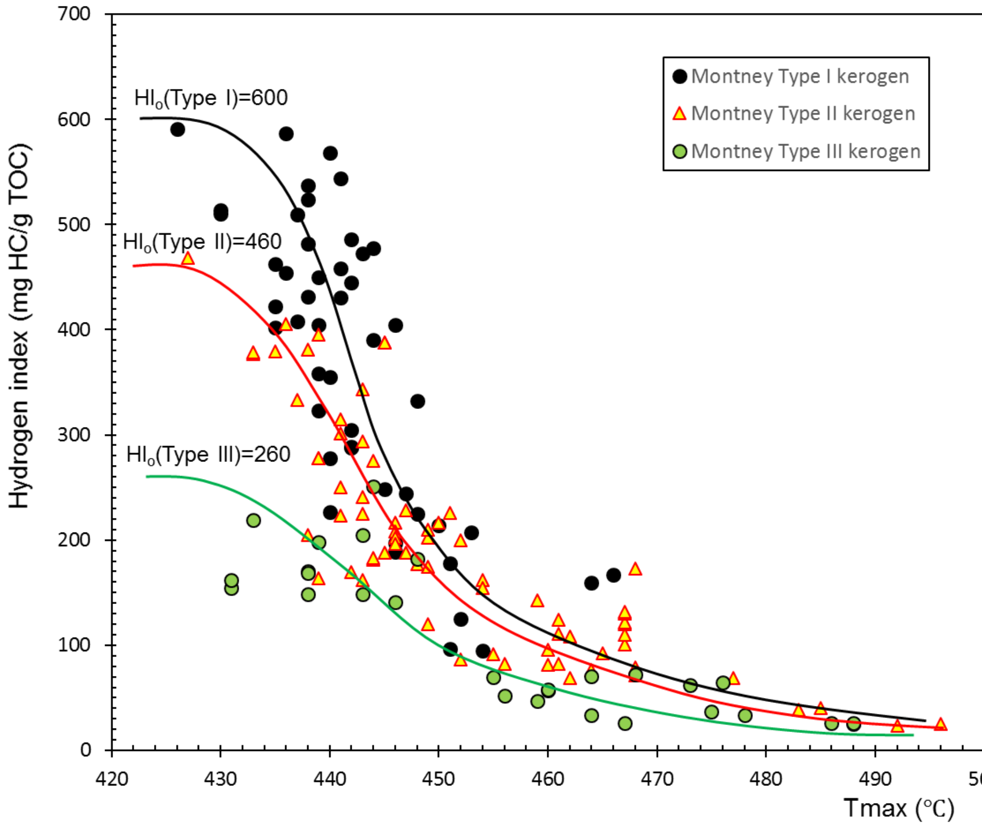

Figure 5-2 hydrogen index vs Tmax plot of different kerogens in Montney organic matters

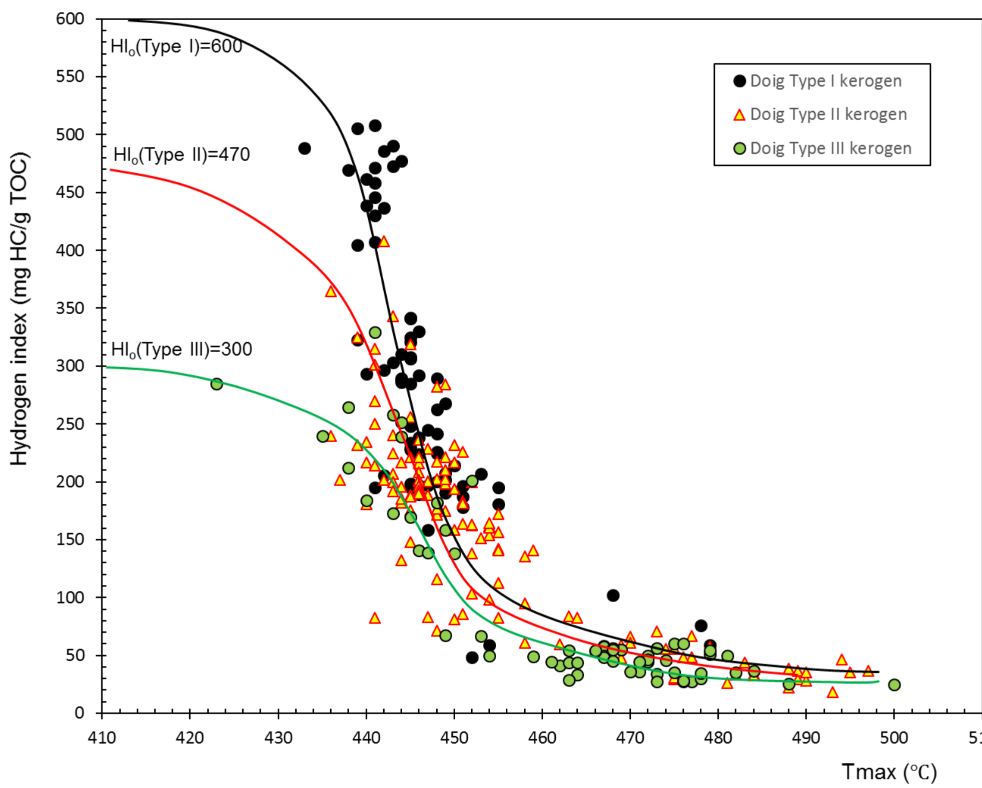

Figure 5-3 hydrogen index vs Tmax plot of different kerogens in Doig organic matters

Given the thermal maturity (Tmax) of organic matter is available, present-day hydrogen index (HI_p) of Montney and Doig organic matters can also be predicted from the model established in Figure 5-2 and Figure 5-3. Table 5-2 and Table 5-3 list some present-day hydrogen index of Montney and Doig organic matters with certain thermal maturity (Tmax). The data are acquired from the trend lines of different kerogens in Figure 5-2 and Figure 5-3 respectively.

Table 5-2 hydrogen index of Montney organic matters with different thermal maturity

Thermal maturity (Tmax)	HI (mg HC/g TOC) Of Type I kerogen	HI (mg HC/g TOC) Of Type II kerogen	HI (mg HC/g TOC) Of Type III kerogen
Original (HI_o)	600	460	260
420 ℃	600	460	260
425 ℃	600	460	260
430 ℃	590	445	250
433 ℃	570	420	240
435 ℃	550	400	225
436 ℃	530	385	217
437 ℃	510	370	210
437.5 ℃	502	360	207
440 ℃	440	320	185
442 ℃	370	280	167
442.5 ℃	350	270	162
443 ℃	335	260	160
445 ℃	280	225	140
447 ℃	240	197	120
447.5 ℃	227	190	118
450 ℃	190	160	100
452 ℃	168	144	90
455 ℃	140	122	78
457.5 ℃	122	110	70
460 ℃	112	97	60
462.5 ℃	100	88	55
465 ℃	90	80	48
470 ℃	72	60	36
475 ℃	60	47	30

Table 5-3 hydrogen index of Doig organic matters with different thermal maturity

Thermal maturity (Tmax)	HI (mg HC/g TOC) Of Type I kerogen	HI (mg HC/g TOC) Of Type II kerogen	HI (mg HC/g TOC) Of Type III kerogen
Original (HI_o)	600	470	300
440 ℃	435	320	230
441 ℃	400	300	220
442 ℃	370	280	210
443 ℃	330	260	200
444 ℃	300	240	190
445 ℃	275	225	175
446 ℃	240	200	160
447℃	210	180	150
447.5 ℃	200	170	140
448 ℃	185	160	130
449 ℃	170	145	120
450 ℃	150	130	110
451 ℃	140	120	100
452 ℃	125	110	90
455 ℃	105	90	75
457.5 ℃	94	81	67
460 ℃	85	75	60
462 ℃	80	70	57
462.5 ℃	78	68	55
465 ℃	72	62	50
470 ℃	61	52	42
475 ℃	53	45	35

5.2.3 Original TOC Restoration

TOC must be recalculated because maturation of source rock has converted a considerable part of TOC (organic matter) into hydrocarbons, which partially expelled from the source rock. Different kerogens have different TOC restoration ratios due to different kinetics during maturation.

Several approaches for estimating the original TOC content have been suggested (Dahl et al., 2004; Peters et al., 2006; Jarvie et al., 2007). None of these approaches consider the effect of hydrocarbon expulsion (in organic pores or within kerogens), possibly leading to overestimation of the original TOC content. In this study, original TOC is estimated using a quantitative expression by Chen and Jiang (2016) that employs a generalized Tmax-HI plot based on Rock-Eval pyrolysis. A hydrocarbon expulsion efficiency factor is introduced and subsequently incorporated into the calculation to improve the estimation of original TOC. The original TOC (TOC_0) can be calculated according to following equation (5),

$$TOC_0(\%) = \frac{TOC}{1-\alpha f T_R(1-0.833TOC/100)} \quad (5)$$

In equation (5), T_R is a measure of the degree of kerogen thermal alternation in terms of hydrocarbon conversion, which is in turn a function of thermal maturity and kinetic characteristics of kerogen in source rocks. T_R stands for the ratio of the organic carbon that has been converted into hydrocarbon to the total organic carbon (the sum of remaining TOC and the converted organic carbon) and can be calculated in equation (6). The hydrocarbon expulsion factor f is the ratio of expelled to the total hydrocarbon generated, which can be expressed and calculated from equation (7). α is the ratio of convertible carbon to total carbon associated with a specific kerogen type ($\alpha = HI_o/1200$ as recommended by Chen and Jiang, 2016).

$$T_R = \frac{1200(HI_o - HI)}{HI_o\ (1200 - HI)} \qquad (6)$$

$$f = 1 - \frac{S_1(1 - T_R)}{S_2 T_R} \qquad (7)$$

Determination of TOC_0 is illustrated in Figure 5-4 for Doig Type I kerogen. Every curved line in Figure 5-4 is drawn manually to fit the data. As shown in the figure, original hydrogen index HI_o can be extrapolated from hydrogen index vs Tmax plot based on Type I kerogen ($S_2>1$, $S_2/S_3>15$) of Doig source rock. HI_o is used to calculate hydrocarbon transformation ratio T_R, with which hydrocarbon efficiency factor f can be obtained. When all the parameters are estimated, the original TOC (TOC_0) can be calculated according to equation (5). TOC restoration ratios of other kerogen types in Doig and Montney organic matters ($S_2>1$) can be calculated in the same way (Figure 5-5, Figure 5-6). With available Tmax, TOC restoration ratio of different kerogens can be predicted.

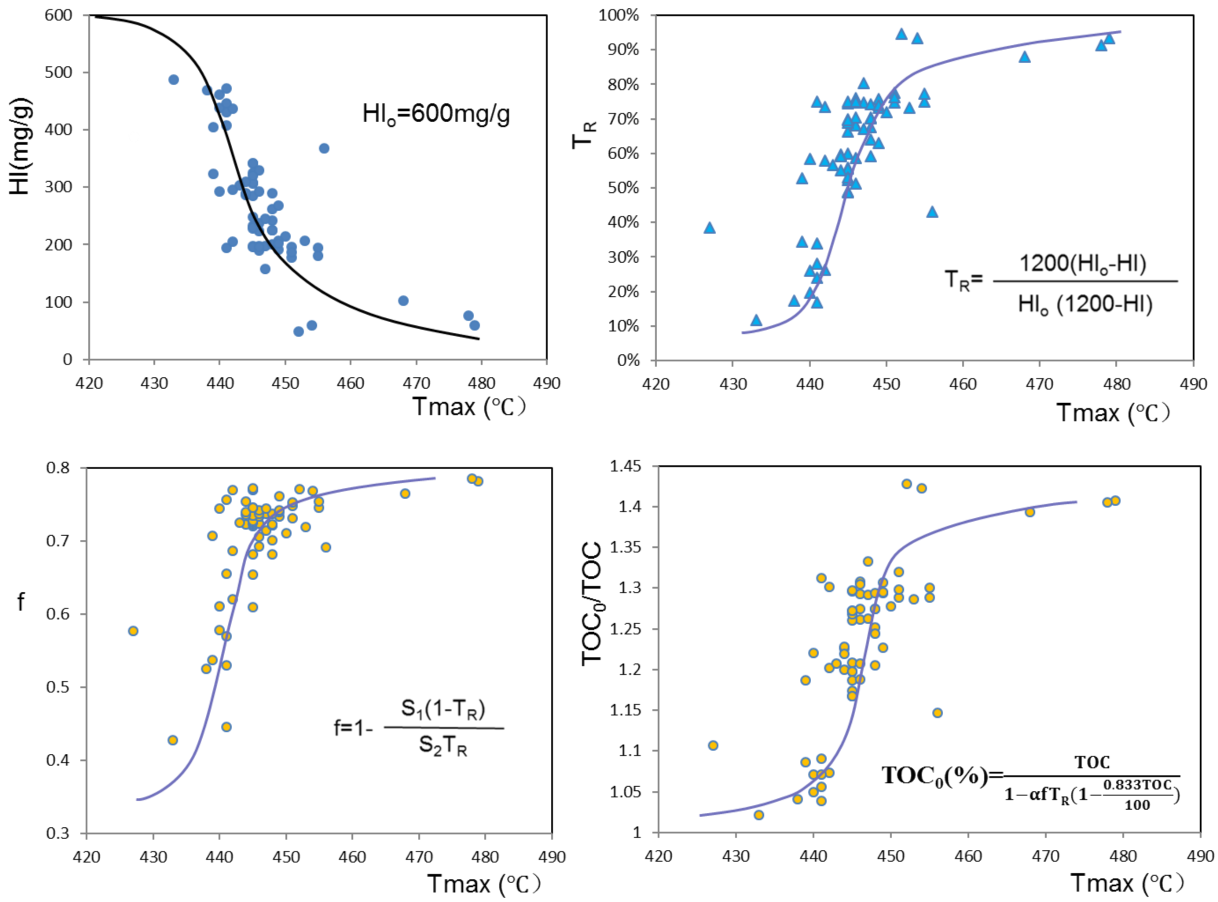

Figure 5-4 TOC restoration for Type I kerogen in Doig organic matters

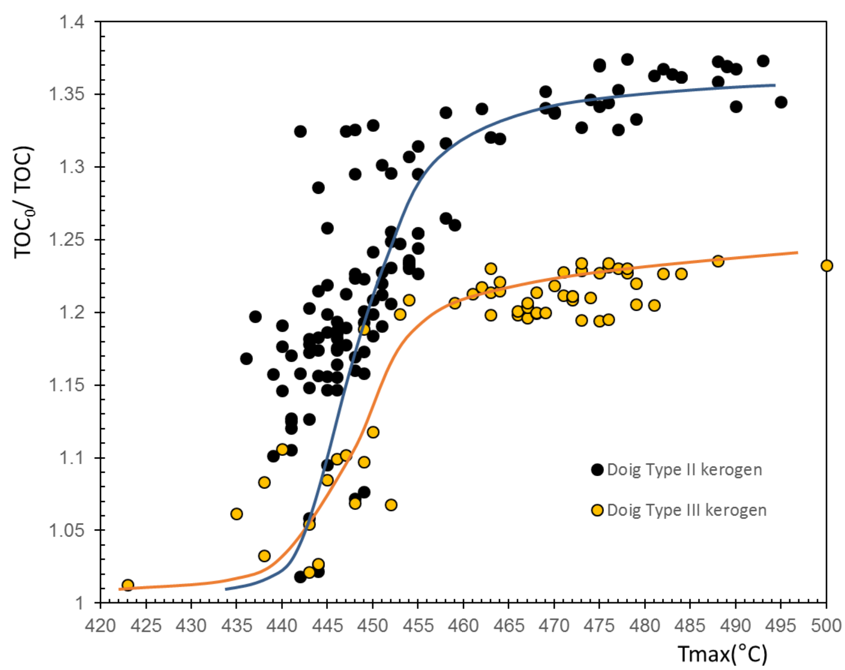

Figure 5-5 TOC restoration for Type II and Type III kerogens in Doig source rock

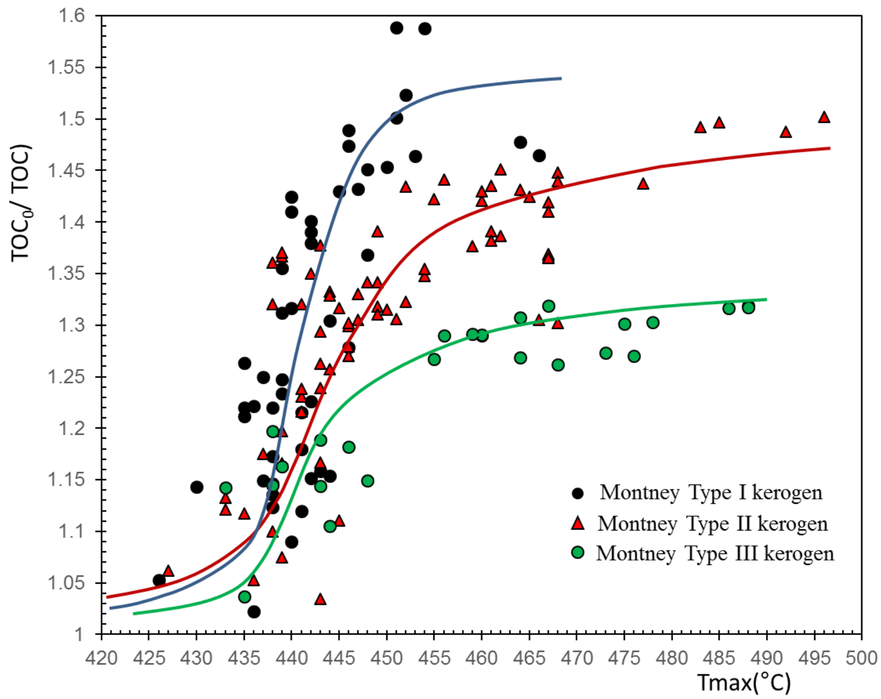

Figure 5-6 TOC restoration for different type of kerogens in Montney source rock

5. 3 In-place Resource Calculation

Equation (4) is applied to calculate of in-place hydrocarbon volumes for different source rocks, relying on specific TOC restoration ratios for each kerogen type and the ratio of different kerogens within the organic matter assemblage.

The mass of hydrocarbons generated per square kilometer (q kg HC) is calculated for 222 Montney wells where TOC values are predicted according to GR-TOC relationship and source rock thicknesses are quantified. Density of the source rock is obtained from average bulk density from DEN or RHOB curves. Tmax of Montney source rock is available from Figure 3-25, from which TOC restoration ratio (Figure 5-6), and present hydrogen index (HI_p) (Figure 5-2, Table 5-2) can be obtained. Original hydrogen index (HI_o) for Type I, Type II and Type III kerogen of Montney organic matters are estimated at 600 mg HC/g TOC, 460 mg HC/g TOC and 260 mg HC/g TOC respectively (Figure 5-2). An example of in-place resource (BOE/km^2 is shown in Table

5-4, assuming it is API 35°oil and 1BOE is equal to oil of 135 kg) calculation of Montney source rock at the location of well C-74-J/94-A-14 (Tmax=450℃). In-place resource (MBOE/km^2) of Montney wells is shown in APPENDIX 5-1 and Figure 5-6.

Calculation of hydrocarbon generation (per square kilometer) for Doig source rock is made with a similar procedure at the locations of 138 wells where TOC values of Doig source rock are measured and source rock thicknesses are determined from GR curves. Tmax of Doig source rock obtained from Figure 3-25 (Doig and Montney source rocks have similar thermal maturity because they are in contact with each other), from which TOC restoration ratio (Figure 5-4, Figure 5-5) and present hydrogen index (HI_p) (Figure 5-3, Table 5-3) can be obtained. Original hydrogen index for Type I, Type II and Type III kerogen of Doig organic matter is 600 mg HC/g TOC, 470 mg HC/g TOC and 300 mg HC/g TOC, respectively (Figure 5-3). The example of in-place resource calculation is shown in Table 5-5 at the location of well 8-19-66-12W6 (Tmax=475℃ at this location). In-place resource (MBOE/km^2) for Doig wells is shown in APPENDIX 5-2 and Figure 5-7.

Table 5-4 In-place resource calculation of Montney source rock at the location of well C-74-J/94-A-14

Source rock	Thickness (m)	Average TOC (%)	Rock density (g/cm^3)	Kerogen type	Kerogen type ratio	TOC restoration ratio	Original hydrogen index (HI_o)	Present hydrogen index (HI_p)	Hydrocarbon generated (BOE/km^2)
2>TOC%≥1 source rock	86.4	1.58	2.636	I	35.8%	1.51	600	190	5908018.9
				II	45%	1.35	460	160	4858090.29
				III	19.2%	1.22	260	100	1000669.04
4>TOC%≥2 source rock	28	2.64	2.64286	I	35.8%	1.51	600	190	3207348.62
				II	45%	1.35	460	160	2637362.79
				III	19.2%	1.22	260	100	543243.77
TOC%≥4 source rock	5.8	5.24	2.63372	I	35.8%	1.51	600	190	1314132.59
				II	45%	1.35	460	160	1080594.85
				III	19.2%	1.22	260	100	222580.84
Total hydrocarbon generated (BOE/km^2)									20772042

Table 5-5 In-place resource calculation of Doig source rock at the location of well 8-19-66-12W6

Source rock	Thickness (m)	Average TOC (%)	Rock density (g/cm^3)	Kerogen type	Kerogen type ratio	TOC restoration ratio	Original hydrogen index (HI_o)	Present hydrogen index (HI_p)	Hydrocarbon generated (BOE/km^2)
Doig phosphate	41	2.6	2.652	I	41.8%	1.42	600	53	6775120.19
				II	41%	1.35	470	45	4929752.23
				III	17.2%	1.23	300	35	1171158.94
Total hydrocarbon generated (BOE/km^2)									12876031

The Montney and Doig Formation are each divided into 11 spatial units, according to the volume of hydrocarbons generated per square kilometer (hydrocarbon generation intensity). The average hydrocarbon generation intensity assigned to each unit is the average value of all in-place resources (MBOE/km2) calculated for all locations within that unit. The area of each unit is measured and is combined with the generation intensity to calculate the hydrocarbon generated in each subdivision and total volume of hydrocarbon generated (Table 5-6 and Table 5-7). The overall in-place resource from Montney Formation is 1716.79 billion barrel of oil equivalent (BOE) and the in-place resource from Doig Formation is 464.02 billion BOE. Therefore, the contribution of

Montney-sourced hydrocarbons is about 3.7 times of that of Doig-sourced hydrocarbons.

Table 5-6 In-place resource from Montney source rock (MBOE)

Subdivisions	Area(km^2)	Average hydrocarbon generation intensity (MBOE/km^2)	hydrocarbon generated (MBOE)
0-2000 (MBOE)	17178	460	7901880
2000-4000 (MBOE)	6266.95	2671	16739023.45
4000-6000 (MBOE)	4642.6	5190	24095094
6000-8000 (MBOE)	2946.45	7166	21114260.7
8000-10000 (MBOE)	1723.62	8672	14947232.64
10000-12000 (MBOE)	2200.76	10578	23279639.28
12000-14000 (MBOE)	4521.58	13205	59707463.9
14000-16000 (MBOE)	2941.56	14855	43696873.8
16000-18000 (MBOE)	2244.14	16972	38087544.08
18000-20000 (MBOE)	2409.02	19545	47084295.9
>20000 MBOE	30575.51	46447	1420140713
Total hydrocarbon generated (MBOE)			1716794021

Table 5-7 In-place resource from Doig source rock (MBOE)

Subdivisions	Area(km^2)	Average hydrocarbon generation intensity (MBOE/km^2)	hydrocarbon generated (MBOE)
0-2000 (MBOE)	17034.37	897	15279829.89
2000-4000 (MBOE)	4785.69	2471	11825439.99
4000-6000 (MBOE)	7660.74	4983	38173467.42
6000-8000 (MBOE)	5370.25	6901	37060095.25
8000-10000 (MBOE)	9460.24	9133	86400371.92
10000-12000 (MBOE)	5312.61	11036	58629963.96
12000-14000 (MBOE)	4301	13003	55925903
14000-16000 (MBOE)	3035.39	14808	44948055.12
16000-18000 (MBOE)	1950.84	17047	33255969.48
18000-20000 (MBOE)	989.2	19257	19049024.4
>20000 MBOE	2829.48	22432	63470895.36
Total hydrocarbon generated (MBOE)			464019015.8

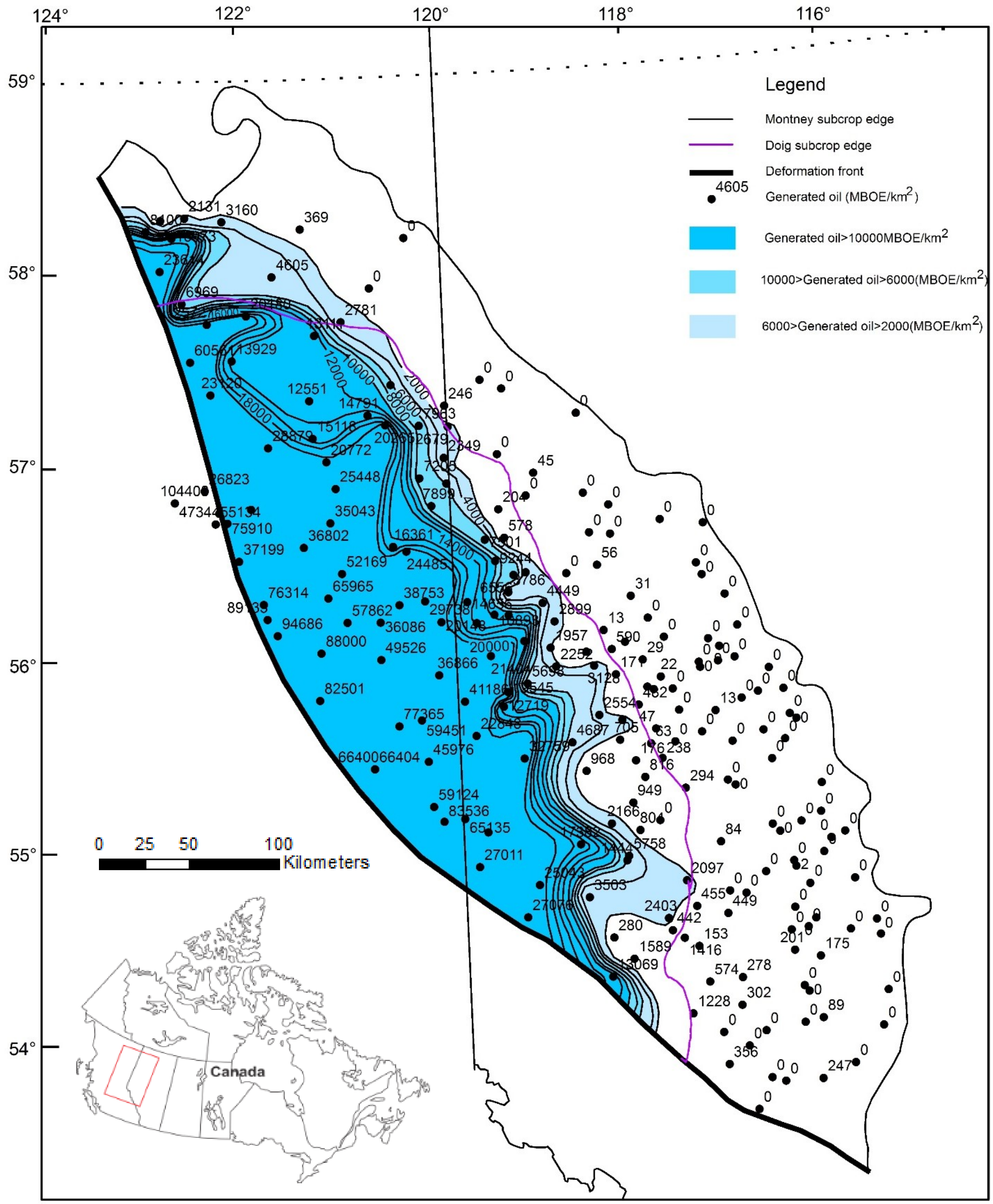

Figure 5-7 Distribution of Montney sourced in-place resource (MBOE/km^2), basemap according to Atlas Shapefiles, Edwards et al., 1994

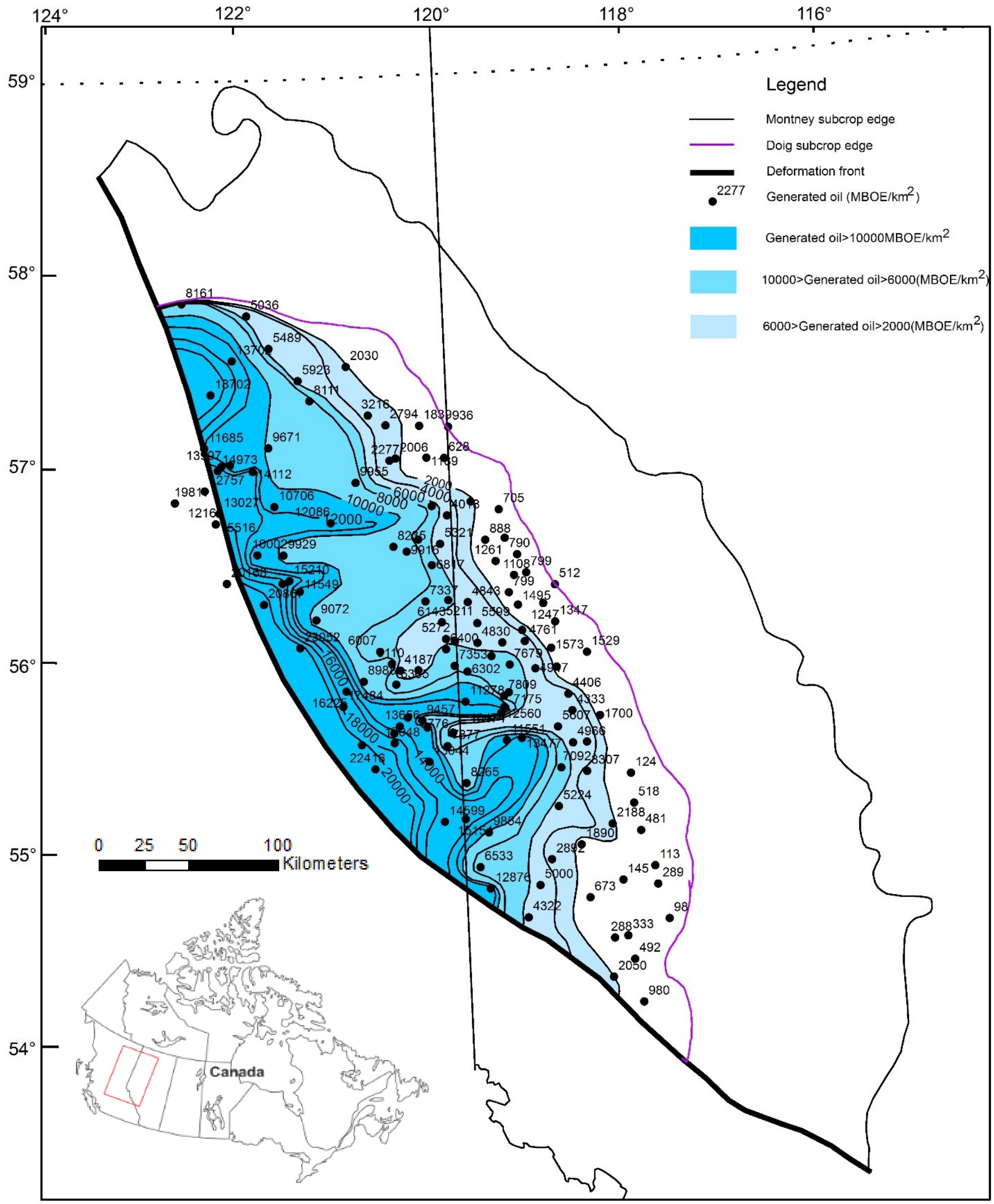

Figure 5-8 Distribution of Doig sourced in-place resource (MBOE/km²), basemap according to Atlas Shapefiles, Edwards et al., 1994

CHAPTER 6: SUMMARY AND CONCLUSIONS

Source rock evaluation suggests the Montney Formation contains good source rock, mostly distributed in the British Columbia. Montney organic matter is primarily Type I and Type II kerogen. Thermal maturity increases from northeast to southwest, represented by successive zones of immature source rock, oil zone, wet gas zone and dry gas zone. TOC values and GR readings demonstrate a linear relationship (log scale) and this empirical relationship can be used to determine the TOC values according to GR logs and to quantify the thickness of the source rock.

End members of three oil families with distinct geochemical signatures have been recognized in the Triassic oil accumulations of Western Canada Sedimentary Basin. Family A oils are characterized by a low ratio of diasteranes/regular steranes, high ratios of C_{24} tetracyclic terpane over C_{26} tricyclic terpanes and C_{29}/C_{30} hopanes, a high C_{35} homohopane index ($C_{35}/C_{34}>1$) and high sulfur contents. These oils likely originated from the organic-rich calcareous shale of Jurassic Gordondale Member. Family B oils have a moderate C_{24} tetracyclic terpane over C_{26} tricyclic terpane ratio, higher abundances of hopanes relative to tricyclic terpanes, a low C_{35} homohopane index ($C_{35}/C_{34}<1$), a high diasteranes/regular steranes ratio and relatively low C_{28} regular steranes. Family B oils are correlated with rock extracts from Doig Formation and are believed to be originated from the Doig phosphate zone. Family C oils contain high abundances of extended tricyclic terpanes and almost no hopanes. Compared with Families A and B, they are also characterized by lighter bulk carbon isotope $\delta^{13}C$ values, higher extended tricyclic terpane ratios (ETR), lower sulfur contents and much lower ratios of C_{24} tetracyclic terpanes over C_{26} tricyclic terpanes. Family C oils bear striking resemblance to extracts from the organic-rich Montney shales. Available evidence indicates that these oils are originated from Montney Formation and a genetic link between Family C oils and the Triassic Doig Phosphate unit or Jurassic Gordondale Member is unreasonable.

Family A oils are mainly distributed near the Montney subcrop edge, where the Gordondale Member directly overlies the Montney Formation. Family B oils are located near Doig Formation subcrop edge, where hydrocarbon migration in the Triassic units followed an up-dip path toward the north-east and overlying unconformity and Gordondale Member as lateral and vertical seal (Ejezie, 2007). Family C oils are mainly distributed in deep basin, where Montney organic-rich silty shale can generate large amount of oil.

The relative contribution of Montney-sourced hydrocarbons compared to that of Doig-sourced hydrocarbons can be indicated from the volumes of hydrocarbons generated from source rocks (Montney and Doig Formations) and can be calculated based on thermal degradation of organic matter and Schmoker's formula. Calculation results suggest the in-place resource generated from Montney source rock is about 1716.79 billion BOE, while the in-place resource generated from Doig Formation is about 464.02 billion BOE. The contribution of Montney-sourced hydrocarbons to the Triassic strata is about 3.7 times of the contribution of Doig-sourced hydrocarbons.

The presence of self-sourced hydrocarbons in Montney Formation indicates that geochemical signatures of oils and source rocks and oil-source correlations can help to improve oil and gas exploration efficiency.

FUTURE WORK

I identify some remaining problems related to the assessment of the Montney Formation as a self-sourced petroleum system.

1) Production volumes of oil, gas and condensate from Montney Formation (especially in deep basin) can be analyzed to see whether volumes of produced hydrocarbons are consistent with source rock richness and the modeled abundance of Montney-sourced in-place resources in the formation. The Arps model (Arps, 1945), Valko model (Valko and Lee, 2010) and Patzek model (Patzek et al., 2013) can be applied for decline analysis of Montney production wells (vertical wells and horizontal wells) to determine the expected ultimate recoverable reserves (EUR). In this analysis, production of horizontal wells should be normalized as per kilometer yield. Selection of a prediction model among the Arps, Valko and Patzek models can be determined by the best curve fitting of existing production data.
2) The EUR of Upper Montney, Middle Montney and Lower Montney production wells can be analyzed across the Montney Basin to identify production sweet spots in the Montney play. Petrophysical properties, organic matter richness and thermal maturity can be linked to the production from Montney wells, to identify the factors are of greatest significance to the production of oil and gas in Montney Formation.
3) The Montney basin can be subdivided into different regions for further study (for example, the eastern subcrop region, central Alberta region and western deep basin). Oil migration and accumulation patterns may be different in these regions,

related to differing rock properties and varying fluid compositions. Local oil migration within Montney deep basin should be further investigated. Source rock richness and quality of the Upper Montney, Middle Montney and Lower Montney can be evaluated separately in the basin to determine the most productive layers within the formation in different areas. Aromatic hydrocarbons and gasoline-range hydrocarbons can give addition information in terms of thermal maturity of source rock and oils in Montney formation. These hydrocarbon fractions may also be useful for oil-source correlation and to indicate oil and gas migration patterns.

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APPENDIX 3-1

Rock-Eval data for samples in Montney Formation, Doig Formation and Gordondale Member and Gamma ray readings from GR logs for some Montney samples

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
1	1-10-82-23W6	1995.3	Montney	VI	06/08/2007	70.8	0.72	447	0.12	0.14	0.37	19	51	114.9	GSC Internal data
	1-10-82-23W6	1995.3	Montney	VI	02/08/2007	70.2	1.28	461	0.56	0.63	0.22	49	17	114.9	GSC Internal data
	1-10-82-23W6	1996.8	Montney	VI	07/08/2007	70.4	3.3	457	0.48	0.92	0.47	28	14	109-220	GSC Internal data
	1-10-82-23W6	1999	Montney	VI	07/08/2007	70	0.89	448	0.16	0.22	0.43	25	48	94-170	GSC Internal data
	1-10-82-23W6	2001	Montney	VI	07/08/2007	70.8	2.28	451	0.36	0.52	0.33	23	14	137.3	GSC Internal data
	1-10-82-23W6	2005.2	Montney	VI	07/08/2007	70	1.56	449	0.27	0.33	0.34	21	22	130-220	GSC Internal data
	1-10-82-23W6	2006.1	Montney	VI	25/02/2010	70.3	1.18	440	0.23	0.21	0.39	18	33	130-220	GSC Internal data
	1-10-82-23W6	2006.6	Montney	VI	07/08/2007	70.9	1.8	457	0.27	0.48	0.31	27	17	130-220	GSC Internal data
	1-10-82-23W6	2008.4	Montney	VI	25/02/2010	70.6	2.77	460	0.35	0.64	0.4	23	14	136-200	GSC Internal data
	1-10-82-23W6	2009	Montney	VI	07/08/2007	50.9	6.74	478	0.71	2.27	0.47	34	7	165.8	GSC Internal data
	1-10-82-23W6	2010.9	Montney	VI	07/08/2007	70.8	2.84	465	0.32	0.79	0.37	28	13	146.1	GSC Internal data
	1-10-82-23W6	2011.2	Montney	VI	25/02/2010	70.1	3.88	452	0.55	0.69	0.37	18	10	145.7	GSC Internal data
	1-10-82-23W6	2012.4	Montney	VI	07/08/2007	69.9	1.73	453	0.2	0.39	0.31	23	18	115-190	GSC Internal data
2	1-14-75-11W6	2477.5	Montney	VI	23/03/2009	70.9	1.1	448	1.13	0.88	0.08	80	7	99-150	GSC Internal data
	1-14-75-11W6	2480.25	Montney	VI	23/03/2009	70.7	1.33	453	0.91	1.05	0.19	79	14	108-131	GSC Internal data
	1-14-75-11W6	2486.45	Montney	VI	23/03/2009	70.3	0.97	448	0.66	0.81	0.12	84	12	101-156	GSC Internal data
	1-14-75-11W6	2489.15	Montney	VI	23/03/2009	70	1.07	448	0.42	0.62	0.13	58	12	90-135	GSC Internal data
	1-14-75-11W6	2495.1	Montney	VI	23/03/2009	70.2	0.37	418	0.04	0.26	0.1	70	27	73.98	GSC Internal data
3	1-36-79-15W6	2006.2	Montney	VI	07/08/2007	50.6	6.56	464	1.9	5.03	0.43	77	7	120-300	GSC Internal data
	1-36-79-15W6	2006.5	Montney	VI	07/08/2007	70.4	1.3	470	0.79	0.89	0.21	68	16	120-300	GSC Internal data
	1-36-79-15W6	2009	Montney	VI	07/08/2007	70.2	1.49	459	0.6	0.84	0.27	56	18	110.8	GSC Internal data
	1-36-79-15W6	2011.2	Montney	VI	07/08/2007	70.3	0.79	441	0.28	0.37	0.29	47	37	113.5	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
3	1-36-79-15W6	2012.3	Montney	VI	07/08/2007	70.1	1.01	454	0.49	0.55	0.23	54	23	113.31	GSC Internal data
	1-36-79-15W6	2013.7	Montney	VI	07/08/2007	70.4	0.77	446	0.45	0.49	0.29	64	38	118.08	GSC Internal data
	1-36-79-15W6	2015	Montney	VI	07/08/2007	70.1	1.23	460	0.69	0.75	0.21	61	17	117-130	GSC Internal data
	1-36-79-15W6	2016.9	Montney	VI	07/08/2007	70.6	0.87	454	0.62	0.52	0.25	60	29	108.59	GSC Internal data
	1-36-79-15W6	2019	Montney	VI	07/08/2007	70.6	0.96	452	0.71	0.6	0.3	62	31	115.11	GSC Internal data
	1-36-79-15W6	2021.4	Montney	VI	07/08/2007	70	1	459	0.85	0.68	0.24	68	24	114-200	GSC Internal data
	1-36-79-15W6	2023	Montney	VI	07/08/2007	70.7	1	455	0.54	0.6	0.23	60	23	119.95	GSC Internal data
	1-36-79-15W6	2025.5	Montney	VI	07/08/2007	70.7	1.05	457	0.77	0.74	0.2	70	19	119-137	GSC Internal data
	1-36-79-15W6	2027.2	Montney	VI	07/08/2007	70.7	0.87	438	0.55	0.44	0.22	51	25	118-170	GSC Internal data
	1-36-79-15W6	2029.8	Montney	VI	08/08/2007	70.4	0.76	451	0.52	0.52	0.19	68	25	112.72	GSC Internal data
	1-36-79-15W6	2031.8	Montney	VI	08/08/2007	70.2	0.78	448	1.08	0.63	0.22	81	28	110-130	GSC Internal data
	1-36-79-15W6	2033.7	Montney	VI	08/08/2007	70.2	0.79	451	0.52	0.46	0.18	58	23	117-193	GSC Internal data
	1-36-79-15W6	2035.9	Montney	VI	08/08/2007	70.3	2.06	456	0.62	1.07	0.33	52	16	130-170	GSC Internal data
	1-36-79-15W6	2037.1	Montney	VI	08/08/2007	70.1	1.23	460	1.03	1.04	0.23	85	19	128.99	GSC Internal data
	1-36-79-15W6	2039.4	Montney	VI	08/08/2007	70.7	1.71	471	0.74	1.06	0.28	62	16	146.14	GSC Internal data
	1-36-79-15W6	2041.6	Montney	VI	08/08/2007	70	1.36	466	0.98	1.13	0.2	83	15	117.47	GSC Internal data
	1-36-79-15W6	2044	Montney	VI	08/08/2007	70.6	0.92	453	0.33	0.46	0.27	50	29	87-100	GSC Internal data
	1-36-79-15W6	2047	Montney	VI	08/08/2007	70.2	1.01	457	1.27	0.76	0.26	75	26	120.5	GSC Internal data
	1-36-79-15W6	2048.8	Montney	VI	08/08/2007	70.9	2.27	441	0.4	0.88	0.44	39	19	119.92	GSC Internal data
	1-36-79-15W6	2051	Montney	VI	08/08/2007	70.9	0.8	452	0.63	0.48	0.25	60	31	104.74	GSC Internal data
	1-36-79-15W6	2052.6	Montney	VI	08/08/2007	70.9	1.09	441	0.38	0.5	0.25	46	23	100.87	GSC Internal data
	1-36-79-15W6	2054.3	Montney	VI	08/08/2007	70.5	1.09	454	1.1	0.79	0.26	72	24	89-150	GSC Internal data
	1-36-79-15W6	2056.6	Montney	VI	08/08/2007	70.7	0.51	442	0.67	0.27	0.25	53	49	90-150	GSC Internal data
4	2-5-79-11W6	2041.15	Montney	VI	2016-07-11	51.2	0.68	438	0.86	1.37	0.14	201	21	112.79	New Analyzed

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
4	2-5-79-11W6	2041.55	Montney	VI	2016-07-11	50.8	0.76	438	1.35	1.56	0.17	205	22	112.31	New Analyzed
	2-5-79-11W6	2041.9	Montney	VI	2016-07-11	50.2	0.82	439	1.25	1.66	0.15	202	18	113.3	New Analyzed
	2-5-79-11W6	2043.63	Montney	VI	08/09/2006	70.2	0.57	430	0.62	1.27	0.17	223	30	99.96	GSC Internal data
	2-5-79-11W6	2049.09	Montney	VI	08/09/2006	70.4	0.37	431	0.49	0.74	0.18	200	49	95.06	GSC Internal data
	2-5-79-11W6	2107.01	Montney	VI	21/10/2006	70.8	0.53	438	0.44	1.17	0.16	221	30	92.9	GSC Internal data
	2-5-79-11W6	2111.22	Montney	VI	21/10/2006	70.6	0.49	435	0.35	0.96	0.16	196	33	93.1	GSC Internal data
	2-5-79-11W6	2111.5	Montney	VI	2016-07-11	50.7	0.81	443	0.82	1.35	0.14	167	17	85-106	New Analyzed
	2-5-79-11W6	2113.06	Montney	VI	21/10/2006	70	0.44	440	0.36	0.98	0.16	223	36	102.4	GSC Internal data
	2-5-79-11W6	2114	Montney	VI	2016-07-11	51.1	1.23	443	1.28	2.32	0.14	189	11	104.4	New Analyzed
5	2-19-79-14W6	2038	Montney	VI	01/08/2007	70.4	0.75	450	0.37	0.37	0.24	49	32	105-125	GSC Internal data
	2-19-79-14W6	2039	Montney	VI	01/08/2007	70.2	0.84	458	0.36	0.42	0.2	50	24	107.9	GSC Internal data
	2-19-79-14W6	2040.2	Montney	VI	01/08/2007	70.6	0.76	448	0.31	0.35	0.19	46	25	110-121	GSC Internal data
	2-19-79-14W6	2041.7	Montney	VI	01/08/2007	70.4	0.91	451	0.37	0.4	0.22	44	24	113-130	GSC Internal data
	2-19-79-14W6	2043.3	Montney	VI	01/08/2007	70.4	1.18	459	0.6	0.68	0.34	58	29	109.3	GSC Internal data
	2-19-79-14W6	2045.1	Montney	VI	01/08/2007	70.8	0.93	455	0.41	0.48	0.29	52	31	106.34	GSC Internal data
	2-19-79-14W6	2048	Montney	VI	28/06/2010	70.7	1.43	458	0.5	0.68	0.21	48	15	110.71	GSC Internal data
	2-19-79-14W6	2048.5	Montney	VI	01/08/2007	70.4	0.84	453	0.45	0.45	0.3	54	36	116.38	GSC Internal data
	2-19-79-14W6	2049.6	Montney	VI	01/08/2007	70.2	1.44	459	0.68	0.76	0.39	53	27	107.39	GSC Internal data
	2-19-79-14W6	2050.6	Montney	VI	01/08/2007	70	1.44	455	0.48	0.63	0.33	44	23	117-136	GSC Internal data
	2-19-79-14W6	2052.5	Montney	VI	01/08/2007	71	1.97	463	0.75	1.07	0.26	54	13	134.08	GSC Internal data
	2-19-79-14W6	2054.2	Montney	VI	01/08/2007	70.2	1.15	453	0.43	0.46	0.27	40	23	129.28	GSC Internal data
	2-19-79-14W6	2055.2	Montney	VI	01/08/2007	70.2	0.68	443	0.26	0.25	0.26	37	38	118.34	GSC Internal data
	2-19-79-14W6	2056.8	Montney	VI	01/08/2007	70.1	0.71	441	0.27	0.31	0.27	44	38	116.74	GSC Internal data
	2-19-79-14W6	2058.7	Montney	VI	01/08/2007	69.9	0.53	439	0.15	0.2	0.25	38	47	115-163	GSC Internal data
	2-19-79-14W6	2060.6	Montney	VI	01/08/2007	70.6	0.85	450	0.29	0.35	0.23	41	27	115-163	GSC Internal data
	2-19-79-14W6	2062.3	Montney	VI	01/08/2007	70.3	0.94	454	0.44	0.45	0.28	48	30	128-175	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	2-19-79-14W6	2063.3	Montney	VI	02/08/2007	70.3	0.86	449	0.25	0.24	0.32	28	37	128-175	GSC Internal data
	2-19-79-14W6	2064.3	Montney	VI	02/08/2007	70.6	1.78	462	0.65	0.79	0.31	44	17	117-175	GSC Internal data
	2-19-79-14W6	2064.9	Montney	VI	02/08/2007	70.2	1.8	463	0.65	0.85	0.26	47	14	117-153	GSC Internal data
	2-19-79-14W6	2066.9	Montney	VI	02/08/2007	70.3	1.71	469	0.7	0.92	0.23	54	13	131	GSC Internal data
	2-19-79-14W6	2068.9	Montney	VI	02/08/2007	70.4	0.67	451	0.33	0.32	0.18	48	27	131	GSC Internal data
	2-19-79-14W6	2069.5	Montney	VI	28/06/2010	70.5	1.27	459	0.55	0.65	0.28	51	22	108-142	GSC Internal data
	2-19-79-14W6	2070.5	Montney	VI	02/08/2007	70	1.64	440	0.34	0.53	0.49	32	30	109-195	GSC Internal data
	2-19-79-14W6	2072	Montney	VI	02/08/2007	71	0.66	448	0.27	0.29	0.19	44	29	113.52	GSC Internal data
	2-19-79-14W6	2073.7	Montney	VI	02/08/2007	70.7	0.55	442	0.26	0.22	0.21	40	38	84-170	GSC Internal data
	2-19-79-14W6	2075.7	Montney	VI	02/08/2007	70.8	1.22	465	0.49	0.61	0.18	50	15	116.91	GSC Internal data
	2-19-79-14W6	2077.9	Montney	VI	02/08/2007	70.3	2.01	454	0.81	0.87	0.27	43	13	105-126	GSC Internal data
	2-19-79-14W6	2079.9	Montney	VI	02/08/2007	70.3	0.95	459	0.45	0.45	0.23	47	24	111.7	GSC Internal data
	2-19-79-14W6	2081.5	Montney	VI	02/08/2007	70.1	1.47	454	0.55	0.6	0.26	41	18	85-118	GSC Internal data
	2-19-79-14W6	2083.4	Montney	VI	02/08/2007	70.4	1.23	444	0.5	0.5	0.34	41	28	85-130	GSC Internal data
	2-19-79-14W6	2085	Montney	VI	18/12/2009	70.4	2.07	454	0.65	0.91	0.09	44	4	125.5	GSC Internal data
	2-19-79-14W6	2085	Montney	VI	28/06/2010	70.7	2.13	445	0.81	0.71	0.33	33	15	125.5	GSC Internal data
	2-19-79-14W6	2085.5	Montney	VI	02/08/2007	70.4	0.6	435	0.2	0.16	0.23	27	38	86-130	GSC Internal data
	2-19-79-14W6	2085.8	Montney	VI	18/12/2009	70.1	0.46	433	0.22	0.15	0.23	33	50	86-130	GSC Internal data
	2-19-79-14W6	2087.7	Montney	VI	02/08/2007	70.7	2.25	446	0.87	0.86	0.26	38	12	123.1	GSC Internal data
	2-19-79-14W6	2089.2	Montney	VI	02/08/2007	70.6	1.67	452	0.64	0.65	0.33	39	20	88-128	GSC Internal data
	2-19-79-14W6	2090.1	Montney	VI	02/08/2007	70.3	1.3	448	0.48	0.47	0.33	36	25	88-128	GSC Internal data
	2-19-79-14W6	2091.4	Montney	VI	02/08/2007	70.9	0.58	444	0.21	0.18	0.26	31	45	110.2	GSC Internal data
6	3-6-78-22W6	3345.22	Montney	VI	26/10/2009	70.7	7.88	607	0.04	0.3	0.41	4	5	152.3	GSC Internal data
	3-6-78-22W6	3348.6	Montney	VI	26/10/2009	70.1	3.94	607	0.03	0.13	0.32	3	8	155.9	GSC Internal data
	3-6-78-22W6	3350.38	Montney	VI	26/10/2009	70.3	0.44	608	0.03	0.03	0.23	7	52	90.89	GSC Internal data
	3-6-78-22W6	3352.6	Montney	VI	26/10/2009	70.1	3.87	608	0.05	0.13	0.26	3	7	130.1	GSC Internal data
	3-6-78-22W6	3353.6	Montney	VI	27/10/2009	70.3	1.7	608	0.06	0.05	0.25	3	15	73-113	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	3-6-78-22W6	3354.1	Montney	VI	27/10/2009	70	0.85	289	0.05	0.02	0.25	2	29	105.14	GSC Internal data
	3-6-78-22W6	3354.4	Montney	VI	28/10/2009	70.3	2.08	608	0.11	0.07	0.23	3	11	105-120	GSC Internal data
	3-6-78-22W6	3355.43	Montney	VI	28/10/2009	70.3	1.97	608	0.04	0.05	0.23	3	12	105-118	GSC Internal data
	3-6-78-22W6	3357.44	Montney	VI	28/10/2009	70.1	1.14	291	0.06	0.04	0.29	4	25	116.37	GSC Internal data
	3-6-78-22W6	3360.34	Montney	VI	28/10/2009	70.5	2.31	608	0.04	0.08	0.3	3	13	131.56	GSC Internal data
	3-6-78-22W6	3361.06	Montney	VI	28/10/2009	70.1	2.87	608	0.04	0.07	0.29	2	10	145.3	GSC Internal data
	3-6-78-22W6	3361.68	Montney	VI	28/10/2009	70.1	5.52	607	0.03	0.14	0.28	3	5	119-146	GSC Internal data
	3-6-78-22W6	3473.8	Montney	VI	28/10/2009	70.5	1.93	291	0.05	0.05	0.25	3	13	101-118	GSC Internal data
	3-6-78-22W6	3474.43	Montney	VI	28/10/2009	70.4	2.46	292	0.03	0.03	0.23	1	9	101-118	GSC Internal data
	3-6-78-22W6	3477.56	Montney	VI	28/10/2009	70.2	1.6	609	0.03	0.03	0.25	2	16	85-106	GSC Internal data
	3-6-78-22W6	3477.79	Montney	VI	28/10/2009	70.6	1.13	288	0.04	0.03	0.3	3	27	85-106	GSC Internal data
	3-6-78-22W6	3480.4	Montney	VI	28/10/2009	70.1	2.28	288	0.06	0.05	0.19	2	8	86-110	GSC Internal data
	3-6-78-22W6	3482.06	Montney	VI	28/10/2009	70.2	1.51	289	0.05	0.04	0.3	3	20	96-114	GSC Internal data
	3-6-78-22W6	3483.12	Montney	VI	28/10/2009	70.1	1.73	608	0.03	0.03	0.26	2	15	113.62	GSC Internal data
	3-6-78-22W6	3484.13	Montney	VI	28/10/2009	70.6	2.04	288	0.05	0.04	0.24	2	12	95-115	GSC Internal data
	3-6-78-22W6	3486.53	Montney	VI	29/10/2009	70.6	1.75	286	0.03	0.03	0.24	2	14	114.16	GSC Internal data
	3-6-78-22W6	3489.39	Montney	VI	29/10/2009	70.7	0.93	289	0.04	0.02	0.19	2	20	106.49	GSC Internal data
7	6-3-76-12W6	2605	Montney	VI	2016-07-11	50.6	0.93	312	0.47	0.13	0.14	14	15	101.3	New Analyzed
	6-3-76-12W6	2605.38	Montney	VI	2016-07-11	50.1	1.21	312	0.55	0.21	0.12	17	10	100.31	New Analyzed
	6-3-76-12W6	2605.77	Montney	VI	2016-07-11	50.8	0.87	314	0.39	0.1	0.12	11	14	99.68	New Analyzed
	6-3-76-12W6	2606.4	Montney	VI	12/03/2009	70.7	0.8	421	0.22	0.12	0.23	15	29	100.68	ERCB/AGS Open File 2010-05
	6-3-76-12W6	2612.9	Montney	II	01/04/1990	100.50	0.78	447	0.46	0.03	0.59	4	76	85-96	GSC Open File 2308
	6-3-76-12W6	2612.9	Montney	II	01/04/1990	100.40	0.83	343	0.46	0.06	0.42	7	51	85-96	GSC Open File 2308
	6-3-76-12W6	2613.6	Montney	II	01/04/1990	101.20	0.65	433	0.37	0.02	0.36	3	55	102.2	GSC Open File 2308
	6-3-76-12W6	2613.6	Montney	II	01/04/1990	100.60	0.65	347	0.37	0.04	0.35	6	54	102.2	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	6-3-76-12W6	2617	Montney	VI	12/03/2009	70.6	0.55	398	0.16	0.09	0.26	16	47	94.19	ERCB/AGS Open File 2010-05
	6-3-76-12W6	2618.8	Montney	VI	12/03/2009	70.7	0.79	454	0.08	0.08	0.22	10	28	116.63	ERCB/AGS Open File 2010-05
	6-3-76-12W6	2619.8	Montney	II	01/04/1990	99.70	0.93	309	0.28	0.05	0.23	5	25	95.8	GSC Open File 2308
	6-3-76-12W6	2619.8	Montney	II	01/04/1990	100.00	0.95	0	0.28	0.06	0.27	6	28	95.8	GSC Open File 2308
	6-3-76-12W6	2619.8	Montney	II	01/04/1990	99.40	1.14	301	0.31	0.08	0.6	7	53	95.8	GSC Open File 2308
	6-3-76-12W6	2619.8	Montney	II	01/04/1990	99.20	1.16	308	0.3	0.07	0.59	6	51	95.8	GSC Open File 2308
	6-3-76-12W6	2620.4	Montney	II	01/04/1990	99.70	1.23	395	0.24	0.1	0.13	8	11	105	GSC Open File 2308
	6-3-76-12W6	2620.4	Montney	II	01/04/1990	100.20	1.31	374	0.24	0.1	0.13	8	10	105	GSC Open File 2308
	6-3-76-12W6	2622.5	Montney	VI	12/03/2009	71.1	0.68	307	0.09	0.08	0.2	12	29	97.9	ERCB/AGS Open File 2010-05
	6-3-76-12W6	2622.5	Montney	II	01/04/1990	100.40	0.54	311	0.12	0.03	0.12	6	22	97.9	GSC Open File 2308
	6-3-76-12W6	2622.5	Montney	II	01/04/1990	99.90	0.55	0	0.12	0.01	0.11	2	20	97.9	GSC Open File 2308
	6-3-76-12W6	2625.6	Montney	II	01/04/1990	100.70	0.96	314	0.23	0.15	0.16	16	17	103.74	GSC Open File 2308
	6-3-76-12W6	2625.6	Montney	II	01/04/1990	99.60	1	367	0.23	0.09	0.08	9	8	103.74	GSC Open File 2308
	6-3-76-12W6	2626.82	Montney	VI	2016-07-11	50.9	1.08	326	0.47	0.26	0.11	24	10	106.62	New Analyzed
	6-3-76-12W6	2627.37	Montney	VI	2016-07-11	50.3	1.13	338	0.36	0.38	0.11	34	10	103.05	New Analyzed
	6-3-76-12W6	2628.14	Montney	VI	2016-07-11	50.3	1.32	325	0.23	0.2	0.1	15	8	98.63	New Analyzed
	6-3-76-12W6	2629.1	Montney	VI	12/03/2009	70.9	0.88	297	0.11	0.1	0.2	11	23	96.5	ERCB/AGS Open File 2010-05
	6-3-76-12W6	2629.7	Montney	II	01/04/1990	100.50	0.96	430	0.14	0.08	0.12	8	13	96.68	GSC Open File 2308
	6-3-76-12W6	2629.7	Montney	II	01/04/1990	99.40	1.01	390	0.16	0.1	0.03	10	3	96.68	GSC Open File 2308
	6-3-76-12W6	2634.3	Montney	II	01/04/1990	100.40	0.92	0	0.59	0.12	0.07	13	8	96.93	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	6-3-76-12W6	2634.3	Montney	II	01/04/1990	100.40	0.93	0	0.61	0.11	0.14	12	15	96.93	GSC Open File 2308
	6-3-76-12W6	2637.7	Montney	II	01/04/1990	99.90	1.16	0	0.29	0.11	0.05	9	4	101.55	GSC Open File 2308
	6-3-76-12W6	2637.7	Montney	II	01/04/1990	100.70	1.19	0	0.32	0.16	0.02	13	2	101.55	GSC Open File 2308
	6-3-76-12W6	2639.9	Montney	VI	12/03/2009	70.8	0.75	298	0.2	0.1	0.18	13	24	106.68	ERCB/AGS Open File 2010-05
	6-3-76-12W6	2641.2	Montney	II	01/04/1990	99.50	0.76	0	0.07	0.03	0	4	0	104.12	GSC Open File 2308
	6-3-76-12W6	2641.2	Montney	II	01/04/1990	100.90	0.8	0	0.07	0.05	0	6	0	104.12	GSC Open File 2308
8	6-14-77-11W6	2189.1	Montney	VI	29/03/2006	70.3	0.93	451	0.55	0.56	0.19	60	20	109.2	GSC Internal data
	6-14-77-11W6	2190.15	Montney	VI	29/03/2006	70.2	0.38	445	0.17	0.19	0.14	50	37	98.3	GSC Internal data
	6-14-77-11W6	2193.9	Montney	VI	03/04/2006	70.3	0.27	445	0.17	0.15	0.16	56	59	78.1	GSC Internal data
	6-14-77-11W6	2195.2	Montney	VI	03/04/2006	70.9	0.66	448	0.3	0.34	0.16	52	24	71-112	GSC Internal data
	6-14-77-11W6	2197.4	Montney	VI	03/04/2006	70.9	0.3	438	0.18	0.19	0.13	63	43	60-96	GSC Internal data
	6-14-77-11W6	2198.1	Montney	VI	03/04/2006	70	0.28	439	0.13	0.13	0.12	46	43	80.8	GSC Internal data
	6-14-77-11W6	2200.35	Montney	VI	03/04/2006	70	0.27	439	0.13	0.12	0.13	44	48	70-107	GSC Internal data
	6-14-77-11W6	2202.35	Montney	VI	03/04/2006	70.8	0.83	444	0.52	0.46	0.13	55	16	116.29	GSC Internal data
	6-14-77-11W6	2205.2	Montney	VI	03/04/2006	70.3	0.77	440	0.61	0.51	0.12	66	16	112.7	GSC Internal data
9	6-26-80-20W6	2385	Montney	VI	25/05/2010	70.3	1.75	455	0.26	0.43	0.39	25	22	112	GSC Internal data
	6-26-80-20W6	2395	Montney	VI	25/05/2010	69.9	1.38	451	0.19	0.24	0.29	17	21	105-135	GSC Internal data
10	6-30-67-23W5	1837.2	Montney	VI	2016-07-11	51.1	0.53	425	0.92	2	0.13	377	25	74.52	New Analyzed
	6-30-67-23W5	1840.8	Montney	II	01/04/1990	100.00	0.89	424	1.66	1.89	0.17	212	19	78.66	GSC Open File 2308
	6-30-67-23W5	1840.8	Montney	II	01/04/1990	99.60	0.92	431	1.65	2.05	0.17	223	18	78.66	GSC Open File 2308
	6-30-67-23W5	1847.1	Montney	VI	2016-07-11	50.8	0.57	413	1.83	1.61	0.16	282	28	84.02	New Analyzed
	6-30-67-23W5	1849.3	Montney	II	01/04/1990	100.40	0.65	445	0.6	2.52	0.21	388	32	69.96	GSC Open File 2308
	6-30-67-23W5	1849.3	Montney	II	01/04/1990	101.10	0.67	438	0.67	2.51	0.19	375	28	69.96	GSC Open File 2308
	6-30-67-23W5	1850.1	Montney	VI	2016-07-11	50.5	0.14	430	0.06	0.28	0.16	200	114	12.62	New Analyzed
	6-30-67-23W5	1850.7	Montney	VI	2016-07-11	50.9	0.25	433	0.18	0.8	0.17	320	68	13.97	New Analyzed

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	6-30-67-23W5	1853.8	Montney	VI	2016-07-11	51.1	0.44	434	0.24	1.2	0.22	273	50	79.17	New Analyzed
	6-30-67-23W5	1857.6	Montney	II	01/04/1990	100.00	0.44	442	0.26	1.18	0.27	268	61	73.26	GSC Open File 2308
	6-30-67-23W5	1857.6	Montney	II	01/04/1990	99.90	0.45	441	0.27	1.2	0.27	267	60	73.26	GSC Open File 2308
11	6-36-71-4W6	1888.15	Montney	VI	2016-07-11	50.5	0.61	437	0.63	1.92	0.27	315	44	92.1	New Analyzed
	6-36-71-4W6	1888.6	Montney	VI	2016-07-11	50.8	0.84	440	0.68	3.13	0.16	373	19	96.2	New Analyzed
	6-36-71-4W6	1889.2	Montney	VI	10/03/2009	70.1	1.1	446	0.4	4.45	0.21	405	19	108.15	GSC Internal data
	6-36-71-4W6	1890.1	Montney	VI	2016-07-11	50.8	0.91	437	0.7	2.9	0.28	319	31	98.4	New Analyzed
	6-36-71-4W6	1890.6	Montney	VI	2016-07-11	50.1	0.84	441	0.98	2.91	0.13	346	15	93.2	New Analyzed
	6-36-71-4W6	1892	Montney	VI	2016-07-11	50.7	0.83	437	1.28	2.86	0.13	345	16	93.8	New Analyzed
	6-36-71-4W6	1893.3	Montney	VI	2016-07-11	50.7	1.01	441	0.98	3.57	0.11	353	11	98.1	New Analyzed
	6-36-71-4W6	1894.5	Montney	VI	2016-07-11	50.9	1.02	438	1.16	3.67	0.1	360	10	101.2	New Analyzed
	6-36-71-4W6	1895.4	Montney	VI	2016-07-11	50.3	1.41	440	0.68	4.68	0.17	332	12	103.85	New Analyzed
	6-36-71-4W6	1899	Montney	VI	2016-07-11	50.4	0.76	435	0.94	2.57	0.14	338	18	107.34	New Analyzed
	6-36-71-4W6	1899.4	Montney	VI	10/03/2009	70.3	1.39	442	0.71	4.23	0.21	304	15	108.96	GSC Internal data
	6-36-71-4W6	1900.4	Montney	VI	2016-07-11	50.5	1.27	440	0.84	4.03	0.15	317	12	108.75	New Analyzed
	6-36-71-4W6	1902.5	Montney	VI	2016-07-11	50.6	1.31	441	0.83	4.15	0.17	317	13	94.49	New Analyzed
	6-36-71-4W6	1903	Montney	VI	2016-07-11	51	1.49	441	0.44	4.99	0.16	335	11	96	New Analyzed
	6-36-71-4W6	1903.6	Montney	VI	10/03/2009	71	1.53	448	0.38	5.09	0.2	333	13	102.83	GSC Internal data
	6-36-71-4W6	1904.7	Montney	VI	2016-07-11	50.5	1.33	442	0.22	4.86	0.15	365	11	80-101	New Analyzed
	6-36-71-4W6	1907.5	Montney	VI	10/03/2009	70	1.76	444	0.37	6.87	0.21	390	12	109.46	GSC Internal data
	6-36-71-4W6	1911.1	Montney	VI	10/03/2009	70.6	1.47	440	1.46	3.33	0.22	227	15	97.44	GSC Internal data
	6-36-71-4W6	1916.6	Montney	VI	10/03/2009	70.7	0.2	316	0.76	0.48	0.11	240	55	75-112	GSC Internal data
	6-36-71-4W6	1919.2	Montney	VI	10/03/2009	70.2	1.55	440	0.49	5.73	0.08	370	5	103.47	GSC Internal data
	6-36-71-4W6	1922.6	Montney	VI	10/03/2009	70.7	1.95	441	0.39	6.55	0.12	336	6	118.07	GSC Internal data
	6-36-71-4W6	1923.5	Montney	VI	2016-07-11	50.2	2.07	441	0.48	7.69	0.07	371	3	79-118	New Analyzed
	6-36-71-4W6	1930.3	Montney	VI	2016-07-11	50.2	1.11	445	0.27	4.37	0.12	394	11	95.71	New Analyzed
	6-36-71-4W6	1931.2	Montney	VI	10/03/2009	70.9	1.34	445	0.26	5.5	0.09	410	7	105.84	GSC Internal data
	6-36-71-4W6	1931.3	Montney	VI	2016-07-11	50.2	0.8	440	0.77	3.58	0.12	448	15	101.58	New Analyzed

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
	6-36-71-4W6	1931.6	Montney	VI	2016-07-11	50.4	0.89	440	0.92	3.74	0.12	420	13	97.07	New Analyzed
	6-36-71-4W6	1932.1	Montney	VI	2016-07-11	50.7	1	445	0.42	4.7	0.11	470	11	110.9	New Analyzed
	6-36-71-4W6	1932.4	Montney	VI	2016-07-11	50.6	0.73	443	0.46	3.22	0.1	441	14	81-133	New Analyzed
	6-36-71-4W6	1934.3	Montney	VI	2016-07-11	50.7	0.7	439	0.89	2.27	0.11	324	16	80-128	New Analyzed
	6-36-71-4W6	1936.8	Montney	VI	2016-07-11	51.1	0.69	432	1.43	2.06	0.13	299	19	109.7	New Analyzed
	6-36-71-4W6	1938.7	Montney	VI	10/03/2009	70.2	0.78	437	1.1	2.21	0.14	283	18	104.94	GSC Internal data
	6-36-71-4W6	1940	Montney	VI	2016-07-11	50	0.7	438	0.83	2.42	0.16	346	23	99	New Analyzed
	6-36-71-4W6	1943	Montney	VI	10/03/2009	70.9	1.03	437	1.4	2.83	0.14	275	14	103.7	GSC Internal data
12	7-5-87-20W6	1941.7	Montney	II	01/04/1990	101.70	1.69	461	1	1.32	0.45	78	27	129.13	GSC Open File 2308
	7-5-87-20W6	1941.7	Montney	II	01/04/1990	101.10	1.69	463	1.01	1.35	0.23	80	14	129.13	GSC Open File 2308
	7-5-87-20W6	1944.6	Montney	II	01/04/1990	101.60	1.58	460	1.06	1.07	0.31	68	20	129.73	GSC Open File 2308
	7-5-87-20W6	1944.6	Montney	II	01/04/1990	101.00	1.63	461	1.05	1.13	0.17	69	10	129.73	GSC Open File 2308
	7-5-87-20W6	1946	Montney	II	01/04/1990	100.00	1.18	451	0.99	0.88	0.2	75	17	122.63	GSC Open File 2308
	7-5-87-20W6	1946	Montney	II	01/04/1990	102.70	1.2	453	0.99	0.93	0.63	78	53	122.63	GSC Open File 2308
	7-5-87-20W6	1947.4	Montney	II	01/04/1990	102.60	1.63	458	0.72	0.59	0.53	36	33	129.62	GSC Open File 2308
	7-5-87-20W6	1947.4	Montney	II	01/04/1990	102.10	1.64	458	0.72	0.61	0.21	37	13	129.62	GSC Open File 2308
	7-5-87-20W6	1948.1	Montney	II	01/04/1990	101.40	2.77	458	0.33	0.45	0.25	16	9	142.9	GSC Open File 2308
	7-5-87-20W6	1948.1	Montney	II	01/04/1990	101.00	2.78	458	0.34	0.45	0.23	16	8	142.9	GSC Open File 2308
	7-5-87-20W6	1948.3	Montney	II	01/04/1990	100.90	0.79	411	0.07	0.1	0.15	13	19	60-227	GSC Open File 2308
	7-5-87-20W6	1948.3	Montney	II	01/04/1990	101.10	0.85	345	0.07	0.1	0.17	12	20	60-227	GSC Open File 2308
13	10-8-79-14W6	2018.5	Montney	VI	14/06/2007	70.7	0.87	442	0.18	0.22	0.26	25	30	104-133	GSC Internal data
	10-8-79-14W6	2021	Montney	VI	14/06/2007	70.6	1.15	458	0.19	0.28	0.16	24	14	111.8	GSC Internal data
	10-8-79-14W6	2021.9	Montney	VI	14/06/2007	70.2	0.81	445	0.17	0.2	0.19	25	23	104.2	GSC Internal data
	10-8-79-14W6	2023.3	Montney	VI	14/06/2007	70.3	1.11	454	0.22	0.3	0.21	27	19	106.8	GSC Internal data
	10-8-79-14W6	2026.3	Montney	VI	14/06/2007	70.4	2.34	460	0.48	0.96	0.2	41	9	107-131	GSC Internal data
	10-8-79-14W6	2029.2	Montney	VI	14/06/2007	70.7	1.87	454	0.34	0.75	0.22	40	12	122.1	GSC Internal data
	10-8-79-14W6	2031	Montney	VI	14/06/2007	70.7	0.65	448	0.14	0.2	0.23	31	35	119.3	GSC Internal data
	10-8-79-14W6	2033.3	Montney	VI	14/06/2007	70.8	0.69	444	0.16	0.2	0.22	29	32	111-210	GSC Internal data
	10-8-79-14W6	2035.9	Montney	VI	14/06/2007	70.5	1.68	453	0.31	0.62	0.24	37	14	121.5	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
	10-8-79-14W6	2048	Montney	VI	15/06/2007	70.5	1.75	466	0.43	0.88	0.23	50	13	107-192	GSC Internal data
	10-8-79-14W6	2048.7	Montney	VI	15/06/2007	70.3	0.89	462	0.22	0.4	0.21	45	24	86-122	GSC Internal data
	10-8-79-14W6	2050.5	Montney	VI	15/06/2007	70.9	0.85	460	0.23	0.38	0.14	45	16	86-150	GSC Internal data
	10-8-79-14W6	2052	Montney	VI	15/06/2007	70.5	2.15	454	0.58	0.68	0.18	32	8	123.7	GSC Internal data
	10-8-79-14W6	2054	Montney	VI	15/06/2007	70.4	0.79	452	0.23	0.28	0.33	35	42	108.4	GSC Internal data
	10-8-79-14W6	2056.4	Montney	VI	15/06/2007	70.6	2.05	451	0.6	0.7	0.19	34	9	93-128	GSC Internal data
	10-8-79-14W6	2058.2	Montney	VI	15/06/2007	70.4	0.37	444	0.11	0.11	0.13	30	35	87-109	GSC Internal data
	10-8-79-14W6	2059	Montney	VI	15/06/2007	70.3	0.81	447	0.21	0.21	0.23	26	28	94-130	GSC Internal data
	10-8-79-14W6	2061.5	Montney	VI	15/06/2007	70.3	1.98	446	0.54	0.55	0.21	28	11	109-130	GSC Internal data
	10-8-79-14W6	2064.1	Montney	VI	15/06/2007	70.2	1.42	449	0.36	0.41	0.26	29	18	70-130	GSC Internal data
	10-8-79-14W6	2066.4	Montney	VI	15/06/2007	70.9	0.49	448	0.15	0.15	0.22	31	45	102	GSC Internal data
14	11-1-75-11W6	2487.2	Montney	VI	26/07/2006	70.7	1.47	428	1.57	1.76	0.11	120	7	129.2	GSC Internal data
	11-1-75-11W6	2491.04	Montney	VI	26/07/2006	70.2	1.12	445	1.21	1.63	0.12	146	11	116.16	GSC Internal data
	11-1-75-11W6	2491.91	Montney	VI	26/07/2006	70.2	1.61	442	1.94	2.45	0.17	152	11	127.67	GSC Internal data
	11-1-75-11W6	2492.41	Montney	VI	26/07/2006	70.8	1.64	447	1.39	1.69	0.14	103	9	133	GSC Internal data
	11-1-75-11W6	2494.01	Montney	VI	26/07/2006	70.6	1.7	436	1.97	2.43	0.14	143	8	130.8	GSC Internal data
	11-1-75-11W6	2495.99	Montney	VI	26/07/2006	70.4	1.22	446	0.8	1.3	0.19	107	16	124.76	GSC Internal data
	11-1-75-11W6	2497.62	Montney	VI	26/07/2006	70.3	0.77	445	0.5	0.55	0.13	71	17	113-150	GSC Internal data
	11-1-75-11W6	2499.01	Montney	VI	26/07/2006	70.4	0.25	442	0.16	0.21	0.09	84	36	72.6	GSC Internal data
	11-1-75-11W6	2502.67	Montney	VI	26/07/2006	70.2	0.19	442	0.1	0.14	0.1	74	53	73.4	GSC Internal data
	11-1-75-11W6	2503.99	Montney	VI	27/07/2006	70.6	0.69	446	0.38	0.64	0.18	93	26	80-200	GSC Internal data
	11-1-75-11W6	2504.69	Montney	VI	27/07/2006	70.4	0.57	446	0.41	0.54	0.2	95	35	76-150	GSC Internal data
15	12-29-78-18W6	2491	Montney	VI	25/02/2009	70.2	1.8	300	2.77	0.68	0.29	38	16	128-213	GSC Internal data
	12-29-78-18W6	2491.4	Montney	VI	25/02/2009	70.8	1.42	301	4.97	0.75	0.25	53	18	128-213	GSC Internal data
	12-29-78-18W6	2492.2	Montney	VI	25/02/2009	70.7	2.12	304	1.73	0.73	0.29	34	14	128.6	GSC Internal data
	12-29-78-18W6	2493.4	Montney	VI	25/02/2009	70.4	3.52	475	0.86	1.29	0.32	37	9	126-150	GSC Internal data
	12-29-78-18W6	2494.4	Montney	VI	25/02/2009	71.1	1.78	302	3.52	0.86	0.06	48	3	122.58	GSC Internal data
	12-29-78-18W6	2495.7	Montney	VI	25/02/2009	70.4	1.53	299	2.14	0.62	0.27	41	18	119-150	GSC Internal data
	12-29-78-18W6	2497.3	Montney	VI	25/02/2009	70.2	1.8	298	1.12	0.49	0.31	27	17	128.14	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
	12-29-78-18W6	2502.6	Montney	VI	25/02/2009	70.2	1.31	299	3.53	0.59	0.23	45	18	128.97	GSC Internal data
	12-29-78-18W6	2505.1	Montney	VI	25/02/2009	70	1.17	298	3.1	0.58	0.24	50	21	126.68	GSC Internal data
16	13-11-81-20W6	2146.39	Montney	VI	21/12/2008	70.5	4.71	480	9.02	3.22	0.32	68	7	106-168	GSC Internal data
	13-11-81-20W6	2147.76	Montney	VI	21/12/2008	70.8	1.85	458	1.76	0.78	0.34	42	18	120.7	GSC Internal data
	13-11-81-20W6	2149.25	Montney	VI	21/12/2008	70.3	1.29	296	3.49	0.64	0.14	50	11	109.54	GSC Internal data
	13-11-81-20W6	2150.39	Montney	VI	21/12/2008	70.1	1.28	298	3.49	0.61	0.21	48	16	109.43	GSC Internal data
	13-11-81-20W6	2151.37	Montney	VI	21/12/2008	70.9	1.69	454	1.61	0.68	0.02	40	1	112.22	GSC Internal data
	13-11-81-20W6	2152.03	Montney	VI	21/12/2008	70.6	1.6	457	4.13	0.79	0	49	0	115.82	GSC Internal data
	13-11-81-20W6	2153.02	Montney	VI	21/12/2008	70.9	1.23	296	3.35	0.58	0.15	47	12	123.81	GSC Internal data
	13-11-81-20W6	2154.02	Montney	VI	21/12/2008	70.4	1.45	298	2.43	0.66	0.19	46	13	110.7	GSC Internal data
	13-11-81-20W6	2155.37	Montney	VI	21/12/2008	70.8	1.98	466	2.4	0.86	0.15	43	8	130.37	GSC Internal data
	13-11-81-20W6	2156.39	Montney	VI	21/12/2008	70.6	2.1	454	1.66	0.77	0	37	0	127.7	GSC Internal data
	13-11-81-20W6	2157.27	Montney	VI	22/12/2008	71	0.87	443	1.05	0.34	0.23	39	26	110.09	GSC Internal data
	13-11-81-20W6	2158.26	Montney	VI	22/12/2008	70.3	2.17	464	0.95	0.74	0.23	34	11	123.8	GSC Internal data
	13-11-81-20W6	2159.03	Montney	VI	22/12/2008	70.5	1.94	454	0.63	0.56	0.24	29	12	122.06	GSC Internal data
	13-11-81-20W6	2160.24	Montney	VI	22/12/2008	70.5	1.3	455	1.2	0.47	0.26	36	20	124.91	GSC Internal data
	13-11-81-20W6	2162.53	Montney	VI	22/12/2008	70.2	2.14	455	2.66	0.84	0.19	39	9	138.77	GSC Internal data
	13-11-81-20W6	2163.39	Montney	VI	22/12/2008	70.8	2.19	461	1.03	0.68	0.21	31	10	110-130	GSC Internal data
	13-11-81-20W6	2306.37	Montney	VI	22/12/2008	70.6	1.36	298	1.18	0.39	0.17	29	12	110	GSC Internal data
	13-11-81-20W6	2308.14	Montney	VI	22/12/2008	70	2.62	455	0.99	0.74	0.16	28	6	110-150	GSC Internal data
	13-11-81-20W6	2308.51	Montney	VI	22/12/2008	70.1	2.26	453	0.61	0.43	0.17	19	8	129.2	GSC Internal data
	13-11-81-20W6	2309.39	Montney	VI	22/12/2008	70.5	5.08	467	1.36	1.47	0.22	29	4	155.64	GSC Internal data
	13-11-81-20W6	2310.37	Montney	VI	22/12/2008	70.1	2.89	299	3.4	1.01	0.25	35	9	117-163	GSC Internal data
	13-11-81-20W6	2310.88	Montney	VI	22/12/2008	70.4	2.3	464	0.75	0.61	0.29	27	13	123.2	GSC Internal data
	13-11-81-20W6	2313.05	Montney	VI	22/12/2008	70.5	1.84	301	1.17	0.54	0.22	29	12	92-119	GSC Internal data
	13-11-81-20W6	2314.39	Montney	VI	22/12/2008	70.1	1.67	297	1.27	0.45	0.19	27	11	94-112	GSC Internal data
	13-11-81-20W6	2316.03	Montney	VI	22/12/2008	70.8	1.19	444	0.51	0.25	0.23	21	19	118.31	GSC Internal data
	13-11-81-20W6	2318.05	Montney	VI	22/12/2008	70.3	1.7	455	0.64	0.4	0.17	24	10	118.5	GSC Internal data
	13-11-81-20W6	2320.05	Montney	VI	22/12/2008	70.5	0.62	297	0.84	0.23	0.17	37	27	107-125	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	13-11-81-20W6	2320.51	Montney	VI	22/12/2008	70.2	1.83	299	1.71	0.61	0.15	33	8	122.6	GSC Internal data
	13-11-81-20W6	2322.03	Montney	VI	23/12/2008	70.7	0.52	296	0.5	0.16	0.15	31	29	105-116	GSC Internal data
	13-11-81-20W6	2322.61	Montney	VI	23/12/2008	70.7	1.59	303	0.81	0.54	0.14	34	9	119.05	GSC Internal data
17	13-12-78-11W6	2196.116	Montney	VI	24/03/2011	70.5	0.42	433	0.14	0.45	0.23	107	55	92-120	GSC Internal data
	13-12-78-11W6	2196.877	Montney	VI	24/03/2011	70.5	0.45	436	0.35	0.55	0.18	122	40	92-120	GSC Internal data
	13-12-78-11W6	2197.379	Montney	VI	24/03/2011	70.3	0.79	440	0.74	0.98	0.2	124	25	92.05	GSC Internal data
	13-12-78-11W6	2197.708	Montney	VI	24/03/2011	70.7	0.49	448	0.07	0.32	0.23	65	47	93.91	GSC Internal data
	13-12-78-11W6	2198.565	Montney	VI	24/03/2011	70.7	0.61	442	0.1	0.53	0.24	87	39	106.54	GSC Internal data
	13-12-78-11W6	2199.515	Montney	VI	24/03/2011	70.3	0.74	431	0.59	1.14	0.26	154	35	105.99	GSC Internal data
	13-12-78-11W6	2199.895	Montney	VI	24/03/2011	70.6	0.77	445	0.21	0.76	0.2	99	26	104.62	GSC Internal data
	13-12-78-11W6	2200.749	Montney	VI	24/03/2011	70	0.95	439	0.88	1.29	0.22	136	23	114.34	GSC Internal data
	13-12-78-11W6	2200.977	Montney	VI	24/03/2011	70.3	0.7	438	0.55	0.89	0.23	127	33	113.88	GSC Internal data
	13-12-78-11W6	2201.839	Montney	VI	24/03/2011	71	0.6	439	0.23	0.47	0.23	78	38	108.63	GSC Internal data
	13-12-78-11W6	2202.674	Montney	VI	24/03/2011	71.1	1.08	438	0.86	1.54	0.24	143	22	116.97	GSC Internal data
	13-12-78-11W6	2203.075	Montney	VI	24/03/2011	70	0.72	440	0.32	0.71	0.24	99	33	106-120	GSC Internal data
	13-12-78-11W6	2203.73	Montney	VI	24/03/2011	70.5	0.63	434	0.55	0.92	0.24	146	38	106-120	GSC Internal data
	13-12-78-11W6	2204.72	Montney	VI	24/03/2011	70.8	0.52	439	0.42	0.6	0.18	115	35	106-120	GSC Internal data
	13-12-78-11W6	2205.116	Montney	VI	24/03/2011	70.3	0.26	417	0.44	0.55	0.19	212	73	106-120	GSC Internal data
	13-12-78-11W6	2206.75	Montney	VI	24/03/2011	70	0.41	439	0.14	0.29	0.19	71	46	106-120	GSC Internal data
	13-12-78-11W6	2207.521	Montney	VI	24/03/2011	70.4	0.61	440	0.47	0.66	0.17	108	28	106.44	GSC Internal data
	13-12-78-11W6	2207.937	Montney	VI	24/03/2011	70.9	0.81	439	0.72	1.01	0.18	125	22	112.59	GSC Internal data
	13-12-78-11W6	2208.54	Montney	VI	25/03/2011	70.5	0.79	440	0.68	1.17	0.19	148	24	113.92	GSC Internal data
	13-12-78-11W6	2209.457	Montney	VI	25/03/2011	70.8	1.2	439	0.55	1.96	0.2	163	17	119.89	GSC Internal data
	13-12-78-11W6	2210.109	Montney	VI	25/03/2011	70.5	0.3	432	0.65	0.38	0.16	127	53	104-120	GSC Internal data
	13-12-78-11W6	2210.358	Montney	VI	25/03/2011	70.5	0.76	441	0.62	0.91	0.19	120	25	108.88	GSC Internal data
	13-12-78-11W6	2210.721	Montney	VI	25/03/2011	70.2	0.94	440	0.81	1.12	0.21	119	22	109.27	GSC Internal data
	13-12-78-11W6	2212.975	Montney	VI	25/03/2011	70.4	0.6	440	0.1	0.45	0.24	75	40	100-120	GSC Internal data
	13-12-78-11W6	2213.396	Montney	VI	25/03/2011	71.1	0.37	441	0.12	0.29	0.22	78	59	100-120	GSC Internal data
18	13-33-67-4W6	2358.2	Montney	VI	28/12/2008	70.4	0.49	421	0.72	0.94	0.13	192	27	93.99	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	13-33-67-4W6	2366.2	Montney	VI	28/12/2008	70.8	0.55	434	0.66	0.93	0.17	169	31	97	GSC Internal data
	13-33-67-4W6	2372.5	Montney	VI	28/12/2008	70.1	0.25	414	0.67	0.53	0.14	212	56	77.5	GSC Internal data
	13-33-67-4W6	2379.4	Montney	VI	28/12/2008	70.2	0.72	436	0.52	1.58	0.19	219	26	97.3	GSC Internal data
19	13-5-68-1W6	2044.4	Montney	VI	12/03/2009	70.3	0.57	433	0.23	1.25	0.27	219	47	106.9	GSC Internal data
	13-5-68-1W6	2047.7	Montney	VI	12/03/2009	70.2	0.31	428	0.05	0.13	0.31	42	100	53-106	GSC Internal data
	13-5-68-1W6	2055.35	Montney	VI	12/03/2009	70.8	0.37	432	0.49	0.79	0.16	214	43	86.04	GSC Internal data
	13-5-68-1W6	2057.35	Montney	VI	12/03/2009	70.8	1.05	441	0.18	5.71	0.23	544	22	102.35	GSC Internal data
	13-5-68-1W6	2235.25	Montney	VI	12/03/2009	70.6	0.65	432	0.59	2.1	0.14	323	22	115.49	GSC Internal data
	13-5-68-1W6	2240.88	Montney	VI	12/03/2009	70.1	0.75	440	0.52	2.13	0.06	284	8	115.17	GSC Internal data
	13-5-68-1W6	2240.88	Montney	VI	16/03/2009	70.4	0.93	441	0.3	2.08	0.34	224	37	115.17	GSC Internal data
20	14-27-67-8W6	3014.6	Montney	VI	2016-07-11	50.8	1.25	316	0.41	0.21	0.12	17	10	94-152	New Analyzed
	14-27-67-8W6	3017.1	Montney	VI	23/03/2009	70.7	0.24	417	0.09	0.08	0.09	33	38	82-117	GSC Internal data
	14-27-67-8W6	3018.7	Montney	VI	2016-07-11	50.9	1.06	304	0.52	0.16	0.11	15	10	115.86	New Analyzed
	14-27-67-8W6	3021.5	Montney	VI	23/03/2009	70.8	1.12	433	0.24	0.1	0.13	9	12	115.26	GSC Internal data
	14-27-67-8W6	3024	Montney	VI	2016-07-11	50.8	1.18	450	0.36	0.15	0.09	13	8	100.63	New Analyzed
	14-27-67-8W6	3026.8	Montney	VI	2016-07-11	50.9	1.12	306	0.54	0.15	0.1	13	9	110-140	New Analyzed
	14-27-67-8W6	3026.85	Montney	VI	23/03/2009	70.4	0.89	306	0.24	0.12	0.1	13	11	110-140	GSC Internal data
	14-27-67-8W6	3028.3	Montney	VI	2016-07-11	50.1	1.21	302	0.73	0.15	0.1	12	8	110-145	New Analyzed
	14-27-67-8W6	3032	Montney	VI	23/03/2009	70	1.28	298	0.77	0.24	0.02	19	2	111.43	GSC Internal data
21	15-19-60-22W5	2583.1	Montney	VI	2016-07-11	50.3	0.29	405	0.44	0.65	0.14	224	48	85-128	New Analyzed
	15-19-60-22W5	2589	Montney	VI	2016-07-11	51.1	0.63	421	0.63	0.85	0.15	135	24	94.53	New Analyzed
	15-19-60-22W5	2590.6	Montney	VI	18/06/2008	70.7	1.44	420	2.2	1.5	0.3	104	21	110.22	GSC Internal data
	15-19-60-22W5	2596.3	Montney	VI	2016-07-11	51.2	0.46	430	0.55	0.59	0.11	128	24	85-101	New Analyzed
	15-19-60-22W5	2599	Montney	VI	18/06/2008	70.8	1.16	417	1.85	1.38	0.16	119	14	112	GSC Internal data
22	15-31-77-10W6	2006.55	Montney	VI	03/08/2006	70.6	0.11	433	0.04	0.12	0.13	109	118	70-270	GSC Internal data
	15-31-77-10W6	2006.55	Montney	VI	06/04/2006	70.3	0.56	443	0.31	0.82	0.19	146	34	70-270	GSC Internal data
	15-31-77-10W6	2007.2	Montney	VI	06/04/2006	70.5	0.32	442	0.12	0.29	0.21	91	66	75.72	GSC Internal data
	15-31-77-10W6	2032.7	Montney	VI	06/04/2006	70.4	0.61	440	1.16	1	0.27	164	44	91.6	GSC Internal data
	15-31-77-10W6	2036	Montney	VI	06/04/2006	70.4	0.31	437	0.21	0.44	0.15	142	48	78.2	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	15-31-77-10W6	2038.1	Montney	VI	06/04/2006	70.7	0.73	441	0.42	0.99	0.2	136	27	71-83	GSC Internal data
	15-31-77-10W6	2038.6	Montney	VI	06/04/2006	70.6	0.25	423	0.04	0.15	0.2	60	80	76.13	GSC Internal data
	15-31-77-10W6	2041	Montney	VI	06/04/2006	70.2	0.68	443	0.42	1.01	0.23	149	34	84.2	GSC Internal data
	15-31-77-10W6	2041.35	Montney	VI	06/04/2006	70.6	0.22	435	0.06	0.14	0.22	64	100	75.51	GSC Internal data
	15-31-77-10W6	2044.2	Montney	VI	07/04/2006	70.8	0.65	442	0.41	1.1	0.21	169	32	90.8	GSC Internal data
	15-31-77-10W6	2044.45	Montney	VI	07/04/2006	70.1	0.23	419	0.09	0.23	0.23	100	100	76.83	GSC Internal data
	15-31-77-10W6	2046	Montney	VI	07/04/2006	70.4	0.54	441	0.3	0.82	0.28	152	52	90.09	GSC Internal data
	15-31-77-10W6	2048	Montney	VI	07/04/2006	70.1	0.56	441	0.39	0.85	0.2	152	36	95.03	GSC Internal data
	15-31-77-10W6	2200.8	Montney	VI	07/04/2006	70.5	0.56	437	0.52	0.6	0.13	107	23	107.85	GSC Internal data
	15-31-77-10W6	2206.5	Montney	VI	07/04/2006	70.3	0.6	457	0.52	0.6	0.14	100	23	111.35	GSC Internal data
	15-31-77-10W6	2212.8	Montney	VI	07/04/2006	70.4	0.81	441	0.5	0.77	0.15	95	19	98-121	GSC Internal data
	15-31-77-10W6	2215.7	Montney	VI	07/04/2006	70.1	0.32	446	0.23	0.27	0.18	84	56	98-113	GSC Internal data
	15-31-77-10W6	2221.1	Montney	VI	05/04/2006	70.6	0.54	456	0.29	0.34	0.16	63	30	104.07	GSC Internal data
	15-31-77-10W6	2222.2	Montney	VI	05/04/2006	70.7	0.83	439	0.41	0.64	0.22	77	27	102.92	GSC Internal data
	15-31-77-10W6	2225.9	Montney	VI	05/04/2006	70.3	0.27	445	0.13	0.17	0.17	63	63	75.96	GSC Internal data
	15-31-77-10W6	2226	Montney	VI	05/04/2006	70.7	0.45	450	0.25	0.25	0.19	56	42	87.84	GSC Internal data
	15-31-77-10W6	2228.85	Montney	VI	05/04/2006	70.9	0.8	455	0.5	0.51	0.12	64	15	104.27	GSC Internal data
	15-31-77-10W6	2231.35	Montney	VI	05/04/2006	70.1	0.69	448	0.44	0.46	0.15	67	22	113.54	GSC Internal data
23	15-34-80-18W6	2065.05	Montney	VI	21/12/2010	70.8	1.97	302	4.02	6.33	0.25	321	13	110-184	GSC Internal data
	15-34-80-18W6	2072.39	Montney	VI	22/12/2010	70	2.49	431	6.34	7.11	0.41	286	16	140	GSC Internal data
	15-34-80-18W6	2210.6	Montney	VI	22/12/2010	70.8	4.69	333	6.96	10.43	0.28	222	6	148-176	GSC Internal data
24	15-5-71-12W6	3116.4	Montney	VI	2016-07-11	50.7	2.1	295	0.65	0.11	0.15	5	7	118	New Analyzed
25	16-27-78-18W6	2371.3	Montney	VI	17/11/2008	70.5	1.44	300	3.28	0.45	0.21	31	15	101.03	GSC Internal data
	16-27-78-18W6	2377.2	Montney	VI	17/11/2008	70.5	1.09	297	1.52	0.28	0.24	26	22	113.07	GSC Internal data
	16-27-78-18W6	2383.2	Montney	VI	17/11/2008	70.1	1.34	299	1.94	0.39	0.25	29	19	110	GSC Internal data
	16-27-78-18W6	2383.4	Montney	VI	17/11/2008	70.9	1.36	448	0.84	0.28	0.31	21	23	107.7	GSC Internal data
	16-27-78-18W6	2385.3	Montney	VI	17/11/2008	70.9	1.14	443	0.87	0.18	0.24	16	21	113.25	GSC Internal data
	16-27-78-18W6	2522.8	Montney	VI	17/11/2008	70.5	2.12	301	5.95	0.87	0.17	41	8	126.7	GSC Internal data
	16-27-78-18W6	2524.3	Montney	VI	17/11/2008	70.8	1.36	300	3.69	0.53	0.23	39	17	113.4	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	16-27-78-18W6	2524.7	Montney	VI	18/11/2008	70.4	2.89	456	0.94	0.6	0.25	21	9	110-122	GSC Internal data
	16-27-78-18W6	2525.8	Montney	VI	18/11/2008	70.5	3.85	303	6.77	1.62	0.19	42	5	85-170	GSC Internal data
	16-27-78-18W6	2526.7	Montney	VI	18/11/2008	70	2.53	457	1.27	0.6	0.26	24	10	146.9	GSC Internal data
	16-27-78-18W6	2529.2	Montney	VI	18/11/2008	70.2	1.39	445	1.04	0.28	0.24	20	17	137-169	GSC Internal data
	16-27-78-18W6	2535.2	Montney	VI	18/11/2008	50.5	3.18	303	5.02	1.13	0.23	36	7	133.68	GSC Internal data
26	16-34-74-11W6	2524.4	Montney	VI	26/07/2006	70.3	0.37	384	0.61	0.51	0.11	138	30	92.6	GSC Internal data
	16-34-74-11W6	2525.01	Montney	VI	26/07/2006	70.4	1.24	455	0.68	0.91	0.19	73	15	111.4	GSC Internal data
	16-34-74-11W6	2530.59	Montney	VI	26/07/2006	70.6	1.2	459	0.82	0.67	0.19	56	16	101.9	GSC Internal data
	16-34-74-11W6	2533.21	Montney	VI	26/07/2006	70.6	0.84	339	0.78	1.02	0.13	121	15	98.1	GSC Internal data
	16-34-74-11W6	2535.49	Montney	VI	26/07/2006	70.4	0.99	453	0.76	0.59	0.14	60	14	97.4	GSC Internal data
	16-34-74-11W6	2536.27	Montney	VI	26/07/2006	70.7	0.32	427	0.35	0.34	0.1	106	31	80-140	GSC Internal data
	16-34-74-11W6	2536.67	Montney	VI	26/07/2006	69.9	0.28	422	0.38	0.37	0.1	132	36	80-140	GSC Internal data
	16-34-74-11W6	2540.72	Montney	VI	26/07/2006	70.4	0.28	411	0.4	0.39	0.1	139	36	80-140	GSC Internal data
	16-34-74-11W6	2541.8	Montney	VI	26/07/2006	71	0.3	439	0.6	0.44	0.1	147	33	80-140	GSC Internal data
	16-34-74-11W6	2541.8	Montney	VI	08/09/2006	70.3	0.7	442	0.4	0.4	0.12	57	17	80-140	GSC Internal data
27	A-10-J/94-B-9	2137.42	Montney	VI	31/07/2009	70.7	1.22	449	0.18	0.15	0.23	12	19	142.39	GSC Internal data
	A-10-J/94-B-9	2137.42	Montney	VI	15/10/2009	70.5	1.34	441	0.01	0.1	0.22	7	16	142.39	GSC Internal data
	A-10-J/94-B-9	2138.1	Montney	VI	30/07/2009	70.4	3.19	481	0.49	0.92	0.37	29	12	146.8	GSC Internal data
	A-10-J/94-B-9	2139.11	Montney	VI	30/07/2009	70.8	4.33	488	0.47	1.13	0.26	26	6	152.34	GSC Internal data
	A-10-J/94-B-9	2139.77	Montney	VI	15/10/2009	70.4	4.32	460	0.04	0.79	0.36	18	8	155.18	GSC Internal data
	A-10-J/94-B-9	2139.77	Montney	VI	30/07/2009	70.1	4.37	486	0.48	1.15	0.31	26	7	155.18	GSC Internal data
	A-10-J/94-B-9	2143.8	Montney	VI	15/10/2009	70.3	3.92	460	0.03	0.6	0.33	15	8	135.7	GSC Internal data
	A-10-J/94-B-9	2143.8	Montney	VI	30/07/2009	70.4	4.39	496	0.41	1.12	0.2	26	5	135.7	GSC Internal data
	A-10-J/94-B-9	2147	Montney	VI	30/07/2009	70.6	2	454	0.25	0.35	0.22	18	11	125-162	GSC Internal data
	A-10-J/94-B-9	2148.55	Montney	VI	31/07/2009	70.3	2.07	461	0.3	0.31	0.17	15	8	132.3	GSC Internal data
	A-10-J/94-B-9	2149.7	Montney	VI	15/10/2009	70.8	1.65	434	0.01	0.16	0.16	10	10	130.1	GSC Internal data
	A-10-J/94-B-9	2149.7	Montney	VI	30/07/2009	70.3	1.65	457	0.19	0.27	0.22	16	13	130.1	GSC Internal data
	A-10-J/94-B-9	2150.8	Montney	VI	30/07/2009	70.4	1.76	457	0.22	0.25	0.01	14	1	120.6	GSC Internal data
	A-10-J/94-B-9	2152.08	Montney	VI	31/07/2009	70.3	2.9	468	0.32	0.43	0.17	15	6	116-142	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	A-10-J/94-B-9	2153.15	Montney	VI	30/07/2009	70.7	1.27	466	0.16	0.26	0.38	20	30	95-142	GSC Internal data
	A-10-J/94-B-9	2153.88	Montney	VI	30/07/2009	70.3	2.59	470	0.27	0.5	0.14	19	5	95-159	GSC Internal data
	A-10-J/94-B-9	2154.58	Montney	VI	31/07/2009	70.8	3.55	479	0.39	0.67	0.21	19	6	150.74	GSC Internal data
	A-10-J/94-B-9	2154.58	Montney	VI	16/10/2009	70.1	3.61	409	0.03	0.81	0.28	22	8	150.74	GSC Internal data
	A-10-J/94-B-9	2155.14	Montney	VI	30/07/2009	70.5	2.99	483	0.29	0.64	0.21	21	7	123.9	GSC Internal data
	A-10-J/94-B-9	2310.5	Montney	VI	31/07/2009	70.4	1.42	475	0.08	0.14	0.01	10	1	108.97	GSC Internal data
	A-10-J/94-B-9	2311.41	Montney	VI	31/07/2009	70.7	1.33	472	0.06	0.14	0.17	11	13	103.84	GSC Internal data
	A-10-J/94-B-9	2312.57	Montney	VI	30/07/2009	70.6	0.99	481	0.04	0.09	0.21	9	21	103.68	GSC Internal data
	A-10-J/94-B-9	2313.67	Montney	VI	31/07/2009	70.4	1.02	466	0.08	0.11	1.12	11	110	104.04	GSC Internal data
	A-10-J/94-B-9	2314.9	Montney	VI	31/07/2009	70.5	1.07	472	0.08	0.13	0.07	12	7	109.99	GSC Internal data
	A-10-J/94-B-9	2315.68	Montney	VI	31/07/2009	70.8	1.35	482	0.06	0.15	0.15	11	11	100.01	GSC Internal data
	A-10-J/94-B-9	2316.55	Montney	VI	31/07/2009	70.7	0.4	565	0.06	0.11	0.17	28	42	76-106	GSC Internal data
	A-10-J/94-B-9	2317.52	Montney	VI	15/10/2009	70.6	1.56	429	0.01	0.08	0.13	5	8	100.2	GSC Internal data
	A-10-J/94-B-9	2317.52	Montney	VI	31/07/2009	70.2	1.56	469	0.11	0.16	0.14	10	9	100.2	GSC Internal data
	A-10-J/94-B-9	2319.56	Montney	VI	31/07/2009	71	1.62	473	0.09	0.15	0.08	9	5	96.7	GSC Internal data
	A-10-J/94-B-9	2320.81	Montney	VI	31/07/2009	70.8	1.25	470	0.09	0.14	0.14	11	11	98.3	GSC Internal data
	A-10-J/94-B-9	2321.48	Montney	VI	31/07/2009	70.2	1.83	503	0.11	0.23	0.21	13	11	98.63	GSC Internal data
	A-10-J/94-B-9	2322.97	Montney	VI	15/10/2009	70.4	2.16	459	0.01	0.14	0.26	6	12	74-98	GSC Internal data
	A-10-J/94-B-9	2322.97	Montney	VI	31/07/2009	70.4	2.23	515	0.14	0.32	0.21	14	9	74-99	GSC Internal data
	A-10-J/94-B-9	2323.6	Montney	VI	31/07/2009	70.6	1.91	498	0.12	0.27	0.1	14	5	95.5	GSC Internal data
	A-10-J/94-B-9	2324.39	Montney	VI	01/08/2009	70.5	1.31	465	0.07	0.1	0.18	8	14	97.42	GSC Internal data
	A-10-J/94-B-9	2326.37	Montney	VI	15/10/2009	70.8	1.77	461	0.01	0.1	0.22	6	12	60-97	GSC Internal data
	A-10-J/94-B-9	2326.37	Montney	VI	31/07/2009	70.2	1.98	486	0.1	0.23	0.07	12	4	60-97	GSC Internal data
	A-10-J/94-B-9	2326.83	Montney	VI	01/08/2009	70.2	1.7	487	0.09	0.19	0.09	11	5	60-98	GSC Internal data
	A-10-J/94-B-9	2327.9	Montney	VI	01/08/2009	70.4	1.88	503	0.07	0.22	0.17	12	9	95.13	GSC Internal data
	A-10-J/94-B-9	2328.2	Montney	VI	15/10/2009	70.7	1.98	607	0.01	0.17	0.34	9	17	98.08	GSC Internal data
	A-10-J/94-B-9	2328.2	Montney	VI	31/07/2009	70.7	2.09	518	0.1	0.35	0.18	17	9	98.08	GSC Internal data
28	A-20-H/93-P-9	2455	Montney	VI	28/06/2010	70.6	2.42	443	0.46	0.33	0.45	14	19	133.5	GSC Internal data
	A-20-H/93-P-9	2457	Montney	VI	28/06/2010	70.4	0.72	425	0.17	0.11	0.35	15	49	120-180	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	A-20-H/93-P-9	2460.57	Montney	VI	28/06/2010	70.5	0.94	416	0.23	0.42	0.42	45	45	96.4	GSC Internal data
29	B-15-I/94-B-1	2360.05	Montney	VI	15/01/2009	70.7	3.82	606	0.14	0.4	0.34	10	9	149.2	GSC Internal data
	B-15-I/94-B-1	2393.15	Montney	VI	15/01/2009	70.1	1.18	307	0.16	0.14	0.27	12	23	126.1	GSC Internal data
	B-15-I/94-B-1	2410.65	Montney	VI	15/01/2009	70.5	2.86	607	0.14	0.27	0.22	9	8	143.3	GSC Internal data
	B-15-I/94-B-1	2427.35	Montney	VI	16/01/2009	70.5	2.02	607	0.13	0.17	0.27	8	13	113.26	GSC Internal data
	B-15-I/94-B-1	2435.85	Montney	VI	16/01/2009	50.3	5.41	605	0.1	0.44	0.31	8	6	169	GSC Internal data
	B-15-I/94-B-1	2440.2	Montney	VI	16/01/2009	70.4	3.38	606	0.11	0.24	0.32	7	9	65-101	GSC Internal data
	B-15-I/94-B-1	2459.1	Montney	VI	16/01/2009	70.1	1.11	444	0.06	0.07	0.27	6	24	108.95	GSC Internal data
	B-15-I/94-B-1	2464.1	Montney	VI	16/01/2009	70.4	0.95	313	0.06	0.06	0.34	6	36	110.81	GSC Internal data
	B-15-I/94-B-1	2477.95	Montney	VI	16/01/2009	70.2	1.15	299	0.13	0.08	0.25	7	22	99.47	GSC Internal data
	B-15-I/94-B-1	2484.2	Montney	VI	16/01/2009	70	1.37	310	0.12	0.1	0.26	7	19	93.8	GSC Internal data
	B-15-I/94-B-1	2528.4	Montney	VI	16/01/2009	70	1.55	305	0.14	0.08	0.26	5	17	96.13	GSC Internal data
	B-15-I/94-B-1	2558.25	Montney	VI	16/01/2009	70.2	1.3	301	0.09	0.07	0.25	5	19	113.01	GSC Internal data
	B-15-I/94-B-1	2585.3	Montney	VI	16/01/2009	70.3	1.68	301	0.17	0.13	0.21	8	12	121.76	GSC Internal data
30	B-30-H/93-P-9	2537.6	Montney	VI	08/08/2007	71	0.43	420	0.12	0.14	0.29	33	67	88-113	GSC Internal data
	B-30-H/93-P-9	2538.8	Montney	VI	08/08/2007	70.1	1.82	447	0.24	0.3	0.34	16	19	114.6	GSC Internal data
	B-30-H/93-P-9	2540.6	Montney	VI	08/08/2007	70.9	1.44	457	0.3	0.44	0.23	31	16	121.1	GSC Internal data
	B-30-H/93-P-9	2542.2	Montney	VI	08/08/2007	70.7	2.03	467	0.54	0.73	0.26	36	13	124.44	GSC Internal data
	B-30-H/93-P-9	2543.8	Montney	VI	08/08/2007	70.8	2.9	468	0.58	0.78	0.22	27	8	107-130	GSC Internal data
	B-30-H/93-P-9	2545.5	Montney	VI	08/08/2007	70.7	2.98	466	0.52	0.79	0.22	27	7	131.1	GSC Internal data
	B-30-H/93-P-9	2547.2	Montney	VI	08/08/2007	69.9	2.19	464	0.38	0.57	0.22	26	10	142.94	GSC Internal data
	B-30-H/93-P-9	2548.4	Montney	VI	08/08/2007	51	3.16	468	0.53	0.9	0.25	28	8	161-190	GSC Internal data
	B-30-H/93-P-9	2550.3	Montney	VI	08/08/2007	70.8	1.61	456	0.38	0.46	0.29	29	18	130-160	GSC Internal data
	B-30-H/93-P-9	2551.3	Montney	VI	08/08/2007	50.2	2.1	464	0.61	0.6	0.27	29	13	127.9	GSC Internal data
	B-30-H/93-P-9	2552.5	Montney	VI	08/08/2007	50.6	2.59	462	0.71	0.72	0.26	28	10	113-136	GSC Internal data
	B-30-H/93-P-9	2553.7	Montney	VI	08/08/2007	70.1	1.94	466	0.59	0.61	0.19	31	10	121.1	GSC Internal data
	B-30-H/93-P-9	2555.1	Montney	VI	08/08/2007	70.6	2.59	467	0.76	0.87	0.2	34	8	140.4	GSC Internal data
	B-30-H/93-P-9	2556	Montney	VI	08/08/2007	70.5	1.1	444	0.22	0.26	0.24	24	22	123.79	GSC Internal data
	B-30-H/93-P-9	2556.9	Montney	VI	08/08/2007	51.1	3.15	467	0.9	1.09	0.22	35	7	126.4	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
31	C-10-E/93-P-10	3724.89	Montney	VI	07/08/2011	70.7	2.18	308	1.62	0.4	0.29	18	13	127.38	GSC Internal data
	C-10-E/93-P-10	3724.89	Montney	VI	17/12/2010	70.7	2.27	310	1.99	0.5	0.35	22	15	127.38	GSC Internal data
	C-10-E/93-P-10	3726.01	Montney	VI	17/12/2010	70.8	2.33	369	0.47	0.25	1.1	11	47	135.87	GSC Internal data
	C-10-E/93-P-10	3726.01	Montney	VI	07/08/2011	70.2	2.36	379	0.81	0.33	0.23	14	10	135.87	GSC Internal data
	C-10-E/93-P-10	3727.03	Montney	VI	17/12/2010	70.7	2.5	378	1.95	0.44	0.23	18	9	141.9	GSC Internal data
	C-10-E/93-P-10	3727.09	Montney	VI	07/08/2011	70.5	2.45	391	1.74	0.45	0.29	18	12	141.9	GSC Internal data
	C-10-E/93-P-10	3728.08	Montney	VI	07/08/2011	70.3	1.56	389	1.13	0.43	0.24	28	15	109-128	GSC Internal data
	C-10-E/93-P-10	3728.08	Montney	VI	17/12/2010	70.7	1.61	372	1.83	0.35	0.22	22	14	109-128	GSC Internal data
	C-10-E/93-P-10	3730.23	Montney	VI	07/08/2011	70.9	0.58	375	0.37	0.21	0.26	36	45	104-112	GSC Internal data
	C-10-E/93-P-10	3730.23	Montney	VI	17/12/2010	70.2	0.63	375	0.59	0.23	0.27	37	43	104-113	GSC Internal data
	C-10-E/93-P-10	3730.92	Montney	VI	07/08/2011	70.9	2.13	312	1.54	0.45	0.23	21	11	105-136	GSC Internal data
	C-10-E/93-P-10	3730.92	Montney	VI	17/12/2010	70.9	2.22	356	1.99	0.65	0.25	29	11	105-137	GSC Internal data
	C-10-E/93-P-10	3733.65	Montney	VI	08/08/2011	70.5	1.99	286	1.09	0.23	0.28	12	14	124.57	GSC Internal data
	C-10-E/93-P-10	3733.65	Montney	VI	17/12/2010	70	2.1	261	1.18	0.31	0.28	15	13	124.57	GSC Internal data
	C-10-E/93-P-10	3734.26	Montney	VI	08/08/2011	70.4	0.82	382	0.45	0.16	0.29	20	35	105-142	GSC Internal data
	C-10-E/93-P-10	3734.26	Montney	VI	17/12/2010	70.3	0.95	388	0.4	0.18	0.29	19	31	105-142	GSC Internal data
	C-10-E/93-P-10	3736.9	Montney	VI	18/12/2010	70.3	0.87	372	0.34	0.18	0.25	21	29	105-142	GSC Internal data
	C-10-E/93-P-10	3736.9	Montney	VI	08/08/2011	70.6	0.91	405	0.38	0.13	0.26	14	29	105-142	GSC Internal data
	C-10-E/93-P-10	3740.81	Montney	VI	18/12/2010	70	1.86	373	0.42	0.28	0.19	15	10	127.29	GSC Internal data
	C-10-E/93-P-10	3740.81	Montney	VI	08/08/2011	70.1	1.87	307	0.71	0.23	0.23	12	12	127.29	GSC Internal data
	C-10-E/93-P-10	3743.76	Montney	VI	08/08/2011	70.9	1.33	367	0.54	0.2	0.22	15	17	113.86	GSC Internal data
	C-10-E/93-P-10	3743.76	Montney	VI	18/12/2010	70.4	1.37	365	0.44	0.24	0.24	18	18	113.86	GSC Internal data
	C-10-E/93-P-10	3743.87	Montney	VI	18/12/2010	70.8	1.07	374	0.47	0.23	0.14	21	13	113.86	GSC Internal data
	C-10-E/93-P-10	3743.87	Montney	VI	08/08/2011	70.7	1.13	310	0.59	0.13	0.22	12	19	113.86	GSC Internal data
	C-10-E/93-P-10	3748.76	Montney	VI	18/12/2010	70.4	0.71	418	0.3	0.21	0.31	30	44	110-137	GSC Internal data
	C-10-E/93-P-10	3748.76	Montney	VI	08/08/2011	70.2	0.72	420	0.34	0.21	0.25	29	35	110-138	GSC Internal data
	C-10-E/93-P-10	3749.69	Montney	VI	18/12/2010	70.5	1.85	297	0.52	0.25	0.18	14	10	121.25	GSC Internal data
	C-10-E/93-P-10	3749.69	Montney	VI	08/08/2011	70.7	2.02	305	0.61	0.28	0.23	14	11	121.25	GSC Internal data
32	C-15-L/93-P-7	3838.9	Montney	VI	23/07/2010	70.4	0.55	398	0.08	0.11	0.24	20	44	90.01	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	C-15-L/93-P-7	3838.9	Montney	VI	23/07/2010	70.2	0.6	419	0.11	0.16	0.23	27	38	90.01	GSC Internal data
	C-15-L/93-P-7	3841.13	Montney	VI	23/07/2010	70.1	0.39	396	0.07	0.08	0.24	21	62	82.45	GSC Internal data
	C-15-L/93-P-7	3841.13	Montney	VI	23/07/2010	70.7	0.48	431	0.14	0.14	0.22	29	46	82.45	GSC Internal data
	C-15-L/93-P-7	3843.34	Montney	VI	23/07/2010	70.7	0.35	396	0.07	0.08	0.22	23	63	83-115	GSC Internal data
	C-15-L/93-P-7	3843.34	Montney	VI	23/07/2010	70	0.36	415	0.09	0.1	0.21	28	58	83-116	GSC Internal data
	C-15-L/93-P-7	3848.14	Montney	VI	31/07/2010	70.7	0.89	406	0.12	0.13	0.26	15	29	104.3	GSC Internal data
	C-15-L/93-P-7	3848.14	Montney	VI	31/07/2010	70.8	1.11	308	0.27	0.29	0.27	26	24	104.3	GSC Internal data
	C-15-L/93-P-7	3850.27	Montney	VI	31/07/2010	71	1.26	311	0.23	0.28	0.29	22	23	103.38	GSC Internal data
	C-15-L/93-P-7	3850.27	Montney	VI	31/07/2010	70.6	1.47	414	0.22	0.18	0.26	12	18	103.38	GSC Internal data
	C-15-L/93-P-7	3855.21	Montney	VI	31/07/2010	70.1	1.07	418	0.12	0.13	0.25	12	23	97.23	GSC Internal data
	C-15-L/93-P-7	3855.21	Montney	VI	31/07/2010	70.6	1.1	307	0.17	0.2	0.27	18	25	97.23	GSC Internal data
	C-15-L/93-P-7	3859.26	Montney	VI	31/07/2010	70.7	1.05	411	0.12	0.11	0.24	10	23	105.59	GSC Internal data
	C-15-L/93-P-7	3859.26	Montney	VI	31/07/2010	70.3	1.13	312	0.15	0.21	0.28	19	25	105.59	GSC Internal data
	C-15-L/93-P-7	3863.52	Montney	VI	31/07/2010	70.4	1.17	421	0.14	0.17	0.27	15	23	101.68	GSC Internal data
	C-15-L/93-P-7	3863.52	Montney	VI	31/07/2010	70.3	1.18	313	0.19	0.28	0.27	24	23	101.68	GSC Internal data
33	C-21-L/94-A-13	1805.4	Montney	VI	08/04/2009	70.2	0.83	450	0.01	0.21	0	25	0	112.6	GSC Internal data
	C-21-L/94-A-13	1805.4	Montney	VI	02/03/2009	70.5	0.92	454	0.55	0.45	0.24	49	26	112.6	GSC Internal data
	C-21-L/94-A-13	1824.4	Montney	VI	08/04/2009	70.4	0.49	446	0.01	0.13	0.25	27	51	104.9	GSC Internal data
	C-21-L/94-A-13	1824.4	Montney	VI	02/03/2009	70.3	0.57	444	0.34	0.3	0.27	53	47	104.9	GSC Internal data
	C-21-L/94-A-13	1844.7	Montney	VI	08/04/2009	70	4.32	485	0.03	1.75	0.23	41	5	147.1	GSC Internal data
	C-21-L/94-A-13	1844.7	Montney	VI	02/03/2009	70.7	4.53	482	1.79	2.49	0	55	0	147.1	GSC Internal data
	C-21-L/94-A-13	1848.6	Montney	VI	08/04/2009	70.5	2.51	476	0.02	0.91	0.19	36	8	116-123	GSC Internal data
	C-21-L/94-A-13	1848.6	Montney	VI	03/03/2009	70.1	2.95	484	1.39	1.53	0.34	52	12	116-123	GSC Internal data
	C-21-L/94-A-13	1858.28	Montney	VI	08/04/2009	70.8	1.3	456	0.01	0.27	0.15	21	12	107.2	GSC Internal data
	C-21-L/94-A-13	1858.28	Montney	VI	03/03/2009	70.7	1.41	460	0.66	0.51	0.2	36	14	107.2	GSC Internal data
	C-21-L/94-A-13	1862.6	Montney	VI	09/04/2009	70.9	5.38	483	0.03	2.07	0.2	38	4	159-302	GSC Internal data
	C-21-L/94-A-13	1862.6	Montney	VI	03/03/2009	50.3	5.68	482	2.2	2.93	0.26	52	5	159-302	GSC Internal data
	C-21-L/94-A-13	1877.1	Montney	VI	09/04/2009	70.3	1.21	451	0.01	0.32	0.18	26	15	116.7	GSC Internal data
	C-21-L/94-A-13	1877.1	Montney	VI	03/03/2009	70.5	1.38	456	0.7	0.66	0.24	48	17	116.7	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	C-21-L/94-A-13	1936.87	Montney	VI	09/04/2009	70.6	0.96	451	0.01	0.21	0.14	22	15	101	GSC Internal data
	C-21-L/94-A-13	1936.87	Montney	VI	03/03/2009	70.4	1.08	446	0.56	0.44	0.23	41	21	101	GSC Internal data
	C-21-L/94-A-13	1968.53	Montney	VI	09/04/2009	70.6	0.35	459	0.01	0.06	0.2	17	57	70-110	GSC Internal data
	C-21-L/94-A-13	1968.53	Montney	VI	03/03/2009	70.5	0.36	323	0.13	0.14	0.21	39	58	70-110	GSC Internal data
	C-21-L/94-A-13	1991.9	Montney	VI	09/04/2009	70.6	1.67	409	0.02	0.5	0.18	30	11	102	GSC Internal data
	C-21-L/94-A-13	1991.9	Montney	VI	03/03/2009	70.3	1.77	448	0.65	0.55	0.19	31	11	102	GSC Internal data
	C-21-L/94-A-13	2034.4	Montney	VI	03/03/2009	70.4	0.64	474	0.17	0.17	0.19	27	30	114.82	GSC Internal data
34	C-25-G/93-P-9	2727.6	Montney	VI	10/04/2009	70.7	0.89	355	0.7	0.19	0.23	21	26	117-132	GSC Internal data
	C-25-G/93-P-9	2729.62	Montney	VI	10/04/2009	70.8	1.07	372	0.98	0.4	0.27	37	25	122.8	GSC Internal data
	C-25-G/93-P-9	2732.35	Montney	VI	10/04/2009	70.7	1.28	365	1.39	0.43	0.29	34	23	125.6	GSC Internal data
	C-25-G/93-P-9	2734.7	Montney	VI	10/04/2009	70.6	1.31	442	0.81	0.26	0.09	20	7	117-134	GSC Internal data
	C-25-G/93-P-9	2742.95	Montney	VI	10/04/2009	70.7	1.66	448	0.7	0.31	0.26	19	16	113.8	GSC Internal data
	C-25-G/93-P-9	2744.99	Montney	VI	10/04/2009	70.6	1.38	450	0.32	0.19	0.16	14	12	111-138	GSC Internal data
	C-25-G/93-P-9	2748.02	Montney	VI	10/04/2009	70.3	0.56	364	0.44	0.14	0.19	25	34	104-150	GSC Internal data
	C-25-G/93-P-9	2753.09	Montney	VI	10/04/2009	70.9	0.91	372	0.83	0.28	0.34	31	37	109.4	GSC Internal data
	C-25-G/93-P-9	2758.72	Montney	VI	10/04/2009	70.2	1.16	357	0.39	0.15	0.26	13	22	119.4	GSC Internal data
35	C-33-B/94-G-7	1702.6	Montney	VI	01/10/2009	70.5	1.96	295	3.31	0.74	0.18	38	9	66-126	GSC Internal data
	C-33-B/94-G-7	1716.6	Montney	VI	01/10/2009	70.8	2.31	297	1.47	0.77	0.19	33	8	127.8	GSC Internal data
	C-33-B/94-G-7	1726.1	Montney	VI	01/10/2009	70.3	2.3	298	0.85	0.76	0.3	33	13	121.1	GSC Internal data
	C-33-B/94-G-7	1746.2	Montney	VI	01/10/2009	70.6	3.08	470	0.69	0.93	0.32	30	10	143.3	GSC Internal data
	C-33-B/94-G-7	1776.6	Montney	VI	01/10/2009	70.3	4.86	488	0.36	1.21	0.27	25	6	161.1	GSC Internal data
	C-33-B/94-G-7	1787.6	Montney	VI	01/10/2009	70.3	2.54	297	0.86	0.85	0.04	33	2	132.8	GSC Internal data
	C-33-B/94-G-7	1805.6	Montney	VI	01/10/2009	50.4	7.35	492	0.36	1.74	0.21	24	3	156-250	GSC Internal data
	C-33-B/94-G-7	1849.8	Montney	VI	01/10/2009	70.3	1.61	304	0.35	0.39	2.94	24	183	112.2	GSC Internal data
36	C-49-H/93-P-10	2973	Montney	VI	30/11/2008	70.2	2.1	342	2.41	1.41	0.29	67	14	116	GSC Internal data
	C-49-H/93-P-10	2981.4	Montney	VI	30/11/2008	70.8	1.91	339	2.86	2.08	0.35	109	18	112.8	GSC Internal data
	C-49-H/93-P-10	2984.3	Montney	VI	30/11/2008	70.6	1.54	339	2.58	0.89	0.28	58	18	114.17	GSC Internal data
	C-49-H/93-P-10	3028	Montney	VI	30/11/2008	70.3	1.32	330	2.31	0.79	0.24	60	18	126.7	GSC Internal data
37	C-85-H/93-P-7	3552.3	Montney	VI	30/11/2008	70.5	1.21	305	1.37	0.55	0.26	45	21	107.8	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	C-85-H/93-P-7	3554.2	Montney	VI	27/11/2008	70.6	0.48	417	0.77	0.3	0.33	62	69	85.2	GSC Internal data
	C-85-H/93-P-7	3554.2	Montney	VI	29/11/2008	70.8	0.5	422	0.67	0.35	0.26	70	52	85.2	GSC Internal data
	C-85-H/93-P-7	3569	Montney	VI	27/11/2008	70.2	0.36	421	0.52	0.21	0.29	58	81	95-116	GSC Internal data
	C-85-H/93-P-7	3569	Montney	VI	29/11/2008	70.5	0.42	424	0.36	0.21	0.31	50	74	95-117	GSC Internal data
	C-85-H/93-P-7	3571.5	Montney	VI	27/11/2008	70.7	1.31	307	1.14	0.33	0.23	25	18	113.8	GSC Internal data
	C-85-H/93-P-7	3571.5	Montney	VI	29/11/2008	70.7	1.31	303	1	0.37	0.19	28	15	113.8	GSC Internal data
	C-85-H/93-P-7	3575	Montney	VI	27/11/2008	70.2	1.08	417	1.36	0.45	0.24	42	22	112.7	GSC Internal data
	C-85-H/93-P-7	3575	Montney	VI	29/11/2008	70.7	1.11	418	1.29	0.49	0.29	44	26	112.7	GSC Internal data
	C-85-H/93-P-7	3587	Montney	VI	28/11/2008	70.2	3.35	305	2.53	1.2	0.29	36	9	141.6	GSC Internal data
	C-85-H/93-P-7	3587	Montney	VI	27/11/2008	70.4	3.37	311	2.62	1.08	0.26	32	8	141.6	GSC Internal data
	C-85-H/93-P-7	3616	Montney	VI	27/11/2008	70	1.48	309	2.63	0.55	0.24	37	16	122.9	GSC Internal data
	C-85-H/93-P-7	3616	Montney	VI	28/11/2008	70.2	1.54	302	2.62	0.67	0.23	44	15	122.9	GSC Internal data
	C-85-H/93-P-7	3624	Montney	VI	28/11/2008	70.5	1.68	301	2.94	0.83	0.35	49	21	124.2	GSC Internal data
	C-85-H/93-P-7	3624	Montney	VI	28/11/2008	70.2	1.69	306	3.02	0.75	0.26	44	15	124.2	GSC Internal data
	C-85-H/93-P-7	3665	Montney	VI	27/11/2008	70.2	0.51	311	4.59	1.51	0	296	0	133-200	GSC Internal data
	C-85-H/93-P-7	3665	Montney	VI	28/11/2008	70.4	3.37	311	4.57	1.49	0.32	44	9	133-200	GSC Internal data
	C-85-H/93-P-7	3665	Montney	VI	28/11/2008	70.8	3.43	305	4.53	1.66	0.27	48	8	133-200	GSC Internal data
38	C-85-I/94-B-1	2444.82	Montney	VI	30/10/2008	70.5	1.61	452	0.19	0.21	0.24	13	15	111.5	GSC Internal data
	C-85-I/94-B-1	2445.3	Montney	VI	30/10/2008	70.6	1.16	446	0.18	0.13	0.28	11	24	90-112	GSC Internal data
	C-85-I/94-B-1	2445.75	Montney	VI	20/12/2008	70.4	1.15	447	0.15	0.22	0.31	19	27	113.8	GSC Internal data
	C-85-I/94-B-1	2446.1	Montney	VI	30/10/2008	70.2	1.36	439	0.35	0.22	0.26	16	19	115.4	GSC Internal data
	C-85-I/94-B-1	2447.07	Montney	VI	30/10/2008	70.9	1.49	444	0.28	0.22	0.34	15	23	105.9	GSC Internal data
	C-85-I/94-B-1	2449.81	Montney	VI	30/10/2008	70.4	1.71	448	0.29	0.24	0.27	14	16	108.5	GSC Internal data
	C-85-I/94-B-1	2450.85	Montney	VI	20/12/2008	70.5	1.96	455	0.21	0.3	0.32	15	16	120.9	GSC Internal data
	C-85-I/94-B-1	2451.2	Montney	VI	30/10/2008	70.6	2.03	451	0.29	0.27	0.25	13	12	121	GSC Internal data
	C-85-I/94-B-1	2453.83	Montney	VI	30/10/2008	70.8	2.17	455	0.33	0.35	0.3	16	14	94-124	GSC Internal data
	C-85-I/94-B-1	2455.9	Montney	VI	20/12/2008	70.7	1.18	455	0.13	0.23	0.34	19	29	98-130	GSC Internal data
	C-85-I/94-B-1	2456.7	Montney	VI	30/10/2008	70.3	2.43	453	0.46	0.39	0.28	16	12	122.4	GSC Internal data
	C-85-I/94-B-1	2458.1	Montney	VI	20/12/2008	70.3	2.84	469	0.29	0.49	0.35	17	12	129.8	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	GR (GAPI)	REFERENCE
	C-85-I/94-B-1	2459.7	Montney	VI	30/10/2008	70.7	2.71	455	0.34	0.33	0.35	12	13	118-170	GSC Internal data
	C-85-I/94-B-1	2461.68	Montney	VI	30/10/2008	70.3	4.29	464	0.57	0.72	0.3	17	7	158.5	GSC Internal data
	C-85-I/94-B-1	2462.98	Montney	VI	30/10/2008	70.2	3.01	461	0.34	0.46	0.39	15	13	105-170	GSC Internal data
	C-85-I/94-B-1	2463.85	Montney	VI	20/12/2008	70.8	2.88	472	0.29	0.41	0.27	14	9	130.8	GSC Internal data
	C-85-I/94-B-1	2464.2	Montney	VI	30/10/2008	70.5	3.12	466	0.51	0.54	0.26	17	8	139	GSC Internal data
	C-85-I/94-B-1	2464.88	Montney	VI	30/10/2008	70.3	2.07	446	0.32	0.26	0.3	13	14	139-167	GSC Internal data
	C-85-I/94-B-1	2465.56	Montney	VI	30/10/2008	70.5	2.52	454	0.37	0.37	0.35	15	14	108-149	GSC Internal data
	C-85-I/94-B-1	2465.95	Montney	VI	20/12/2008	70.4	1.72	460	0.34	0.29	0.42	17	24	102-142	GSC Internal data
39	D-21-G/93-P-9	2530.9	Montney	VI	09/08/2007	70.9	0.83	442	0.24	0.31	0.25	37	30	97.1	GSC Internal data
	D-21-G/93-P-9	2532.8	Montney	VI	09/08/2007	70.7	1.15	303	0.5	0.51	0.23	44	20	109.1	GSC Internal data
	D-21-G/93-P-9	2532.9	Montney	VI	25/02/2010	70.1	0.64	426	0.15	0.09	0.31	14	48	107.6	GSC Internal data
	D-21-G/93-P-9	2534.3	Montney	VI	09/08/2007	70.1	0.71	434	0.22	0.22	0.24	31	34	96.2	GSC Internal data
	D-21-G/93-P-9	2535.6	Montney	VI	09/08/2007	70.2	1.52	441	0.29	0.36	0.27	24	18	113-137	GSC Internal data
	D-21-G/93-P-9	2536.5	Montney	VI	09/08/2007	70.4	1.49	451	0.26	0.27	0.28	18	19	107	GSC Internal data
	D-21-G/93-P-9	2538.3	Montney	VI	09/08/2007	70.1	1	440	0.19	0.24	0.28	24	28	105.6	GSC Internal data
	D-21-G/93-P-9	2539.3	Montney	VI	09/08/2007	70.4	0.93	439	0.32	0.31	0.28	33	30	104.2	GSC Internal data
	D-21-G/93-P-9	2540.2	Montney	VI	09/08/2007	70.1	1.94	446	0.42	0.37	0.37	19	19	104.5	GSC Internal data
	D-21-G/93-P-9	2541.6	Montney	VI	09/08/2007	70.5	1.35	449	0.38	0.42	0.23	31	17	88-150	GSC Internal data
	D-21-G/93-P-9	2542.1	Montney	VI	25/02/2010	70.7	0.41	430	0.12	0.08	0.32	20	78	86.7	GSC Internal data
	D-21-G/93-P-9	2542.5	Montney	VI	09/08/2007	70.1	0.34	436	0.09	0.12	0.2	35	59	80-120	GSC Internal data
	D-21-G/93-P-9	2543.4	Montney	VI	09/08/2007	70	1.35	450	0.3	0.35	0.2	26	15	98-150	GSC Internal data
40	D-65-G/93-P-8	3055	Montney	VI	30/07/2007	70.7	8.31	314	3.35	3.26	0.43	39	5	126.5	GSC Internal data
	D-65-G/93-P-8	3055.7	Montney	VI	18/12/2009	50.8	7.56	417	0.43	1.92	0.37	25	5	121.4	GSC Internal data
	D-65-G/93-P-8	3056.6	Montney	VI	30/07/2007	70.6	5.5	311	1.05	1.27	0.38	23	7	112.2	GSC Internal data
	D-65-G/93-P-8	3058.1	Montney	VI	30/07/2007	70.4	7.43	598	0.93	1.7	0.43	23	6	106.3	GSC Internal data
	D-65-G/93-P-8	3059.1	Montney	VI	30/07/2007	70.2	8.47	604	2.77	1.15	0.54	14	6	106	GSC Internal data
	D-65-G/93-P-8	3060.17	Montney	VI	27/11/2008	70.2	0.23	597	1.69	1.07	0	465	0	128.7	GSC Internal data
	D-65-G/93-P-8	3060.17	Montney	VI	28/11/2008	70	6.79	594	1.75	1.1	0.42	16	6	128.7	GSC Internal data
	D-65-G/93-P-8	3060.17	Montney	VI	28/11/2008	70.8	6.89	596	1.91	1.09	0.37	16	5	128.7	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	D-65-G/93-P-8	3060.5	Montney	VI	18/12/2009	70.5	5.62	602	0.83	0.9	0.27	16	5	120.7	GSC Internal data
	D-65-G/93-P-8	3061.6	Montney	VI	30/07/2007	70.8	7.56	587	2.46	1.41	0.37	19	5	133.1	GSC Internal data
	D-65-G/93-P-8	3063.7	Montney	VI	30/07/2007	70.4	4.4	605	1.21	0.67	0.31	15	7	150.9	GSC Internal data
	D-65-G/93-P-8	3067	Montney	VI	18/12/2009	70.5	7.2	599	0.8	1.04	0.43	14	6	121.5	GSC Internal data
	D-65-G/93-P-8	3067.3	Montney	VI	30/07/2007	70.5	6.94	592	0.39	1.31	0.4	19	6	119.2	GSC Internal data
	D-65-G/93-P-8	3068.8	Montney	VI	30/07/2007	50.6	8.31	592	0.37	1.44	0.47	17	6	120.9	GSC Internal data
	D-65-G/93-P-8	3068.87	Montney	VI	27/11/2008	70.4	0.3	593	2.45	1.12	0	373	0	121.9	GSC Internal data
	D-65-G/93-P-8	3068.87	Montney	VI	28/11/2008	70.4	8.59	591	2.49	1.18	0.52	14	6	121.9	GSC Internal data
	D-65-G/93-P-8	3069.7	Montney	VI	30/07/2007	70.1	1.24	311	0.73	0.31	0.31	25	25	120.1	GSC Internal data
	D-65-G/93-P-8	3070.97	Montney	VI	27/11/2008	70.8	0.03	408	0.27	0.15	0	500	0	109.3	GSC Internal data
	D-65-G/93-P-8	3070.97	Montney	VI	28/11/2008	70.5	0.84	420	0.28	0.21	0.24	25	29	109.3	GSC Internal data
	D-65-G/93-P-8	3070.97	Montney	VI	28/11/2008	70	0.89	405	0.27	0.16	0.3	18	34	109.3	GSC Internal data
	D-65-G/93-P-8	3071.2	Montney	VI	30/07/2007	70.6	0.86	305	0.8	0.28	0.31	33	36	101.8	GSC Internal data
	D-65-G/93-P-8	3073.5	Montney	VI	30/07/2007	70.3	2.4	309	1.91	0.8	0.3	33	12	121.3	GSC Internal data
	D-65-G/93-P-8	3118	Montney	VI	27/11/2008	70.4	0.09	313	0.57	0.53	0	589	0	88.3-180	GSC Internal data
	D-65-G/93-P-8	3118	Montney	VI	28/11/2008	70.3	3.47	311	0.57	0.53	0.35	15	10	88.3-180	GSC Internal data
	D-65-G/93-P-8	3118	Montney	VI	28/11/2008	70.7	3.51	311	0.59	0.58	0.32	17	9	88.3-180	GSC Internal data
	D-65-G/93-P-8	3118.4	Montney	VI	31/07/2007	70.1	3.21	327	0.75	0.57	0.4	18	12	88.3-180	GSC Internal data
	D-65-G/93-P-8	3120	Montney	VI	31/07/2007	70.9	2.86	311	4.13	1.42	0.32	50	11	97-214	GSC Internal data
	D-65-G/93-P-8	3121.8	Montney	VI	31/07/2007	50.8	2.57	294	1.49	0.33	0.35	13	14	97-214	GSC Internal data
	D-65-G/93-P-8	3122.9	Montney	VI	31/07/2007	50.3	2.88	311	4.99	1.4	0.31	49	11	97-214	GSC Internal data
	D-65-G/93-P-8	3124.6	Montney	VI	31/07/2007	50.7	1.64	307	2.56	0.65	0.25	40	15	125.1	GSC Internal data
	D-65-G/93-P-8	3126.8	Montney	VI	31/07/2007	50.7	3.29	312	4.82	1.29	0.34	39	10	131.7	GSC Internal data
	D-65-G/93-P-8	3128.3	Montney	VI	31/07/2007	70.9	2.55	316	2.79	0.98	0.31	38	12	102-170	GSC Internal data
	D-65-G/93-P-8	3129.6	Montney	VI	31/07/2007	50.2	5.93	321	0.82	1.22	0.4	21	7	170.4	GSC Internal data
	D-65-G/93-P-8	3131.3	Montney	VI	31/07/2007	70.8	3.69	314	0.9	0.91	0.22	25	6	148-240	GSC Internal data
	D-65-G/93-P-8	3132.8	Montney	VI	31/07/2007	50.1	3.9	305	0.89	0.5	0.31	13	8	148-240	GSC Internal data
	D-65-G/93-P-8	3134.7	Montney	VI	31/07/2007	50.3	3.43	307	1.18	0.77	0.28	22	8	148-241	GSC Internal data
	D-65-G/93-P-8	3135.8	Montney	VI	31/07/2007	50.5	2.57	297	0.53	0.28	0.3	11	12	108-130	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
41	D-85-A/93-P-10	2777.62	Montney	VI	17/01/2009	70.6	1.53	371	2.75	0.93	0.31	61	20	124-160	GSC Internal data
	D-85-A/93-P-10	2778.49	Montney	VI	17/01/2009	70.8	1.26	294	0.19	0.17	0.11	13	9	114.6	GSC Internal data
	D-85-A/93-P-10	2780.72	Montney	VI	17/01/2009	70.8	1.34	294	0.16	0.14	0.34	10	25	127.1	GSC Internal data
	D-85-A/93-P-10	2784.79	Montney	VI	17/01/2009	70.5	1.32	301	2.48	0.66	0.01	50	1	121.47	GSC Internal data
	D-85-A/93-P-10	2787.04	Montney	VI	17/01/2009	70.3	1.2	300	2.06	0.45	0.31	38	26	128.56	GSC Internal data
	D-85-A/93-P-10	2790.67	Montney	VI	17/01/2009	70.6	1.29	413	2.87	0.73	0.32	57	25	112-132	GSC Internal data
	D-85-A/93-P-10	2792.27	Montney	VI	17/01/2009	70.9	0.72	296	0.32	0.12	0.36	17	50	116.71	GSC Internal data
	D-85-A/93-P-10	2793.47	Montney	VI	17/01/2009	70.4	1.52	301	2.58	0.64	0.34	42	22	125.59	GSC Internal data
	D-85-A/93-P-10	2795.52	Montney	VI	17/01/2009	70.6	0.6	435	1.17	0.55	0.38	92	63	106.92	GSC Internal data
	D-85-A/93-P-10	2795.78	Montney	VI	17/01/2009	70.6	1.11	295	0.45	0.15	0.38	14	34	118.63	GSC Internal data
	D-85-A/93-P-10	2797.34	Montney	VI	17/01/2009	70.8	1.33	302	2.71	0.6	0.3	45	23	116-131	GSC Internal data
	D-85-A/93-P-10	2801.98	Montney	VI	17/01/2009	70.2	1.75	305	3.11	0.76	0.3	43	17	93-141	GSC Internal data
42	1-12-84-23W6	1899.9	Montney	II	01/04/1990	99.60	1.24	451	0.78	0.36	0.37	29	30		GSC Open File 2308
	1-12-84-23W6	1899.9	Montney	II	01/04/1990	101.50	1.26	453	0.71	0.22	0.46	17	37		GSC Open File 2308
	1-12-84-23W6	1901.5	Montney	II	01/04/1990	99.90	1.24	450	1.11	0.47	0.5	38	40		GSC Open File 2308
	1-12-84-23W6	1901.5	Montney	II	01/04/1990	100.00	1.26	450	1.13	0.51	0.63	40	50		GSC Open File 2308
	1-12-84-23W6	1902.4	Montney	II	01/04/1990	100.20	1.05	450	0.8	0.49	0.22	47	21		GSC Open File 2308
	1-12-84-23W6	1902.4	Montney	II	01/04/1990	100.20	1.06	451	0.81	0.49	0.39	46	37		GSC Open File 2308
	1-12-84-23W6	1904.5	Montney	II	01/04/1990	101.20	0.95	448	0.85	0.35	0.42	37	44		GSC Open File 2308
	1-12-84-23W6	1904.5	Montney	II	01/04/1990	99.40	0.95	446	0.87	0.4	0.36	42	38		GSC Open File 2308
	1-12-84-23W6	1905.1	Montney	II	01/04/1990	100.30	0.71	453	0.95	0.36	0.44	51	62		GSC Open File 2308
	1-12-84-23W6	1905.1	Montney	II	01/04/1990	99.40	0.71	452	0.88	0.26	0.28	37	39		GSC Open File 2308
43	10-18-67-23W5	1864.9	Montney	II	01/04/1990	100.20	0.72	435	0.31	2.76	0.77	383	107		GSC Open File 2308
	10-18-67-23W5	1864.9	Montney	II	01/04/1990	101.70	0.76	435	0.28	2.56	0.79	337	104		GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
44	10-21-92-3W6	781.1	Montney	VI	12/03/2009	70.2	0.22	302	0.84	0.62	0.43	282	195		ERCB/AGS Open File 2010-05
	10-21-92-3W6	798.3	Montney	VI	12/03/2009	70	1.69	416	3.36	12.46	0.18	737	11		ERCB/AGS Open File 2010-05
45	10-24-86-21W6	1959.9	Montney	II	01/04/1990	100.60	0.75	416	0.65	0.48	0.39	64	52		GSC Open File 2308
	10-24-86-21W6	1959.9	Montney	II	01/04/1990	100.20	0.76	408	0.68	0.51	0.2	67	26		GSC Open File 2308
	10-24-86-21W6	1964.1	Montney	II	01/04/1990	99.10	1.55	458	1.28	1.13	0.22	73	14		GSC Open File 2308
	10-24-86-21W6	1964.1	Montney	II	01/04/1990	100.60	1.57	455	1.33	1.07	0.17	68	11		GSC Open File 2308
	10-24-86-21W6	1967.5	Montney	II	01/04/1990	99.40	0.65	410	0.53	0.42	0.12	65	18		GSC Open File 2308
	10-24-86-21W6	1967.5	Montney	II	01/04/1990	101.00	0.67	408	0.51	0.45	0.12	67	18		GSC Open File 2308
	10-24-86-21W6	1969.9	Montney	II	01/04/1990	101.20	0.37	421	0.33	0.37	0.02	100	5		GSC Open File 2308
	10-24-86-21W6	1969.9	Montney	II	01/04/1990	99.30	0.37	393	0.33	0.36	0	97	0		GSC Open File 2308
	10-24-86-21W6	1970.8	Montney	II	01/04/1990	99.60	1.05	465	0.52	0.59	0	56	0		GSC Open File 2308
	10-24-86-21W6	1970.8	Montney	II	01/04/1990	100.10	1.06	467	0.53	0.58	0	55	0		GSC Open File 2308
46	10-34-64-19W5	1768.5	Montney	VI	10/03/2009	70.3	0.35	428	0.57	1.16	0	331	0		GSC Internal data
	10-34-64-19W5	1776.2	Montney	VI	11/03/2009	70.3	0.72	420	2.02	2.3	0.15	319	21		GSC Internal data
	10-34-64-19W5	1785.9	Montney	VI	11/03/2009	70.3	0.3	434	0.07	0.19	0.26	63	87		GSC Internal data
47	10-6-60-20W5	2522	Montney	VI	15/07/2009	70.9	0.1	326	0.02	0.08	0	80	0		GSC Internal data
	10-6-60-20W5	2531	Montney	VI	15/07/2009	70.1	0.08	431	0.05	0.16	0.14	200	175		GSC Internal data
48	11-14-57-23W5	3013.3	Montney	VI	12/03/2009	70.3	0.13	352	0.02	0.08	0.23	62	177		GSC Internal data
49	11-17-88-03W6	2317.5	Montney	VI	28/12/2008	70.3	4.08	437	2.37	16.66	0.25	408	6		GSC Internal data
50	11-20-73-7W6	2051.4	Montney	VI	06/04/2006	70.3	0.41	445	0.4	0.36	0.14	88	34		GSC Internal data
51	11-24-62-20W5	2105.101	Montney	VI	12/03/2009	70	0.26	411	0.4	0.57	0.29	219	112		GSC Internal data
	11-24-62-20W5	2105.101	Montney	VI	16/03/2009	70.7	0.34	397	0.63	0.88	0.27	259	79		GSC Internal data
52	11-27-77-6W6	1741.2	Montney	VI	12/03/2009	70.4	0.98	442	0.41	4.36	0.27	445	28		ERCB/AGS Open File 2010-05
	11-27-77-6W6	1746.6	Montney	VI	12/03/2009	70.8	0.81	439	1.43	2.25	0.26	278	32		ERCB/AGS Open File 2010-05

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	11-27-77-6W6	1750.2	Montney	VI	12/03/2009	71	0.82	439	1.11	3.24	0.37	395	45		ERCB/AGS Open File 2010-05
	11-27-77-6W6	1751.1	Montney	VI	12/03/2009	70.6	0.87	439	1.12	2.42	0.25	278	29		ERCB/AGS Open File 2010-05
53	11-28-71-3W6	1820.5	Montney	VI	11/03/2009	70.3	0.55	437	0.2	0.67	0.12	122	22		GSC Internal data
	11-28-71-3W6	1826.4	Montney	VI	11/03/2009	70.5	1.72	440	0.22	9.77	0.23	568	13		GSC Internal data
	11-28-71-3W6	1827.6	Montney	VI	2016-07-11	50.4	1.94	438	0.29	11.05	0.17	570	9		New Analyzed
	11-28-71-3W6	1829.9	Montney	VI	11/03/2009	70.8	0.71	436	0.81	2.73	0.17	385	24		GSC Internal data
	11-28-71-3W6	1836.1	Montney	VI	11/03/2009	70.2	1.5	438	0.46	7.85	0.32	523	21		GSC Internal data
	11-28-71-3W6	1840.7	Montney	VI	11/03/2009	70.6	0.57	438	0.68	2.17	0.23	381	40		GSC Internal data
	11-28-71-3W6	1845.8	Montney	VI	12/03/2009	70.5	3.64	436	0.62	23.33	0.24	641	7		GSC Internal data
	11-28-71-3W6	1852.1	Montney	VI	11/03/2009	70.7	2.22	438	0.46	11.93	0.38	537	17		GSC Internal data
	11-28-71-3W6	1852.6	Montney	VI	2016-07-11	50.7	2.56	439	0.45	14.45	0.16	564	6		New Analyzed
	11-28-71-3W6	1853.95	Montney	VI	2016-07-11	50.7	3.27	436	0.59	19.47	0.16	595	5		New Analyzed
	11-28-71-3W6	1857.6	Montney	VI	11/03/2009	70.3	0.99	437	0.7	4.49	0.13	454	13		GSC Internal data
	11-28-71-3W6	1862.8	Montney	VI	11/03/2009	70.3	1.59	437	0.47	9.05	0.16	569	10		GSC Internal data
	11-28-71-3W6	1869.8	Montney	VI	11/03/2009	70.6	0.42	439	0.4	1.14	0.23	271	55		GSC Internal data
54	11-34-78-2W6	1770.3	Montney	VI	12/03/2009	70	0.26	296	0.35	0.27	0.32	104	123		ERCB/AGS Open File 2010-05
	11-34-78-2W6	1779.9	Montney	VI	12/03/2009	70	0.94	421	1.71	4.01	0.13	427	14		ERCB/AGS Open File 2010-05
	11-34-78-2W6	1787.3	Montney	VI	12/03/2009	70.8	0.87	426	1.72	4.31	0.15	495	17		ERCB/AGS Open File 2010-05
55	11-3-73-7W6	2044.1	Montney	VI	12/05/2006	70.3	1.07	443	0.38	1.73	0.23	162	21		GSC Internal data
	11-3-73-7W6	2044.1	Montney	VI	12/05/2006	70.7	1.13	448	0.64	2.29	0.17	203	15		GSC Internal data
	11-3-73-7W6	2044.35	Montney	VI	2016-07-11	51.1	0.33	440	0.31	0.27	0.15	82	45		New Analyzed
	11-3-73-7W6	2045.59	Montney	VI	08/09/2006	70.9	0.33	438	0.39	0.33	0.1	100	30		GSC Internal data
	11-3-73-7W6	2045.9	Montney	VI	2016-07-11	50.5	0.34	436	0.52	0.41	0.12	121	35		New Analyzed
	11-3-73-7W6	2047.55	Montney	VI	2016-07-11	51	1.19	448	0.47	2.31	0.13	194	11		New Analyzed

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	11-3-73-7W6	2048	Montney	VI	2016-07-11	50.8	0.34	437	0.57	0.42	0.15	124	44		New Analyzed
	11-3-73-7W6	2049.91	Montney	VI	08/09/2006	70.7	0.36	440	0.45	0.47	0.17	131	47		GSC Internal data
	11-3-73-7W6	2050.35	Montney	VI	2016-07-11	51.2	1.44	450	0.55	2.84	0.14	197	10		New Analyzed
	11-3-73-7W6	2050.95	Montney	VI	2016-07-11	50.5	0.97	447	0.86	1.63	0.15	168	15		New Analyzed
	11-3-73-7W6	2051.3	Montney	VI	2016-07-11	51.2	0.43	436	0.88	0.68	0.14	158	33		New Analyzed
	11-3-73-7W6	2051.6	Montney	VI	08/09/2006	70.8	0.22	422	0.38	0.26	0.13	118	59		GSC Internal data
	11-3-73-7W6	2052.4	Montney	VI	2016-07-11	50.5	1.48	446	0.73	2.62	0.16	177	11		New Analyzed
	11-3-73-7W6	2052.9	Montney	VI	2016-07-11	50.3	0.27	443	0.39	0.31	0.17	115	63		New Analyzed
	11-3-73-7W6	2053.75	Montney	VI	2016-07-11	50.7	0.41	433	0.76	0.66	0.13	161	32		New Analyzed
	11-3-73-7W6	2054.6	Montney	VI	2016-07-11	51.1	0.3	425	0.53	0.35	0.18	117	60		New Analyzed
	11-3-73-7W6	2054.9	Montney	VI	2016-07-11	50.7	0.91	443	0.71	1.5	0.12	165	13		New Analyzed
	11-3-73-7W6	2055.3	Montney	VI	2016-07-11	51	0.25	421	0.46	0.31	0.13	124	52		New Analyzed
	11-3-73-7W6	2055.8	Montney	VI	2016-07-11	50.6	0.18	418	0.33	0.27	0.14	150	78		New Analyzed
	11-3-73-7W6	2056.3	Montney	VI	2016-07-11	50.9	0.41	437	0.59	0.63	0.19	154	46		New Analyzed
	11-3-73-7W6	2057.5	Montney	VI	2016-07-11	50.7	0.2	432	0.39	0.21	0.18	105	90		New Analyzed
56	11-4-79-14W6	2051.1	Montney	VI	18/12/2009	70.4	0.67	450	0.24	0.31	0.14	46	21		GSC Internal data
	11-4-79-14W6	2064.1	Montney	VI	28/06/2010	70.7	1.66	450	0.6	0.81	0.45	49	27		GSC Internal data
	11-4-79-14W6	2068.9	Montney	VI	24/02/2010	70	0.75	435	0.2	0.13	0.36	17	48		GSC Internal data
	11-4-79-14W6	2070.2	Montney	VI	24/02/2010	70.1	1.99	453	0.42	0.49	0.35	25	18		GSC Internal data
	11-4-79-14W6	2073.2	Montney	VI	28/06/2010	70.7	0.95	434	0.28	0.28	0.5	29	53		GSC Internal data
	11-4-79-14W6	2091.8	Montney	VI	24/02/2010	70.8	0.45	415	0.16	0.11	0.41	24	91		GSC Internal data
	11-4-79-14W6	2093.6	Montney	VI	24/02/2010	70.1	0.62	431	0.23	0.18	0.39	29	63		GSC Internal data
57	1-14-91-12W6	1110.8	Montney	VI	21/03/2009	70.5	6.31	438	2.5	30.42	0.32	482	5		GSC Internal data
	1-14-91-12W6	1116.85	Montney	VI	21/03/2009	70.5	0.71	436	1.09	2.88	0.21	406	30		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	1-14-91-12W6	1118.15	Montney	VI	21/03/2009	70.3	1.45	435	1.73	5.83	0.22	402	15		GSC Internal data
58	1-1-76-6W6	1697.25	Montney	VI	03/08/2006	70.7	0.42	437	0.26	0.7	0.21	167	50		GSC Internal data
59	12-17-72-12W6	2865	Montney	VI	18/10/2006	70.5	2.63	296	0.68	0.41	0.53	16	20		GSC Internal data
60	12-27-74-12W6	2567.11	Montney	VI	06/11/2006	70.6	0.51	441	0.27	0.24	0.18	47	35		GSC Internal data
	12-27-74-12W6	2568.17	Montney	VI	06/11/2006	70.4	0.61	442	0.32	0.25	0.2	41	33		GSC Internal data
	12-27-74-12W6	2569.12	Montney	VI	06/11/2006	70.2	0.4	444	0.18	0.18	0.17	45	42		GSC Internal data
	12-27-74-12W6	2570.2	Montney	VI	07/11/2006	70.6	0.27	431	0.12	0.09	0.19	33	70		GSC Internal data
	12-27-74-12W6	2570.7	Montney	VI	07/11/2006	70.3	0.5	442	0.27	0.23	0.21	46	42		GSC Internal data
	12-27-74-12W6	2571.09	Montney	VI	07/11/2006	70.1	0.71	441	0.31	0.33	0.22	46	31		GSC Internal data
	12-27-74-12W6	2571.6	Montney	VI	07/11/2006	70.6	1.17	448	0.51	0.48	0.18	41	15		GSC Internal data
	12-27-74-12W6	2572.14	Montney	VI	07/11/2006	70.6	0.64	445	0.31	0.27	0.2	42	31		GSC Internal data
	12-27-74-12W6	2572.7	Montney	VI	07/11/2006	70.3	0.75	443	0.4	0.31	0.16	41	21		GSC Internal data
	12-27-74-12W6	2573.18	Montney	VI	07/11/2006	70	1.03	446	0.47	0.35	0.16	34	16		GSC Internal data
	12-27-74-12W6	2574.16	Montney	VI	07/11/2006	70.6	0.41	437	0.2	0.16	0.19	39	46		GSC Internal data
	12-27-74-12W6	2575.11	Montney	VI	07/11/2006	70.8	1.04	449	0.51	0.39	0.13	38	12		GSC Internal data
	12-27-74-12W6	2577.5	Montney	VI	07/11/2006	71	0.56	444	0.23	0.21	0.22	38	39		GSC Internal data
	12-27-74-12W6	2578.18	Montney	VI	07/11/2006	70.2	0.81	447	0.31	0.33	0.22	41	27		GSC Internal data
	12-27-74-12W6	2579.06	Montney	VI	07/11/2006	70.2	1.12	449	0.46	0.46	0.21	41	19		GSC Internal data
	12-27-74-12W6	2580.15	Montney	VI	07/11/2006	70.8	0.72	452	0.41	0.35	0.17	49	24		GSC Internal data
	12-27-74-12W6	2581.16	Montney	VI	08/11/2006	70.5	0.53	445	0.32	0.22	0.21	42	40		GSC Internal data
	12-27-74-12W6	2581.66	Montney	VI	08/11/2006	70.2	0.56	440	0.24	0.23	0.26	41	46		GSC Internal data
	12-27-74-12W6	2582.09	Montney	VI	08/11/2006	70.2	0.77	442	0.34	0.25	0.22	32	29		GSC Internal data
	12-27-74-12W6	2582.66	Montney	VI	08/11/2006	70	0.57	441	0.23	0.2	0.25	35	44		GSC Internal data
	12-27-74-12W6	2583.09	Montney	VI	08/11/2006	70.8	0.61	446	0.34	0.24	0.21	39	34		GSC Internal data
61	12-27-80-13W6	1741.1	Montney	VI	28/12/2008	70.4	0.66	418	2.53	2.02	0.15	306	23		GSC Internal data
	12-27-80-13W6	1743.9	Montney	VI	28/12/2008	70.2	1.37	444	0.97	2.51	0.29	183	21		GSC Internal data
	12-27-80-13W6	1751	Montney	VI	28/12/2008	70.9	0.32	442	0.3	0.24	0.17	75	53		GSC Internal data
	12-27-80-13W6	1758	Montney	VI	28/12/2008	70.8	0.25	443	0.22	0.24	0.23	96	92		GSC Internal data
62	12-35-79-17W6	2124.43	Montney	VI	09/04/2009	70.4	1.6	461	1.04	0.6	0.23	38	14		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	12-35-79-17W6	2130.22	Montney	VI	09/04/2009	70.6	3.21	467	1.83	1.25	0.31	39	10		GSC Internal data
	12-35-79-17W6	2133.2	Montney	VI	09/04/2009	70.5	2.62	462	1.95	1.14	0.42	44	16		GSC Internal data
	12-35-79-17W6	2136.01	Montney	VI	09/04/2009	70.6	1.44	459	1.89	0.97	0.29	67	20		GSC Internal data
63	12-7-67-24W5	1908.5	Montney	VI	2016-07-11	50.3	0.6	429	2.46	1.95	0.09	325	15		New Analyzed
	12-7-67-24W5	1910.1	Montney	VI	21/03/2009	70.4	0.64	423	1.88	2.77	0.15	433	23		GSC Internal data
	12-7-67-24W5	1910.3	Montney	VI	2016-07-11	49.9	0.77	431	2.73	2.5	0.1	325	13		New Analyzed
	12-7-67-24W5	1910.7	Montney	VI	2016-07-11	50.3	1.46	438	3.9	4.63	0.09	317	6		New Analyzed
	12-7-67-24W5	1911.5	Montney	VI	2016-07-11	50.2	1.02	423	6.03	3.43	0.08	336	8		New Analyzed
	12-7-67-24W5	1912.2	Montney	VI	2016-07-11	51.1	0.98	432	3.25	3.78	0.09	386	9		New Analyzed
	12-7-67-24W5	1912.6	Montney	VI	2016-07-11	50.8	1	421	6.32	3.18	0.09	318	9		New Analyzed
	12-7-67-24W5	1913.3	Montney	VI	2016-07-11	50	0.8	430	2.96	2.78	0.09	348	11		New Analyzed
	12-7-67-24W5	1914	Montney	VI	2016-07-11	50.1	0.87	425	3.89	2.76	0.09	317	10		New Analyzed
	12-7-67-24W5	1914.4	Montney	VI	21/03/2009	70.6	0.68	431	1.2	2.97	0.14	437	21		GSC Internal data
	12-7-67-24W5	1914.4	Montney	VI	2016-07-11	50.3	0.78	424	4.16	2.64	0.07	338	9		New Analyzed
	12-7-67-24W5	1915.6	Montney	VI	2016-07-11	50	1.3	421	8.18	4.05	0.1	312	8		New Analyzed
	12-7-67-24W5	1916.9	Montney	VI	2016-07-11	50.5	0.94	439	1.59	4.98	0.11	530	12		New Analyzed
	12-7-67-24W5	1917.2	Montney	VI	2016-07-11	50.2	1.07	420	6.37	3.76	0.07	351	7		New Analyzed
	12-7-67-24W5	1917.6	Montney	VI	21/03/2009	70.8	1.75	435	3.01	7.81	0.19	446	11		GSC Internal data
	12-7-67-24W5	1918.55	Montney	VI	2016-07-11	50	1.08	420	6.77	3.49	0.07	323	6		New Analyzed
	12-7-67-24W5	1918.9	Montney	VI	2016-07-11	50.1	0.73	439	1.16	3.18	0.11	436	15		New Analyzed
	12-7-67-24W5	1919.8	Montney	VI	2016-07-11	50.8	0.84	433	2.1	3.12	0.12	371	14		New Analyzed
	12-7-67-24W5	1920.5	Montney	VI	21/03/2009	70.8	0.74	432	1.86	2.35	0.14	318	19		GSC Internal data
	12-7-67-24W5	1921.1	Montney	VI	2016-07-11	50.9	1.18	435	3.91	3.43	0.1	291	8		New Analyzed

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	12-7-67-24W5	1921.6	Montney	VI	2016-07-11	50.7	0.78	440	0.84	4.06	0.1	521	13		New Analyzed
	12-7-67-24W5	1922.2	Montney	VI	2016-07-11	50.4	0.83	439	1.41	3.21	0.13	387	16		New Analyzed
	12-7-67-24W5	1922.7	Montney	VI	2016-07-11	50.6	0.81	321	3.68	2.66	0.1	328	12		New Analyzed
64	13-15-77-19W6	3175.59	Montney	VI	05/07/2009	70.3	1.21	357	0.11	0.09	0.3	7	25		GSC Internal data
	13-15-77-19W6	3177.36	Montney	VI	05/07/2009	70.5	0.95	307	0.06	0.06	0.25	6	26		GSC Internal data
	13-15-77-19W6	3177.96	Montney	VI	05/07/2009	70.9	1.27	609	0.05	0.08	0.3	6	24		GSC Internal data
	13-15-77-19W6	3179.3	Montney	VI	05/07/2009	70.6	1.03	453	0.05	0.06	0.25	6	24		GSC Internal data
	13-15-77-19W6	3182.13	Montney	VI	05/07/2009	70.8	2.12	607	0.04	0.11	0.33	5	16		GSC Internal data
	13-15-77-19W6	3182.94	Montney	VI	05/07/2009	70.9	2.77	605	0.07	0.17	0.3	6	11		GSC Internal data
	13-15-77-19W6	3184.25	Montney	VI	05/07/2009	70.9	2.61	606	0.07	0.17	0.49	7	19		GSC Internal data
	13-15-77-19W6	3185.56	Montney	VI	05/07/2009	70.6	1.07	607	0.05	0.1	0.36	9	34		GSC Internal data
	13-15-77-19W6	3186.44	Montney	VI	05/07/2009	70.5	2.8	295	0.14	0.24	0.34	9	12		GSC Internal data
	13-15-77-19W6	3187.875	Montney	VI	06/07/2009	70.5	1.77	302	0.06	0.09	0.29	5	16		GSC Internal data
	13-15-77-19W6	3188.685	Montney	VI	06/07/2009	70.4	1.37	605	0.05	0.1	0.34	7	25		GSC Internal data
	13-15-77-19W6	3191.18	Montney	VI	06/07/2009	70.4	2.33	605	0.05	0.15	0.04	6	2		GSC Internal data
	13-15-77-19W6	3245.14	Montney	VI	06/07/2009	70.6	1.15	293	0.05	0.06	0.22	5	19		GSC Internal data
	13-15-77-19W6	3246.55	Montney	VI	06/07/2009	70.7	1.1	293	0.04	0.07	0.2	6	18		GSC Internal data
	13-15-77-19W6	3247.665	Montney	VI	06/07/2009	71	1.2	295	0.07	0.08	0.27	7	22		GSC Internal data
	13-15-77-19W6	3250.19	Montney	VI	06/07/2009	70.1	1.86	300	0.13	0.15	0.29	8	16		GSC Internal data
	13-15-77-19W6	3251.96	Montney	VI	06/07/2009	70.8	1.69	607	0.05	0.09	0.21	5	12		GSC Internal data
	13-15-77-19W6	3253.55	Montney	VI	06/07/2009	70.6	1.55	468	0.03	0.06	0.13	4	8		GSC Internal data
	13-15-77-19W6	3254.885	Montney	VI	06/07/2009	70.6	1.45	605	0.04	0.11	0.22	8	15		GSC Internal data
	13-15-77-19W6	3255.915	Montney	VI	06/07/2009	71	1.15	608	0.04	0.06	0.29	5	25		GSC Internal data
	13-15-77-19W6	3256.95	Montney	VI	06/07/2009	70.7	1.32	302	0.05	0.08	0.22	6	17		GSC Internal data
	13-15-77-19W6	3258.89	Montney	VI	06/07/2009	70.2	2.19	607	0.02	0.07	0.18	3	8		GSC Internal data
65	13-16-79-14W6	2015	Montney	VI	28/06/2010	70.9	1.63	454	0.61	0.68	0.36	42	22		GSC Internal data
66	13-18-82-19W6	3011	Montney	VI	13/01/2009	71	0.9	460	0.67	0.83	0.39	92	43		GSC Internal data
67	13-31-67-18W5	1662.1	Montney	VI	12/03/2009	70.5	0.14	421	0.25	0.16	0.1	114	71		ERCB/AGS Open File 2010-05

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	13-31-67-18W5	1665.9	Montney	VI	12/03/2009	70.7	0.34	409	0.32	0.2	0.14	59	41		ERCB/AGS Open File 2010-05
	13-31-67-18W5	1672.9	Montney	VI	12/03/2009	70.2	0.19	415	0.42	0.55	0.3	289	158		ERCB/AGS Open File 2010-05
68	13-5-74-9W6	2260.05	Montney	VI	05/11/2006	70.1	0.55	457	0.25	0.41	0.12	75	22		GSC Internal data
	13-5-74-9W6	2260.47	Montney	VI	05/11/2006	71	0.49	456	0.23	0.39	0.12	80	24		GSC Internal data
	13-5-74-9W6	2261.12	Montney	VI	05/11/2006	70.3	0.53	447	0.22	0.44	0.21	83	40		GSC Internal data
	13-5-74-9W6	2261.48	Montney	VI	05/11/2006	70.3	0.43	445	0.15	0.35	0.21	81	49		GSC Internal data
	13-5-74-9W6	2262	Montney	VI	05/11/2006	70	0.17	438	0.07	0.1	0.15	59	88		GSC Internal data
	13-5-74-9W6	2263.03	Montney	VI	05/11/2006	70.3	0.33	438	0.1	0.14	0.16	42	48		GSC Internal data
	13-5-74-9W6	2264.05	Montney	VI	05/11/2006	70.8	0.34	443	0.16	0.28	0.15	82	44		GSC Internal data
	13-5-74-9W6	2265.08	Montney	VI	05/11/2006	70.5	0.38	444	0.18	0.29	0.17	76	45		GSC Internal data
	13-5-74-9W6	2266.14	Montney	VI	05/11/2006	70.4	0.31	438	0.15	0.23	0.17	74	55		GSC Internal data
	13-5-74-9W6	2267.1	Montney	VI	05/11/2006	70.1	0.18	432	0.07	0.09	0.16	50	89		GSC Internal data
	13-5-74-9W6	2268.17	Montney	VI	05/11/2006	70.7	0.25	443	0.16	0.18	0.16	72	64		GSC Internal data
	13-5-74-9W6	2269.15	Montney	VI	06/11/2006	70.1	0.26	437	0.11	0.12	0.16	46	62		GSC Internal data
	13-5-74-9W6	2270.12	Montney	VI	06/11/2006	70.7	0.4	447	0.23	0.33	0.17	82	42		GSC Internal data
	13-5-74-9W6	2271.1	Montney	VI	06/11/2006	70.2	0.18	430	0.06	0.07	0.14	39	78		GSC Internal data
	13-5-74-9W6	2272.09	Montney	VI	06/11/2006	70.5	0.33	447	0.18	0.21	0.17	64	52		GSC Internal data
	13-5-74-9W6	2273.09	Montney	VI	06/11/2006	70.7	0.25	442	0.11	0.16	0.18	64	72		GSC Internal data
	13-5-74-9W6	2274.14	Montney	VI	06/11/2006	70.3	0.21	439	0.13	0.18	0.16	86	76		GSC Internal data
	13-5-74-9W6	2275.17	Montney	VI	06/11/2006	70.8	0.25	437	0.12	0.14	0.21	56	84		GSC Internal data
	13-5-74-9W6	2275.93	Montney	VI	06/11/2006	70.3	0.32	442	0.16	0.23	0.21	72	66		GSC Internal data
	13-5-74-9W6	2277.26	Montney	VI	06/11/2006	70.4	0.34	448	0.21	0.34	0.22	100	65		GSC Internal data
	13-5-74-9W6	2278.33	Montney	VI	06/11/2006	70.9	0.43	436	0.38	0.56	0.18	130	42		GSC Internal data
	13-5-74-9W6	2279.28	Montney	VI	06/11/2006	70.4	0.49	428	0.48	0.58	0.16	118	33		GSC Internal data
	13-5-74-9W6	2280.3	Montney	VI	06/11/2006	70.9	0.49	438	0.38	0.48	0.21	98	43		GSC Internal data
69	14-20-79-22W5	866.6	Montney	VI	12/03/2009	70.5	0.39	353	1.52	1.16	0.14	297	36		GSC Internal data
	14-20-79-22W5	879.2	Montney	VI	12/03/2009	70.7	0.2	299	0.76	0.44	0.18	220	90		GSC Internal data
70	14-30-82-7W6	1231.2	Montney	VI	12/03/2009	70.4	0.87	437	0.7	2.9	0.22	333	25		ERCB/AGS Open File 2010-05

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	14-30-82-7W6	1235.6	Montney	VI	12/03/2009	70.9	0.31	434	0.33	0.79	0.21	255	68		ERCB/AGS Open File 2010-05
	14-30-82-7W6	1241.6	Montney	VI	22/03/2009	70.4	0.66	434	1.48	1.87	0.11	283	17		GSC Internal data
	14-30-82-7W6	1245.7	Montney	VI	22/03/2009	70.5	2.75	436	2.15	16.13	0.24	587	9		GSC Internal data
	14-30-82-7W6	1248.3	Montney	VI	22/03/2009	70.6	0.35	435	0.27	0.89	0.09	254	26		GSC Internal data
71	14-34-84-25W6	1992.5	Montney	VI	18/10/2007	70.8	2.77	459	0.84	1.3	0.59	47	21		GSC Internal data
	14-34-84-25W6	1997.5	Montney	VI	18/10/2007	70.8	1.23	447	0.99	0.74	0.64	60	52		GSC Internal data
	14-34-84-25W6	2017	Montney	VI	01/12/2007	70.1	1.03	444	0.8	0.52	0.25	50	24		GSC Internal data
	14-34-84-25W6	2018.2	Montney	VI	01/12/2007	70.5	0.98	441	0.91	0.52	0.34	53	35		GSC Internal data
	14-34-84-25W6	2031.5	Montney	VI	02/12/2007	70.2	1.95	460	1.1	1.21	0.24	62	12		GSC Internal data
	14-34-84-25W6	2043.2	Montney	VI	02/12/2007	70.8	0.62	448	0.56	0.51	0.22	82	35		GSC Internal data
	14-34-84-25W6	2073.5	Montney	VI	02/12/2007	70.6	2.43	469	1.32	1.64	0.3	67	12		GSC Internal data
	14-34-84-25W6	2086	Montney	VI	02/12/2007	50.2	5.42	477	2.06	3.72	0.32	69	6		GSC Internal data
	14-34-84-25W6	2096.8	Montney	VI	02/12/2007	50.7	4.14	476	1.64	2.43	0.3	59	7		GSC Internal data
	14-34-84-25W6	2100.4	Montney	VI	01/12/2007	70.3	2.3	463	1.3	1.35	0.29	59	13		GSC Internal data
	14-34-84-25W6	2103.2	Montney	VI	02/12/2007	70.8	1.67	464	0.94	1.15	0.25	69	15		GSC Internal data
	14-34-84-25W6	2114.5	Montney	VI	01/12/2007	70.8	2.28	472	1.3	1.59	0.33	70	14		GSC Internal data
	14-34-84-25W6	2123.3	Montney	VI	03/12/2007	70.2	2.87	459	1.33	1.57	0.35	55	12		GSC Internal data
	14-34-84-25W6	2128	Montney	VI	01/12/2007	70.1	1.44	441	0.77	0.67	0.38	47	26		GSC Internal data
	14-34-84-25W6	2129	Montney	VI	01/12/2007	71	1.51	447	1.01	0.86	0.35	57	23		GSC Internal data
	14-34-84-25W6	2246.1	Montney	VI	03/12/2007	70.6	1.23	436	0.57	0.41	0.24	33	20		GSC Internal data
	14-34-84-25W6	2261.6	Montney	VI	03/12/2007	70.4	1.24	431	0.6	0.53	0.26	43	21		GSC Internal data
72	14-9-77-11W6	2270	Montney	II	01/04/1990	99.90	0.86	445	1.41	0.54	0.31	63	36		GSC Open File 2308
	14-9-77-11W6	2270	Montney	II	01/04/1990	101.00	0.89	445	1.39	0.52	0.27	58	30		GSC Open File 2308
	14-9-77-11W6	2271.6	Montney	VI	08/03/2009	70.4	0.96	449	1.06	0.76	0.02	79	2		GSC Internal data
	14-9-77-11W6	2274.1	Montney	II	01/04/1990	99.20	0.85	438	2.13	0.67	0.35	79	41		GSC Open File 2308
	14-9-77-11W6	2274.1	Montney	II	01/04/1990	99.70	0.85	442	2.04	0.69	0.36	81	42		GSC Open File 2308
	14-9-77-11W6	2276	Montney	VI	08/03/2009	70.4	1.22	452	1.88	1.01	0.23	83	19		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	14-9-77-11W6	2278	Montney	II	01/04/1990	99.60	1.22	454	1.37	0.63	0.31	52	25		GSC Open File 2308
	14-9-77-11W6	2278	Montney	II	01/04/1990	99.40	1.48	454	1.31	0.57	0.33	39	22		GSC Open File 2308
	14-9-77-11W6	2279.85	Montney	VI	08/03/2009	70.2	0.72	398	0.68	0.65	0.23	90	32		GSC Internal data
	14-9-77-11W6	2279.9	Montney	II	01/04/1990	99.70	0.91	443	1.65	0.61	0.42	67	46		GSC Open File 2308
	14-9-77-11W6	2279.9	Montney	II	01/04/1990	100.10	0.94	444	1.6	0.44	0.43	47	46		GSC Open File 2308
	14-9-77-11W6	2280.4	Montney	II	01/04/1990	100.40	0.97	450	0.66	0.32	0.22	33	23		GSC Open File 2308
	14-9-77-11W6	2280.4	Montney	II	01/04/1990	100.50	0.97	449	0.67	0.35	0.25	36	26		GSC Open File 2308
	14-9-77-11W6	2281.5	Montney	VI	08/03/2009	70.6	0.93	437	0.44	0.52	0.17	56	18		GSC Internal data
73	15-34-77-1W6	1123.5	Montney	II	01/04/1990	99.30	1.48	438	1.46	2.5	0.64	169	43		GSC Open File 2308
	15-34-77-1W6	1123.5	Montney	II	01/04/1990	99.20	1.57	438	1.5	2.67	0.58	170	37		GSC Open File 2308
74	15-6-76-3W6	1458.9	Montney	VI	20/03/2009	70.4	0.86	433	0.66	3.24	0.23	377	27		GSC Internal data
75	15-8-81-12W6	1827.7	Montney	VI	14/05/2009	70.3	0.66	443	0.82	1.64	0.13	248	20		GSC Internal data
	15-8-81-12W6	1827.7	Montney	VI	22/03/2009	70.1	0.72	441	0.93	2	0.13	278	18		GSC Internal data
	15-8-81-12W6	1833.1	Montney	VI	22/03/2009	71	0.8	441	1.45	2.08	0.2	260	25		GSC Internal data
	15-8-81-12W6	1839.1	Montney	VI	22/03/2009	70.7	0.39	441	0.69	0.85	0.12	218	31		GSC Internal data
76	16-23-57-06W6	2646.578	Montney	VI	14/05/2009	70.6	1.14	301	0.25	0.21	0.14	18	12		GSC Internal data
77	16-31-66-23W5	1708.6	Montney	VI	12/03/2009	70.5	0.37	418	0.82	0.86	0.29	232	78		ERCB/AGS Open File 2010-05
	16-31-66-23W5	1711.5	Montney	VI	12/03/2009	70.2	0.33	429	0.71	0.85	0.19	258	58		ERCB/AGS Open File 2010-05
	16-31-66-23W5	1718.1	Montney	VI	12/03/2009	70.4	0.32	422	0.4	0.35	0.22	109	69		ERCB/AGS Open File 2010-05
	16-31-66-23W5	1720	Montney	VI	12/03/2009	70.8	0.31	429	0.06	0.59	0.3	190	97		ERCB/AGS Open File 2010-05
	16-31-66-23W5	1725.5	Montney	VI	12/03/2009	70	0.19	430	0.1	0.49	0.27	258	142		ERCB/AGS Open File 2010-05
78	16-35-78-21W6	2957.6	Montney	VI	21/01/2011	70.4	1.33	453	0.1	0.15	0.25	11	19		GSC Internal data
	16-35-78-21W6	2972.77	Montney	VI	21/01/2011	70.4	1.51	464	0.06	0.14	0.25	9	17		GSC Internal data
79	2-27-74-11W6	2567.3	Montney	VI	26/07/2006	71	0.3	440	0.23	0.33	0.16	110	53		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	2-27-74-11W6	2567.53	Montney	VI	26/07/2006	70.4	0.25	407	0.19	0.27	0.07	108	28		GSC Internal data
	2-27-74-11W6	2571.14	Montney	VI	26/07/2006	70.4	0.95	448	0.52	0.42	0.16	44	17		GSC Internal data
	2-27-74-11W6	2575.51	Montney	VI	26/07/2006	70.6	1.38	455	0.78	0.58	0.08	42	6		GSC Internal data
	2-27-74-11W6	2576.16	Montney	VI	26/07/2006	70.6	1.32	450	0.65	0.47	0.12	36	9		GSC Internal data
	2-27-74-11W6	2581.6	Montney	VI	26/07/2006	70.4	0.26	418	0.15	0.28	0.06	108	23		GSC Internal data
80	3-28-68-8W6	2875.05	Montney	VI	17/11/2008	70.1	0.4	304	0.64	0.16	0.21	40	52		GSC Internal data
	3-28-68-8W6	2878.94	Montney	VI	17/11/2008	70.4	1.04	308	0.56	0.38	0.13	37	12		GSC Internal data
	3-28-68-8W6	2887.15	Montney	VI	17/11/2008	70.3	1.49	306	0.97	0.46	0.1	31	7		GSC Internal data
81	4-14-84-23W6	1733.5	Montney	VI	30/06/2008	70.2	1.29	462	0.61	0.82	0.28	64	22		GSC Internal data
	4-14-84-23W6	1735	Montney	VI	30/06/2008	70.6	1.51	455	0.88	1.38	0.25	91	17		GSC Internal data
	4-14-84-23W6	1736.5	Montney	VI	30/06/2008	70.9	1.91	455	1.08	1.59	0.3	83	16		GSC Internal data
	4-14-84-23W6	1737.5	Montney	VI	30/06/2008	70.6	1.13	463	0.7	0.89	0.27	79	24		GSC Internal data
	4-14-84-23W6	1738.5	Montney	VI	30/06/2008	70.3	1.23	464	0.85	1.02	0.28	83	23		GSC Internal data
	4-14-84-23W6	1740	Montney	VI	30/06/2008	70.4	1.29	465	0.96	1.12	0.25	87	19		GSC Internal data
	4-14-84-23W6	1741.1	Montney	VI	30/06/2008	70.9	0.81	460	0.79	0.8	0.23	99	28		GSC Internal data
	4-14-84-23W6	1741.8	Montney	VI	01/07/2008	70.3	0.75	454	0.71	0.66	0.2	88	27		GSC Internal data
	4-14-84-23W6	1742.5	Montney	VI	01/07/2008	70.7	0.72	457	0.64	0.64	0.22	89	31		GSC Internal data
	4-14-84-23W6	1743.5	Montney	VI	01/07/2008	70.4	0.98	462	0.89	0.88	0.18	90	18		GSC Internal data
	4-14-84-23W6	1744.8	Montney	VI	01/07/2008	70.6	0.4	440	0.2	0.21	0.29	52	72		GSC Internal data
	4-14-84-23W6	1745.5	Montney	VI	01/07/2008	70.2	1	458	1.09	1.06	0.26	106	26		GSC Internal data
	4-14-84-23W6	1765.8	Montney	VI	02/07/2008	70.4	0.97	457	0.56	0.64	0.28	66	29		GSC Internal data
	4-14-84-23W6	1766.4	Montney	VI	03/07/2008	70.3	1.7	465	0.84	1.2	0.31	71	18		GSC Internal data
	4-14-84-23W6	1766.8	Montney	VI	01/07/2008	70.3	1.9	456	0.8	1.56	0.31	82	16		GSC Internal data
	4-14-84-23W6	1767.4	Montney	VI	01/07/2008	70.1	0.82	461	0.75	0.79	0.22	96	27		GSC Internal data
	4-14-84-23W6	1768.8	Montney	VI	01/07/2008	70.6	1.15	457	0.6	0.8	0.28	70	24		GSC Internal data
	4-14-84-23W6	1769.5	Montney	VI	01/07/2008	70.4	1.57	463	0.77	1.1	0.26	70	17		GSC Internal data
	4-14-84-23W6	1770.9	Montney	VI	01/07/2008	70.7	1.71	467	1.01	1.24	0.22	73	13		GSC Internal data
	4-14-84-23W6	1772	Montney	VI	01/07/2008	70.3	1.51	464	0.74	1.07	0.28	71	19		GSC Internal data
	4-14-84-23W6	1773	Montney	VI	01/07/2008	70.1	1.19	461	0.68	0.74	0.22	62	18		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	4-14-84-23W6	1775	Montney	VI	01/07/2008	70.5	0.73	454	0.65	0.56	0.17	77	23		GSC Internal data
	4-14-84-23W6	1776.3	Montney	VI	01/07/2008	70.1	0.44	453	0.47	0.41	0.19	93	43		GSC Internal data
	4-14-84-23W6	1778	Montney	VI	01/07/2008	70.5	0.94	455	0.55	0.63	0.21	67	22		GSC Internal data
	4-14-84-23W6	1780	Montney	VI	01/07/2008	70	0.56	447	0.58	0.6	0.25	107	45		GSC Internal data
	4-14-84-23W6	1786.07	Montney	VI	09/08/2008	70.4	0.53	457	0.41	0.54	0.24	102	45		GSC Internal data
	4-14-84-23W6	1807.27	Montney	VI	09/08/2008	70.4	0.74	461	0.45	0.55	0.27	74	36		GSC Internal data
	4-14-84-23W6	1825.5	Montney	VI	02/07/2008	70.1	2.97	463	1.16	2.34	0.19	79	6		GSC Internal data
	4-14-84-23W6	1826.1	Montney	VI	02/07/2008	70.2	1.38	468	0.65	1	0.31	72	22		GSC Internal data
	4-14-84-23W6	1826.4	Montney	VI	02/07/2008	70.9	2.07	462	0.89	1.43	0.2	69	10		GSC Internal data
	4-14-84-23W6	1828	Montney	VI	02/07/2008	70.8	1.59	467	0.85	1.24	0.24	78	15		GSC Internal data
	4-14-84-23W6	1828.8	Montney	VI	02/07/2008	70.5	1.88	461	0.93	1.55	0.25	82	13		GSC Internal data
	4-14-84-23W6	1830	Montney	VI	02/07/2008	70.4	1.63	468	0.8	1.29	0.2	79	12		GSC Internal data
	4-14-84-23W6	1831.3	Montney	VI	03/07/2008	70.2	1.19	461	0.76	1	0.26	84	22		GSC Internal data
	4-14-84-23W6	1831.6	Montney	VI	02/07/2008	70.5	1.06	459	0.47	0.69	0.33	65	31		GSC Internal data
	4-14-84-23W6	1831.7	Montney	VI	02/07/2008	70.2	0.37	444	0.11	0.19	0.28	51	76		GSC Internal data
	4-14-84-23W6	1833	Montney	VI	02/07/2008	70.3	3.41	468	1.22	2.42	0.23	71	7		GSC Internal data
	4-14-84-23W6	1834.7	Montney	VI	02/07/2008	70.3	3.6	467	1.22	2.59	0.19	72	5		GSC Internal data
	4-14-84-23W6	1835.4	Montney	VI	02/07/2008	70.4	4.73	470	1.66	4.33	0.15	92	3		GSC Internal data
	4-14-84-23W6	1835.5	Montney	VI	02/07/2008	70	3.77	464	1.76	3.72	0.17	99	5		GSC Internal data
	4-14-84-23W6	1836	Montney	VI	02/07/2008	70.6	3.17	465	1.36	2.93	0.22	92	7		GSC Internal data
	4-14-84-23W6	1837	Montney	VI	02/07/2008	70.5	2.67	460	1.26	2.56	0.21	96	8		GSC Internal data
	4-14-84-23W6	1839.5	Montney	VI	02/07/2008	70.8	3.6	464	1.4	3.05	0.15	85	4		GSC Internal data
	4-14-84-23W6	1840.27	Montney	VI	09/08/2008	70.3	3.67	466	1.58	3.69	0.14	101	4		GSC Internal data
	4-14-84-23W6	1840.7	Montney	VI	02/07/2008	70.6	2.6	460	1.37	2.11	0.22	81	8		GSC Internal data
	4-14-84-23W6	1842	Montney	VI	02/07/2008	70	3.83	465	1.62	3.42	0.12	89	3		GSC Internal data
	4-14-84-23W6	1842.7	Montney	VI	02/07/2008	70.9	4.12	468	1.64	3.22	0.18	78	4		GSC Internal data
	4-14-84-23W6	1844.77	Montney	VI	09/08/2008	70.2	4.61	469	1.77	3.9	0.12	85	3		GSC Internal data
	4-14-84-23W6	1854.83	Montney	VI	09/08/2008	70.3	1.49	471	0.9	1.11	0.18	74	12		GSC Internal data
	4-14-84-23W6	1877.13	Montney	VI	10/08/2008	70.5	0.93	462	0.67	0.88	0.13	95	14		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	4-14-84-23W6	1906.17	Montney	VI	10/08/2008	70.5	1.44	461	0.98	1.38	0.15	96	10		GSC Internal data
	4-14-84-23W6	1942.57	Montney	VI	10/08/2008	70.5	0.99	447	0.54	0.61	0.13	62	13		GSC Internal data
	4-14-84-23W6	1986.8	Montney	VI	10/08/2008	70.6	0.98	441	0.47	0.59	0.1	60	10		GSC Internal data
	4-14-84-23W6	2029.9	Montney	VI	10/08/2008	70.5	2.09	459	0.81	1.03	0.1	49	5		GSC Internal data
82	4-27-88-17W6	1369.2	Montney	II	01/04/1990	100.00	1.53	453	1.25	0.94	0.28	61	18		GSC Open File 2308
	4-27-88-17W6	1369.2	Montney	II	01/04/1990	100.40	1.53	449	1.23	1.01	0.31	66	20		GSC Open File 2308
	4-27-88-17W6	1371	Montney	II	01/04/1990	100.70	2.27	454	1.26	1.36	0.3	60	13		GSC Open File 2308
	4-27-88-17W6	1371	Montney	II	01/04/1990	101.10	2.33	457	1.26	1.3	0.33	56	14		GSC Open File 2308
83	4-32-84-12W6	1581.3	Montney	VI	21/03/2009	70.2	2.84	437	0.93	14.48	0.5	510	18		GSC Internal data
	4-32-84-12W6	1581.39	Montney	VI	2016-07-11	50.6	1.35	432	1.1	5.87	0.44	435	33		New Analyzed
	4-32-84-12W6	1581.9	Montney	VI	2016-07-11	51	1.67	433	0.92	7.71	0.45	462	27		New Analyzed
	4-32-84-12W6	1583.6	Montney	VI	2016-07-11	50.7	1.24	436	0.81	5.29	0.3	427	24		New Analyzed
	4-32-84-12W6	1584.1	Montney	VI	22/03/2009	70.6	1.22	438	0.88	5.26	0.28	431	23		GSC Internal data
	4-32-84-12W6	1587	Montney	VI	22/03/2009	70.7	0.6	439	0.44	2.51	0.18	418	30		GSC Internal data
	4-32-84-12W6	1591.1	Montney	VI	2016-07-11	50.8	1.33	437	0.93	5.9	0.2	444	15		New Analyzed
	4-32-84-12W6	1591.6	Montney	VI	2016-07-11	50.5	0.23	411	0.08	0.06	0.31	26	135		New Analyzed
	4-32-84-12W6	1592.5	Montney	VI	22/03/2009	70.8	0.82	431	0.32	1.33	0.63	162	77		GSC Internal data
	4-32-84-12W6	1593.5	Montney	VI	2016-07-11	50.8	1.18	434	0.67	4.58	0.3	388	25		New Analyzed
84	4-6-59-20W5	2656.35	Montney	VI	12/03/2009	70.7	0.11	421	0.02	0.09	0.15	82	136		GSC Internal data
85	4-8-74-5W6	2075.8	Montney	II	01/04/1990	99.50	1.11	429	1.98	0.97	0.55	87	50		GSC Open File 2308
	4-8-74-5W6	2075.8	Montney	II	01/04/1990	100.40	1.13	430	1.86	0.89	0.49	79	43		GSC Open File 2308
	4-8-74-5W6	2076.9	Montney	II	01/04/1990	99.40	0.4	387	0.53	0.16	0.53	40	133		GSC Open File 2308
	4-8-74-5W6	2076.9	Montney	II	01/04/1990	100.10	0.42	362	0.56	0.24	0.51	57	121		GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	GR (GAPI)	REFERENCE
	4-8-74-5W6	2077.7	Montney	II	01/04/1990	101.20	0.79	398	1.78	0.42	0.54	53	68		GSC Open File 2308
	4-8-74-5W6	2077.7	Montney	II	01/04/1990	99.70	0.8	406	1.77	0.44	0.55	55	69		GSC Open File 2308
	4-8-74-5W6	2080.4	Montney	II	01/04/1990	99.30	0.65	395	1.2	0.32	0.53	49	82		GSC Open File 2308
	4-8-74-5W6	2080.4	Montney	II	01/04/1990	100.10	0.66	396	1.2	0.32	0.56	48	85		GSC Open File 2308
	4-8-74-5W6	2081.8	Montney	II	01/04/1990	99.20	0.58	344	1	0.22	0.51	38	88		GSC Open File 2308
	4-8-74-5W6	2081.8	Montney	II	01/04/1990	101.00	0.59	351	0.99	0.19	0.5	32	85		GSC Open File 2308
	4-8-74-5W6	2083.3	Montney	II	01/04/1990	100.60	0.57	347	0.34	0.11	0.46	19	81		GSC Open File 2308
	4-8-74-5W6	2083.3	Montney	II	01/04/1990	99.60	0.6	339	0.33	0.11	0.44	18	73		GSC Open File 2308
86	5-14-78-11W6	2189.9	Montney	VI	09/03/2009	70	0.78	432	1.28	1.27	0.15	163	19		GSC Internal data
	5-14-78-11W6	2193.5	Montney	VI	09/03/2009	69.9	0.62	425	1.14	1.19	0.2	192	32		GSC Internal data
	5-14-78-11W6	2206.2	Montney	VI	09/03/2009	70.7	0.68	438	0.86	0.75	0.21	110	31		GSC Internal data
	5-14-78-11W6	2214.4	Montney	VI	09/03/2009	70.7	1.2	451	0.78	1.21	0.14	101	12		GSC Internal data
	5-14-78-11W6	2220.85	Montney	VI	09/03/2009	71	1.77	449	1.86	1.82	0.18	103	10		GSC Internal data
	5-14-78-11W6	2255.5	Montney	VI	09/03/2009	70.6	1.08	431	2.12	1.69	0.21	156	19		GSC Internal data
87	5-24-68-22W5	1556.257	Montney	VI	23/03/2009	70.3	0.61	417	1.96	2.28	0.14	374	23		GSC Internal data
	5-24-68-22W5	1559.229	Montney	VI	23/03/2009	70.3	0.59	419	1.75	2.4	0.23	407	39		GSC Internal data
	5-24-68-22W5	1562.505	Montney	VI	24/03/2009	70.6	0.46	417	0.84	1.7	0.13	370	28		GSC Internal data
	5-24-68-22W5	1568.272	Montney	VI	24/03/2009	70.8	0.24	307	0.34	0.4	0.24	167	100		GSC Internal data
	5-24-68-22W5	1568.272	Montney	VI	24/03/2009	70.7	0.54	418	0.38	0.82	0.21	152	39		GSC Internal data
88	5-26-80-13W6	1925.8	Montney	VI	08/04/2010	70.8	0.54	435	1.13	0.73	0.32	135	59		GSC Internal data
	5-26-80-13W6	1929.5	Montney	VI	08/04/2010	69.9	0.55	440	1.55	0.5	0.34	91	62		GSC Internal data
	5-26-80-13W6	1929.5	Montney	VI	21/04/2010	70.6	0.55	440	1.47	0.64	0.34	116	62		GSC Internal data
	5-26-80-13W6	1933.3	Montney	VI	08/04/2010	71.1	0.55	448	1.83	0.55	0.35	100	64		GSC Internal data
	5-26-80-13W6	1938.1	Montney	VI	08/04/2010	71.1	0.92	444	2.83	0.98	0.29	107	32		GSC Internal data
	5-26-80-13W6	1940.4	Montney	VI	08/04/2010	70.5	0.71	443	1.87	0.67	0.29	94	41		GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	5-26-80-13W6	1943.1	Montney	VI	08/04/2010	70.6	0.79	439	2.51	1.24	0.24	157	30	GSC Internal data
	5-26-80-13W6	1944.8	Montney	VI	08/04/2010	70.9	1.17	446	1.59	1.68	0.25	144	21	GSC Internal data
	5-26-80-13W6	1946.5	Montney	VI	08/04/2010	70.2	0.8	438	1.25	1.45	0.24	181	30	GSC Internal data
	5-26-80-13W6	1949.1	Montney	VI	08/04/2010	70.6	0.96	441	1.53	1.33	0.28	139	29	GSC Internal data
	5-26-80-13W6	1952.2	Montney	VI	08/04/2010	70.5	0.46	443	1.23	0.54	0.34	117	74	GSC Internal data
	5-26-80-13W6	1954.2	Montney	VI	08/04/2010	70.5	0.8	441	1.83	0.81	0.3	101	38	GSC Internal data
	5-26-80-13W6	1955.7	Montney	VI	09/04/2010	70.4	0.66	439	1.33	1.02	0.26	155	39	GSC Internal data
	5-26-80-13W6	1957.5	Montney	VI	09/04/2010	71	0.52	435	1.48	0.68	0.3	131	58	GSC Internal data
	5-26-80-13W6	1958	Montney	VI	09/04/2010	70.8	0.68	441	1.7	0.79	0.25	116	37	GSC Internal data
	5-26-80-13W6	1959.9	Montney	VI	09/04/2010	70.7	0.48	443	0.97	0.51	0.25	106	52	GSC Internal data
	5-26-80-13W6	1961.5	Montney	VI	09/04/2010	69.9	0.71	440	1.94	0.72	0.3	101	42	GSC Internal data
89	5-32-73-12W6	2815.1	Montney	VI	10/03/2009	70.3	1.42	305	0.62	0.27	0.2	19	14	GSC Internal data
	5-32-73-12W6	2816.4	Montney	VI	14/05/2009	70.2	1.83	296	0.59	0.31	0.23	17	13	GSC Internal data
	5-32-73-12W6	2817.9	Montney	VI	10/03/2009	70.2	1.82	302	1.26	0.45	0.22	25	12	GSC Internal data
	5-32-73-12W6	2823.3	Montney	VI	10/03/2009	70.3	1.75	311	0.32	0.3	0.19	17	11	GSC Internal data
	5-32-73-12W6	2832.2	Montney	VI	10/03/2009	70.4	0.26	393	0.08	0.07	0.27	27	104	GSC Internal data
90	6-10-79-15W6	2141.9	Montney	VI	24/02/2010	70.7	1.86	444	0.68	0.59	0.34	32	18	GSC Internal data
	6-10-79-15W6	2157.6	Montney	VI	24/02/2010	70.8	1.38	456	0.39	0.47	0.3	34	22	GSC Internal data
91	6-12-79-12W6	2013.56	Montney	VI	23/03/2009	70.2	0.61	441	0.69	1.2	0.14	197	23	GSC Internal data
	6-12-79-12W6	2013.56	Montney	VI	24/03/2009	70.5	0.64	442	0.67	1.08	0.13	169	20	GSC Internal data
	6-12-79-12W6	2016.1	Montney	VI	23/03/2009	70.2	0.48	438	0.63	0.91	0.1	190	21	GSC Internal data
	6-12-79-12W6	2020.12	Montney	VI	23/03/2009	69.8	0.37	431	0.65	0.88	0.09	238	24	GSC Internal data
	6-12-79-12W6	2023.95	Montney	VI	23/03/2009	70.5	0.4	432	0.96	0.95	0.15	238	38	GSC Internal data
	6-12-79-12W6	2028.5	Montney	VI	23/03/2009	70.5	0.72	436	1.59	1.78	0.11	247	15	GSC Internal data
92	6-14-66-6W6	3026.4	Montney	VI	12/03/2009	70.1	1.28	445	0.93	0.84	0.1	66	8	ERCB/AGS Open File 2010-05
	6-14-66-6W6	3030.6	Montney	VI	12/03/2009	70.9	1.23	333	0.79	0.76	0.13	62	11	ERCB/AGS Open File 2010-05
	6-14-66-6W6	3034.3	Montney	VI	12/03/2009	70.5	0.87	326	0.76	0.69	0.12	79	14	ERCB/AGS Open File 2010-05

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	6-14-66-6W6	3040.6	Montney	VI	12/03/2009	70.9	0.84	327	0.6	0.53	0.12	63	14	ERCB/AGS Open File 2010-05
	6-14-66-6W6	3044.1	Montney	VI	12/03/2009	70.4	0.82	315	0.45	0.41	0.12	50	15	ERCB/AGS Open File 2010-05
93	6-17-86-18W6	1656.9	Montney	VI	25/02/2010	70.5	0.69	428	0.5	0.79	0.28	114	41	GSC Internal data
	6-17-86-19W6	1827.6	Montney	II	01/04/1990	101.30	0.6	442	0.64	0.6	0.44	100	73	GSC Open File 2308
	6-17-86-19W6	1827.6	Montney	II	01/04/1990	99.80	0.66	442	0.66	0.6	0.4	91	61	GSC Open File 2308
	6-17-86-19W6	1830	Montney	II	01/04/1990	100.40	0.45	427	0.46	0.54	0.39	120	87	GSC Open File 2308
	6-17-86-19W6	1830	Montney	II	01/04/1990	100.30	0.49	429	0.47	0.57	0.16	116	33	GSC Open File 2308
	6-17-86-19W6	1831.3	Montney	II	01/04/1990	99.80	0.88	449	0.67	0.61	0.11	69	13	GSC Open File 2308
	6-17-86-19W6	1831.3	Montney	II	01/04/1990	100.70	0.88	446	0.68	0.66	0.08	75	9	GSC Open File 2308
	6-17-86-19W6	1832.5	Montney	II	01/04/1990	99.70	0.68	438	0.49	0.42	0.08	62	12	GSC Open File 2308
	6-17-86-19W6	1832.5	Montney	II	01/04/1990	99.80	0.69	442	0.49	0.45	0.07	65	10	GSC Open File 2308
	6-17-86-19W6	1834.5	Montney	II	01/04/1990	99.50	0.63	448	0.38	0.38	0.06	60	10	GSC Open File 2308
	6-17-86-19W6	1834.5	Montney	II	01/04/1990	100.20	0.64	449	0.38	0.34	0.07	53	11	GSC Open File 2308
	6-17-86-19W6	1835.7	Montney	II	01/04/1990	99.60	0.87	456	0.49	0.46	0.05	53	6	GSC Open File 2308
	6-17-86-19W6	1835.7	Montney	II	01/04/1990	99.50	0.87	453	0.5	0.53	0.05	61	6	GSC Open File 2308
94	6-23-68-8W6	2972.78	Montney	VI	23/03/2009	70.9	0.23	306	0.11	0.1	0.09	43	39	GSC Internal data
95	6-33-72-25W5	1542.5	Montney	VI	12/03/2009	70.8	1.24	430	1.77	5.23	0.25	422	20	ERCB/AGS Open File 2010-05
	6-33-72-25W5	1590.1	Montney	VI	12/03/2009	70.3	0.76	427	0.4	2.53	0.29	333	38	ERCB/AGS Open File 2010-05
	6-33-72-25W5	1592.2	Montney	VI	12/03/2009	70.6	1.26	430	0.95	5.49	0.16	436	13	ERCB/AGS Open File 2010-05
	6-33-72-25W5	1595.5	Montney	VI	12/03/2009	70.3	1.72	430	0.45	8.84	0.2	514	12	ERCB/AGS Open File 2010-05
	6-33-72-25W5	1602	Montney	VI	12/03/2009	71	0.32	425	0.12	0.65	0.24	203	75	ERCB/AGS Open File 2010-05
	6-33-72-25W5	1607.4	Montney	VI	12/03/2009	70.5	1.05	430	0.46	5.36	0.26	510	25	ERCB/AGS Open File 2010-05
96	6-4-79-9W6	1760	Montney	VI	08/09/2006	70.7	1.37	434	0.53	2.35	0.22	172	16	GSC Internal data
97	6-8-75-2W6	1468.3	Montney	VI	03/04/2006	70.8	0.66	439	0.25	1.31	0.35	198	53	GSC Internal data
98	6-8-90-11W6	1361.8	Montney	II	01/04/1990	99.80	2.22	449	1.22	9.32	0.4	420	18	GSC Open File 2308
	6-8-90-11W6	1361.8	Montney	II	01/04/1990	100.90	2.38	451	1.19	8.99	0.37	378	16	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
99	7-13-79-15W6	2084.5	Montney	VI	28/06/2010	70.3	1.29	442	0.31	0.31	0.32	24	25	GSC Internal data
	7-13-79-15W6	2106.6	Montney	VI	09/08/2007	70.3	1.33	451	0.57	0.62	0.3	47	23	GSC Internal data
	7-13-79-15W6	2107.4	Montney	VI	09/08/2007	70.2	1.98	464	0.51	0.84	0.31	42	16	GSC Internal data
	7-13-79-15W6	2108.6	Montney	VI	09/08/2007	70	2.05	465	0.9	1.13	0.23	55	11	GSC Internal data
100	7-14-64-25W5	2291.7	Montney	VI	2016-07-11	50.2	0.59	433	0.88	1.01	0.12	171	20	New Analyzed
	7-14-64-25W5	2292.1	Montney	VI	2016-07-11	50	0.64	448	0.66	0.77	0.15	120	23	New Analyzed
	7-14-64-25W5	2292.88	Montney	VI	2016-07-11	50.7	0.37	444	0.3	0.39	0.13	105	35	New Analyzed
	7-14-64-25W5	2293.56	Montney	VI	2016-07-11	50.5	0.77	440	1.02	1.49	0.09	194	12	New Analyzed
	7-14-64-25W5	2294.55	Montney	VI	2016-07-11	51.2	0.43	426	0.7	0.72	0.12	167	28	New Analyzed
	7-14-64-25W5	2295.3	Montney	VI	2016-07-11	51.2	1.24	442	1.37	2.25	0.08	181	6	New Analyzed
	7-14-64-25W5	2295.65	Montney	VI	2016-07-11	51.1	0.41	427	1.09	0.92	0.1	224	24	New Analyzed
	7-14-64-25W5	2296.7	Montney	VI	2016-07-11	50.7	0.28	426	0.23	0.76	0.11	271	39	New Analyzed
	7-14-64-25W5	2297.65	Montney	VI	2016-07-11	50.8	0.66	432	1.11	1.67	0.09	253	14	New Analyzed
	7-14-64-25W5	2298.5	Montney	VI	2016-07-11	50.8	0.59	434	0.91	2.61	0.12	442	20	New Analyzed
	7-14-64-25W5	2298.85	Montney	VI	2016-07-11	50.7	0.63	425	2.15	1.57	0.11	249	17	New Analyzed
	7-14-64-25W5	2299.75	Montney	VI	2016-07-11	51	0.68	434	0.81	2.74	0.12	403	18	New Analyzed
	7-14-64-25W5	2300.25	Montney	VI	2016-07-11	51.1	0.52	428	1.34	1.27	0.11	244	21	New Analyzed
	7-14-64-25W5	2300.75	Montney	VI	2016-07-11	50.7	0.77	439	0.57	4.16	0.1	540	13	New Analyzed
	7-14-64-25W5	2301.9	Montney	VI	2016-07-11	50.4	0.63	433	0.88	2.69	0.15	427	24	New Analyzed
	7-14-64-25W5	2302.45	Montney	VI	2016-07-11	50.1	0.72	431	1.5	2.09	0.12	290	17	New Analyzed
	7-14-64-25W5	2302.45	Montney	VI	2016-07-11	50	0.75	431	1.52	2.17	0.11	289	15	New Analyzed
	7-14-64-25W5	2302.8	Montney	VI	2016-07-11	51.1	0.58	441	0.34	3.42	0.09	590	16	New Analyzed

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	7-14-64-25W5	2304.32	Montney	VI	2016-07-11	50.6	0.8	436	1.06	2.54	0.1	318	13	New Analyzed
	7-14-64-25W5	2304.67	Montney	VI	2016-07-11	50.2	0.89	429	1.87	2.3	0.12	258	13	New Analyzed
	7-14-64-25W5	2305.55	Montney	VI	2016-07-11	50.2	0.68	426	2.35	2.23	0.1	328	15	New Analyzed
	7-14-64-25W5	2306.39	Montney	VI	2016-07-11	50.8	0.89	425	2.77	2.82	0.1	317	11	New Analyzed
	7-14-64-25W5	2306.7	Montney	VI	2016-07-11	51	0.83	438	0.49	3.67	0.12	442	14	New Analyzed
	7-14-64-25W5	2307.3	Montney	VI	2016-07-11	50.5	0.78	432	1.66	2.28	0.1	292	13	New Analyzed
	7-14-64-25W5	2291.5	Montney	VI	21/03/2009	70.7	0.35	427	0.35	0.57	0.23	163	66	GSC Internal data
	7-14-64-25W5	2295.2	Montney	VI	21/03/2009	71.3	0.22	424	0.07	0.31	0.18	141	82	GSC Internal data
	7-14-64-25W5	2297.3	Montney	VI	14/05/2009	70.5	0.47	434	0.39	1.78	0.29	379	62	GSC Internal data
	7-14-64-25W5	2297.3	Montney	VI	21/03/2009	70.6	0.81	437	0.4	2.91	0.12	359	15	GSC Internal data
	7-14-64-25W5	2304	Montney	VI	21/03/2009	70.5	0.97	437	0.5	4.2	0.11	433	11	GSC Internal data
	7-14-64-25W5	2306.9	Montney	VI	21/03/2009	70.4	0.79	437	0.47	3.56	0.14	451	18	GSC Internal data
101	7-18-58-20W5	2463.5	Montney	VI	19/06/2008	70.1	0.17	323	0.03	0.04	0.24	24	141	GSC Internal data
102	7-26-59-20W5	2507.59	Montney	VI	19/06/2008	70.4	0.15	424	0.05	0.15	0.19	100	127	GSC Internal data
	7-26-59-20W5	2510.638	Montney	VI	19/06/2008	70.2	0.15	360	0.03	0.09	0.18	60	120	GSC Internal data
103	7-29-73-1W6	1481.1	Montney	II	01/04/1990	99.20	1.86	446	0.7	11.95	0.47	642	25	GSC Open File 2308
	7-29-73-1W6	1481.1	Montney	II	01/04/1990	99.70	1.86	445	0.7	11.69	0.47	628	25	GSC Open File 2308
104	7-33-79-21W6	2722	Montney	VI	25/05/2006	50.9	7.92	595	1.59	1.54	0.41	19	5	GSC Internal data
	7-33-79-21W6	2723	Montney	VI	25/05/2006	50.1	3.76	286	1.13	0.81	0.32	22	9	GSC Internal data
	7-33-79-21W6	2727.5	Montney	VI	25/05/2006	50.7	8.29	579	1.01	1.73	0.47	21	6	GSC Internal data
105	7-5-67-7W6	3076.346	Montney	VI	11/03/2009	70.9	1.46	449	0.92	0.41	0.15	28	10	GSC Internal data
	7-5-67-7W6	3080.309	Montney	VI	11/03/2009	70	0.87	450	0.42	0.22	0.15	25	17	GSC Internal data
	7-5-67-7W6	3081.376	Montney	VI	11/03/2009	70.6	0.92	445	0.5	0.28	0	30	0	GSC Internal data
	7-5-67-7W6	3084.475	Montney	VI	11/03/2009	70.5	1.29	444	0.68	0.45	0.12	35	9	GSC Internal data
	7-5-67-7W6	3088.386	Montney	VI	11/03/2009	70.4	1.07	451	0.52	0.29	0.15	27	14	GSC Internal data
	7-5-67-7W6	3088.386	Montney	VI	14/05/2009	70.5	1.17	304	0.58	0.34	0.23	29	20	GSC Internal data
	7-5-67-7W6	3093.72	Montney	VI	11/03/2009	70	1.08	447	0.48	0.23	0.18	21	17	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	8-10-84-18W6	1861.3	Montney	II	01/04/1990	99.70	0.52	418	0.26	0.1	0.09	19	17	GSC Open File 2308
	8-10-84-18W6	1864.3	Montney	II	01/04/1990	100.20	0.46	348	0.22	0.04	0.06	9	13	GSC Open File 2308
	8-10-84-18W6	1864.3	Montney	II	01/04/1990	100.20	0.48	350	0.25	0.16	0.04	33	8	GSC Open File 2308
	8-10-84-18W6	1866.6	Montney	II	01/04/1990	100.70	0.61	405	0.32	0.07	0.05	11	8	GSC Open File 2308
	8-10-84-18W6	1866.6	Montney	II	01/04/1990	100.50	0.62	405	0.31	0.05	0.07	8	11	GSC Open File 2308
	8-10-84-18W6	1868.9	Montney	II	01/04/1990	100.30	1.26	463	0.64	0.31	0.08	25	6	GSC Open File 2308
	8-10-84-18W6	1868.9	Montney	II	01/04/1990	101.10	1.27	463	0.61	0.2	0.15	16	12	GSC Open File 2308
	8-10-84-18W6	1873.1	Montney	II	01/04/1990	100.90	0.58	414	0.32	0.11	0.04	19	7	GSC Open File 2308
	8-10-84-18W6	1873.1	Montney	II	01/04/1990	101.00	0.59	423	0.35	0.21	0.04	36	7	GSC Open File 2308
	8-10-84-18W6	1876.1	Montney	II	01/04/1990	100.20	0.43	369	0.2	0.12	0.04	28	9	GSC Open File 2308
	8-10-84-18W6	1876.1	Montney	II	01/04/1990	99.70	0.44	315	0.17	0.01	0.04	2	9	GSC Open File 2308
	8-10-84-18W6	1877.3	Montney	VI	08/10/2003	70.9	0.44	432	0.16	0.15	0.7	34	159	GSC Internal data
	8-10-84-18W6	1878.2	Montney	II	01/04/1990	101.20	0.43	331	0.15	0.04	0.01	9	2	GSC Open File 2308
	8-10-84-18W6	1878.2	Montney	II	01/04/1990	100.20	0.43	358	0.17	0.11	0.03	26	7	GSC Open File 2308
	8-10-84-18W6	1878.3	Montney	II	01/04/1990	100.20	0.11	0	0	0	0.04	0	36	GSC Open File 2308
	8-10-84-18W6	1878.3	Montney	II	01/04/1990	101.00	0.12	0	0.01	0.03	0.04	25	33	GSC Open File 2308
107	8-11-87-25W6	1562	Montney	II	01/04/1990	100.40	0.38	452	0.32	0.28	0.16	74	42	GSC Open File 2308
	8-11-87-25W6	1562	Montney	II	01/04/1990	100.10	0.4	452	0.33	0.29	0.18	73	45	GSC Open File 2308
	8-11-87-25W6	1563.6	Montney	II	01/04/1990	99.90	0.44	469	0.2	0.03	0.05	7	11	GSC Open File 2308
	8-11-87-25W6	1563.6	Montney	II	01/04/1990	101.10	0.45	459	0.2	0.1	0.05	22	11	GSC Open File 2308
	8-11-87-25W6	1564.2	Montney	II	01/04/1990	101.50	1.25	457	1.02	1.04	0.2	83	16	GSC Open File 2308
	8-11-87-25W6	1564.2	Montney	II	01/04/1990	101.00	1.28	458	1	0.92	0.28	72	22	GSC Open File 2308
	8-11-87-25W6	1951.4	Montney	II	01/04/1990	99.60	1.33	449	0.63	0.42	0.22	32	17	GSC Open File 2308
	8-11-87-25W6	1951.4	Montney	II	01/04/1990	101.30	1.38	454	0.7	0.63	0.13	46	9	GSC Open File 2308
	8-11-87-25W6	1952.9	Montney	II	01/04/1990	100.90	1.32	463	0.66	0.3	0.13	23	10	GSC Open File 2308
	8-11-87-25W6	1952.9	Montney	II	01/04/1990	99.50	1.33	461	0.61	0.25	0.12	19	9	GSC Open File 2308
	8-11-87-25W6	1953.3	Montney	II	01/04/1990	99.80	0.88	461	0.41	0.44	0	50	0	GSC Open File 2308
	8-11-87-25W6	1953.3	Montney	II	01/04/1990	100.00	0.89	460	0.44	0.48	0.01	54	1	GSC Open File 2308
	8-11-87-25W6	1954.1	Montney	II	01/04/1990	100.90	1.04	458	0.64	0.41	0.27	39	26	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	8-11-87-25W6	1954.5	Montney	II	01/04/1990	101.00	1.27	456	0.68	0.68	0	54	0	GSC Open File 2308
	8-11-87-25W6	1954.5	Montney	II	01/04/1990	100.10	1.28	458	0.66	0.71	0	55	0	GSC Open File 2308
108	8-16-74-10W6	2255.7	Montney	VI	30/11/1998	99.7	4.86	454	1.24	4.62	0.2	96	4	GSC Internal data
	8-16-74-10W6	2255.7	Montney	VI	30/11/1998	100.4	4.87	451	1.11	4.7	0.21	98	4	GSC Internal data
	8-16-74-10W6	2262.3	Montney	VI	30/11/1998	100.1	3.03	452	1.17	2.61	0.28	87	9	GSC Internal data
109	8-18-63-6W6	3600	Montney	VI	17/10/2006	70.3	0.65	442	1.6	1.34	0.3	206	46	GSC Internal data
110	8-18-78-10W6	1925	Montney	VI	13/12/2006	70.3	0.46	439	0.49	0.82	0.16	178	35	GSC Internal data
	8-18-78-10W6	1933.9	Montney	VI	13/12/2006	70.5	0.86	440	0.66	2.41	0.16	280	19	GSC Internal data
	8-18-78-10W6	1951	Montney	VI	13/12/2006	70.4	0.37	439	0.4	0.71	0.1	192	27	GSC Internal data
	8-18-78-10W6	1956	Montney	VI	13/12/2006	70.6	0.3	438	0.35	0.62	0.12	207	40	GSC Internal data
	8-18-78-10W6	1988	Montney	VI	13/12/2006	70.3	0.2	440	0.21	0.39	0.14	195	70	GSC Internal data
	8-18-78-10W6	2016.3	Montney	VI	13/12/2006	70.2	0.07	425	0.05	0.08	0.14	114	200	GSC Internal data
	8-18-78-10W6	2024.5	Montney	VI	13/12/2006	70.5	0.53	435	0.77	1.26	0.16	238	30	GSC Internal data
	8-18-78-10W6	2045	Montney	VI	13/12/2006	70.7	0.68	440	0.75	1.72	0.14	253	21	GSC Internal data
	8-18-78-10W6	2052	Montney	VI	13/12/2006	70.7	0.38	434	0.55	0.89	0.16	234	42	GSC Internal data
	8-18-78-10W6	2060.5	Montney	VI	13/12/2006	70.3	0.42	438	0.59	0.95	0.15	226	36	GSC Internal data
	8-18-78-10W6	2069	Montney	VI	13/12/2006	70.4	0.83	442	0.38	2.07	0.13	249	16	GSC Internal data
	8-18-78-10W6	2089.2	Montney	VI	13/12/2006	70.1	0.52	440	0.74	1.2	0.14	231	27	GSC Internal data
	8-18-78-10W6	2092.2	Montney	VI	12/12/2006	70.1	0.62	439	0.89	1.63	0.14	263	23	GSC Internal data
	8-18-78-10W6	2100	Montney	VI	12/12/2006	70.6	0.83	439	0.94	1.83	0.13	220	16	GSC Internal data
	8-18-78-10W6	2107.5	Montney	VI	12/12/2006	71	0.51	434	0.65	0.88	0.2	173	39	GSC Internal data
	8-18-78-10W6	2118.7	Montney	VI	12/12/2006	70.2	0.65	432	1.03	1.45	0.11	223	17	GSC Internal data
	8-18-78-10W6	2130.4	Montney	VI	12/12/2006	70.2	1.07	442	1.1	1.71	0.15	160	14	GSC Internal data
	8-18-78-10W6	2137.5	Montney	VI	12/12/2006	70	0.56	450	0.36	0.59	0.15	105	27	GSC Internal data
	8-18-78-10W6	2141	Montney	VI	12/12/2006	70.7	0.71	442	0.59	0.73	0.2	103	28	GSC Internal data
	8-18-78-10W6	2149	Montney	VI	12/12/2006	70.4	0.68	540	0.13	0.23	0.17	34	25	GSC Internal data
111	8-30-82-22W6	1759.52	Montney	VI	07/12/2008	70.3	2.05	476	0.78	1.04	0.11	51	5	GSC Internal data
	8-30-82-22W6	1785.74	Montney	VI	07/12/2008	70.3	3.4	476	1.18	2.02	0.14	59	4	GSC Internal data
	8-30-82-22W6	1810.63	Montney	VI	07/12/2008	70.5	3.05	475	1.31	1.79	0.18	59	6	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	8-30-82-22W6	1875.68	Montney	VI	07/12/2008	70.2	1.78	466	0.82	0.88	0.23	49	13	GSC Internal data
	8-30-82-22W6	1903.33	Montney	VI	07/12/2008	70.7	2.02	464	1.09	1.15	0.17	57	8	GSC Internal data
	8-30-82-22W6	1931.33	Montney	VI	07/12/2008	70.1	1.57	455	0.89	0.75	0.11	48	7	GSC Internal data
	8-30-82-22W6	1947.23	Montney	VI	07/12/2008	70.5	1.24	446	0.83	0.74	0.09	60	7	GSC Internal data
112	8-33-79-13W6	1815.6	Montney	VI	18/12/2006	70.2	0.73	448	0.45	0.66	0.46	90	63	GSC Internal data
	8-33-79-13W6	1817.63	Montney	VI	18/12/2006	70.1	1.01	449	0.69	1.21	0.21	120	21	GSC Internal data
	8-33-79-13W6	1817.63	Montney	VI	03/08/2006	70	1.12	453	0.61	1.12	0.13	100	12	GSC Internal data
	8-33-79-13W6	1818.69	Montney	VI	03/08/2006	71	0.98	464	0.45	0.65	0.14	66	14	GSC Internal data
	8-33-79-13W6	1819.87	Montney	VI	03/08/2006	70.7	0.33	434	0.07	0.09	0.17	27	52	GSC Internal data
	8-33-79-13W6	1825.02	Montney	VI	03/08/2006	70.1	0.34	440	0.11	0.32	0.11	94	32	GSC Internal data
113	8-7-85-18W6	1825.26	Montney	VI	08/10/2003	70.4	1.14	418	6.07	2.42	0.37	213	32	GSC Internal data
114	8-8-76-7W6	1915	Montney	VI	18/10/2006	70.6	0.39	438	0.57	0.82	0.31	210	79	GSC Internal data
	8-8-76-7W6	2060	Montney	VI	18/10/2006	70.3	0.87	441	1.9	0.82	0.26	94	30	GSC Internal data
115	9-29-79-14W6	1999	Montney	VI	28/06/2010	70.8	1.96	455	0.75	0.81	0.34	41	17	GSC Internal data
116	9-9-59-22W5	2876.5	Montney	VI	19/06/2008	70.4	0.39	443	0.06	0.1	0.19	26	49	GSC Internal data
	9-9-59-22W5	2879	Montney	VI	24/06/2008	70.3	0.18	441	0.06	0.04	0.29	22	161	GSC Internal data
	9-9-59-22W5	2884	Montney	VI	24/06/2008	70.8	0.15	317	0.04	0.05	0.21	33	140	GSC Internal data
	9-9-59-22W5	2886	Montney	VI	15/07/2009	70	0.18	299	0.04	0.06	0.19	33	106	GSC Internal data
	9-9-59-22W5	2891.5	Montney	VI	24/06/2008	70.1	0.15	326	0.04	0.1	0.12	67	80	GSC Internal data
	9-9-59-22W5	2891.5	Montney	VI	15/07/2009	70.9	0.21	308	0.09	0.1	0.12	48	57	GSC Internal data
117	A-53-L/94-A-13	2044.4	Montney	VI	01/04/1990	100.30	1.09	334	0.31	0.02	0.07	2	6	GSC Open File 2308
	A-53-L/94-A-13	2044.4	Montney	VI	01/04/1990	100.90	1.12	365	0.32	0.06	0.07	5	6	GSC Open File 2308
	A-53-L/94-A-13	2047.3	Montney	VI	01/04/1990	101.00	1.02	0	0.26	0.01	0.07	1	7	GSC Open File 2308
	A-53-L/94-A-13	2047.3	Montney	VI	01/04/1990	100.10	1.04	368	0.29	0.12	0.07	12	7	GSC Open File 2308
	A-53-L/94-A-13	2049.8	Montney	VI	01/04/1990	99.80	0.25	396	0.1	0.02	0.04	8	16	GSC Open File 2308
	A-53-L/94-A-13	2049.8	Montney	VI	01/04/1990	100.00	0.27	437	0.13	0.09	0.06	33	22	GSC Open File 2308
	A-53-L/94-A-13	2053.2	Montney	VI	01/04/1990	100.40	0.81	300	0.22	0.01	0.02	1	2	GSC Open File 2308
	A-53-L/94-A-13	2053.2	Montney	VI	01/04/1990	99.80	0.84	345	0.26	0.14	0.03	17	4	GSC Open File 2308
118	B-32-G/93-P-9	2707	Montney	VI	28/06/2010	70.3	1.16	424	0.4	0.27	0.34	23	29	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	B-57-G/93-P-9	2762.7	Montney	VI	03/08/2007	70.4	1.79	485	0.32	0.35	0.26	20	15	GSC Internal data
	B-57-G/93-P-9	2766.3	Montney	VI	03/08/2007	70.1	0.64	404	0.16	0.14	0.28	22	44	GSC Internal data
120	D-39-F/93-P-9	2962.2	Montney	VI	10/08/2007	71	0.94	434	0.13	0.18	0.27	19	29	GSC Internal data
121	D-45-G/94-H-9	905.8	Montney	VI	16/12/2003	70.3	1.23	431	0.8	4.8	0.23	390	19	GSC Internal data
	D-45-G/94-H-9	909.2	Montney	VI	16/12/2003	70.6	0.82	433	0.33	2.91	0.19	355	23	GSC Internal data
	D-45-G/94-H-9	914.5	Montney	VI	16/12/2003	70.4	2.02	439	0.41	9.09	0.26	450	13	GSC Internal data
	D-45-G/94-H-9	917.4	Montney	VI	16/12/2003	70.5	1.28	435	0.36	5.4	0.22	422	17	GSC Internal data
122	D-49-E/93-P-5	4135	Montney	VI	22/06/2006	70.2	2.64	388	0.11	0.33	0.47	12	18	GSC Internal data
	D-49-E/93-P-5	4550	Montney	VI	22/06/2006	70	2.36	408	0.27	0.56	0.45	24	19	GSC Internal data
123	D-88-F/94-G-2	2130.8	Montney	VI	16/12/2003	70.6	0.87	490	0.02	0.02	0.11	2	13	GSC Open File 7044
	D-88-F/94-G-2	2131.3	Montney	VI	16/12/2003	70.5	0.64	490	0	0.01	0.08	2	13	GSC Open File 7044
	D-88-F/94-G-2	2132.4	Montney	VI	16/12/2003	70.2	0.4	40	0	0	0.15	0	38	GSC Internal data
	D-88-F/94-G-2	2133.1	Montney	VI	16/12/2003	70.9	0.43	500	0	0	0.1	0	23	GSC Open File 7044
124	11-32-82-25W5	927.4	Montney	VI	22/03/2009	70.2	0.51	413	1.52	1.81	0.12	355	24	GSC Internal data
	11-32-82-25W5	929	Montney	VI	22/03/2009	70.5	0.72	294	0.3	0.19	0.61	26	85	GSC Internal data
	11-32-82-25W5	933.85	Montney	VI	22/03/2009	70.8	0.28	299	0.15	0.15	0.55	54	196	GSC Internal data
	11-32-82-25W5	936.7	Montney	VI	22/03/2009	70.9	0.32	299	0.27	0.21	0.34	66	106	GSC Internal data
	11-32-82-25W5	940.4	Montney	VI	22/03/2009	70.6	0.34	293	2.19	0.46	0.12	135	35	GSC Internal data
125	8-20-64-22W5	2046.5	Montney	VI	16/07/2009	70.9	0.5	438	0.73	1.83	0.14	366	28	GSC Internal data
126	A-15-A/93-O-10	1465.7	Montney	VI	01/04/1990	99.10	1.08	346	0.12	0.09	0.14	8	13	GSC Open File 2308
	A-15-A/93-O-10	1465.7	Montney	VI	01/04/1990	99.00	1.09	329	0.11	0.08	0.11	7	10	GSC Open File 2308
	A-15-A/93-O-10	1774.2	Montney	VI	01/04/1990	101.10	1.94	412	0.11	0.14	0.16	7	8	GSC Open File 2308
	A-15-A/93-O-10	1774.2	Montney	VI	01/04/1990	99.50	1.94	429	0.13	0.16	0.14	8	7	GSC Open File 2308
	A-15-A/93-O-10	2711.8	Montney	VI	01/04/1990	99.70	1.92	337	0.04	0.11	0.12	6	6	GSC Open File 2308
	A-15-A/93-O-10	2711.8	Montney	VI	01/04/1990	99.90	1.97	341	0.05	0.12	0.12	6	6	GSC Open File 2308
127	2-30-71-20W5	1319.6	Montney	VI	22/03/2009	70.7	0.26	418	0.63	1.2	0.04	462	15	GSC Internal data
	2-30-71-20W5	1324.3	Montney	VI	24/03/2009	70.5	0.28	311	0.81	0.88	0.21	314	75	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
128	2-33-77-17W6	2693	Montney	VI	21/10/2008	50.6	2.78	329	1.29	0.92	0.28	33	10	GSC Internal data
	2-33-77-17W6	2695	Montney	VI	21/10/2008	50	3.32	332	1.04	1.05	0.2	32	6	GSC Internal data
D1	10-13-79-21W6	2713.1	Doig	VI	2008-04-29	70.3	2.26	605	0.48	0.51	0.24	23	11	GSC Internal data
	10-13-79-21W6	2735	Doig	VI	2008-04-29	70.3	4.94	598	0.3	0.97	0.42	20	9	GSC Internal data
D2	10-15-76-4W6	1480.1	Doig	II	1990-04-01		1.31	444	0.68	3.29	0.88	251	67	GSC Open File 2308
	10-15-76-4W6	1480.1	Doig	II	1990-04-01		1.3	443	0.66	3.35	0.83	258	64	GSC Open File 2308
	10-15-76-4W6	1482.5	Doig	II	1990-04-01		4.33	441	1.64	13.03	0.93	301	21	GSC Open File 2308
	10-15-76-4W6	1482.5	Doig	II	1990-04-01		4.21	439	1.75	13.59	0.84	323	20	GSC Open File 2308
	10-15-76-4W6	1484.1	Doig	II	1990-04-01		2.23	443	0.95	6.55	0.82	294	37	GSC Open File 2308
	10-15-76-4W6	1484.1	Doig	II	1990-04-01		2.28	441	1.01	7.18	0.73	315	32	GSC Open File 2308
D3	10-5-84-11W6	1230.6	Doig	II	1990-04-01		5.21	440	1.62	24.06	0.74	462	14	GSC Open File 2308
	10-5-84-11W6	1230.6	Doig	II	1990-04-01		5.13	441	1.64	24.2	0.86	472	17	GSC Open File 2308
	10-5-84-11W6	1230.6	Doig	VI	1998-11-30	99.6	4.58	441	1.21	23.26	0.34	508	7	GSC Internal data
	10-5-84-11W6	1230.6	Doig	VI	1998-11-30	100.9	5.04	439	1.37	25.48	0.36	506	7	GSC Internal data
	10-5-84-11W6	1231.6	Doig	II	1990-04-01		5.17	442	1.81	22.59	0.75	437	15	GSC Open File 2308
	10-5-84-11W6	1231.6	Doig	II	1990-04-01		5.11	440	1.86	22.41	0.72	439	14	GSC Open File 2308
	10-5-84-11W6	1231.6	Doig	VI	1998-12-01	100	4.81	441	1.22	21.44	0.46	446	10	GSC Internal data
	10-5-84-11W6	1231.7	Doig	II	1990-04-01		3.2	442	1.23	13.05	0.95	408	30	GSC Open File 2308
	10-5-84-11W6	1231.7	Doig	II	1990-04-01		3.16	444	1.19	12.79	0.96	405	30	GSC Open File 2308
D4	10-8-70-9W6	2572.9	Doig	II	1990-04-01		3.68	461	2.7	2.86	0.52	78	14	GSC Open File 2308
	10-8-70-9W6	2572.9	Doig	II	1990-04-01		3.69	460	2.67	2.66	0.58	72	16	GSC Open File 2308
	10-8-70-9W6	2575.1	Doig	II	1990-04-01		2.83	465	2.1	1.51	0.57	53	20	GSC Open File 2308
	10-8-70-9W6	2575.1	Doig	II	1990-04-01		2.81	463	2.2	1.63	0.55	58	20	GSC Open File 2308
	10-8-70-9W6	2575.5	Doig	II	1990-04-01		2.62	467	1.94	1.4	0.49	53	19	GSC Open File 2308
	10-8-70-9W6	2575.5	Doig	II	1990-04-01		2.63	465	1.93	1.52	0.5	58	19	GSC Open File 2308
	10-8-70-9W6	2576.7	Doig	II	1990-04-01		2.9	466	2.15	1.45	0.49	50	17	GSC Open File 2308
	10-8-70-9W6	2576.7	Doig	II	1990-04-01		2.87	469	2.07	1.58	0.49	55	17	GSC Open File 2308
	10-8-70-9W6	2577.3	Doig	II	1990-04-01		2.96	465	2.14	1.61	0.48	54	16	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	10-8-70-9W6	2577.3	Doig	II	1990-04-01		2.95	461	2.33	1.76	0.51	60	17	GSC Open File 2308
	10-8-70-9W6	2579.6	Doig	II	1990-04-01		2.85	470	1.75	1.3	0.45	46	16	GSC Open File 2308
	10-8-70-9W6	2579.6	Doig	II	1990-04-01		2.79	464	1.7	1.37	0.47	49	17	GSC Open File 2308
	10-8-70-9W6	2580.8	Doig	II	1990-04-01		1.66	463	0.97	0.7	1.01	42	61	GSC Open File 2308
	10-8-70-9W6	2580.8	Doig	II	1990-04-01		1.68	456	1.05	0.83	0.79	49	47	GSC Open File 2308
	10-8-70-9W6	2581.6	Doig	II	1990-04-01		1.86	459	1.79	0.97	0.45	52	24	GSC Open File 2308
	10-8-70-9W6	2581.6	Doig	II	1990-04-01		2.04	461	1.73	0.87	0.43	43	21	GSC Open File 2308
	10-8-70-9W6	2583.5	Doig	II	1990-04-01		1.86	469	1.43	0.81	0.4	44	22	GSC Open File 2308
	10-8-70-9W6	2583.5	Doig	II	1990-04-01		1.97	461	1.49	0.88	0.4	45	20	GSC Open File 2308
D5	1-10-82-23W6	1831.2	Doig	VI	2007-08-03	70.8	2.98	473	0.31	1.01	0.22	34	7	GSC Internal data
	1-10-82-23W6	1834.6	Doig	VI	2007-08-03	70.7	1.29	461	0.24	0.42	0.22	33	17	GSC Internal data
	1-10-82-23W6	1834.8	Doig	VI	2007-08-03	70.1	1.93	467	0.23	0.68	0.19	35	10	GSC Internal data
	1-10-82-23W6	1836.4	Doig	VI	2007-08-03	70.3	2.41	471	0.3	0.94	0.21	39	9	GSC Internal data
	1-10-82-23W6	1836.8	Doig	VI	2007-08-03	70.7	1.63	465	0.28	0.68	0.23	42	14	GSC Internal data
	1-10-82-23W6	1837.1	Doig	VI	2007-08-03	70.8	4.41	483	0.41	1.94	0.28	44	6	GSC Internal data
	1-10-82-23W6	1838.9	Doig	VI	2007-08-03	70.4	3	471	0.31	1.07	0.29	36	10	GSC Internal data
	1-10-82-23W6	1840.6	Doig	VI	2007-08-04	70.8	1.17	485	0.21	0.56	0.23	48	20	GSC Internal data
	1-10-82-23W6	1841.1	Doig	VI	2007-08-04	70.4	1.11	459	0.15	0.31	0.19	28	17	GSC Internal data
	1-10-82-23W6	1841.7	Doig	VI	2007-08-04	70.6	4.19	482	0.33	1.48	0.35	35	8	GSC Internal data
	1-10-82-23W6	1844	Doig	VI	2007-08-04	70.4	2.01	468	0.25	0.67	0.22	33	11	GSC Internal data
	1-10-82-23W6	1845.8	Doig	VI	2007-08-04	70.6	4.96	489	0.31	1.83	0.32	37	6	GSC Internal data
	1-10-82-23W6	1847	Doig	VI	2007-08-04	70.7	4.1	478	0.31	1.4	0.26	34	6	GSC Internal data
	1-10-82-23W6	1847.6	Doig	VI	2007-08-04	70.9	1.27	497	0.15	0.55	0.17	43	13	GSC Internal data
	1-10-82-23W6	1849	Doig	VI	2007-08-04	70.7	4.33	484	0.29	1.58	0.36	36	8	GSC Internal data
	1-10-82-23W6	1850	Doig	VI	2007-08-04	50.7	12.47	494	0.67	5.79	0.45	46	4	GSC Internal data
	1-10-82-23W6	1850.9	Doig	VI	2007-08-04	70.1	2.58	477	0.24	0.72	0.3	28	12	GSC Internal data
	1-10-82-23W6	1851.3	Doig	VI	2007-08-04	70.1	3.36	478	0.35	1.17	0.28	35	8	GSC Internal data
	1-10-82-23W6	1853.8	Doig	VI	2007-08-04	50.2	6.15	482	0.35	2.06	0.33	33	5	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	1-10-82-23W6	1856.8	Doig	VI	2007-08-04	50.2	7.21	484	0.43	2.47	0.4	34	6	GSC Internal data
	1-10-82-23W6	1858.2	Doig	VI	2007-08-06	50	4.44	475	0.28	1.58	0.46	36	10	GSC Internal data
	1-10-82-23W6	1860.5	Doig	VI	2007-08-06	20.9	11.31	495	0.45	3.99	0.65	35	6	GSC Internal data
	1-10-82-23W6	1862.5	Doig	VI	2007-08-06	50.7	7.64	484	0.37	2.5	0.42	33	5	GSC Internal data
	1-10-82-23W6	1863.7	Doig	VI	2007-08-06	20	15.62	497	0.62	5.68	0.74	36	5	GSC Internal data
	1-10-82-23W6	1863.9	Doig	VI	2007-08-06	70.2	1.51	467	0.12	0.4	0.29	26	19	GSC Internal data
	1-10-82-23W6	1865	Doig	VI	2008-04-30	70.4	5.6	478	0.23	1.68	0.4	30	7	GSC Internal data
	1-10-82-23W6	1865.6	Doig	VI	2007-08-06	20.3	11.83	490	0.59	4.2	0.79	36	7	GSC Internal data
	1-10-82-23W6	1866.6	Doig	VI	2007-08-06	70.7	1.14	457	0.15	0.21	0.28	18	25	GSC Internal data
	1-10-82-23W6	1867.2	Doig	VI	2007-08-06	70.6	3.98	473	0.29	1.09	0.32	27	8	GSC Internal data
	1-10-82-23W6	1867.8	Doig	VI	2007-08-06	50.5	5.08	476	0.32	1.43	0.46	28	9	GSC Internal data
D6	11-20-73-7W6	2026.9	Doig	VI	2006-04-06	70.7	4.2	448	2.05	8.7	0.19	207	5	GSC Internal data
	11-20-73-7W6	2029.6	Doig	VI	2006-04-06	70.7	4.68	449	2.3	9.46	0.14	202	3	GSC Internal data
	11-20-73-7W6	2033.3	Doig	VI	2006-04-06	70.1	6.22	446	2.76	11.17	0.19	180	3	GSC Internal data
	11-20-73-7W6	2042.3	Doig	VI	2006-04-06	50.2	9.14	449	2.56	18.42	0.32	202	4	GSC Internal data
	11-20-73-7W6	2047.4	Doig	VI	2006-04-06	70.2	1.05	423	1.68	2.33	0.2	222	19	GSC Internal data
D7	11-25-84-19W6	1545	Doig	VI	2008-04-27	70.3	1.52	436	0.13	1.9	0.26	125	17	GSC Internal data
D8	11-3-73-7W6	2015.2	Doig	II	1990-04-01		4.71	454	2.62	7.61	0.88	162	19	GSC Open File 2308
	11-3-73-7W6	2015.2	Doig	II	1990-04-01		4.55	451	2.66	7.44	0.9	164	20	GSC Open File 2308
	11-3-73-7W6	2015.52	Doig	VI	2006-05-12	70.3	2.01	445	1.44	4.02	0.13	200	6	GSC Internal data
	11-3-73-7W6	2015.75	Doig	VI	2016-07-11	50.2	2.05	441	1.54	3.51	0.2	171	10	New Analyzed
	11-3-73-7W6	2018.3	Doig	II	1990-04-01		5.48	450	2.28	8.69	0.86	159	16	GSC Open File 2308
	11-3-73-7W6	2018.3	Doig	II	1990-04-01		5.49	455	2.23	8.58	0.93	156	17	GSC Open File 2308
	11-3-73-7W6	2018.4	Doig	VI	2016-07-11	50.1	1.84	444	1.7	3.74	0.13	203	7	New Analyzed
	11-3-73-7W6	2018.6	Doig	VI	2006-05-12	70.1	1.03	440	1.04	1.86	0.24	181	23	GSC Internal data
	11-3-73-7W6	2019.1	Doig	II	1990-04-01		4.62	452	2.57	7.49	0.92	162	20	GSC Open File 2308
	11-3-73-7W6	2019.1	Doig	II	1990-04-01		4.58	454	2.48	7.36	0.95	161	21	GSC Open File 2308
	11-3-73-7W6	2019.5	Doig	II	1990-04-01		4.59	455	2.27	7.9	1.05	172	23	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	11-3-73-7W6	2019.5	Doig	II	1990-04-01		4.7	454	2.25	7.71	1.01	164	21	GSC Open File 2308
	11-3-73-7W6	2021.2	Doig	VI	2016-07-11	50.3	4.43	447	2.41	8.46	0.18	191	4	New Analyzed
	11-3-73-7W6	2022.33	Doig	VI	2006-05-12	70.7	3.95	448	2.19	7.91	0.2	200	5	GSC Internal data
	11-3-73-7W6	2023.4	Doig	VI	2016-07-11	50.9	3.71	446	2.44	7.17	0.16	193	4	New Analyzed
	11-3-73-7W6	2024.2	Doig	VI	2006-05-12	70.3	4.08	449	1.91	8.46	0.29	207	7	GSC Internal data
	11-3-73-7W6	2024.85	Doig	VI	2016-07-11	50.8	5.27	448	2.28	9.68	0.25	184	5	New Analyzed
	11-3-73-7W6	2025.45	Doig	VI	2016-07-11	51.1	4.47	449	2	8.18	0.17	183	4	New Analyzed
	11-3-73-7W6	2025.8	Doig	II	1990-04-01		5.75	455	2.5	8.1	1.1	141	19	GSC Open File 2308
	11-3-73-7W6	2025.8	Doig	II	1990-04-01		5.72	452	2.57	7.89	1.17	138	20	GSC Open File 2308
	11-3-73-7W6	2026.8	Doig	II	1990-04-01		5.9	453	2.39	8.91	1.1	151	19	GSC Open File 2308
	11-3-73-7W6	2026.8	Doig	II	1990-04-01		5.79	455	2.37	8.24	1.07	142	18	GSC Open File 2308
	11-3-73-7W6	2026.93	Doig	VI	2006-05-12	70.8	0.98	441	0.86	2.1	0.24	214	24	GSC Internal data
	11-3-73-7W6	2027	Doig	VI	2016-07-11	50.5	3.37	444	1.79	5.9	0.2	175	6	New Analyzed
	11-3-73-7W6	2027.82	Doig	VI	2006-05-12	70	3.56	446	1.74	6.96	0.2	196	6	GSC Internal data
	11-3-73-7W6	2027.82	Doig	VI	2006-09-08	50.2	4.1	447	1.31	8.37	0.19	204	5	GSC Internal data
	11-3-73-7W6	2029.8	Doig	VI	2016-07-11	50.9	2.34	442	2.06	4.55	0.14	194	6	New Analyzed
	11-3-73-7W6	2030.05	Doig	VI	2006-05-12	70.3	3.56	445	2.05	7.06	0.43	198	12	GSC Internal data
	11-3-73-7W6	2030.5	Doig	II	1990-04-01		11.21	455	3.94	20.29	1.11	181	10	GSC Open File 2308
	11-3-73-7W6	2030.5	Doig	II	1990-04-01		10.42	455	4.15	20.33	0.82	195	8	GSC Open File 2308
	11-3-73-7W6	2032.9	Doig	VI	2016-07-11	50.9	5.1	448	2.29	8.77	0.25	172	5	New Analyzed
	11-3-73-7W6	2033.8	Doig	VI	2016-07-11	50.8	8.4	449	2.73	15.4	0.18	183	2	New Analyzed
	11-3-73-7W6	2036.2	Doig	VI	2006-05-12	70.6	5.27	449	2.28	10.05	0.21	191	4	GSC Internal data
	11-3-73-7W6	2037.4	Doig	VI	2016-07-11	50.2	8.41	450	2.84	15.17	0.25	180	3	New Analyzed
	11-3-73-7W6	2037.7	Doig	II	1990-04-01		4.41	459	1.79	6.21	0.95	141	22	GSC Open File 2308
	11-3-73-7W6	2037.7	Doig	II	1990-04-01		4.49	458	1.81	6.08	0.92	135	20	GSC Open File 2308
	11-3-73-7W6	2037.8	Doig	VI	2016-07-11	50.3	2.81	449	1.66	4.66	0.15	166	5	New Analyzed
	11-3-73-7W6	2040.03	Doig	VI	2016-07-11	51.2	2.92	446	2.05	5.4	0.13	185	4	New Analyzed
	11-3-73-7W6	2041.32	Doig	VI	2016-07-11	51.1	3.45	449	1.62	6.05	0.15	175	4	New Analyzed

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	11-3-73-7W6	2042.01	Doig	VI	08/09/2006	70.9	1.35	447	0.84	1.79	0.17	133	13	GSC Internal data
	11-3-73-7W6	2043.7	Doig	VI	2016-07-11	50	3.85	452	1.45	5.82	0.15	151	4	New Analyzed
D9	12-17-72-12W6	2800	Doig	VI	2006-10-17	70.9	0.94	446	0.28	0.33	0.34	35	36	GSC Internal data
	12-17-72-12W6	2840	Doig	VI	2006-10-18	70.1	1.77	305	0.47	0.31	0.45	18	25	GSC Internal data
D10	12-25-79-16W6	2135	Doig	VI	2008-04-29	70.8	1.2	422	3.1	0.99	0.19	82	16	GSC Internal data
	12-25-79-16W6	2155	Doig	VI	2008-05-01	70.9	1.96	429	2.37	1.67	0.38	85	19	GSC Internal data
D11	12-29-80-22W6	2465	Doig	VI	2008-04-29	70.8	4.69	311	1.4	1.38	0.48	29	10	GSC Internal data
	12-29-80-22W6	2485	Doig	VI	2008-04-29	70.7	1.26	306	0.42	0.21	0.28	17	22	GSC Internal data
D12	12-35-79-17W6	2104.32	Doig	VI	2009-04-09	70.7	5.2	478	1.83	3.08	0.13	59	2	GSC Internal data
D13	1-36-79-15W6	2005.2	Doig	VI	2007-08-07	70.6	1.54	461	0.56	0.75	0.22	49	14	GSC Internal data
D14	14-11-77-10W6	1942.1	Doig	II	1990-04-01		2.79	447	1.05	6.37	0.59	228	21	GSC Open File 2308
	14-11-77-10W6	1942.1	Doig	II	1990-04-01		2.84	443	1.07	6.83	0.6	240	21	GSC Open File 2308
	14-11-77-10W6	1947.6	Doig	II	1990-04-01		5.97	447	2.05	14.6	0.61	245	10	GSC Open File 2308
	14-11-77-10W6	1947.6	Doig	II	1990-04-01		5.87	445	1.95	14.58	0.63	248	11	GSC Open File 2308
	14-11-77-10W6	1951.7	Doig	II	1990-04-01		3.69	448	1.93	8.29	0.49	225	13	GSC Open File 2308
	14-11-77-10W6	1951.7	Doig	II	1990-04-01		3.71	448	1.92	8.37	0.53	226	14	GSC Open File 2308
	14-11-77-10W6	1952.3	Doig	II	1990-04-01		6.18	446	2.63	14.71	0.51	238	8	GSC Open File 2308
	14-11-77-10W6	1952.3	Doig	II	1990-04-01		6.33	446	2.64	14.19	0.47	224	7	GSC Open File 2308
	14-11-77-10W6	1953.8	Doig	II	1990-04-01		10.24	451	3.63	19.19	0.4	187	4	GSC Open File 2308
	14-11-77-10W6	1953.8	Doig	II	1990-04-01		10.26	451	3.89	20.14	0.21	196	2	GSC Open File 2308
	14-11-77-10W6	1956.2	Doig	II	1990-04-01		4.58	456	3.71	6.73	0.14	147	3	GSC Open File 2308
	14-11-77-10W6	1956.2	Doig	II	1990-04-01		4.58	454	3.65	6.85	0.19	150	4	GSC Open File 2308
	14-11-77-10W6	1957.9	Doig	II	1990-04-01		11.09	449	3.84	29.69	0.26	268	2	GSC Open File 2308
	14-11-77-10W6	1957.9	Doig	II	1990-04-01		11.63	450	4.06	31.65	0.19	272	2	GSC Open File 2308
D15	14-14-78-10W6	1837.9	Doig	VI	2006-12-18	70.8	0.43	439	0.58	0.91	0.12	212	28	GSC Internal data
	14-14-78-10W6	1838	Doig	VI	2006-12-17	70.1	0.48	439	0.54	1.03	0.14	215	29	GSC Internal data
	14-14-78-10W6	1839.7	Doig	VI	2006-12-17	71	0.78	439	0.65	1.81	0.23	232	29	GSC Internal data
	14-14-78-10W6	1840.1	Doig	VI	2006-12-18	70.4	1.51	437	1.68	3.83	0.18	254	12	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	14-14-78-10W6	1841.18	Doig	VI	2006-12-18	70.4	0.38	439	0.5	0.89	0.12	234	32	GSC Internal data
	14-34-84-25W6	1948.9	Doig	VI	2007-12-02	70.7	3.11	458	0.99	1.9	0.34	61	11	GSC Internal data
	14-34-84-25W6	1957	Doig	VI	2007-12-02	70.3	3.93	470	1.08	2.39	0.28	61	7	GSC Internal data
	14-34-84-25W6	1968.3	Doig	VI	2007-12-02	70.2	3.25	474	0.83	1.81	0.31	56	10	GSC Internal data
	14-34-84-25W6	1981.8	Doig	VI	2007-12-02	25.9	7.86	479	1.32	4.53	0.45	58	6	GSC Internal data
	14-34-84-25W6	1985.3	Doig	VI	2007-12-02	25.5	11.3	479	2.15	6.67	0.4	59	4	GSC Internal data
D16	14-9-79-19W6	2285	Doig	VI	2006-10-08	70.6	0.73	440	0.98	1.12	0.5	153	68	GSC Internal data
	14-9-79-19W6	2300	Doig	VI	2006-10-08	70.6	0.66	436	0.92	0.66	0.44	100	67	GSC Internal data
	14-9-79-19W6	2300	Doig	VI	2006-10-08	50.1	0.68	441	0.74	0.51	0.48	75	71	GSC Internal data
	14-9-79-19W6	2350	Doig	VI	2006-10-08	69.9	2.02	422	5.64	2.7	0.9	134	45	GSC Internal data
	14-9-79-19W6	2385	Doig	VI	2006-10-08	70.4	1.44	437	3.8	2.15	0.68	149	47	GSC Internal data
	14-9-79-19W6	2410	Doig	VI	2006-10-08	70.1	2.95	425	5.26	2.7	0.65	92	22	GSC Internal data
D17	15-6-76-3W6	1449.6	Doig	VI	2009-03-20	70.2	1.91	438	0.67	1.78	0.33	93	17	GSC Internal data
D18	15-7-74-8W6	2048.6	Doig	II	1990-04-01		1.29	443	2	2.09	0.45	162	35	GSC Open File 2308
	15-7-74-8W6	2048.6	Doig	II	1990-04-01		1.3	445	2.03	1.94	0.44	149	34	GSC Open File 2308
	15-7-74-8W6	2049.6	Doig	II	1990-04-01		1.55	445	1.74	3.43	0.47	221	30	GSC Open File 2308
	15-7-74-8W6	2049.6	Doig	II	1990-04-01		1.58	446	1.77	3.5	0.58	222	37	GSC Open File 2308
	15-7-74-8W6	2049.8	Doig	II	1990-04-01		1.13	442	1.45	1.78	0.57	158	50	GSC Open File 2308
	15-7-74-8W6	2049.8	Doig	II	1990-04-01		1.11	442	1.39	1.61	0.48	145	43	GSC Open File 2308
	15-7-74-8W6	2050.9	Doig	II	1990-04-01		2.22	444	2.6	4.11	0.45	185	20	GSC Open File 2308
	15-7-74-8W6	2050.9	Doig	II	1990-04-01		2.21	442	2.66	4.45	0.51	201	23	GSC Open File 2308
	15-7-74-8W6	2059.7	Doig	II	1990-04-01		1.6	439	2.38	2.61	0.58	163	36	GSC Open File 2308
	15-7-74-8W6	2059.7	Doig	II	1990-04-01		1.49	438	2.44	2.87	0.55	193	37	GSC Open File 2308
	15-7-74-8W6	2060.3	Doig	II	1990-04-01		3.86	448	2.4	9.32	0.58	241	15	GSC Open File 2308
	15-7-74-8W6	2060.3	Doig	II	1990-04-01		4.72	445	2.51	9.22	0.47	195	10	GSC Open File 2308
	15-7-74-8W6	2061	Doig	II	1990-04-01		6.43	449	1.31	4.35	0.95	68	15	GSC Open File 2308
	15-7-74-8W6	2061	Doig	II	1990-04-01		6.02	448	1.33	4.3	0.82	71	14	GSC Open File 2308
	15-7-74-8W6	2061.9	Doig	II	1990-04-01		4.49	447	2.31	7.11	0.44	158	10	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S_1 (mg/g)	S_2 (mg/g)	S_3	HI	OI	REFERENCE
	15-7-74-8W6	2061.9	Doig	II	1990-04-01		3.76	447	2.35	7.42	0.45	197	12	GSC Open File 2308
D19	16-23-57-6W6	2479.85	Doig	VI	2009-03-19	50.5	3.73	607	0.06	0.33	0.14	9	4	GSC Internal data
	16-23-57-6W6	2480.3	Doig	II	1990-04-01		0.84	0	0.28	0	0	0	0	GSC Open File 2308
	16-23-57-6W6	2480.3	Doig	II	1990-04-01		0.84	344	0.29	0.02	0.09	2	11	GSC Open File 2308
	16-23-57-6W6	2481.4	Doig	II	1990-04-01		3.6	555	0.07	0.13	0	4	0	GSC Open File 2308
	16-23-57-6W6	2481.4	Doig	II	1990-04-01		3.52	554	0.07	0.14	0	4	0	GSC Open File 2308
	16-23-57-6W6	2481.6	Doig	II	1990-04-01		10.86	579	0.16	0.69	0	6	0	GSC Open File 2308
	16-23-57-6W6	2481.6	Doig	II	1990-04-01		10.16	578	0.15	0.63	0.06	6	1	GSC Open File 2308
	16-23-57-6W6	2482.3	Doig	II	1990-04-01		4.56	572	0.11	0.28	0	6	0	GSC Open File 2308
	16-23-57-6W6	2482.3	Doig	II	1990-04-01		4.84	574	0.1	0.28	0	6	0	GSC Open File 2308
D20	16-32-79-9W6	1645.3	Doig	II	1990-04-01		2.49	449	1.49	3.94	1.01	158	41	GSC Open File 2308
	16-32-79-9W6	1645.3	Doig	II	1990-04-01		2.61	450	1.38	3.61	0.84	138	32	GSC Open File 2308
	16-32-79-9W6	1646.3	Doig	II	1990-04-01		2.38	445	1.55	4.03	0.86	169	36	GSC Open File 2308
	16-32-79-9W6	1646.3	Doig	II	1990-04-01		2.36	451	1.56	4.28	0.75	181	32	GSC Open File 2308
	16-32-79-9W6	1646.7	Doig	II	1990-04-01		2.25	448	1.3	3.86	0.35	172	16	GSC Open File 2308
	16-32-79-9W6	1646.7	Doig	II	1990-04-01		2.28	445	1.46	4	0.49	175	21	GSC Open File 2308
D21	2-19-79-14W6	2020	Doig	VI	2008-05-01	70.3	2.1	455	0.19	0.58	0.26	28	12	GSC Internal data
	3-15-79-19W6	2365	Doig	VI	2008-05-02	69.9	2.33	441	3.58	1.4	0.38	60	16	GSC Internal data
	3-15-79-19W6	2370	Doig	VI	2008-04-29	70.3	2.25	443	3.13	1.25	0.33	56	15	GSC Internal data
	3-15-79-19W6	2380	Doig	VI	2008-04-29	70.5	4.27	435	6.98	2.36	0.49	55	11	GSC Internal data
D22	3-16-87-17W6	1395	Doig	VI	2008-04-27	70.9	2.86	452	1.2	2.95	0.24	103	8	GSC Internal data
D23	3-22-78-10W6	1820.1	Doig	II	1990-04-01		4.32	444	1.45	12.45	0.74	288	17	GSC Open File 2308
	3-22-78-10W6	1820.1	Doig	II	1990-04-01		4.5	444	1.45	12.89	0.79	286	18	GSC Open File 2308
	3-22-78-10W6	1820.1	Doig	VI	2006-12-18	70.7	6.29	440	1.78	18.46	0.22	293	3	GSC Internal data
	3-22-78-10W6	1821.7	Doig	II	1990-04-01		5.28	443	1.94	15.99	0.82	303	16	GSC Open File 2308
	3-22-78-10W6	1821.7	Doig	II	1990-04-01		5.35	444	1.98	16.6	0.81	310	15	GSC Open File 2308
	3-22-78-10W6	1824.5	Doig	II	1990-04-01		3.66	446	1.65	8.64	0.77	236	21	GSC Open File 2308
	3-22-78-10W6	1824.5	Doig	II	1990-04-01		3.7	445	1.77	9.47	0.75	256	20	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	3-22-78-10W6	1825.7	Doig	II	1990-04-01		3.89	446	2.16	11.36	0.7	292	18	GSC Open File 2308
	3-22-78-10W6	1825.7	Doig	II	1990-04-01		3.93	442	2.25	11.65	0.69	296	18	GSC Open File 2308
	3-22-78-10W6	1828.4	Doig	II	1990-04-01		4.33	445	2.74	12.32	0.61	285	14	GSC Open File 2308
	3-22-78-10W6	1828.4	Doig	II	1990-04-01		4.36	448	2.7	12.62	0.55	289	13	GSC Open File 2308
	3-22-78-10W6	1832.4	Doig	II	1990-04-01		1.82	449	2.43	5.17	0.61	284	34	GSC Open File 2308
	3-22-78-10W6	1832.4	Doig	II	1990-04-01		1.82	448	2.6	5.14	0.61	282	34	GSC Open File 2308
	3-22-78-10W6	1833	Doig	VI	2006-12-18	70.3	3.01	432	1.61	8.82	0.68	293	23	GSC Internal data
	3-22-78-10W6	1833.2	Doig	II	1990-04-01		8.9	445	2.78	30.39	0.83	341	9	GSC Open File 2308
	3-22-78-10W6	1833.2	Doig	II	1990-04-01		8.92	445	2.72	30.48	0.82	342	9	GSC Open File 2308
	3-22-78-10W6	1833.2	Doig	VI	1998-11-30	99.9	9.5	444	2.28	27.52	0.34	291	4	GSC Internal data
	3-22-78-10W6	1833.6	Doig	II	1990-04-01		5.95	445	1.46	19.08	0.83	321	14	GSC Open File 2308
	3-22-78-10W6	1833.6	Doig	II	1990-04-01		5.87	446	1.47	19.38	0.74	330	13	GSC Open File 2308
	3-22-78-10W6	1835.2	Doig	VI	2006-12-18	70.2	0.25	435	0.13	0.35	0.14	140	56	GSC Internal data
	3-22-78-10W6	1839.5	Doig	VI	2006-12-18	70.8	0.67	441	0.72	1.56	0.15	233	22	GSC Internal data
	3-22-78-10W6	1842.9	Doig	VI	2006-12-18	70.7	1.66	435	1.63	3.89	0.16	234	10	GSC Internal data
	3-22-78-10W6	1843.1	Doig	VI	2006-12-18	70.8	2.16	437	1.86	5.36	0.19	248	9	GSC Internal data
	3-22-78-10W6	1850	Doig	VI	2006-12-18	70.9	0.67	435	1.55	1.92	0.12	287	18	GSC Internal data
D24	3-60-78-22W6	3188.2	Doig	VI	2009-10-25	70.4	1.69	418	0.06	0.07	0.28	4	17	GSC Internal data
	3-60-78-22W6	3190.6	Doig	VI	2009-10-25	71.1	1.75	608	0.05	0.06	0.23	3	13	GSC Internal data
	3-60-78-22W6	3191.13	Doig	VI	2009-10-25	70.3	1.73	609	0.04	0.06	0.24	3	14	GSC Internal data
	3-60-78-22W6	3192.78	Doig	VI	2009-10-25	70.1	3.6	607	0.05	0.16	0.25	4	7	GSC Internal data
	3-60-78-22W6	3194.33	Doig	VI	2009-10-25	70.4	2.14	606	0.04	0.14	0.24	7	11	GSC Internal data
	3-60-78-22W6	3195.66	Doig	VI	2009-10-25	70.3	2.79	606	0.07	0.18	0.29	6	10	GSC Internal data
	3-60-78-22W6	3196.09	Doig	VI	2009-10-25	70.7	4.12	607	0.06	0.17	0.28	4	7	GSC Internal data
	3-60-78-22W6	3196.19	Doig	VI	2009-10-26	70.7	2.96	608	0.06	0.15	0.27	5	9	GSC Internal data
	3-60-78-22W6	3196.71	Doig	VI	2009-10-26	70.6	3.39	607	0.08	0.16	0.25	5	7	GSC Internal data
	3-60-78-22W6	3198.48	Doig	VI	2009-10-26	70.2	4.28	607	0.07	0.29	0.32	7	7	GSC Internal data
	3-60-78-22W6	3199.91	Doig	VI	2009-10-26	70.4	1.59	607	0.04	0.08	0.2	5	13	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
D25	4-14-84-23W6	1730.7	Doig	VI	2008-06-30	70	5.1	468	1.68	5.22	0.27	102	5	GSC Internal data
	4-14-84-23W6	1732.2	Doig	VI	2008-06-30	70.3	0.26	444	0.12	0.2	0.22	77	85	GSC Internal data
D26	5-12-74-12W6	2464.6	Doig	II	1990-04-01		1.25	549	0.07	0.08	0	6	0	GSC Open File 2308
	5-12-74-12W6	2464.6	Doig	II	1990-04-01		1.3	539	0.06	0.11	0.32	8	25	GSC Open File 2308
	5-12-74-12W6	2465.5	Doig	II	1990-04-01		1.31	406	0.19	0.08	0	6	0	GSC Open File 2308
	5-12-74-12W6	2465.5	Doig	II	1990-04-01		1.27	405	0.2	0.05	0	4	0	GSC Open File 2308
	5-12-74-12W6	2466.4	Doig	II	1990-04-01		1.36	532	0.08	0.11	0.19	8	14	GSC Open File 2308
	5-12-74-12W6	2466.4	Doig	II	1990-04-01		1.35	529	0.07	0.1	0	7	0	GSC Open File 2308
	5-12-74-12W6	2467.1	Doig	II	1990-04-01		1.45	379	0.06	0.12	0.14	8	10	GSC Open File 2308
	5-12-74-12W6	2467.1	Doig	II	1990-04-01		1.58	448	0.08	0.11	0.19	7	12	GSC Open File 2308
	5-12-74-12W6	2468.9	Doig	II	1990-04-01		1.44	413	0.16	0.08	0.11	6	8	GSC Open File 2308
	5-12-74-12W6	2468.9	Doig	II	1990-04-01		1.46	459	0.14	0.09	0.12	6	8	GSC Open File 2308
	5-12-74-12W6	2470.4	Doig	II	1990-04-01		1.53	485	0.01	0.07	0.1	5	7	GSC Open File 2308
	5-12-74-12W6	2470.4	Doig	II	1990-04-01		1.58	484	0.01	0.06	0.12	4	8	GSC Open File 2308
D27	6-16-78-10W6	1855.5	Doig	VI	2006-12-17	70.8	1.42	441	1.13	3.31	0.19	233	13	GSC Internal data
	6-16-78-10W6	1858.74	Doig	VI	2006-12-17	70.7	0.81	436	0.47	1.94	0.28	240	35	GSC Internal data
	6-16-78-10W6	1859.7	Doig	VI	2006-12-17	70.3	0.46	440	0.35	0.8	0.14	174	30	GSC Internal data
	6-16-78-10W6	1861.9	Doig	VI	2006-12-17	70.2	0.63	441	0.43	1.32	0.14	210	22	GSC Internal data
	6-16-78-10W6	1864.4	Doig	VI	2006-12-17	70.2	1.47	440	1.09	3.19	0.22	217	15	GSC Internal data
	6-34-78-10W6	1819.1	Doig	VI	2006-12-17	70.6	1.58	442	1.65	4.02	0.15	254	9	GSC Internal data
	6-34-78-10W6	1820	Doig	VI	2006-12-17	71.3	0.9	427	0.61	3.49	0.23	388	26	GSC Internal data
	6-34-78-10W6	1825.1	Doig	VI	2006-12-17	70.3	0.4	434	0.45	1	0.13	250	32	GSC Internal data
	6-34-78-10W6	1826.12	Doig	VI	2006-12-17	70.5	0.35	436	0.19	0.43	0.12	123	34	GSC Internal data
	6-34-78-10W6	1832	Doig	VI	2006-12-17	70.9	0.75	441	0.46	1.52	0.12	203	16	GSC Internal data
	6-34-78-10W6	1836	Doig	VI	2006-12-17	70.3	0.72	436	1.02	1.94	0.14	269	19	GSC Internal data
D28	6-8-90-11W6	1350	Doig	II	1990-04-01		3.5	441	3.47	8.76	0.95	250	27	GSC Open File 2308
	6-8-90-11W6	1350	Doig	II	1990-04-01		3.62	440	3.29	8.49	0.63	235	17	GSC Open File 2308
	6-8-90-11W6	1351.6	Doig	II	1990-04-01		3.77	450	2.32	8.08	0.34	214	9	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	6-8-90-11W6	1351.6	Doig	II	1990-04-01		3.82	453	2.19	7.91	0.31	207	8	GSC Open File 2308
	6-8-90-11W6	1351.9	Doig	II	1990-04-01		2.53	441	1.85	8.33	1.75	329	69	GSC Open File 2308
	6-8-90-11W6	1351.9	Doig	II	1990-04-01		2.56	443	1.9	8.78	0.82	343	32	GSC Open File 2308
	6-8-90-11W6	1354.7	Doig	II	1990-04-01		4.38	448	2.7	15.6	4.66	356	106	GSC Open File 2308
	6-8-90-11W6	1354.7	Doig	II	1990-04-01		4.47	448	2.73	15.23	3.53	341	79	GSC Open File 2308
	6-8-90-11W6	1355	Doig	II	1990-04-01		3.16	448	2.12	10.67	2.59	338	82	GSC Open File 2308
	6-8-90-11W6	1355	Doig	II	1990-04-01		3.05	448	2.05	10.69	3.97	350	130	GSC Open File 2308
D29	7-13-79-15W6	2054.5	Doig	VI	2007-08-09	70.7	2.88	477	1.22	1.92	0.29	67	10	GSC Internal data
	7-13-79-15W6	2055.1	Doig	VI	2007-08-09	71	4.41	469	0.91	2.1	0.32	48	7	GSC Internal data
	7-13-79-15W6	2055.22	Doig	VI	2010-06-28	70.1	3.54	464	0.7	1.18	0.44	33	12	GSC Internal data
	7-13-79-15W6	2057.2	Doig	VI	2007-08-09	70.3	1.08	459	0.51	0.59	0.23	55	21	GSC Internal data
D30	7-30-82-20W6	1675	Doig	VI	2008-05-01	70.6	1.92	467	0.8	1.14	0.72	59	38	GSC Internal data
D31	7-35-68-7W6	2520	Doig	VI	2006-10-17	70.1	1.24	418	1.3	2.03	0.37	164	30	GSC Internal data
	7-35-68-7W6	2525	Doig	VI	2006-10-17	70.4	1.81	452	0.71	2.95	0.42	163	23	GSC Internal data
D32	8-14-86-20W6	1613.5	Doig	II	1990-04-01		2.52	447	3.49	3.7	1.29	147	51	GSC Open File 2308
	8-14-86-20W6	1613.5	Doig	II	1990-04-01		2.54	450	3.39	3.64	1.21	143	48	GSC Open File 2308
	8-16-74-10W6	2254.7	Doig	II	1990-04-01		2.56	450	1.65	1.35	0.19	53	7	GSC Open File 2308
	8-16-74-10W6	2254.7	Doig	II	1990-04-01		2.5	438	1.72	1.26	0.22	50	9	GSC Open File 2308
	8-16-74-10W6	2255.7	Doig	II	1990-04-01		7.3	452	2.23	3.55	0.2	49	3	GSC Open File 2308
	8-16-74-10W6	2255.7	Doig	II	1990-04-01		6.53	454	2.11	3.85	0.21	59	3	GSC Open File 2308
	8-16-74-10W6	2256.1	Doig	II	1990-04-01		3	455	1.8	2.17	0.24	72	8	GSC Open File 2308
	8-16-74-10W6	2256.1	Doig	II	1990-04-01		3.27	452	1.93	2.3	0.2	70	6	GSC Open File 2308
	8-16-74-10W6	2258	Doig	II	1990-04-01		2.52	452	1.76	1.35	0.23	54	9	GSC Open File 2308
	8-16-74-10W6	2258	Doig	II	1990-04-01		2.57	449	1.76	1.59	0.21	62	8	GSC Open File 2308
	8-16-74-10W6	2258.4	Doig	II	1990-04-01		2.81	451	1.46	1.3	0.15	46	5	GSC Open File 2308
	8-16-74-10W6	2258.4	Doig	II	1990-04-01		2.71	447	1.43	1.38	0.18	51	7	GSC Open File 2308
	8-16-74-10W6	2259.7	Doig	II	1990-04-01		1.74	453	1.71	1.04	0.23	60	13	GSC Open File 2308
	8-16-74-10W6	2259.7	Doig	II	1990-04-01		1.79	452	1.75	1	0.35	56	20	GSC Open File 2308

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	8-16-74-10W6	2260.9	Doig	II	1990-04-01		4.12	453	1.82	1.97	0.25	48	6	GSC Open File 2308
	8-16-74-10W6	2260.9	Doig	II	1990-04-01		3.93	453	1.81	1.85	0.25	47	6	GSC Open File 2308
	8-16-74-10W6	2261.4	Doig	II	1990-04-01		3.54	454	1.65	1.86	0.26	53	7	GSC Open File 2308
	8-16-74-10W6	2261.4	Doig	II	1990-04-01		3.02	449	1.72	2.13	0.25	71	8	GSC Open File 2308
	8-16-74-10W6	2262.3	Doig	II	1990-04-01		4.4	455	1.69	2.06	0.25	47	6	GSC Open File 2308
	8-16-74-10W6	2262.3	Doig	II	1990-04-01		3.36	453	1.8	2.4	0.22	71	7	GSC Open File 2308
	8-16-74-10W6	2264.1	Doig	II	1990-04-01		1.58	444	2.27	1.14	0.37	72	23	GSC Open File 2308
	8-16-74-10W6	2264.1	Doig	II	1990-04-01		1.55	437	2.27	1.13	0.4	73	26	GSC Open File 2308
D33	8-30-82-22W6	1708.84	Doig	VI	2008-12-07	70.2	0.84	456	0.31	0.29	0.21	35	25	GSC Internal data
	8-30-82-22W6	1716.89	Doig	VI	2008-12-07	50.7	9.76	478	1.44	7.41	0.2	76	2	GSC Internal data
	8-30-82-22W6	1720	Doig	VI	2008-12-18	70.7	3.55	479	0.08	1.82	0.49	51	14	GSC Internal data
D34	8-8-76-7W6	1810	Doig	VI	2006-10-18	70.6	3.04	447	4.93	5.93	0.39	195	13	GSC Internal data
	8-8-76-7W6	1921	Doig	VI	2006-12-13	70	0.54	438	0.79	1.29	0.12	239	22	GSC Internal data
D35	9-14-80-20W6	2440	Doig	VI	2008-04-29	70.3	2.58	459	0.58	0.8	0.37	31	14	GSC Internal data
	9-14-80-20W6	2445	Doig	VI	2008-05-01	70.4	2.14	453	0.49	0.68	0.56	32	26	GSC Internal data
	9-14-80-20W6	2450	Doig	VI	2008-04-29	70.5	3.11	460	0.42	0.9	0.59	29	19	GSC Internal data
D36	9-33-79-21W5	2661	Doig	VI	2006-05-26	70.2	1.53	288	0.81	0.37	0.3	24	20	GSC Internal data
	9-33-79-21W5	2669	Doig	VI	2006-05-26	70.5	0.58	303	0.2	0.11	0.18	19	31	GSC Internal data
	9-33-79-21W5	2687.5	Doig	VI	2006-05-26	50.2	5.68	563	0.88	1.31	0.4	23	7	GSC Internal data
	9-33-79-21W5	2688.5	Doig	VI	2006-05-26	70.8	0.6	440	0.2	0.13	0.19	22	32	GSC Internal data
	9-33-79-21W5	2690	Doig	VI	2006-05-26	50.5	1.15	436	0.51	0.34	0.22	30	19	GSC Internal data
	9-33-79-21W5	2692.5	Doig	VI	2006-05-26	50.7	4.06	597	1.02	0.87	0.35	21	9	GSC Internal data
	9-33-79-21W5	2696	Doig	VI	2006-05-26	50.1	4.12	299	0.97	0.95	0.34	23	8	GSC Internal data
	9-33-79-21W5	2700	Doig	VI	2006-05-26	50.8	9.86	595	1.21	1.98	0.54	20	5	GSC Internal data
	9-33-79-21W5	2703.9	Doig	VI	2006-05-26	50.8	10.54	593	1.44	2	0.57	19	5	GSC Internal data
	9-33-79-21W5	2707	Doig	VI	2006-05-26	50.6	7.93	592	1.93	1.97	0.49	25	6	GSC Internal data
	9-33-79-21W5	2712	Doig	VI	2006-05-26	50.5	3.49	303	0.85	0.79	0.27	23	8	GSC Internal data
	9-33-79-21W5	2713.6	Doig	VI	2006-05-26	50.6	5.73	601	0.91	1.08	0.35	19	6	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	9-33-79-21W5	2715	Doig	VI	2006-05-26	50.1	5.28	313	0.77	1.43	0.35	27	7	GSC Internal data
	9-33-79-21W5	2716.5	Doig	VI	2006-05-26	51	9.9	577	1.8	2.48	0.5	25	5	GSC Internal data
D37	A-23-I/94-G-14	885	Doig	VI	2008-10-03	70.5	2.97	472	0.69	1.33	0.27	45	9	GSC Open File 7044
	A-23-I/94-G-14	910	Doig	VI	2008-10-03	70.1	1.42	458	0.75	0.73	0.18	51	13	GSC Open File 7044
	A-23-I/94-G-14	920	Doig	VI	2008-10-03	70.1	2.28	461	0.95	1.01	0.21	44	9	GSC Open File 7044
D38	A-26-A/94-G-9	1508.76	Doig	VI	2008-10-04	70.5	1.82	453	0.37	1.21	0.36	66	20	GSC Open File 7044
	A-26-A/94-G-9	1524	Doig	VI	2008-10-04	70.7	1.73	458	0.5	1.64	0.3	95	17	GSC Open File 7044
	A-26-A/94-G-9	1539.24	Doig	VI	2008-10-04	70.4	1.9	455	0.68	2.14	0.39	113	21	GSC Open File 7044
	A-26-A/94-G-9	1551.432	Doig	VI	2008-10-04	70.3	3.11	461	1.54	2.18	0.33	70	11	GSC Open File 7044
D39	A-29-H/93-P-9	2445	Doig	VI	2008-05-02	70.5	1.98	463	0.32	0.83	0.17	42	9	GSC Internal data
	A-29-H/93-P-9	2450	Doig	VI	2008-04-30	70.7	2.41	474	0.19	0.91	0.19	38	8	GSC Internal data
D40	A-51-H/94-B-10	2140	Doig	VI	2008-07-29	70.8	2.13	599	0.31	0.44	0.48	21	23	GSC Internal data
	A-51-H/94-B-10	2150	Doig	VI	2008-07-22	70.5	3.16	598	0.37	0.61	0.42	19	13	GSC Internal data
	A-51-H/94-B-10	2160	Doig	VI	2008-07-22	70.1	3.21	600	0.2	0.56	0.45	17	14	GSC Internal data
D41	A-59-G/94-A-16	1150.2	Doig	II	1990-04-01		2.63	443	2.26	12.43	0.44	473	17	GSC Open File 2308
	A-59-G/94-A-16	1150.2	Doig	II	1990-04-01		2.64	444	2.22	12.61	0.48	478	18	GSC Open File 2308
	A-59-G/94-A-16	1153.2	Doig	II	1990-04-01		2.71	441	2.13	12.43	0.51	459	19	GSC Open File 2308
	A-59-G/94-A-16	1153.2	Doig	II	1990-04-01		2.65	443	2.15	12.99	0.44	490	17	GSC Open File 2308
	A-59-G/94-A-16	1156.4	Doig	II	1990-04-01		2.37	442	1.74	11.52	0.5	486	21	GSC Open File 2308
	A-59-G/94-A-16	1156.4	Doig	II	1990-04-01		2.44	443	1.73	11.46	0.86	470	35	GSC Open File 2308
	A-59-G/94-A-16	1159.2	Doig	II	1990-04-01		3.05	441	2.27	13.13	0.47	430	15	GSC Open File 2308
	A-59-G/94-A-16	1159.2	Doig	II	1990-04-01		3.23	439	2.26	13.08	0.47	405	15	GSC Open File 2308
D42	B-10-C/94-H-1	1123.19	Doig	II	1990-04-01		1.87	452	0.98	3.76	0.83	201	44	GSC Open File 2308
	B-10-C/94-H-1	1123.19	Doig	II	1990-04-01		1.88	449	1.09	3.95	0.74	210	39	GSC Open File 2308
D43	B-15-I/94-B-1	2296.4	Doig	VI	2009-01-15	71	1.19	303	0.24	0.15	0.26	13	22	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	B-15-I/94-B-1	2304.25	Doig	VI	2009-01-15	70.7	1.67	408	0.22	0.61	0.25	37	15	GSC Internal data
	B-15-I/94-B-1	2313.05	Doig	VI	2009-01-15	69.9	3.51	607	0.15	0.41	0.38	12	11	GSC Internal data
	B-15-I/94-B-1	2317.55	Doig	VI	2009-01-15	25.4	12.19	588	0.18	2.28	0.58	19	5	GSC Internal data
D44	B-21-A/94-H-2	1109.015	Doig	VI	1999-10-18	100.2	1.94	445	1.04	6.19	0.46	319	24	GSC Internal data
D45	B-61-H/94-B-16	1840	Doig	VI	2008-04-26	70.6	3.41	446	5.6	2.5	0.3	73	9	GSC Internal data
	B-61-H/94-B-16	1850	Doig	VI	2008-04-26	70.4	3.17	448	4.52	2.94	0.44	93	14	GSC Internal data
	B-61-H/94-B-16	1855	Doig	VI	2008-05-02	70.1	3.15	450	3.8	2.91	0.36	92	11	GSC Internal data
D46	B-64-I/94-A-12	1712	Doig	II	1990-04-01		1.73	447	1.34	2.4	1.32	139	76	GSC Open File 2308
	B-64-I/94-A-12	1712	Doig	II	1990-04-01		1.74	446	1.37	2.45	1.18	141	68	GSC Open File 2308
D47	B-66-B/94-G-2	2150	Doig	VI	2009-12-12	70.5	4.22	476	0.3	0.91	0.17	22	4	GSC Internal data
D48	B-68-E/94-H-4	1685	Doig	VI	2008-04-30	70.3	2.32	322	0.72	1.44	0.38	62	16	GSC Internal data
	B-68-E/94-H-4	1690	Doig	VI	2008-04-26	70.8	2.51	326	0.76	1.58	0.4	63	16	GSC Internal data
	B-68-E/94-H-4	1705	Doig	VI	2008-05-01	70.4	4.96	481	1.02	2.46	0.5	50	10	GSC Internal data
D49	C-44-L/94-B-8	2296.14	Doig	VI	2009-07-06	70.1	2.59	474	0.13	0.44	0.24	17	9	GSC Internal data
	C-44-L/94-B-8	2297.84	Doig	VI	2009-07-06	70.2	4.4	591	0.17	0.92	0.26	21	6	GSC Internal data
	C-44-L/94-B-8	2300.2	Doig	VI	2009-07-06	70.1	2.17	484	0.1	0.37	0.2	17	9	GSC Internal data
	C-44-L/94-B-8	2300.2	Doig	VI	2009-10-16	70.4	2.31	606	0.01	0.29	1.03	13	45	GSC Internal data
	C-44-L/94-B-8	2301.55	Doig	VI	2009-07-06	70	2.81	478	0.13	0.44	0.22	16	8	GSC Internal data
	C-44-L/94-B-8	2302.17	Doig	VI	2009-07-06	70.1	7.41	488	0.21	1.63	0.24	22	3	GSC Internal data
	C-44-L/94-B-8	2302.17	Doig	VI	2009-10-16	70.4	4.74	601	0.03	0.76	0.32	16	7	GSC Internal data
	C-44-L/94-B-8	2303.29	Doig	VI	2009-07-06	70.6	3.71	487	0.13	0.73	0.22	20	6	GSC Internal data
	C-44-L/94-B-8	2306.2	Doig	VI	2009-07-06	70.2	3.52	511	0.11	0.72	0.24	20	7	GSC Internal data
	C-44-L/94-B-8	2308.51	Doig	VI	2009-07-06	70.8	3.77	488	0.15	0.73	0.32	19	8	GSC Internal data
	C-44-L/94-B-8	2310.6	Doig	VI	2009-07-06	70.4	3.79	510	0.11	0.84	0.27	22	7	GSC Internal data
	C-44-L/94-B-8	2310.6	Doig	VI	2009-10-16	70.6	4.35	596	0.02	0.79	0.33	18	8	GSC Internal data
	C-44-L/94-B-8	2313.6	Doig	VI	2009-07-06	70.8	5.51	501	0.12	0.97	0.35	18	6	GSC Internal data
D50	C-74-L/94-A-14	1542.288	Doig	VI	2004-04-08	70.4	3.25	451	1.69	2.79	0.52	87	16	GSC Internal data
	C-74-L/94-A-14	1554.48	Doig	VI	2004-04-08	50.2	4.68	455	1.48	3.85	0.55	84	12	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
D51	C-85-I/94-B-1	2360.35	Doig	VI	2008-12-20	50.4	7.67	493	0.35	1.42	0.23	19	3	GSC Internal data
	C-85-I/94-B-1	2361.05	Doig	VI	2008-10-29	70.2	0.63	456	0.11	0.1	0.23	16	37	GSC Internal data
	C-85-I/94-B-1	2361.98	Doig	VI	2008-10-29	70.5	3	472	0.22	0.45	0.3	15	10	GSC Internal data
	C-85-I/94-B-1	2362.8	Doig	VI	2008-10-29	70.6	1.04	455	0.13	0.11	0.24	11	23	GSC Internal data
	C-85-I/94-B-1	2363.9	Doig	VI	2008-10-29	70.5	4.03	483	0.31	0.99	0.19	25	5	GSC Internal data
	C-85-I/94-B-1	2364.7	Doig	VI	2008-10-29	70.5	1.63	460	0.16	0.19	0.22	12	13	GSC Internal data
	C-85-I/94-B-1	2365.46	Doig	VI	2008-10-29	70.2	4.55	488	0.22	1.17	0.26	26	6	GSC Internal data
	C-85-I/94-B-1	2365.71	Doig	VI	2008-10-29	70.6	6.74	489	0.3	1.97	0.26	29	4	GSC Internal data
	C-85-I/94-B-1	2365.75	Doig	VI	2008-12-20	70.1	3.57	481	0.17	0.91	0.32	25	9	GSC Internal data
	C-85-I/94-B-1	2368.31	Doig	VI	2008-10-29	70.3	2.4	478	0.11	0.43	0.2	18	8	GSC Internal data
	C-85-I/94-B-1	2368.9	Doig	VI	2008-10-29	70.3	2.86	592	0.13	0.64	0.2	22	7	GSC Internal data
	C-85-I/94-B-1	2369.41	Doig	VI	2008-10-29	70.6	3.12	475	0.29	0.56	0.25	18	8	GSC Internal data
	C-85-I/94-B-1	2369.45	Doig	VI	2008-12-20	70.2	2.75	479	0.11	0.55	0.27	20	10	GSC Internal data
	C-85-I/94-B-1	2370.39	Doig	VI	2008-10-29	70.3	0.96	563	0.13	0.25	0.18	26	19	GSC Internal data
	C-85-I/94-B-1	2372.17	Doig	VI	2008-10-29	70.3	3.66	479	0.17	0.75	0.27	20	7	GSC Internal data
	C-85-I/94-B-1	2372.4	Doig	VI	2008-12-20	70.7	3.58	498	0.16	0.86	0.25	24	7	GSC Internal data
	C-85-I/94-B-1	2372.8	Doig	VI	2008-10-30	50.5	7.22	490	0.34	2.05	0.32	28	4	GSC Internal data
	C-85-I/94-B-1	2373.9	Doig	VI	2008-10-30	50	6.34	500	0.24	1.59	0.35	25	6	GSC Internal data
D52	C-86-I/94-B-10	2245	Doig	VI	2008-07-23	70	1.85	605	0.26	0.25	0.28	14	15	GSC Internal data
	C-86-I/94-B-10	2255	Doig	VI	2008-07-23	70.6	2.68	604	0.4	0.37	0.58	14	22	GSC Internal data
	C-86-I/94-B-10	2265	Doig	VI	2008-07-23	70.2	2.38	604	0.31	0.41	0.48	17	20	GSC Internal data
D53	D-13-D/94-H-1	1133.2	Doig	VI	2003-12-14	70.7	4.03	447	1.19	8.8	0.17	219	4	GSC Internal data
	D-13-D/94-H-1	1134.8	Doig	VI	2003-12-14	70.4	2.37	447	0.83	5.18	0.19	219	8	GSC Internal data
D54	D-25-D/94-H-1	1120.14	Doig	II	1990-04-01		3.06	451	1.19	6.91	0.92	226	30	GSC Open File 2308
	D-25-D/94-H-1	1120.14	Doig	II	1990-04-01		3.15	450	1.2	6.83	0.92	217	29	GSC Open File 2308
D55	D-2-B/94-G-1	1830	Doig	VI	2008-10-01	70.3	2.53	465	0.76	0.73	0.33	29	13	GSC Open File 7044
	D-2-B/94-G-1	1840	Doig	VI	2008-10-01	70.6	2.94	470	0.68	1.05	0.37	36	13	GSC Open File 7044
D56	D-39-F/93-P-9	2649.9	Doig	VI	2007-08-09	70.5	3.83	476	0.29	1.05	0.32	27	8	GSC Internal data

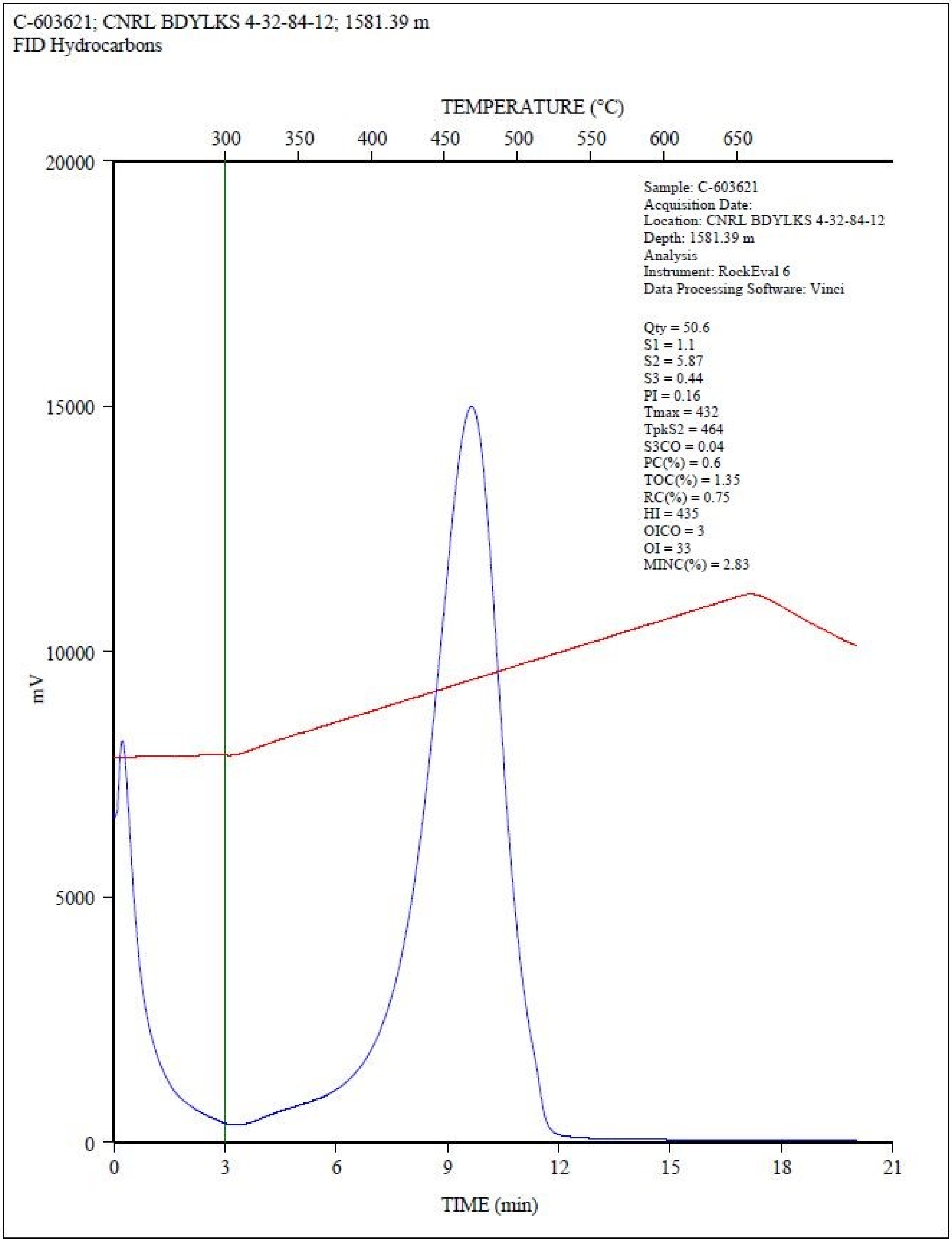
Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	D-39-F/93-P-9	2650.8	Doig	VI	2007-08-09	70.9	2.85	462	0.54	1.17	0.3	41	11	GSC Internal data
	D-39-F/93-P-9	2651.6	Doig	VI	2007-08-09	71	1.56	467	0.31	0.58	0.23	37	15	GSC Internal data
	D-39-F/93-P-9	2652.4	Doig	VI	2007-08-09	50.2	8.3	481	0.52	2.17	0.41	26	5	GSC Internal data
	D-39-F/93-P-9	2653.6	Doig	VI	2007-08-09	70.6	3.34	454	0.52	0.87	0.47	26	14	GSC Internal data
	D-39-F/93-P-9	2653.9	Doig	VI	2007-08-09	70.6	1.77	452	0.75	0.81	0.35	46	20	GSC Internal data
D57	D-48-H/94-H-1	1051.3	Doig	VI	2003-12-14	70.9	0.12	425	0.01	0.05	0.31	42	258	GSC Internal data
	D-48-H/94-H-1	1053.8	Doig	VI	2003-12-14	70.4	2.65	438	0.9	12.44	0.3	469	11	GSC Internal data
	D-48-H/94-H-1	1056	Doig	VI	2003-12-14	70	5.86	433	1.78	28.61	0.33	489	6	GSC Internal data
D58	D-4-B/94-H-2	1178.97	Doig	II	1990-04-01		2.82	452	1.43	5.63	0.98	200	35	GSC Open File 2308
	D-4-B/94-H-2	1178.97	Doig	II	1990-04-01		2.75	449	1.5	5.56	0.9	202	33	GSC Open File 2308
D59	D-52-F/94-G-2	2015	Doig	VI	2009-12-12	70.8	5.89	475	0.33	1.81	0.28	31	5	GSC Internal data
	D-52-F/94-G-2	2015	Doig	VI	2009-12-12	70.3	5.8	475	0.08	1.69	0.02	29	0	GSC Internal data
	D-52-F/94-G-2	2015	Doig	VI	2009-12-12	70	5.91	475	0.52	1.73	0.23	29	4	GSC Internal data
D60	D-55-D/94-A-13	1785	Doig	VI	2008-04-26	70.7	3.3	464	1.04	2.72	0.51	82	15	GSC Internal data
	D-55-D/94-A-13	1790	Doig	VI	2008-05-01	70.2	3.2	463	0.94	2.68	0.5	84	16	GSC Internal data
D61	D-69-J/94-A-15	1219.3	Doig	II	1990-04-01		1.56	449	1.61	3.09	0.37	198	24	GSC Open File 2308
	D-69-J/94-A-15	1219.3	Doig	II	1990-04-01		1.58	448	1.63	3.2	0.45	203	28	GSC Open File 2308
	D-69-J/94-A-15	1220.6	Doig	II	1990-04-01		1.68	447	1.57	3.37	0.33	201	20	GSC Open File 2308
	D-69-J/94-A-15	1220.6	Doig	II	1990-04-01		1.67	444	1.53	3.27	0.42	196	25	GSC Open File 2308
	D-69-J/94-A-15	1221.8	Doig	II	1990-04-01		1.71	443	1.86	2.96	0.61	173	36	GSC Open File 2308
	D-69-J/94-A-15	1221.8	Doig	II	1990-04-01		1.65	446	1.86	3.13	0.58	190	35	GSC Open File 2308
	D-69-J/94-A-15	1222.2	Doig	II	1990-04-01		2.02	445	1.95	3.78	0.61	187	30	GSC Open File 2308
	D-69-J/94-A-15	1222.2	Doig	II	1990-04-01		2.01	446	1.78	3.87	0.6	193	30	GSC Open File 2308
	D-69-J/94-A-15	1223.3	Doig	II	1990-04-01		1.97	448	1.9	4.28	0.54	217	27	GSC Open File 2308
	D-69-J/94-A-15	1223.3	Doig	II	1990-04-01		2.03	449	1.92	4.49	0.52	221	26	GSC Open File 2308
	D-69-J/94-A-15	1224.9	Doig	II	1990-04-01		2.02	443	1.76	4.04	0.49	200	24	GSC Open File 2308
	D-69-J/94-A-15	1224.9	Doig	II	1990-04-01		2.04	443	1.87	4.22	0.5	207	25	GSC Open File 2308
	D-69-J/94-A-15	1225.4	Doig	VI	1998-12-01	100.5	2.26	437	1.39	4.56	0.36	202	16	GSC Internal data

Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	D-69-J/94-A-15	1225.4	Doig	II	1990-04-01		2.03	444	2.08	4.4	0.45	217	22	GSC Open File 2308
	D-69-J/94-A-15	1225.4	Doig	II	1990-04-01		2.07	443	2.15	4.65	0.43	225	21	GSC Open File 2308
	D-69-J/94-A-15	1226.1	Doig	II	1990-04-01		2.08	446	2.13	4.33	0.53	208	25	GSC Open File 2308
	D-69-J/94-A-15	1226.1	Doig	II	1990-04-01		2.1	446	2.19	4.54	0.51	216	24	GSC Open File 2308
	D-69-J/94-A-15	1226.3	Doig	II	1990-04-01		2.01	446	1.73	3.95	0.53	197	26	GSC Open File 2308
	D-69-J/94-A-15	1226.3	Doig	II	1990-04-01		2.04	446	1.71	4.12	0.51	202	25	GSC Open File 2308
	D-69-J/94-A-15	1226.5	Doig	II	1990-04-01		2.04	445	1.58	3.84	0.34	188	17	GSC Open File 2308
	D-69-J/94-A-15	1226.5	Doig	II	1990-04-01		2.03	448	1.51	3.7	1.45	182	71	GSC Open File 2308
	D-69-J/94-A-15	1227.9	Doig	II	1990-04-01		2.46	444	1.51	4.47	0.39	182	16	GSC Open File 2308
	D-69-J/94-A-15	1227.9	Doig	II	1990-04-01		2.44	449	1.42	4.27	0.33	175	14	GSC Open File 2308
	D-69-J/94-A-15	1228.2	Doig	II	1990-04-01		2.97	448	1.59	5.25	0.48	177	16	GSC Open File 2308
	D-69-J/94-A-15	1228.2	Doig	II	1990-04-01		2.92	451	1.54	5.2	0.29	178	10	GSC Open File 2308
	D-69-J/94-A-15	1228.6	Doig	II	1990-04-01		2.93	450	1.58	5.68	0.47	194	16	GSC Open File 2308
	D-69-J/94-A-15	1228.6	Doig	II	1990-04-01		3	451	1.53	5.49	0.51	183	17	GSC Open File 2308
	D-69-J/94-A-15	1230.8	Doig	II	1990-04-01		2.28	446	1.57	4.57	0.31	200	14	GSC Open File 2308
	D-69-J/94-A-15	1230.8	Doig	II	1990-04-01		2.3	446	1.57	4.53	0.29	197	13	GSC Open File 2308
	D-69-J/94-A-15	1231	Doig	II	1990-04-01		2.57	447	1.44	4.84	0.53	188	21	GSC Open File 2308
	D-69-J/94-A-15	1231	Doig	II	1990-04-01		2.59	446	1.47	4.9	0.32	189	12	GSC Open File 2308
	D-69-J/94-A-15	1234.7	Doig	II	1990-04-01		1.86	447	3.63	2.94	0.37	158	20	GSC Open File 2308
	D-69-J/94-A-15	1234.7	Doig	II	1990-04-01		1.88	442	3.74	3.14	0.49	167	26	GSC Open File 2308
	D-69-J/94-A-15	1237.3	Doig	II	1990-04-01		3.28	454	2.03	5.3	0.38	162	12	GSC Open File 2308
	D-69-J/94-A-15	1237.3	Doig	II	1990-04-01		3.23	454	2.02	4.98	0.62	154	19	GSC Open File 2308
D62	D-72-E/94-H-2	1176.3	Doig	VI	2003-12-14	70.4	1.76	443	1.57	3.9	0.18	222	10	GSC Internal data
	D-72-E/94-H-2	1180.6	Doig	VI	2003-12-14	70.1	5.27	443	1.62	9.93	0.18	189	3	GSC Internal data
	D-72-E/94-H-2	1180.6	Doig	VI	2003-12-17	49.9	5.02	441	1.59	9.79	0.21	196	4	GSC Internal data
	D-72-E/94-H-2	1182.9	Doig	VI	2003-12-14	70	7.73	442	1.64	15.9	0.2	207	3	GSC Internal data
	D-72-E/94-H-2	1182.9	Doig	VI	2003-12-17	50.1	7.58	442	1.57	15.49	0.18	206	2	GSC Internal data
	D-72-E/94-H-2	1184.45	Doig	II	1990-04-01		5.77	448	2.09	15.16	0.71	263	12	GSC Open File 2308

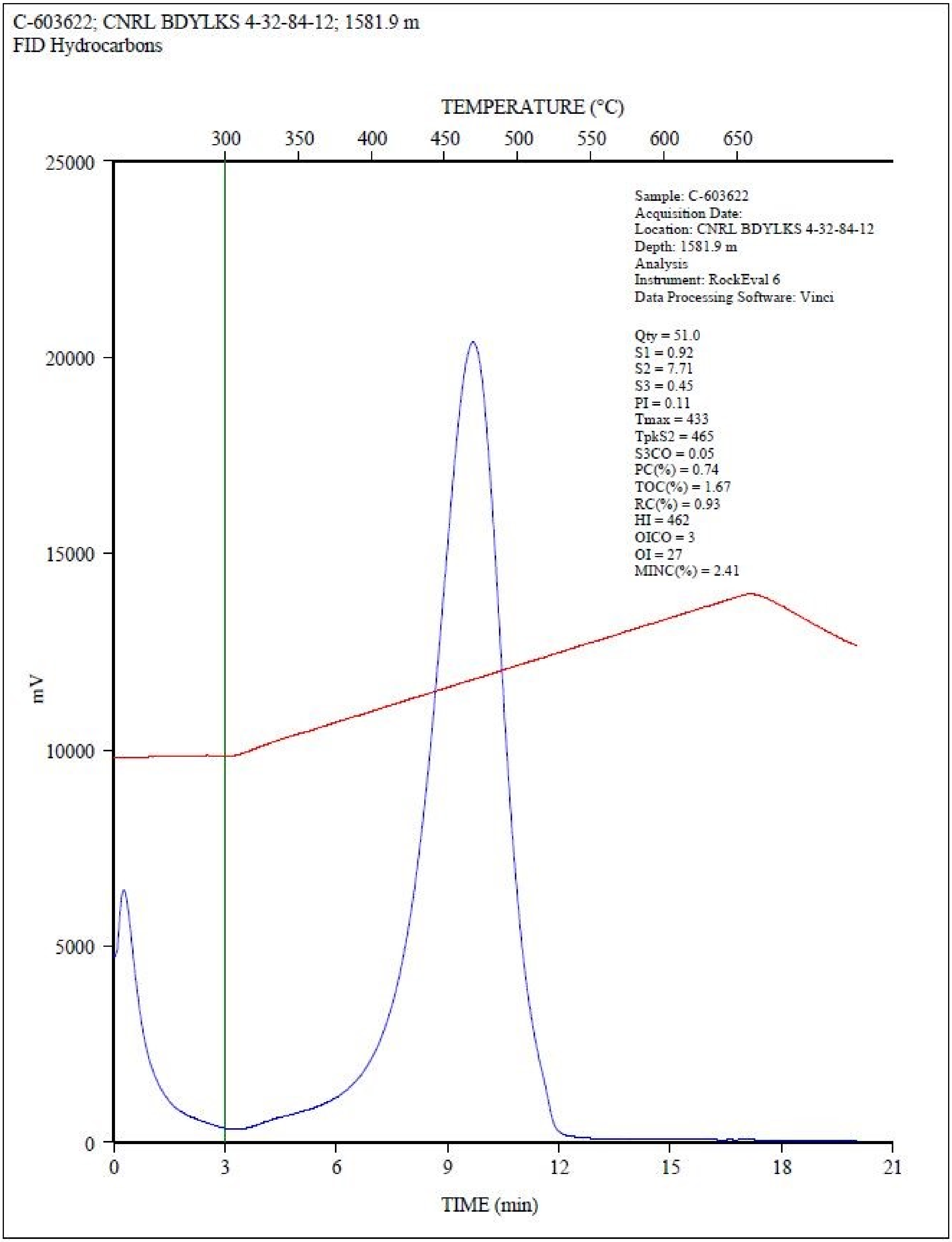
Map No.	Well Location	Depth (m)	Unit	Rock-Eval	Compiled Date	Weight (g)	TOC%	Tmax (°C)	S1 (mg/g)	S2 (mg/g)	S3	HI	OI	REFERENCE
	D-72-E/94-H-2	1184.45	Doig	II	1990-04-01		6.38	450	2	14.79	0.99	232	16	GSC Open File 2308
	D-72-E/94-H-2	1186.1	Doig	VI	2003-12-14	70.1	10.98	445	2.01	25.17	0.22	231	2	GSC Internal data
	D-72-E/94-H-2	1186.1	Doig	VI	2003-12-17	50.5	10.79	445	2.08	24.62	0.21	230	2	GSC Internal data
	D-72-E/94-H-2	1187.4	Doig	VI	2003-12-14	70.7	10.95	444	2.14	25.68	0.18	236	2	GSC Internal data
	D-72-E/94-H-2	1187.4	Doig	VI	2003-12-17	50.4	10.76	445	2.1	25.13	0.2	235	2	GSC Internal data
D63	D-81-E/94-H-1	1068.3	Doig	II	1990-04-01		2.11	454	0.83	7.52	0.18	356	9	GSC Open File 2308
	D-81-E/94-H-1	1068.3	Doig	II	1990-04-01		2.07	456	0.78	7.63	0.33	369	16	GSC Open File 2308
	D-81-E/94-H-1	1068.3	Doig	VI	1998-12-01	100.3	2.16	445	0.63	7.01	0.4	325	19	GSC Internal data
G1	12-7-67-24W5	1904.8	Gordondale	VI	2016-07-11	50.1	15.06	430	5.73	86.73	1.39	576	9	New Analyzed
	12-7-67-24W5	1905.5	Gordondale	VI	2016-07-11	50.6	12.92	436	6.54	76.15	0.58	589	4	New Analyzed
	12-7-67-24W5	1906	Gordondale	VI	2016-07-11	51.2	15.8	438	2.89	88.28	0.52	559	3	New Analyzed
	12-7-67-24W5	1907.1	Gordondale	VI	2016-07-11	50.4	11.04	440	2.39	66.87	0.32	606	3	New Analyzed
	12-7-67-24W5	1907.7	Gordondale	VI	2016-07-11	50.5	14.28	441	1.85	84.48	0.25	592	2	New Analyzed
G2	7-14-64-24W5	2288.16	Gordondale	VI	2016-07-11	50.5	8.89	438	2.34	37.41	0.48	421	5	New Analyzed
	7-14-64-24W5	2288.9	Gordondale	VI	2016-07-11	51.2	13.79	439	2.18	62.37	0.48	452	3	New Analyzed
	7-14-64-24W5	2289.5	Gordondale	VI	2016-07-11	50.3	10.34	440	1.9	49.37	0.5	477	5	New Analyzed
	7-14-64-24W5	2290.7	Gordondale	VI	2016-07-11	50.4	11.47	442	1.22	54.13	0.27	472	2	New Analyzed
	7-14-64-24W5	2290.7	Gordondale	VI	2016-07-11	50.5	11.67	441	1.17	54.93	0.29	471	2	New Analyzed
	7-14-64-24W5	2291.1	Gordondale	VI	2016-07-11	50.6	11.12	443	0.83	57.84	0.29	520	3	New Analyzed

APPENDIX 3-2

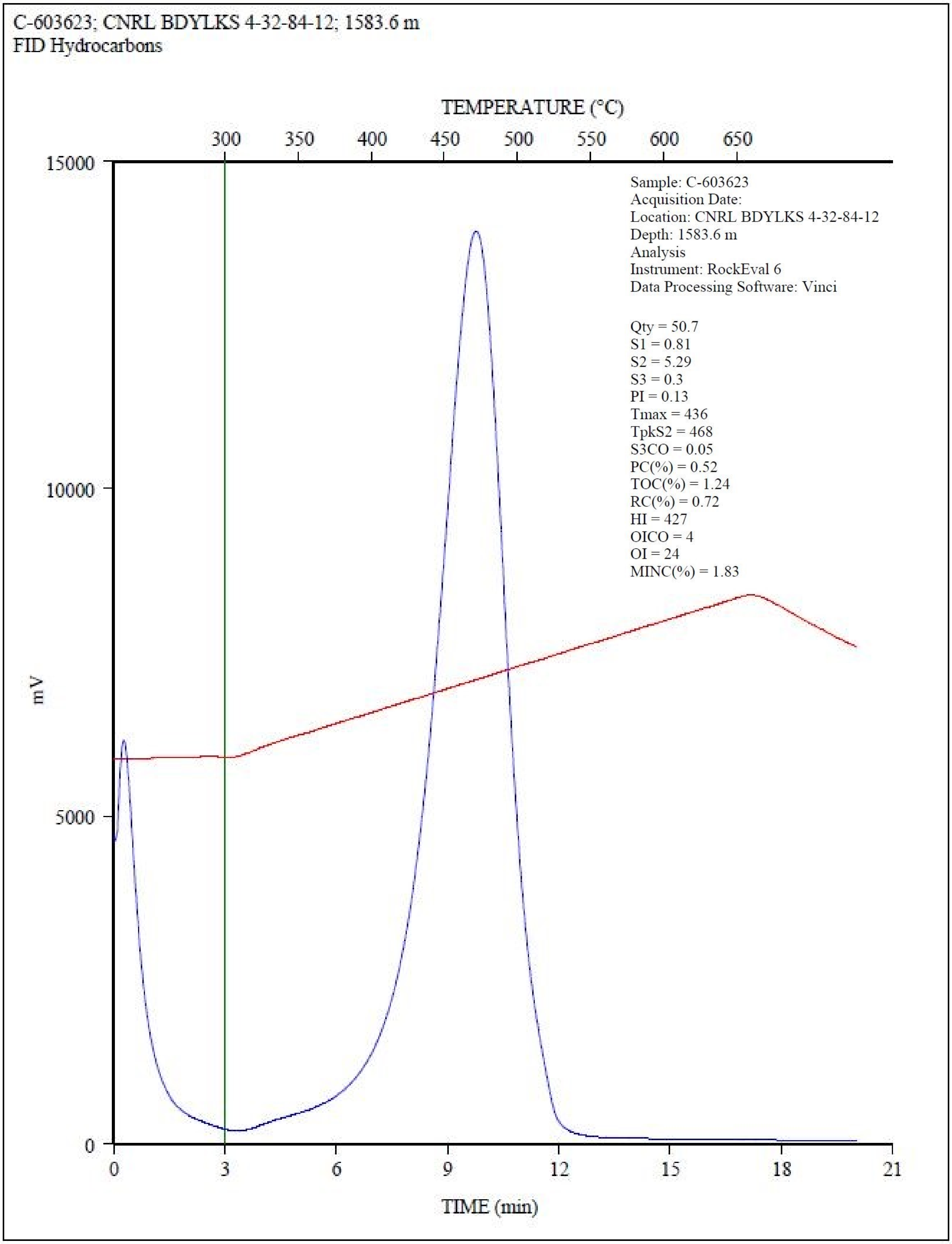
Graphs showing Rock-Eval pyrolysis of new analyzed samples



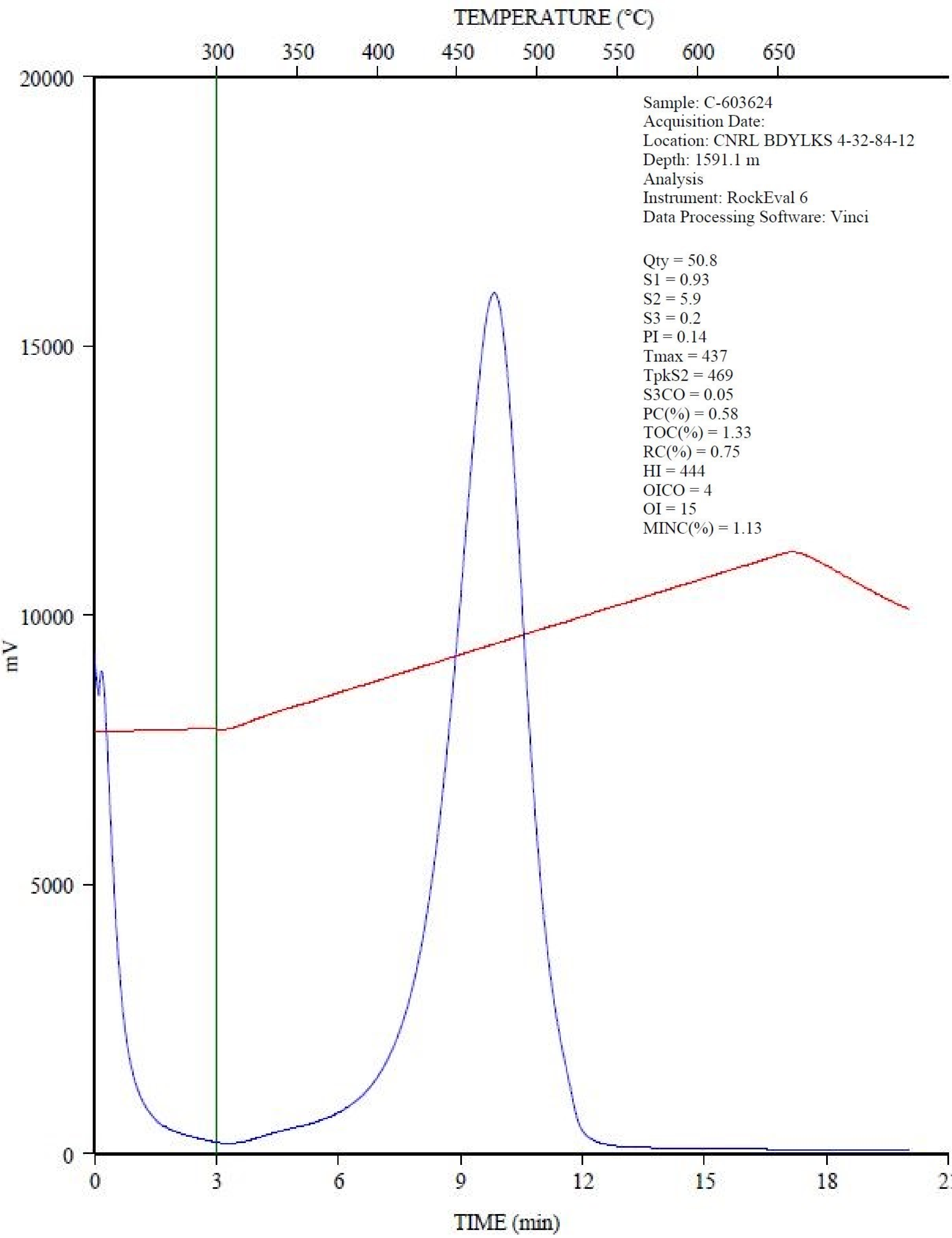
C-603621; CNRL BDYLKS 4-32-84-12; 1581.39 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603621
Acquisition Date:
Location: CNRL BDYLKS 4-32-84-12
Depth: 1581.39 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 1.1
S2 = 5.87
S3 = 0.44
PI = 0.16
Tmax = 432
TpkS2 = 464
S3CO = 0.04
PC(%) = 0.6
TOC(%) = 1.35
RC(%) = 0.75
HI = 435
OICO = 3
OI = 33
MINC(%) = 2.83
0
3
6
9
12
15
18
21
TIME (min)

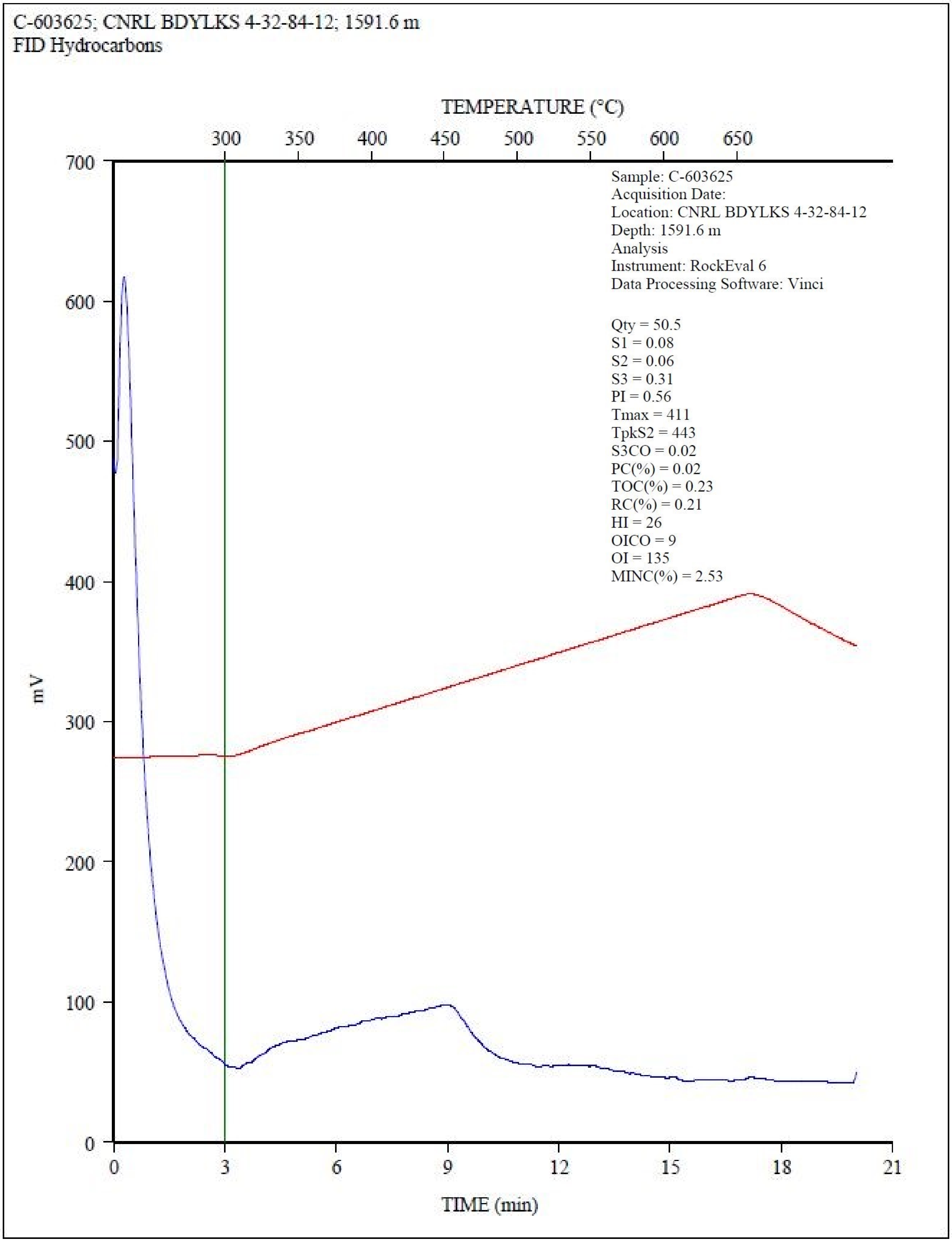


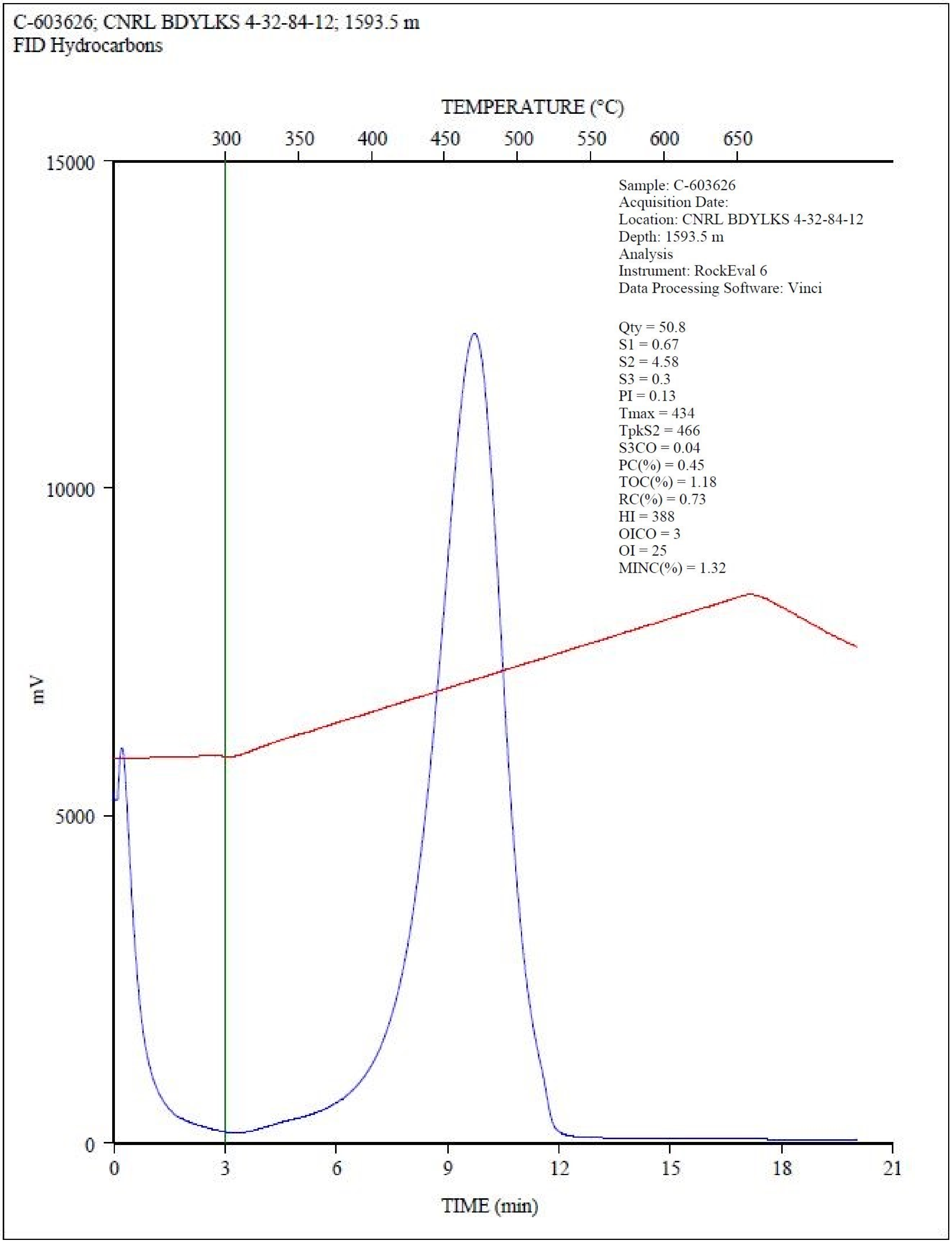
C-603622; CNRL BDYLKS 4-32-84-12; 1581.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
25000
20000
15000
10000
5000
0
mV
Sample: C-603622
Acquisition Date:
Location: CNRL BDYLKS 4-32-84-12
Depth: 1581.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.0
S1 = 0.92
S2 = 7.71
S3 = 0.45
PI = 0.11
Tmax = 433
TpkS2 = 465
S3CO = 0.05
PC(%) = 0.74
TOC(%) = 1.67
RC(%) = 0.93
HI = 462
OICO = 3
OI = 27
MINC(%) = 2.41
0
3
6
9
12
15
18
21
TIME (min)


C-603623; CNRL BDYLKS 4-32-84-12; 1583.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603623
Acquisition Date:
Location: CNRL BDYLKS 4-32-84-12
Depth: 1583.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.81
S2 = 5.29
S3 = 0.3
PI = 0.13
Tmax = 436
TpkS2 = 468
S3CO = 0.05
PC(%) = 0.52
TOC(%) = 1.24
RC(%) = 0.72
HI = 427
OICO = 4
OI = 24
MINC(%) = 1.83

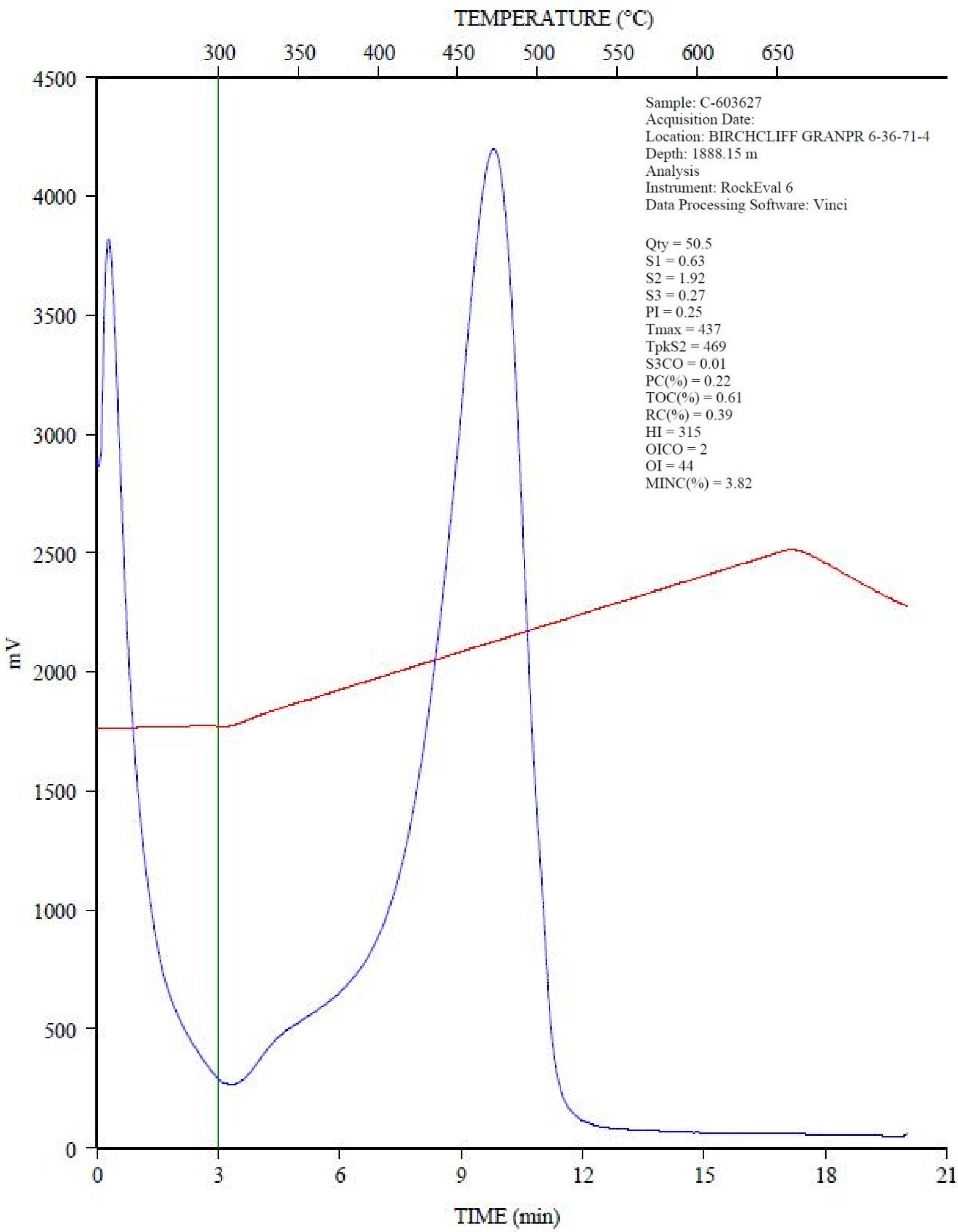
C-603624; CNRL BDYLKS 4-32-84-12; 1591.1 m
FID Hydrocarbons

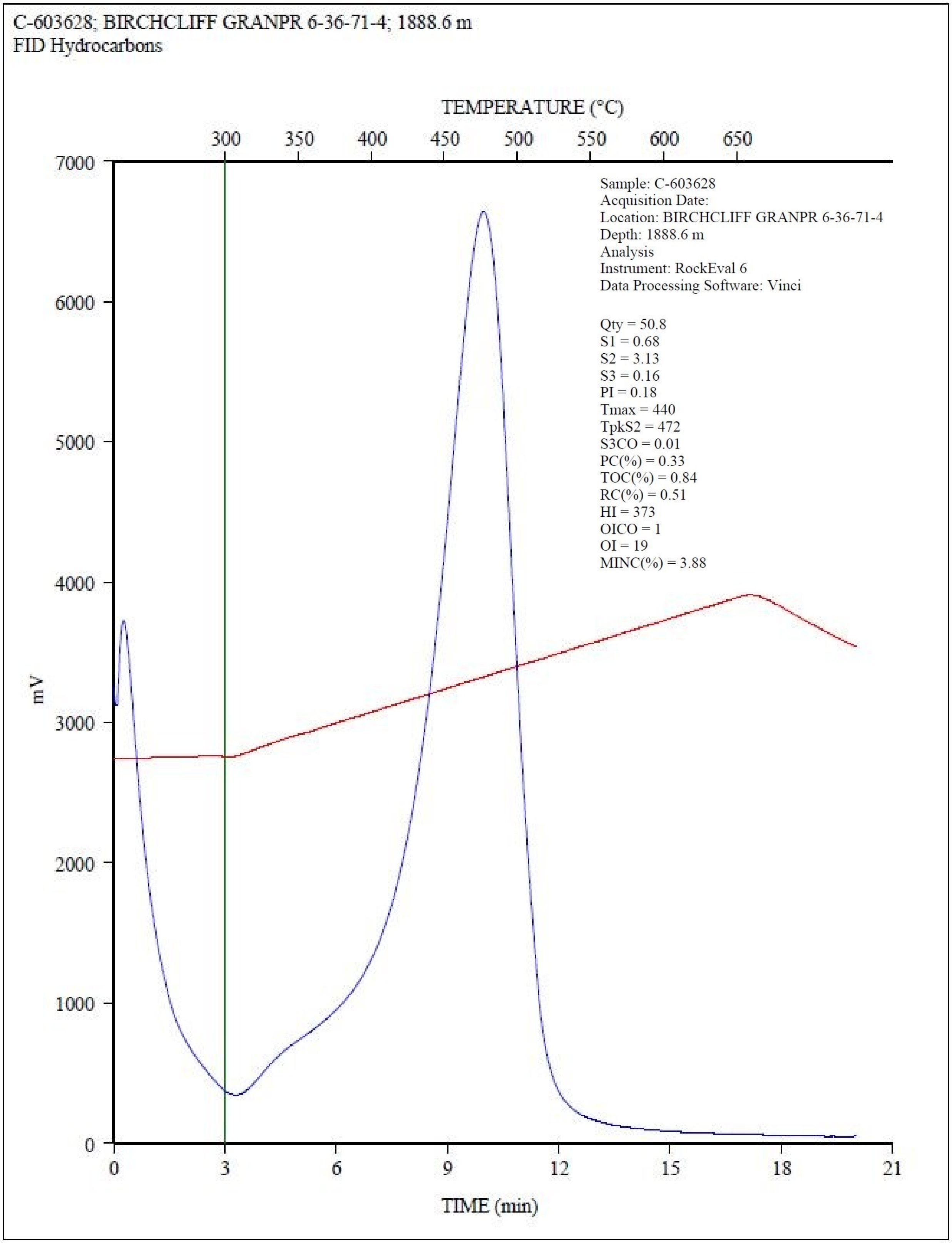


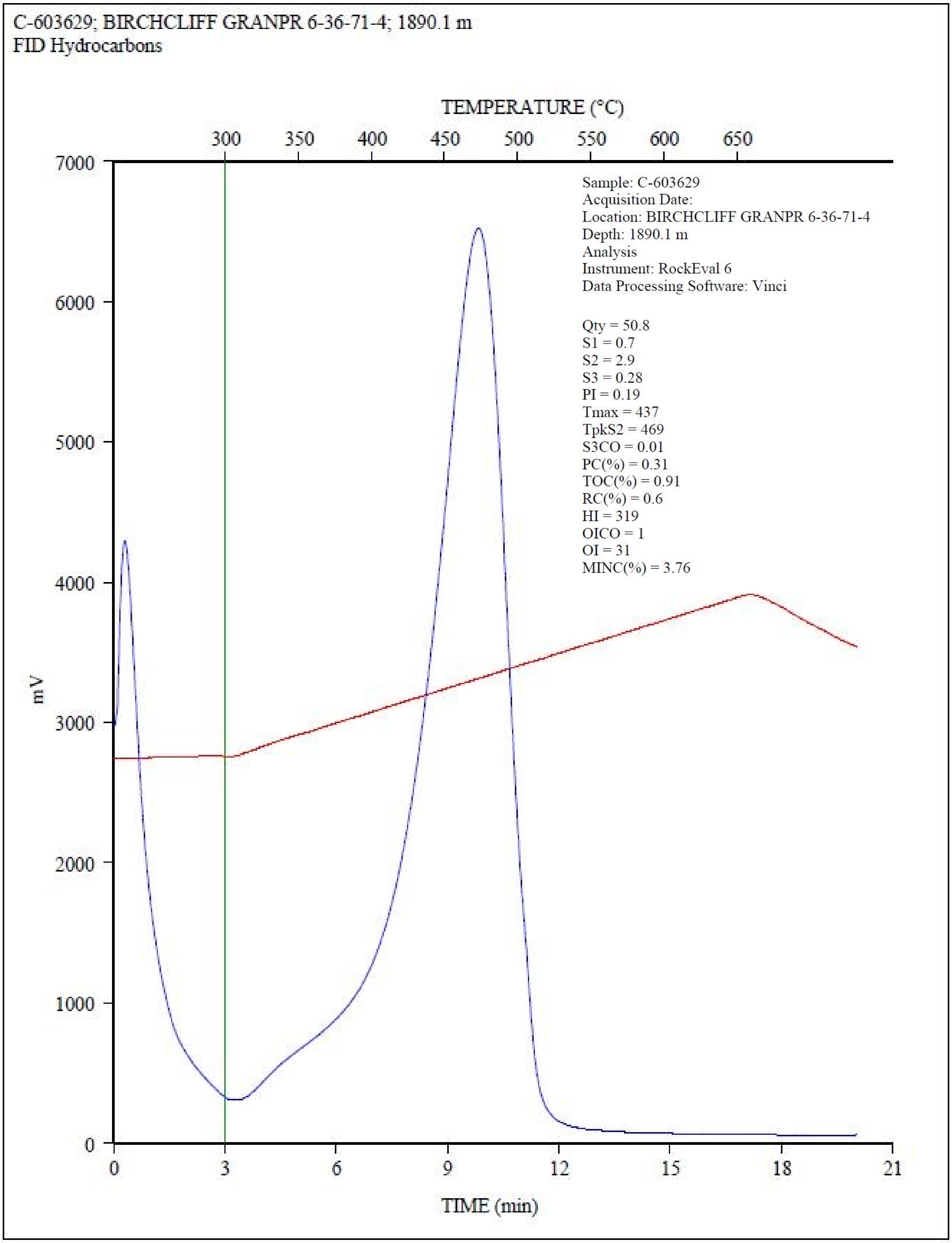

C-603625; CNRL BDYLKS 4-32-84-12; 1591.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603625
Acquisition Date:
Location: CNRL BDYLKS 4-32-84-12
Depth: 1591.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 0.08
S2 = 0.06
S3 = 0.31
PI = 0.56
Tmax = 411
TpkS2 = 443
S3CO = 0.02
PC(%) = 0.02
TOC(%) = 0.23
RC(%) = 0.21
HI = 26
OICO = 9
OI = 135
MINC(%) = 2.53
700
600
500
400
300
200
100
0
mV
0
3
6
9
12
15
18
21
TIME (min)


C-603626; CNRL BDYLKS 4-32-84-12; 1593.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603626
Acquisition Date:
Location: CNRL BDYLKS 4-32-84-12
Depth: 1593.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.67
S2 = 4.58
S3 = 0.3
PI = 0.13
Tmax = 434
TpkS2 = 466
S3CO = 0.04
PC(%) = 0.45
TOC(%) = 1.18
RC(%) = 0.73
HI = 388
OICO = 3
OI = 25
MINC(%) = 1.32
0
3
6
9
12
15
18
21
TIME (min)

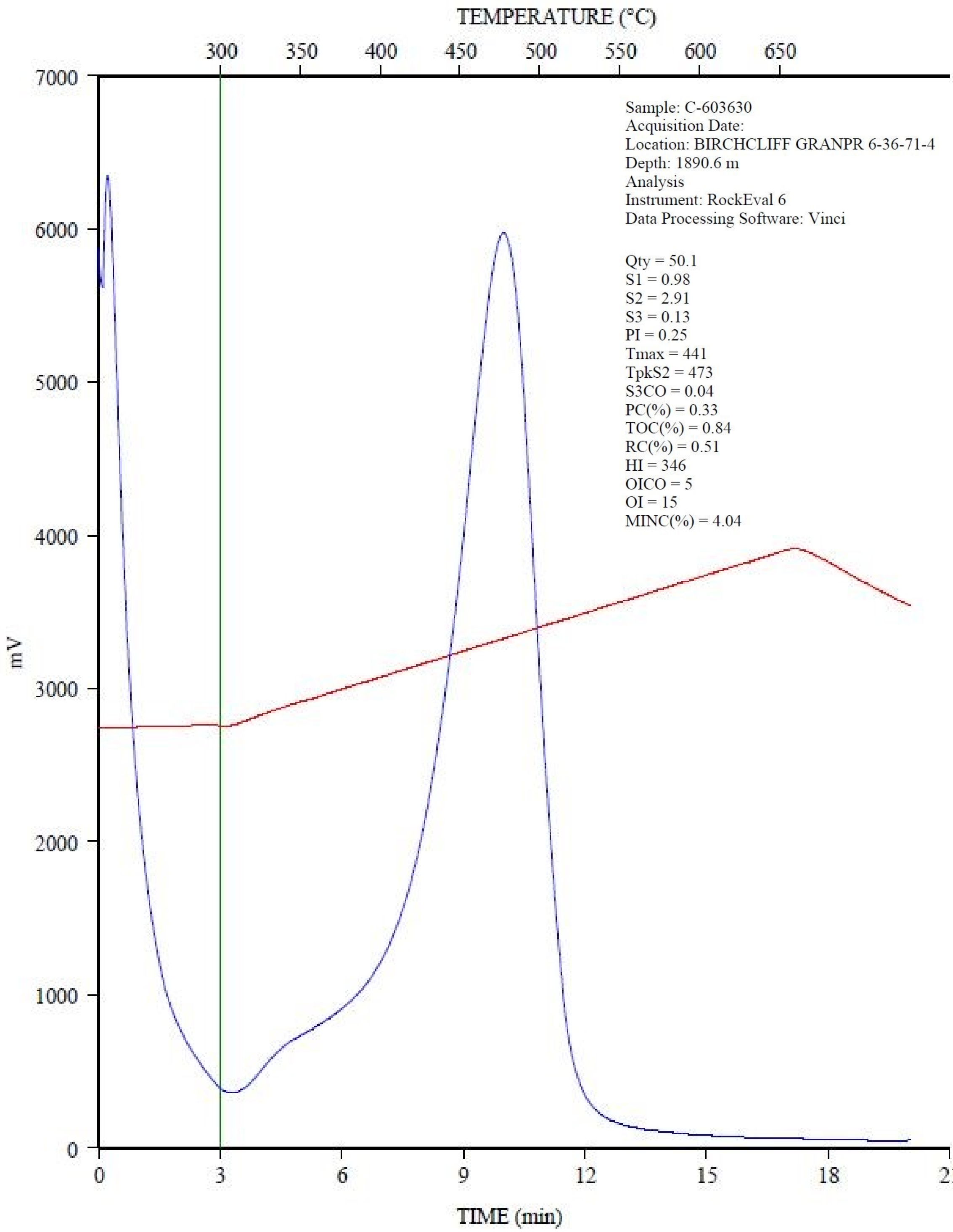
C-603627; BIRCHCLIFF GRANPR 6-36-71-4; 1888.15 m
FID Hydrocarbons

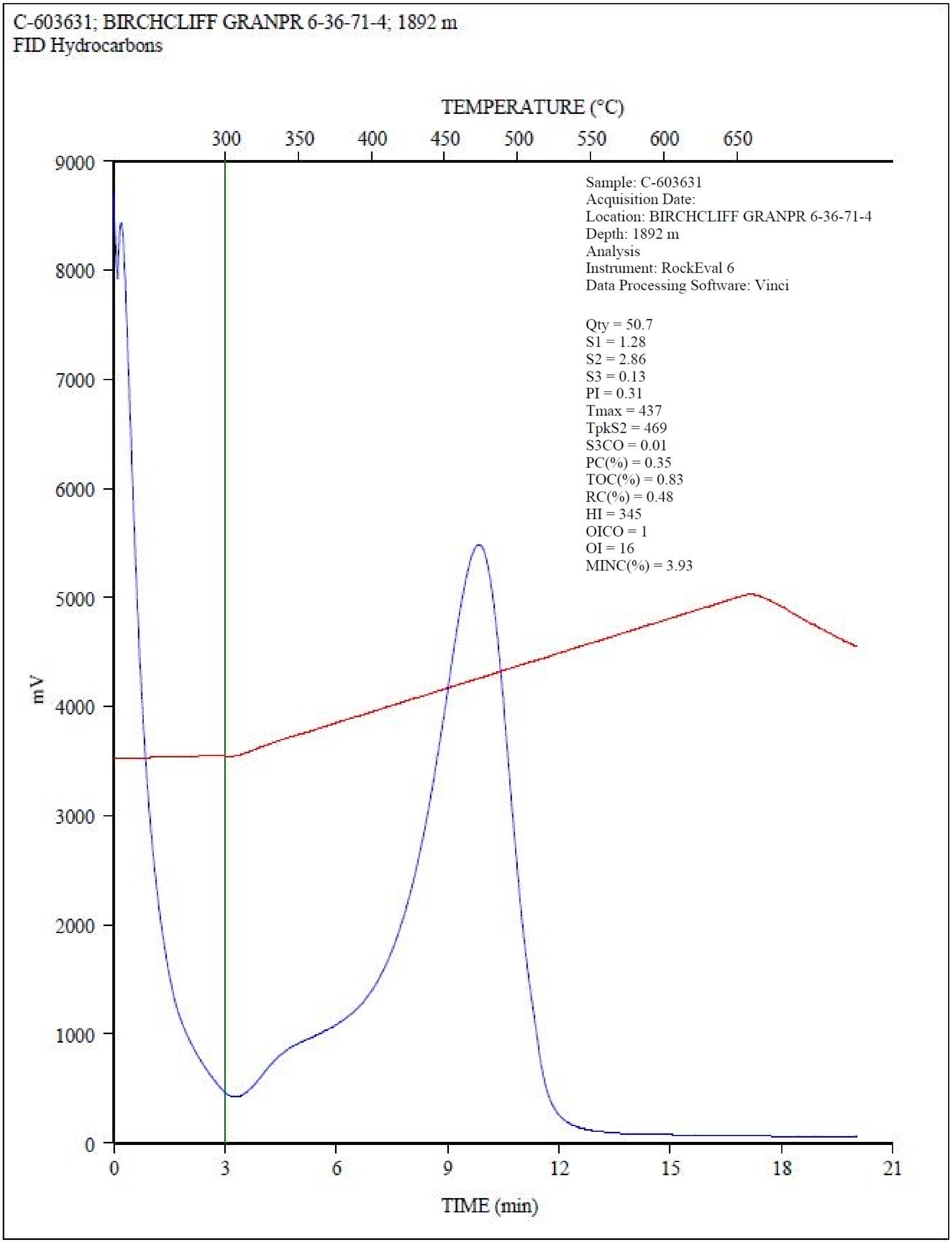


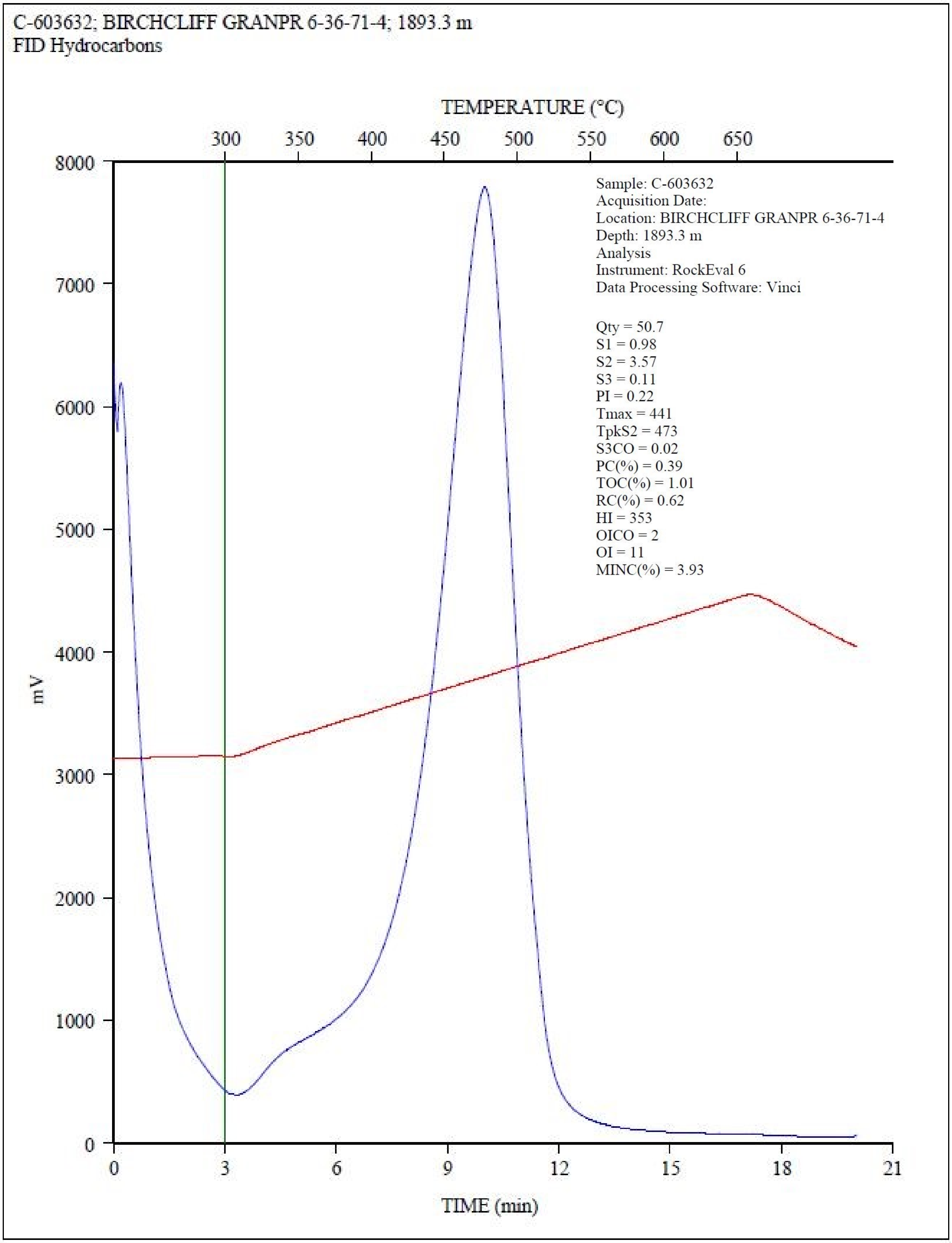

C-603628; BIRCHCLIFF GRANPR 6-36-71-4; 1888.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603628
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1888.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.68
S2 = 3.13
S3 = 0.16
PI = 0.18
Tmax = 440
TpkS2 = 472
S3CO = 0.01
PC(%) = 0.33
TOC(%) = 0.84
RC(%) = 0.51
HI = 373
OICO = 1
OI = 19
MINC(%) = 3.88


C-603629; BIRCHCLIFF GRANPR 6-36-71-4; 1890.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603629
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1890.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.7
S2 = 2.9
S3 = 0.28
PI = 0.19
Tmax = 437
TpkS2 = 469
S3CO = 0.01
PC(%) = 0.31
TOC(%) = 0.91
RC(%) = 0.6
HI = 319
OICO = 1
OI = 31
MINC(%) = 3.76

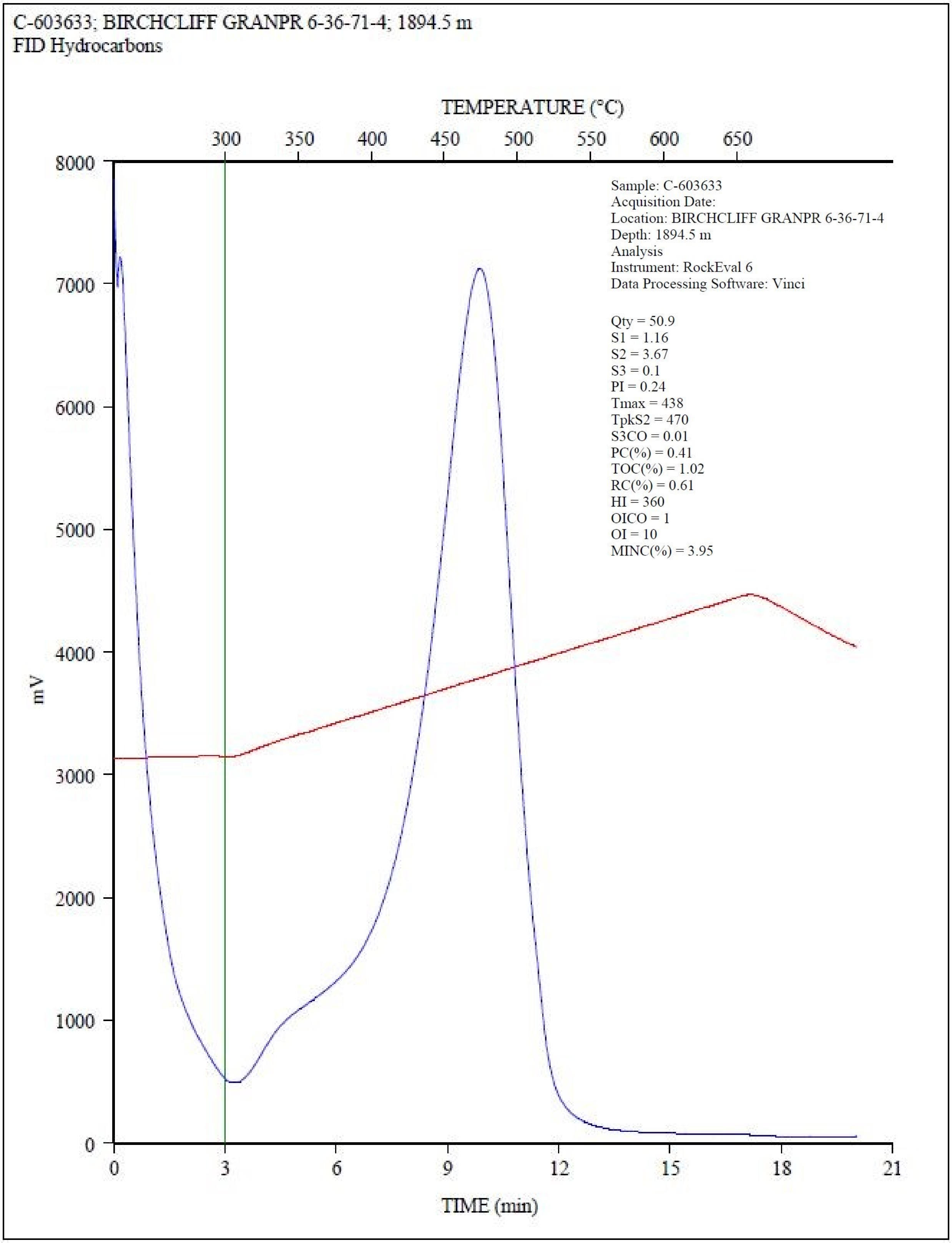
C-603630; BIRCHCLIFF GRANPR 6-36-71-4; 1890.6 m
FID Hydrocarbons

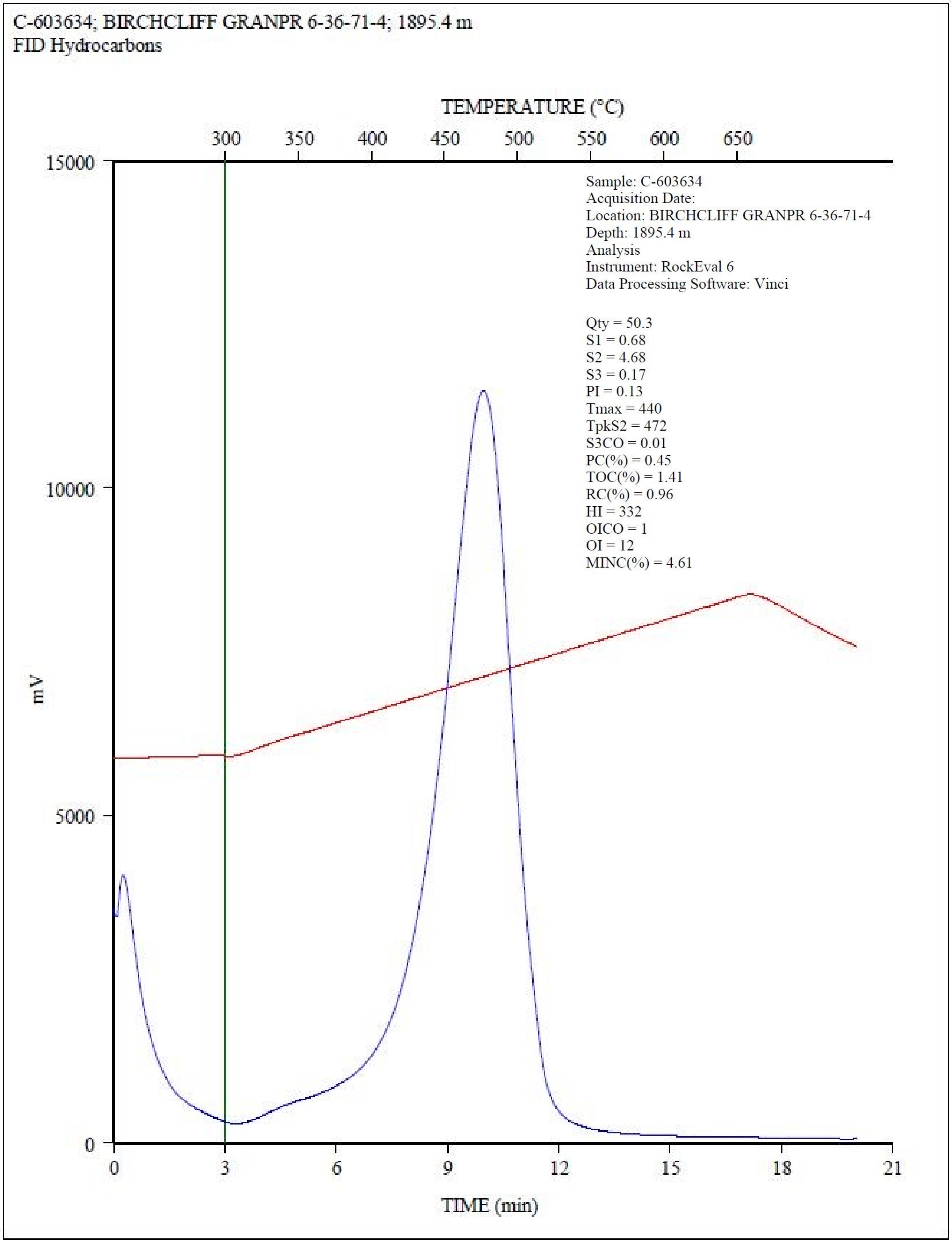


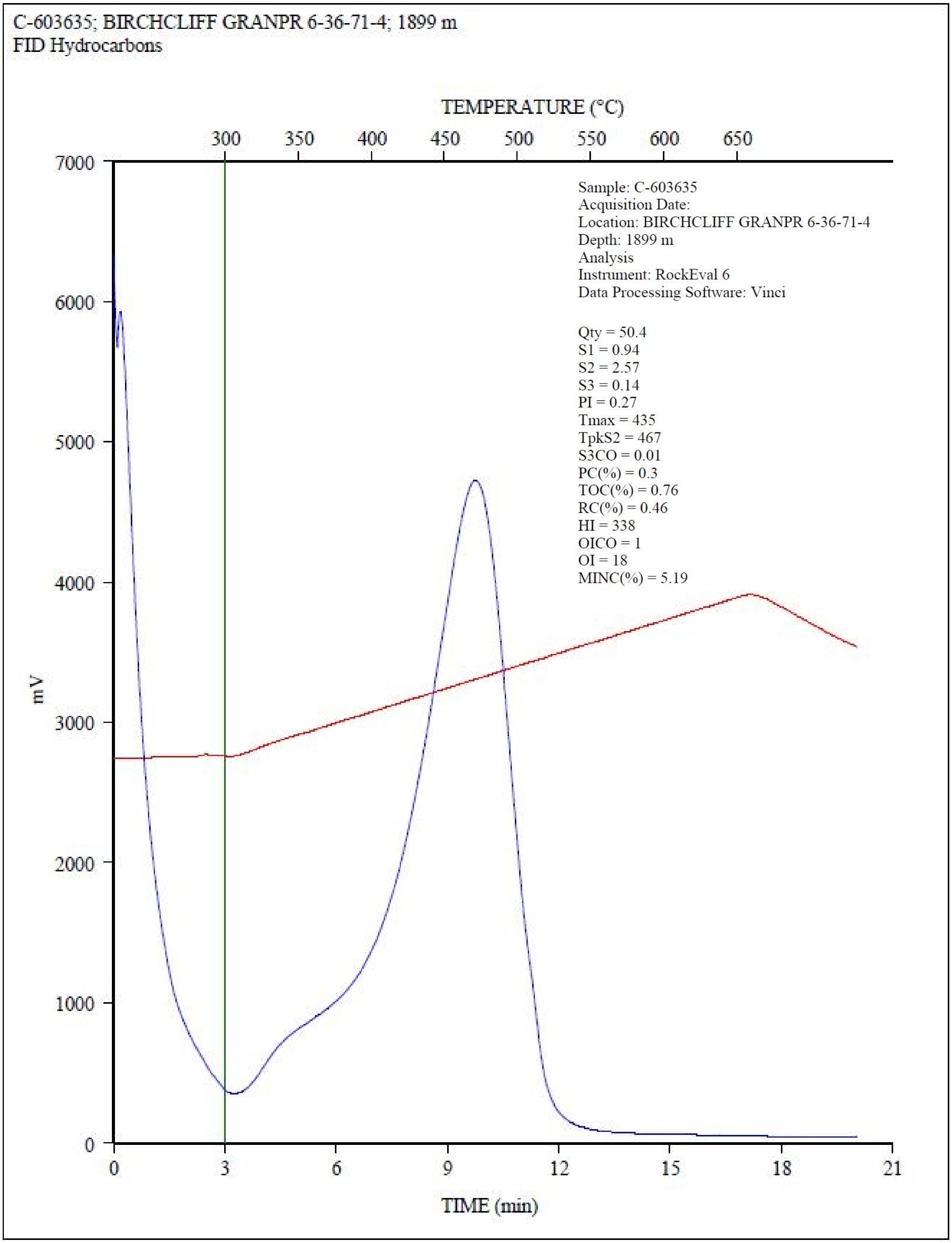

C-603631; BIRCHCLIFF GRANPR 6-36-71-4; 1892 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603631
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1892 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 1.28
S2 = 2.86
S3 = 0.13
PI = 0.31
Tmax = 437
TpkS2 = 469
S3CO = 0.01
PC(%) = 0.35
TOC(%) = 0.83
RC(%) = 0.48
HI = 345
OICO = 1
OI = 16
MINC(%) = 3.93
0
3
6
9
12
15
18
21
TIME (min)



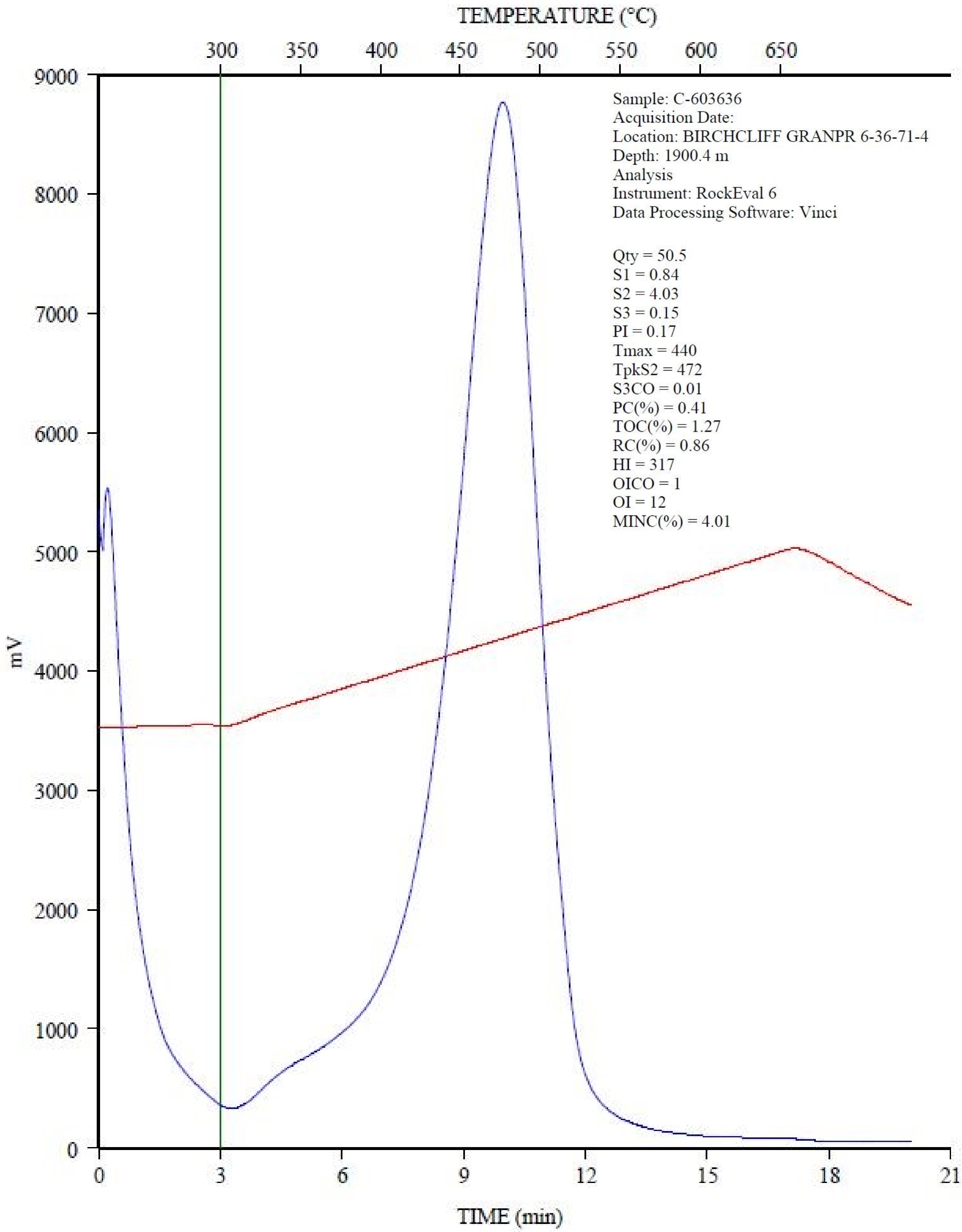
C-603632; BIRCHCLIFF GRANPR 6-36-71-4; 1893.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603632
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1893.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.98
S2 = 3.57
S3 = 0.11
PI = 0.22
Tmax = 441
TpkS2 = 473
S3CO = 0.02
PC(%) = 0.39
TOC(%) = 1.01
RC(%) = 0.62
HI = 353
OICO = 2
OI = 11
MINC(%) = 3.93

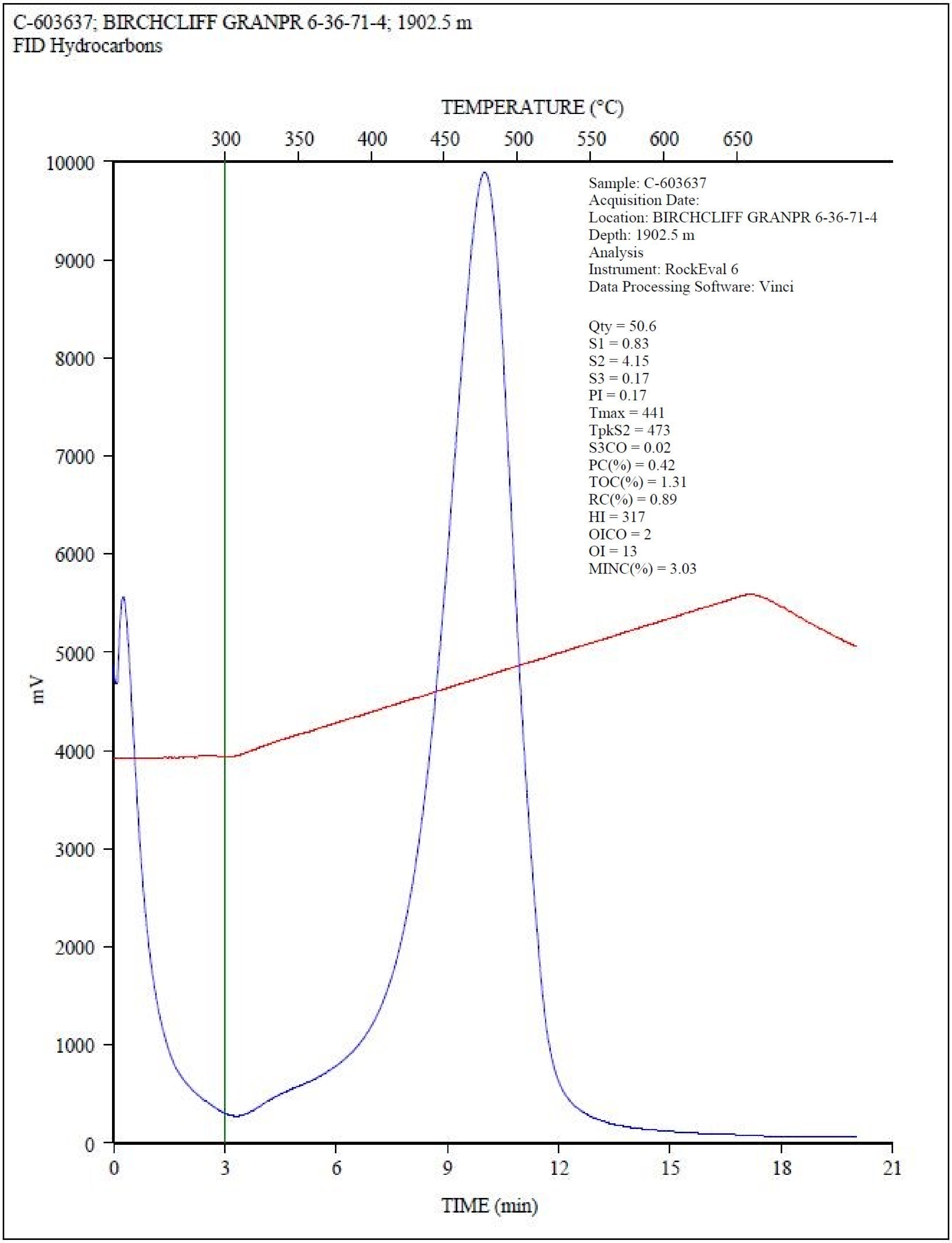

C-603633; BIRCHCLIFF GRANPR 6-36-71-4; 1894.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603633
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1894.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 1.16
S2 = 3.67
S3 = 0.1
PI = 0.24
Tmax = 438
TpkS2 = 470
S3CO = 0.01
PC(%) = 0.41
TOC(%) = 1.02
RC(%) = 0.61
HI = 360
OICO = 1
OI = 10
MINC(%) = 3.95
0
3
6
9
12
15
18
21
TIME (min)


C-603634; BIRCHCLIFF GRANPR 6-36-71-4; 1895.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603634
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1895.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 0.68
S2 = 4.68
S3 = 0.17
PI = 0.13
Tmax = 440
TpkS2 = 472
S3CO = 0.01
PC(%) = 0.45
TOC(%) = 1.41
RC(%) = 0.96
HI = 332
OICO = 1
OI = 12
MINC(%) = 4.61
0
3
6
9
12
15
18
21
TIME (min)

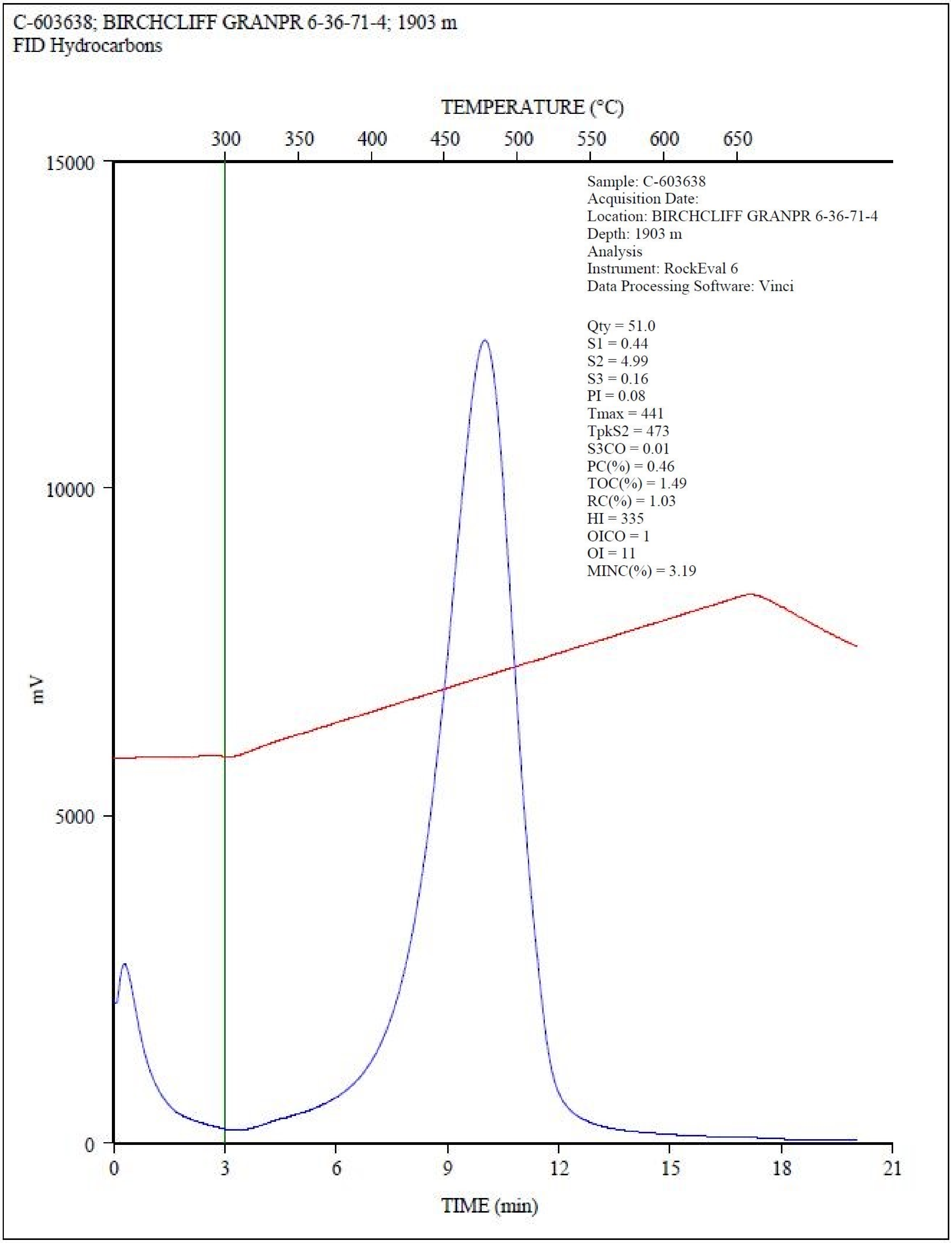

C-603635; BIRCHCLIFF GRANPR 6-36-71-4; 1899 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603635
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1899 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.4
S1 = 0.94
S2 = 2.57
S3 = 0.14
PI = 0.27
Tmax = 435
TpkS2 = 467
S3CO = 0.01
PC(%) = 0.3
TOC(%) = 0.76
RC(%) = 0.46
HI = 338
OICO = 1
OI = 18
MINC(%) = 5.19
0
3
6
9
12
15
18
21
TIME (min)

C-603636; BIRCHCLIFF GRANPR 6-36-71-4; 1900.4 m
FID Hydrocarbons



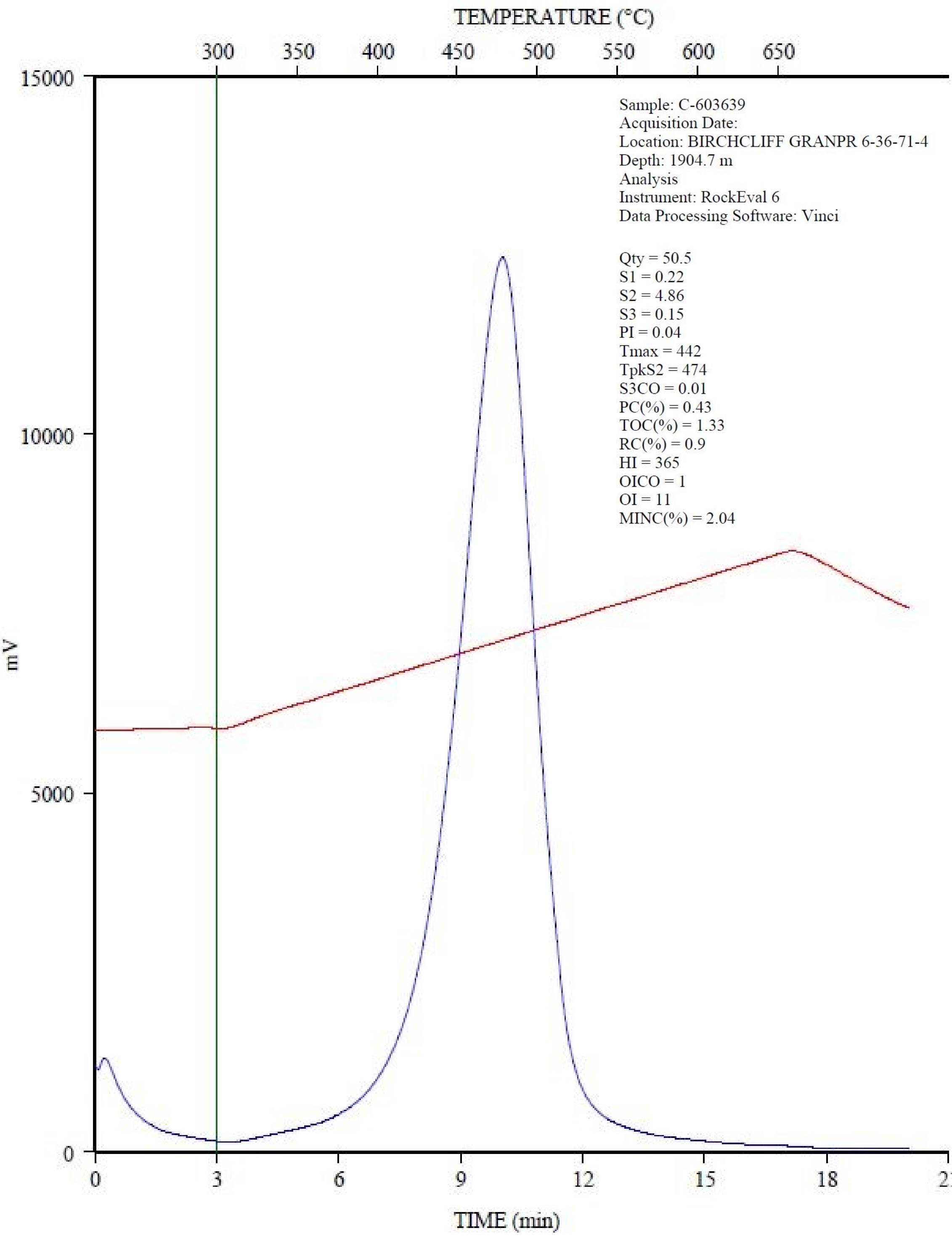


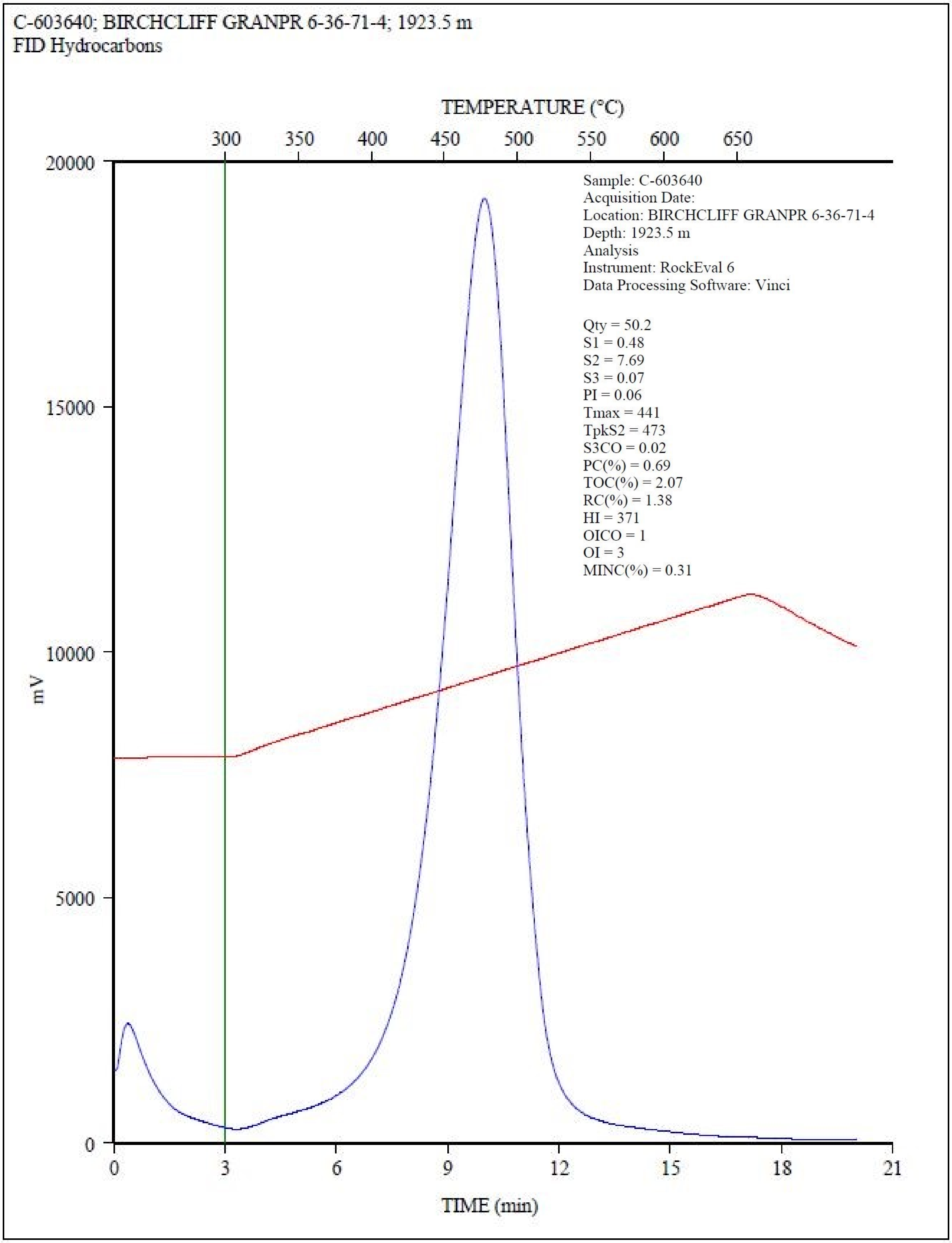
C-603637; BIRCHCLIFF GRANPR 6-36-71-4; 1902.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603637
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1902.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 0.83
S2 = 4.15
S3 = 0.17
PI = 0.17
Tmax = 441
TpkS2 = 473
S3CO = 0.02
PC(%) = 0.42
TOC(%) = 1.31
RC(%) = 0.89
HI = 317
OICO = 2
OI = 13
MINC(%) = 3.03



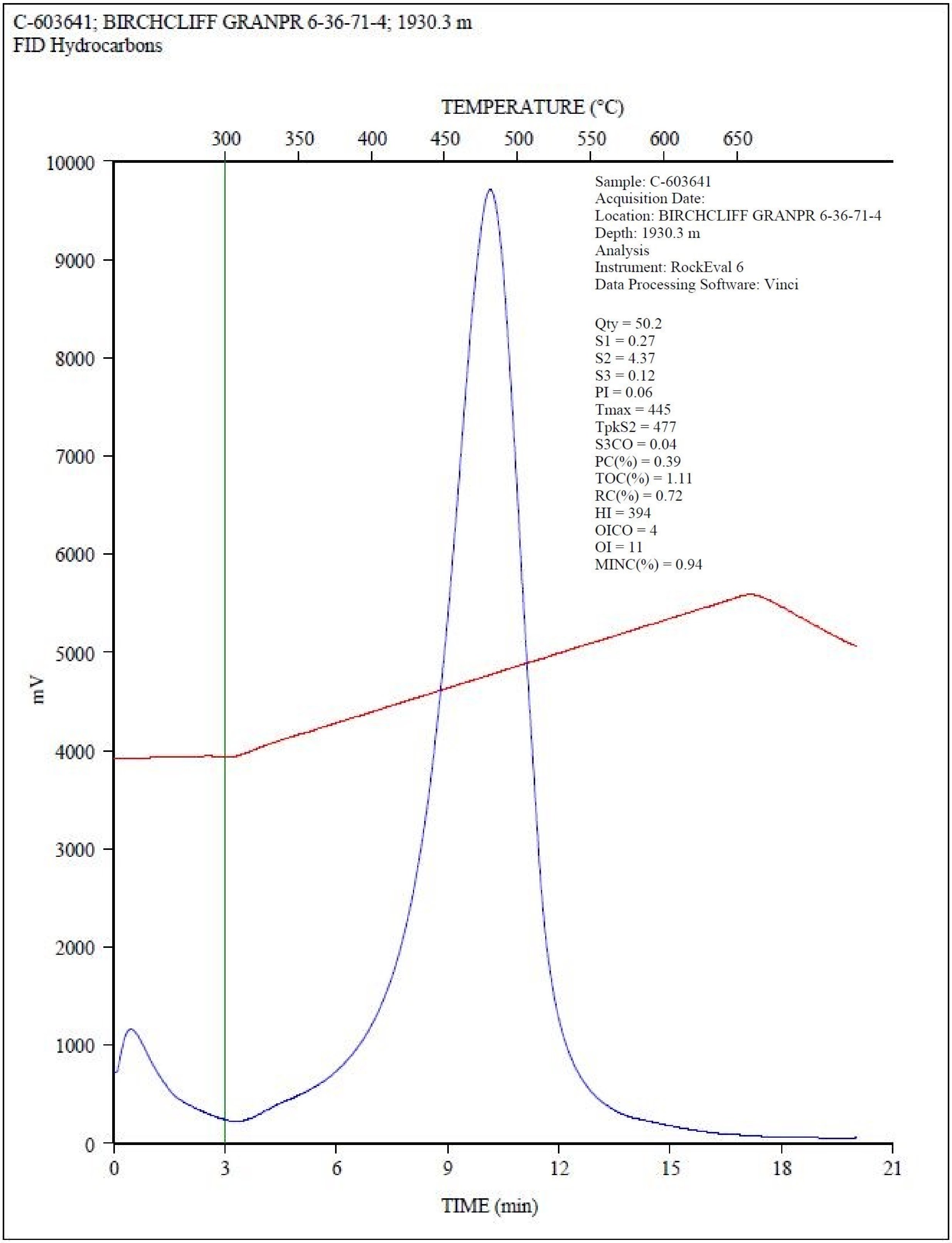
C-603638; BIRCHCLIFF GRANPR 6-36-71-4; 1903 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603638
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1903 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.0
S1 = 0.44
S2 = 4.99
S3 = 0.16
PI = 0.08
Tmax = 441
TpkS2 = 473
S3CO = 0.01
PC(%) = 0.46
TOC(%) = 1.49
RC(%) = 1.03
HI = 335
OICO = 1
OI = 11
MINC(%) = 3.19
0
3
6
9
12
15
18
21
TIME (min)

C-603639; BIRCHCLIFF GRANPR 6-36-71-4; 1904.7 m
FID Hydrocarbons

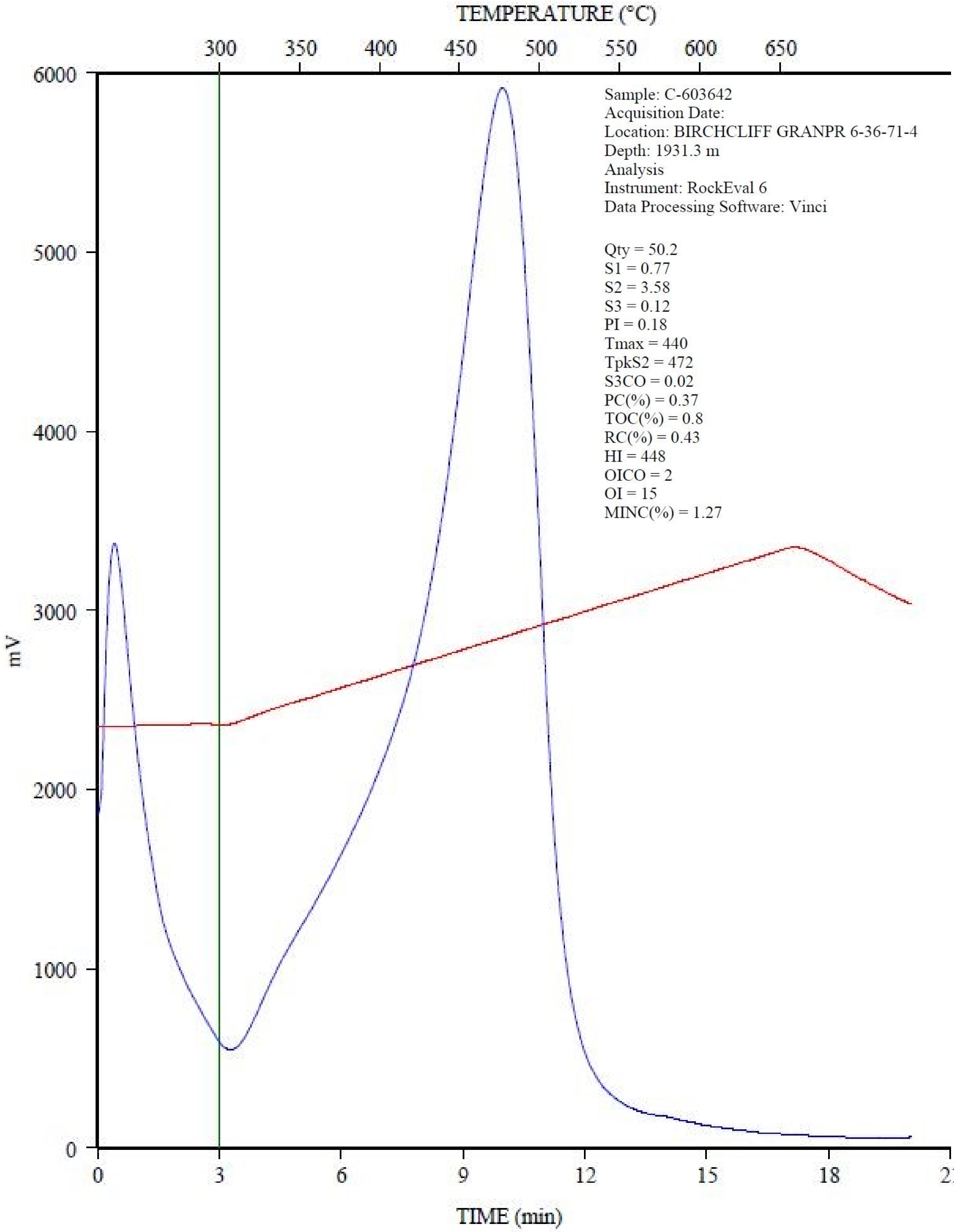


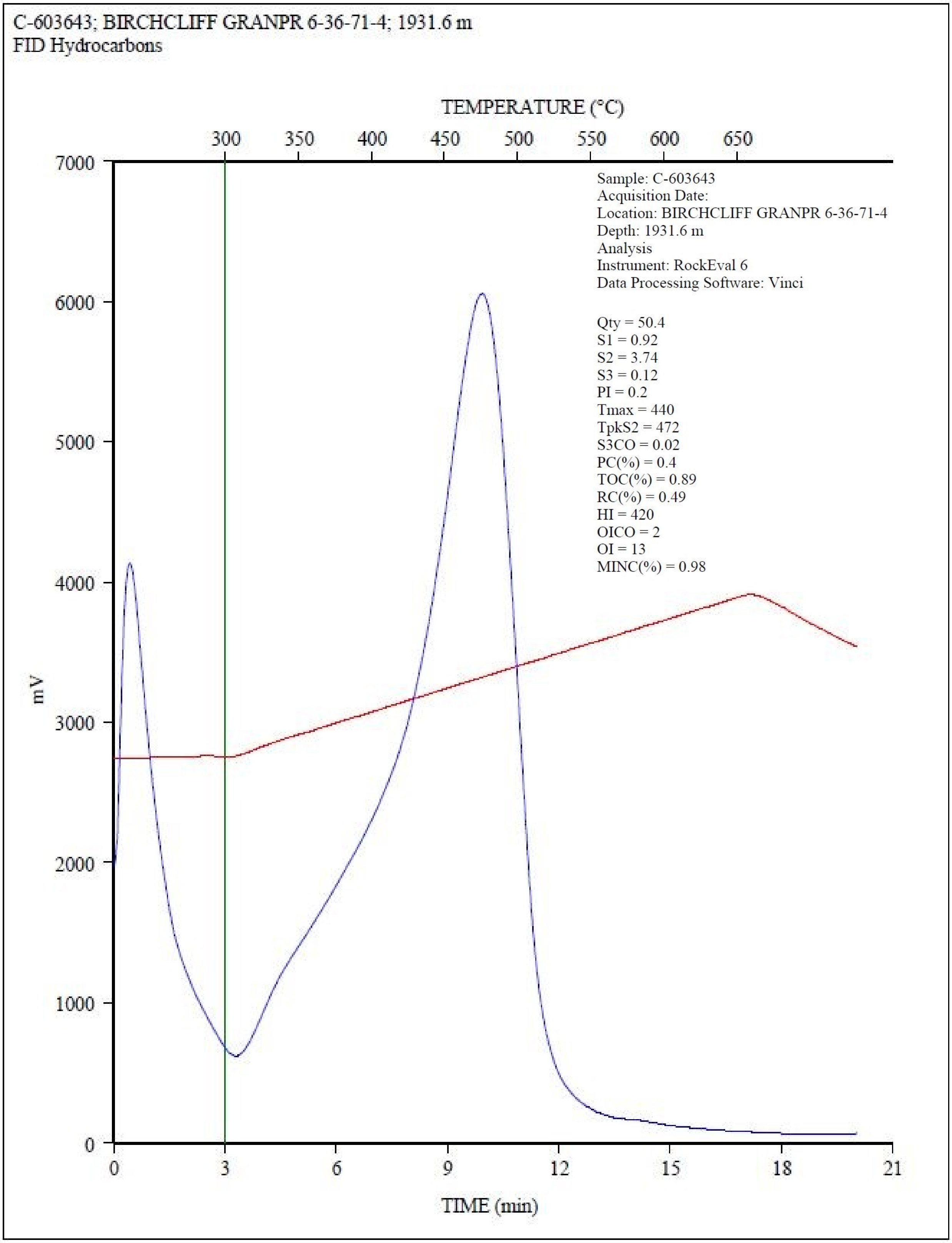


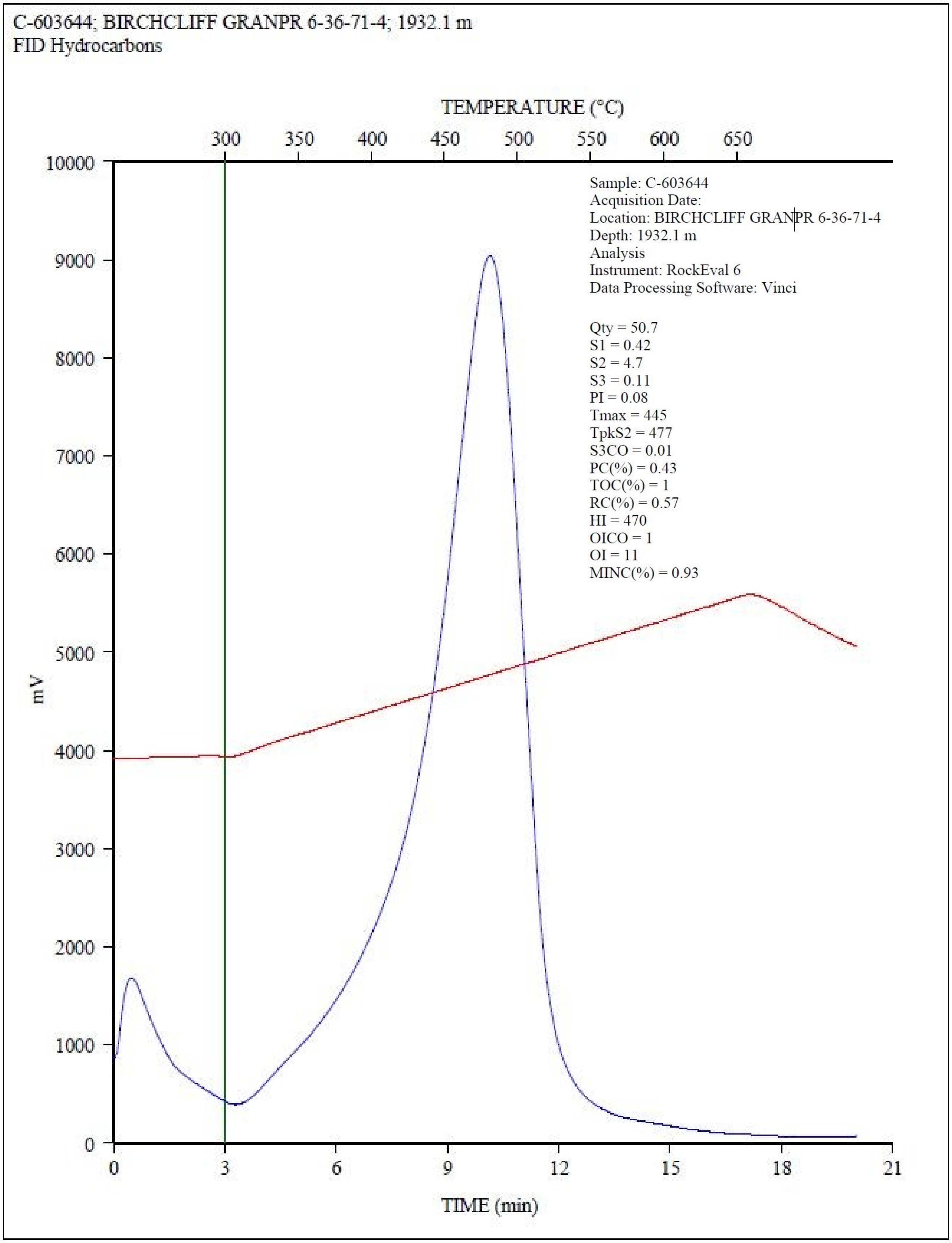
C-603640; BIRCHCLIFF GRANPR 6-36-71-4; 1923.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603640
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1923.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 0.48
S2 = 7.69
S3 = 0.07
PI = 0.06
Tmax = 441
TpkS2 = 473
S3CO = 0.02
PC(%) = 0.69
TOC(%) = 2.07
RC(%) = 1.38
HI = 371
OICO = 1
OI = 3
MINC(%) = 0.31
0
3
6
9
12
15
18
21
TIME (min)

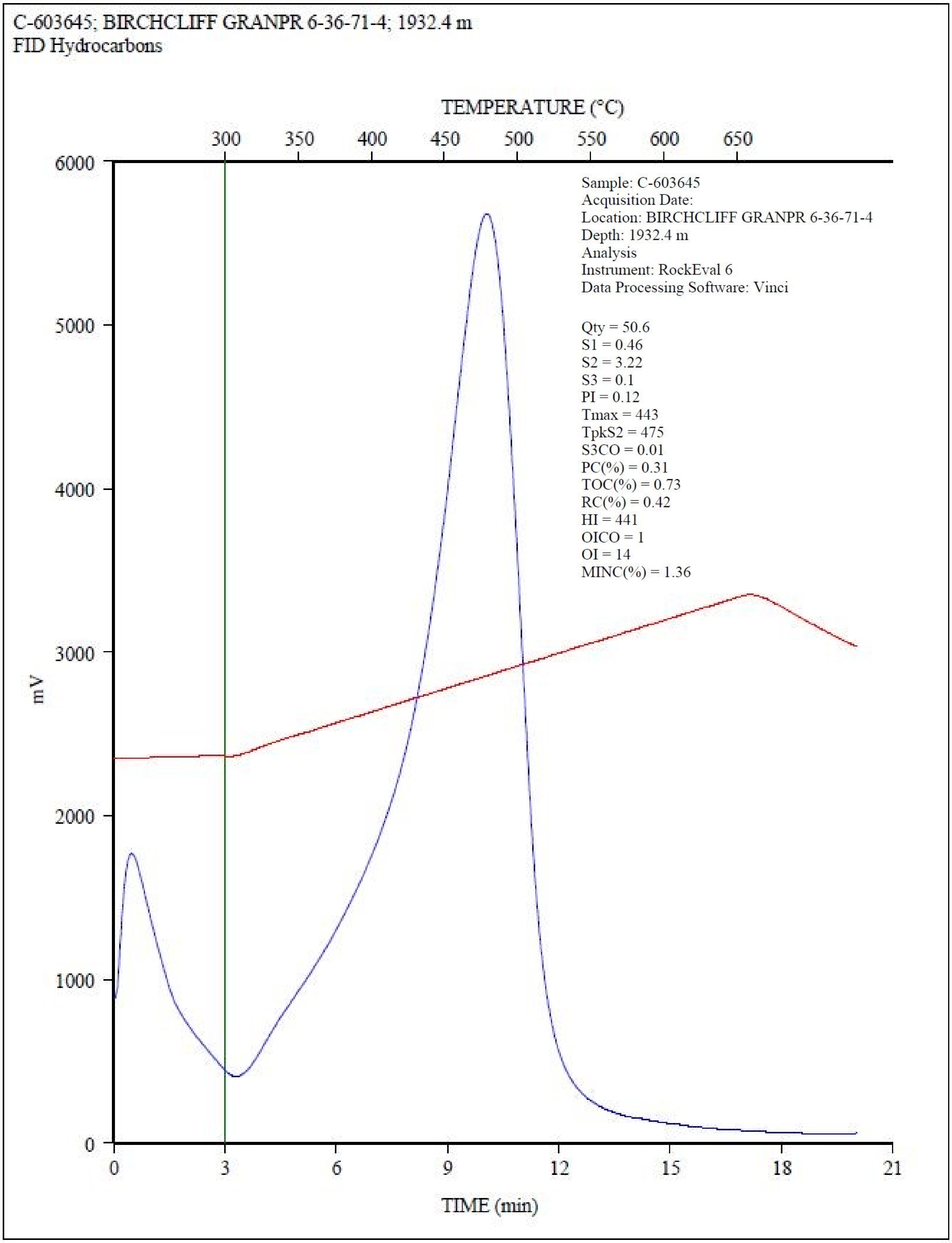

C-603641; BIRCHCLIFF GRANPR 6-36-71-4; 1930.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603641
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1930.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 0.27
S2 = 4.37
S3 = 0.12
PI = 0.06
Tmax = 445
TpkS2 = 477
S3CO = 0.04
PC(%) = 0.39
TOC(%) = 1.11
RC(%) = 0.72
HI = 394
OICO = 4
OI = 11
MINC(%) = 0.94
0
3
6
9
12
15
18
21
TIME (min)

C-603642; BIRCHCLIFF GRANPR 6-36-71-4; 1931.3 m
FID Hydrocarbons



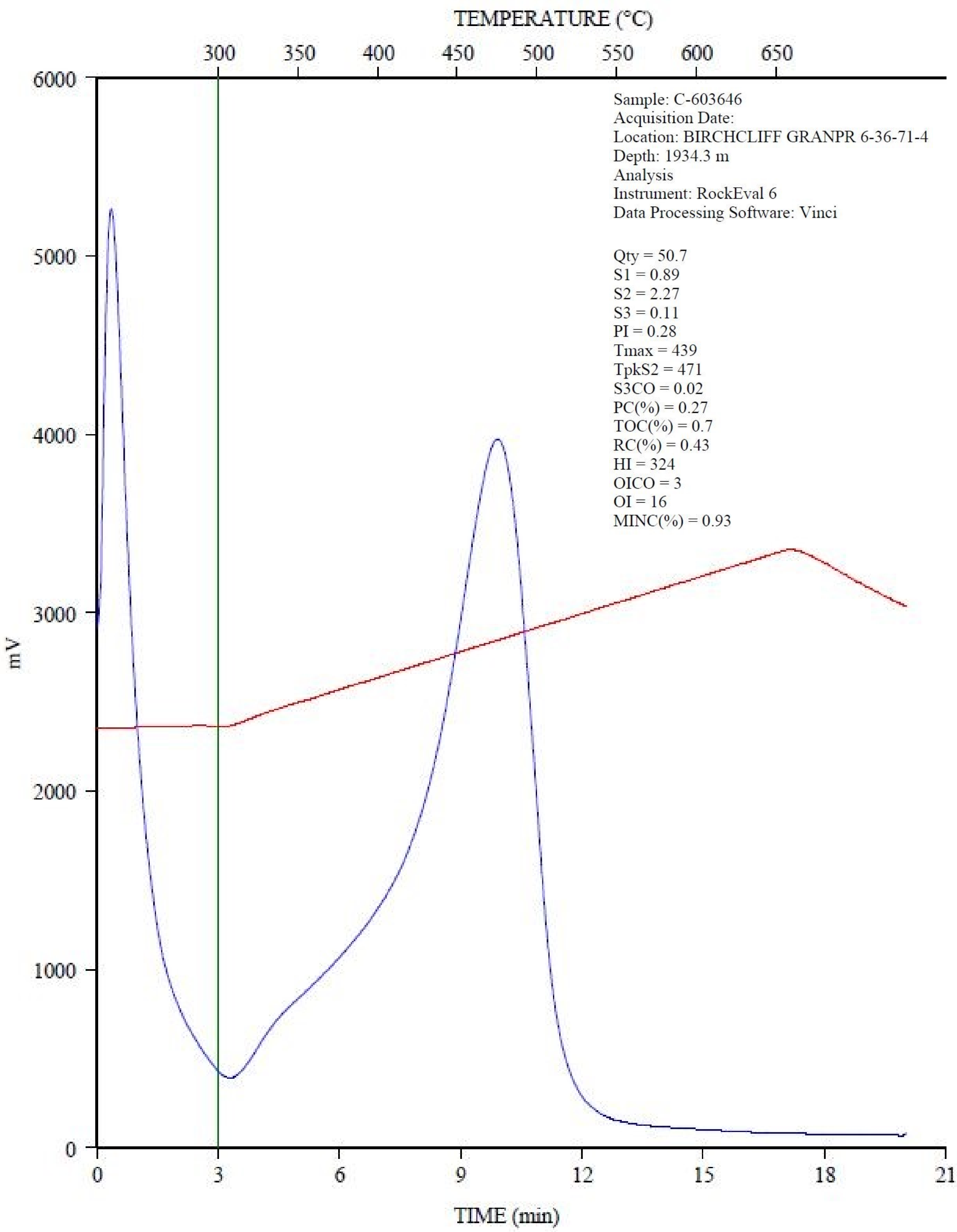

C-603643; BIRCHCLIFF GRANPR 6-36-71-4; 1931.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
mV
0 1000 2000 3000 4000 5000 6000 7000
TIME (min)
0 3 6 9 12 15 18 21
Sample: C-603643
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1931.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.4
S1 = 0.92
S2 = 3.74
S3 = 0.12
PI = 0.2
Tmax = 440
TpkS2 = 472
S3CO = 0.02
PC(%) = 0.4
TOC(%) = 0.89
RC(%) = 0.49
HI = 420
OICO = 2
OI = 13
MINC(%) = 0.98


C-603644; BIRCHCLIFF GRANPR 6-36-71-4; 1932.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603644
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1932.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.42
S2 = 4.7
S3 = 0.11
PI = 0.08
Tmax = 445
TpkS2 = 477
S3CO = 0.01
PC(%) = 0.43
TOC(%) = 1
RC(%) = 0.57
HI = 470
OICO = 1
OI = 11
MINC(%) = 0.93
0
3
6
9
12
15
18
21
TIME (min)

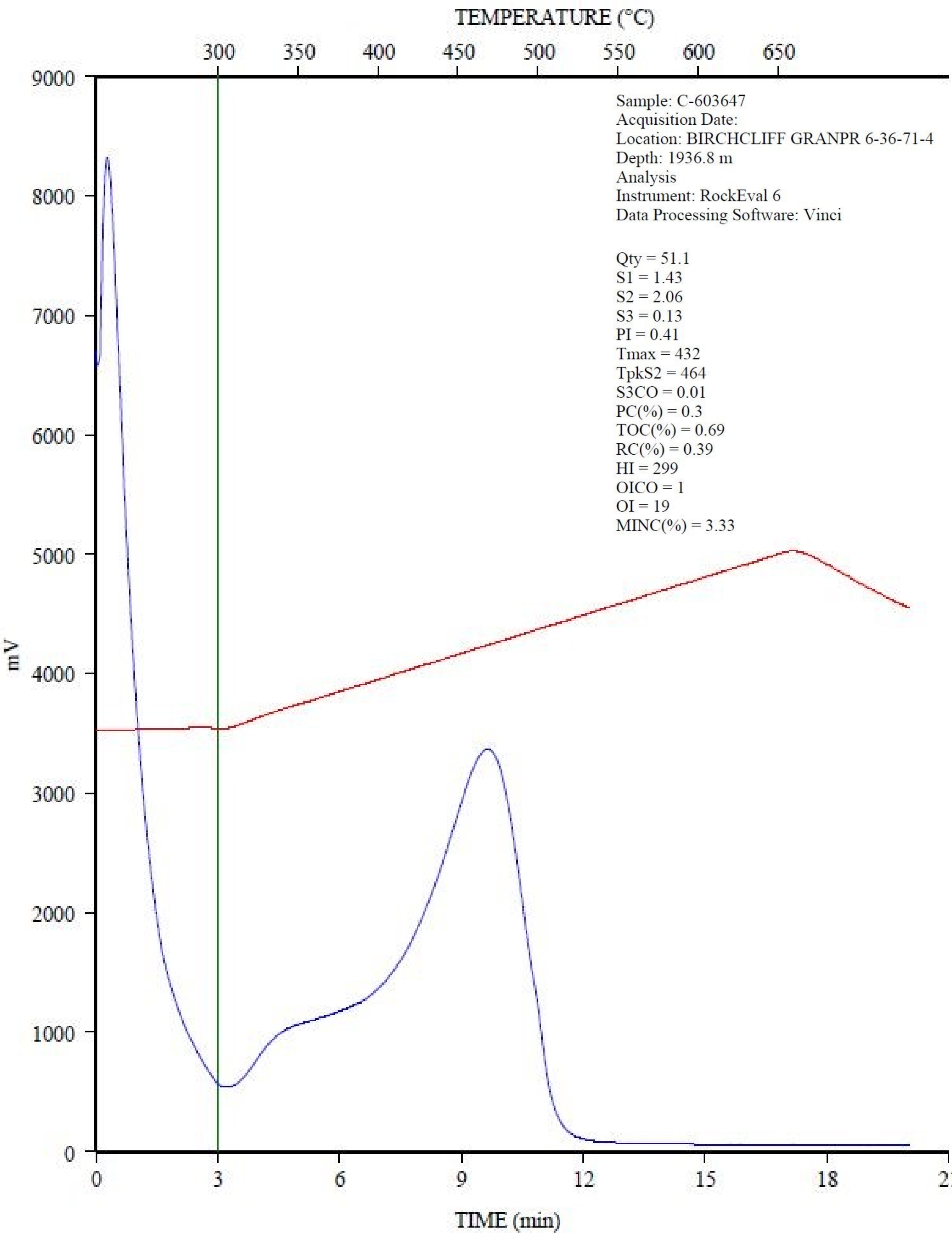


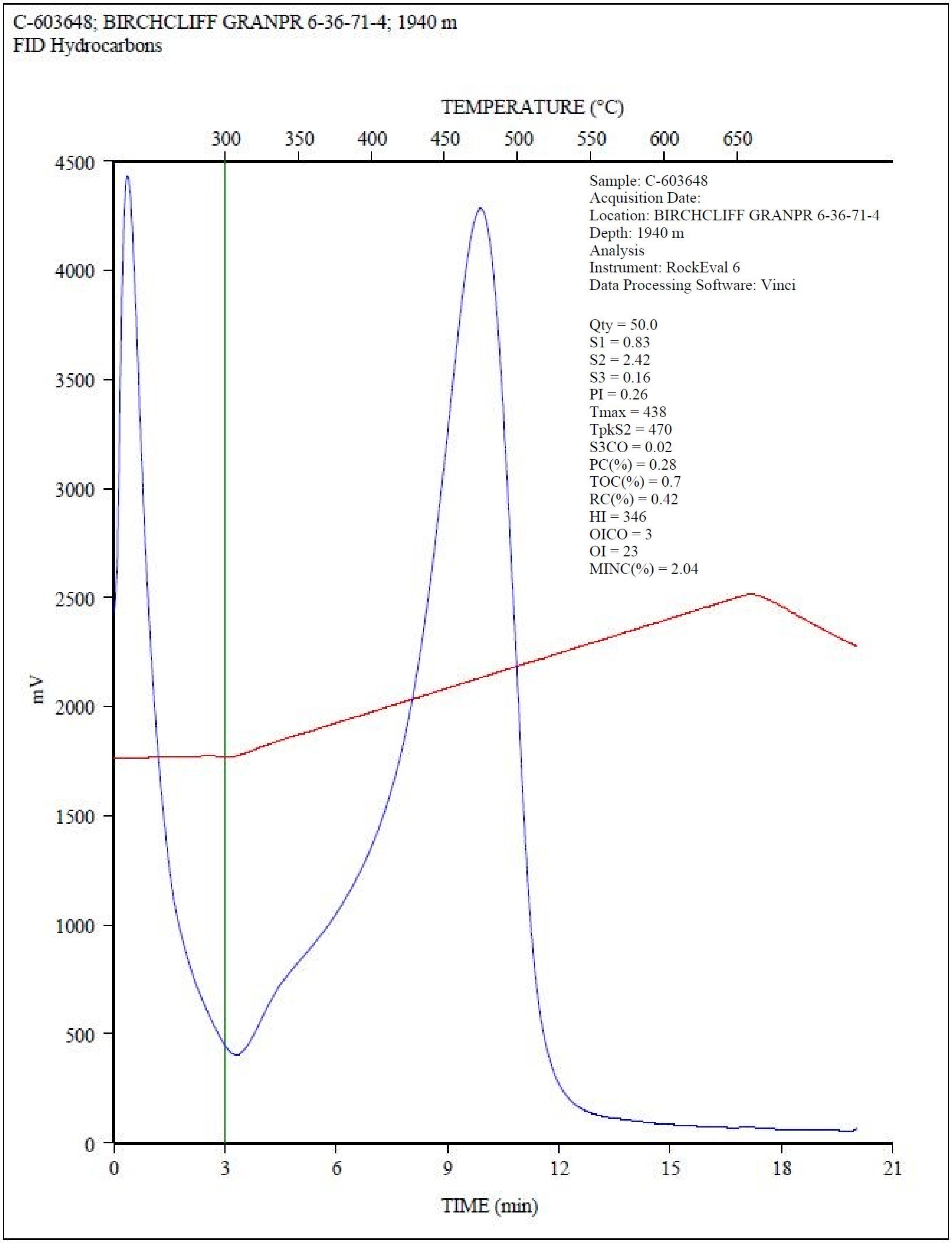
C-603645; BIRCHCLIFF GRANPR 6-36-71-4; 1932.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603645
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1932.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 0.46
S2 = 3.22
S3 = 0.1
PI = 0.12
Tmax = 443
TpkS2 = 475
S3CO = 0.01
PC(%) = 0.31
TOC(%) = 0.73
RC(%) = 0.42
HI = 441
OICO = 1
OI = 14
MINC(%) = 1.36
mV
6000
5000
4000
3000
2000
1000
0
0
3
6
9
12
15
18
21
TIME (min)

C-603646; BIRCHCLIFF GRANPR 6-36-71-4; 1934.3 m
FID Hydrocarbons

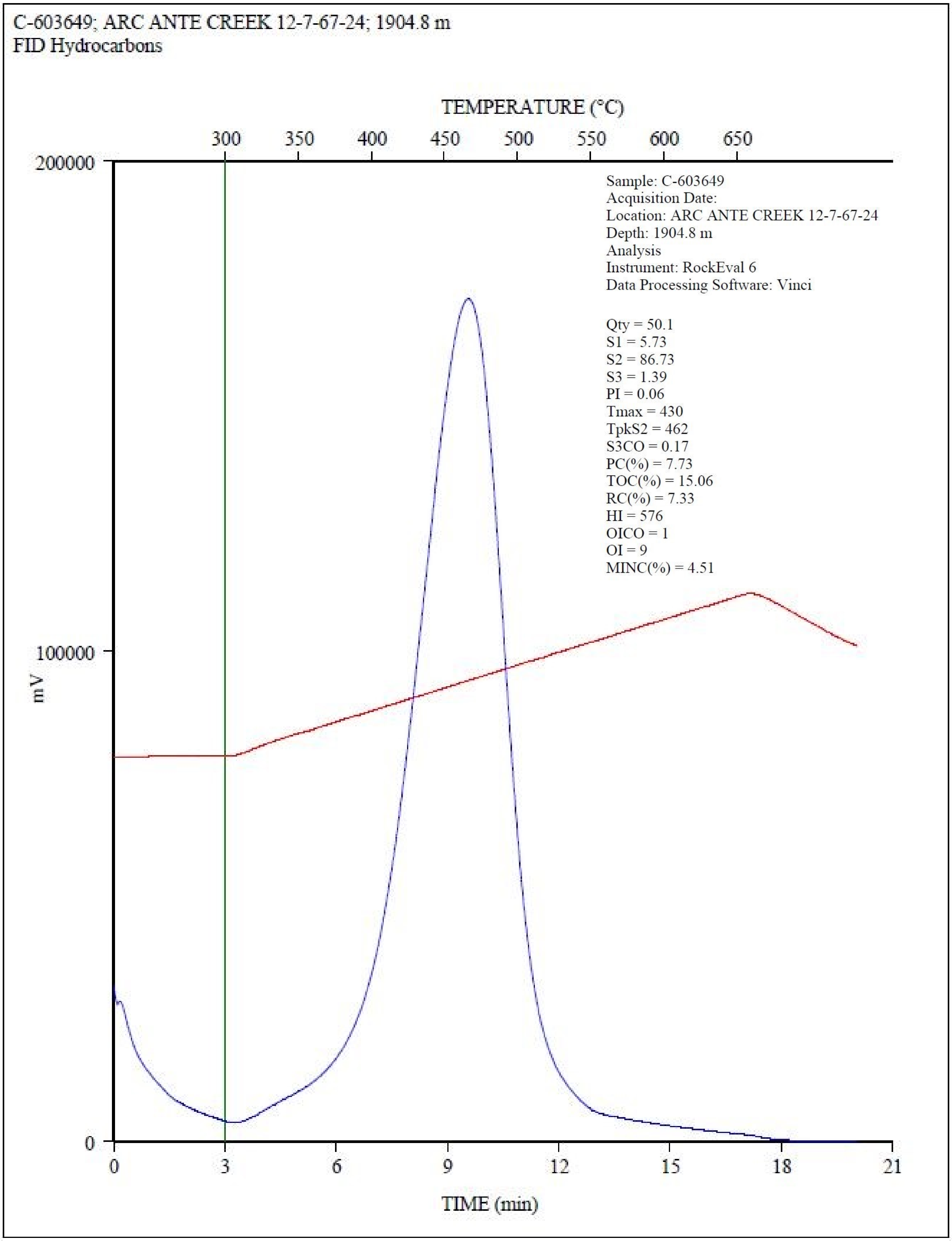


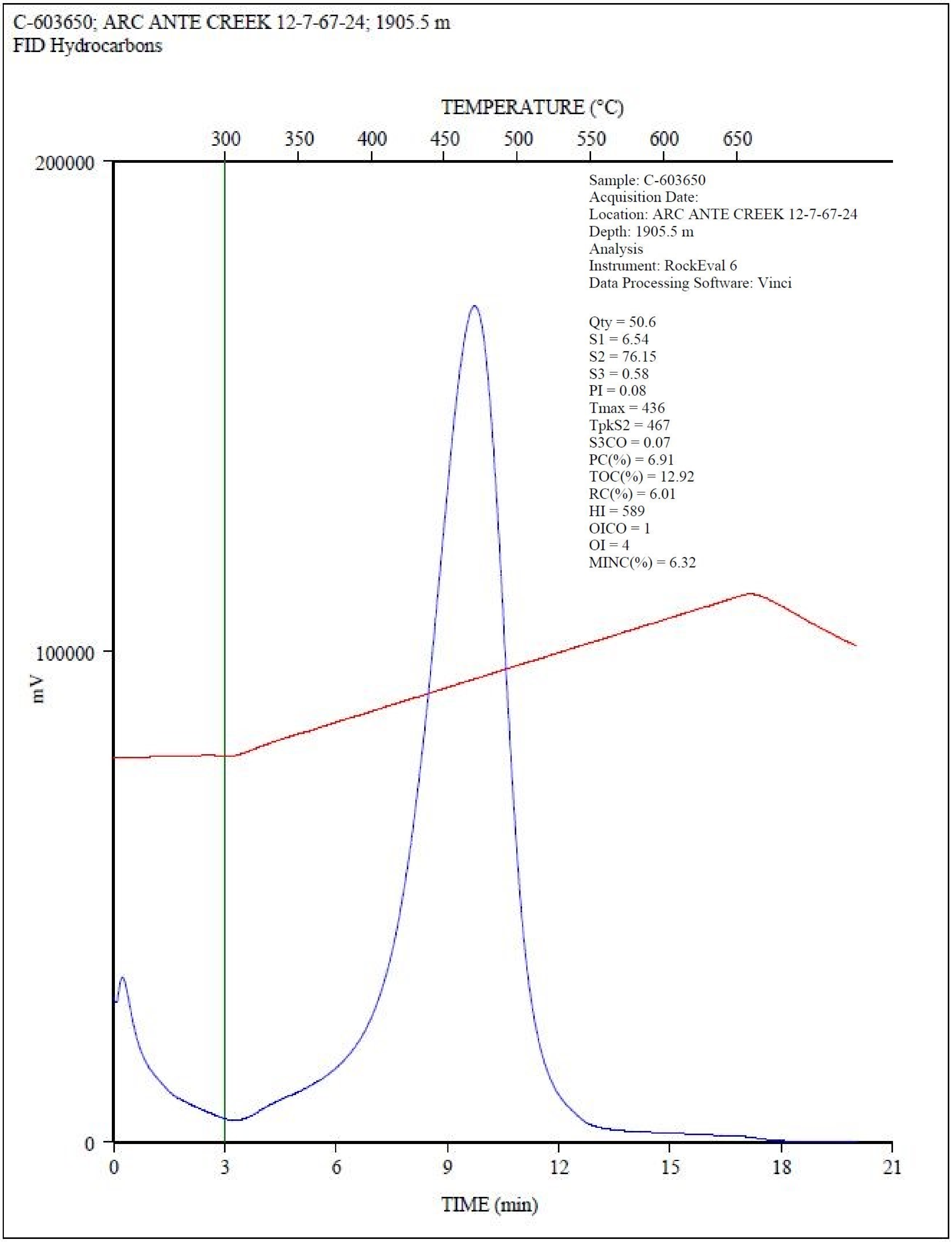
C-603647; BIRCHCLIFF GRANPR 6-36-71-4; 1936.8 m
FID Hydrocarbons

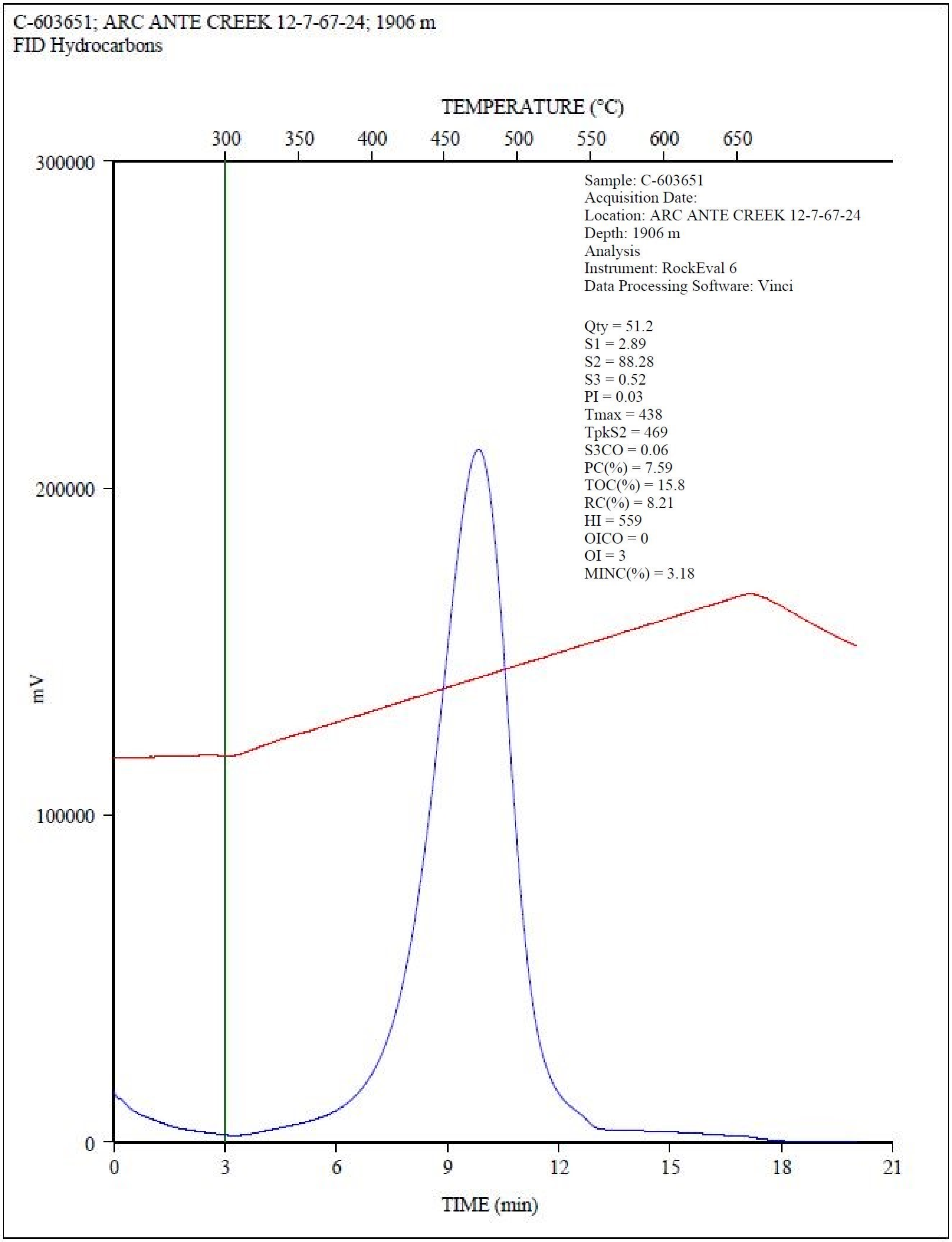




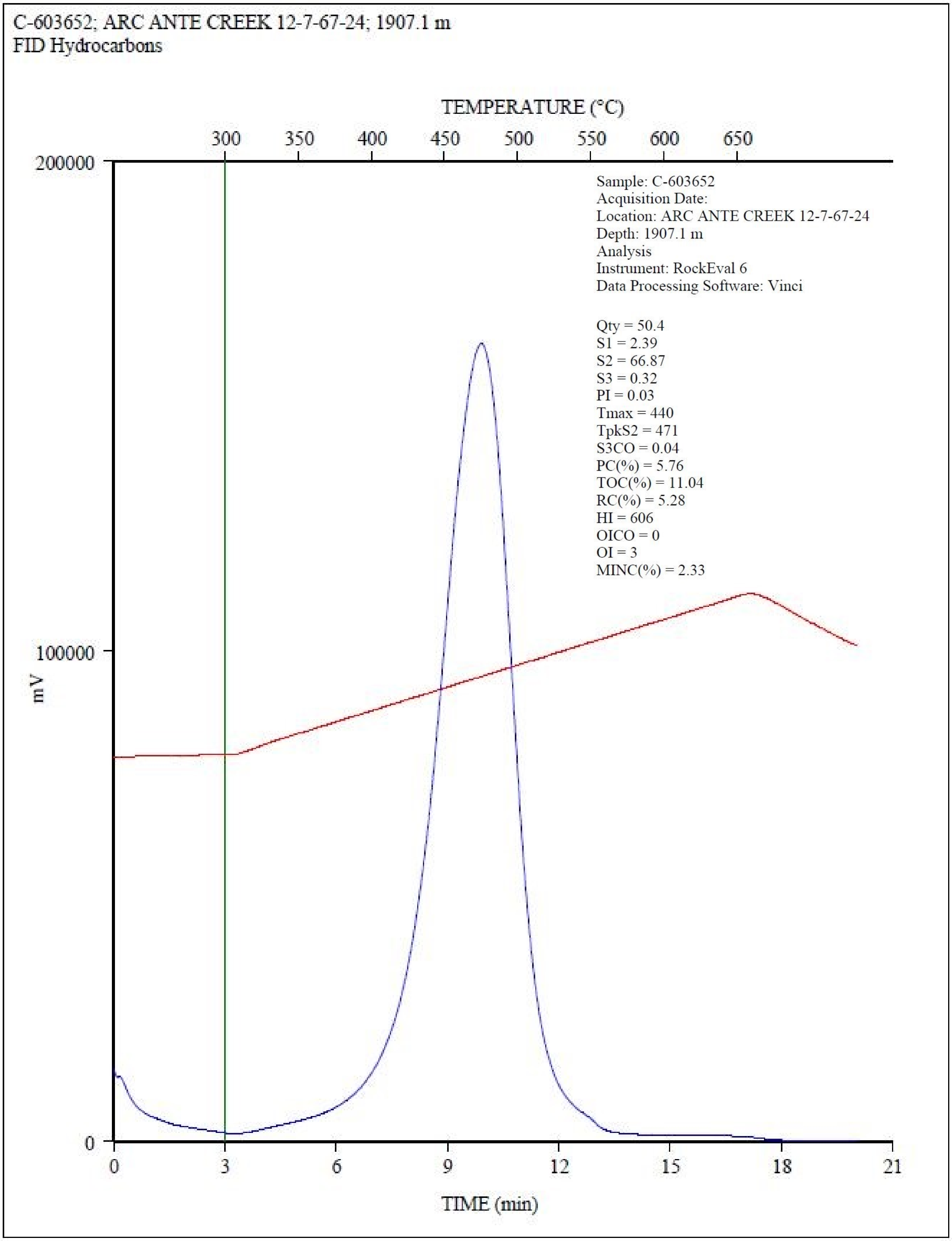
C-603648; BIRCHCLIFF GRANPR 6-36-71-4; 1940 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603648
Acquisition Date:
Location: BIRCHCLIFF GRANPR 6-36-71-4
Depth: 1940 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.0
S1 = 0.83
S2 = 2.42
S3 = 0.16
PI = 0.26
Tmax = 438
TpkS2 = 470
S3CO = 0.02
PC(%) = 0.28
TOC(%) = 0.7
RC(%) = 0.42
HI = 346
OICO = 3
OI = 23
MINC(%) = 2.04

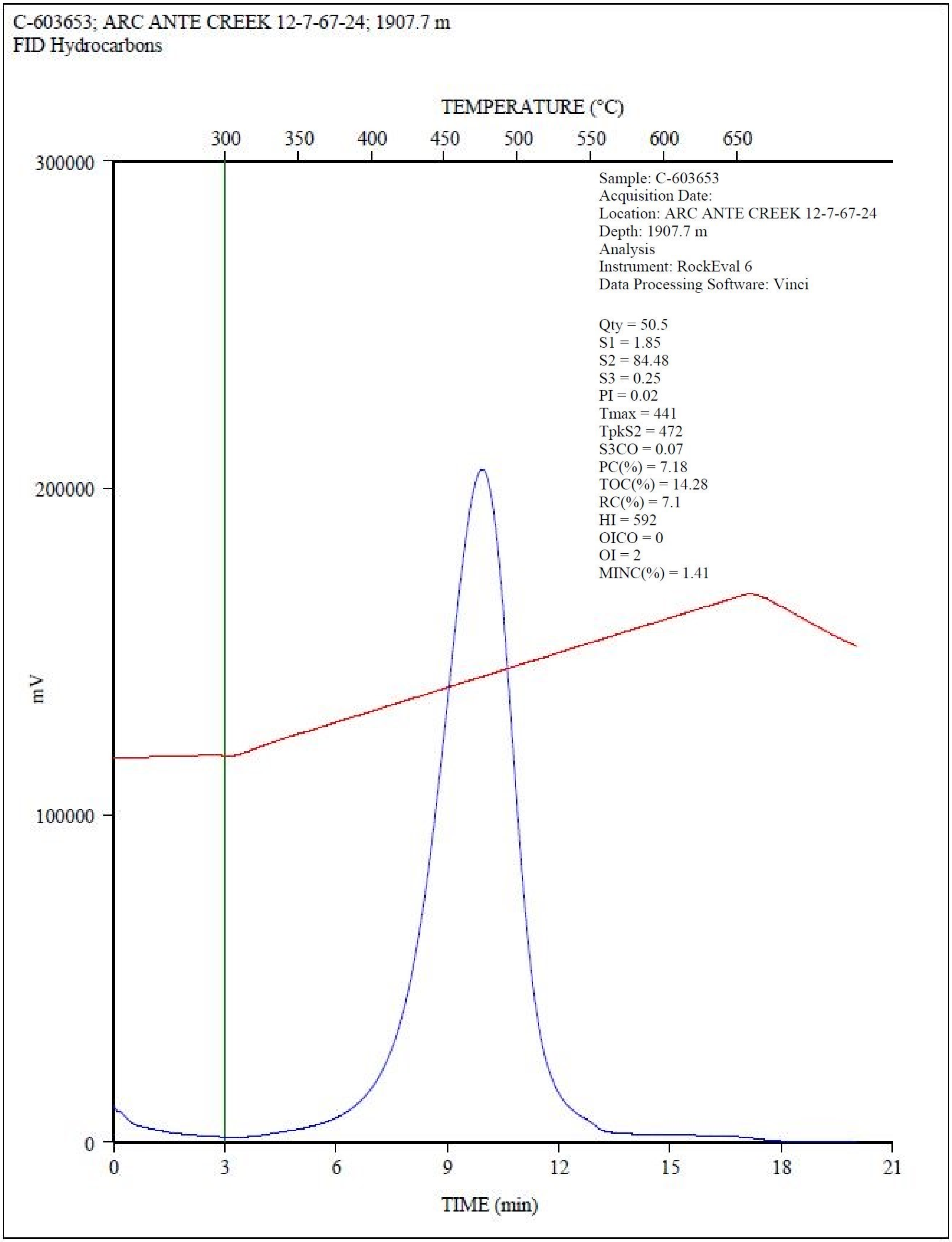

C-603649; ARC ANTE CREEK 12-7-67-24; 1904.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
200000
100000
0
mV
Sample: C-603649
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1904.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 5.73
S2 = 86.73
S3 = 1.39
PI = 0.06
Tmax = 430
TpkS2 = 462
S3CO = 0.17
PC(%) = 7.73
TOC(%) = 15.06
RC(%) = 7.33
HI = 576
OICO = 1
OI = 9
MINC(%) = 4.51
0
3
6
9
12
15
18
21
TIME (min)

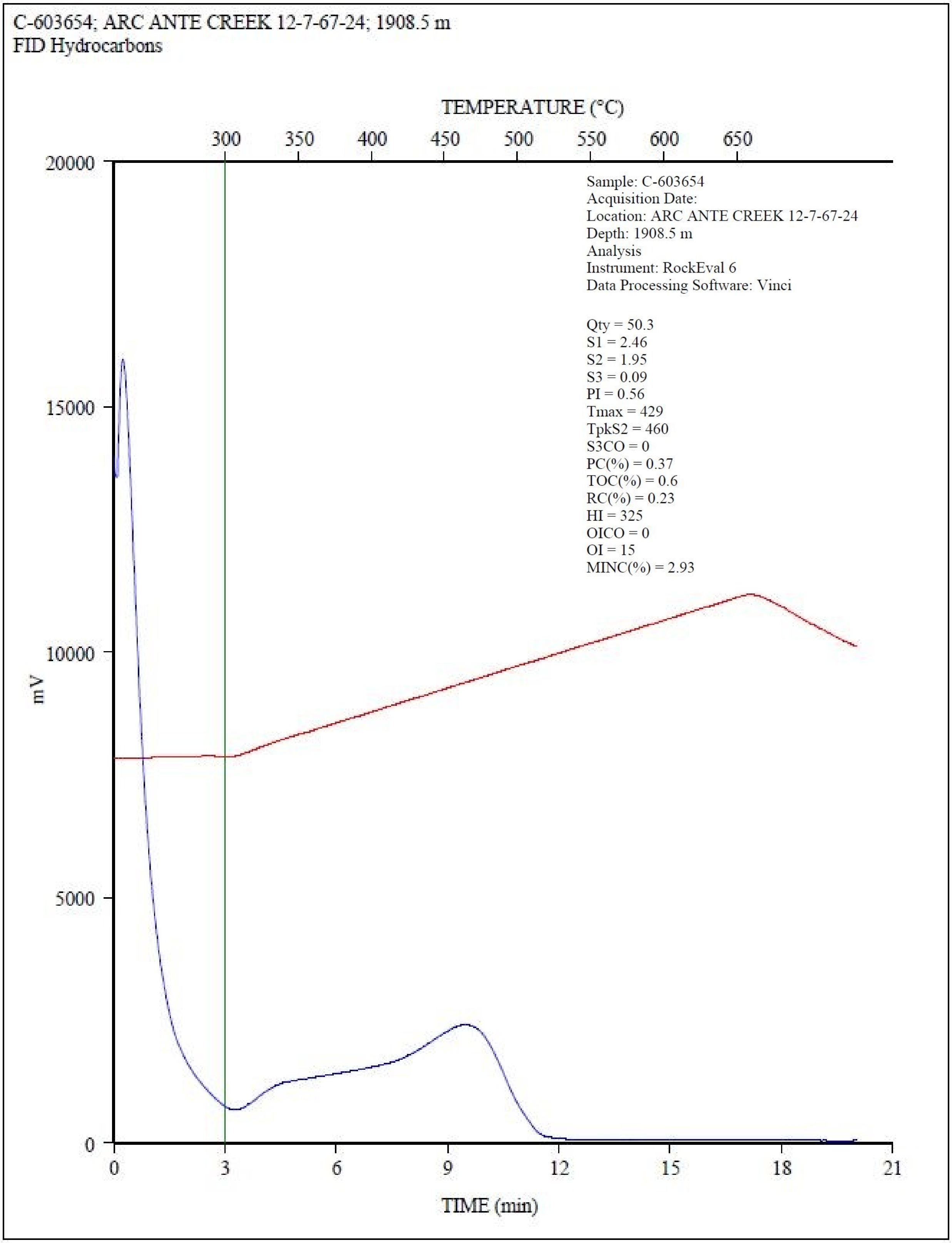

C-603650; ARC ANTE CREEK 12-7-67-24; 1905.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
200000
100000
0
mV
Sample: C-603650
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1905.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 6.54
S2 = 76.15
S3 = 0.58
PI = 0.08
Tmax = 436
TpkS2 = 467
S3CO = 0.07
PC(%) = 6.91
TOC(%) = 12.92
RC(%) = 6.01
HI = 589
OICO = 1
OI = 4
MINC(%) = 6.32
0
3
6
9
12
15
18
21
TIME (min)

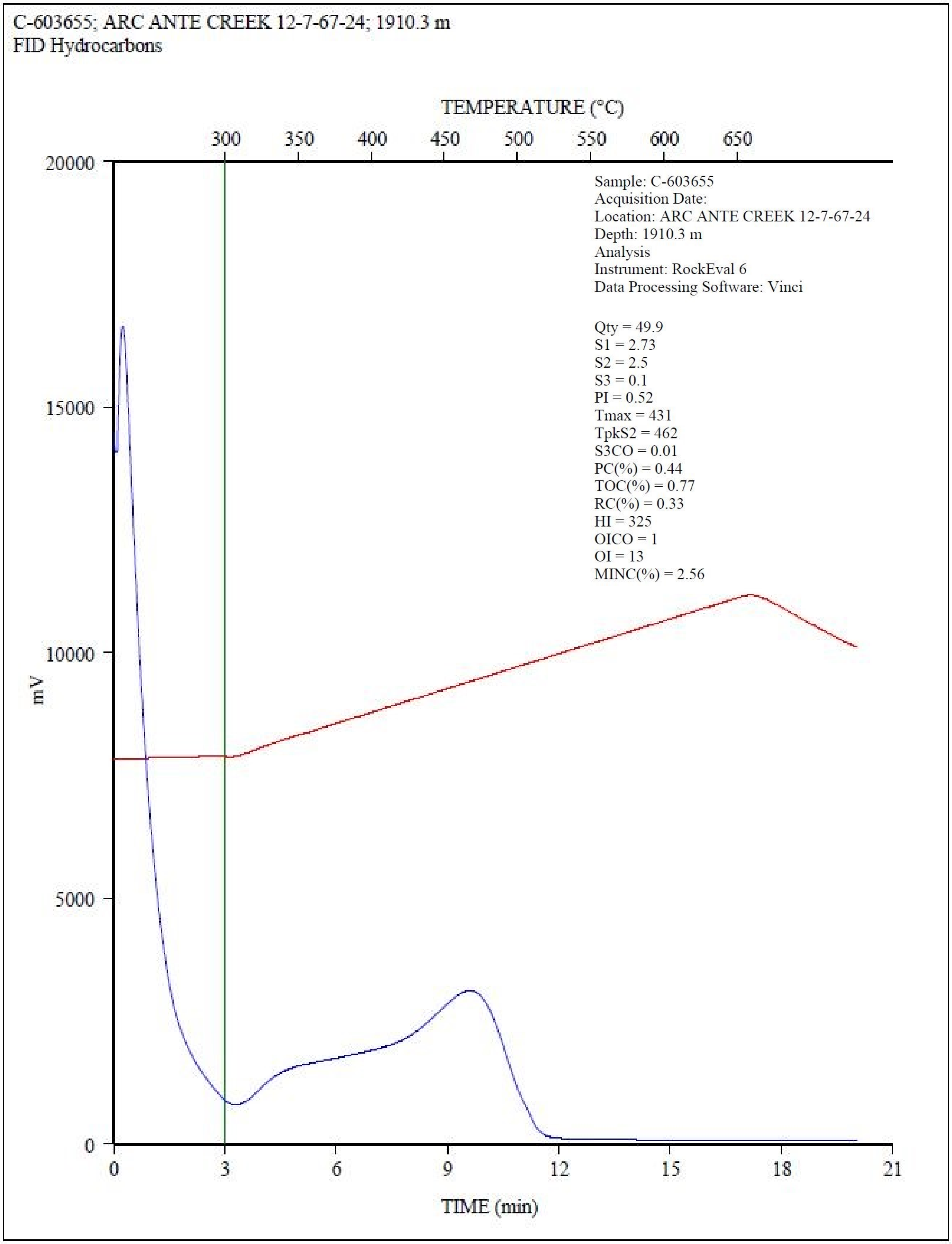


C-603651; ARC ANTE CREEK 12-7-67-24; 1906 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
300000
200000
100000
0
mV
Sample: C-603651
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1906 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 2.89
S2 = 88.28
S3 = 0.52
PI = 0.03
Tmax = 438
TpkS2 = 469
S3CO = 0.06
PC(%) = 7.59
TOC(%) = 15.8
RC(%) = 8.21
HI = 559
OICO = 0
OI = 3
MINC(%) = 3.18
0
3
6
9
12
15
18
21
TIME (min)

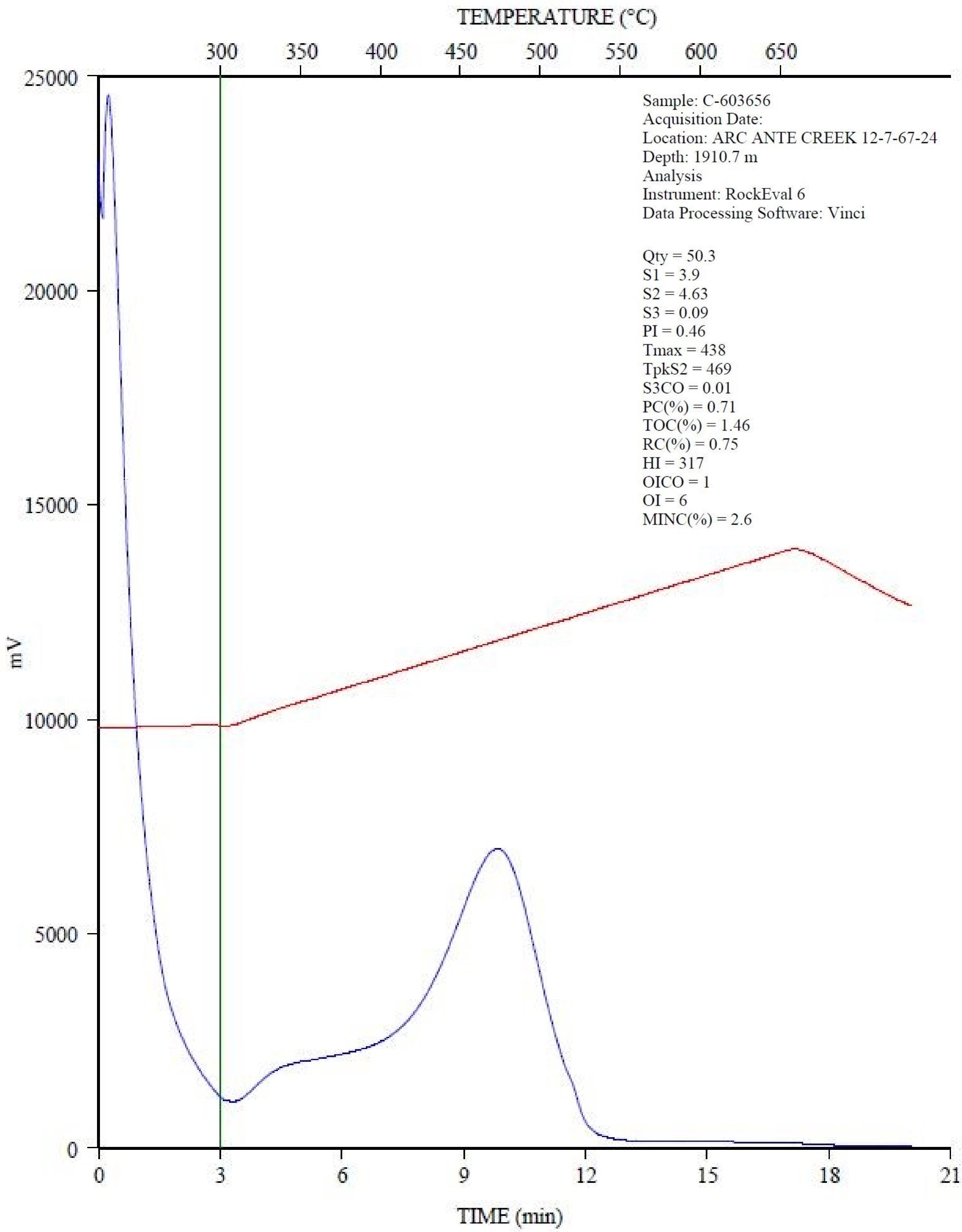

C-603652; ARC ANTE CREEK 12-7-67-24; 1907.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
200000
100000
0
mV
Sample: C-603652
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1907.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.4
S1 = 2.39
S2 = 66.87
S3 = 0.32
PI = 0.03
Tmax = 440
TpkS2 = 471
S3CO = 0.04
PC(%) = 5.76
TOC(%) = 11.04
RC(%) = 5.28
HI = 606
OICO = 0
OI = 3
MINC(%) = 2.33
0
3
6
9
12
15
18
21
TIME (min)

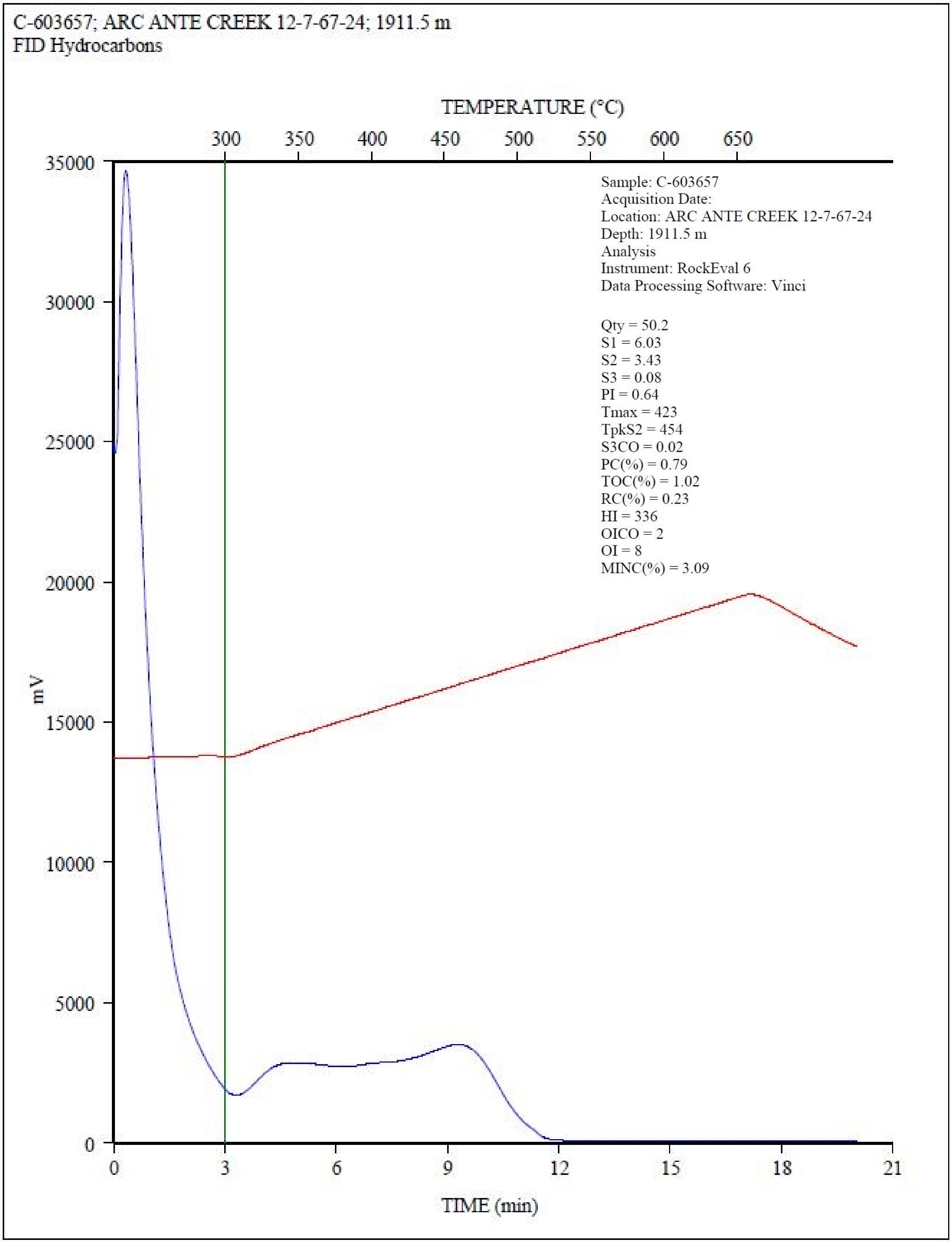

C-603653; ARC ANTE CREEK 12-7-67-24; 1907.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
300000
200000
100000
0
mV
Sample: C-603653
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1907.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 1.85
S2 = 84.48
S3 = 0.25
PI = 0.02
Tmax = 441
TpkS2 = 472
S3CO = 0.07
PC(%) = 7.18
TOC(%) = 14.28
RC(%) = 7.1
HI = 592
OICO = 0
OI = 2
MINC(%) = 1.41
0
3
6
9
12
15
18
21
TIME (min)


C-603654; ARC ANTE CREEK 12-7-67-24; 1908.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603654
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1908.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 2.46
S2 = 1.95
S3 = 0.09
PI = 0.56
Tmax = 429
TpkS2 = 460
S3CO = 0
PC(%) = 0.37
TOC(%) = 0.6
RC(%) = 0.23
HI = 325
OICO = 0
OI = 15
MINC(%) = 2.93
0
3
6
9
12
15
18
21
TIME (min)

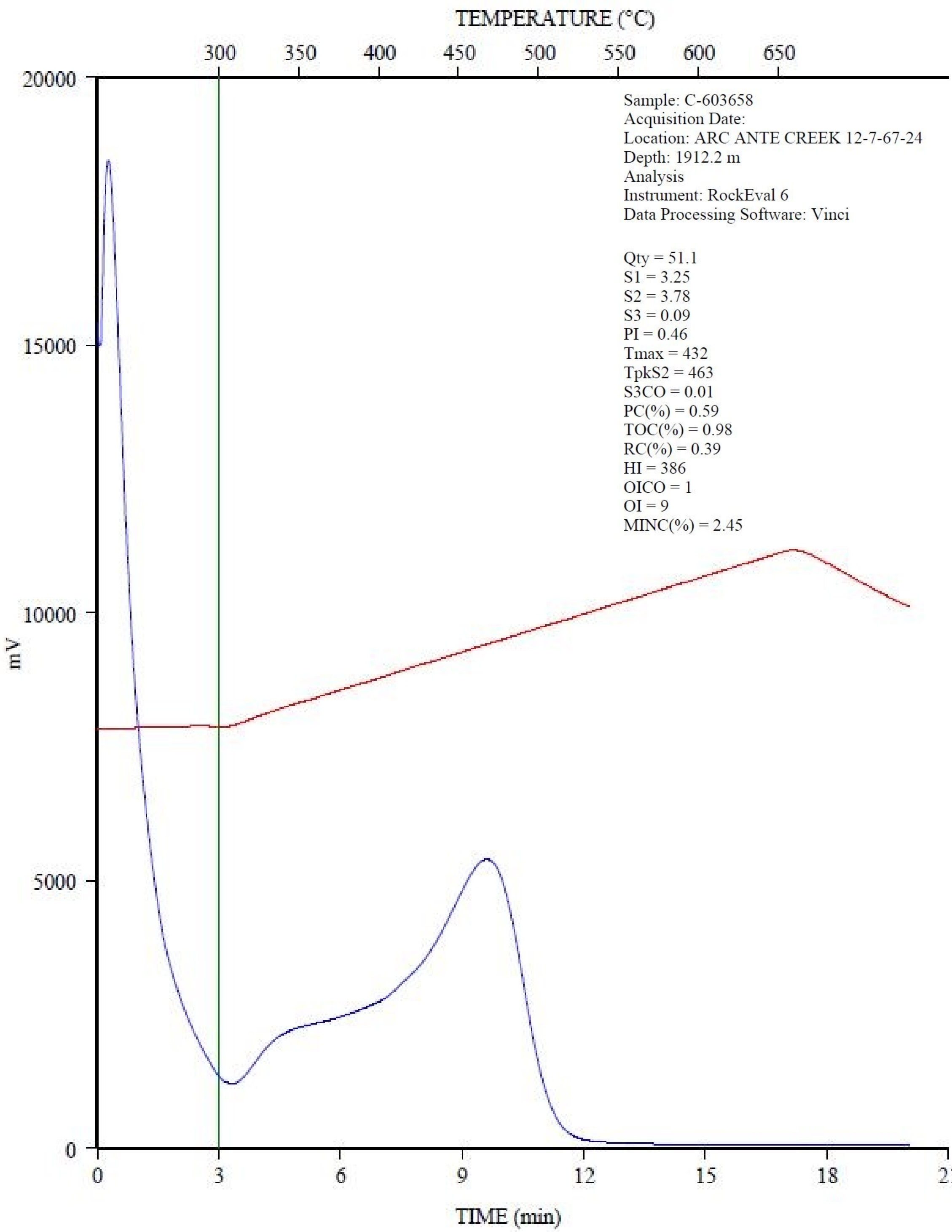

C-603655; ARC ANTE CREEK 12-7-67-24; 1910.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603655
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1910.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 49.9
S1 = 2.73
S2 = 2.5
S3 = 0.1
PI = 0.52
Tmax = 431
TpkS2 = 462
S3CO = 0.01
PC(%) = 0.44
TOC(%) = 0.77
RC(%) = 0.33
HI = 325
OICO = 1
OI = 13
MINC(%) = 2.56
0
3
6
9
12
15
18
21
TIME (min)

C-603656; ARC ANTE CREEK 12-7-67-24; 1910.7 m
FID Hydrocarbons

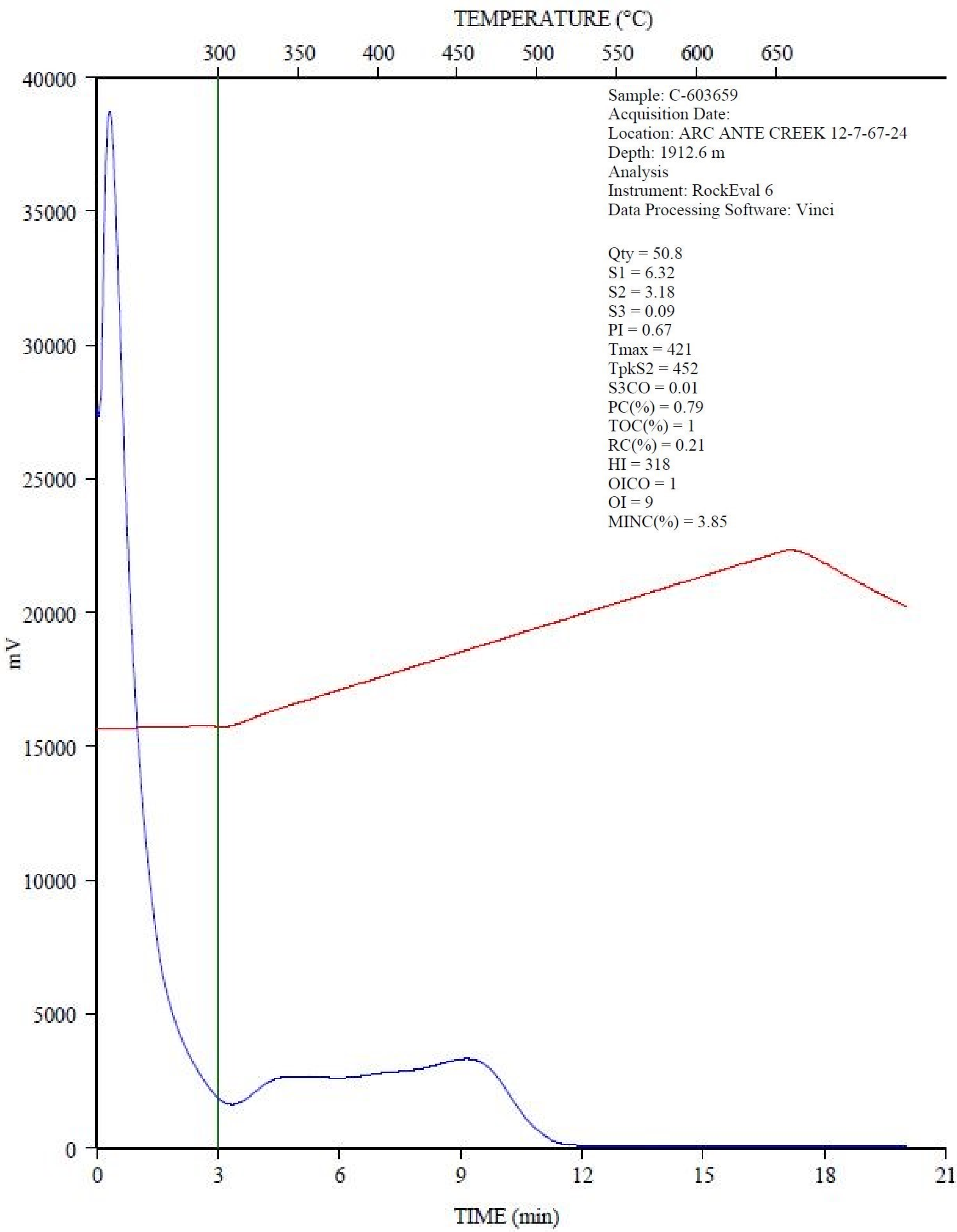


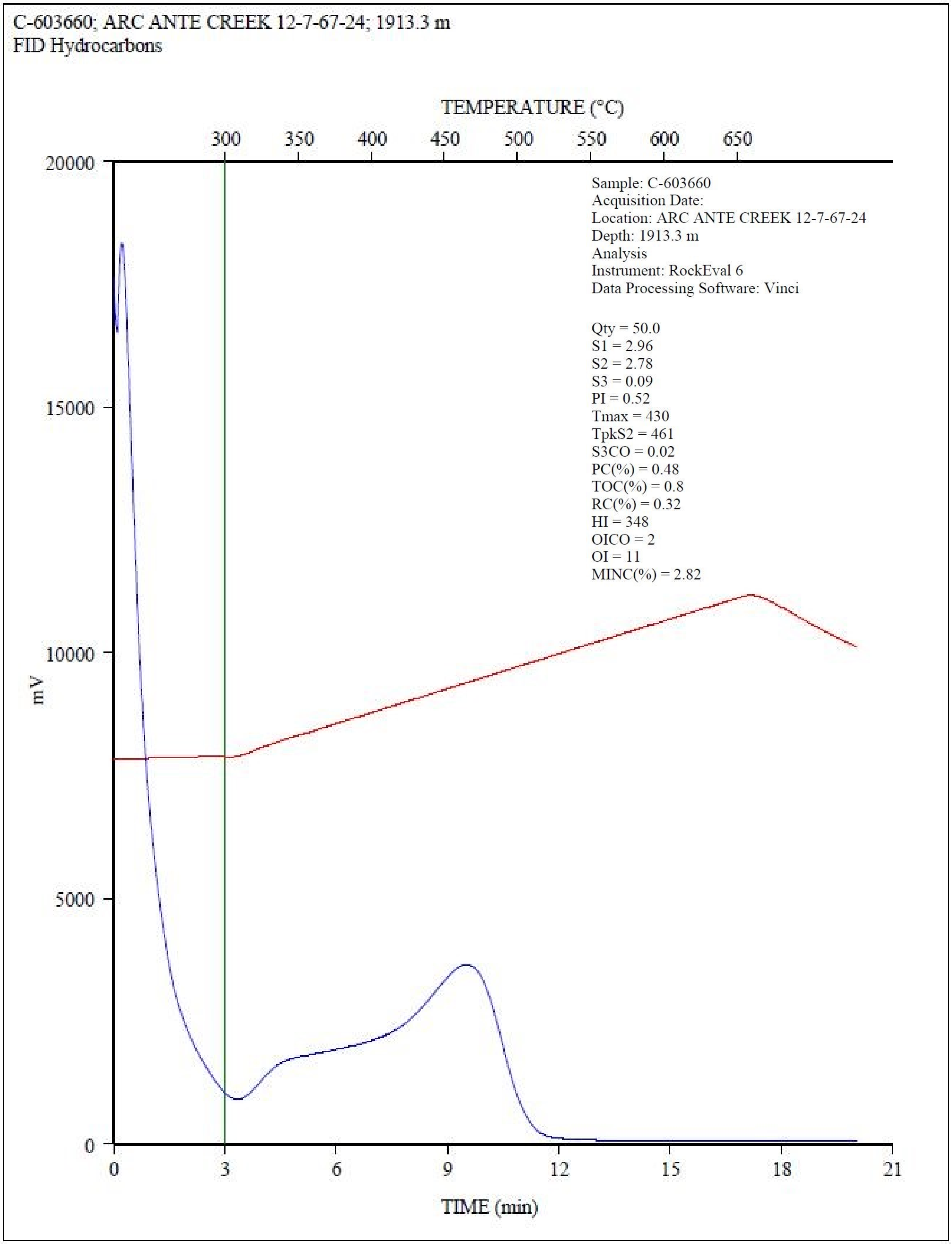

C-603657; ARC ANTE CREEK 12-7-67-24; 1911.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
35000
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603657
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1911.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 6.03
S2 = 3.43
S3 = 0.08
PI = 0.64
Tmax = 423
TpkS2 = 454
S3CO = 0.02
PC(%) = 0.79
TOC(%) = 1.02
RC(%) = 0.23
HI = 336
OICO = 2
OI = 8
MINC(%) = 3.09
0
3
6
9
12
15
18
21
TIME (min)

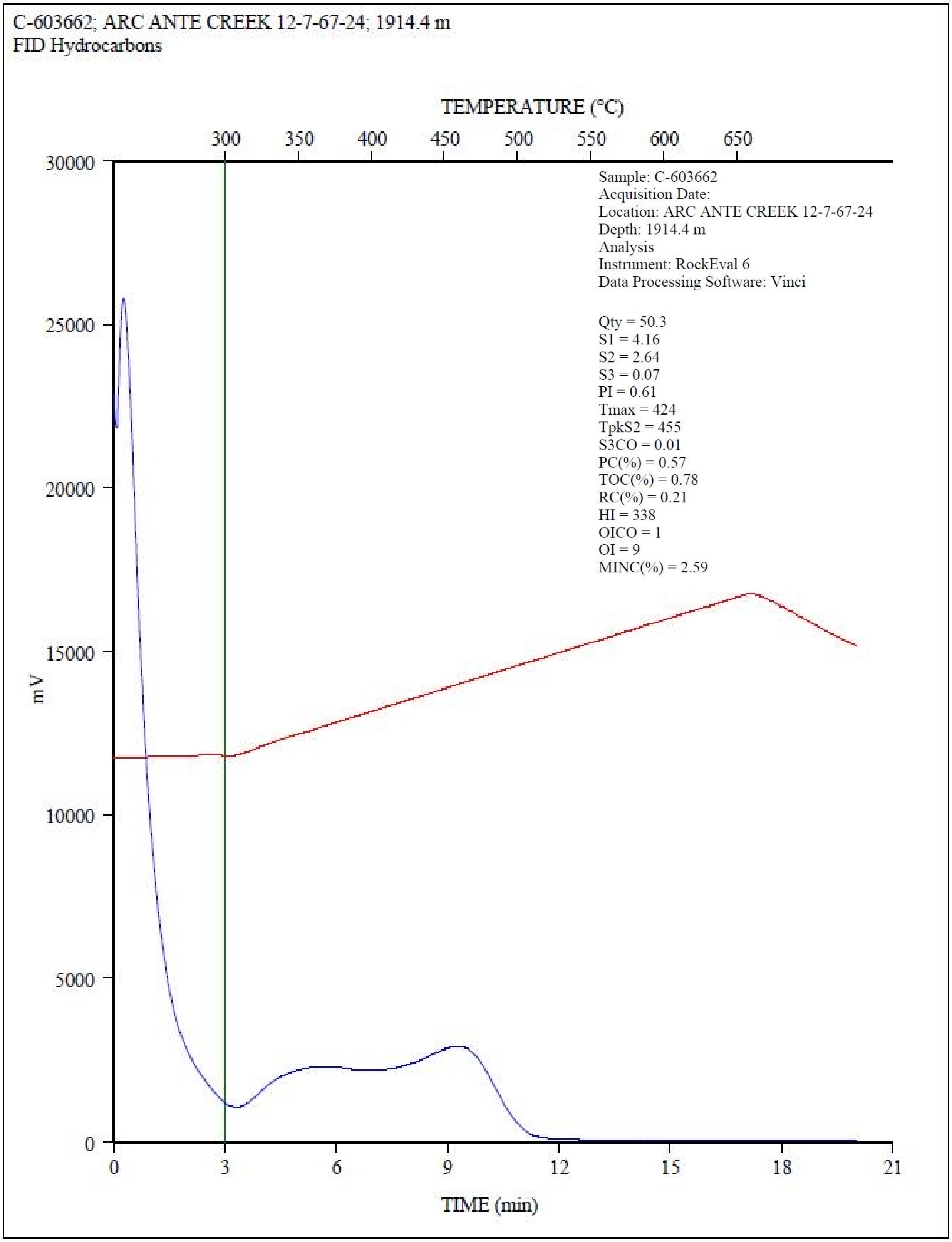
C-603658; ARC ANTE CREEK 12-7-67-24; 1912.2 m
FID Hydrocarbons

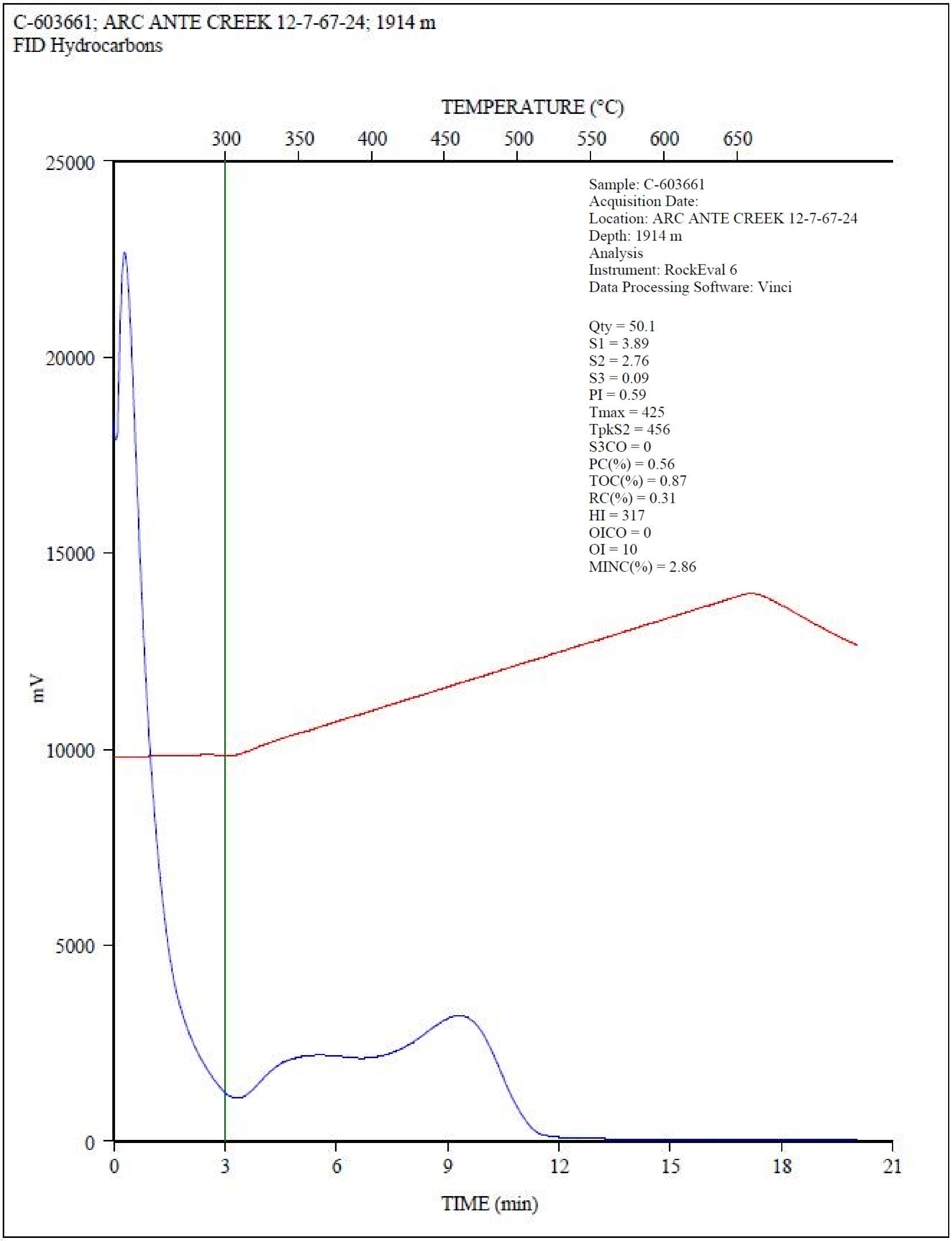


C-603659; ARC ANTE CREEK 12-7-67-24; 1912.6 m
FID Hydrocarbons

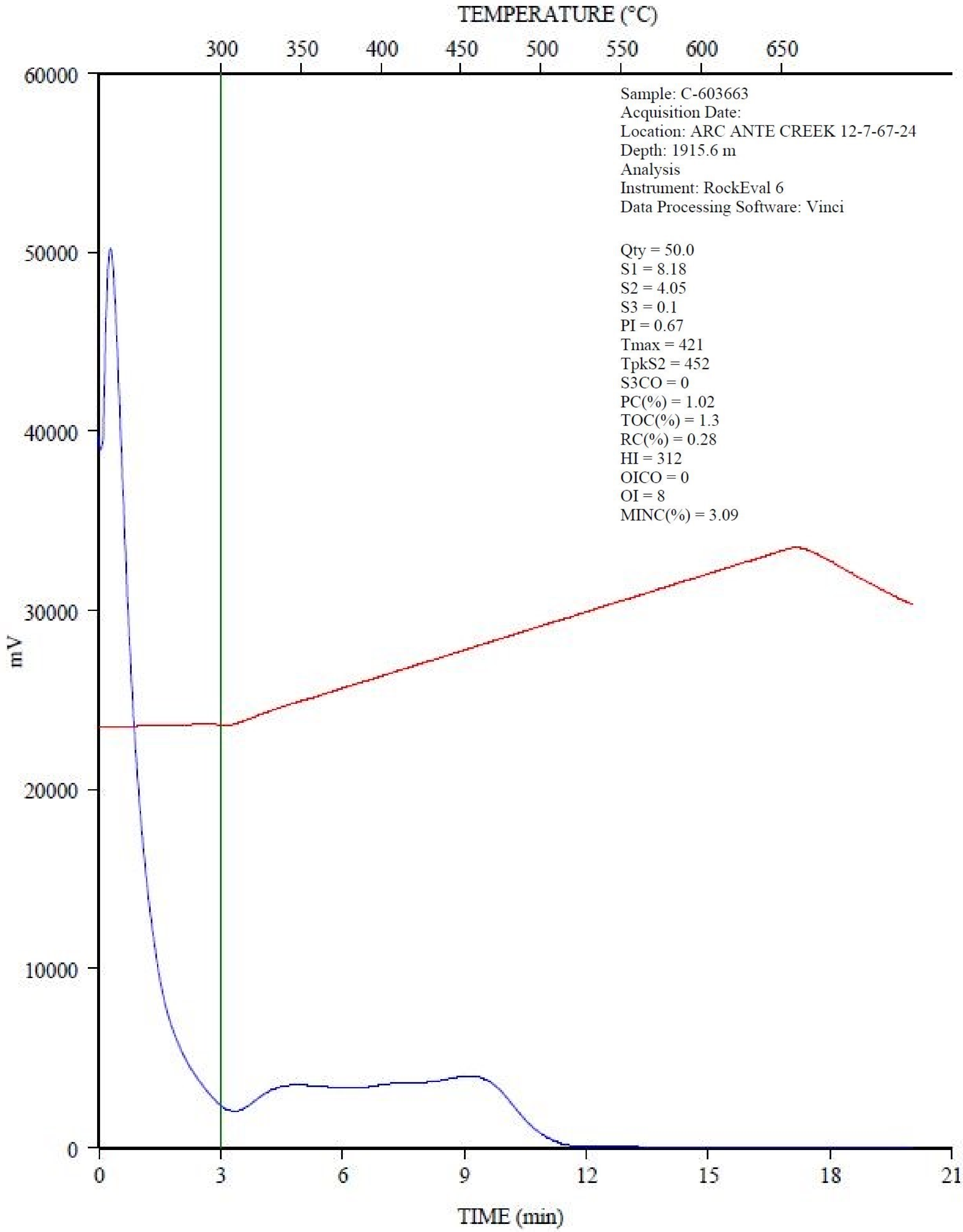


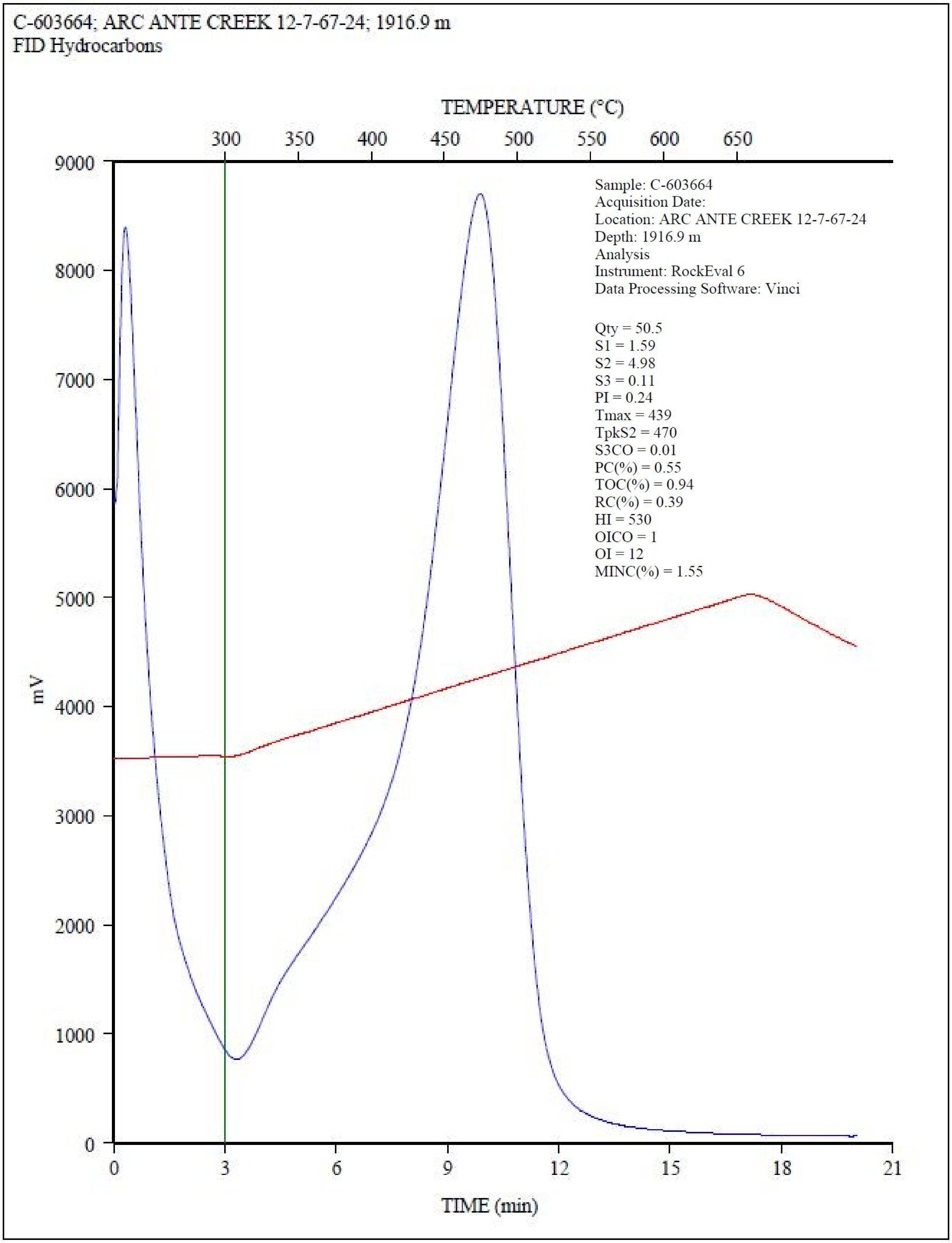

C-603660; ARC ANTE CREEK 12-7-67-24; 1913.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603660
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1913.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.0
S1 = 2.96
S2 = 2.78
S3 = 0.09
PI = 0.52
Tmax = 430
TpkS2 = 461
S3CO = 0.02
PC(%) = 0.48
TOC(%) = 0.8
RC(%) = 0.32
HI = 348
OICO = 2
OI = 11
MINC(%) = 2.82
0
3
6
9
12
15
18
21
TIME (min)


C-603662; ARC ANTE CREEK 12-7-67-24; 1914.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603662
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1914.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 4.16
S2 = 2.64
S3 = 0.07
PI = 0.61
Tmax = 424
TpkS2 = 455
S3CO = 0.01
PC(%) = 0.57
TOC(%) = 0.78
RC(%) = 0.21
HI = 338
OICO = 1
OI = 9
MINC(%) = 2.59
0
3
6
9
12
15
18
21
TIME (min)


C-603661; ARC ANTE CREEK 12-7-67-24; 1914 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
25000 20000 15000 10000 5000 0
mV
Sample: C-603661
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1914 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 3.89
S2 = 2.76
S3 = 0.09
PI = 0.59
Tmax = 425
TpkS2 = 456
S3CO = 0
PC(%) = 0.56
TOC(%) = 0.87
RC(%) = 0.31
HI = 317
OICO = 0
OI = 10
MINC(%) = 2.86
0 3 6 9 12 15 18 21
TIME (min)

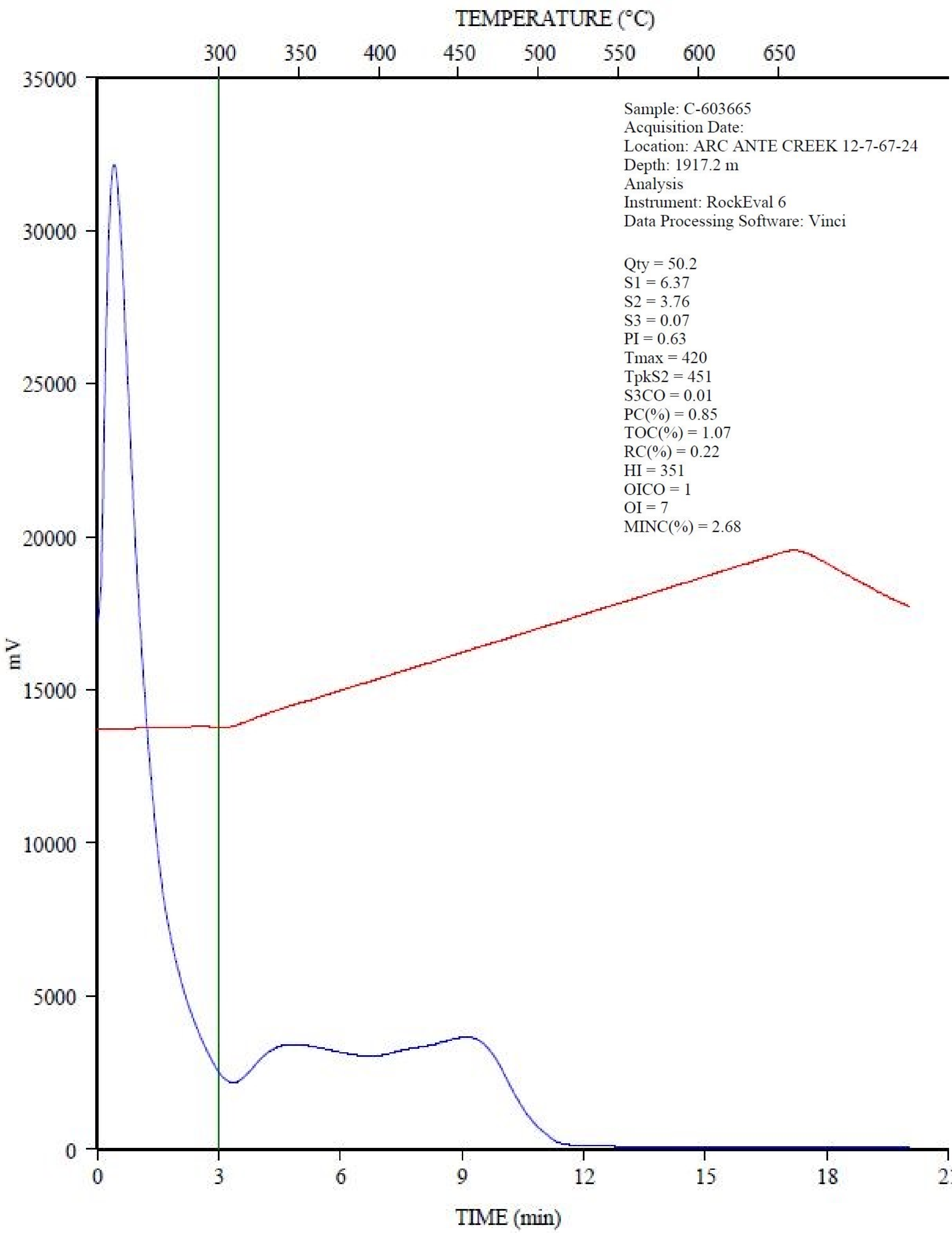
C-603663; ARC ANTE CREEK 12-7-67-24; 1915.6 m
FID Hydrocarbons



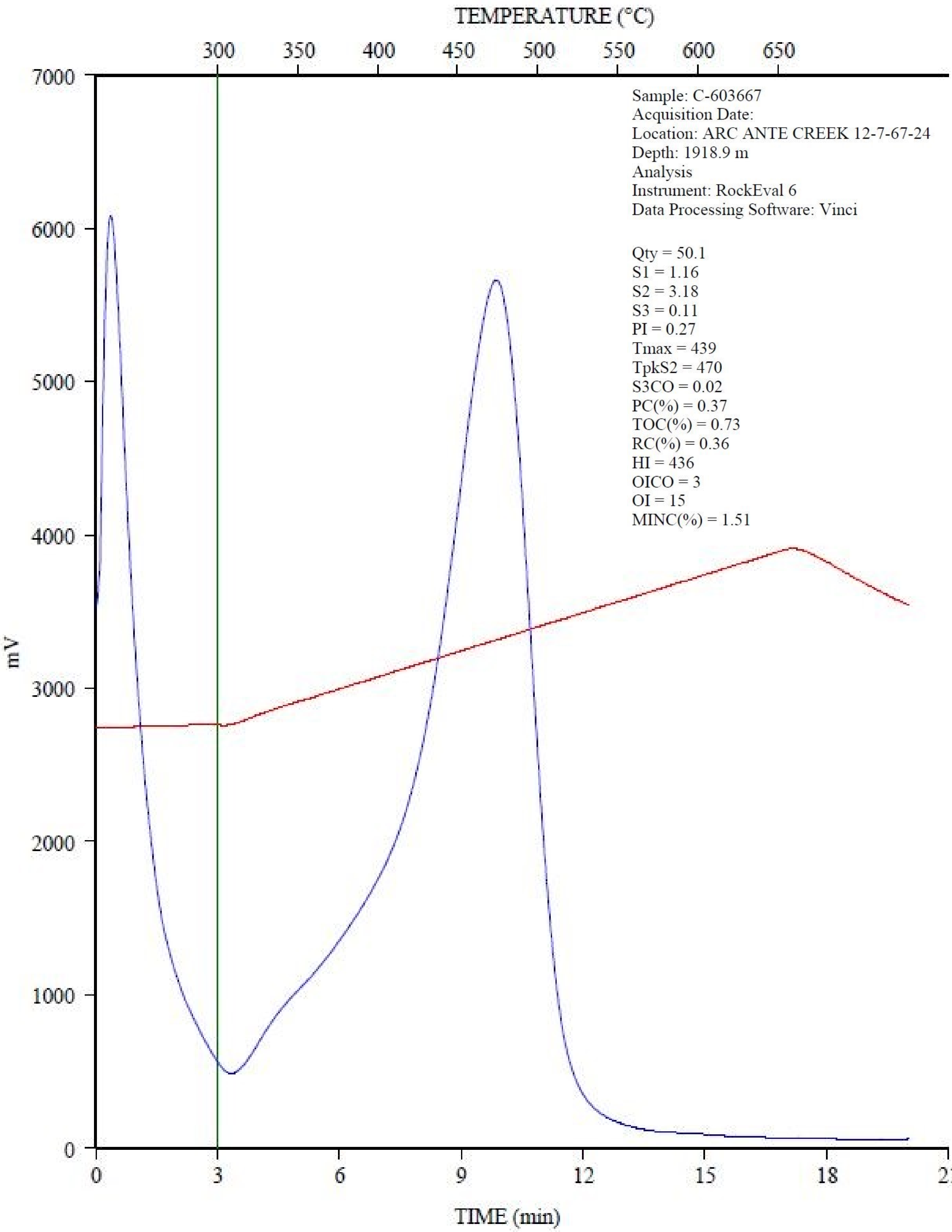


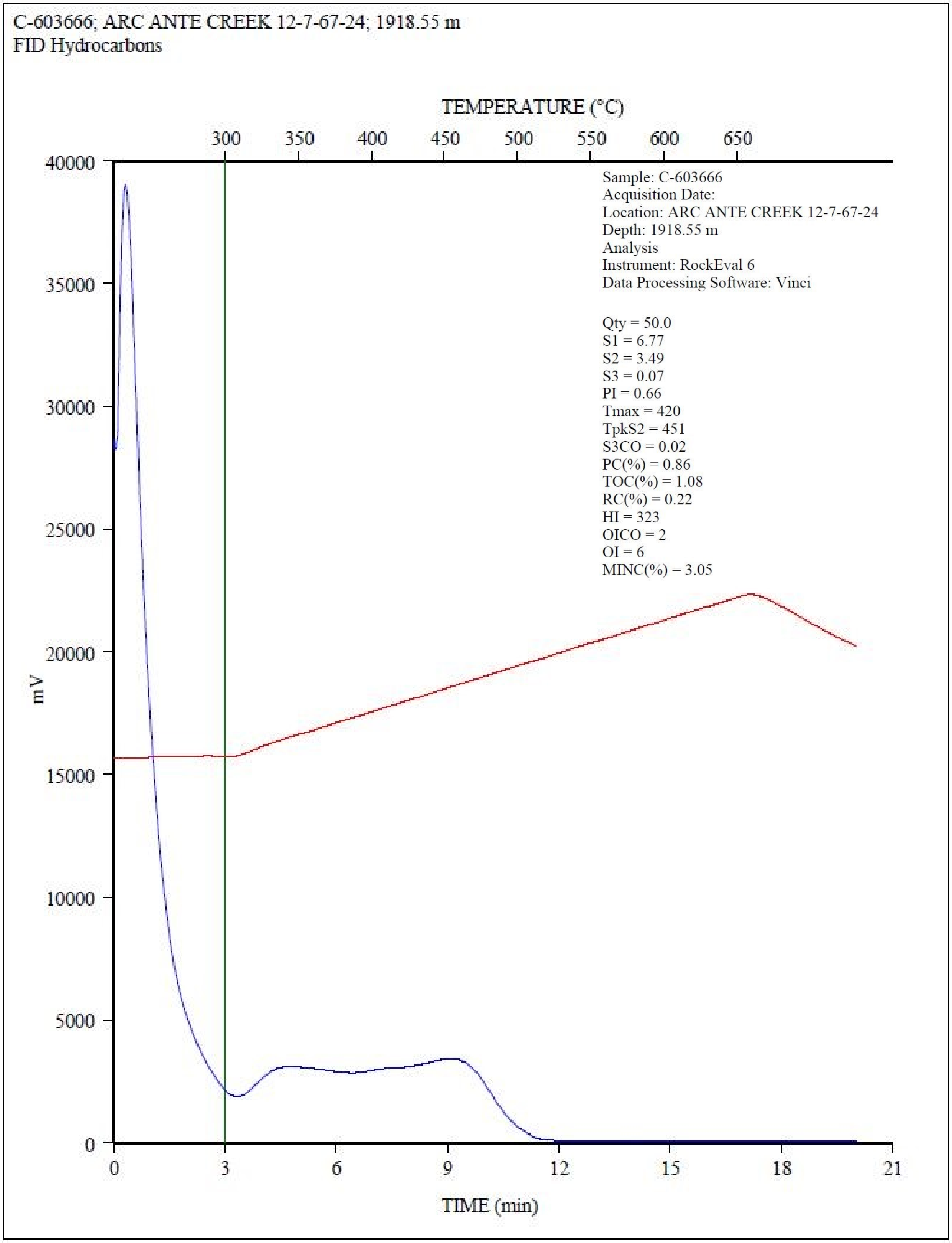
C-603664; ARC ANTE CREEK 12-7-67-24; 1916.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603664
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1916.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 1.59
S2 = 4.98
S3 = 0.11
PI = 0.24
Tmax = 439
TpkS2 = 470
S3CO = 0.01
PC(%) = 0.55
TOC(%) = 0.94
RC(%) = 0.39
HI = 530
OICO = 1
OI = 12
MINC(%) = 1.55
0
3
6
9
12
15
18
21
TIME (min)

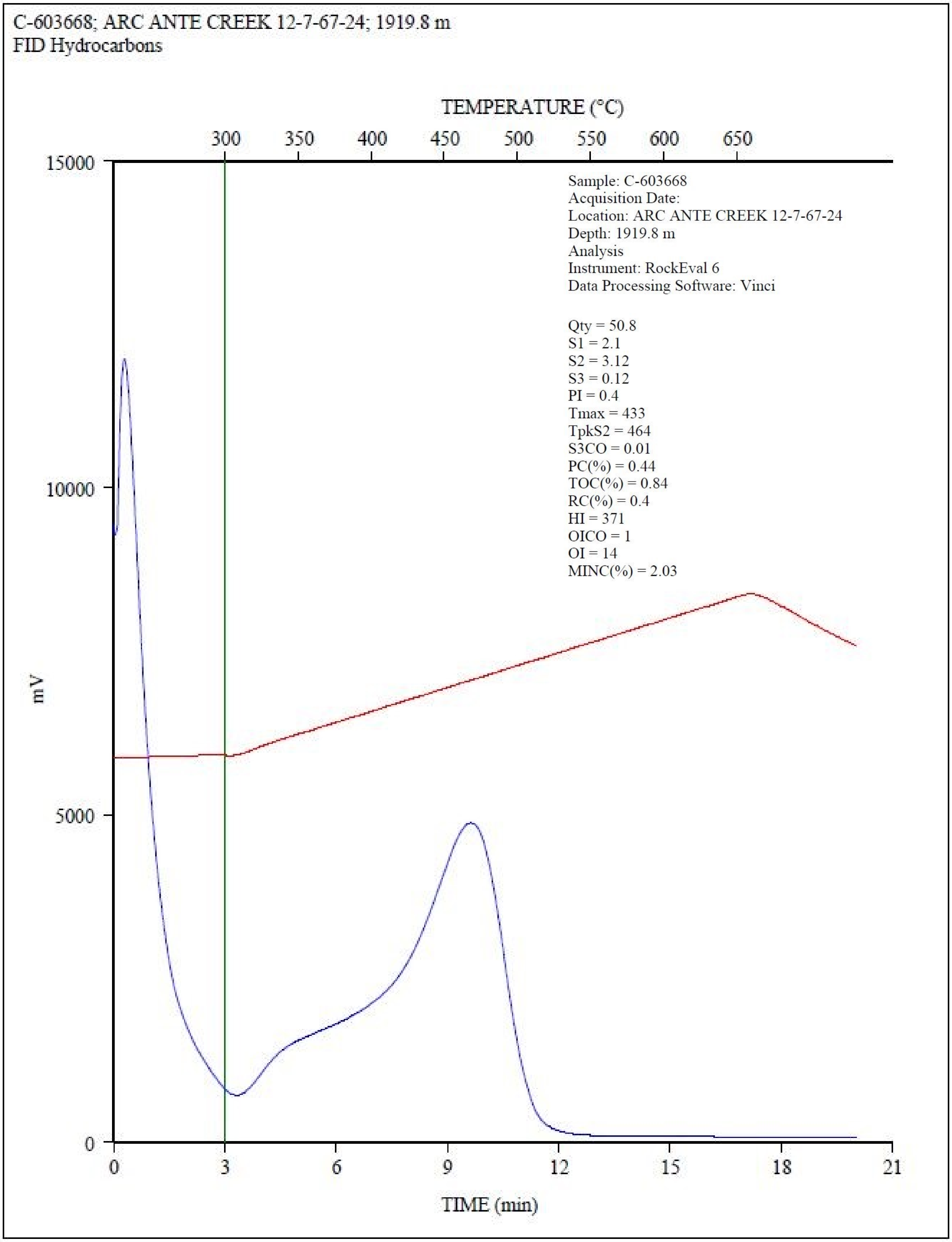
C-603665; ARC ANTE CREEK 12-7-67-24; 1917.2 m
FID Hydrocarbons

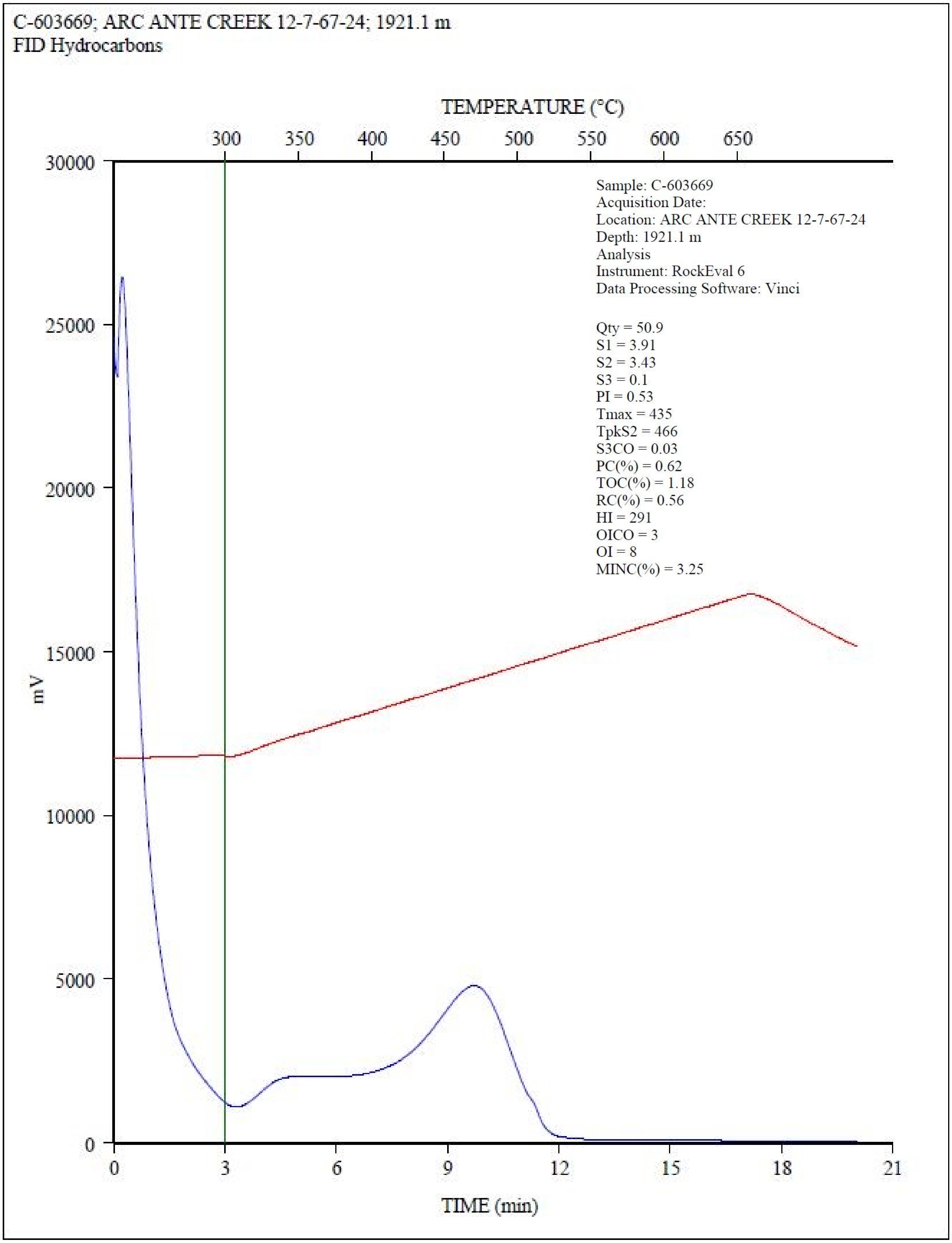


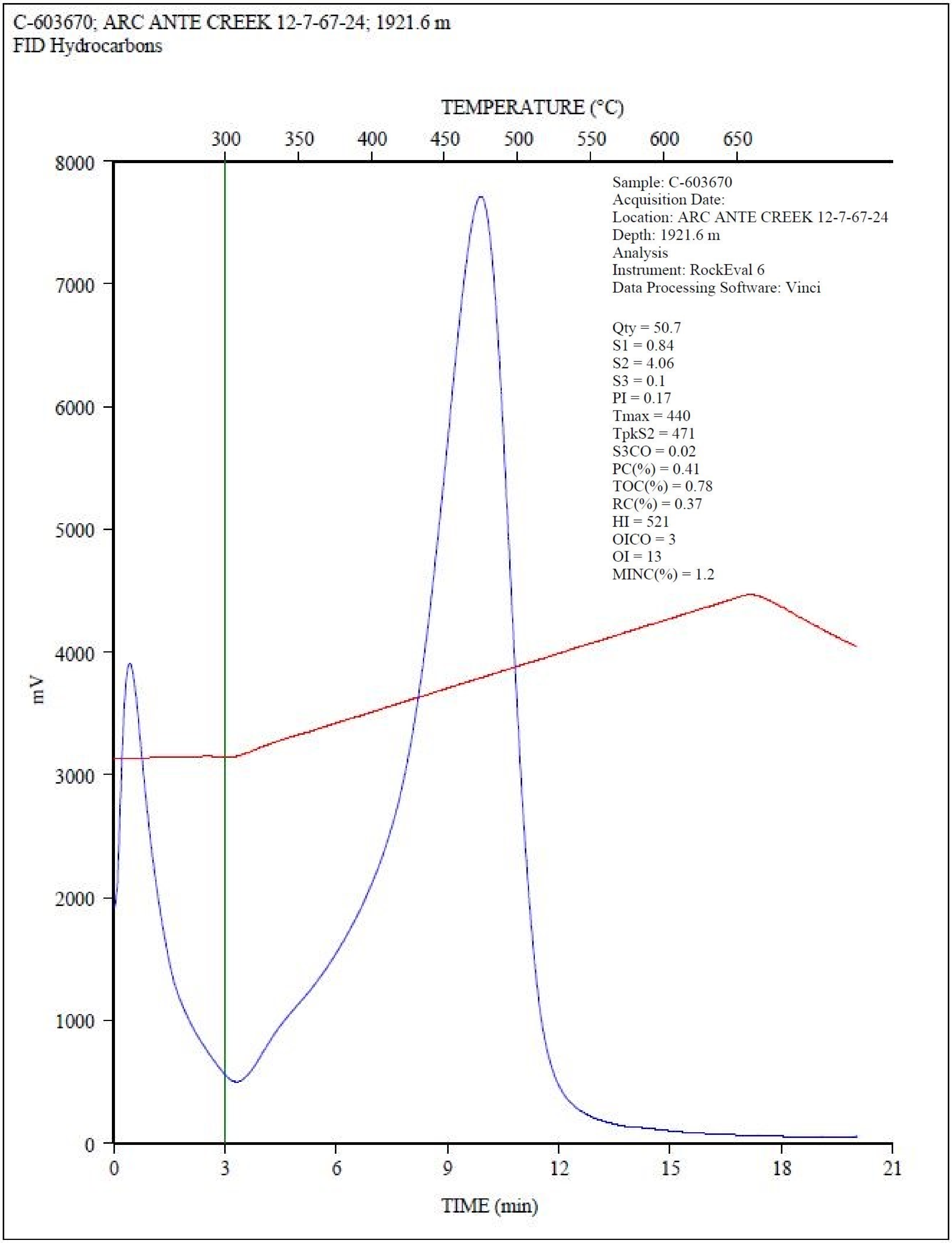
C-603667; ARC ANTE CREEK 12-7-67-24; 1918.9 m
FID Hydrocarbons



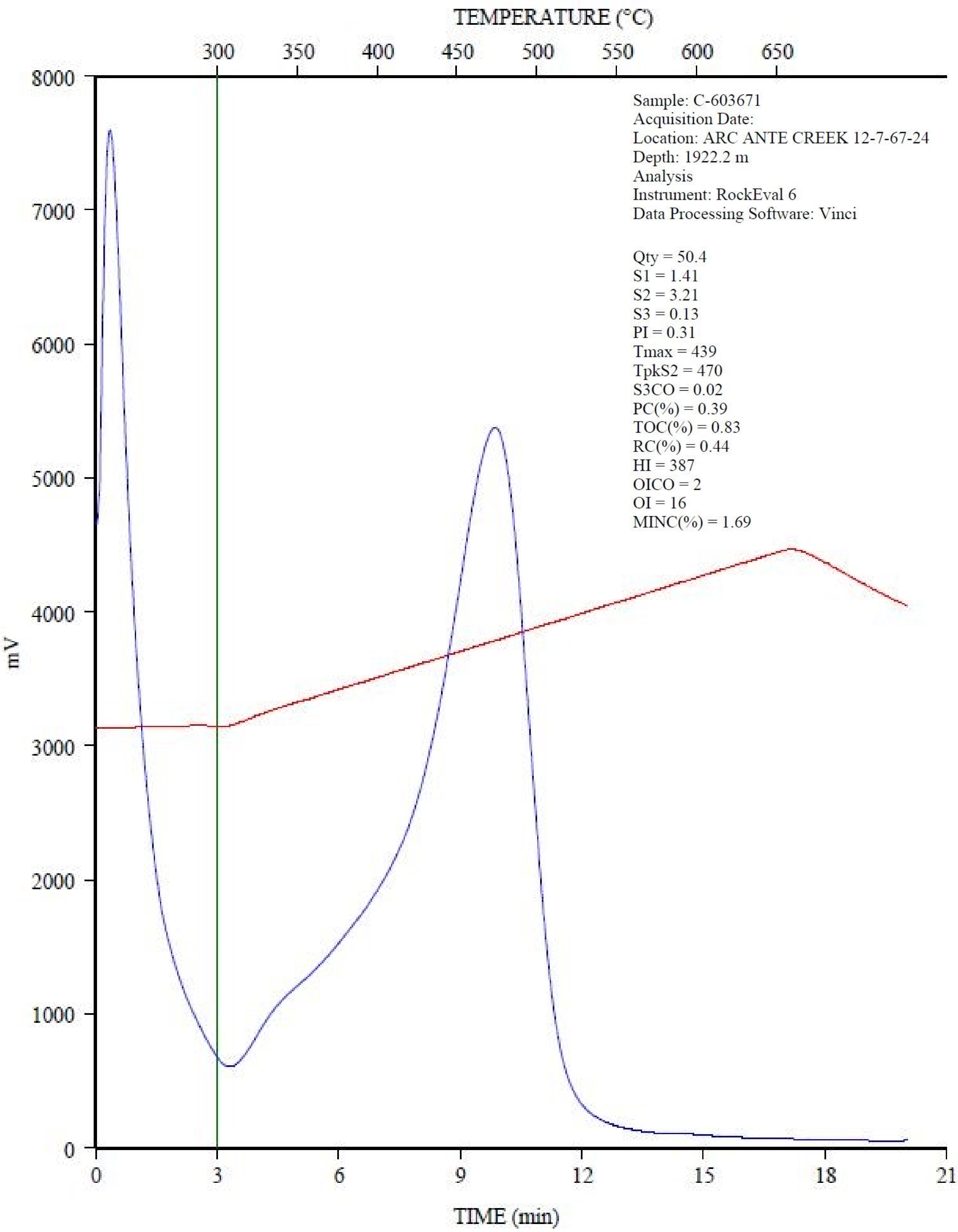

C-603666; ARC ANTE CREEK 12-7-67-24; 1918.55 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603666
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1918.55 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.0
S1 = 6.77
S2 = 3.49
S3 = 0.07
PI = 0.66
Tmax = 420
TpkS2 = 451
S3CO = 0.02
PC(%) = 0.86
TOC(%) = 1.08
RC(%) = 0.22
HI = 323
OICO = 2
OI = 6
MINC(%) = 3.05
mV
40000
35000
30000
25000
20000
15000
10000
5000
0
0
3
6
9
12
15
18
21
TIME (min)


C-603668; ARC ANTE CREEK 12-7-67-24; 1919.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603668
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1919.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 2.1
S2 = 3.12
S3 = 0.12
PI = 0.4
Tmax = 433
TpkS2 = 464
S3CO = 0.01
PC(%) = 0.44
TOC(%) = 0.84
RC(%) = 0.4
HI = 371
OICO = 1
OI = 14
MINC(%) = 2.03
0
3
6
9
12
15
18
21
TIME (min)

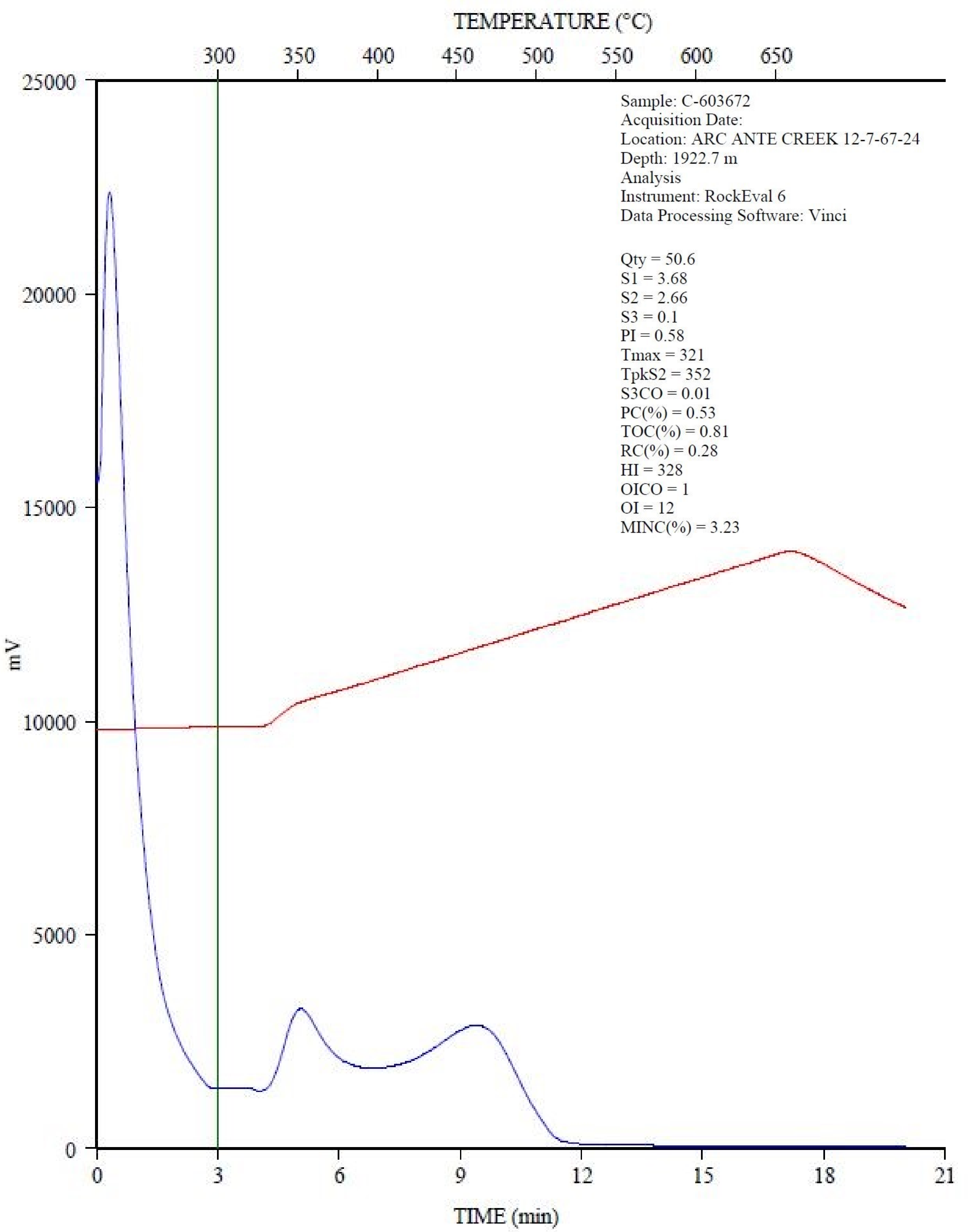

C-603669; ARC ANTE CREEK 12-7-67-24; 1921.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603669
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1921.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 3.91
S2 = 3.43
S3 = 0.1
PI = 0.53
Tmax = 435
TpkS2 = 466
S3CO = 0.03
PC(%) = 0.62
TOC(%) = 1.18
RC(%) = 0.56
HI = 291
OICO = 3
OI = 8
MINC(%) = 3.25
0
3
6
9
12
15
18
21
TIME (min)


C-603670; ARC ANTE CREEK 12-7-67-24; 1921.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603670
Acquisition Date:
Location: ARC ANTE CREEK 12-7-67-24
Depth: 1921.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.84
S2 = 4.06
S3 = 0.1
PI = 0.17
Tmax = 440
TpkS2 = 471
S3CO = 0.02
PC(%) = 0.41
TOC(%) = 0.78
RC(%) = 0.37
HI = 521
OICO = 3
OI = 13
MINC(%) = 1.2
0
3
6
9
12
15
18
21
TIME (min)

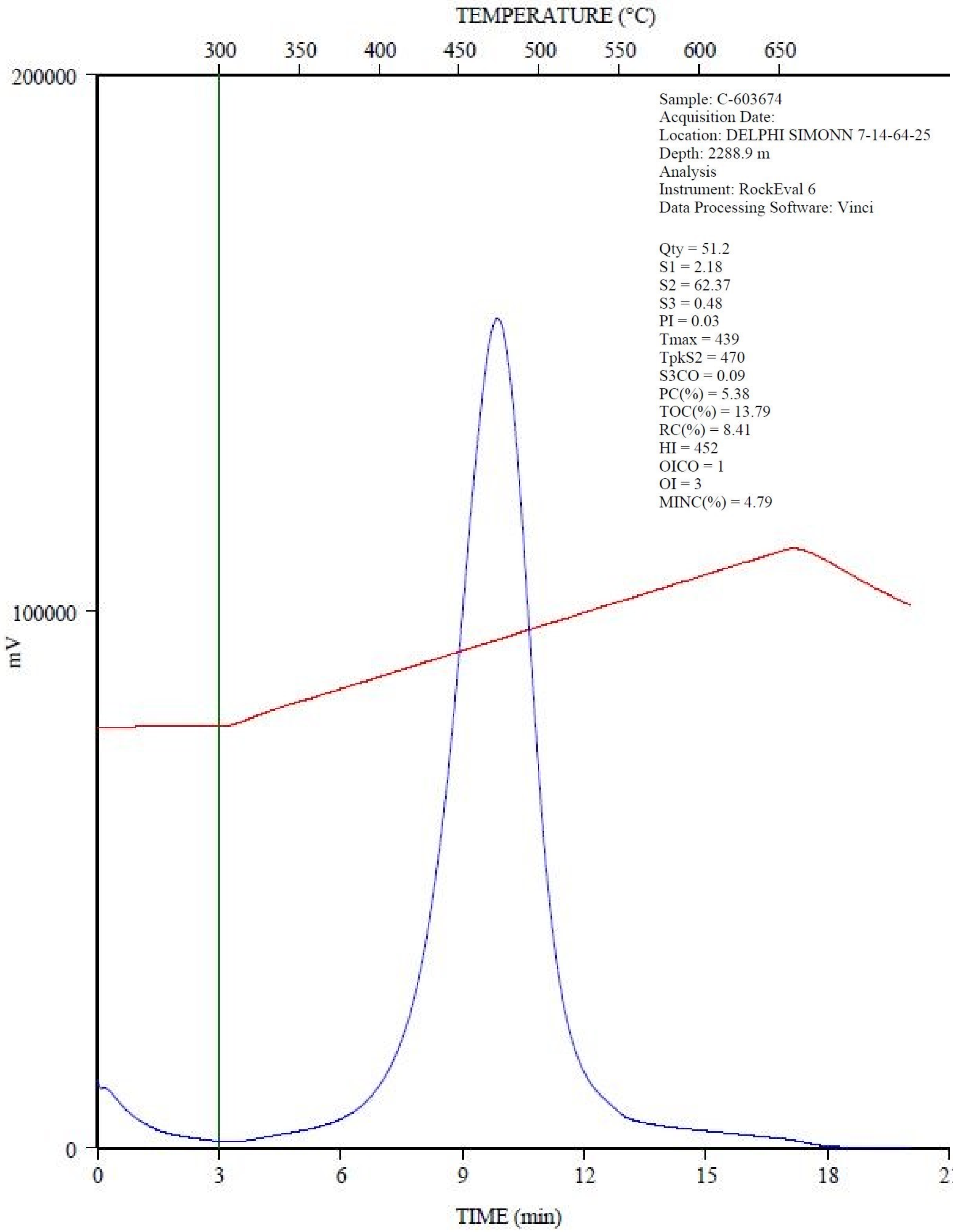
C-603671; ARC ANTE CREEK 12-7-67-24; 1922.2 m
FID Hydrocarbons

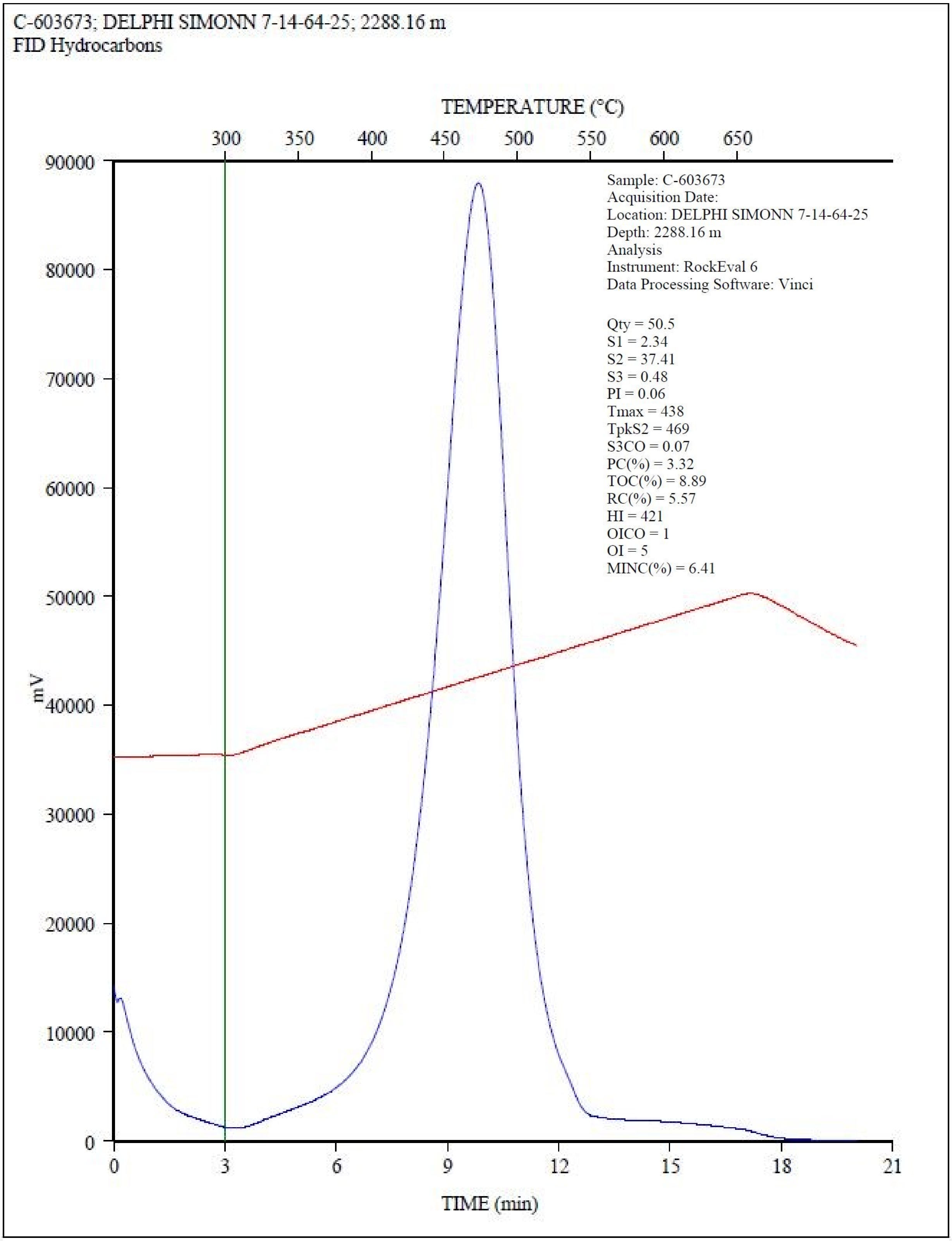


C-603672; ARC ANTE CREEK 12-7-67-24; 1922.7 m
FID Hydrocarbons

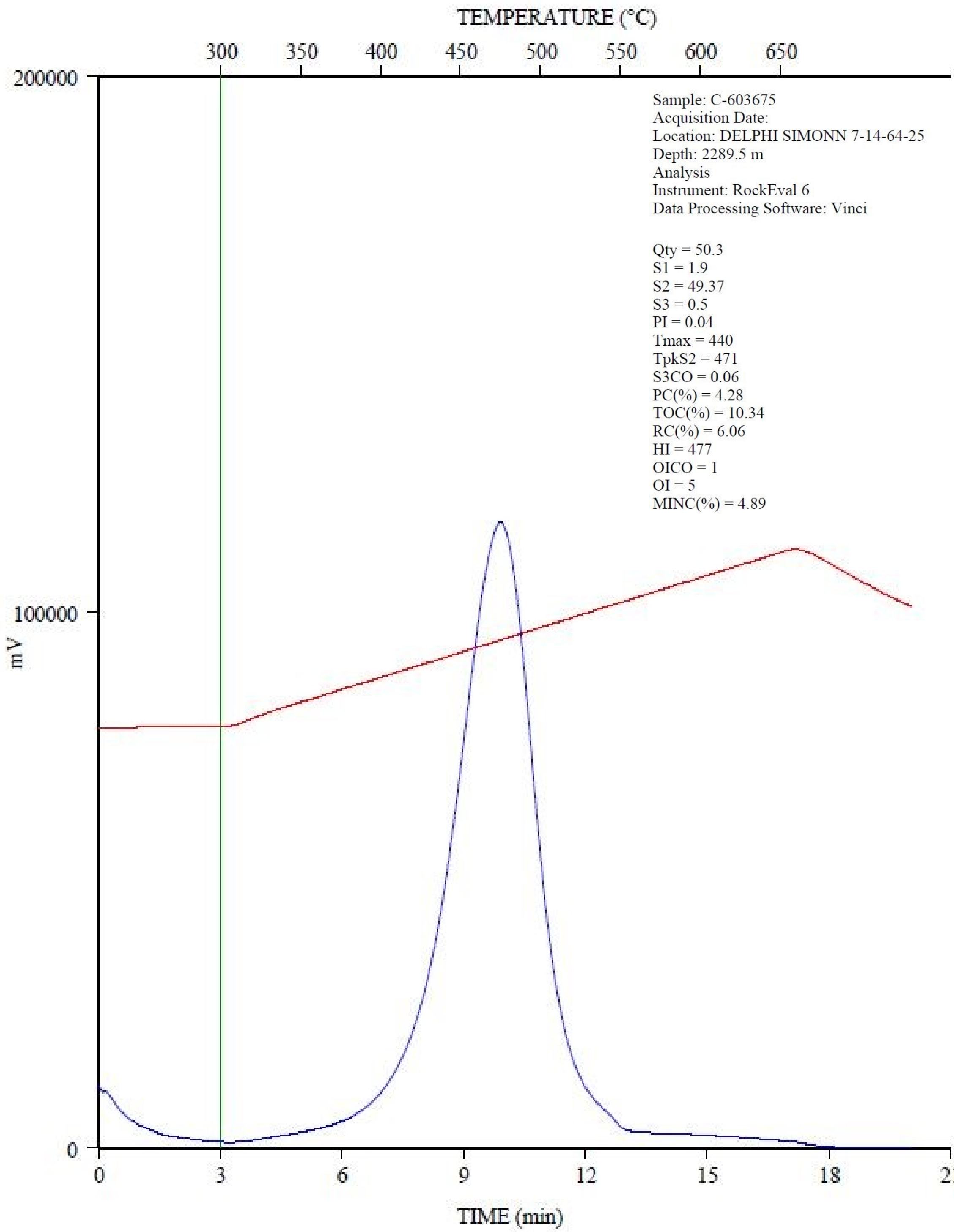


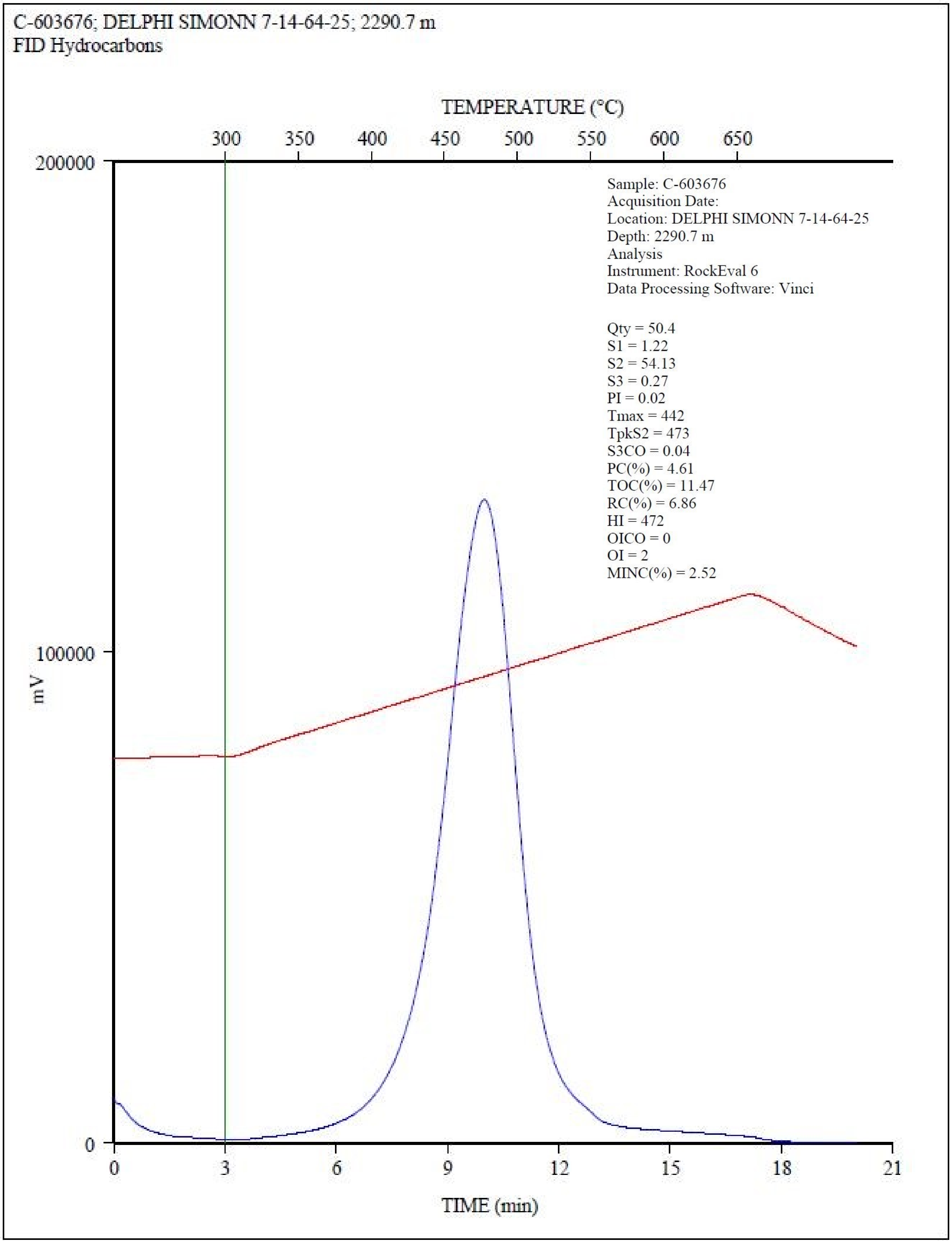
C-603674; DELPHI SIMONN 7-14-64-25; 2288.9 m
FID Hydrocarbons

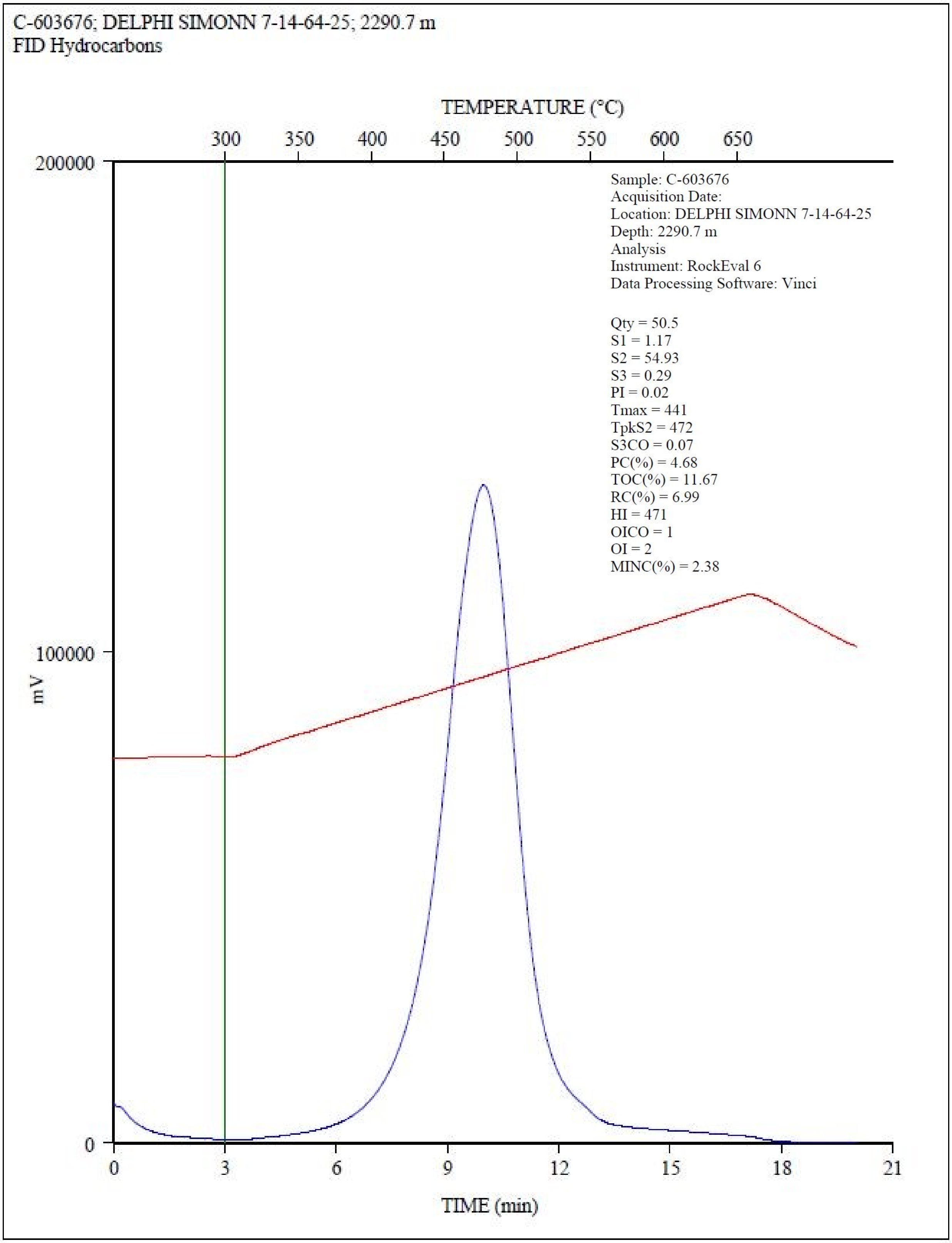


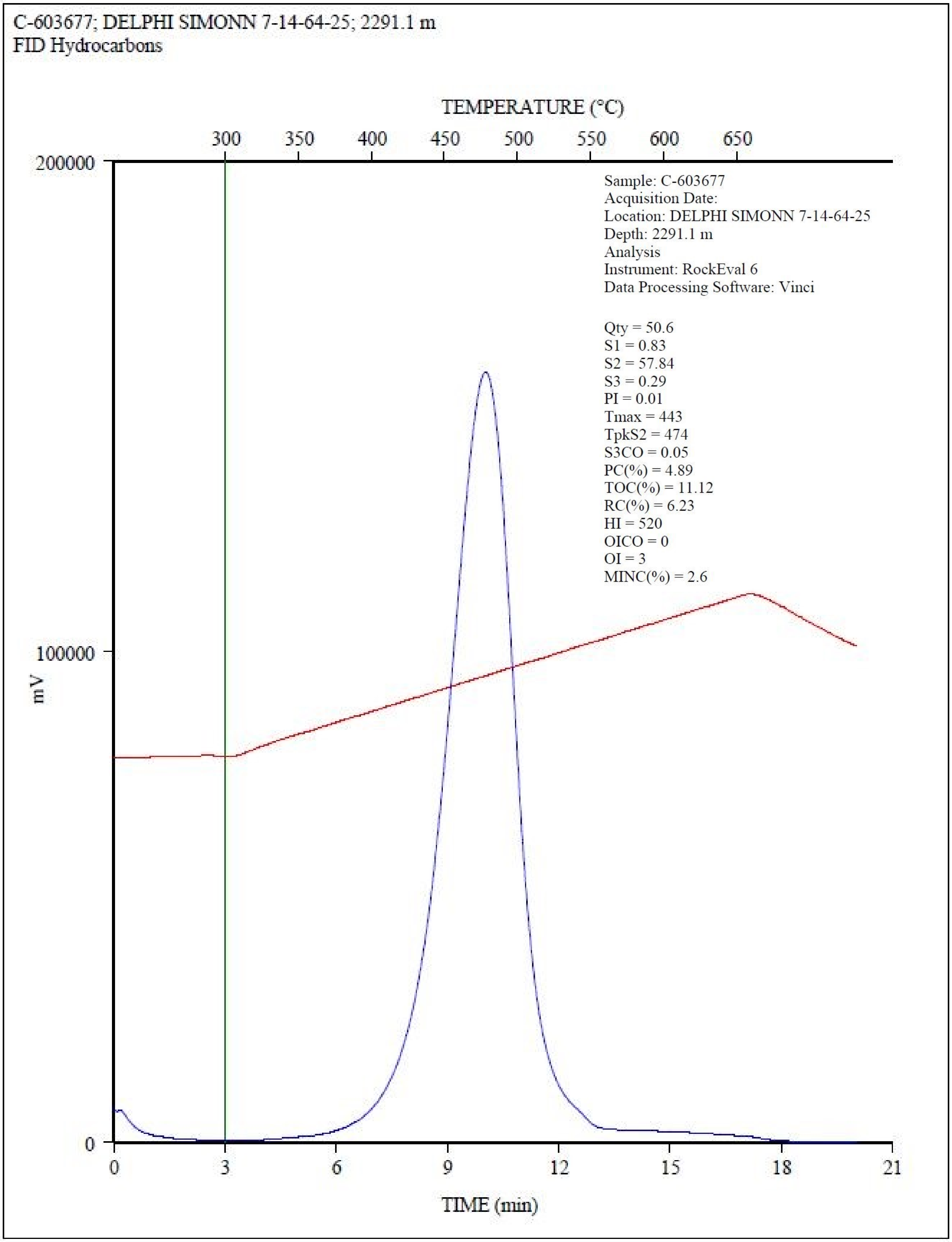

C-603673; DELPHI SIMONN 7-14-64-25; 2288.16 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
mV
Sample: C-603673
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2288.16 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 2.34
S2 = 37.41
S3 = 0.48
PI = 0.06
Tmax = 438
TpkS2 = 469
S3CO = 0.07
PC(%) = 3.32
TOC(%) = 8.89
RC(%) = 5.57
HI = 421
OICO = 1
OI = 5
MINC(%) = 6.41
0
3
6
9
12
15
18
21
TIME (min)

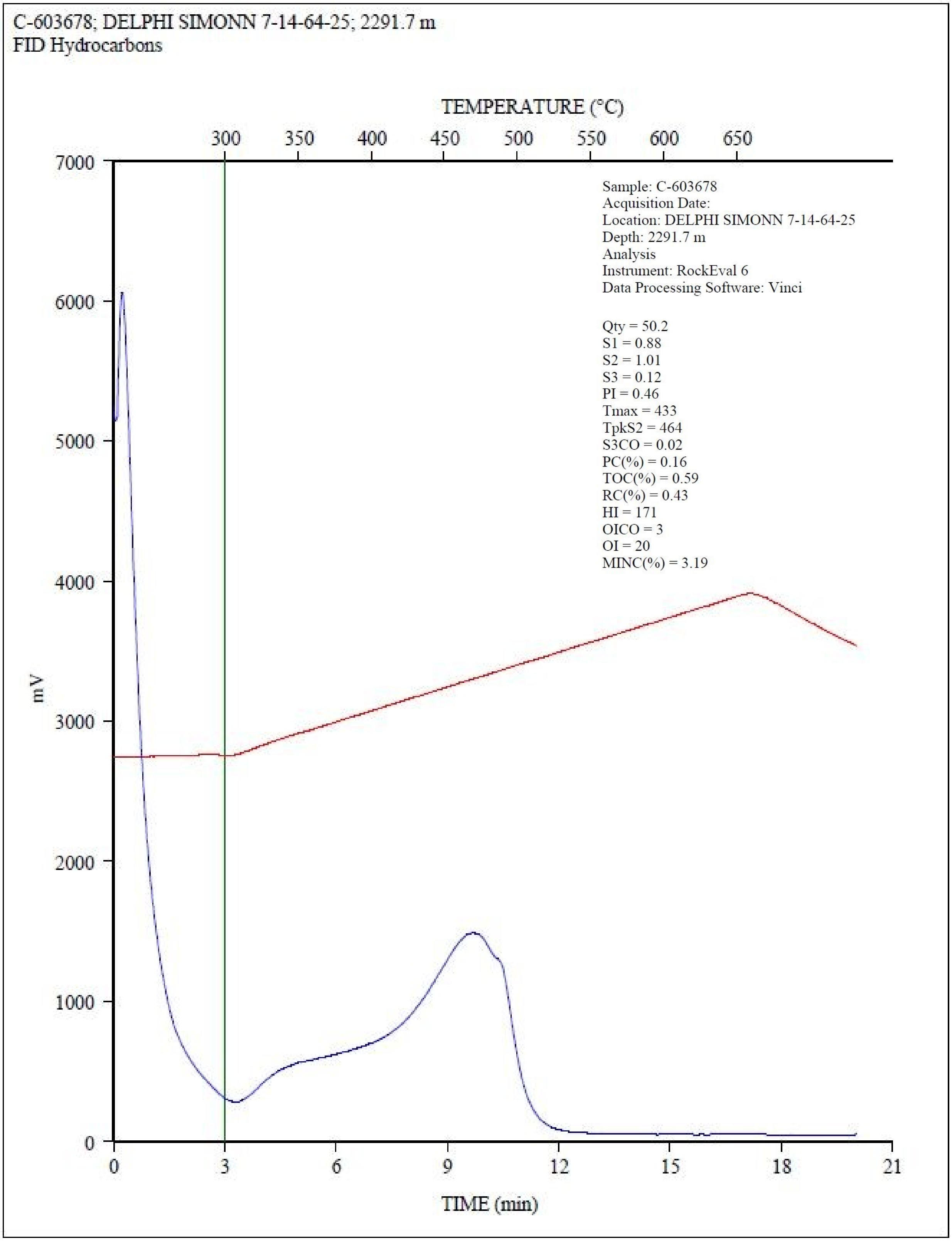
C-603675; DELPHI SIMONN 7-14-64-25; 2289.5 m
FID Hydrocarbons



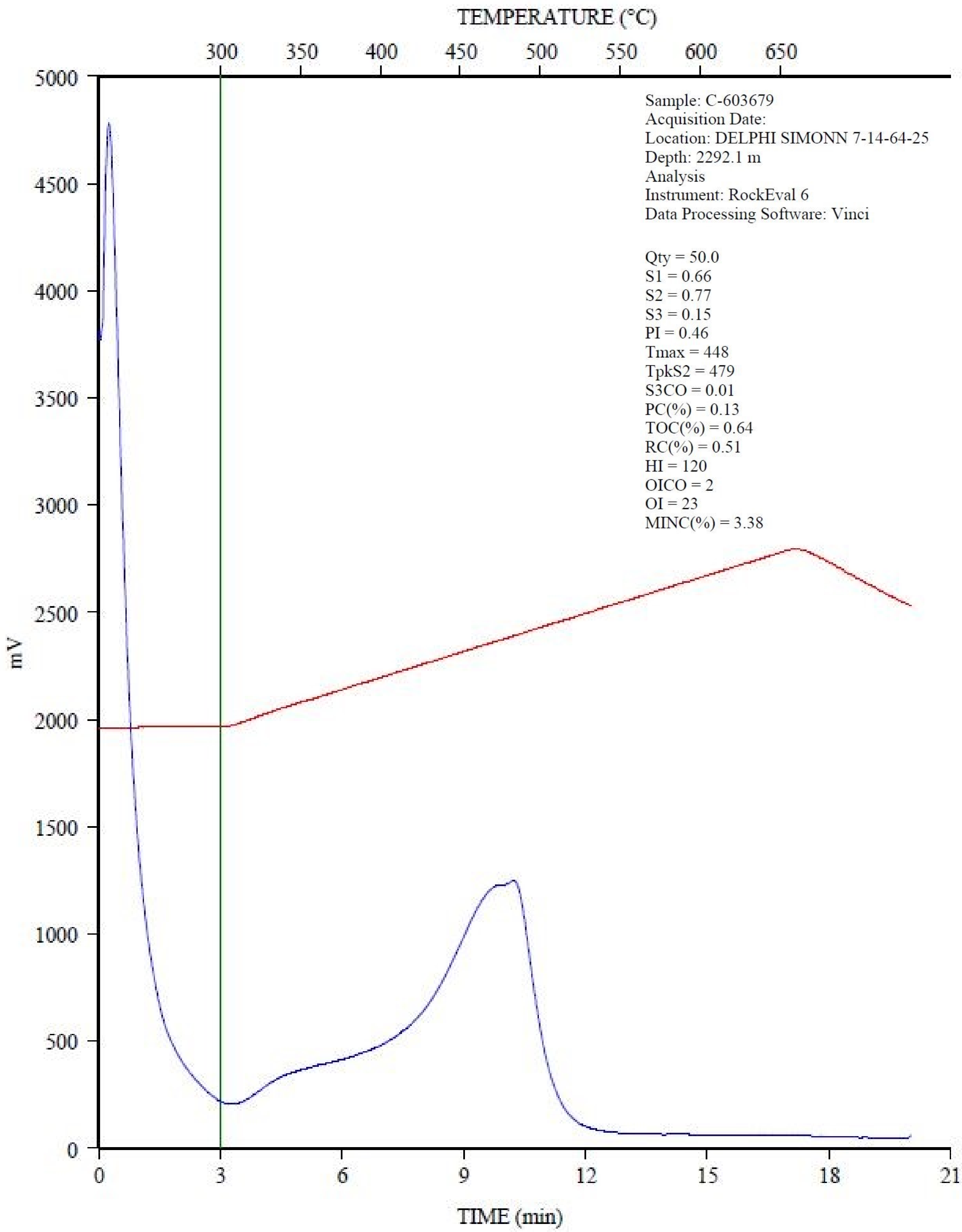

C-603676; DELPHI SIMONN 7-14-64-25; 2290.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
200000
100000
0
mV
Sample: C-603676
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2290.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.4
S1 = 1.22
S2 = 54.13
S3 = 0.27
PI = 0.02
Tmax = 442
TpkS2 = 473
S3CO = 0.04
PC(%) = 4.61
TOC(%) = 11.47
RC(%) = 6.86
HI = 472
OICO = 0
OI = 2
MINC(%) = 2.52
0
3
6
9
12
15
18
21
TIME (min)


C-603676; DELPHI SIMONN 7-14-64-25; 2290.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
200000
100000
0
mV
Sample: C-603676
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2290.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 1.17
S2 = 54.93
S3 = 0.29
PI = 0.02
Tmax = 441
TpkS2 = 472
S3CO = 0.07
PC(%) = 4.68
TOC(%) = 11.67
RC(%) = 6.99
HI = 471
OICO = 1
OI = 2
MINC(%) = 2.38
0
3
6
9
12
15
18
21
TIME (min)

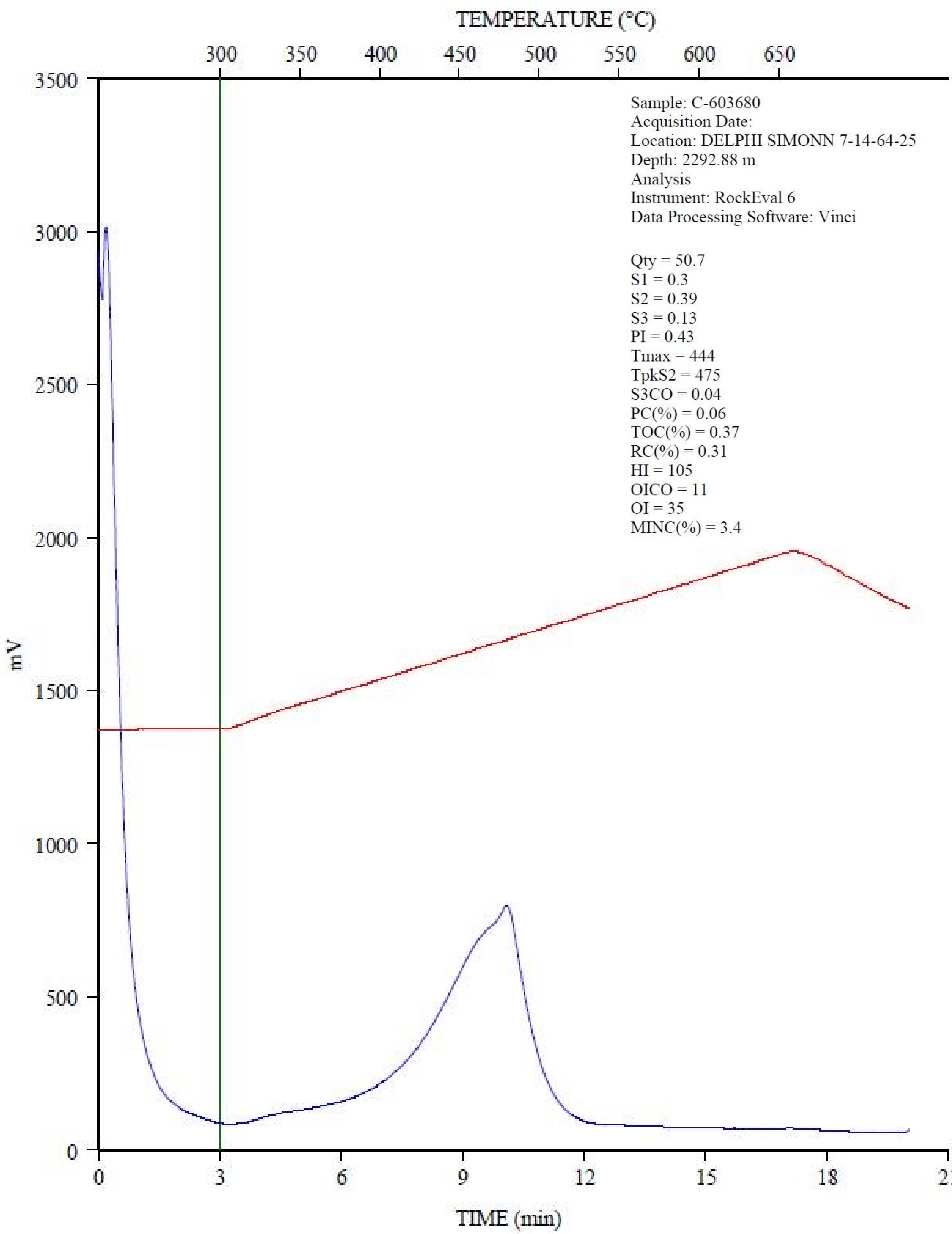

C-603677; DELPHI SIMONN 7-14-64-25; 2291.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
200000
100000
0
mV
Sample: C-603677
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2291.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 0.83
S2 = 57.84
S3 = 0.29
PI = 0.01
Tmax = 443
TpkS2 = 474
S3CO = 0.05
PC(%) = 4.89
TOC(%) = 11.12
RC(%) = 6.23
HI = 520
OICO = 0
OI = 3
MINC(%) = 2.6
0
3
6
9
12
15
18
21
TIME (min)

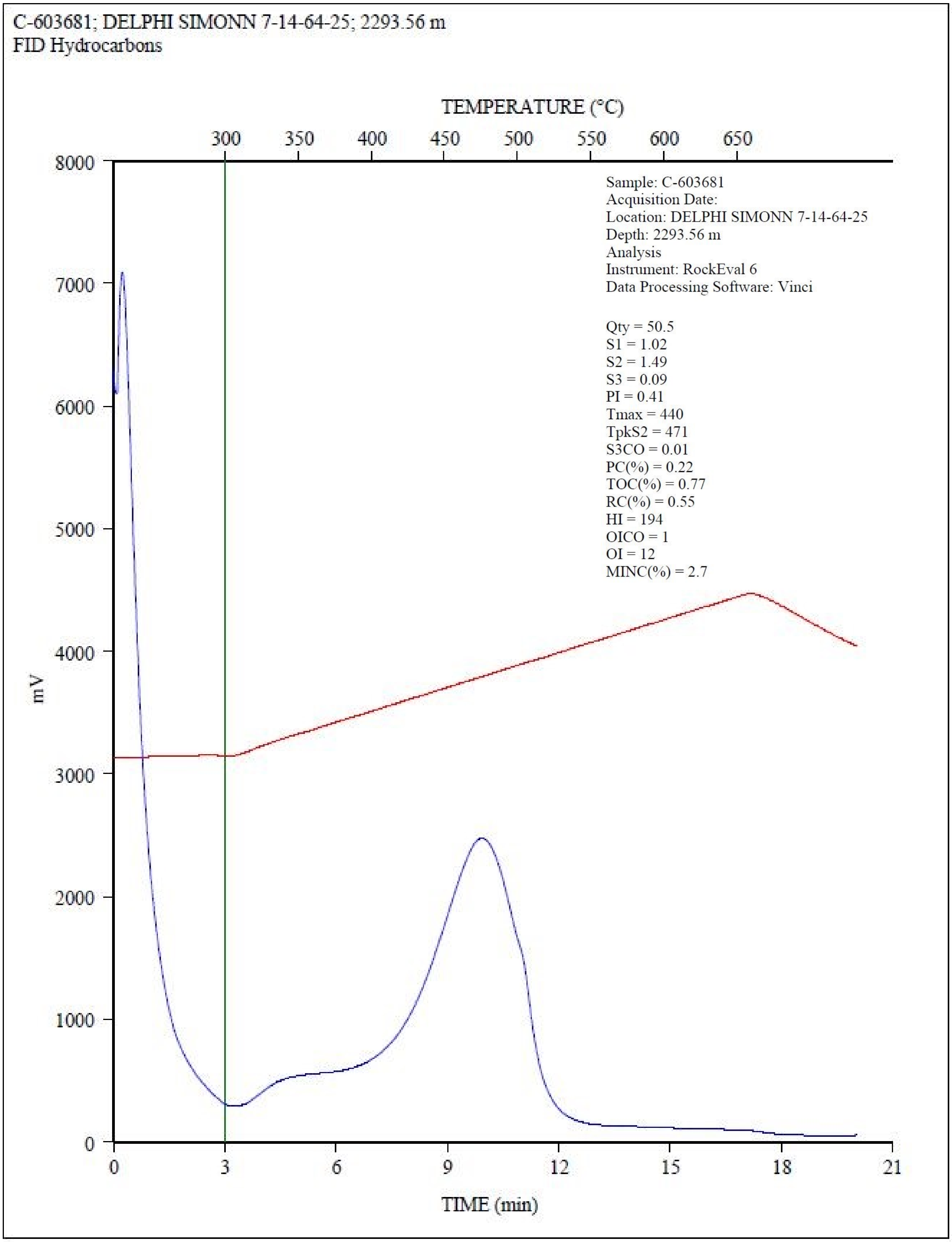

C-603678; DELPHI SIMONN 7-14-64-25; 2291.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
7000 6000 5000 4000 3000 2000 1000 0
mV
Sample: C-603678
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2291.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 0.88
S2 = 1.01
S3 = 0.12
PI = 0.46
Tmax = 433
TpkS2 = 464
S3CO = 0.02
PC(%) = 0.16
TOC(%) = 0.59
RC(%) = 0.43
HI = 171
OICO = 3
OI = 20
MINC(%) = 3.19
0 3 6 9 12 15 18 21
TIME (min)

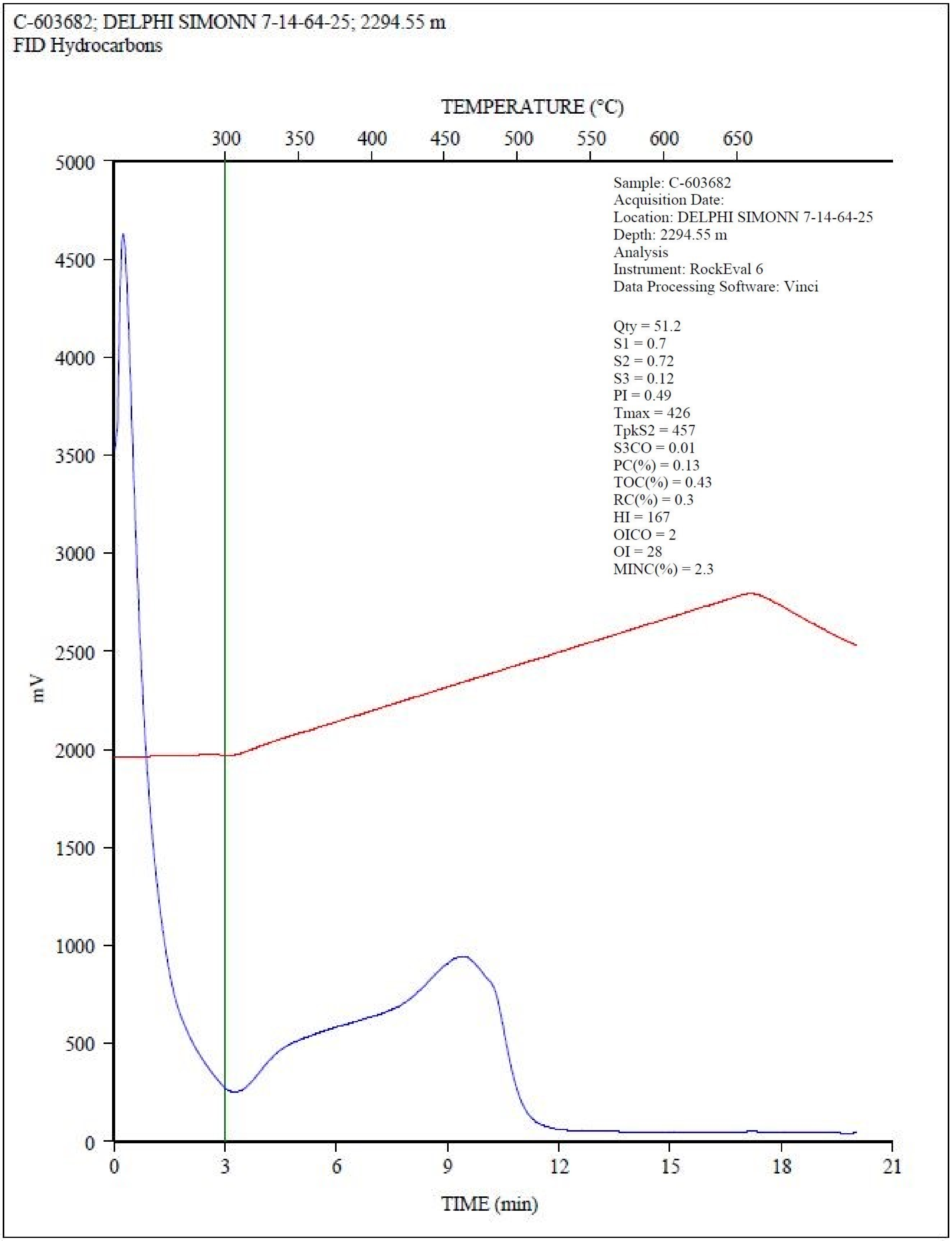
C-603679; DELPHI SIMONN 7-14-64-25; 2292.1 m
FID Hydrocarbons

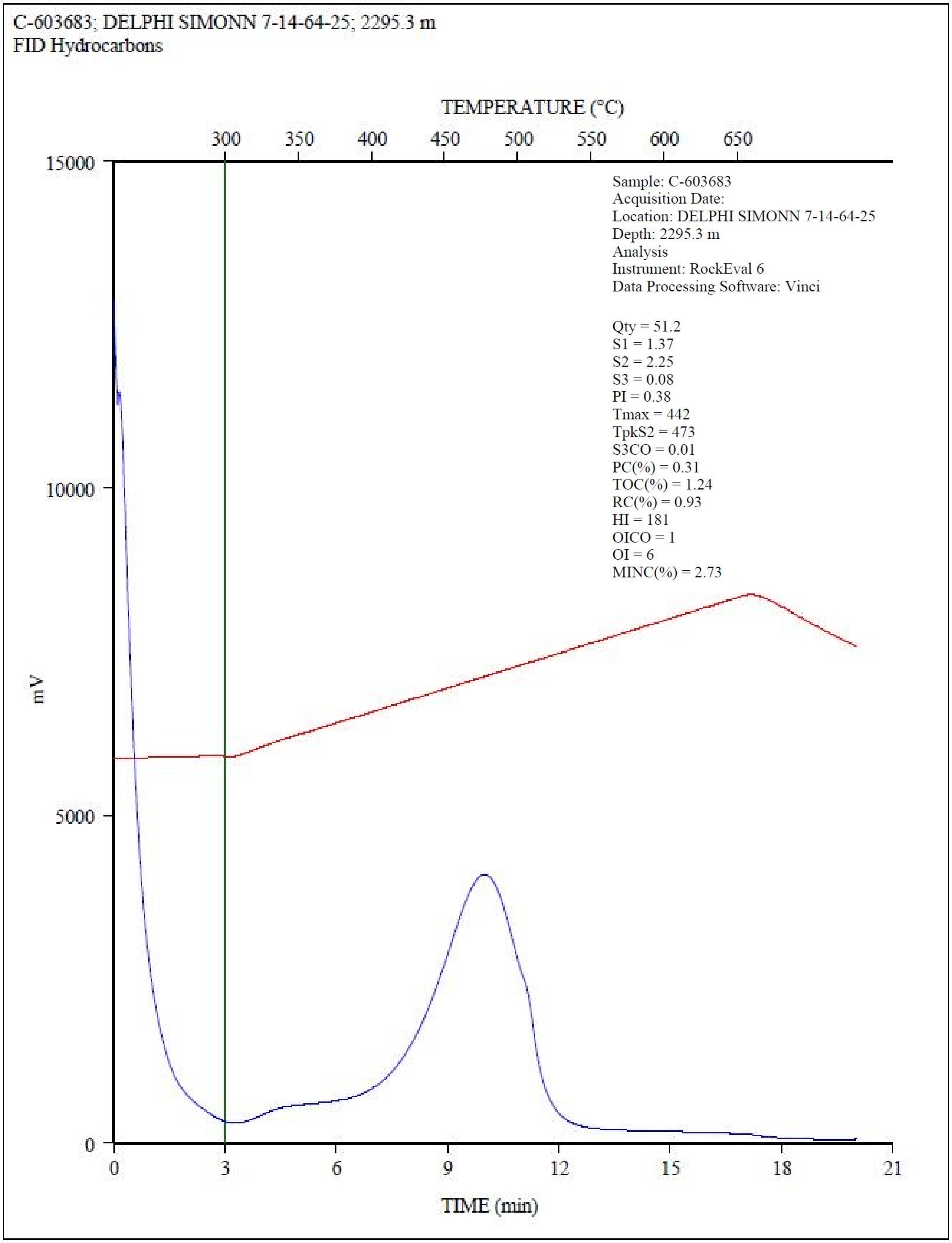


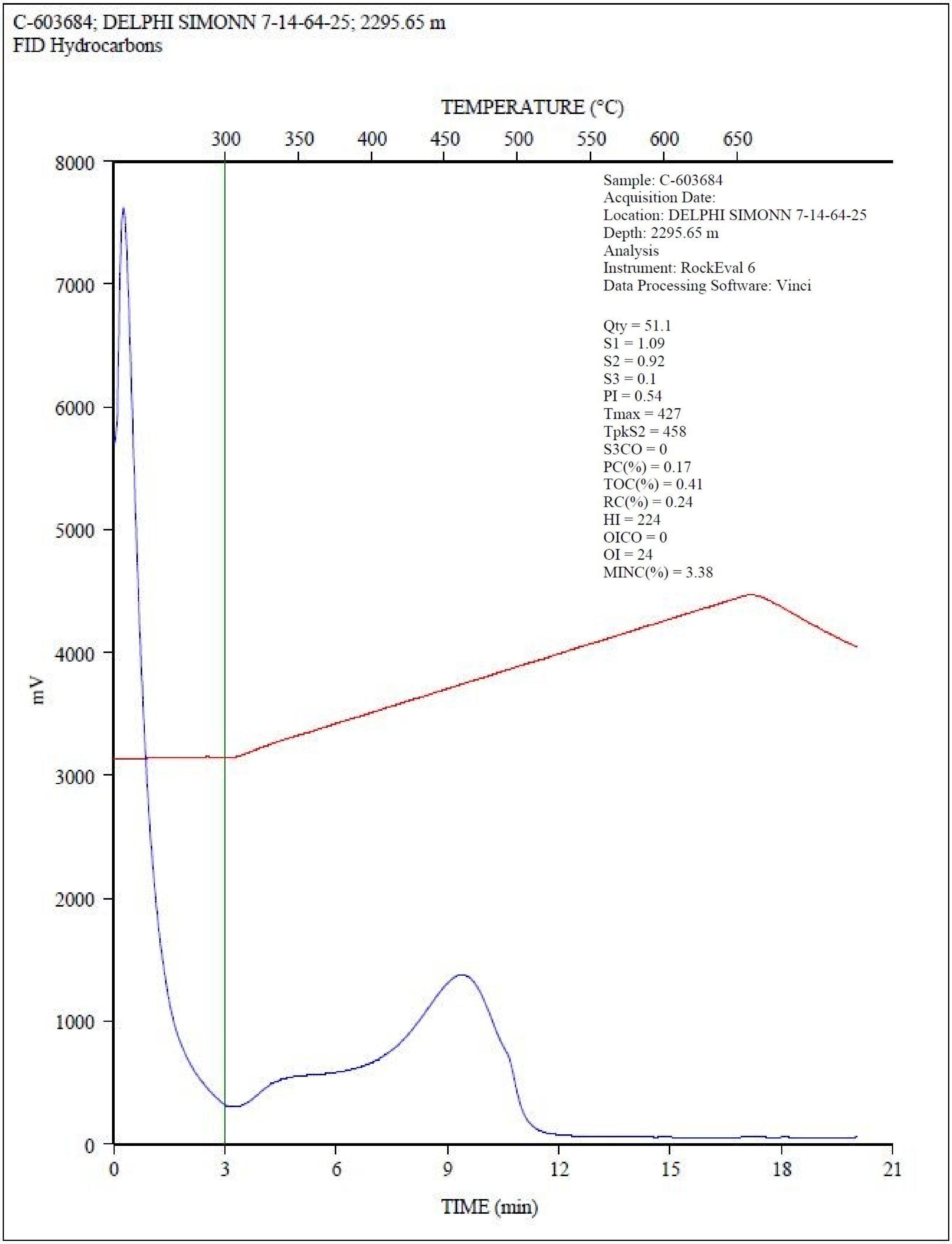
C-603680; DELPHI SIMONN 7-14-64-25; 2292.88 m
FID Hydrocarbons

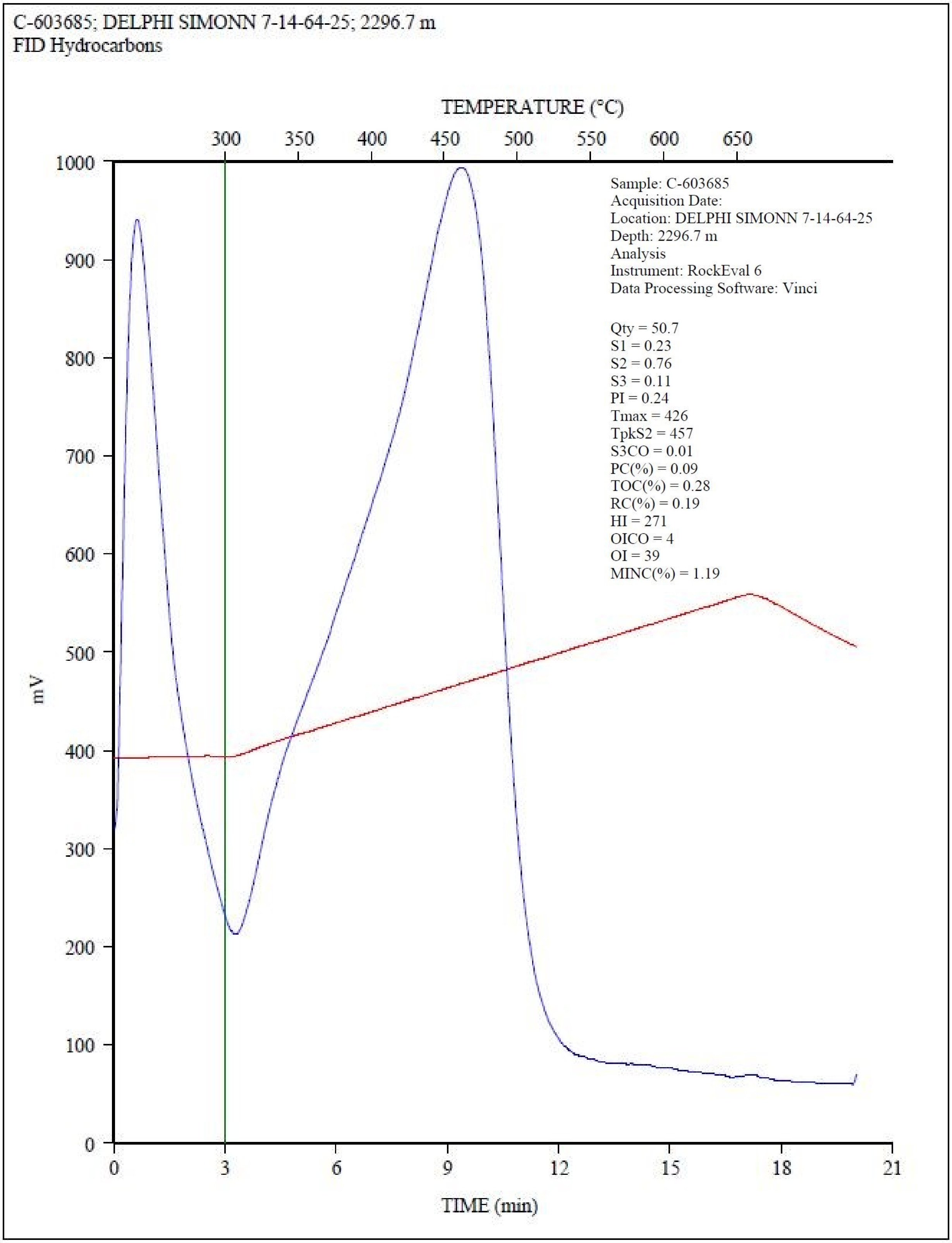


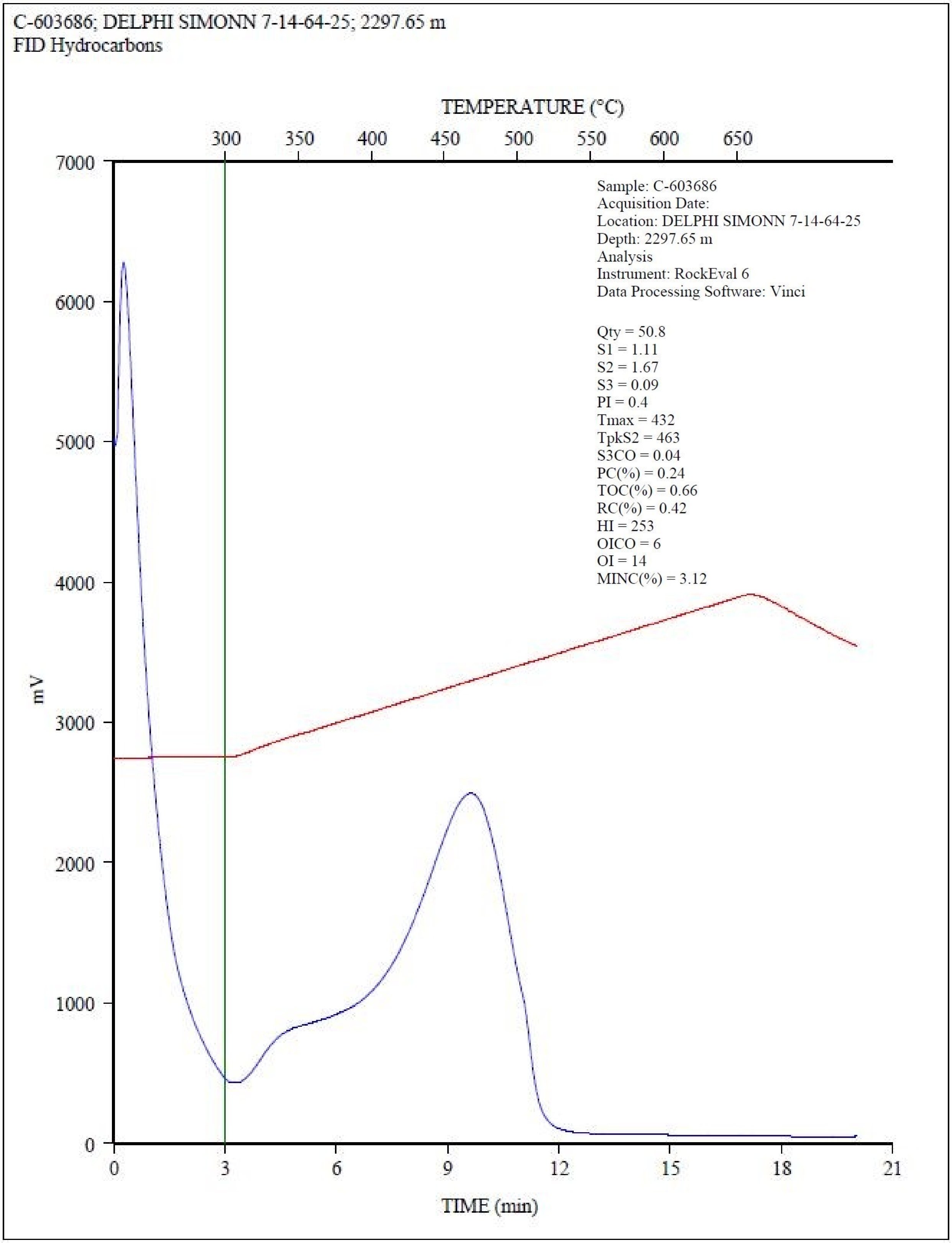

C-603681; DELPHI SIMONN 7-14-64-25; 2293.56 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
8000 7000 6000 5000 4000 3000 2000 1000 0
mV
Sample: C-603681
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2293.56 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 1.02
S2 = 1.49
S3 = 0.09
PI = 0.41
Tmax = 440
TpkS2 = 471
S3CO = 0.01
PC(%) = 0.22
TOC(%) = 0.77
RC(%) = 0.55
HI = 194
OICO = 1
OI = 12
MINC(%) = 2.7
0 3 6 9 12 15 18 21
TIME (min)

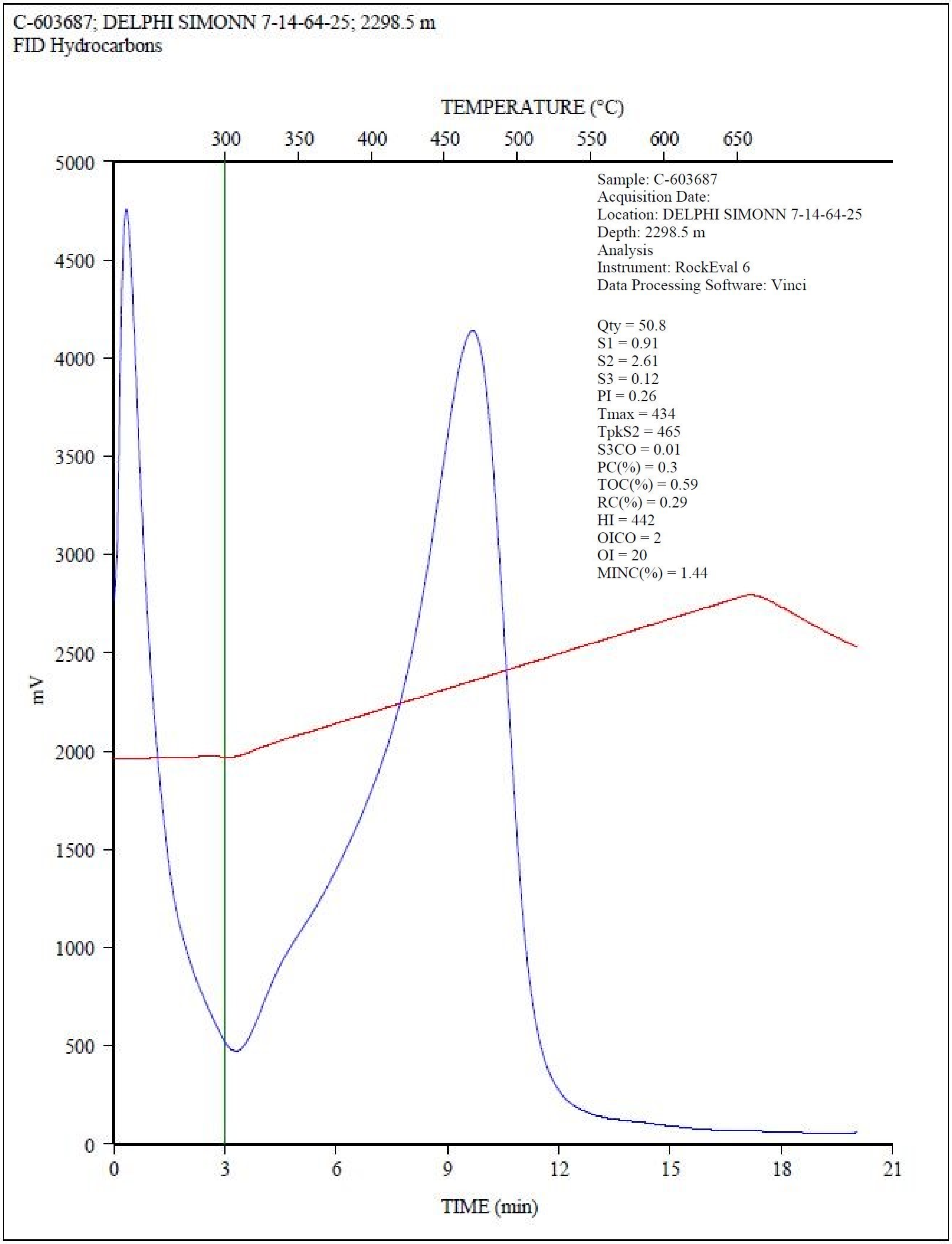

C-603682; DELPHI SIMONN 7-14-64-25; 2294.55 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603682
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2294.55 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 0.7
S2 = 0.72
S3 = 0.12
PI = 0.49
Tmax = 426
TpkS2 = 457
S3CO = 0.01
PC(%) = 0.13
TOC(%) = 0.43
RC(%) = 0.3
HI = 167
OICO = 2
OI = 28
MINC(%) = 2.3
0
3
6
9
12
15
18
21
TIME (min)

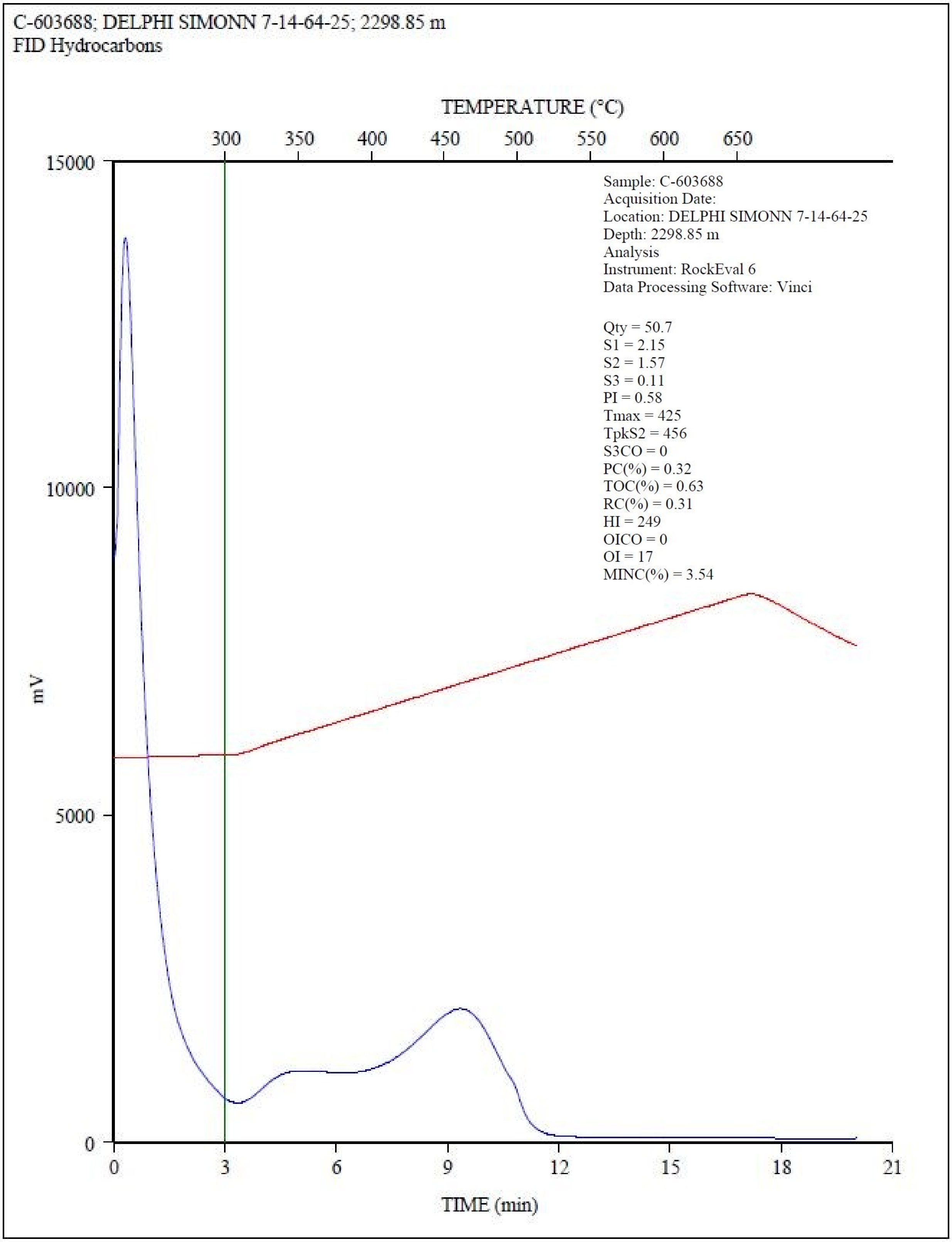

C-603683; DELPHI SIMONN 7-14-64-25; 2295.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603683
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2295.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 1.37
S2 = 2.25
S3 = 0.08
PI = 0.38
Tmax = 442
TpkS2 = 473
S3CO = 0.01
PC(%) = 0.31
TOC(%) = 1.24
RC(%) = 0.93
HI = 181
OICO = 1
OI = 6
MINC(%) = 2.73
0
3
6
9
12
15
18
21
TIME (min)


C-603684; DELPHI SIMONN 7-14-64-25; 2295.65 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603684
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2295.65 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 1.09
S2 = 0.92
S3 = 0.1
PI = 0.54
Tmax = 427
TpkS2 = 458
S3CO = 0
PC(%) = 0.17
TOC(%) = 0.41
RC(%) = 0.24
HI = 224
OICO = 0
OI = 24
MINC(%) = 3.38
mV
8000
7000
6000
5000
4000
3000
2000
1000
0
0
3
6
9
12
15
18
21
TIME (min)

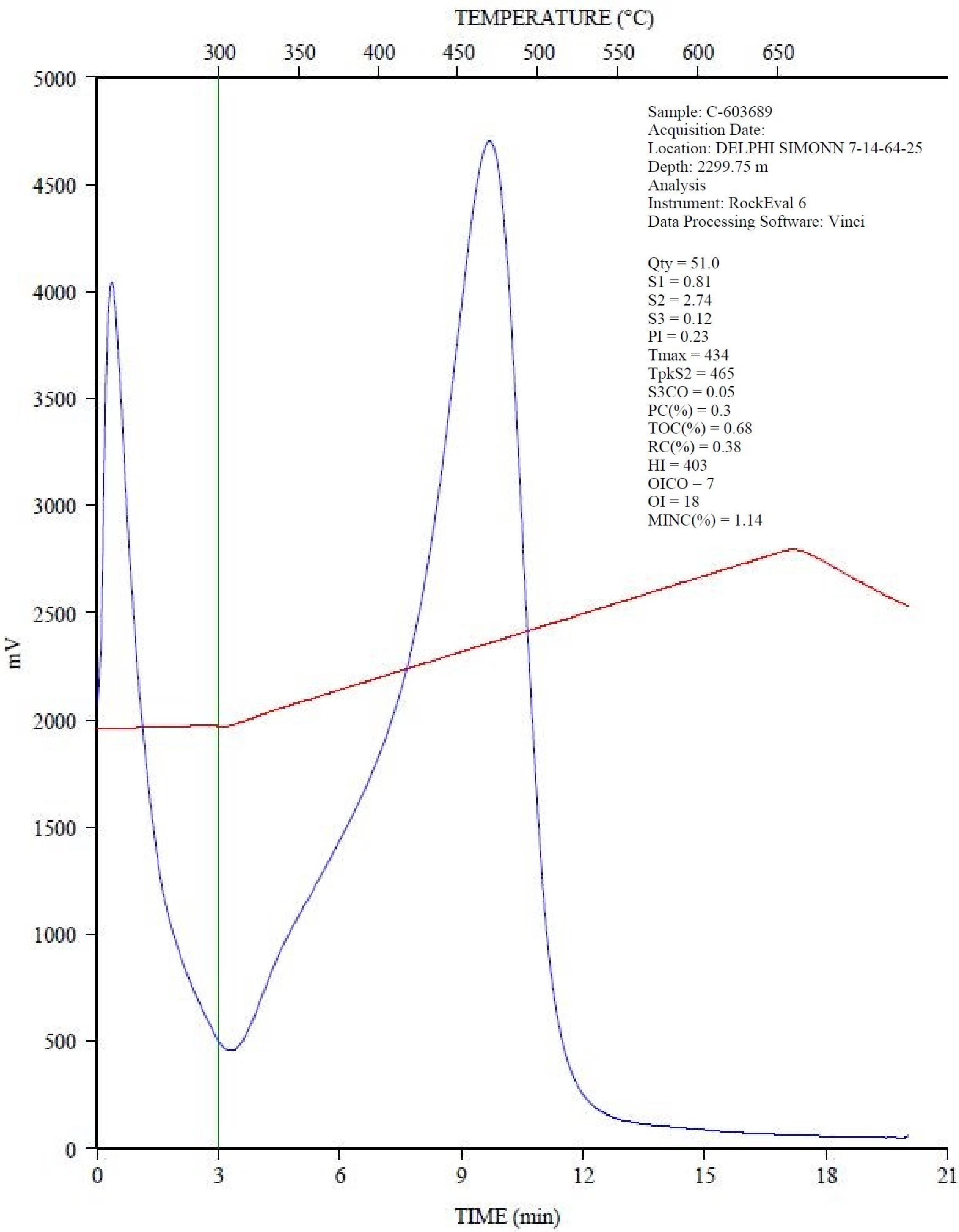

C-603685; DELPHI SIMONN 7-14-64-25; 2296.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
1000
900
800
700
600
500
400
300
200
100
0
mV
Sample: C-603685
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2296.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.23
S2 = 0.76
S3 = 0.11
PI = 0.24
Tmax = 426
TpkS2 = 457
S3CO = 0.01
PC(%) = 0.09
TOC(%) = 0.28
RC(%) = 0.19
HI = 271
OICO = 4
OI = 39
MINC(%) = 1.19
0
3
6
9
12
15
18
21
TIME (min)


C-603686; DELPHI SIMONN 7-14-64-25; 2297.65 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603686
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2297.65 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 1.11
S2 = 1.67
S3 = 0.09
PI = 0.4
Tmax = 432
TpkS2 = 463
S3CO = 0.04
PC(%) = 0.24
TOC(%) = 0.66
RC(%) = 0.42
HI = 253
OICO = 6
OI = 14
MINC(%) = 3.12
0
3
6
9
12
15
18
21
TIME (min)

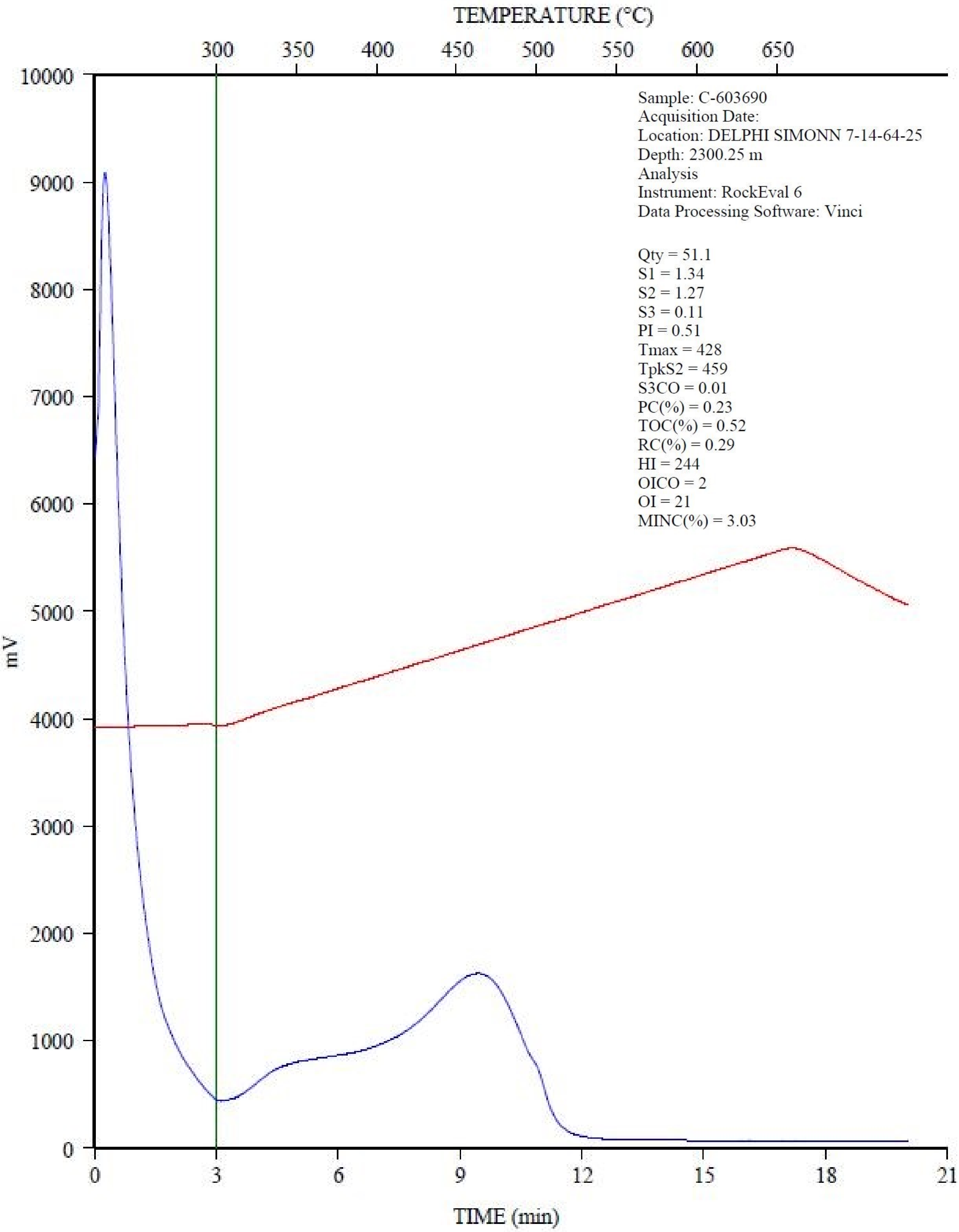

C-603687; DELPHI SIMONN 7-14-64-25; 2298.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603687
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2298.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.91
S2 = 2.61
S3 = 0.12
PI = 0.26
Tmax = 434
TpkS2 = 465
S3CO = 0.01
PC(%) = 0.3
TOC(%) = 0.59
RC(%) = 0.29
HI = 442
OICO = 2
OI = 20
MINC(%) = 1.44
0
3
6
9
12
15
18
21
TIME (min)


C-603688; DELPHI SIMONN 7-14-64-25; 2298.85 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603688
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2298.85 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 2.15
S2 = 1.57
S3 = 0.11
PI = 0.58
Tmax = 425
TpkS2 = 456
S3CO = 0
PC(%) = 0.32
TOC(%) = 0.63
RC(%) = 0.31
HI = 249
OICO = 0
OI = 17
MINC(%) = 3.54
0
3
6
9
12
15
18
21
TIME (min)

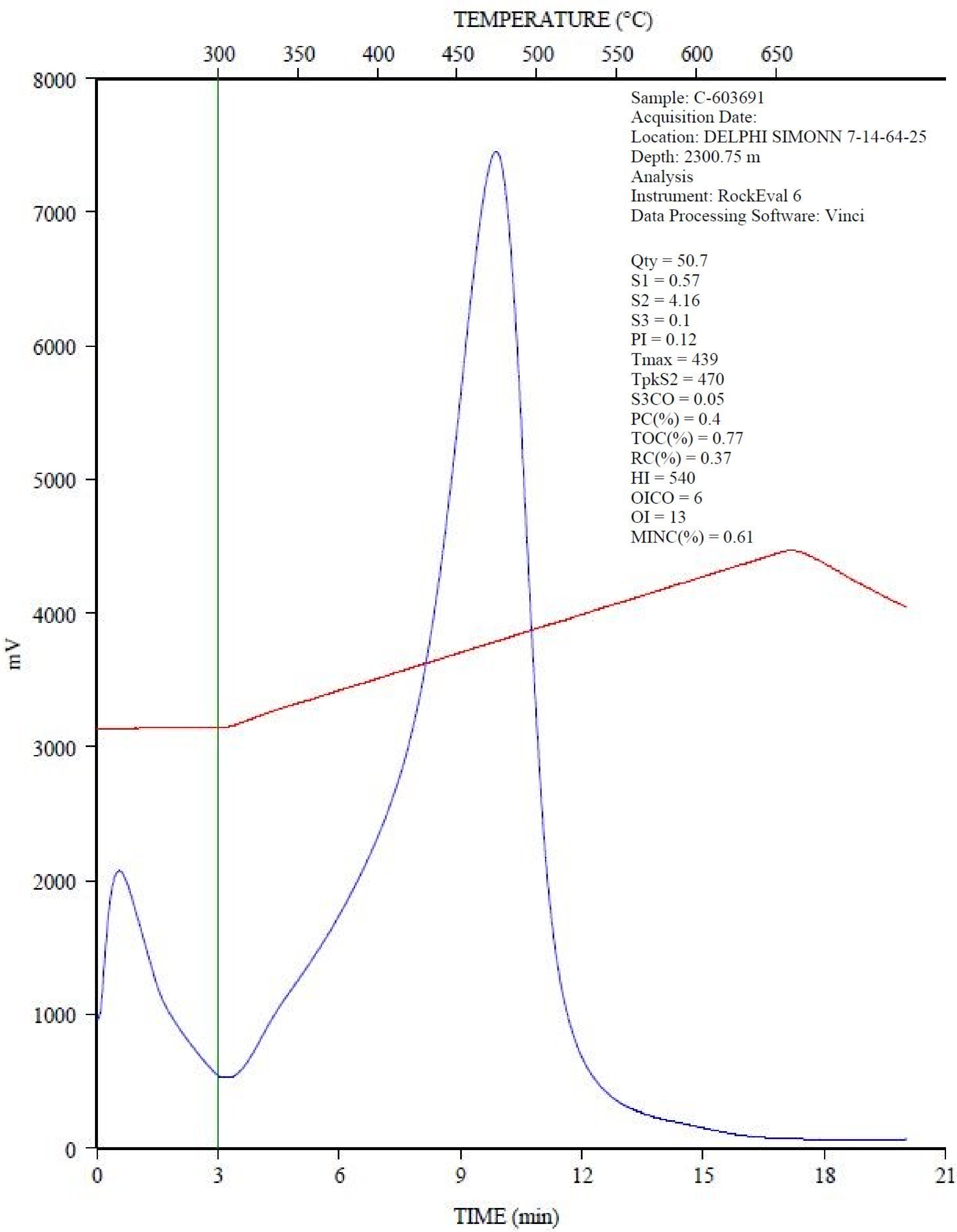
C-603689; DELPHI SIMONN 7-14-64-25; 2299.75 m
FID Hydrocarbons

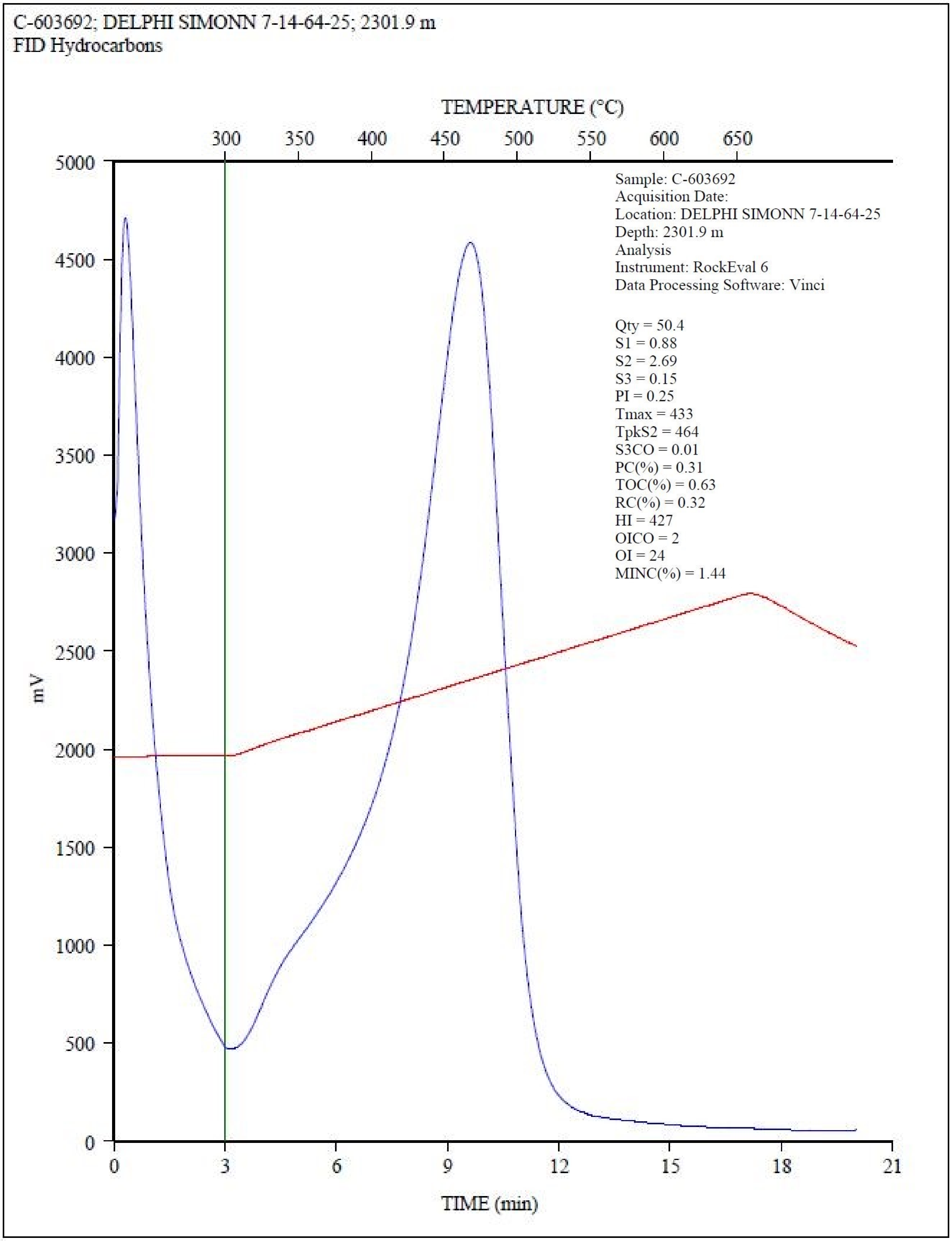


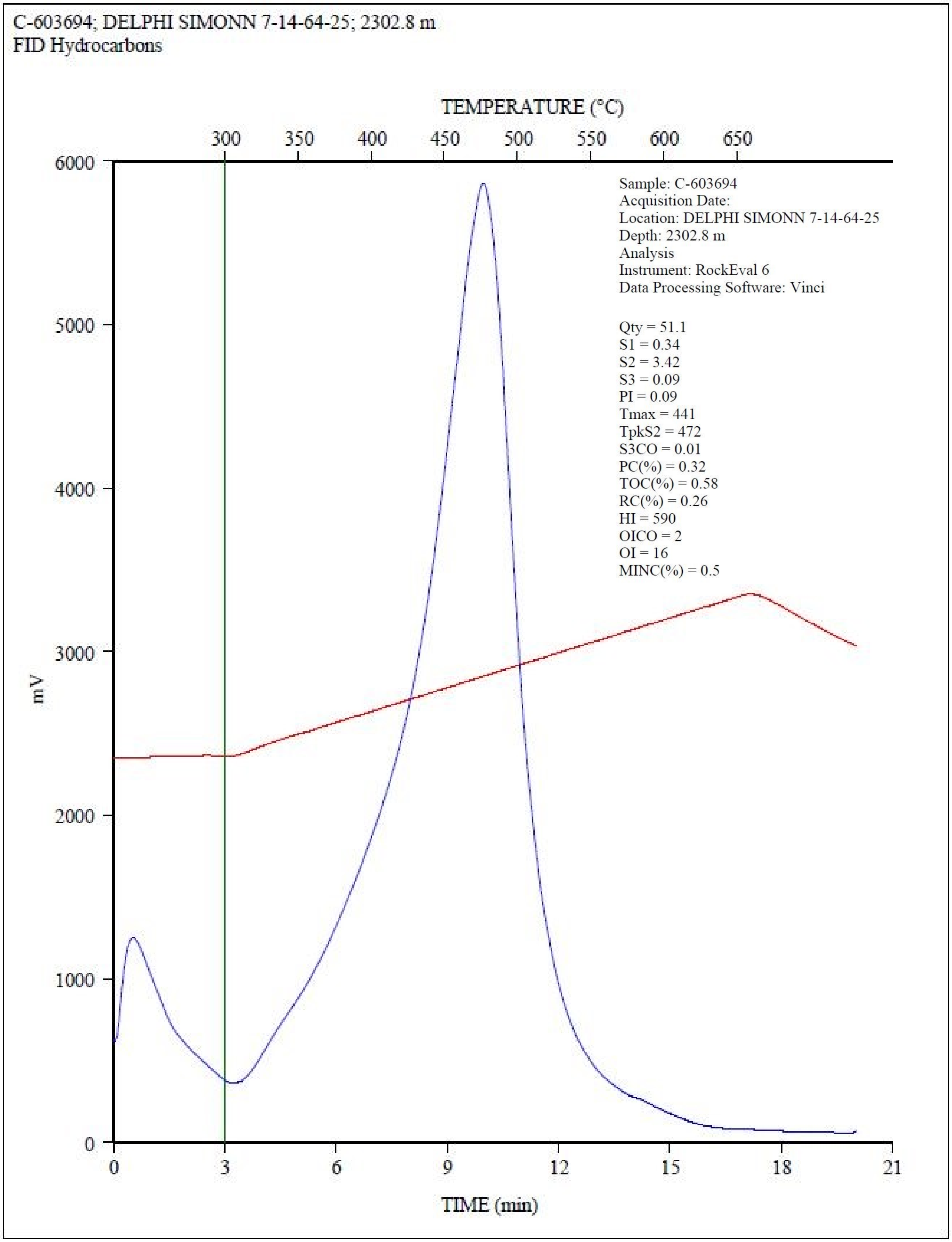
C-603690; DELPHI SIMONN 7-14-64-25; 2300.25 m
FID Hydrocarbons



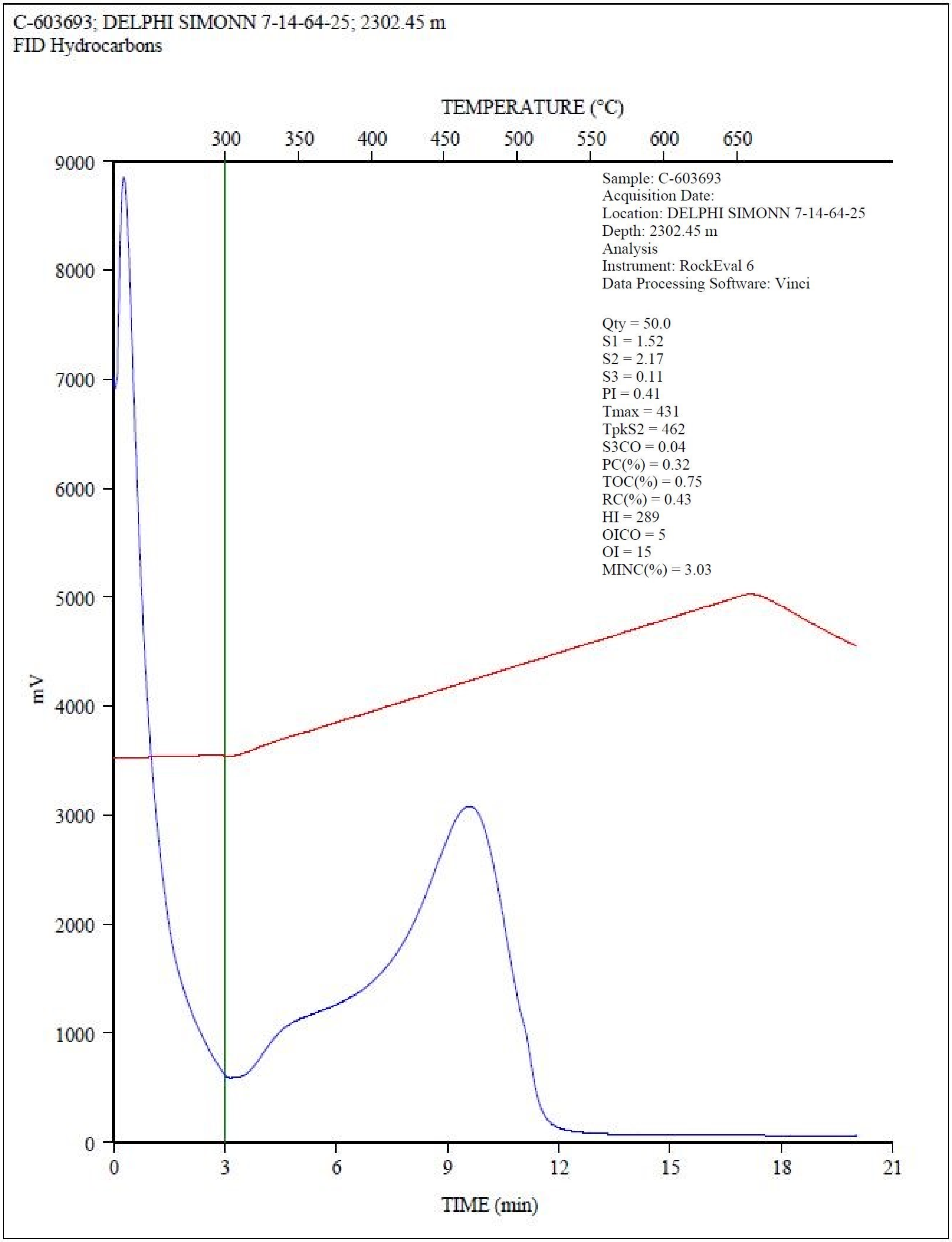
C-603691; DELPHI SIMONN 7-14-64-25; 2300.75 m
FID Hydrocarbons

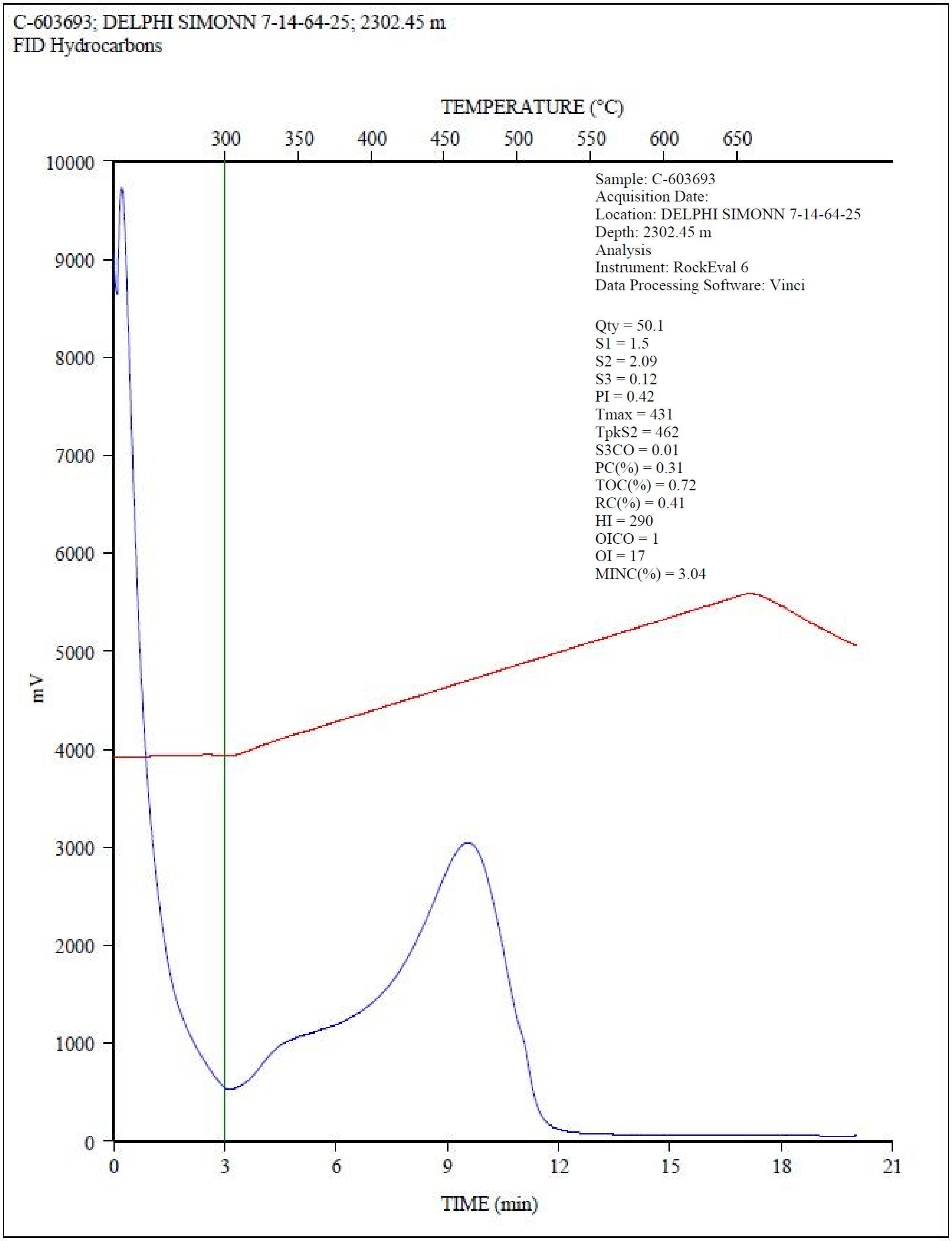


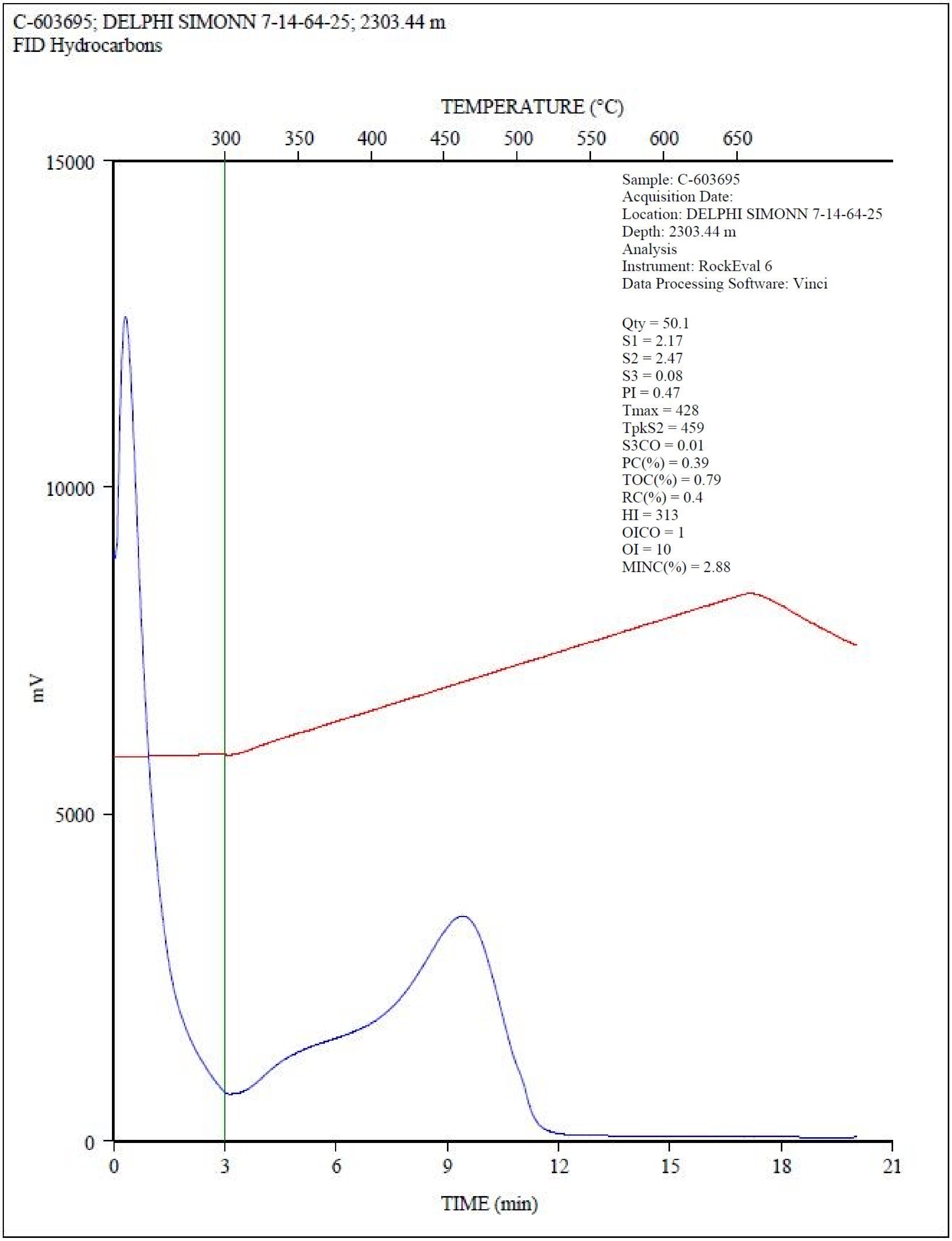

C-603692; DELPHI SIMONN 7-14-64-25; 2301.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
mV
TIME (min)
Sample: C-603692
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2301.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.4
S1 = 0.88
S2 = 2.69
S3 = 0.15
PI = 0.25
Tmax = 433
TpkS2 = 464
S3CO = 0.01
PC(%) = 0.31
TOC(%) = 0.63
RC(%) = 0.32
HI = 427
OICO = 2
OI = 24
MINC(%) = 1.44

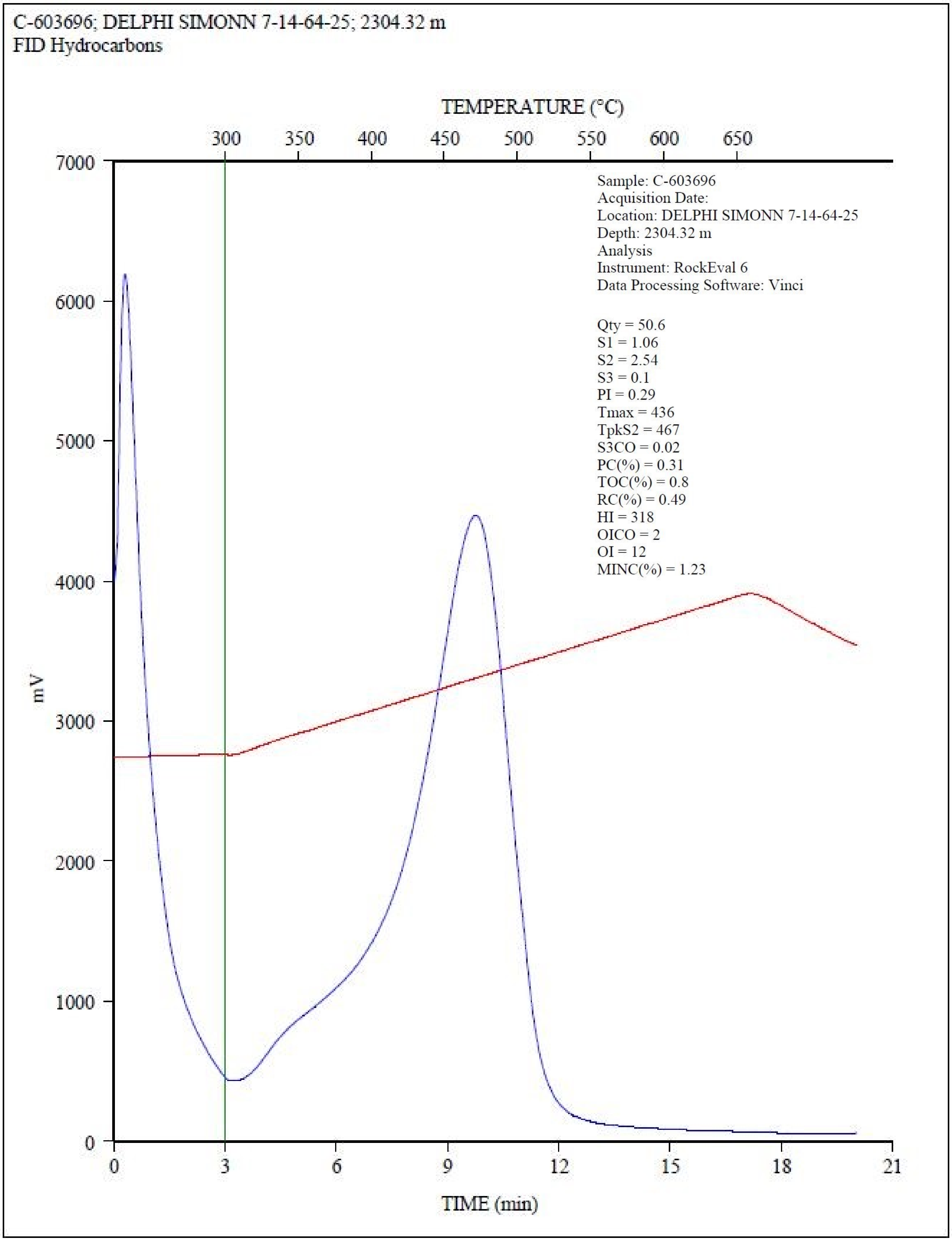


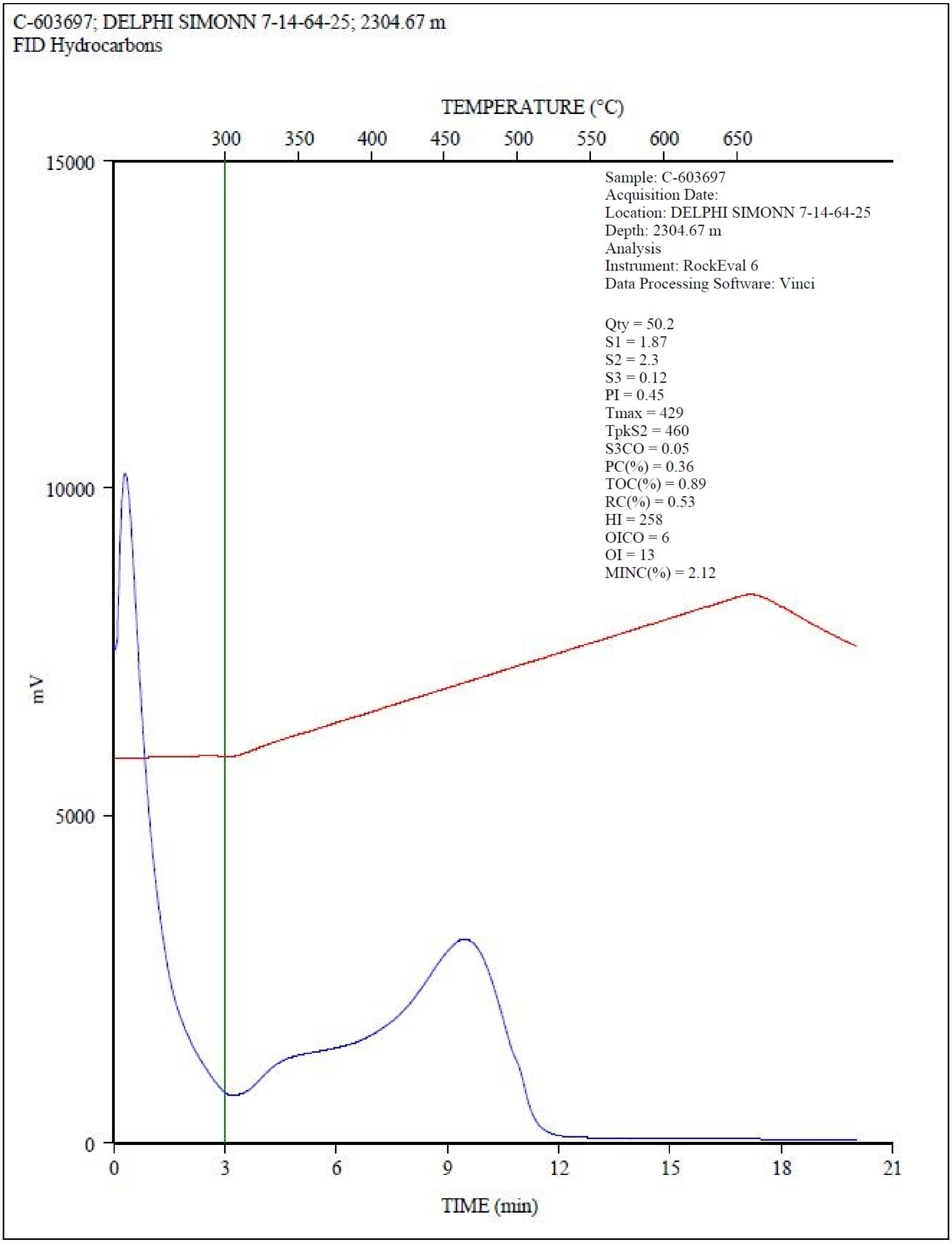
C-603694; DELPHI SIMONN 7-14-64-25; 2302.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603694
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2302.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 0.34
S2 = 3.42
S3 = 0.09
PI = 0.09
Tmax = 441
TpkS2 = 472
S3CO = 0.01
PC(%) = 0.32
TOC(%) = 0.58
RC(%) = 0.26
HI = 590
OICO = 2
OI = 16
MINC(%) = 0.5


C-603693; DELPHI SIMONN 7-14-64-25; 2302.45 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603693
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2302.45 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.0
S1 = 1.52
S2 = 2.17
S3 = 0.11
PI = 0.41
Tmax = 431
TpkS2 = 462
S3CO = 0.04
PC(%) = 0.32
TOC(%) = 0.75
RC(%) = 0.43
HI = 289
OICO = 5
OI = 15
MINC(%) = 3.03
mV
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
3
6
9
12
15
18
21
TIME (min)

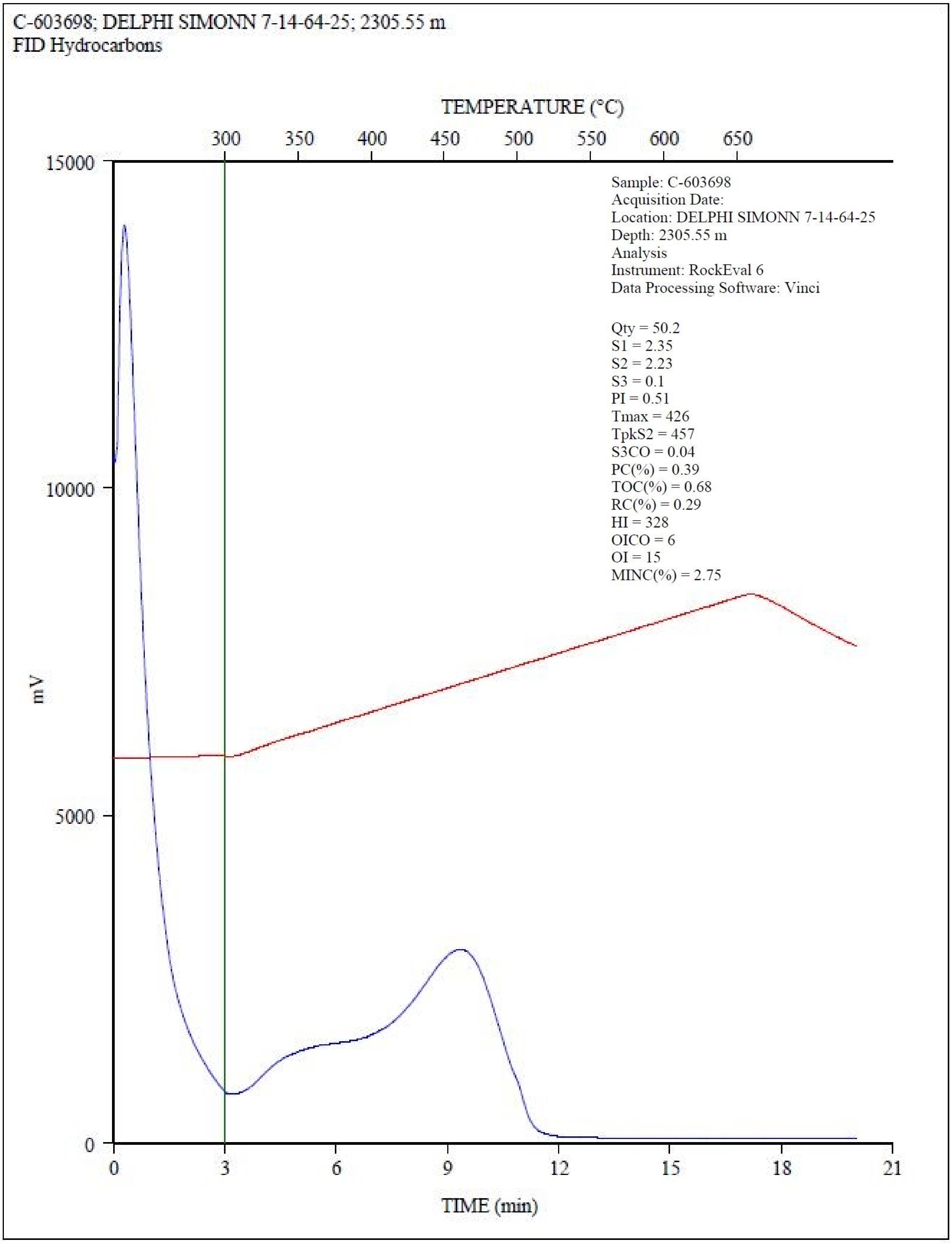

C-603693; DELPHI SIMONN 7-14-64-25; 2302.45 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
Sample: C-603693
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2302.45 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 1.5
S2 = 2.09
S3 = 0.12
PI = 0.42
Tmax = 431
TpkS2 = 462
S3CO = 0.01
PC(%) = 0.31
TOC(%) = 0.72
RC(%) = 0.41
HI = 290
OICO = 1
OI = 17
MINC(%) = 3.04
mV
10000 9000 8000 7000 6000 5000 4000 3000 2000 1000 0
0 3 6 9 12 15 18 21
TIME (min)


C-603695; DELPHI SIMONN 7-14-64-25; 2303.44 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603695
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2303.44 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 2.17
S2 = 2.47
S3 = 0.08
PI = 0.47
Tmax = 428
TpkS2 = 459
S3CO = 0.01
PC(%) = 0.39
TOC(%) = 0.79
RC(%) = 0.4
HI = 313
OICO = 1
OI = 10
MINC(%) = 2.88
0
3
6
9
12
15
18
21
TIME (min)

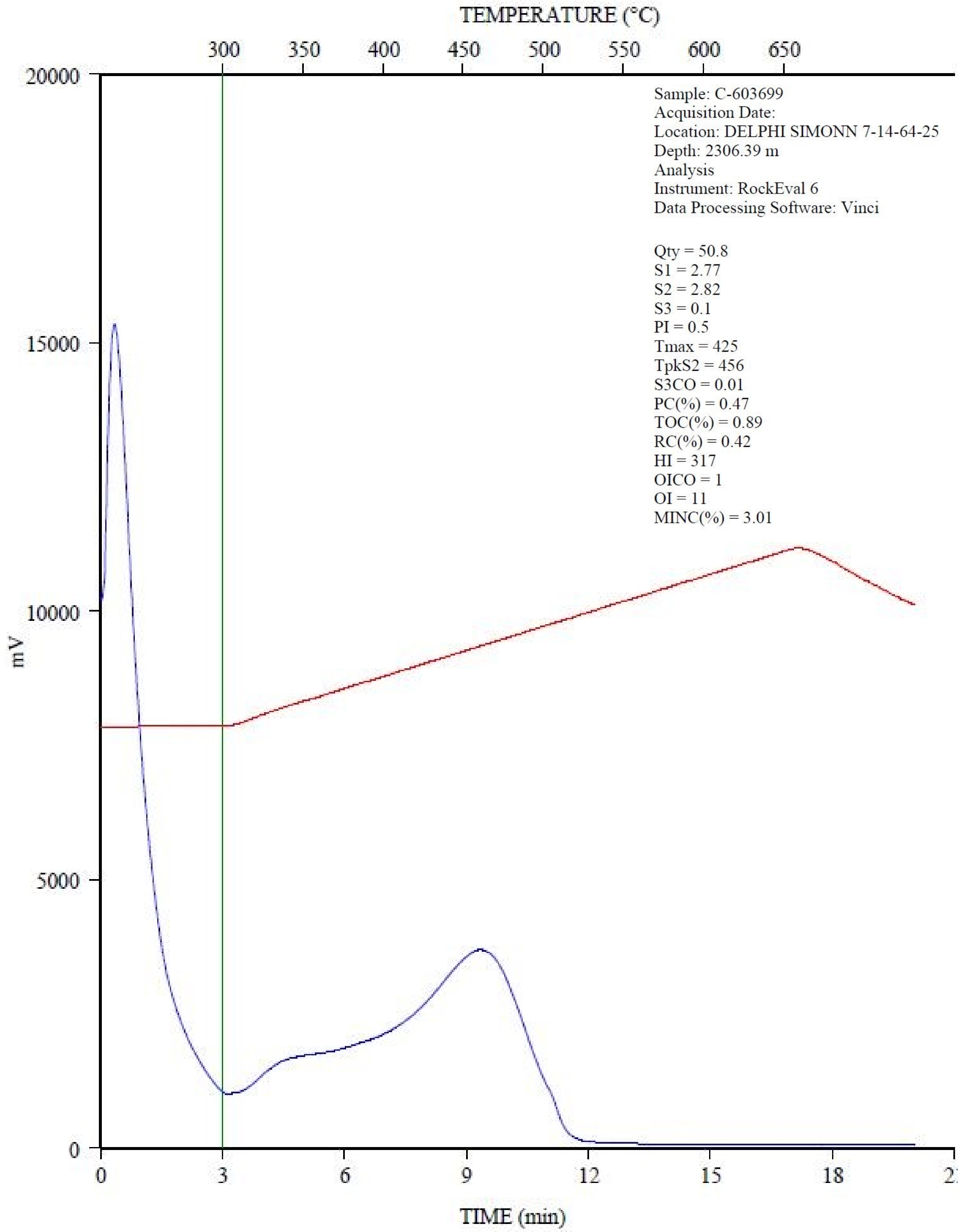

C-603696; DELPHI SIMONN 7-14-64-25; 2304.32 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603696
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2304.32 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 1.06
S2 = 2.54
S3 = 0.1
PI = 0.29
Tmax = 436
TpkS2 = 467
S3CO = 0.02
PC(%) = 0.31
TOC(%) = 0.8
RC(%) = 0.49
HI = 318
OICO = 2
OI = 12
MINC(%) = 1.23
0
3
6
9
12
15
18
21
TIME (min)

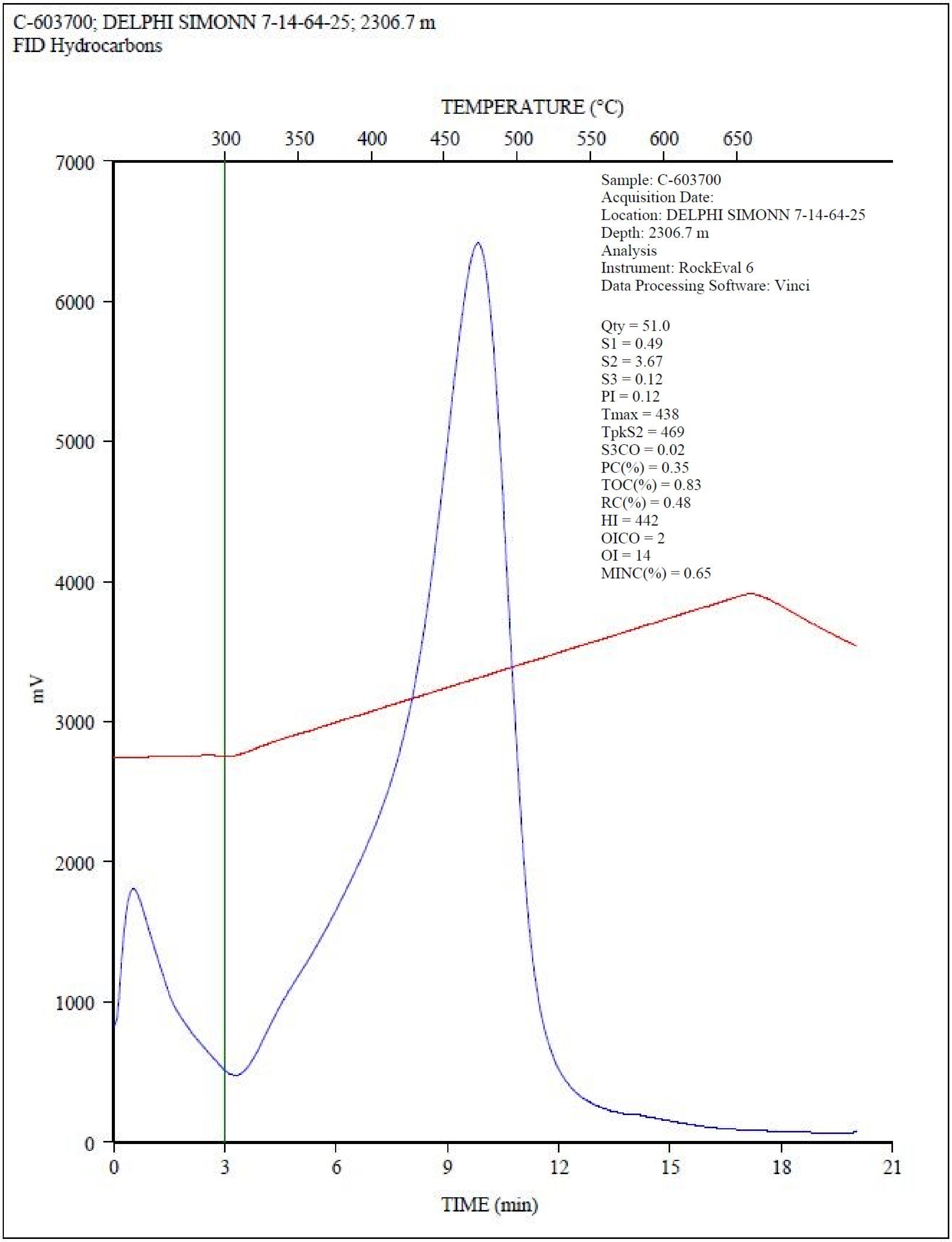


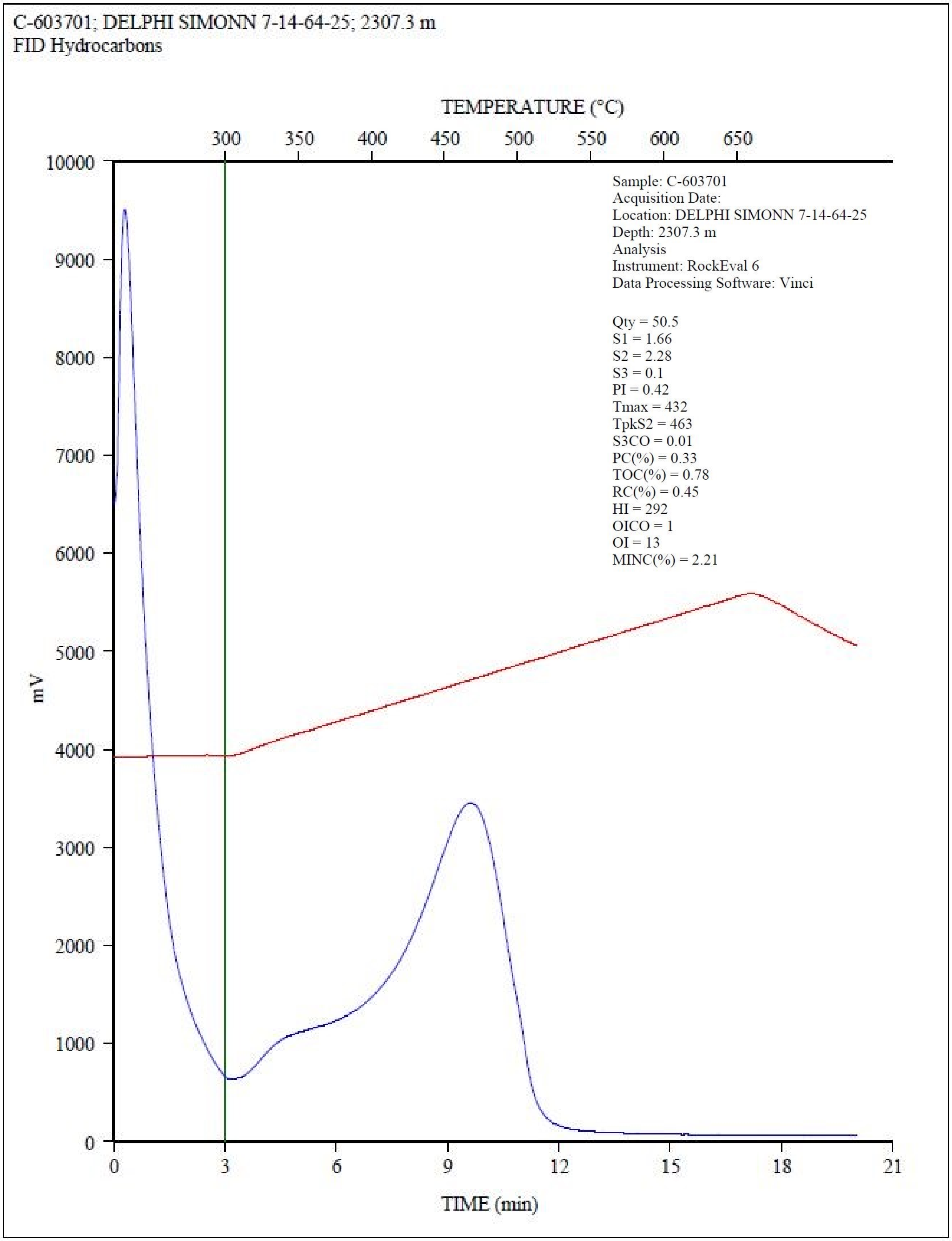
C-603697; DELPHI SIMONN 7-14-64-25; 2304.67 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603697
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2304.67 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 1.87
S2 = 2.3
S3 = 0.12
PI = 0.45
Tmax = 429
TpkS2 = 460
S3CO = 0.05
PC(%) = 0.36
TOC(%) = 0.89
RC(%) = 0.53
HI = 258
OICO = 6
OI = 13
MINC(%) = 2.12
0
3
6
9
12
15
18
21
TIME (min)

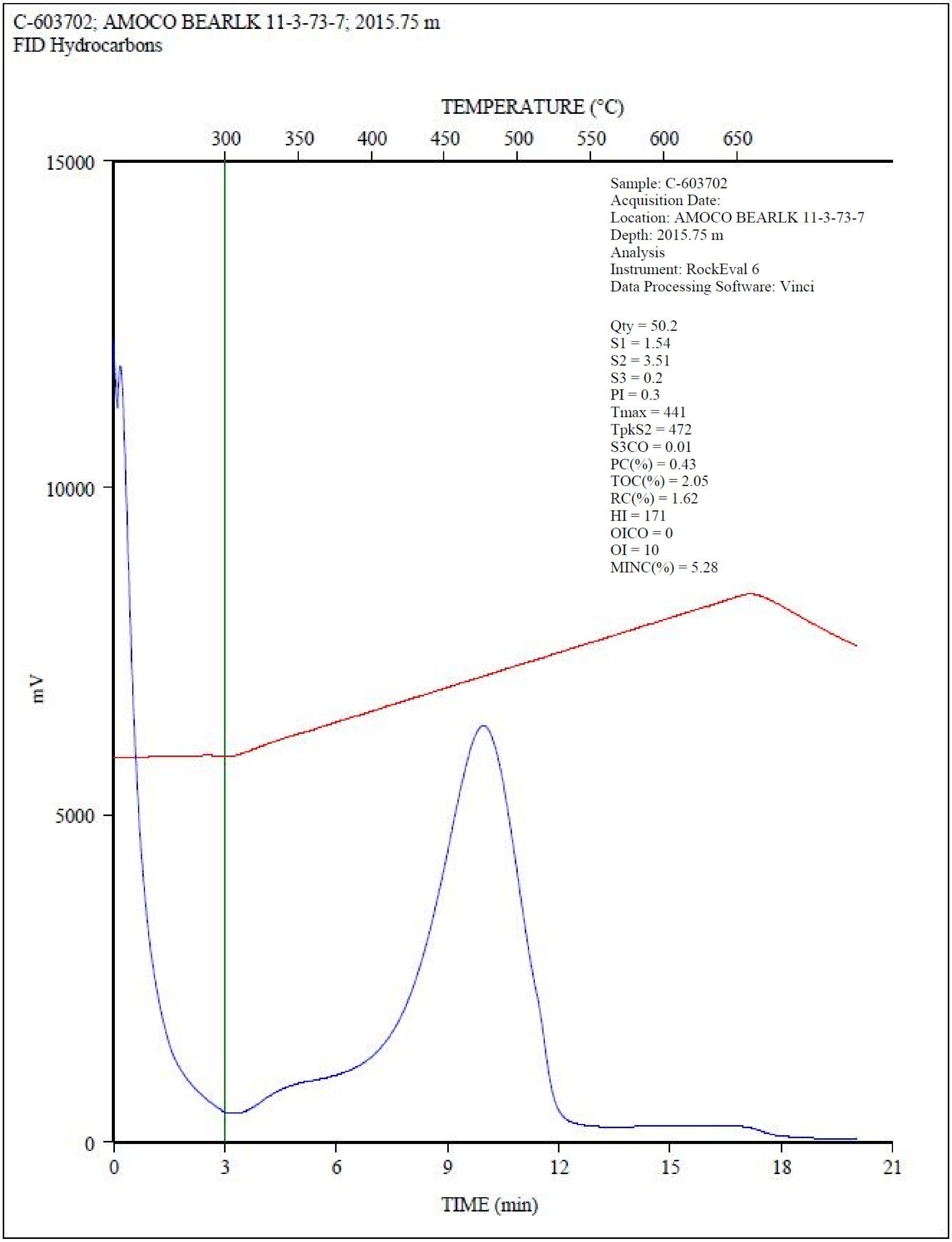

C-603698; DELPHI SIMONN 7-14-64-25; 2305.55 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603698
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2305.55 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 2.35
S2 = 2.23
S3 = 0.1
PI = 0.51
Tmax = 426
TpkS2 = 457
S3CO = 0.04
PC(%) = 0.39
TOC(%) = 0.68
RC(%) = 0.29
HI = 328
OICO = 6
OI = 15
MINC(%) = 2.75
0
3
6
9
12
15
18
21
TIME (min)

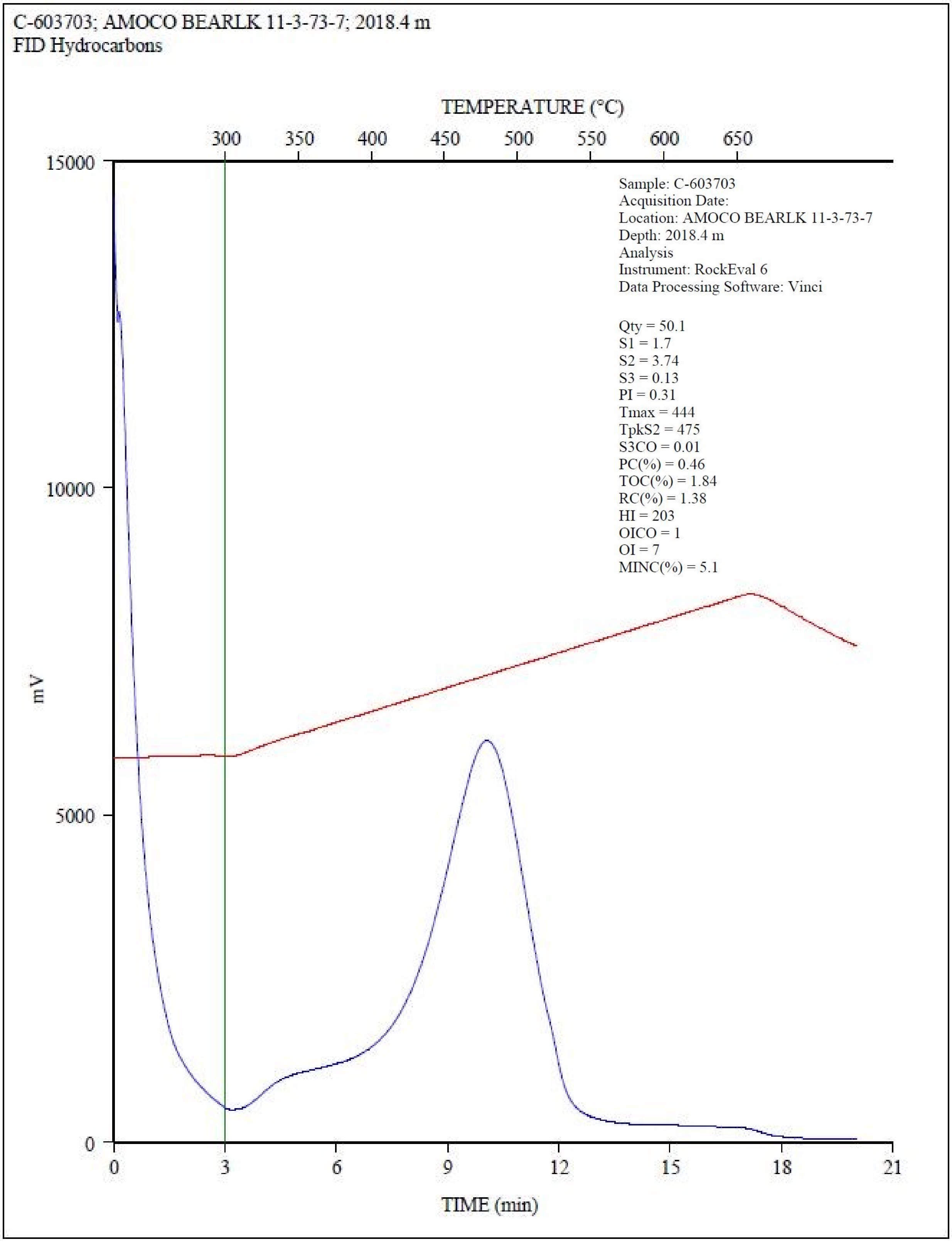
C-603699; DELPHI SIMONN 7-14-64-25; 2306.39 m
FID Hydrocarbons



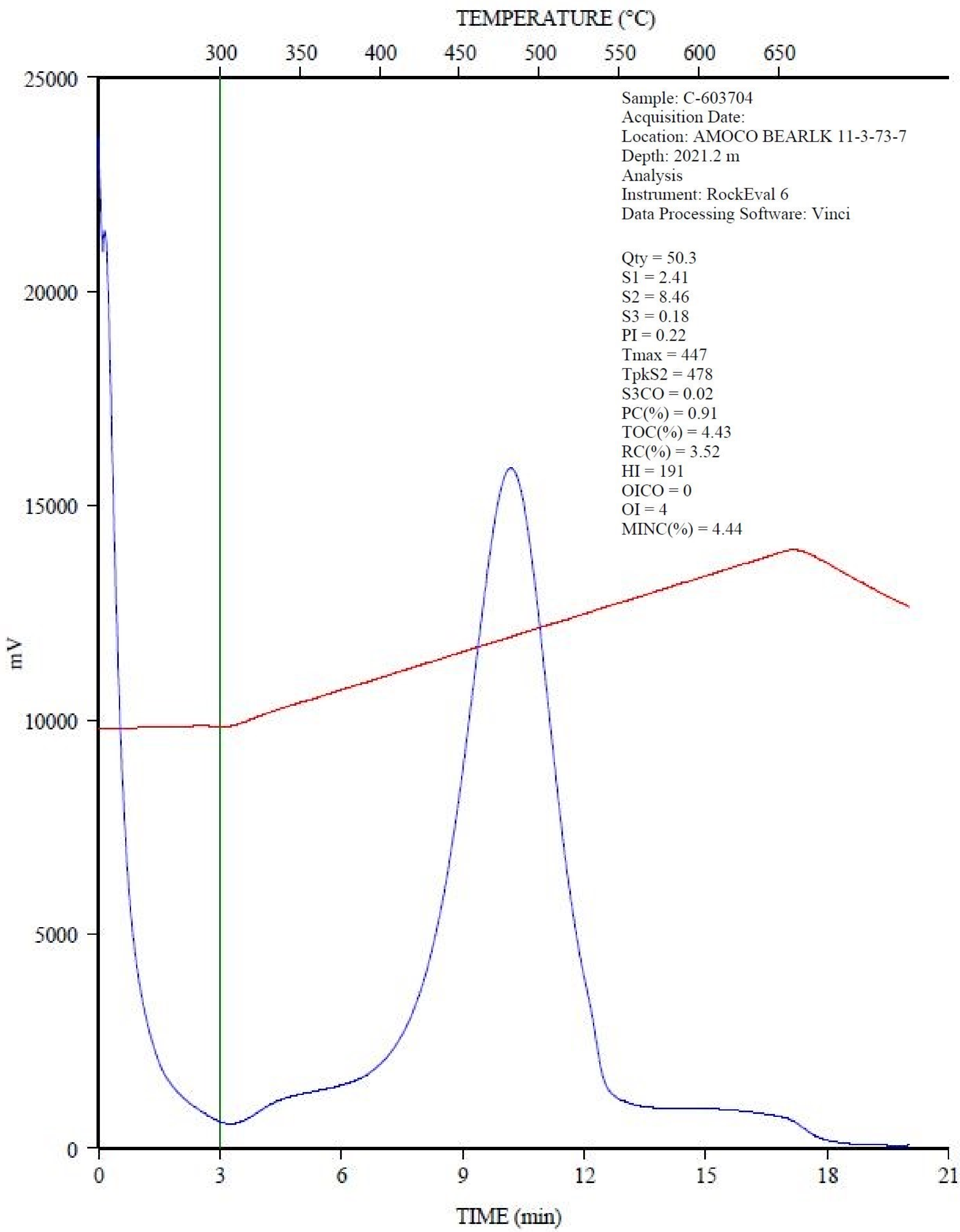

C-603700; DELPHI SIMONN 7-14-64-25; 2306.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603700
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2306.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.0
S1 = 0.49
S2 = 3.67
S3 = 0.12
PI = 0.12
Tmax = 438
TpkS2 = 469
S3CO = 0.02
PC(%) = 0.35
TOC(%) = 0.83
RC(%) = 0.48
HI = 442
OICO = 2
OI = 14
MINC(%) = 0.65
0
3
6
9
12
15
18
21
TIME (min)

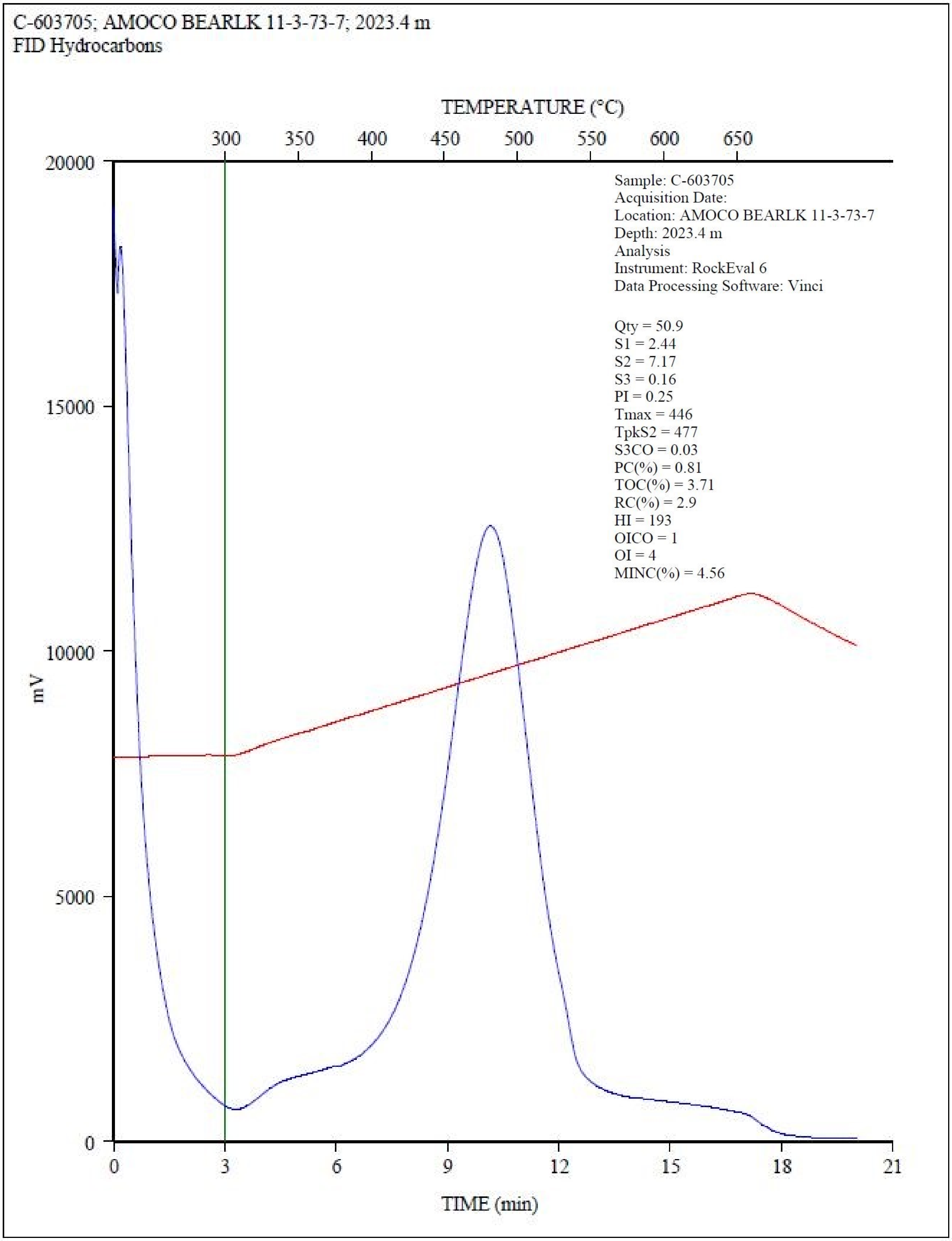

C-603701; DELPHI SIMONN 7-14-64-25; 2307.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
mV
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
TIME (min)
0 3 6 9 12 15 18 21
Sample: C-603701
Acquisition Date:
Location: DELPHI SIMONN 7-14-64-25
Depth: 2307.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 1.66
S2 = 2.28
S3 = 0.1
PI = 0.42
Tmax = 432
TpkS2 = 463
S3CO = 0.01
PC(%) = 0.33
TOC(%) = 0.78
RC(%) = 0.45
HI = 292
OICO = 1
OI = 13
MINC(%) = 2.21


C-603702; AMOCO BEARLK 11-3-73-7; 2015.75 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603702
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2015.75 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 1.54
S2 = 3.51
S3 = 0.2
PI = 0.3
Tmax = 441
TpkS2 = 472
S3CO = 0.01
PC(%) = 0.43
TOC(%) = 2.05
RC(%) = 1.62
HI = 171
OICO = 0
OI = 10
MINC(%) = 5.28
0
3
6
9
12
15
18
21
TIME (min)


C-603703; AMOCO BEARLK 11-3-73-7; 2018.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
15000
10000
5000
0
mV
Sample: C-603703
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2018.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 1.7
S2 = 3.74
S3 = 0.13
PI = 0.31
Tmax = 444
TpkS2 = 475
S3CO = 0.01
PC(%) = 0.46
TOC(%) = 1.84
RC(%) = 1.38
HI = 203
OICO = 1
OI = 7
MINC(%) = 5.1
0 3 6 9 12 15 18 21
TIME (min)

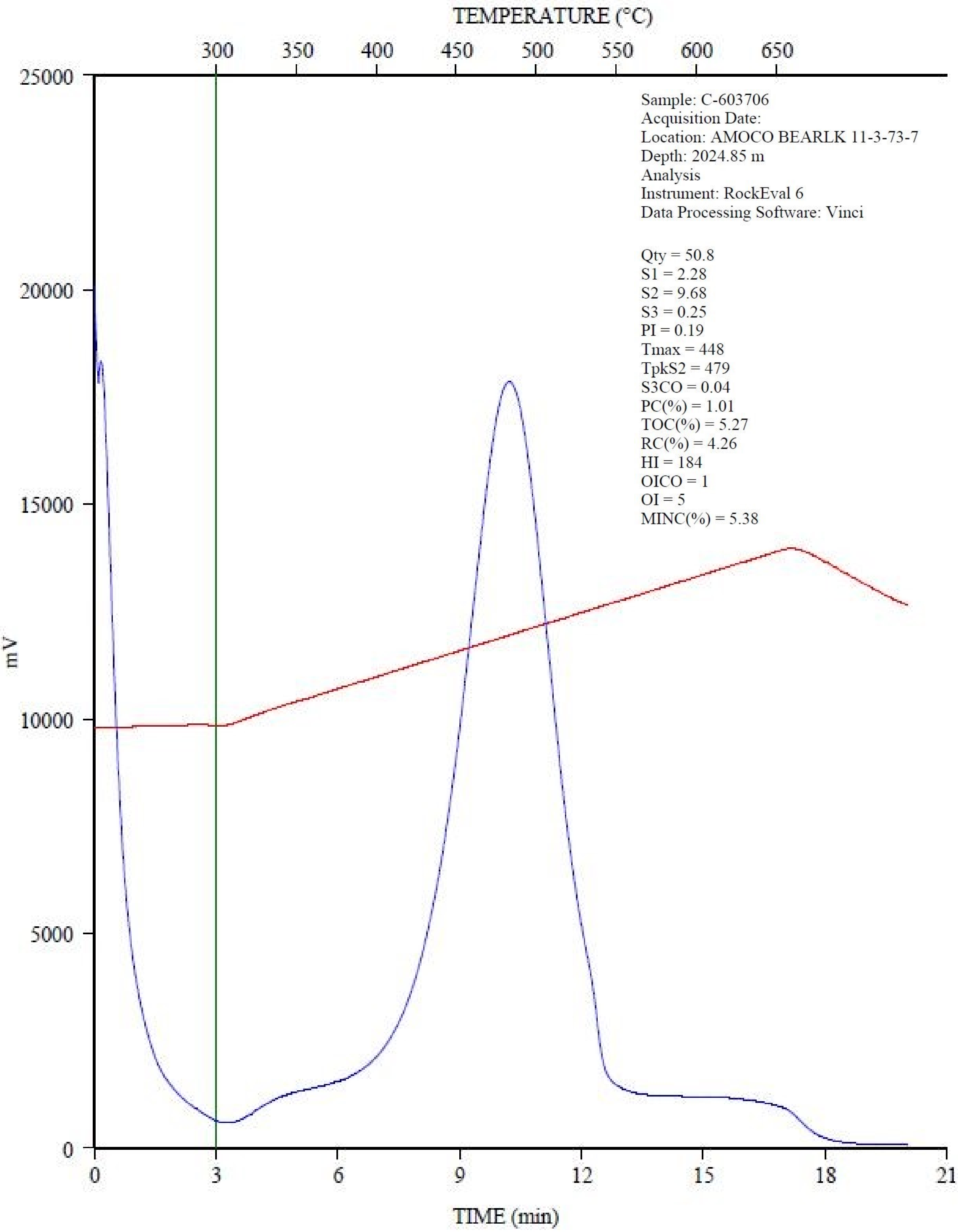
C-603704; AMOCO BEARLK 11-3-73-7; 2021.2 m
FID Hydrocarbons



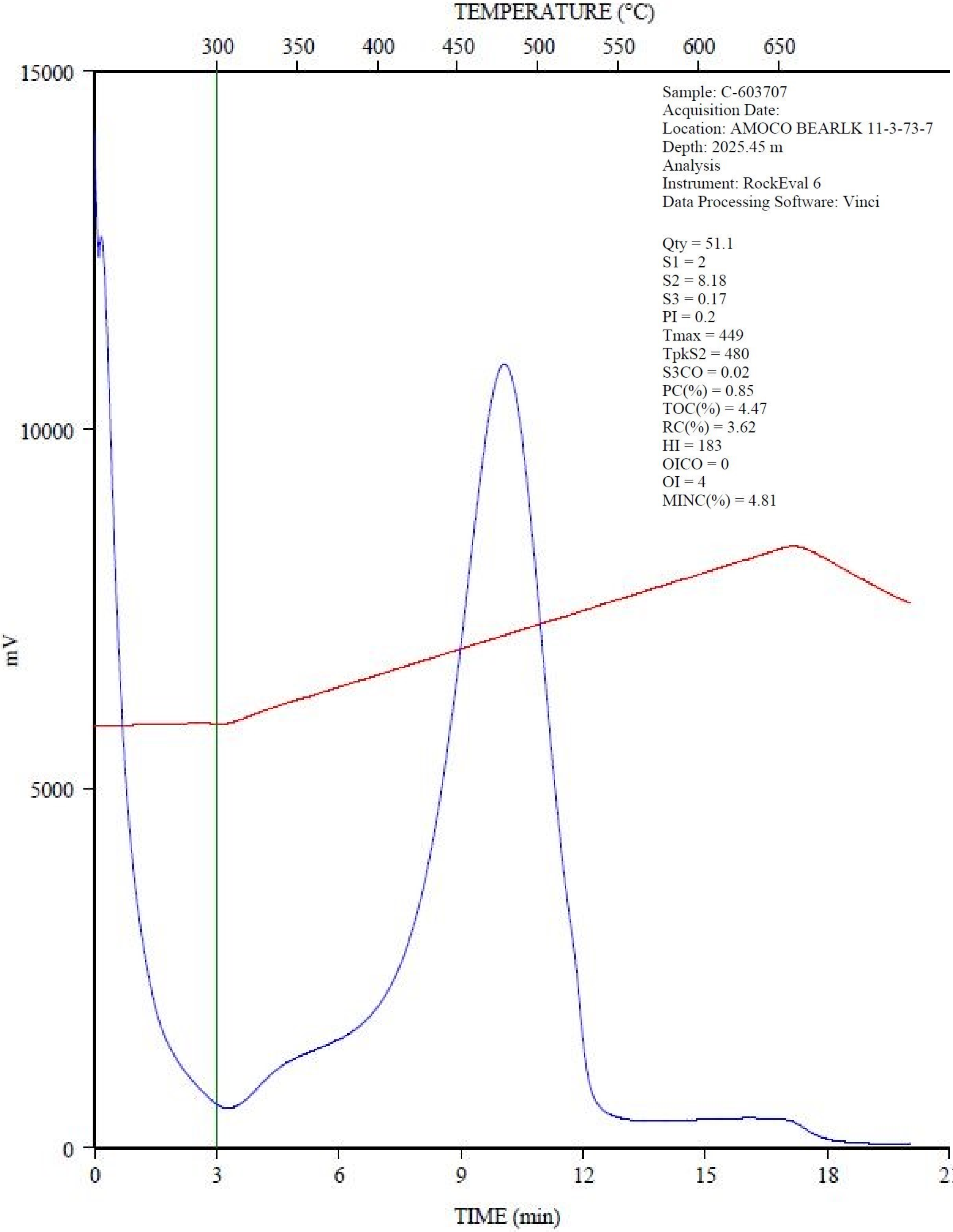


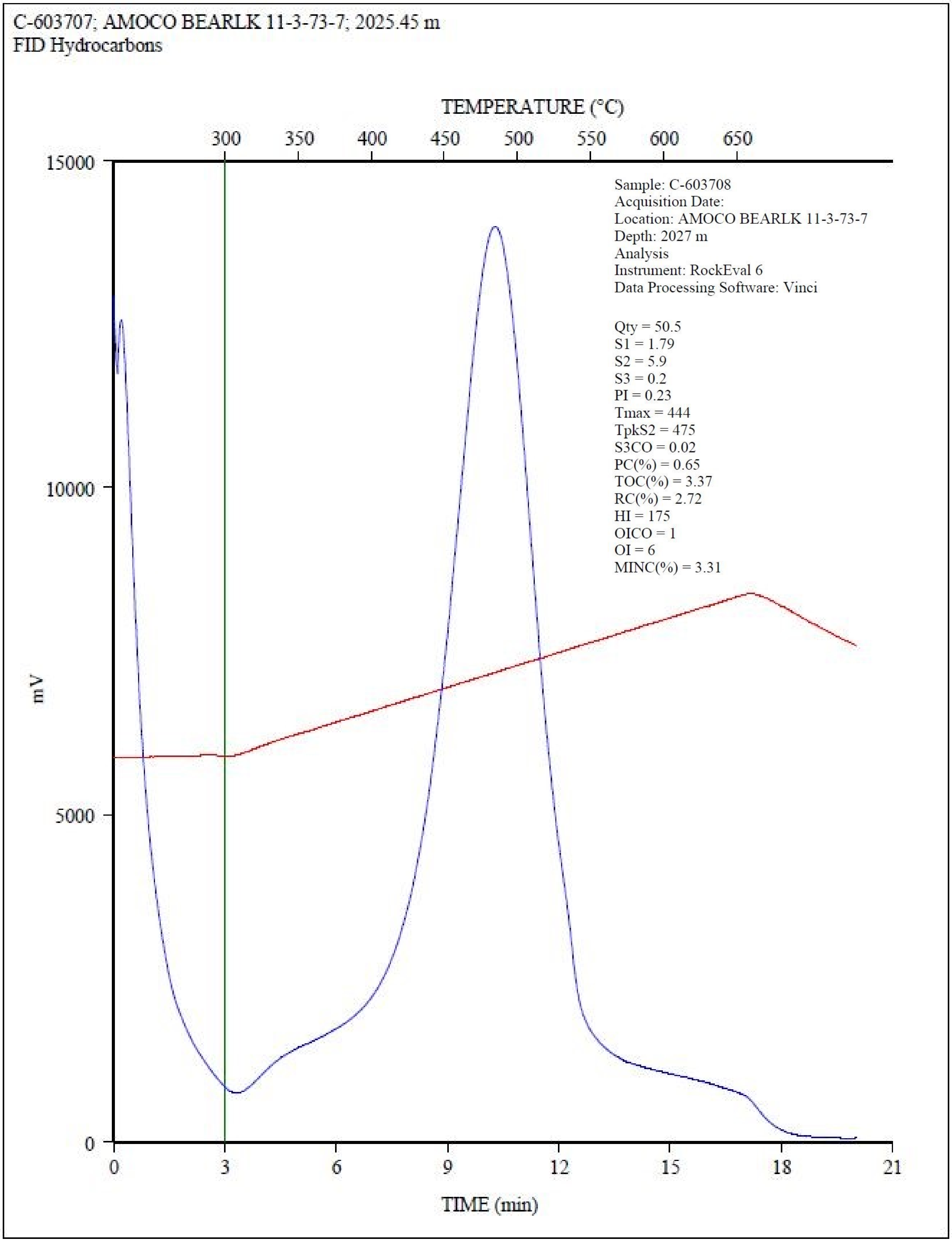
C-603705; AMOCO BEARLK 11-3-73-7; 2023.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603705
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2023.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 2.44
S2 = 7.17
S3 = 0.16
PI = 0.25
Tmax = 446
TpkS2 = 477
S3CO = 0.03
PC(%) = 0.81
TOC(%) = 3.71
RC(%) = 2.9
HI = 193
OICO = 1
OI = 4
MINC(%) = 4.56
0
3
6
9
12
15
18
21
TIME (min)

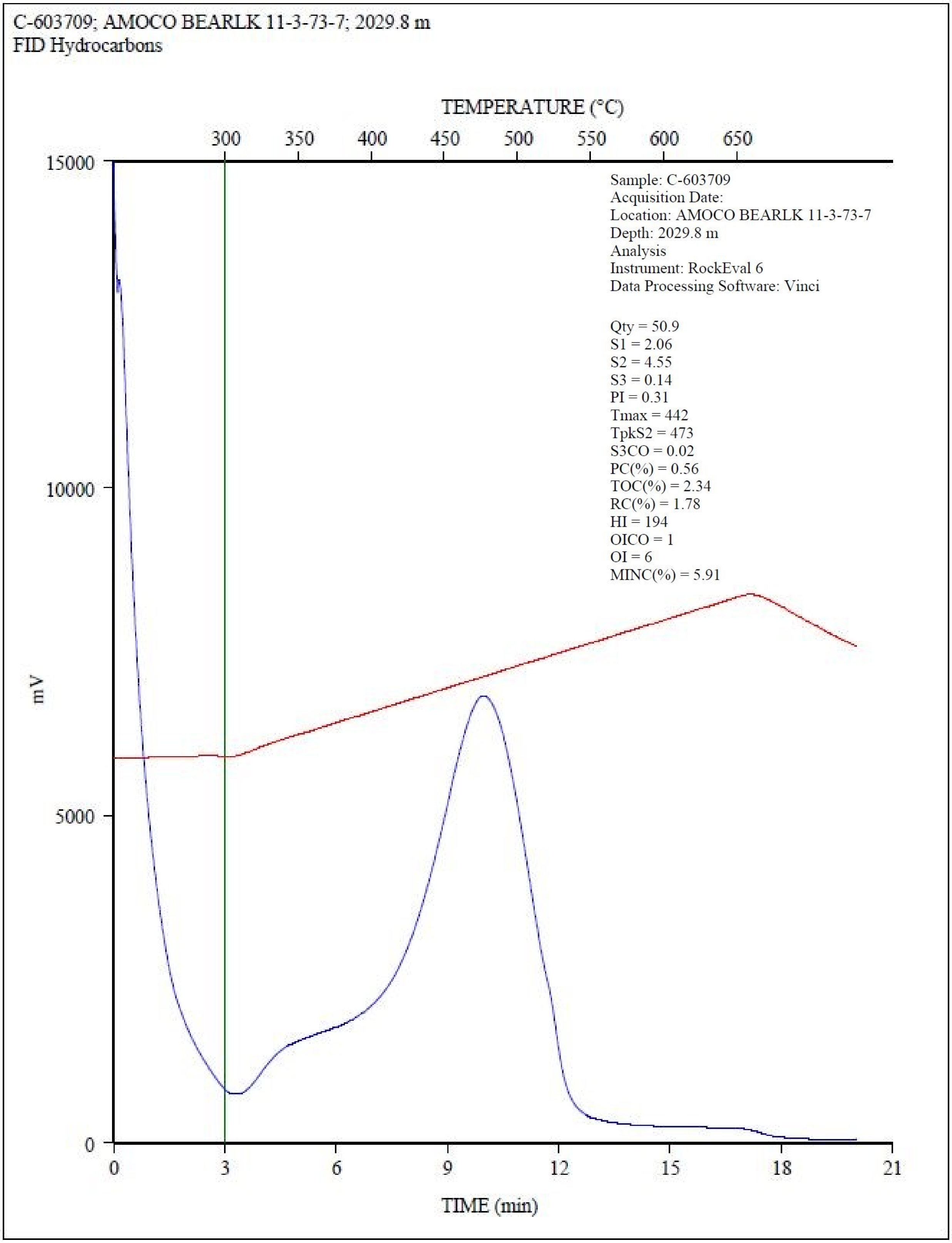
C-603706; AMOCO BEARLK 11-3-73-7; 2024.85 m
FID Hydrocarbons

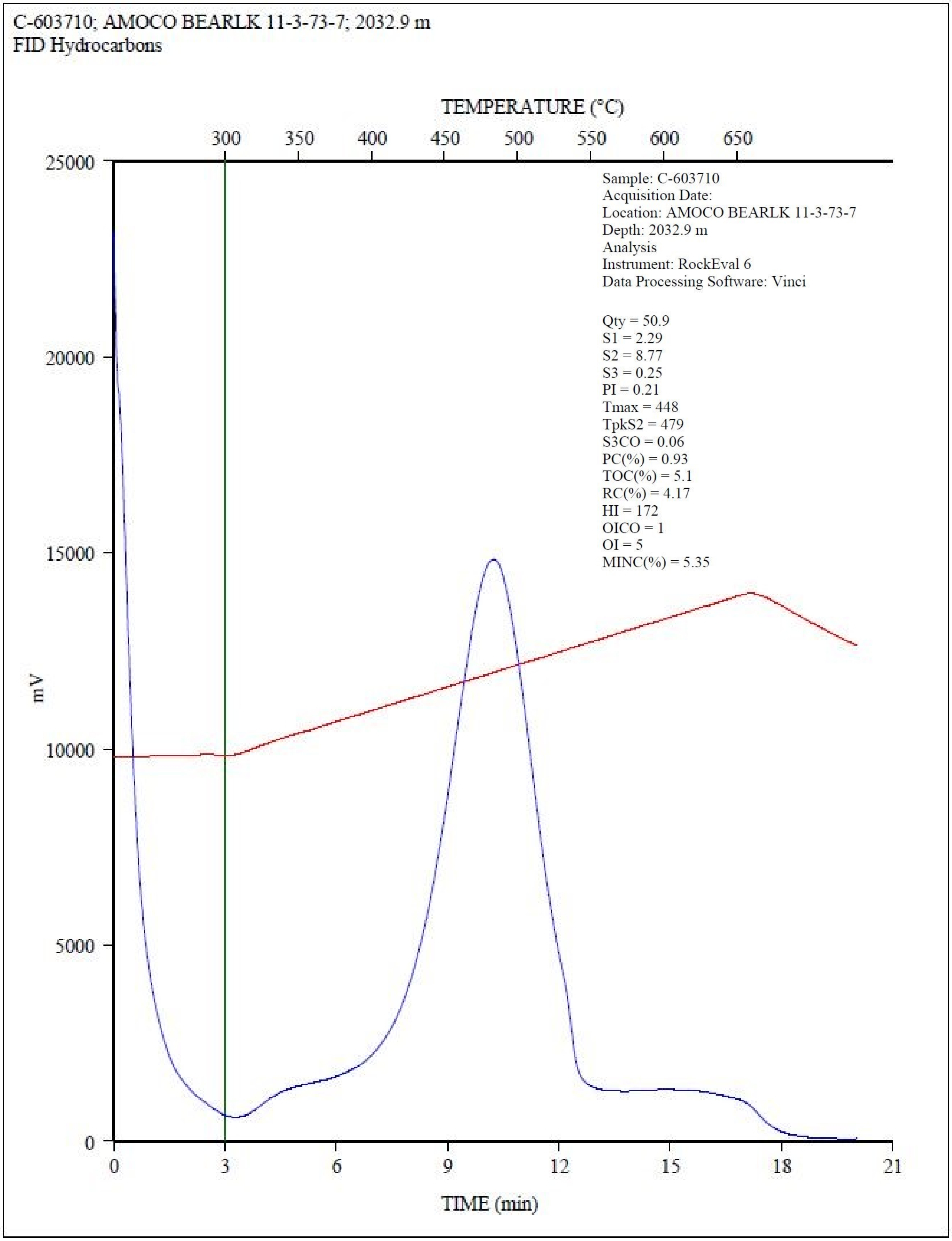


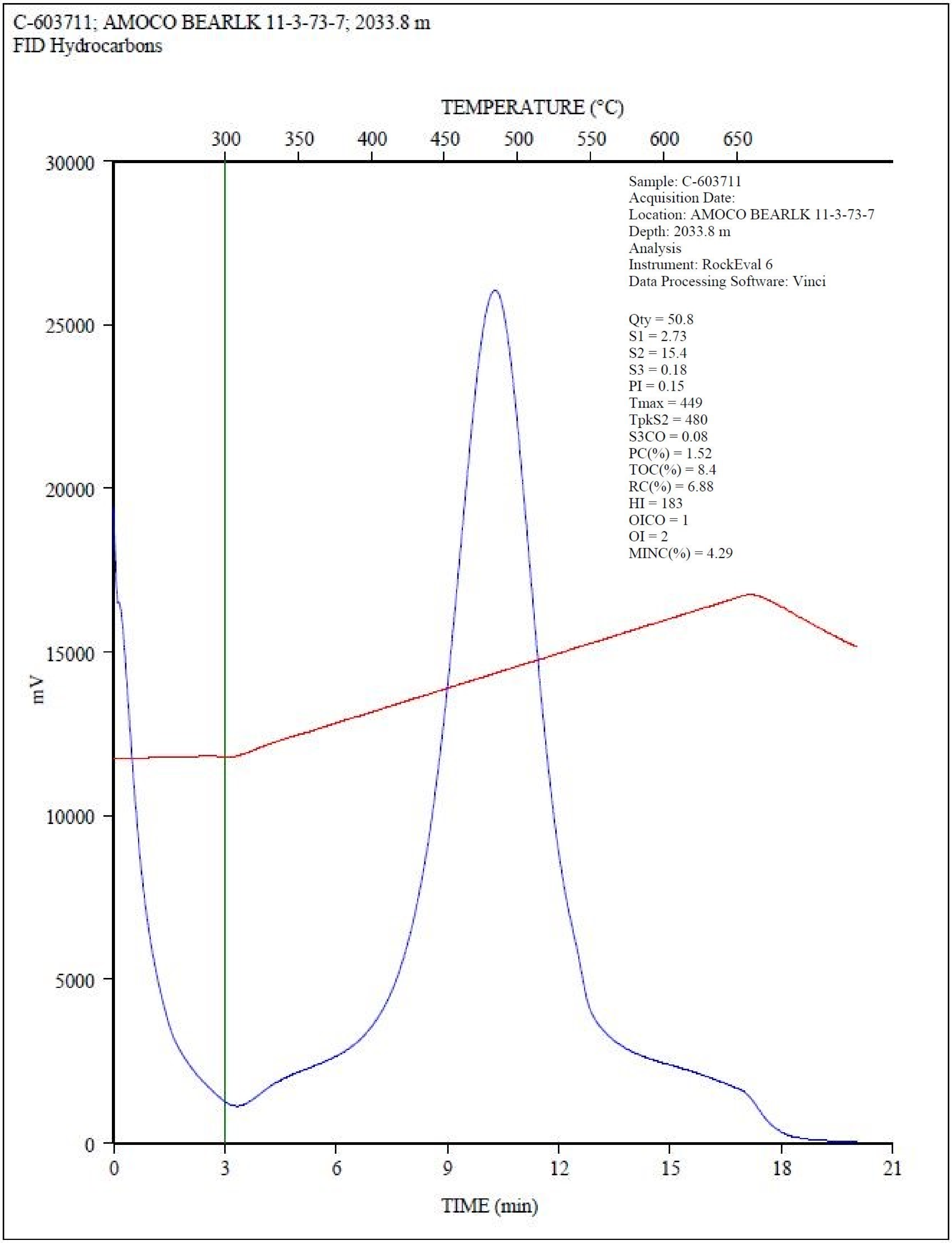
C-603708; AMOCO BEARLK 11-3-73-7; 2027 m
FID Hydrocarbons

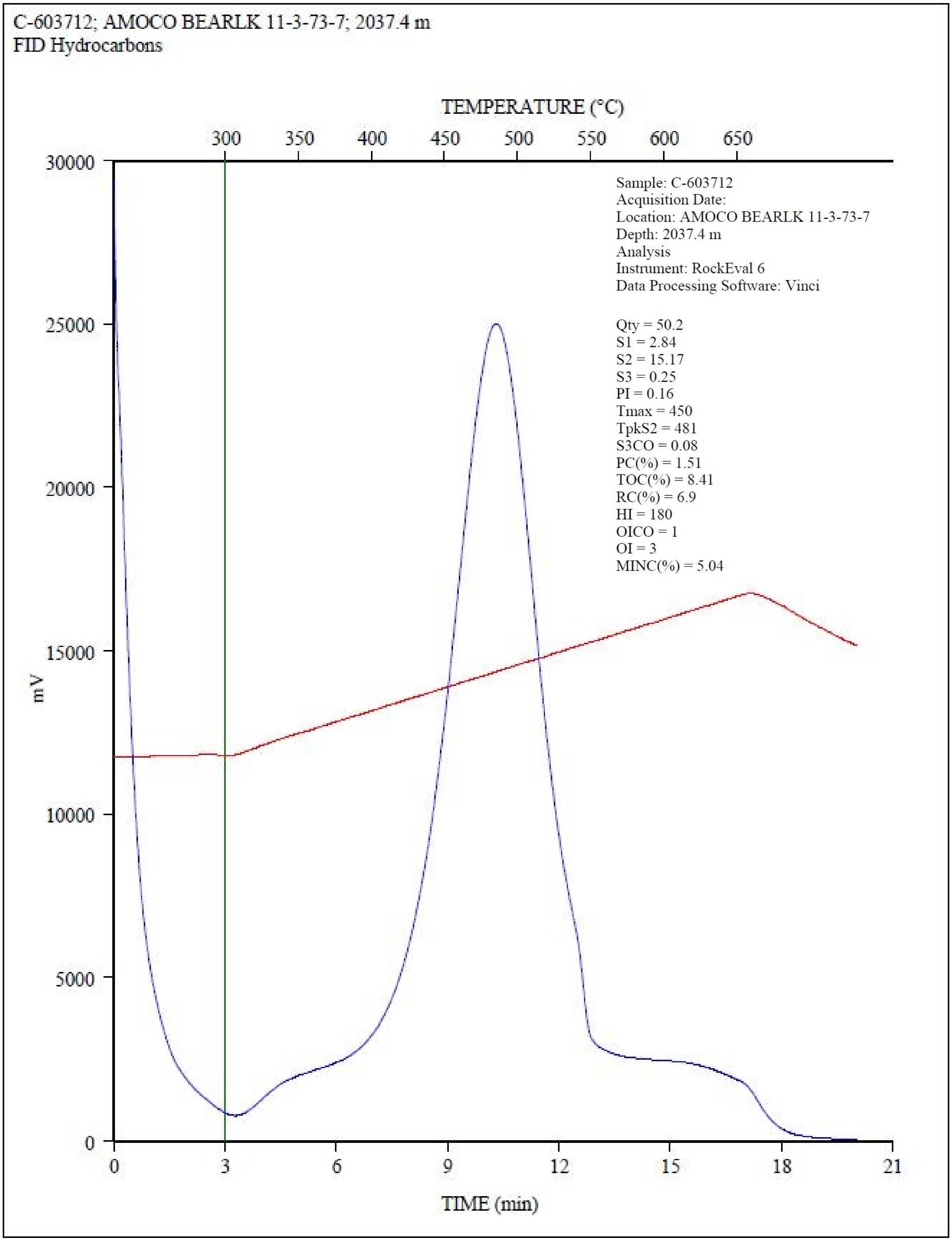



C-603707; AMOCO BEARLK 11-3-73-7; 2025.45 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603708
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2027 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 1.79
S2 = 5.9
S3 = 0.2
PI = 0.23
Tmax = 444
TpkS2 = 475
S3CO = 0.02
PC(%) = 0.65
TOC(%) = 3.37
RC(%) = 2.72
HI = 175
OICO = 1
OI = 6
MINC(%) = 3.31
0
3
6
9
12
15
18
21
TIME (min)

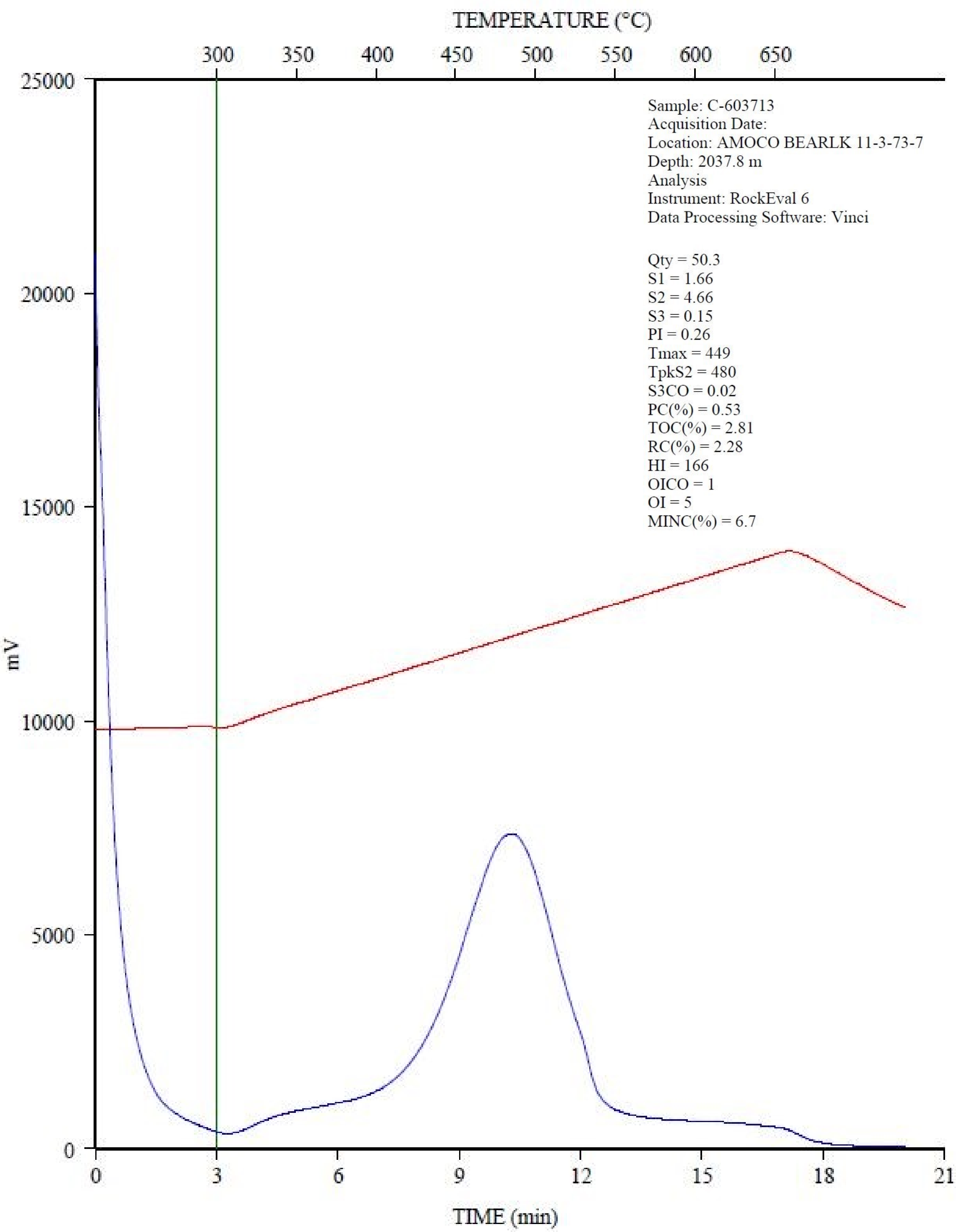

C-603709; AMOCO BEARLK 11-3-73-7; 2029.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603709
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2029.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 2.06
S2 = 4.55
S3 = 0.14
PI = 0.31
Tmax = 442
TpkS2 = 473
S3CO = 0.02
PC(%) = 0.56
TOC(%) = 2.34
RC(%) = 1.78
HI = 194
OICO = 1
OI = 6
MINC(%) = 5.91
0
3
6
9
12
15
18
21
TIME (min)

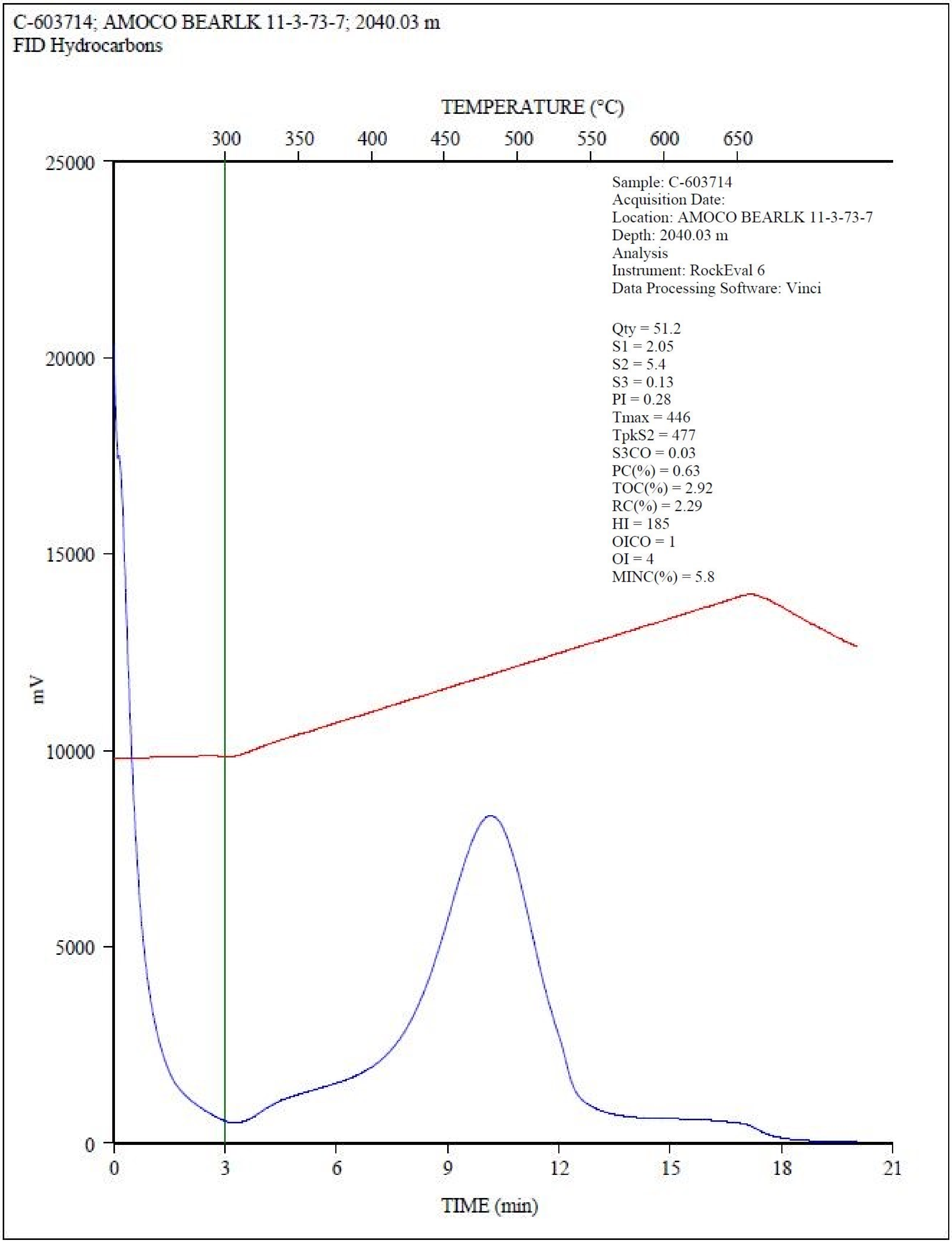

C-603710; AMOCO BEARLK 11-3-73-7; 2032.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
25000 20000 15000 10000 5000 0
mV
0 3 6 9 12 15 18 21
TIME (min)
Sample: C-603710
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2032.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 2.29
S2 = 8.77
S3 = 0.25
PI = 0.21
Tmax = 448
TpkS2 = 479
S3CO = 0.06
PC(%) = 0.93
TOC(%) = 5.1
RC(%) = 4.17
HI = 172
OICO = 1
OI = 5
MINC(%) = 5.35

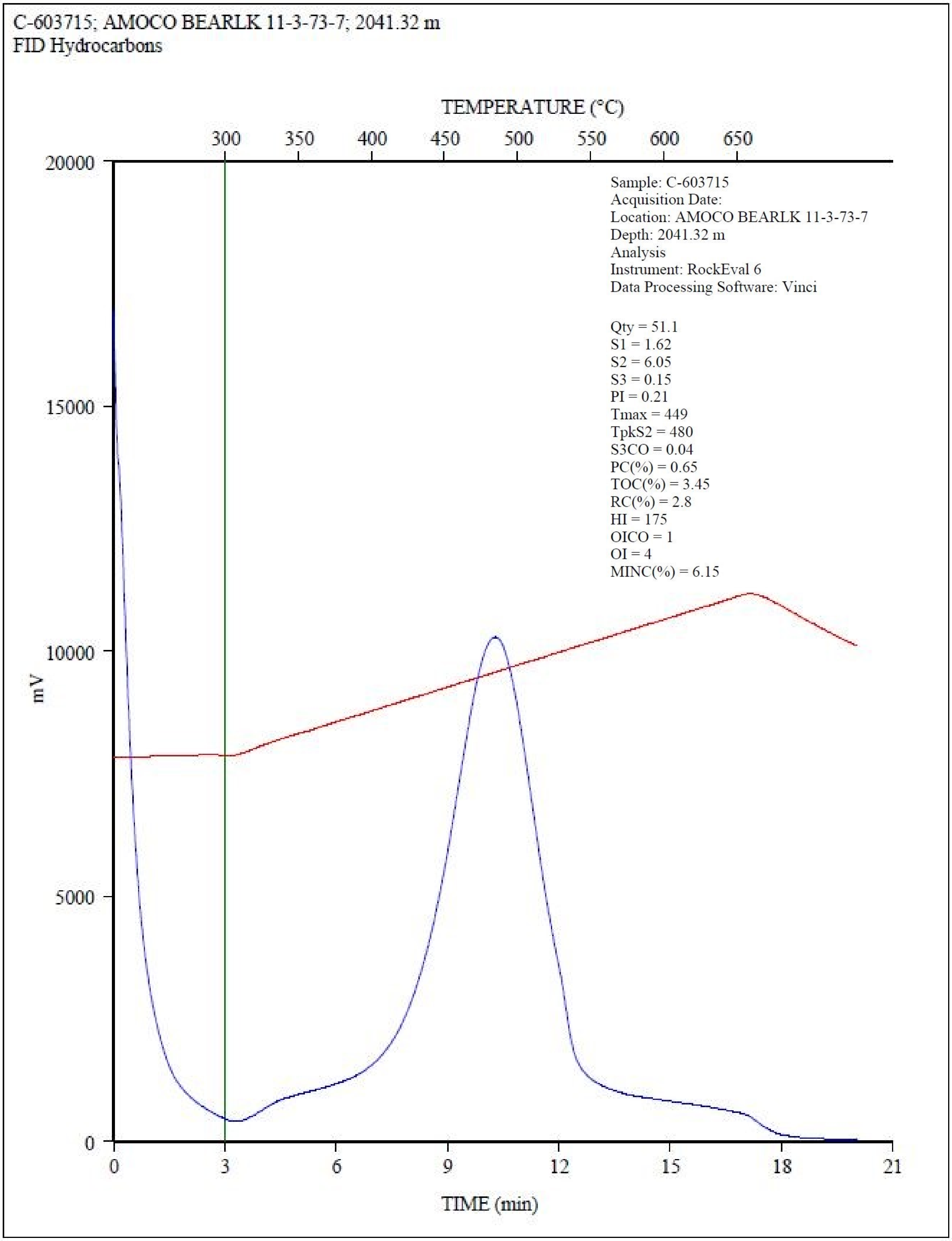

C-603711; AMOCO BEARLK 11-3-73-7; 2033.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603711
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2033.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 2.73
S2 = 15.4
S3 = 0.18
PI = 0.15
Tmax = 449
TpkS2 = 480
S3CO = 0.08
PC(%) = 1.52
TOC(%) = 8.4
RC(%) = 6.88
HI = 183
OICO = 1
OI = 2
MINC(%) = 4.29
0
3
6
9
12
15
18
21
TIME (min)

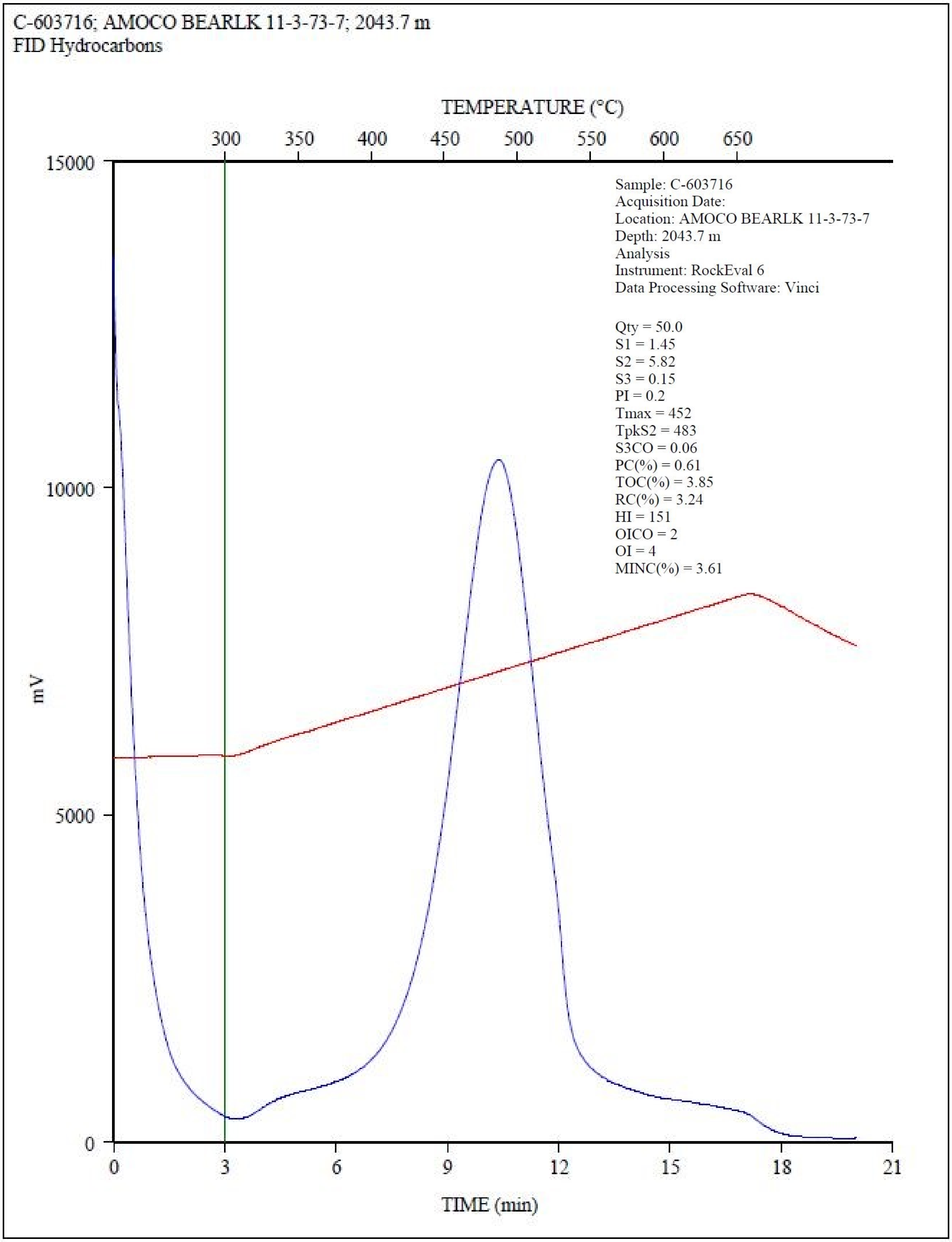

C-603712; AMOCO BEARLK 11-3-73-7; 2037.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603712
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2037.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 2.84
S2 = 15.17
S3 = 0.25
PI = 0.16
Tmax = 450
TpkS2 = 481
S3CO = 0.08
PC(%) = 1.51
TOC(%) = 8.41
RC(%) = 6.9
HI = 180
OICO = 1
OI = 3
MINC(%) = 5.04
0
3
6
9
12
15
18
21
TIME (min)

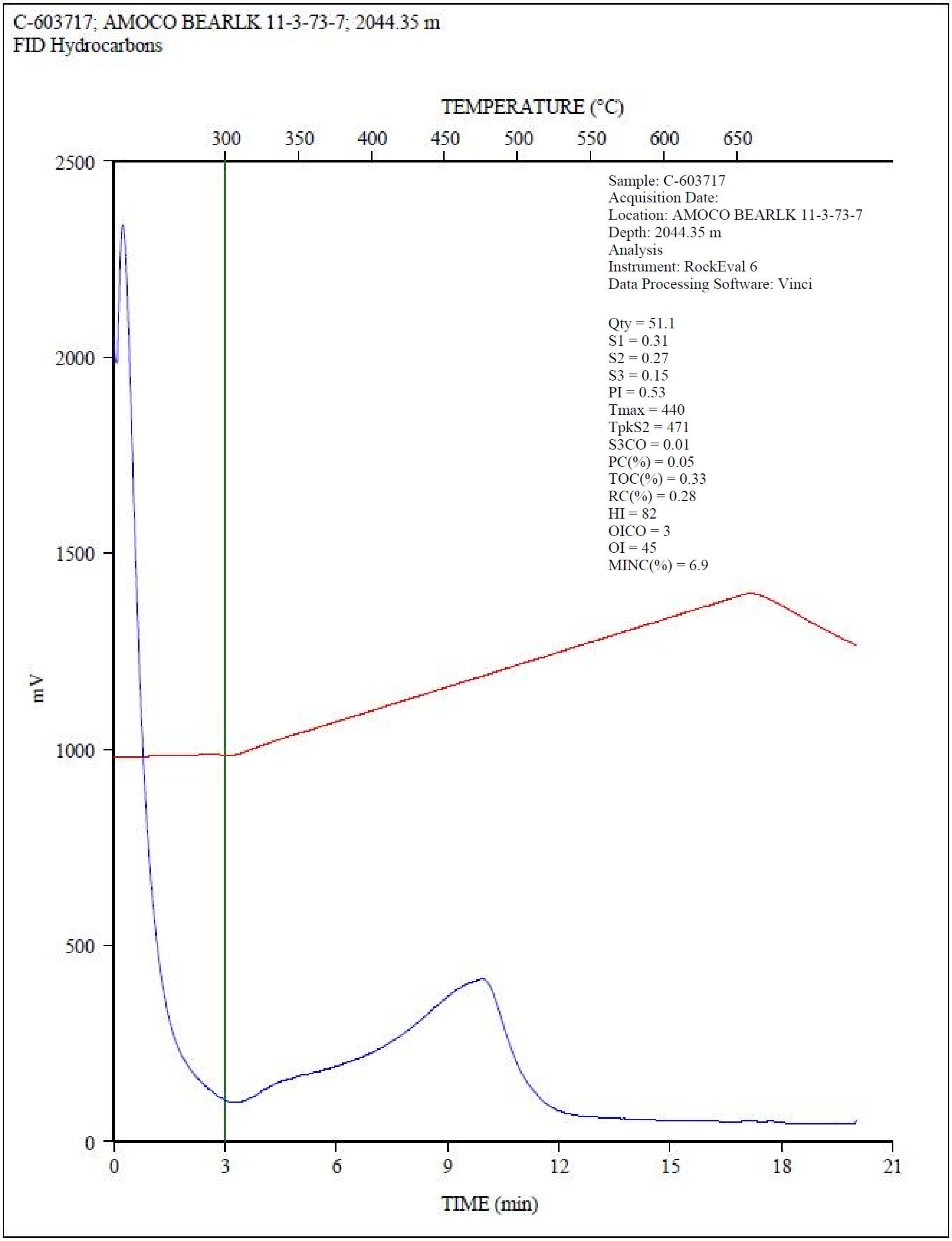
C-603713; AMOCO BEARLK 11-3-73-7; 2037.8 m
FID Hydrocarbons

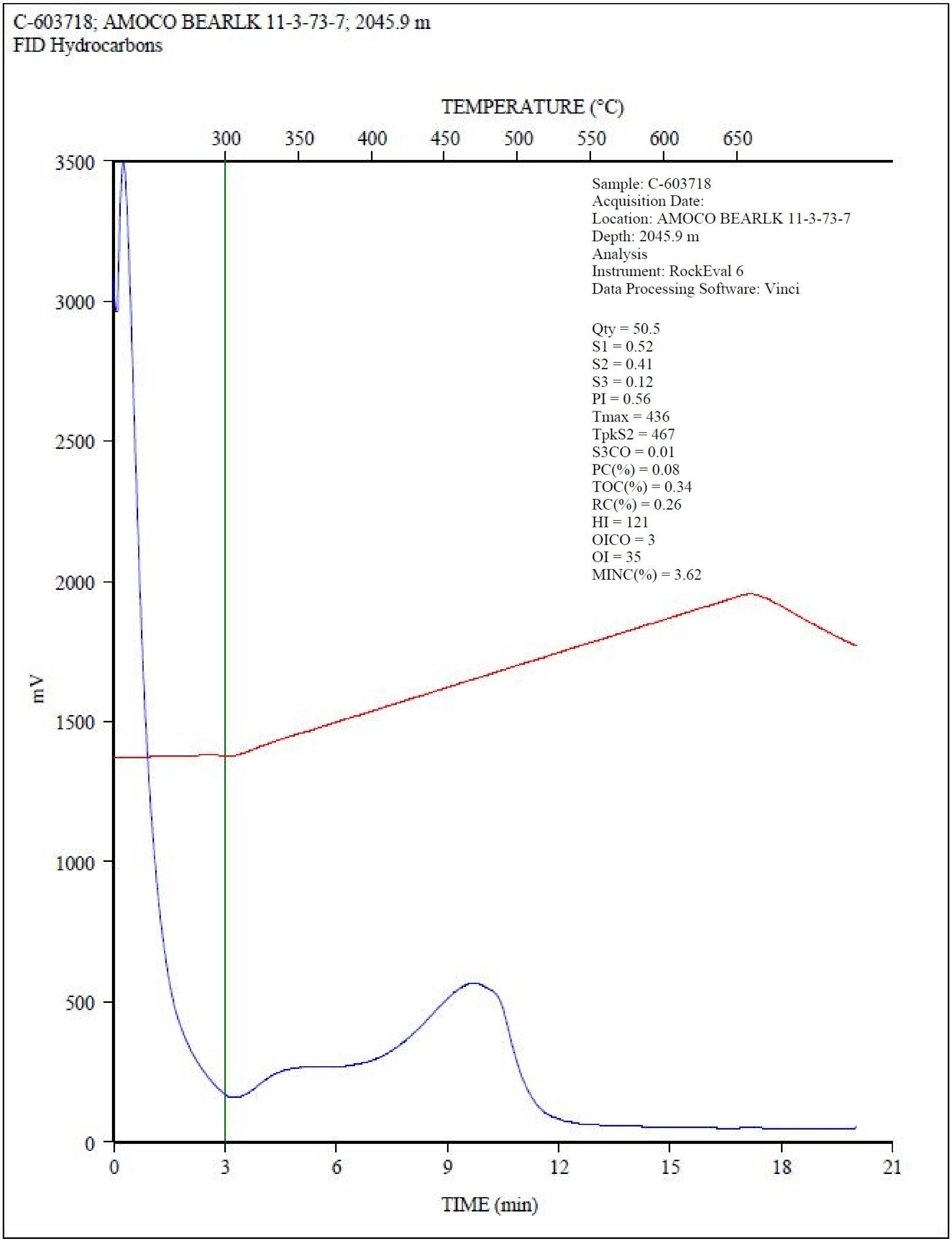


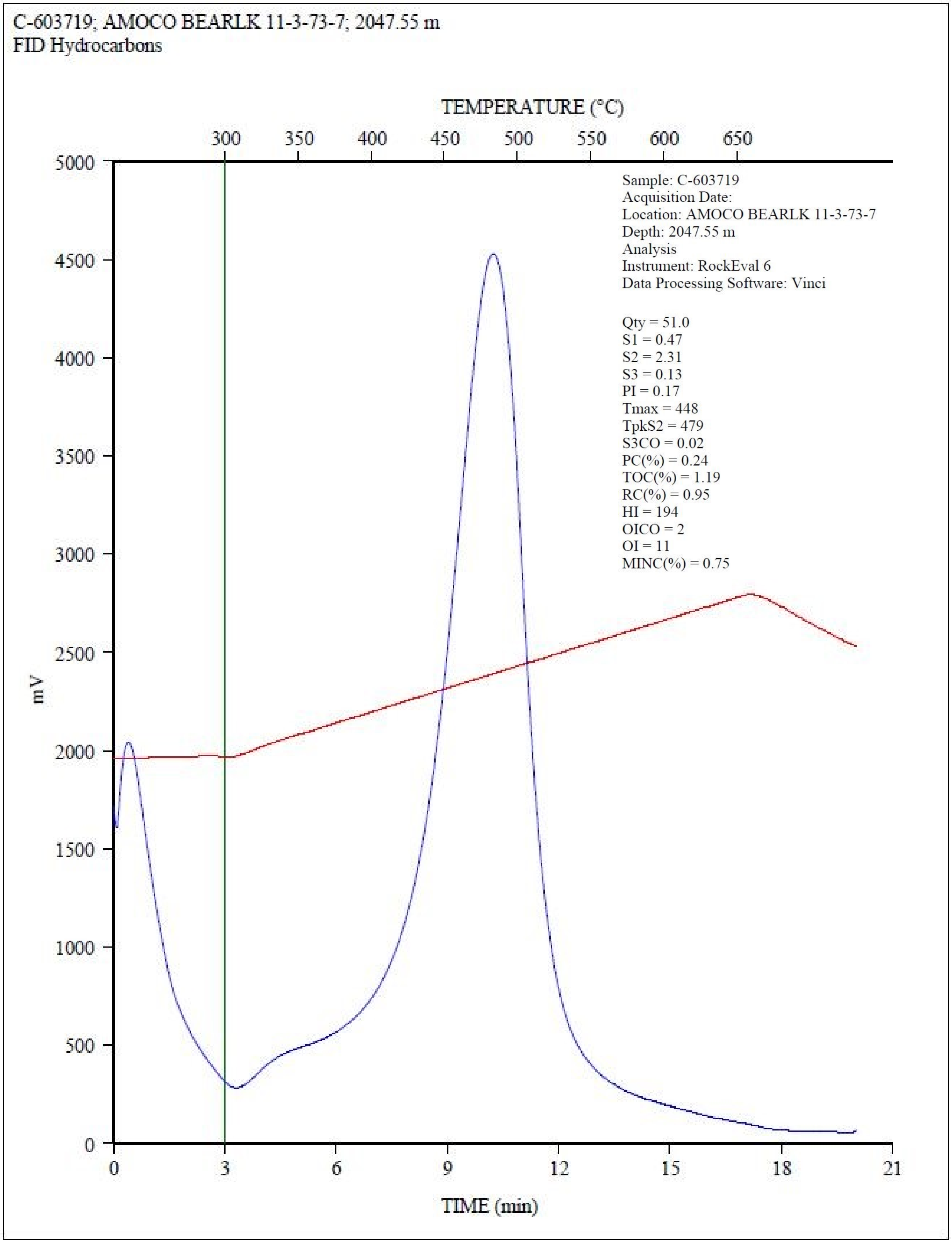

C-603714; AMOCO BEARLK 11-3-73-7; 2040.03 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
25000 20000 15000 10000 5000 0
mV
Sample: C-603714
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2040.03 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 2.05
S2 = 5.4
S3 = 0.13
PI = 0.28
Tmax = 446
TpkS2 = 477
S3CO = 0.03
PC(%) = 0.63
TOC(%) = 2.92
RC(%) = 2.29
HI = 185
OICO = 1
OI = 4
MINC(%) = 5.8
0 3 6 9 12 15 18 21
TIME (min)


C-603715; AMOCO BEARLK 11-3-73-7; 2041.32 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603715
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2041.32 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 1.62
S2 = 6.05
S3 = 0.15
PI = 0.21
Tmax = 449
TpkS2 = 480
S3CO = 0.04
PC(%) = 0.65
TOC(%) = 3.45
RC(%) = 2.8
HI = 175
OICO = 1
OI = 4
MINC(%) = 6.15
0
3
6
9
12
15
18
21
TIME (min)

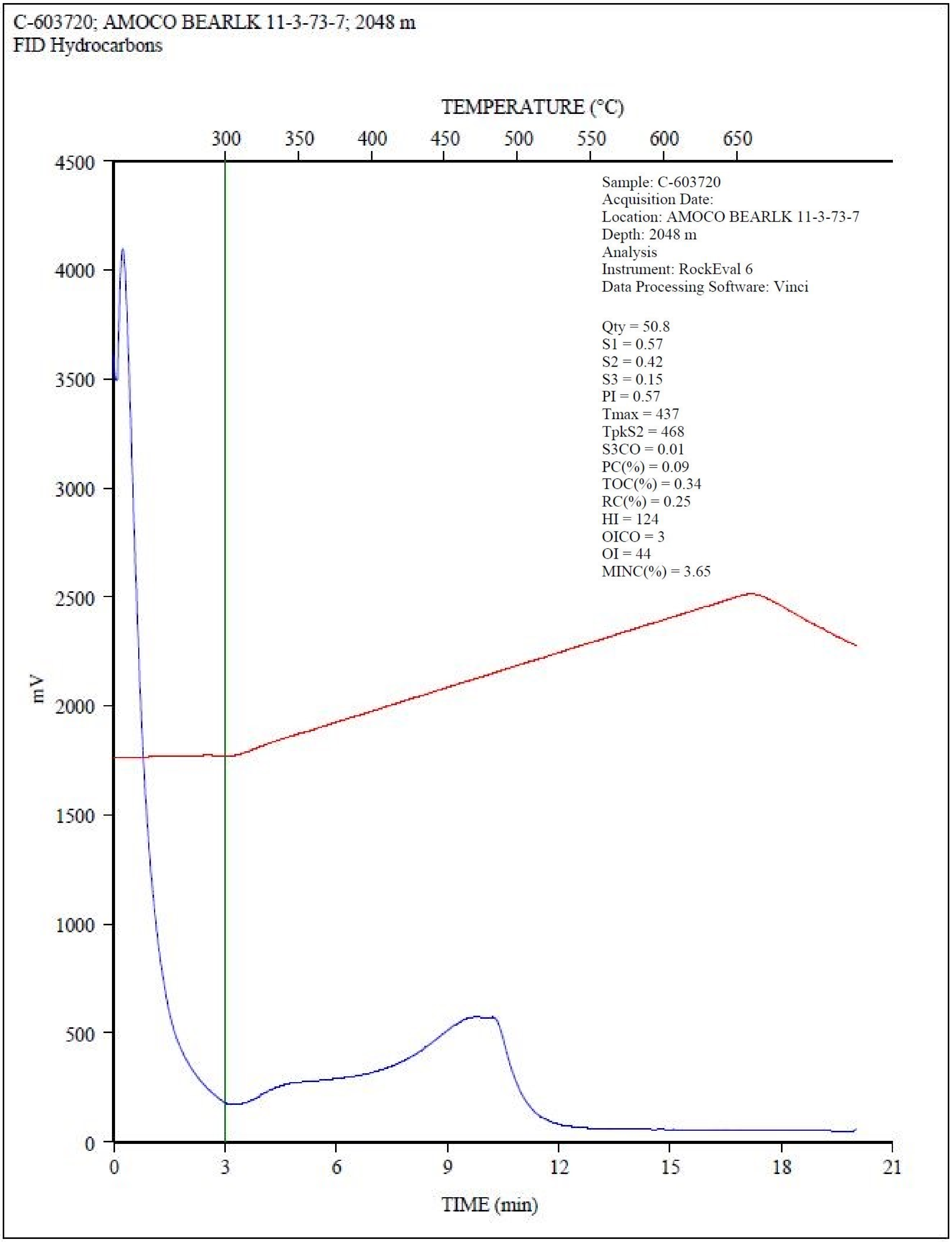

C-603716; AMOCO BEARLK 11-3-73-7; 2043.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603716
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2043.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.0
S1 = 1.45
S2 = 5.82
S3 = 0.15
PI = 0.2
Tmax = 452
TpkS2 = 483
S3CO = 0.06
PC(%) = 0.61
TOC(%) = 3.85
RC(%) = 3.24
HI = 151
OICO = 2
OI = 4
MINC(%) = 3.61
0
3
6
9
12
15
18
21
TIME (min)


C-603717; AMOCO BEARLK 11-3-73-7; 2044.35 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603717
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2044.35 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 0.31
S2 = 0.27
S3 = 0.15
PI = 0.53
Tmax = 440
TpkS2 = 471
S3CO = 0.01
PC(%) = 0.05
TOC(%) = 0.33
RC(%) = 0.28
HI = 82
OICO = 3
OI = 45
MINC(%) = 6.9
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)

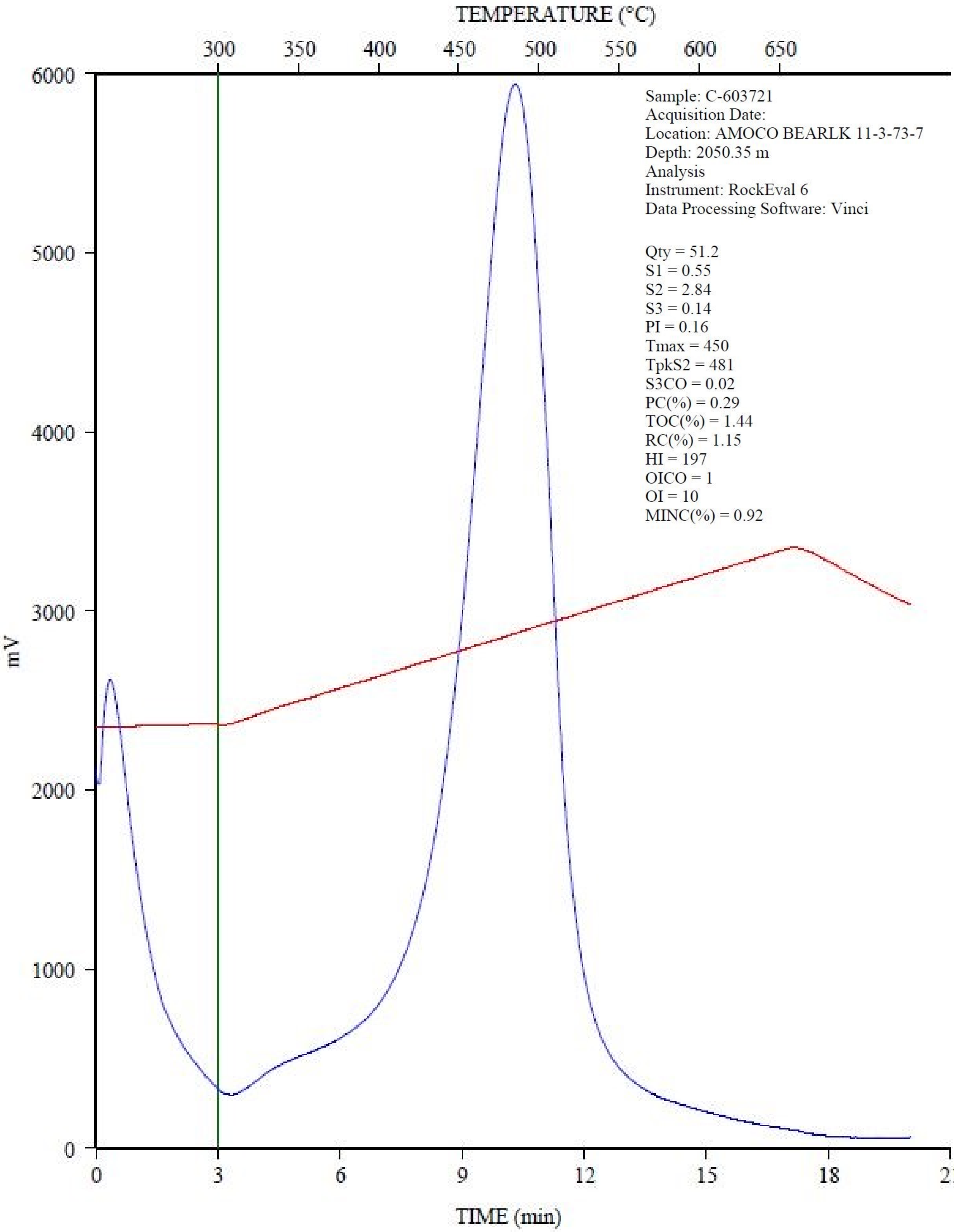

C-603718; AMOCO BEARLK 11-3-73-7; 2045.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603718
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2045.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 0.52
S2 = 0.41
S3 = 0.12
PI = 0.56
Tmax = 436
TpkS2 = 467
S3CO = 0.01
PC(%) = 0.08
TOC(%) = 0.34
RC(%) = 0.26
HI = 121
OICO = 3
OI = 35
MINC(%) = 3.62
0
3
6
9
12
15
18
21
TIME (min)

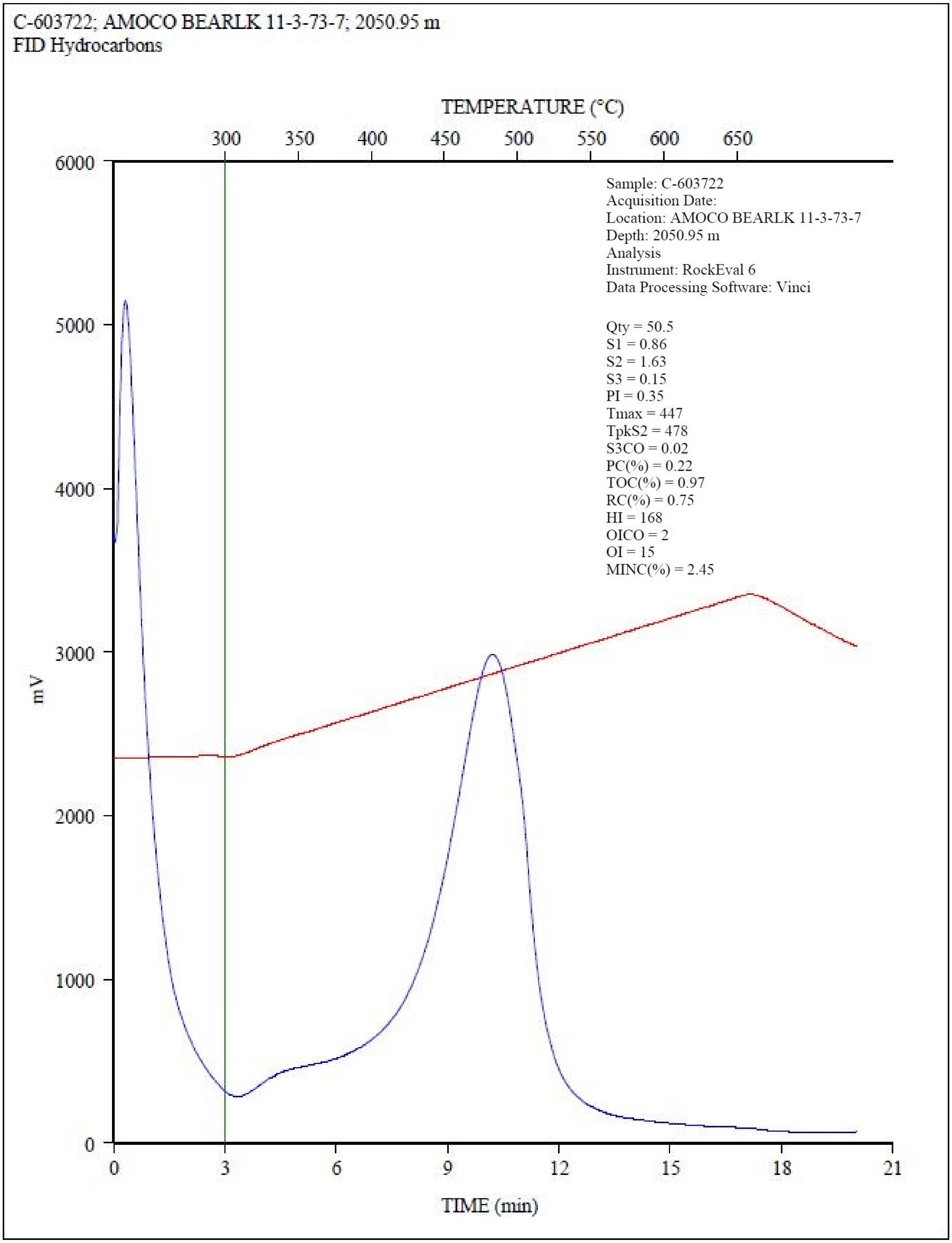


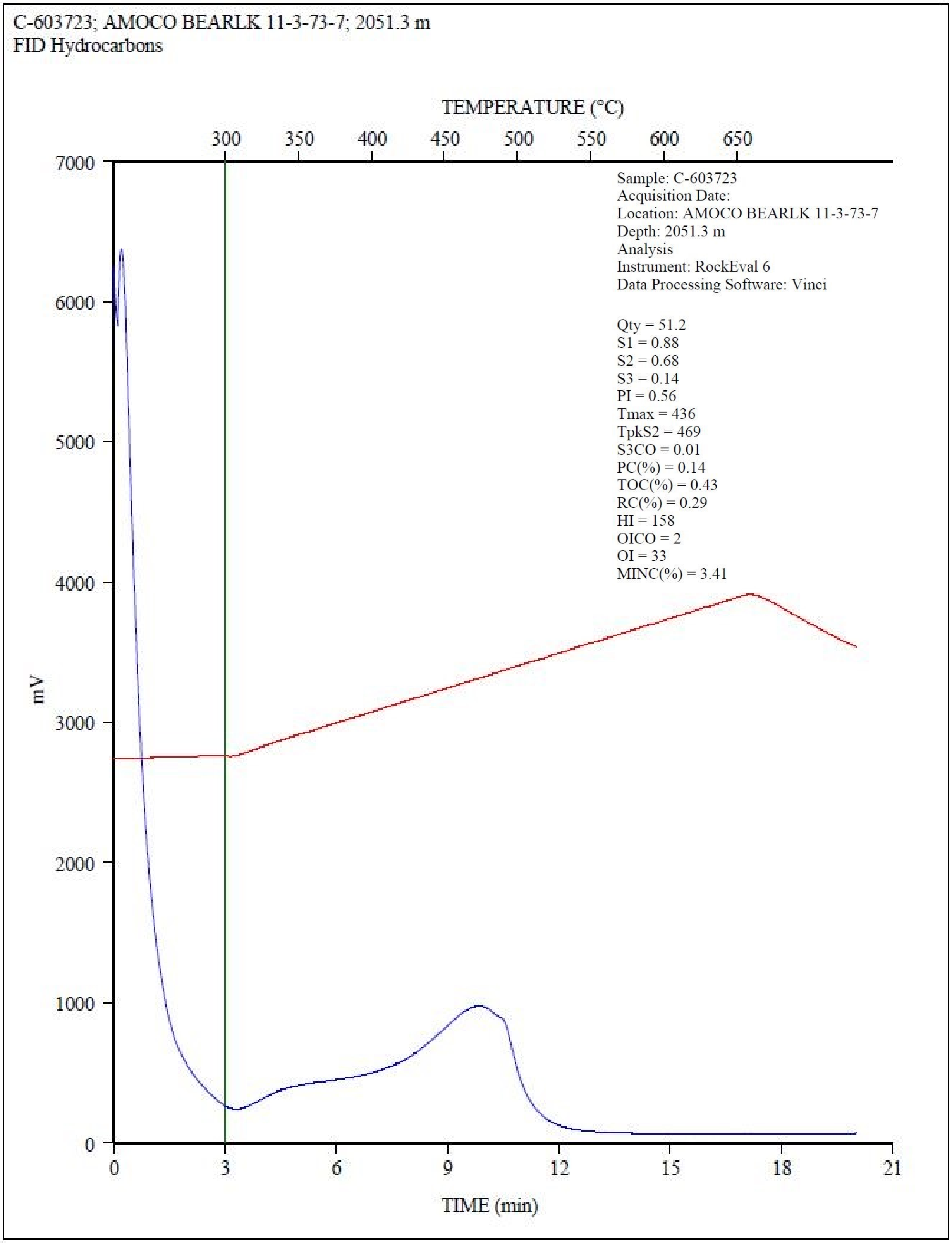
C-603719; AMOCO BEARLK 11-3-73-7; 2047.55 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603719
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2047.55 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.0
S1 = 0.47
S2 = 2.31
S3 = 0.13
PI = 0.17
Tmax = 448
TpkS2 = 479
S3CO = 0.02
PC(%) = 0.24
TOC(%) = 1.19
RC(%) = 0.95
HI = 194
OICO = 2
OI = 11
MINC(%) = 0.75

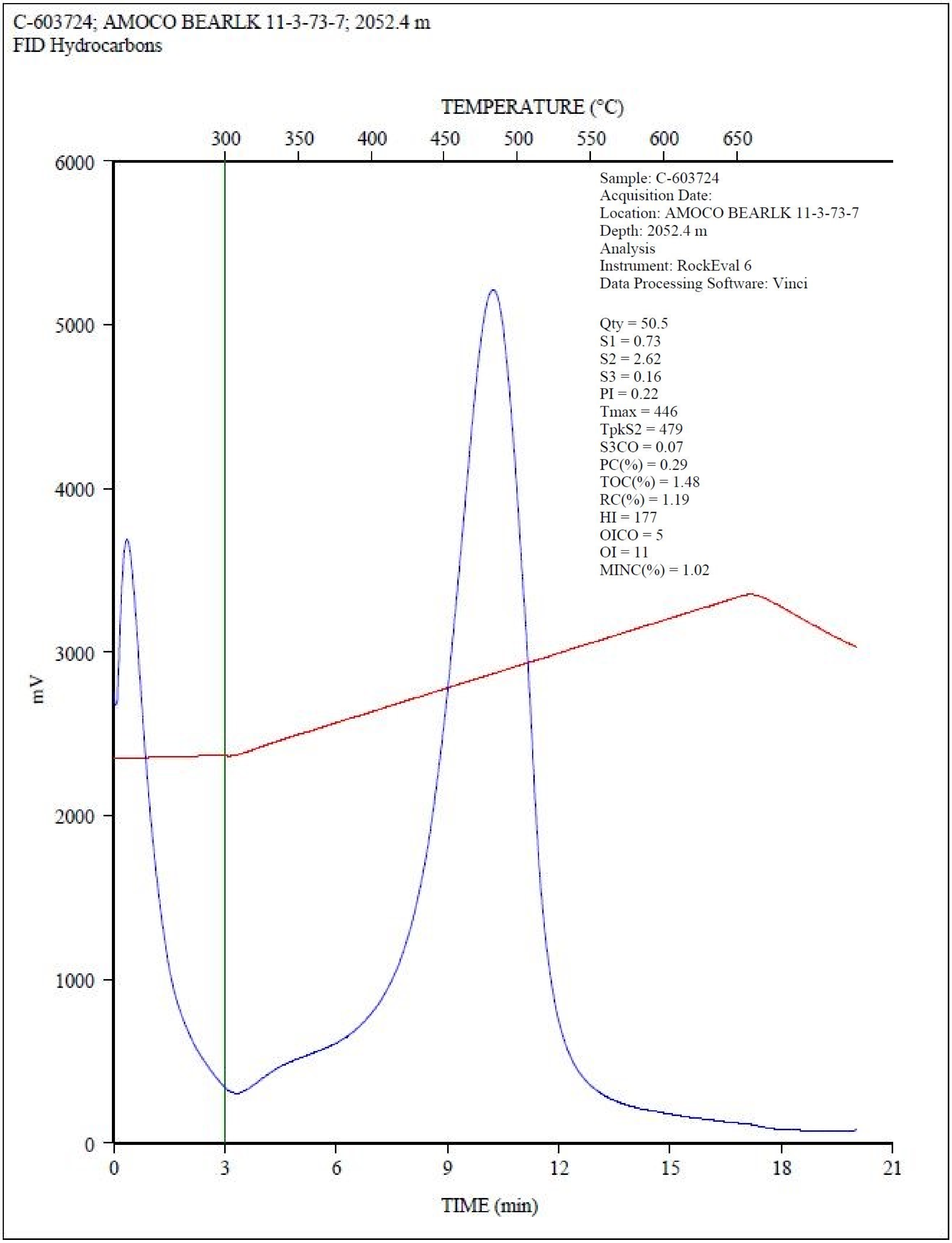

C-603720; AMOCO BEARLK 11-3-73-7; 2048 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603720
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2048 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.57
S2 = 0.42
S3 = 0.15
PI = 0.57
Tmax = 437
TpkS2 = 468
S3CO = 0.01
PC(%) = 0.09
TOC(%) = 0.34
RC(%) = 0.25
HI = 124
OICO = 3
OI = 44
MINC(%) = 3.65
0
3
6
9
12
15
18
21
TIME (min)

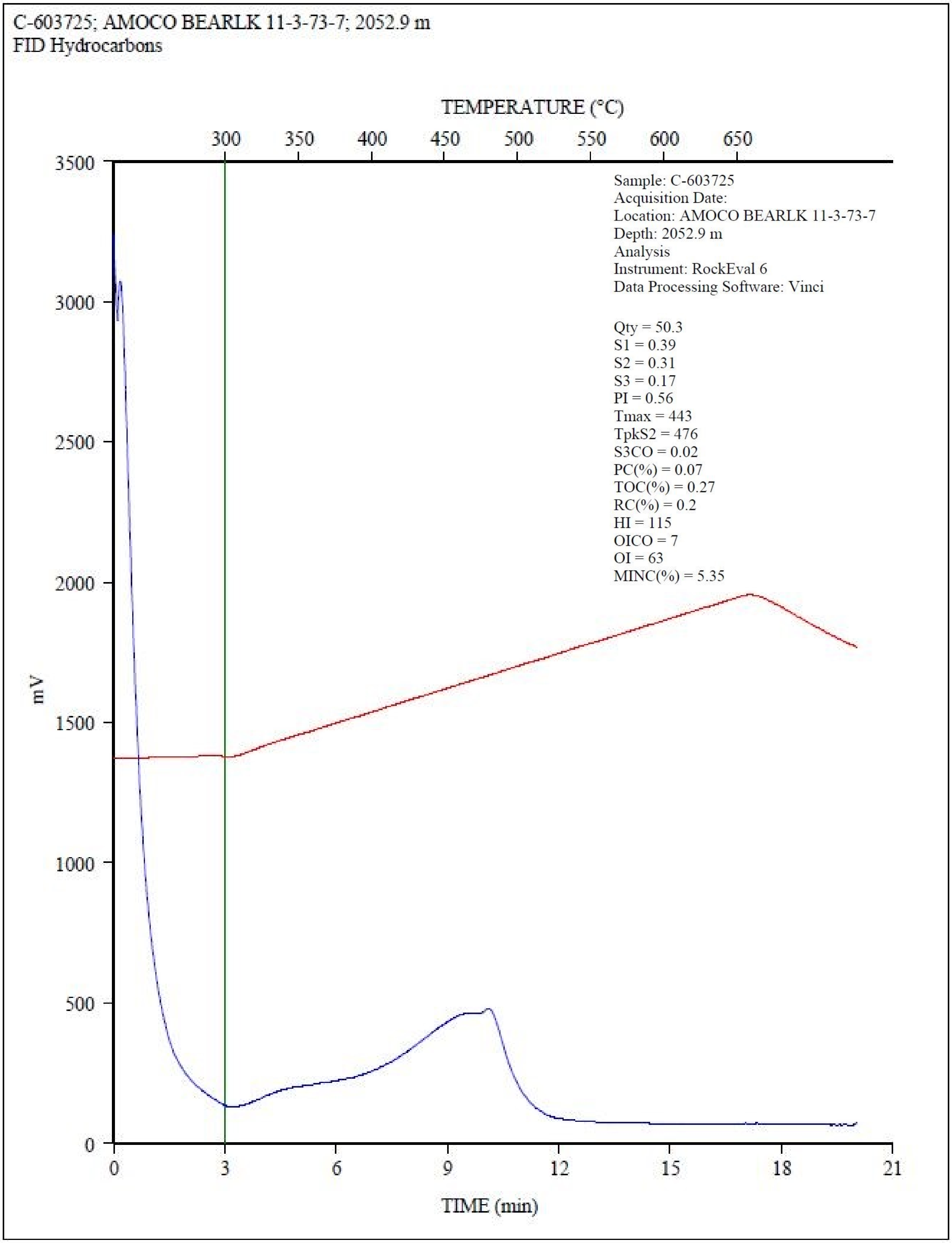
C-603721; AMOCO BEARLK 11-3-73-7; 2050.35 m
FID Hydrocarbons



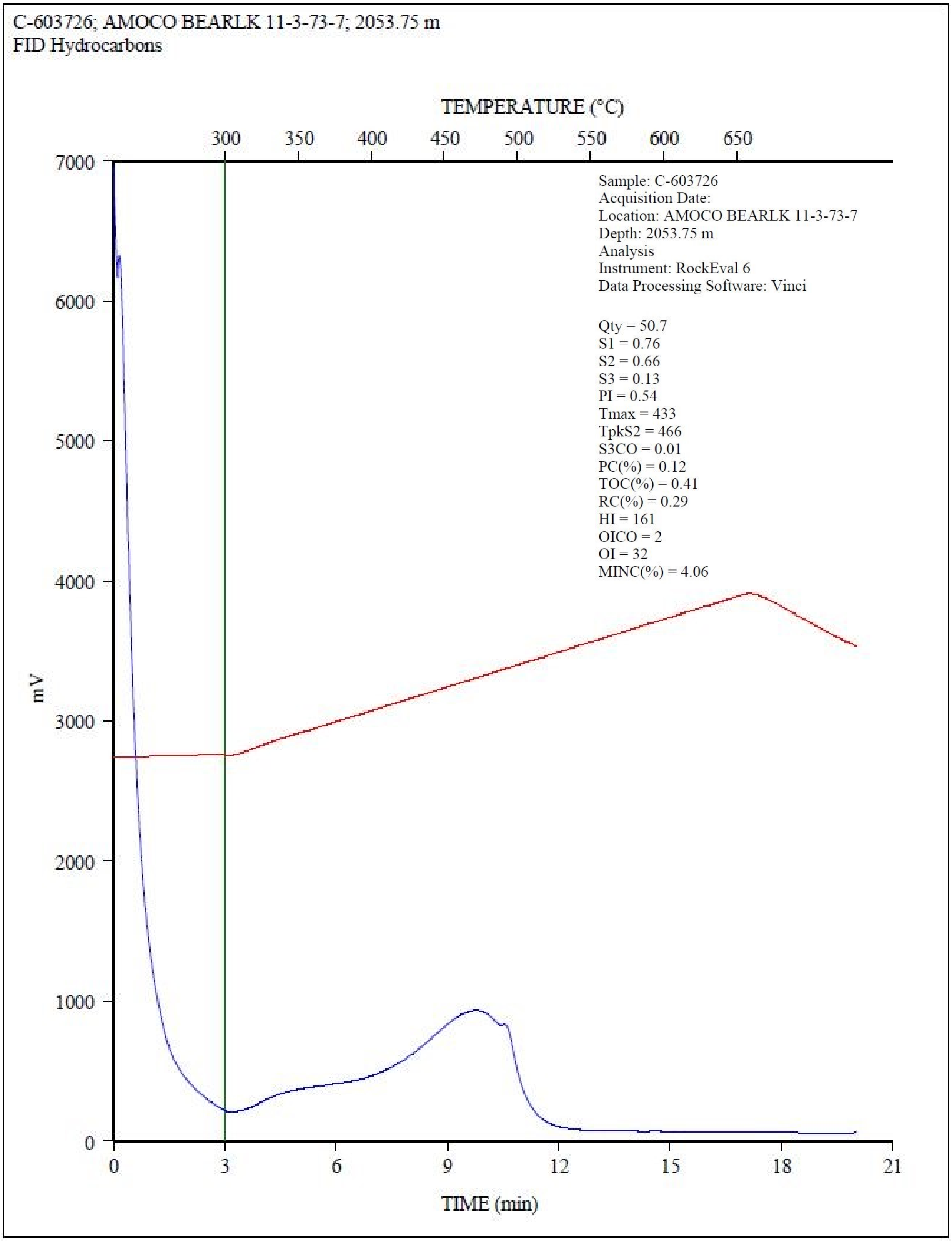

C-603722; AMOCO BEARLK 11-3-73-7; 2050.95 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603722
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2050.95 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 0.86
S2 = 1.63
S3 = 0.15
PI = 0.35
Tmax = 447
TpkS2 = 478
S3CO = 0.02
PC(%) = 0.22
TOC(%) = 0.97
RC(%) = 0.75
HI = 168
OICO = 2
OI = 15
MINC(%) = 2.45
0
3
6
9
12
15
18
21
TIME (min)

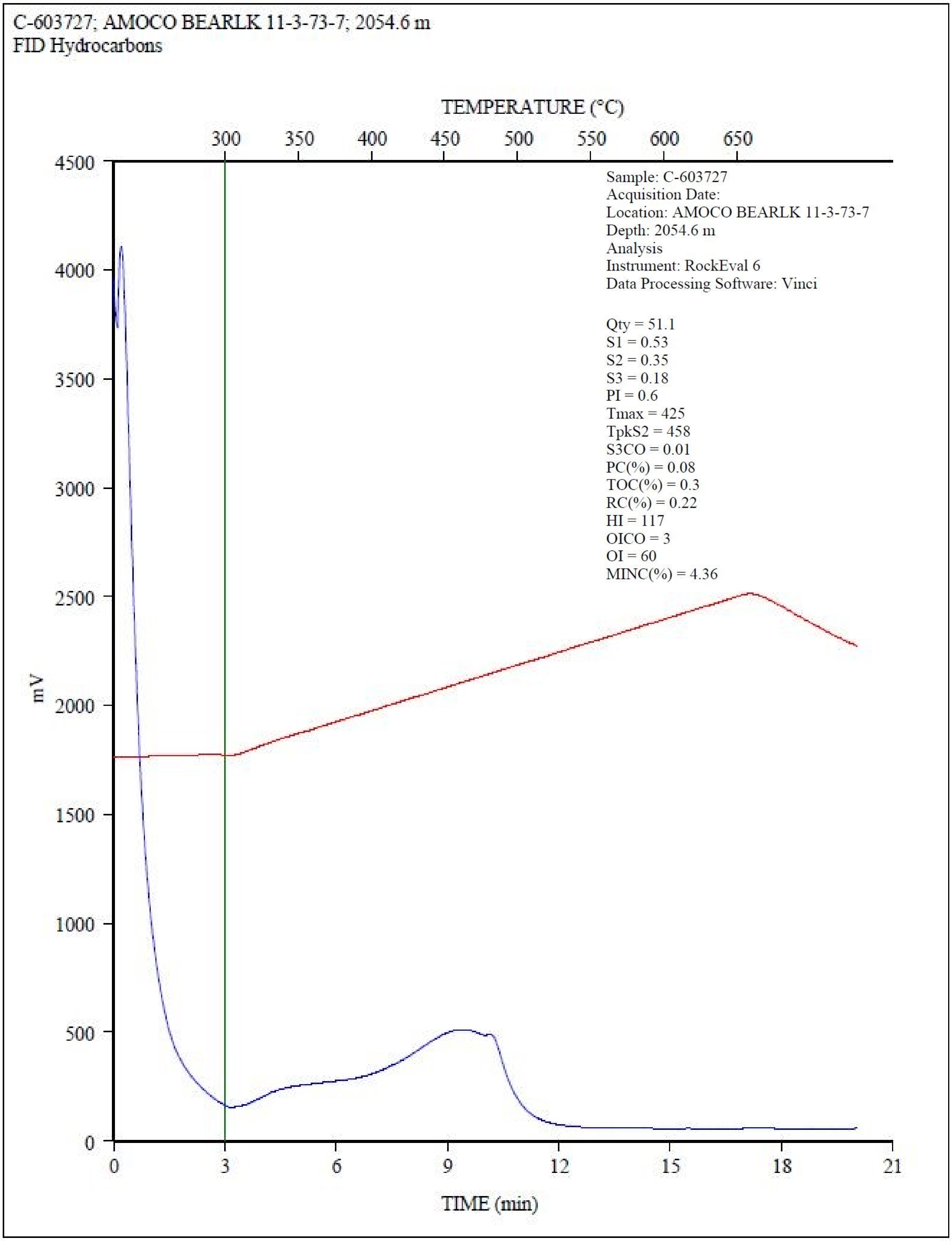

C-603723; AMOCO BEARLK 11-3-73-7; 2051.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603723
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2051.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 0.88
S2 = 0.68
S3 = 0.14
PI = 0.56
Tmax = 436
TpkS2 = 469
S3CO = 0.01
PC(%) = 0.14
TOC(%) = 0.43
RC(%) = 0.29
HI = 158
OICO = 2
OI = 33
MINC(%) = 3.41
0
3
6
9
12
15
18
21
TIME (min)

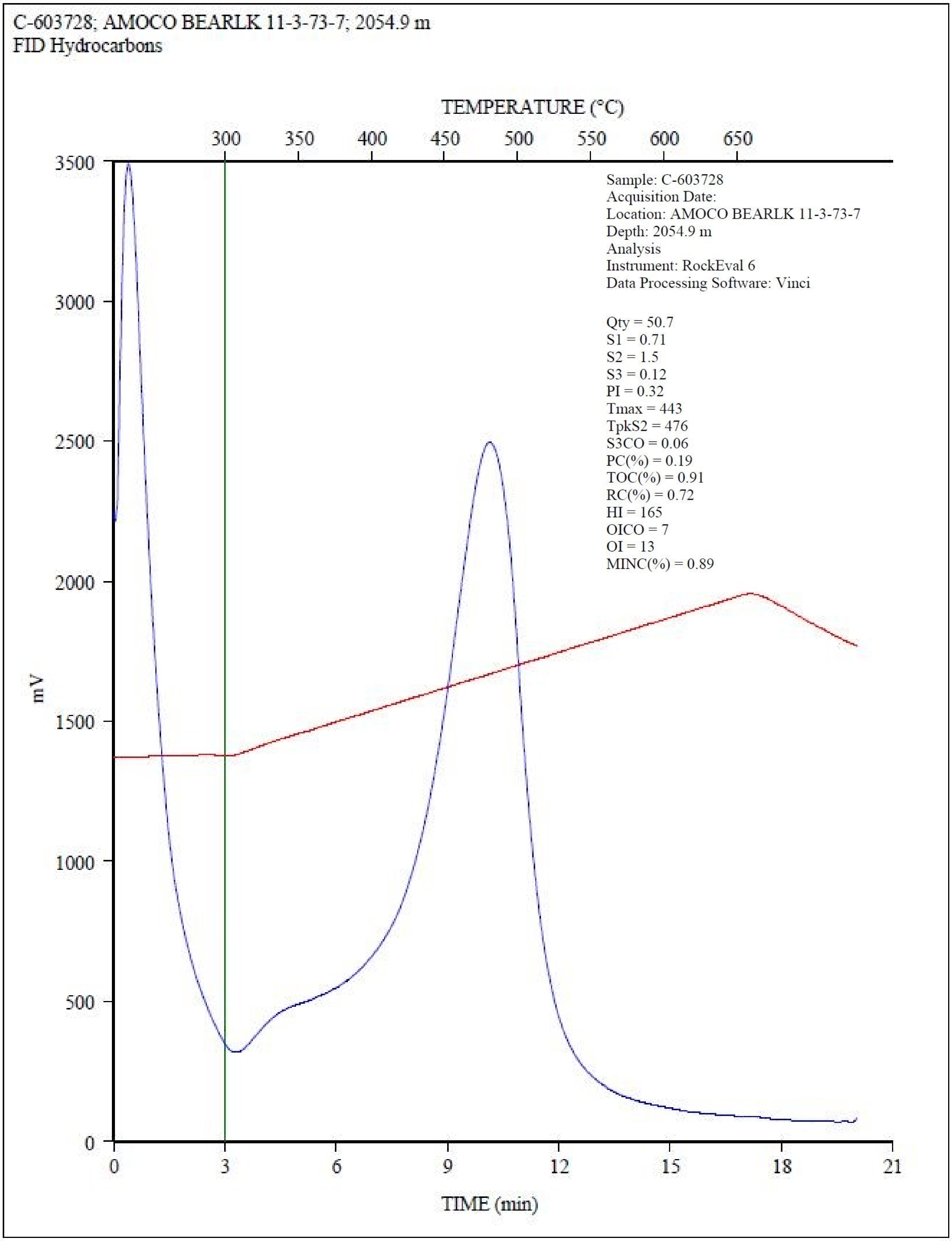

C-603724; AMOCO BEARLK 11-3-73-7; 2052.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603724
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2052.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.5
S1 = 0.73
S2 = 2.62
S3 = 0.16
PI = 0.22
Tmax = 446
TpkS2 = 479
S3CO = 0.07
PC(%) = 0.29
TOC(%) = 1.48
RC(%) = 1.19
HI = 177
OICO = 5
OI = 11
MINC(%) = 1.02



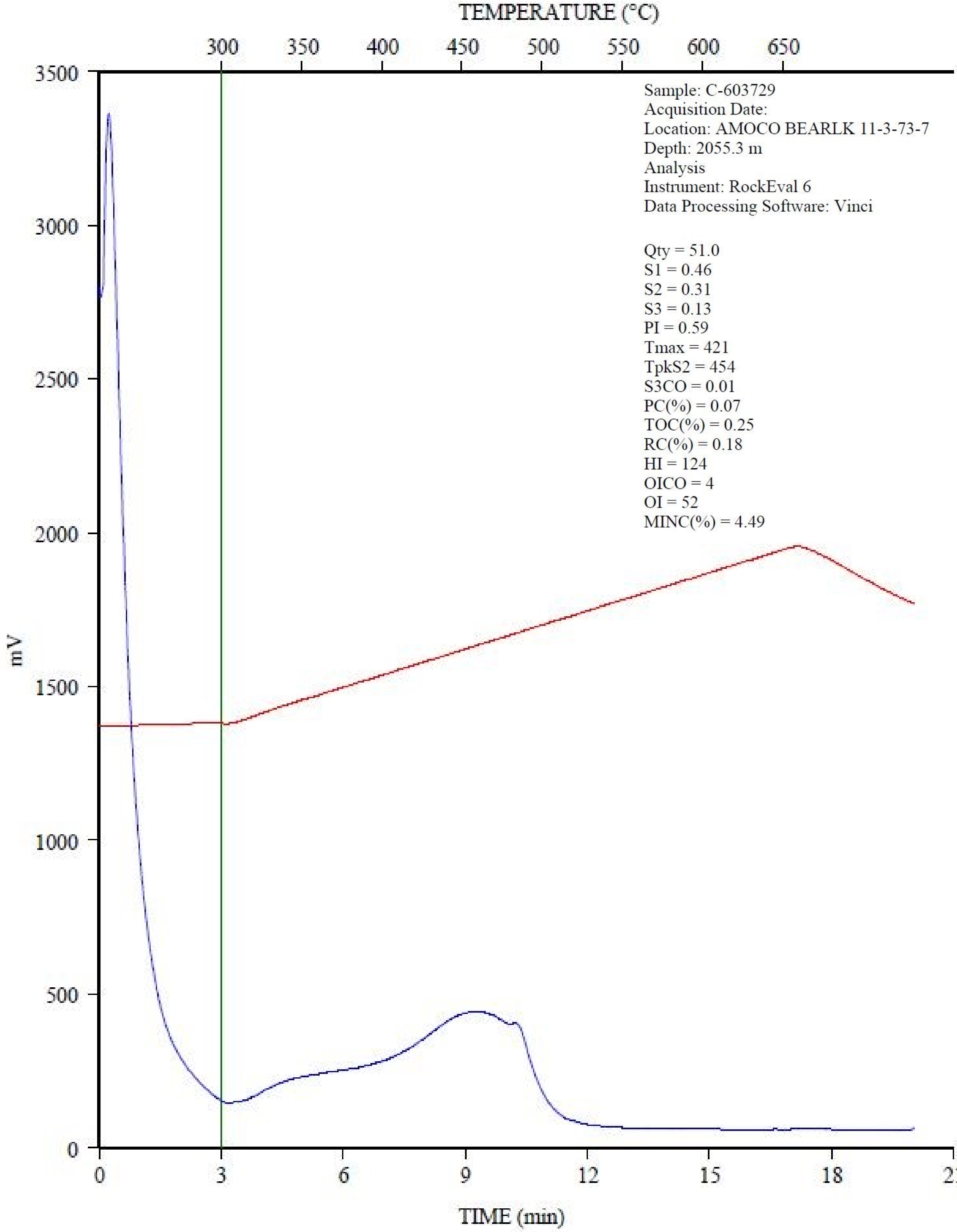
C-603725; AMOCO BEARLK 11-3-73-7; 2052.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603725
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2052.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 0.39
S2 = 0.31
S3 = 0.17
PI = 0.56
Tmax = 443
TpkS2 = 476
S3CO = 0.02
PC(%) = 0.07
TOC(%) = 0.27
RC(%) = 0.2
HI = 115
OICO = 7
OI = 63
MINC(%) = 5.35
mV
3500
3000
2500
2000
1500
1000
500
0
0
3
6
9
12
15
18
21
TIME (min)

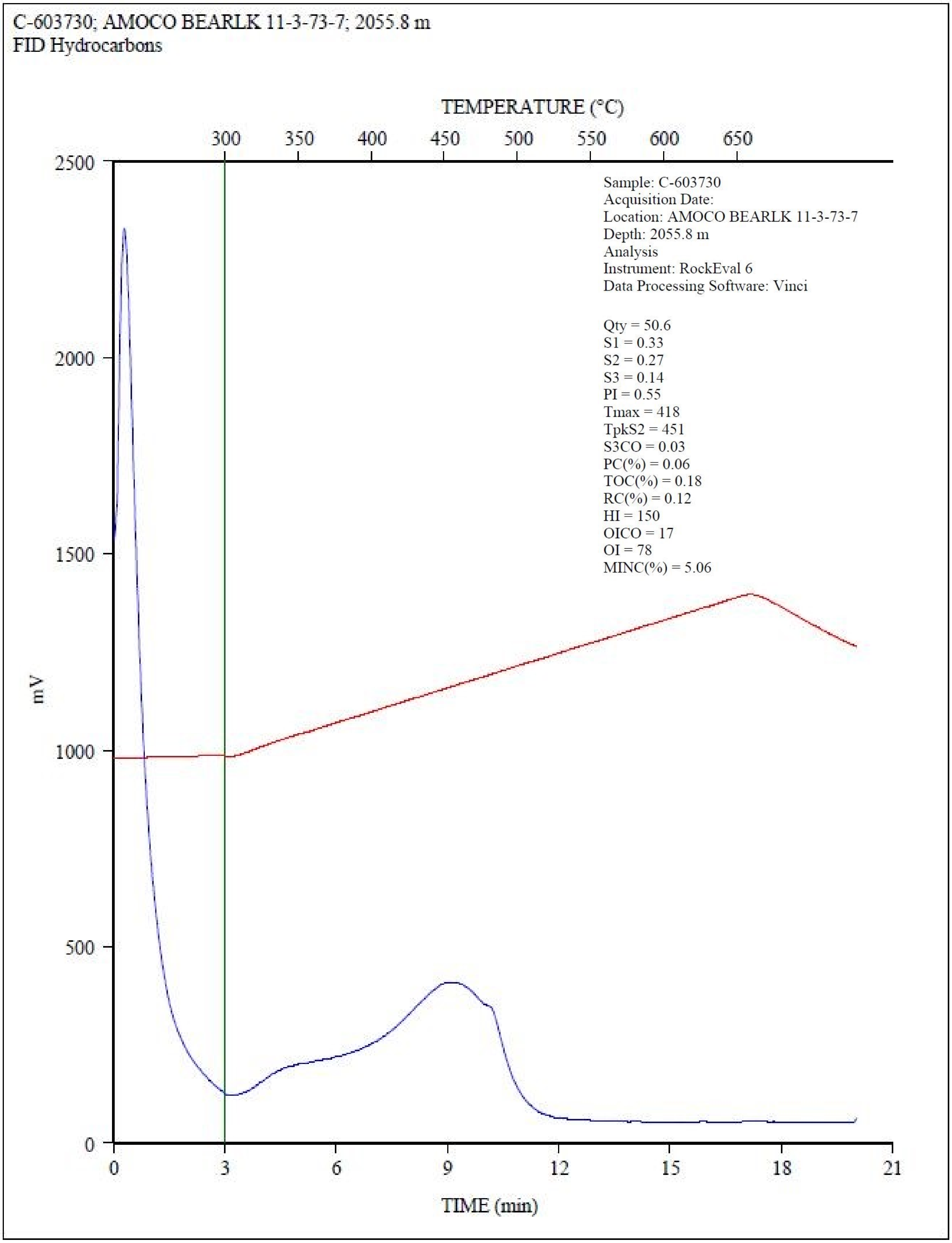

C-603726; AMOCO BEARLK 11-3-73-7; 2053.75 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
Sample: C-603726
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2053.75 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.76
S2 = 0.66
S3 = 0.13
PI = 0.54
Tmax = 433
TpkS2 = 466
S3CO = 0.01
PC(%) = 0.12
TOC(%) = 0.41
RC(%) = 0.29
HI = 161
OICO = 2
OI = 32
MINC(%) = 4.06
0
3
6
9
12
15
18
21
TIME (min)


C-603727; AMOCO BEARLK 11-3-73-7; 2054.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603727
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2054.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 0.53
S2 = 0.35
S3 = 0.18
PI = 0.6
Tmax = 425
TpkS2 = 458
S3CO = 0.01
PC(%) = 0.08
TOC(%) = 0.3
RC(%) = 0.22
HI = 117
OICO = 3
OI = 60
MINC(%) = 4.36
mV
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
3
6
9
12
15
18
21
TIME (min)

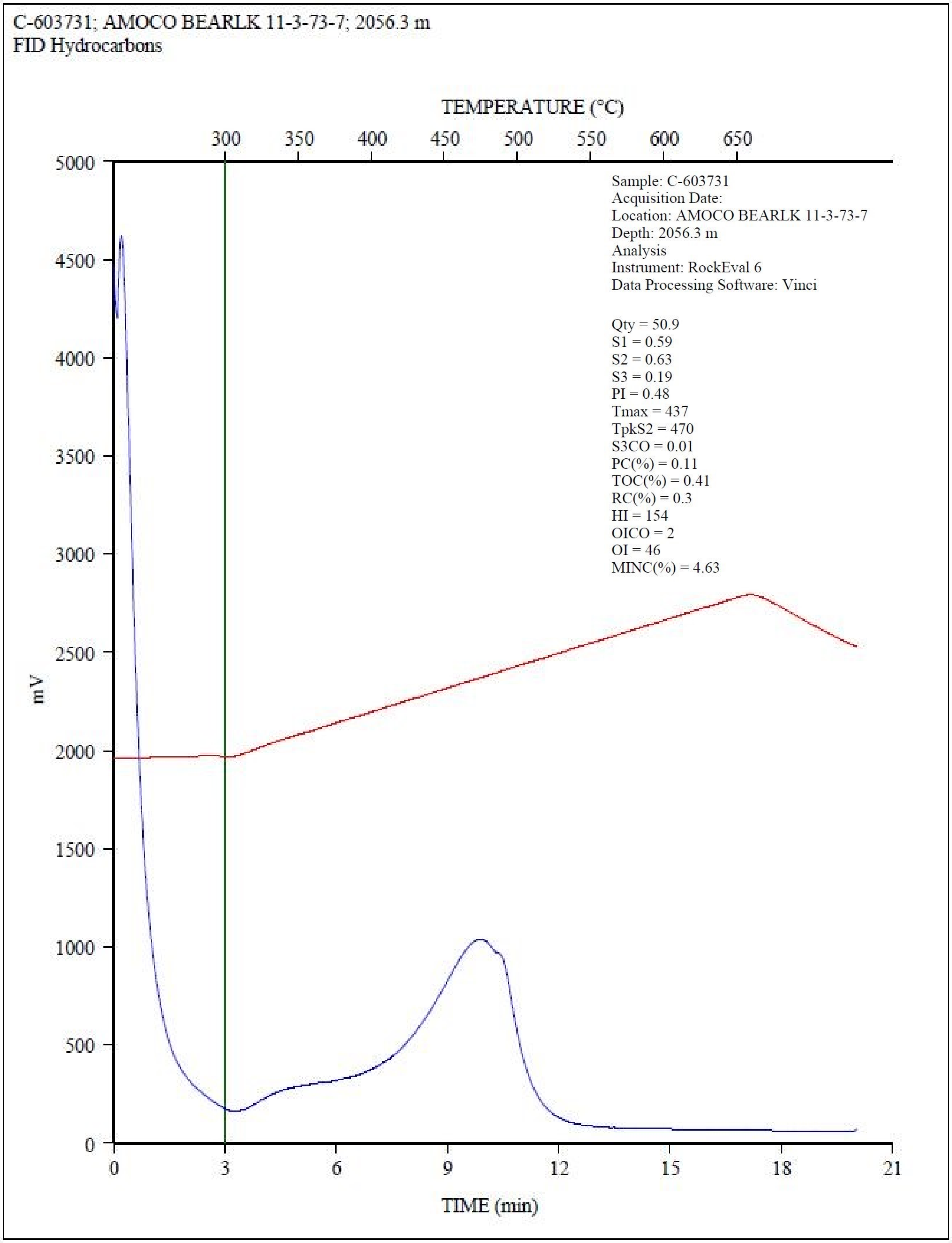

C-603728; AMOCO BEARLK 11-3-73-7; 2054.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603728
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2054.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.71
S2 = 1.5
S3 = 0.12
PI = 0.32
Tmax = 443
TpkS2 = 476
S3CO = 0.06
PC(%) = 0.19
TOC(%) = 0.91
RC(%) = 0.72
HI = 165
OICO = 7
OI = 13
MINC(%) = 0.89
mV
3500
3000
2500
2000
1500
1000
500
0
0
3
6
9
12
15
18
21
TIME (min)

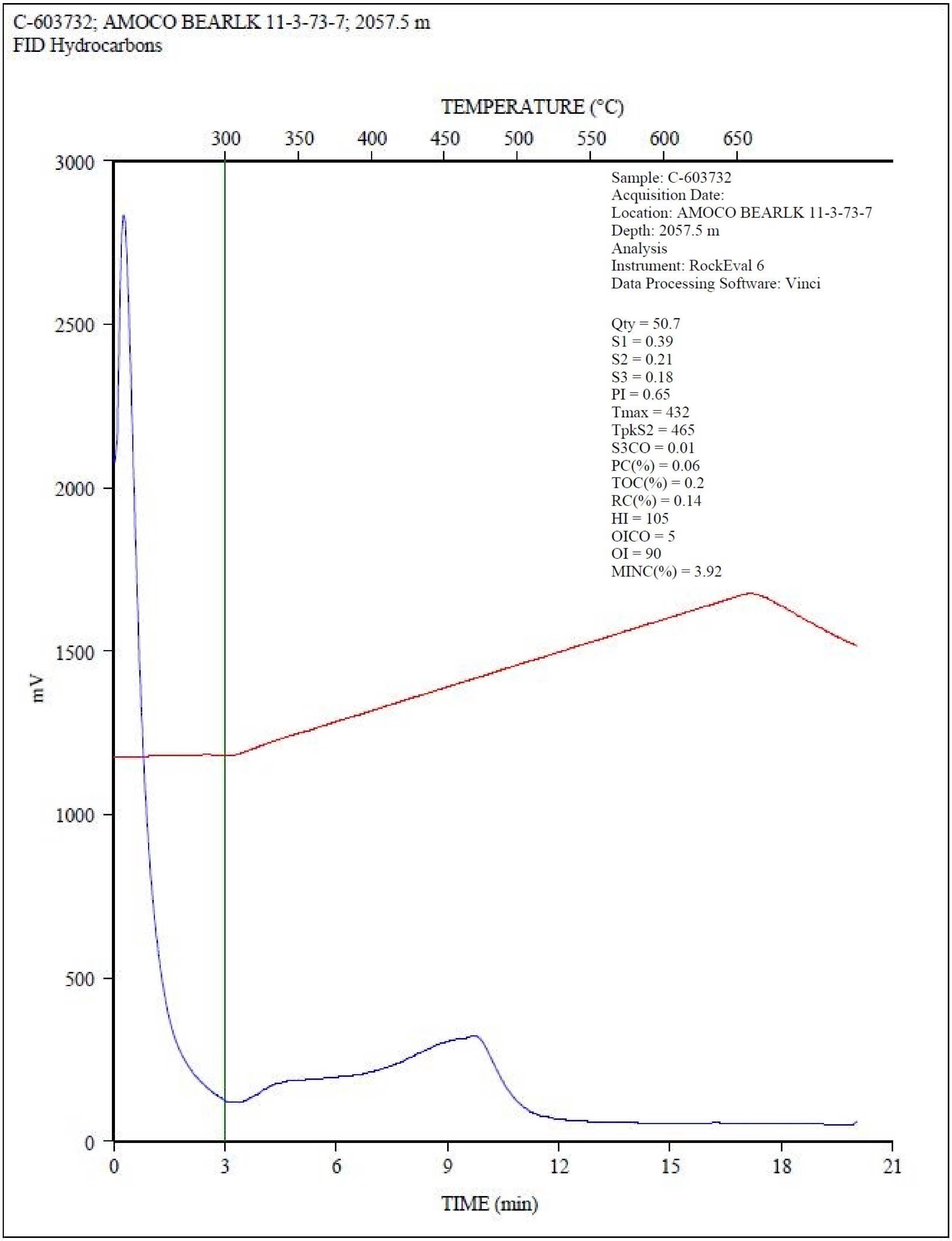
C-603729; AMOCO BEARLK 11-3-73-7; 2055.3 m
FID Hydrocarbons

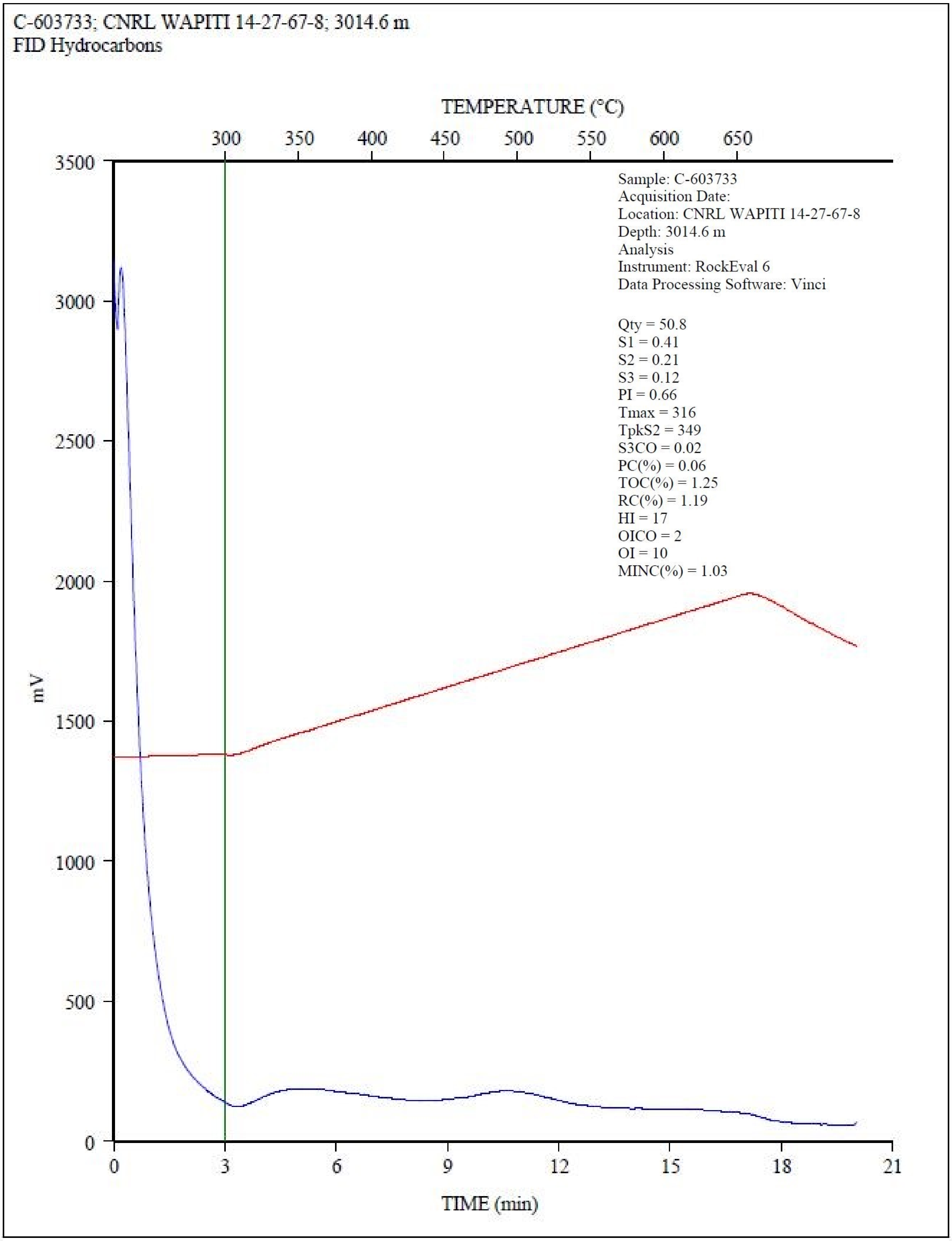


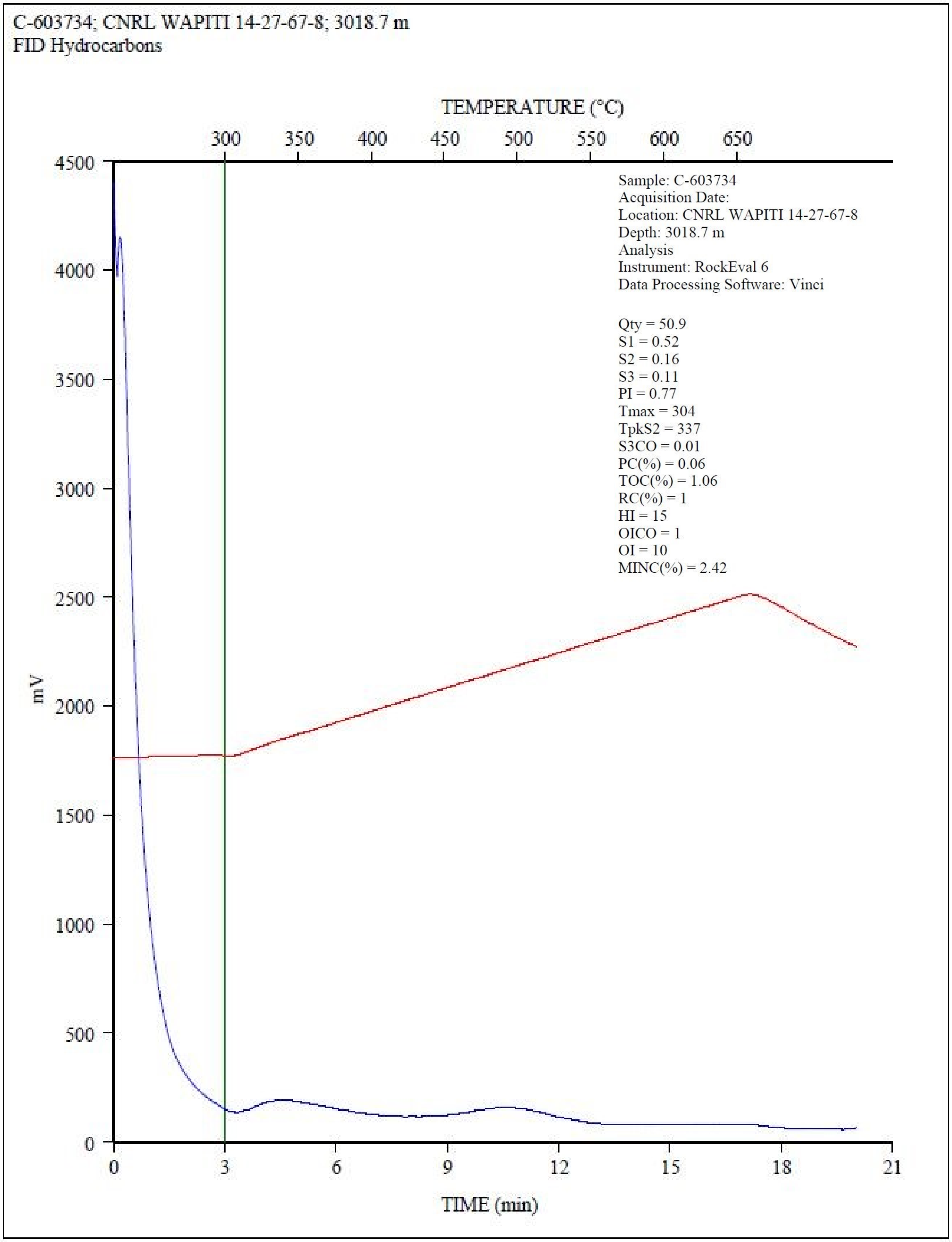


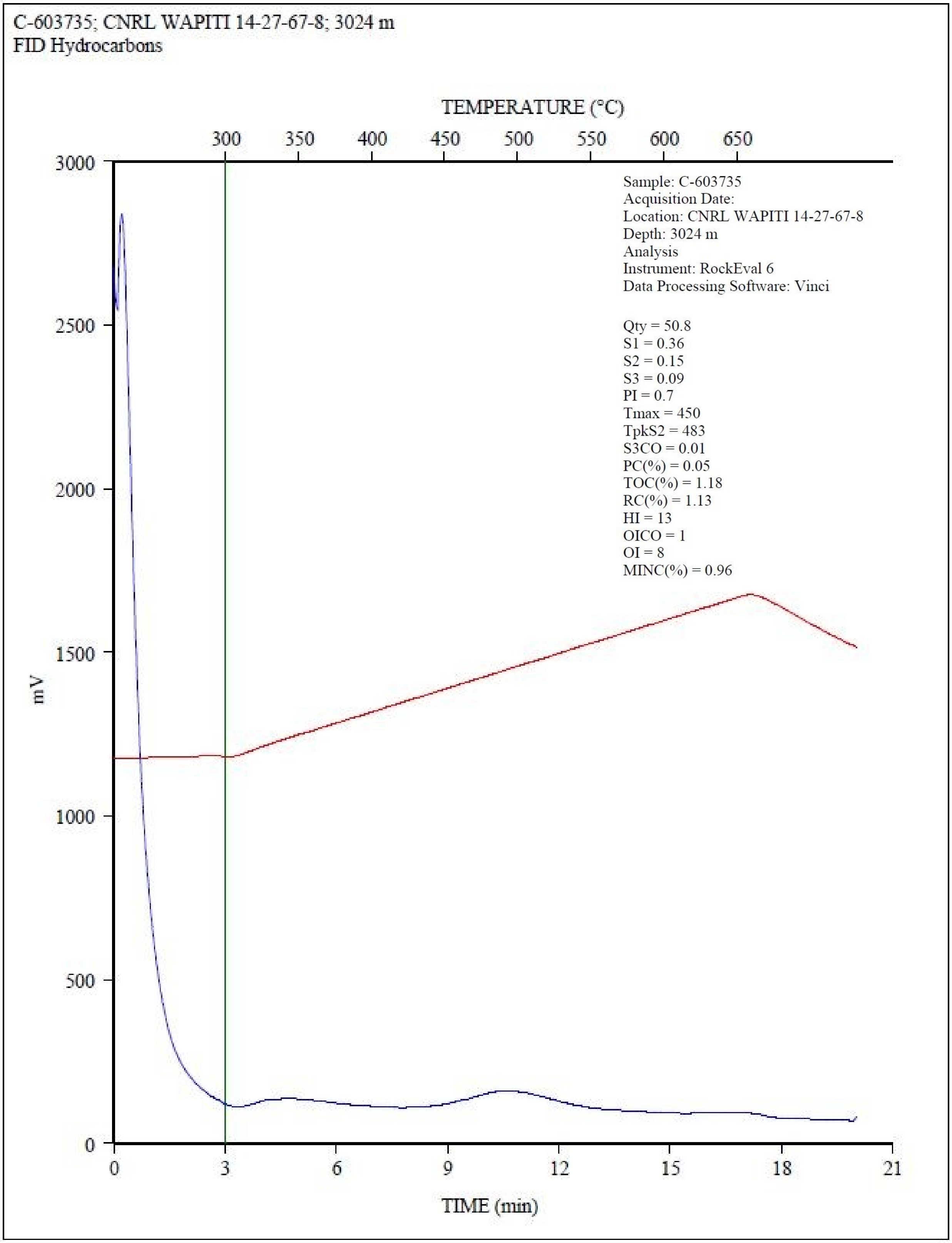
C-603730; AMOCO BEARLK 11-3-73-7; 2055.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
2500
2000
1500
1000
500
0
mV
Sample: C-603730
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2055.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.6
S1 = 0.33
S2 = 0.27
S3 = 0.14
PI = 0.55
Tmax = 418
TpkS2 = 451
S3CO = 0.03
PC(%) = 0.06
TOC(%) = 0.18
RC(%) = 0.12
HI = 150
OICO = 17
OI = 78
MINC(%) = 5.06
0
3
6
9
12
15
18
21
TIME (min)

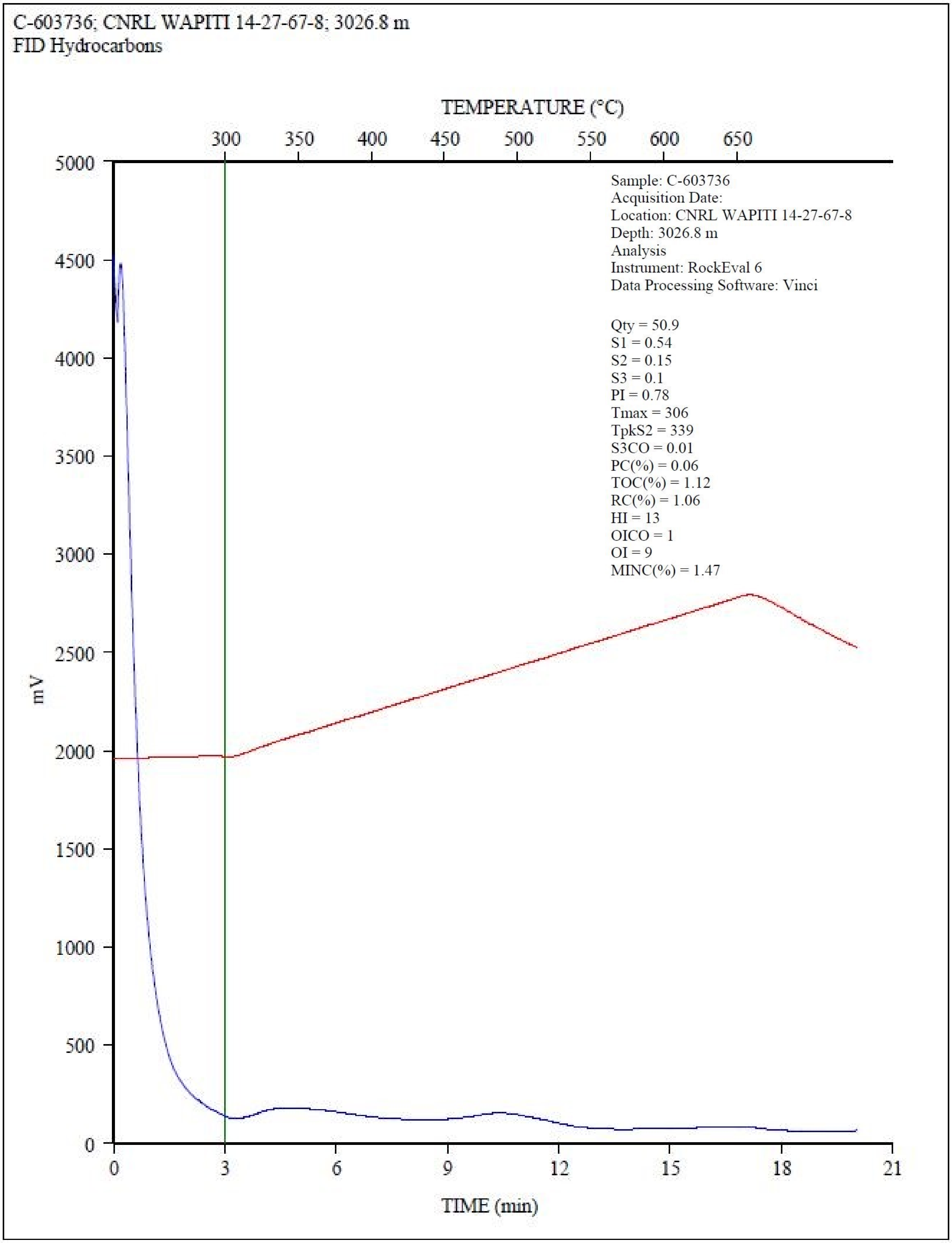

C-603731; AMOCO BEARLK 11-3-73-7; 2056.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603731
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2056.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 0.59
S2 = 0.63
S3 = 0.19
PI = 0.48
Tmax = 437
TpkS2 = 470
S3CO = 0.01
PC(%) = 0.11
TOC(%) = 0.41
RC(%) = 0.3
HI = 154
OICO = 2
OI = 46
MINC(%) = 4.63
0
3
6
9
12
15
18
21
TIME (min)


C-603732; AMOCO BEARLK 11-3-73-7; 2057.5 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
mV
3000 2500 2000 1500 1000 500 0
0 3 6 9 12 15 18 21
TIME (min)
Sample: C-603732
Acquisition Date:
Location: AMOCO BEARLK 11-3-73-7
Depth: 2057.5 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.39
S2 = 0.21
S3 = 0.18
PI = 0.65
Tmax = 432
TpkS2 = 465
S3CO = 0.01
PC(%) = 0.06
TOC(%) = 0.2
RC(%) = 0.14
HI = 105
OICO = 5
OI = 90
MINC(%) = 3.92

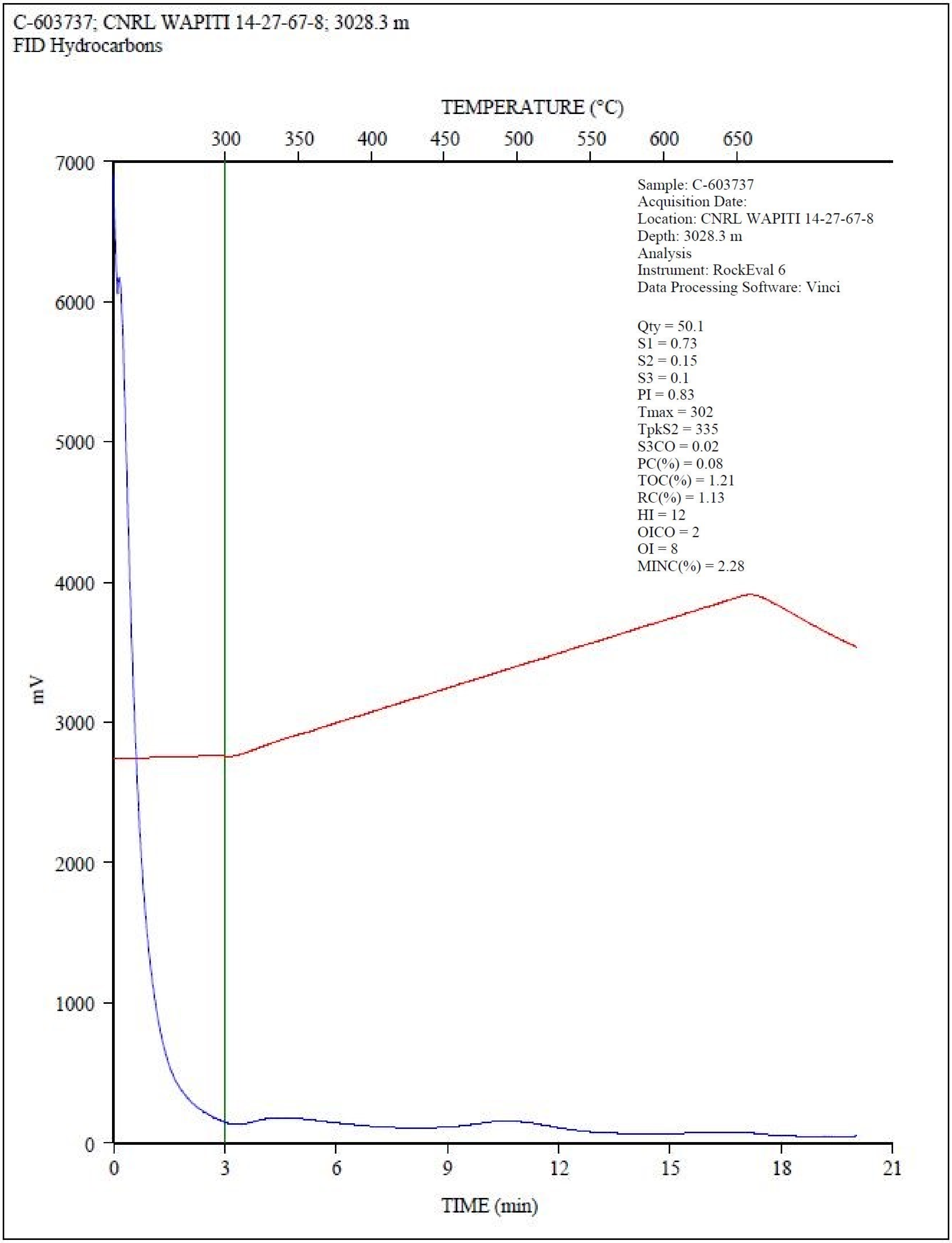

C-603733; CNRL WAPITI 14-27-67-8; 3014.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603733
Acquisition Date:
Location: CNRL WAPITI 14-27-67-8
Depth: 3014.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.41
S2 = 0.21
S3 = 0.12
PI = 0.66
Tmax = 316
TpkS2 = 349
S3CO = 0.02
PC(%) = 0.06
TOC(%) = 1.25
RC(%) = 1.19
HI = 17
OICO = 2
OI = 10
MINC(%) = 1.03
0
3
6
9
12
15
18
21
TIME (min)

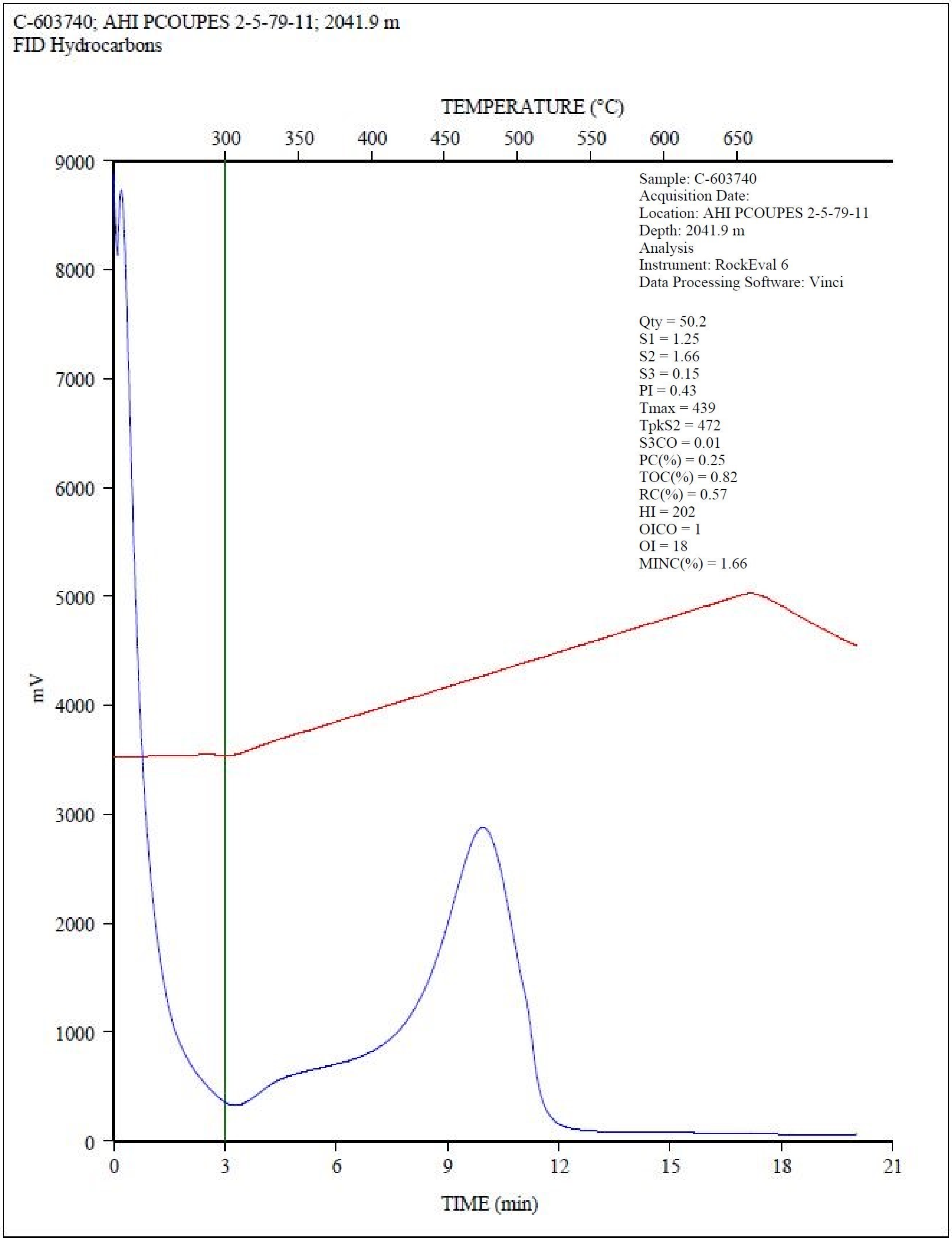

C-603734; CNRL WAPITI 14-27-67-8; 3018.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603734
Acquisition Date:
Location: CNRL WAPITI 14-27-67-8
Depth: 3018.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 0.52
S2 = 0.16
S3 = 0.11
PI = 0.77
Tmax = 304
TpkS2 = 337
S3CO = 0.01
PC(%) = 0.06
TOC(%) = 1.06
RC(%) = 1
HI = 15
OICO = 1
OI = 10
MINC(%) = 2.42

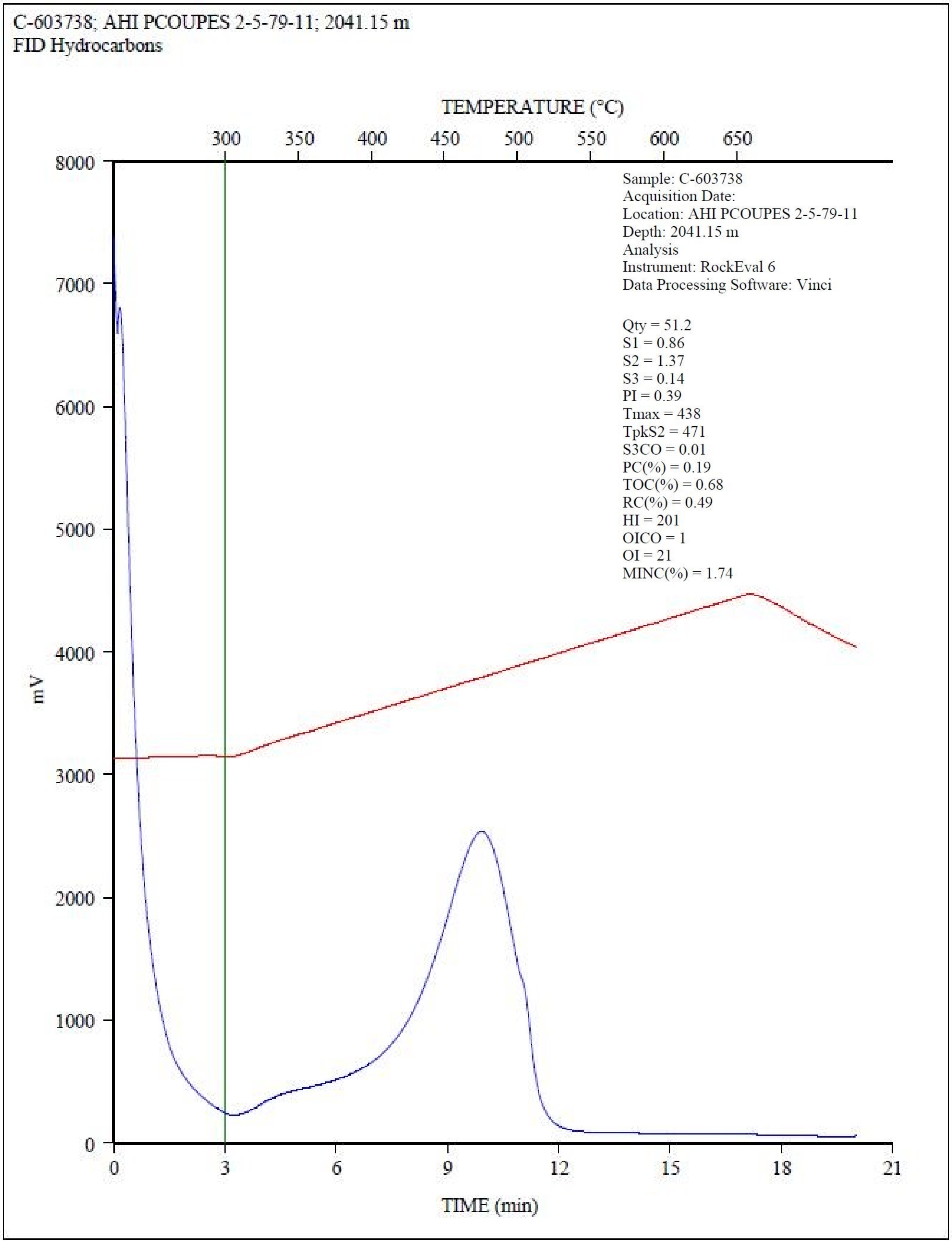

C-603735; CNRL WAPITI 14-27-67-8; 3024 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
3000
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603735
Acquisition Date:
Location: CNRL WAPITI 14-27-67-8
Depth: 3024 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.36
S2 = 0.15
S3 = 0.09
PI = 0.7
Tmax = 450
TpkS2 = 483
S3CO = 0.01
PC(%) = 0.05
TOC(%) = 1.18
RC(%) = 1.13
HI = 13
OICO = 1
OI = 8
MINC(%) = 0.96

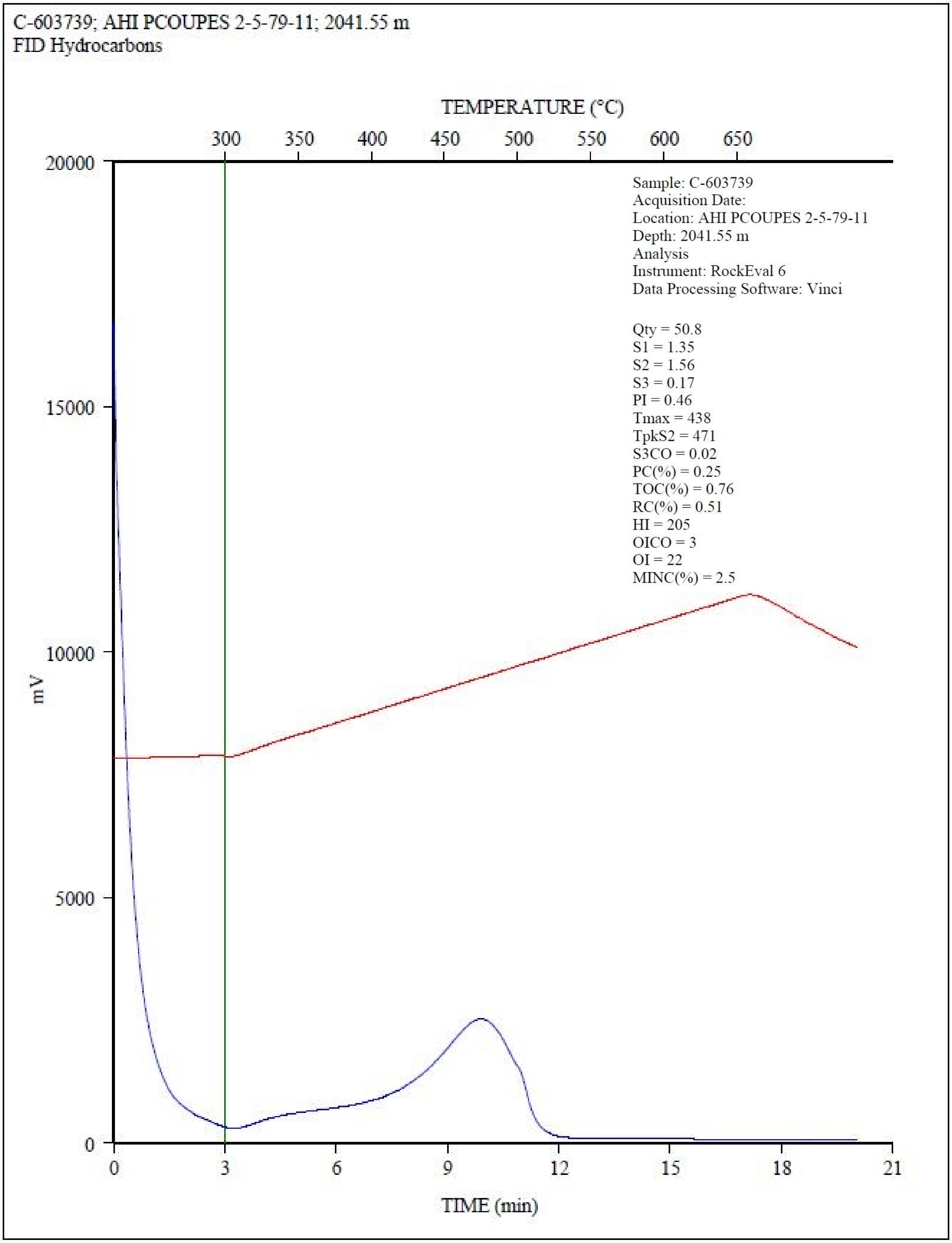


C-603736; CNRL WAPITI 14-27-67-8; 3026.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603736
Acquisition Date:
Location: CNRL WAPITI 14-27-67-8
Depth: 3026.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 0.54
S2 = 0.15
S3 = 0.1
PI = 0.78
Tmax = 306
TpkS2 = 339
S3CO = 0.01
PC(%) = 0.06
TOC(%) = 1.12
RC(%) = 1.06
HI = 13
OICO = 1
OI = 9
MINC(%) = 1.47

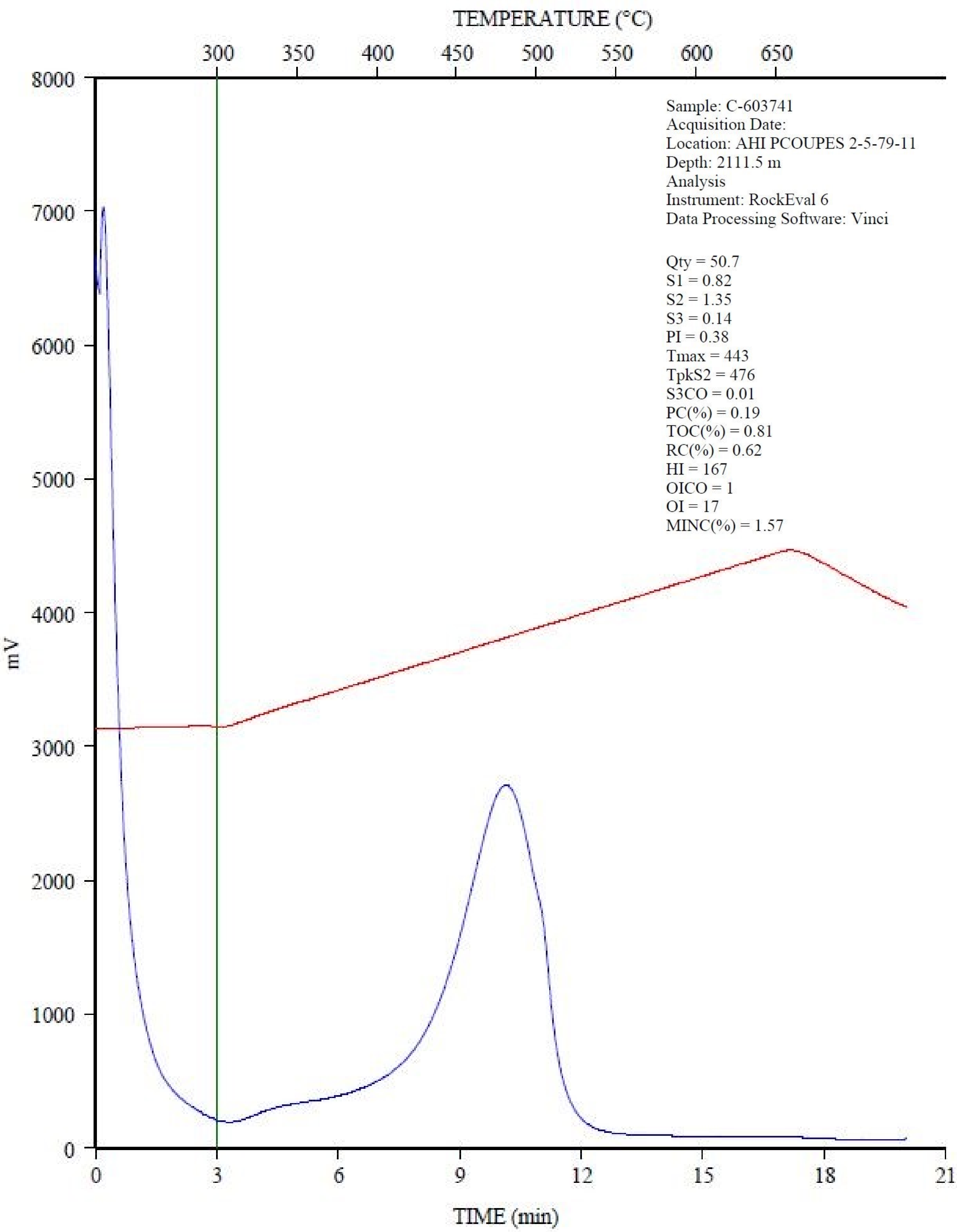

C-603737; CNRL WAPITI 14-27-67-8; 3028.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
7000
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603737
Acquisition Date:
Location: CNRL WAPITI 14-27-67-8
Depth: 3028.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 0.73
S2 = 0.15
S3 = 0.1
PI = 0.83
Tmax = 302
TpkS2 = 335
S3CO = 0.02
PC(%) = 0.08
TOC(%) = 1.21
RC(%) = 1.13
HI = 12
OICO = 2
OI = 8
MINC(%) = 2.28

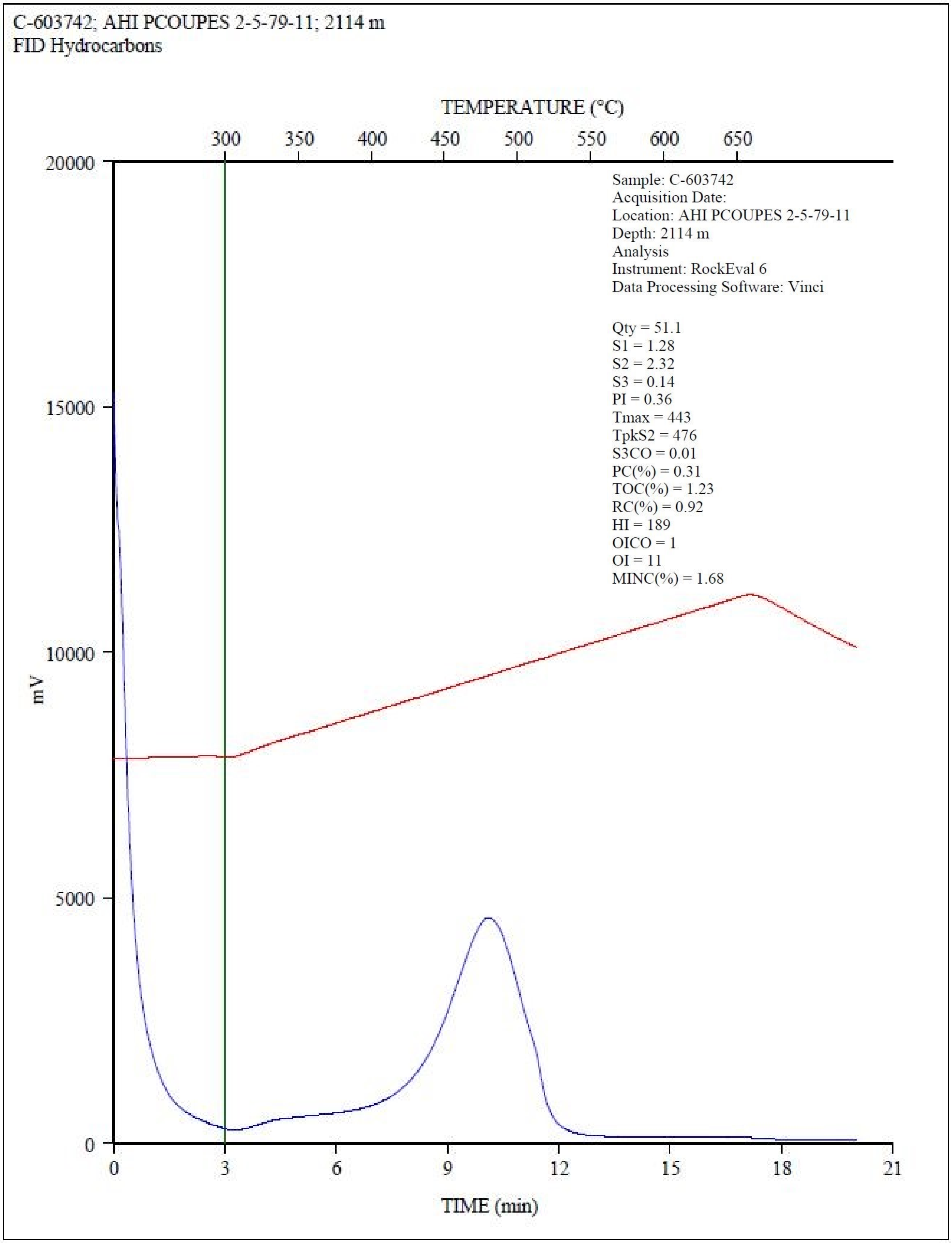

C-603740; AHI PCOUPES 2-5-79-11; 2041.9 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
Sample: C-603740
Acquisition Date:
Location: AHI PCOUPES 2-5-79-11
Depth: 2041.9 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.2
S1 = 1.25
S2 = 1.66
S3 = 0.15
PI = 0.43
Tmax = 439
TpkS2 = 472
S3CO = 0.01
PC(%) = 0.25
TOC(%) = 0.82
RC(%) = 0.57
HI = 202
OICO = 1
OI = 18
MINC(%) = 1.66
mV
9000 8000 7000 6000 5000 4000 3000 2000 1000 0
0 3 6 9 12 15 18 21
TIME (min)


C-603738; AHI PCOUPES 2-5-79-11; 2041.15 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
8000
7000
6000
5000
4000
3000
2000
1000
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603738
Acquisition Date:
Location: AHI PCOUPES 2-5-79-11
Depth: 2041.15 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 0.86
S2 = 1.37
S3 = 0.14
PI = 0.39
Tmax = 438
TpkS2 = 471
S3CO = 0.01
PC(%) = 0.19
TOC(%) = 0.68
RC(%) = 0.49
HI = 201
OICO = 1
OI = 21
MINC(%) = 1.74

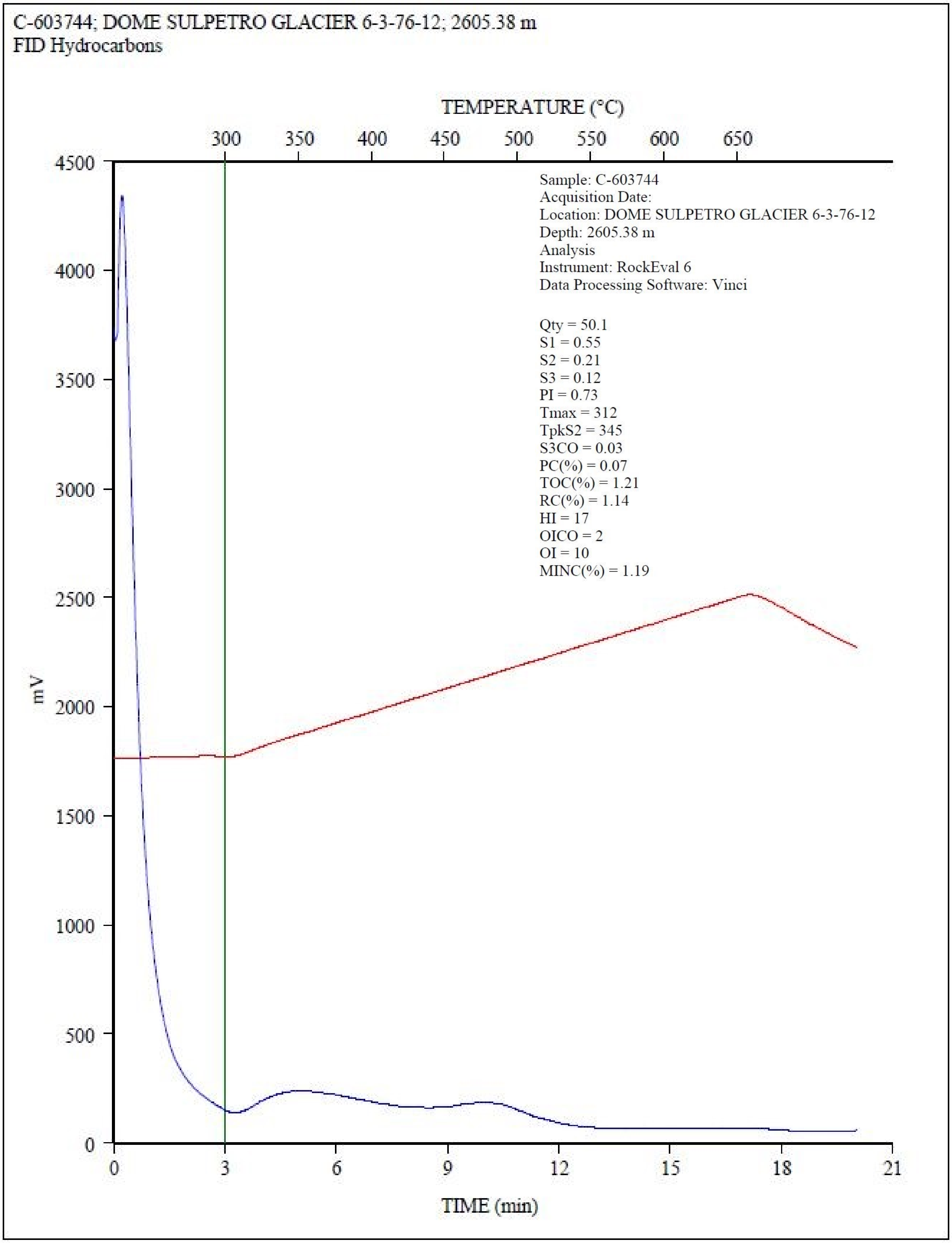

C-603739; AHI PCOUPES 2-5-79-11; 2041.55 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603739
Acquisition Date:
Location: AHI PCOUPES 2-5-79-11
Depth: 2041.55 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 1.35
S2 = 1.56
S3 = 0.17
PI = 0.46
Tmax = 438
TpkS2 = 471
S3CO = 0.02
PC(%) = 0.25
TOC(%) = 0.76
RC(%) = 0.51
HI = 205
OICO = 3
OI = 22
MINC(%) = 2.5
0
3
6
9
12
15
18
21
TIME (min)

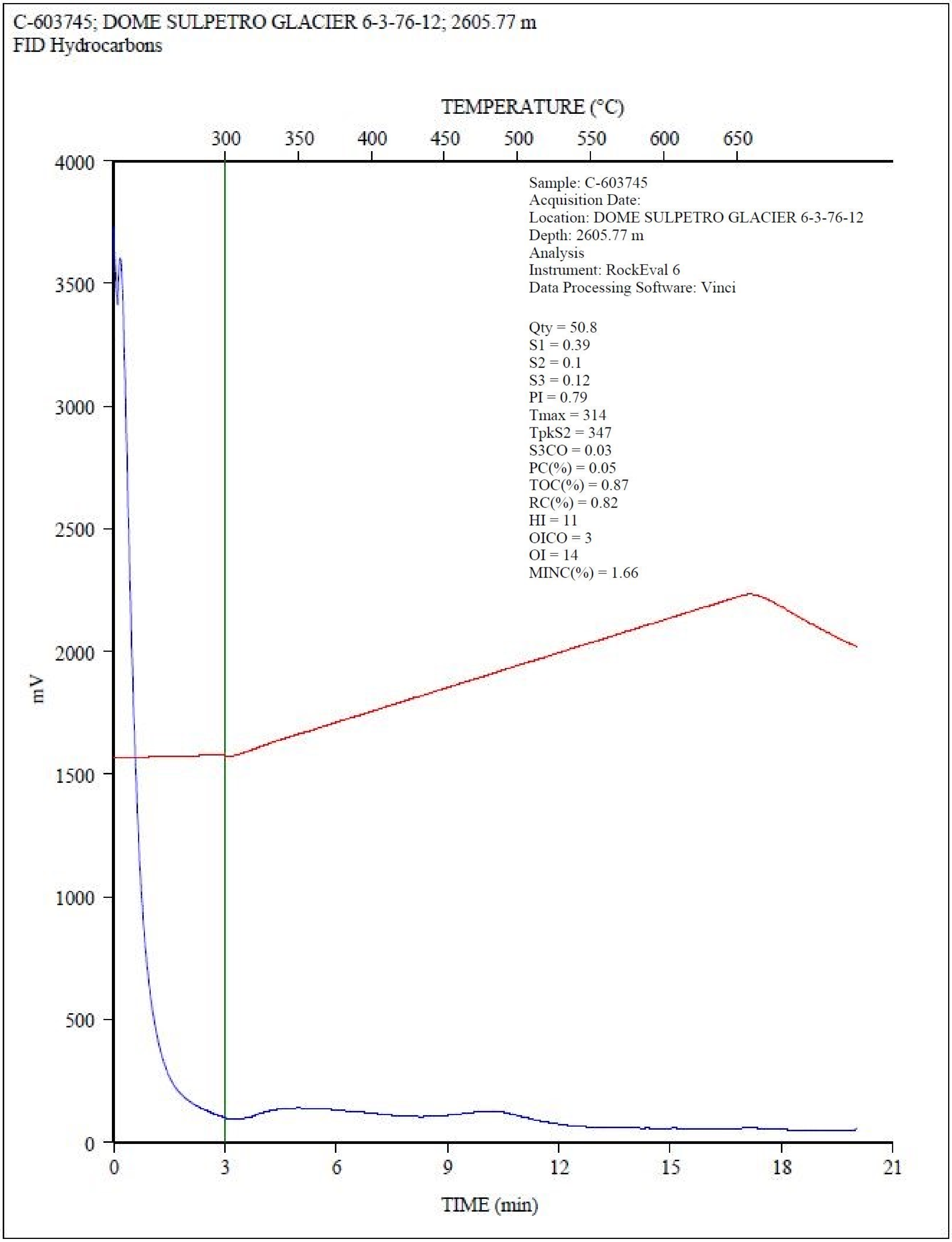
C-603741; AHI PCOUPES 2-5-79-11; 2111.5 m
FID Hydrocarbons



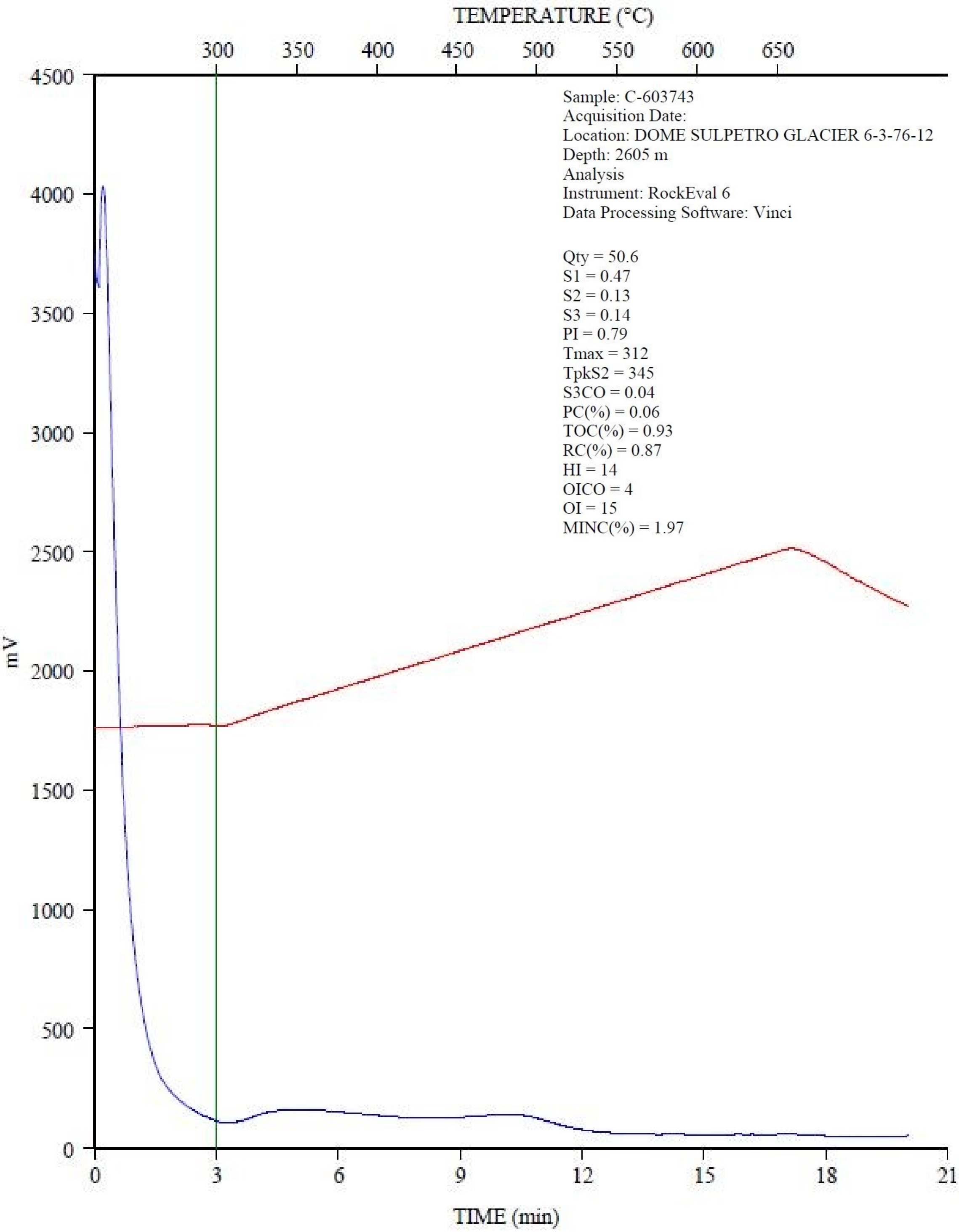


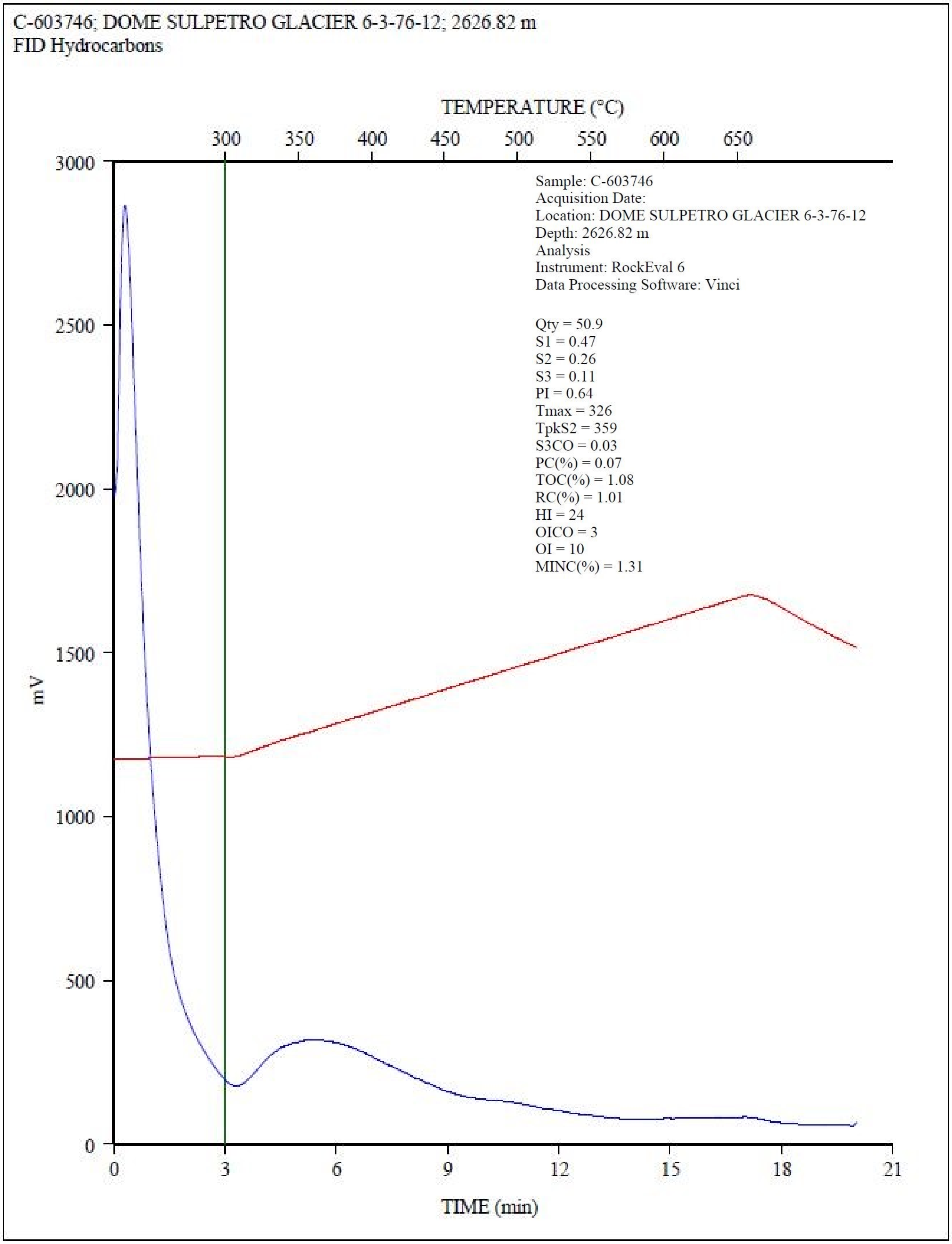
C-603742; AHI PCOUPES 2-5-79-11; 2114 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
20000
15000
10000
5000
0
mV
Sample: C-603742
Acquisition Date:
Location: AHI PCOUPES 2-5-79-11
Depth: 2114 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 1.28
S2 = 2.32
S3 = 0.14
PI = 0.36
Tmax = 443
TpkS2 = 476
S3CO = 0.01
PC(%) = 0.31
TOC(%) = 1.23
RC(%) = 0.92
HI = 189
OICO = 1
OI = 11
MINC(%) = 1.68
0
3
6
9
12
15
18
21
TIME (min)

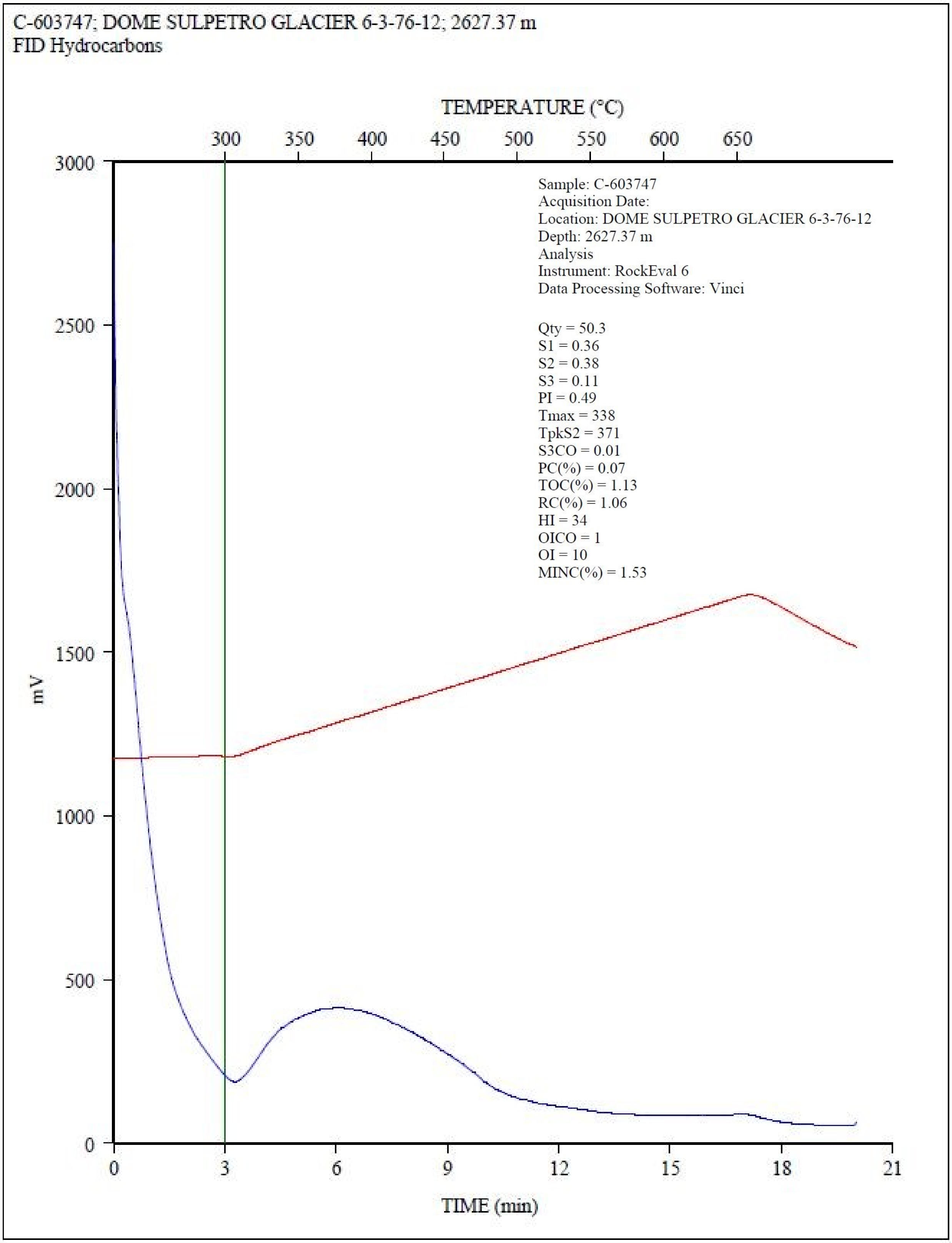

C-603744; DOME SULPETRO GLACIER 6-3-76-12; 2605.38 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
Sample: C-603744
Acquisition Date:
Location: DOME SULPETRO GLACIER 6-3-76-12
Depth: 2605.38 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.1
S1 = 0.55
S2 = 0.21
S3 = 0.12
PI = 0.73
Tmax = 312
TpkS2 = 345
S3CO = 0.03
PC(%) = 0.07
TOC(%) = 1.21
RC(%) = 1.14
HI = 17
OICO = 2
OI = 10
MINC(%) = 1.19
mV
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
3
6
9
12
15
18
21
TIME (min)

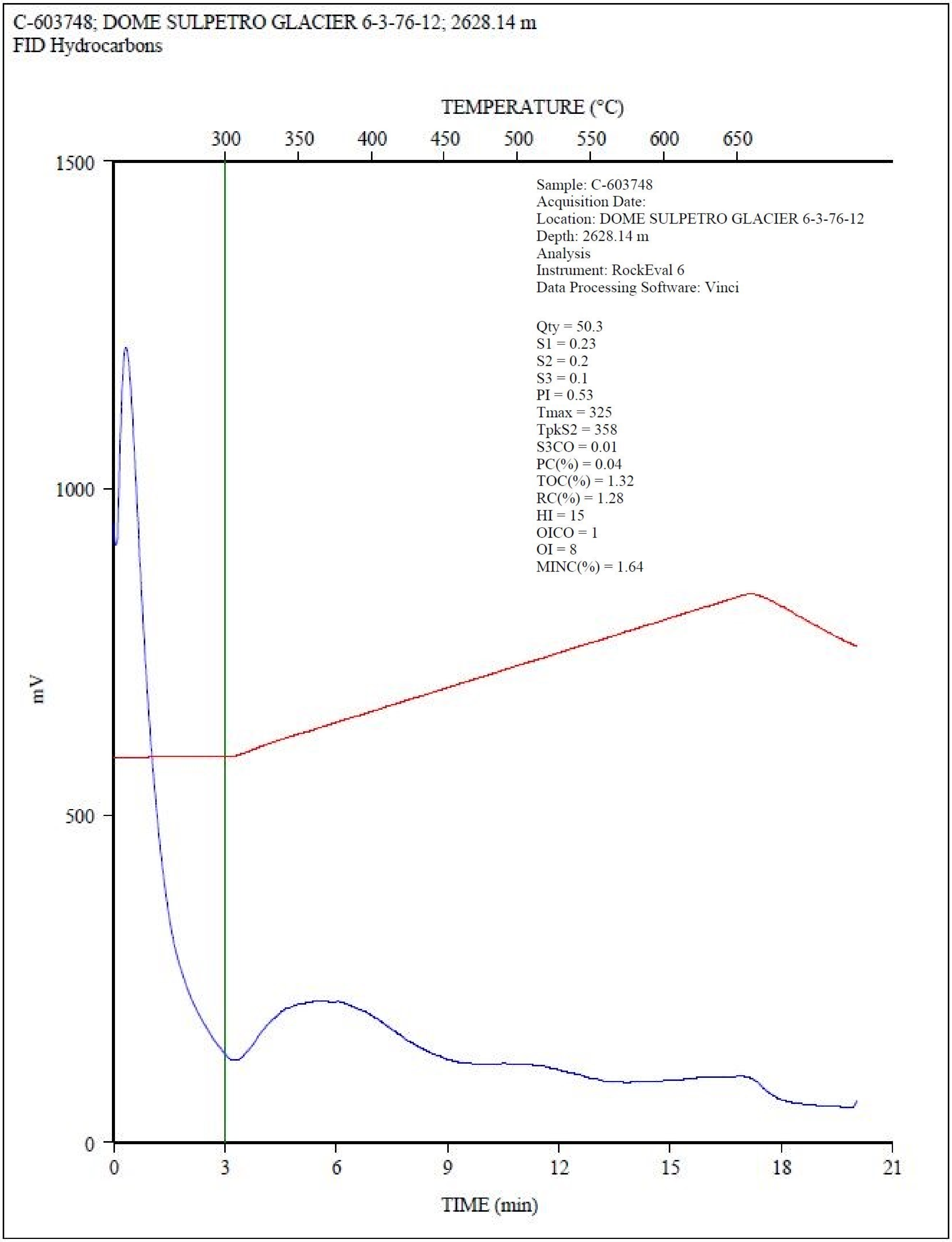

C-603745; DOME SULPETRO GLACIER 6-3-76-12; 2605.77 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603745
Acquisition Date:
Location: DOME SULPETRO GLACIER 6-3-76-12
Depth: 2605.77 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 0.39
S2 = 0.1
S3 = 0.12
PI = 0.79
Tmax = 314
TpkS2 = 347
S3CO = 0.03
PC(%) = 0.05
TOC(%) = 0.87
RC(%) = 0.82
HI = 11
OICO = 3
OI = 14
MINC(%) = 1.66
0
3
6
9
12
15
18
21
TIME (min)

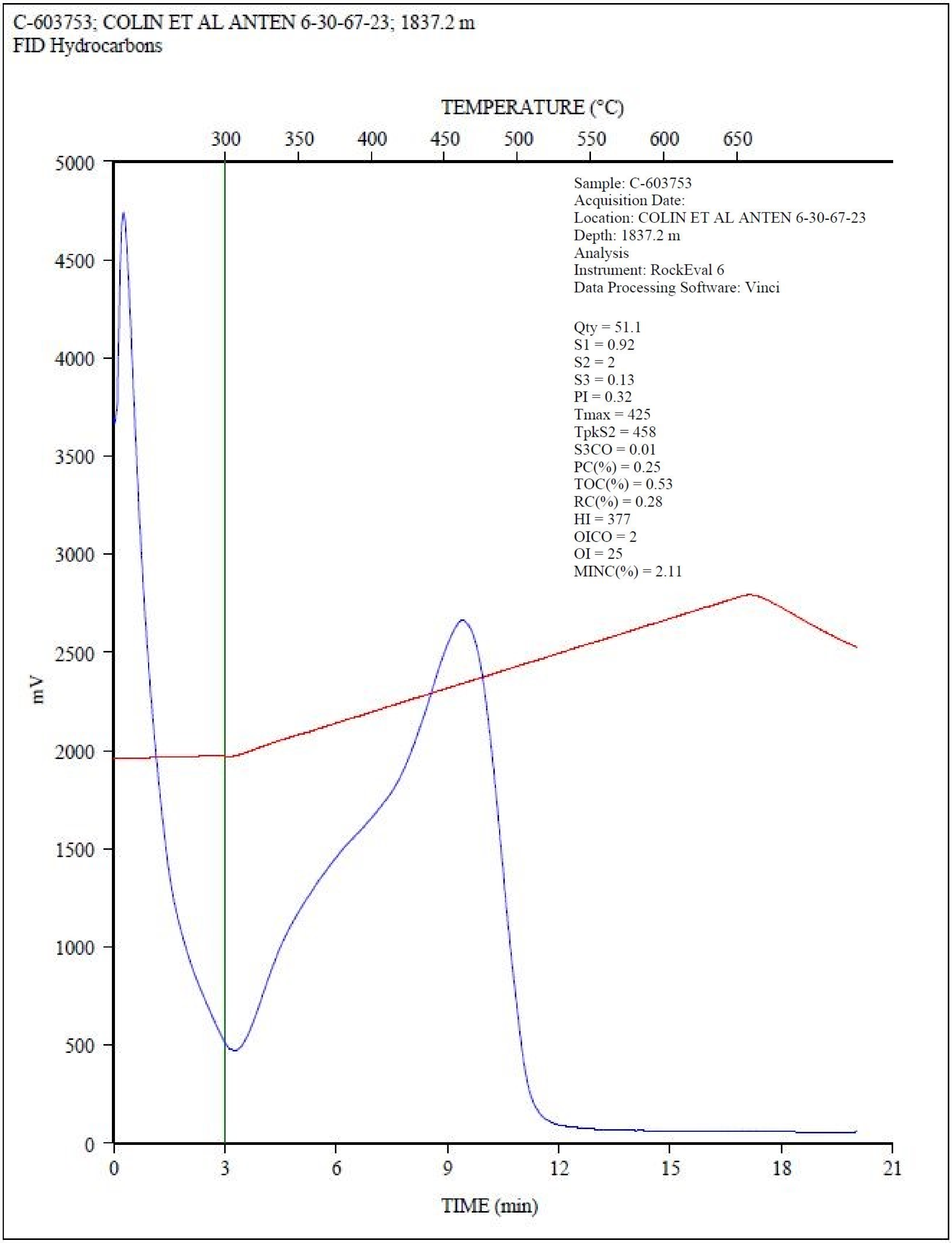
C-603743; DOME SULPETRO GLACIER 6-3-76-12; 2605 m
FID Hydrocarbons

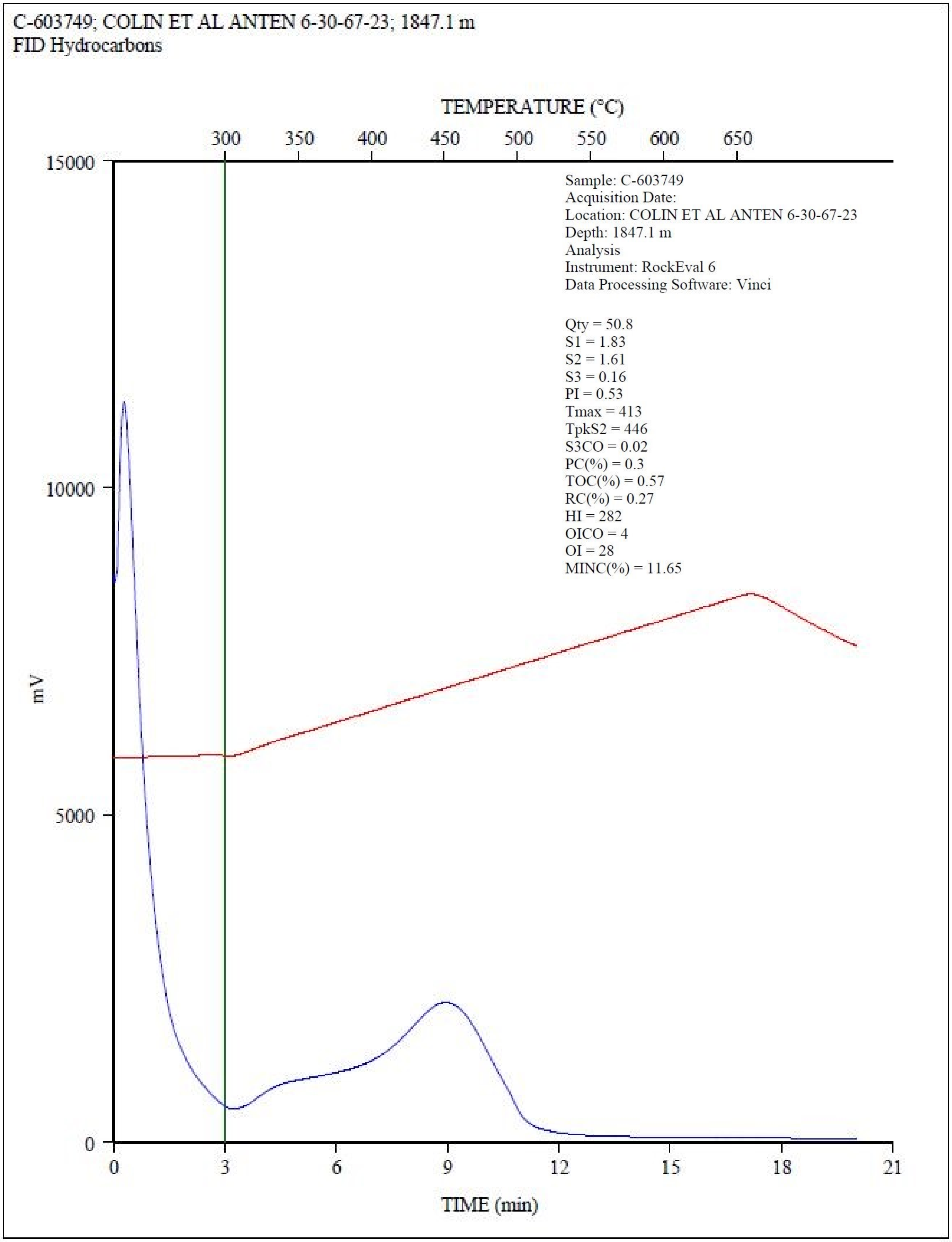



C-603746; DOME SULPETRO GLACIER 6-3-76-12; 2626.82 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
3000
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603746
Acquisition Date:
Location: DOME SULPETRO GLACIER 6-3-76-12
Depth: 2626.82 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 0.47
S2 = 0.26
S3 = 0.11
PI = 0.64
Tmax = 326
TpkS2 = 359
S3CO = 0.03
PC(%) = 0.07
TOC(%) = 1.08
RC(%) = 1.01
HI = 24
OICO = 3
OI = 10
MINC(%) = 1.31

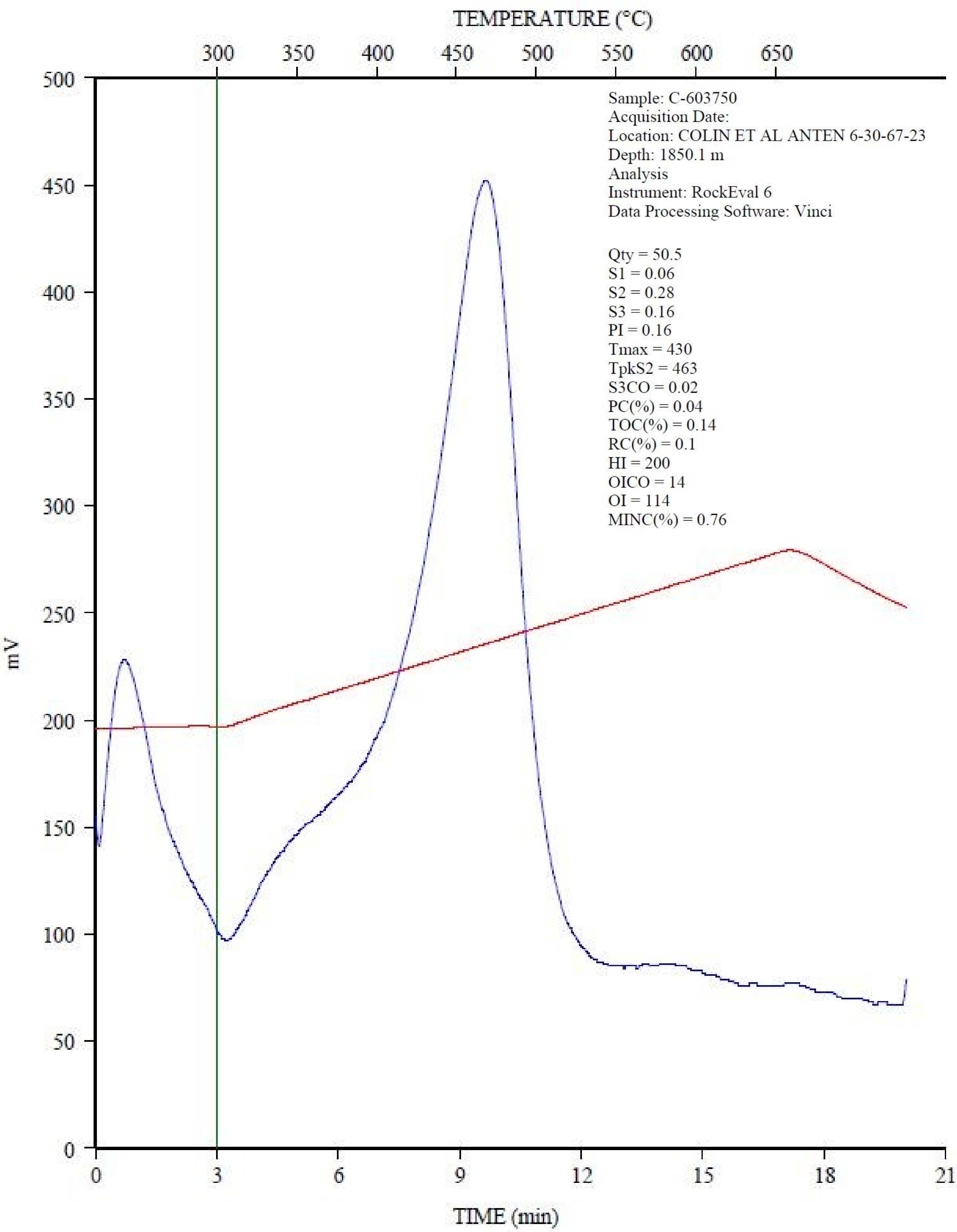

C-603747; DOME SULPETRO GLACIER 6-3-76-12; 2627.37 m
FID Hydrocarbons
TEMPERATURE (°C)
300 350 400 450 500 550 600 650
3000 2500 2000 1500 1000 500 0
mV
Sample: C-603747
Acquisition Date:
Location: DOME SULPETRO GLACIER 6-3-76-12
Depth: 2627.37 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 0.36
S2 = 0.38
S3 = 0.11
PI = 0.49
Tmax = 338
TpkS2 = 371
S3CO = 0.01
PC(%) = 0.07
TOC(%) = 1.13
RC(%) = 1.06
HI = 34
OICO = 1
OI = 10
MINC(%) = 1.53
0 3 6 9 12 15 18 21
TIME (min)

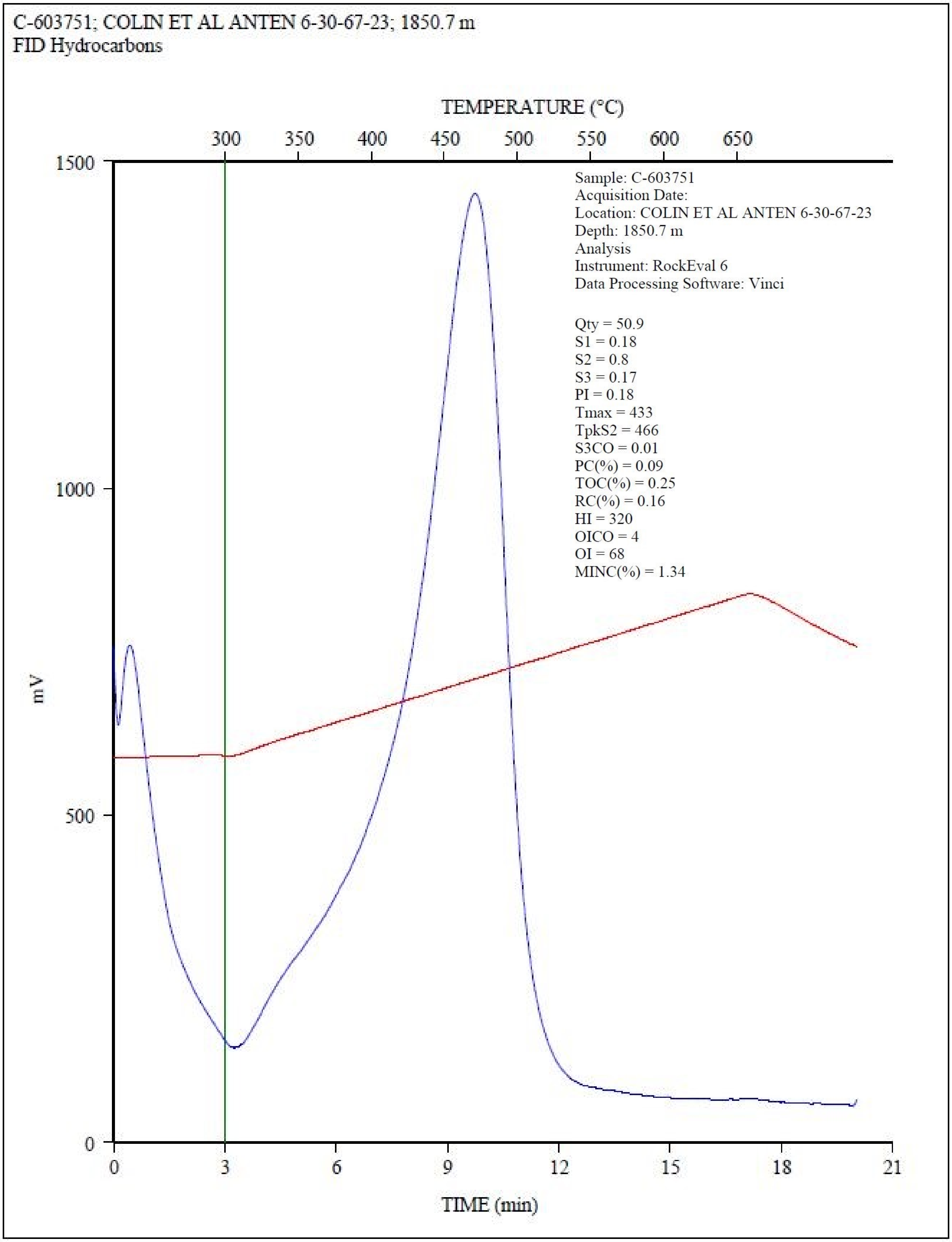

C-603748; DOME SULPETRO GLACIER 6-3-76-12; 2628.14 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603748
Acquisition Date:
Location: DOME SULPETRO GLACIER 6-3-76-12
Depth: 2628.14 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 0.23
S2 = 0.2
S3 = 0.1
PI = 0.53
Tmax = 325
TpkS2 = 358
S3CO = 0.01
PC(%) = 0.04
TOC(%) = 1.32
RC(%) = 1.28
HI = 15
OICO = 1
OI = 8
MINC(%) = 1.64

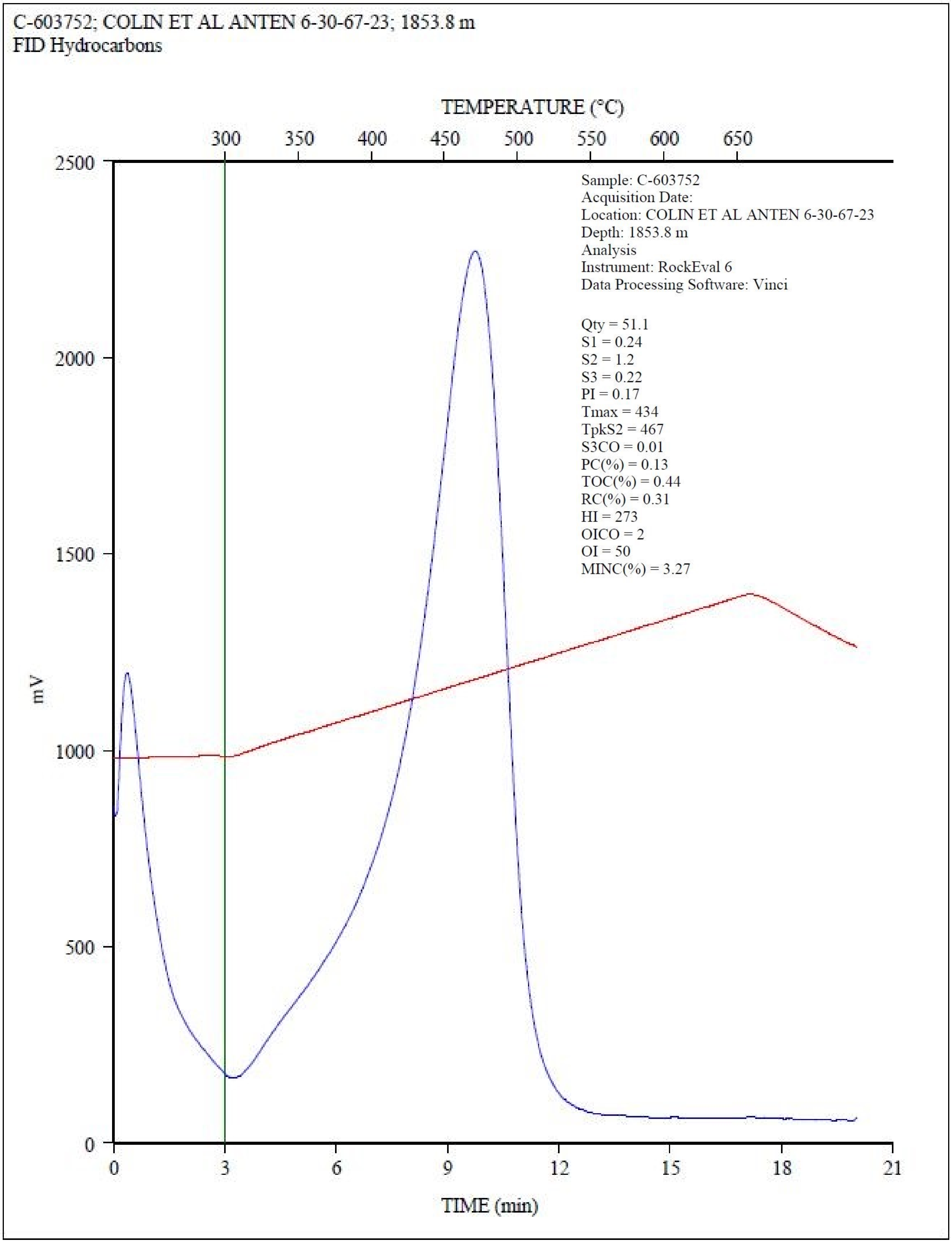

C-603753; COLIN ET AL ANTEN 6-30-67-23; 1837.2 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603753
Acquisition Date:
Location: COLIN ET AL ANTEN 6-30-67-23
Depth: 1837.2 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 0.92
S2 = 2
S3 = 0.13
PI = 0.32
Tmax = 425
TpkS2 = 458
S3CO = 0.01
PC(%) = 0.25
TOC(%) = 0.53
RC(%) = 0.28
HI = 377
OICO = 2
OI = 25
MINC(%) = 2.11
0
3
6
9
12
15
18
21
TIME (min)


C-603749; COLIN ET AL ANTEN 6-30-67-23; 1847.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
15000
10000
5000
0
mV
Sample: C-603749
Acquisition Date:
Location: COLIN ET AL ANTEN 6-30-67-23
Depth: 1847.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.8
S1 = 1.83
S2 = 1.61
S3 = 0.16
PI = 0.53
Tmax = 413
TpkS2 = 446
S3CO = 0.02
PC(%) = 0.3
TOC(%) = 0.57
RC(%) = 0.27
HI = 282
OICO = 4
OI = 28
MINC(%) = 11.65
0
3
6
9
12
15
18
21
TIME (min)

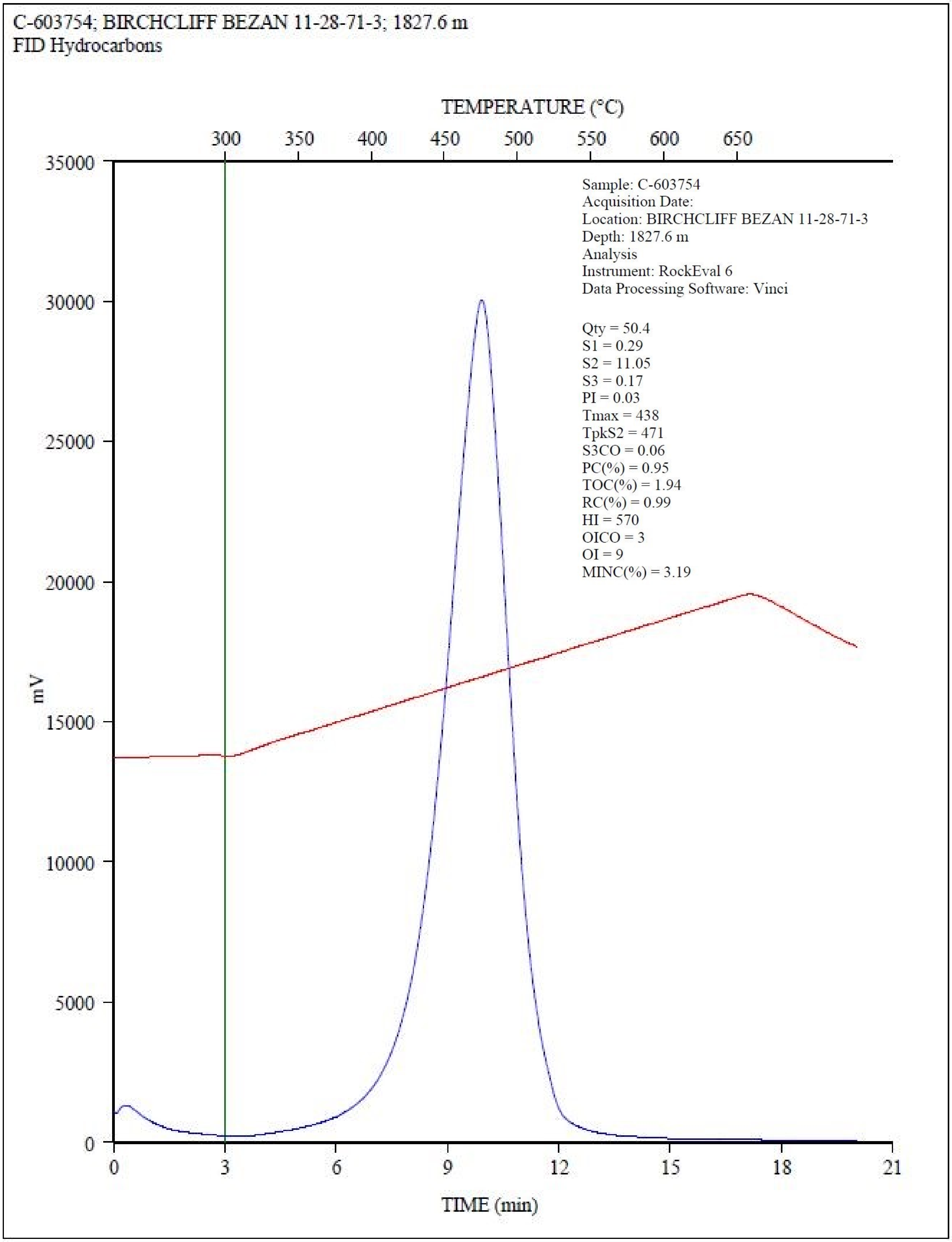
C-603750; COLIN ET AL ANTEN 6-30-67-23; 1850.1 m
FID Hydrocarbons



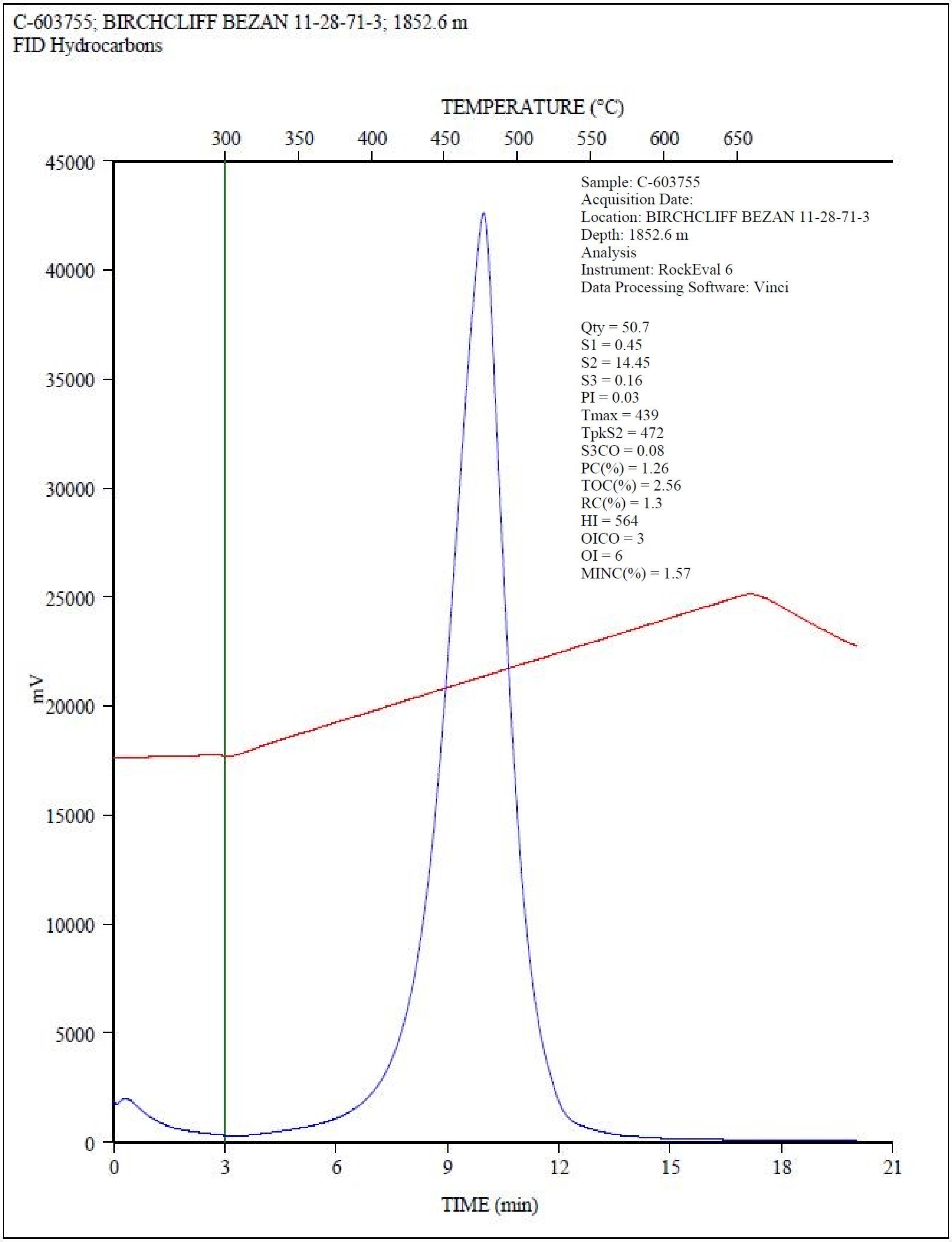

C-603751; COLIN ET AL ANTEN 6-30-67-23; 1850.7 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
1500
1000
500
0
mV
Sample: C-603751
Acquisition Date:
Location: COLIN ET AL ANTEN 6-30-67-23
Depth: 1850.7 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.9
S1 = 0.18
S2 = 0.8
S3 = 0.17
PI = 0.18
Tmax = 433
TpkS2 = 466
S3CO = 0.01
PC(%) = 0.09
TOC(%) = 0.25
RC(%) = 0.16
HI = 320
OICO = 4
OI = 68
MINC(%) = 1.34
0
3
6
9
12
15
18
21
TIME (min)

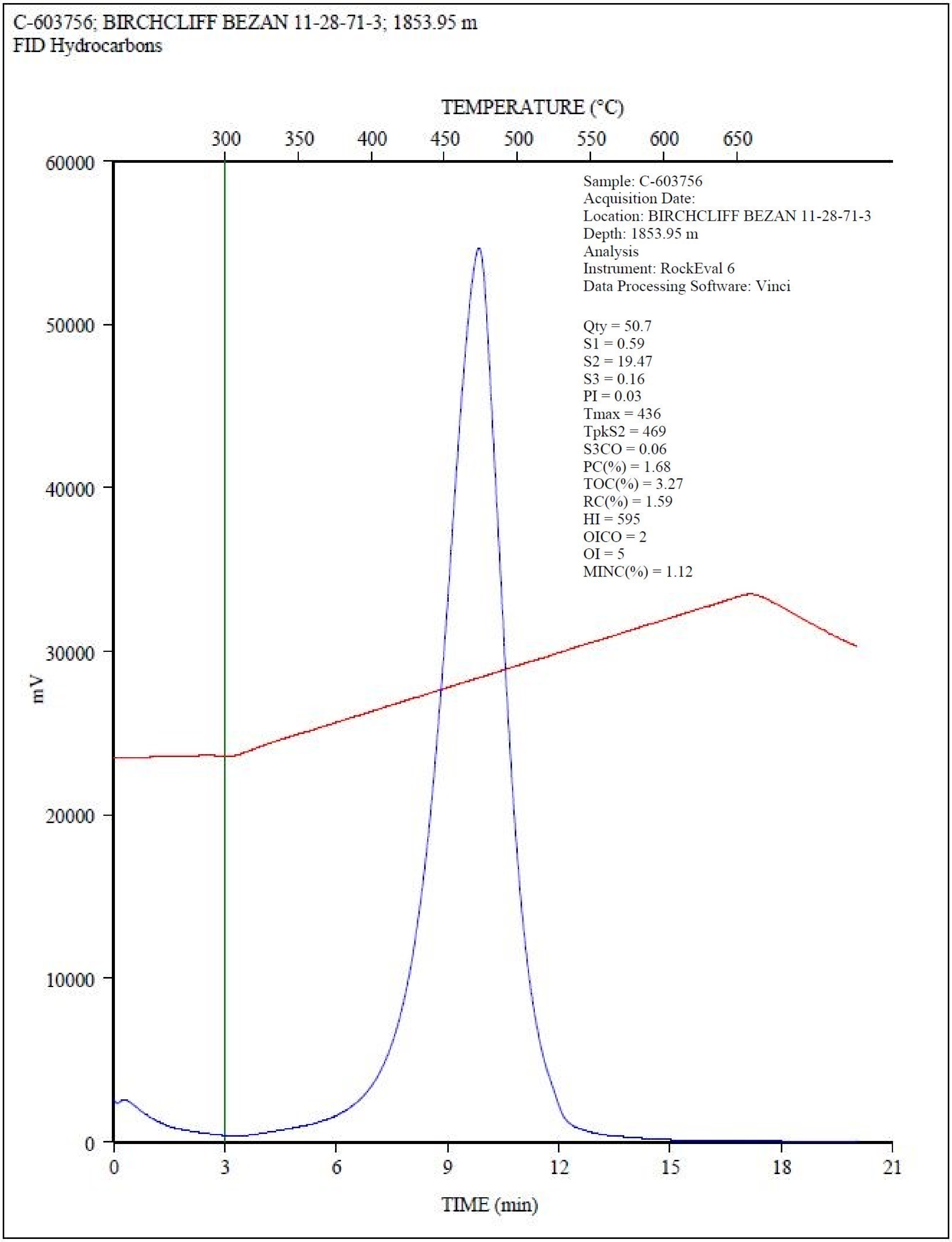


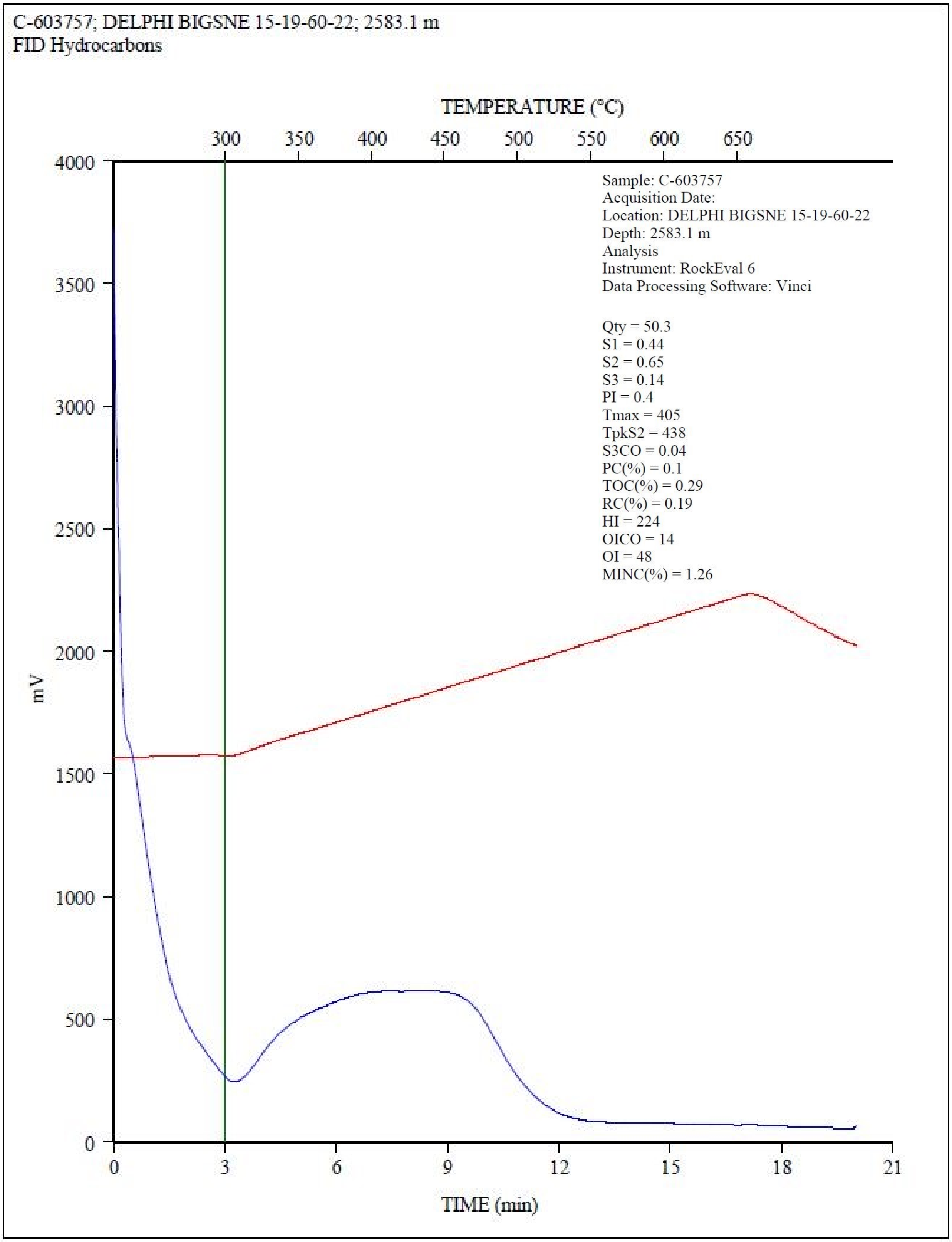
C-603752; COLIN ET AL ANTEN 6-30-67-23; 1853.8 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
2500
2000
1500
1000
500
0
mV
0
3
6
9
12
15
18
21
TIME (min)
Sample: C-603752
Acquisition Date:
Location: COLIN ET AL ANTEN 6-30-67-23
Depth: 1853.8 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.1
S1 = 0.24
S2 = 1.2
S3 = 0.22
PI = 0.17
Tmax = 434
TpkS2 = 467
S3CO = 0.01
PC(%) = 0.13
TOC(%) = 0.44
RC(%) = 0.31
HI = 273
OICO = 2
OI = 50
MINC(%) = 3.27



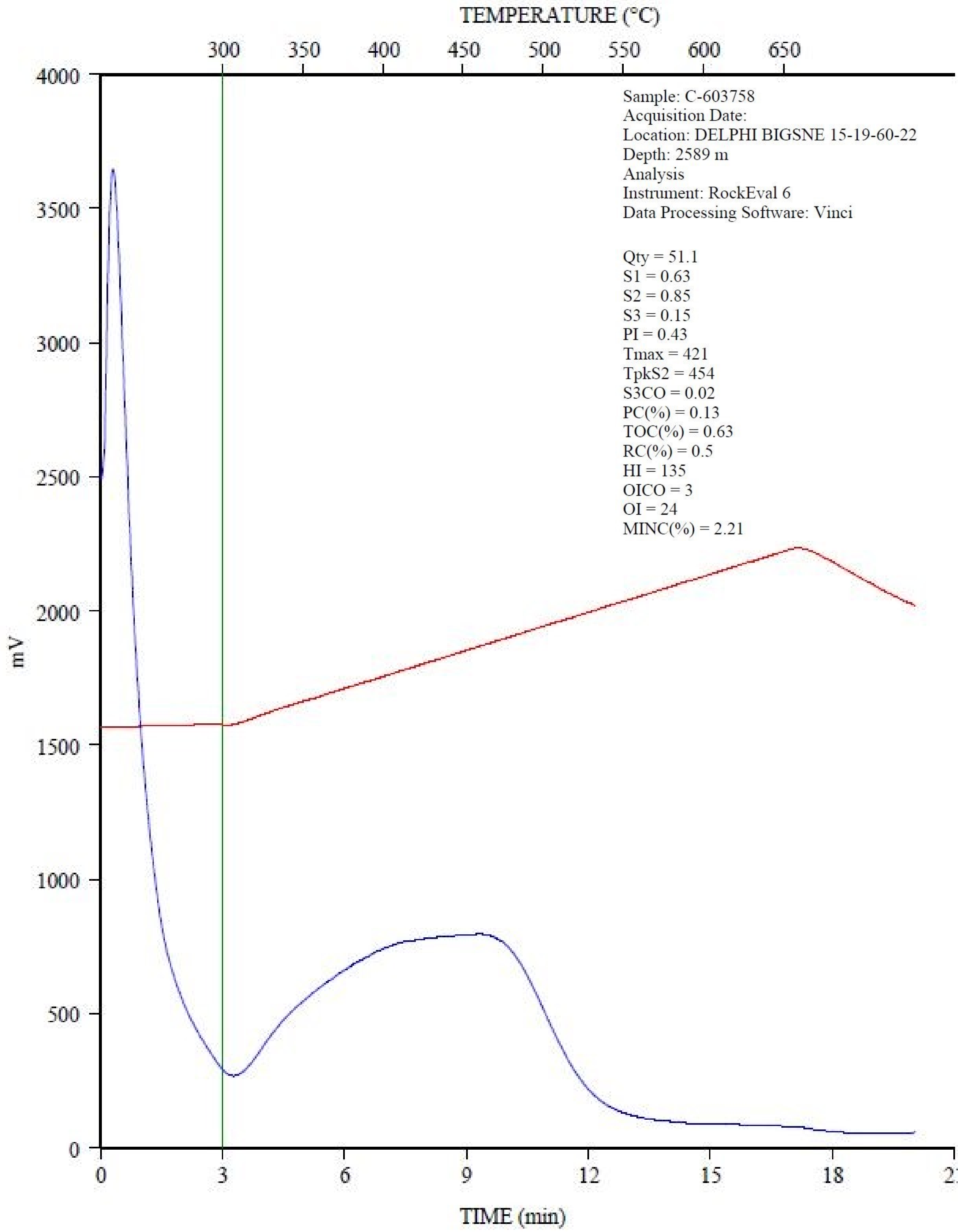
C-603754; BIRCHCLIFF BEZAN 11-28-71-3; 1827.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
35000
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603754
Acquisition Date:
Location: BIRCHCLIFF BEZAN 11-28-71-3
Depth: 1827.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.4
S1 = 0.29
S2 = 11.05
S3 = 0.17
PI = 0.03
Tmax = 438
TpkS2 = 471
S3CO = 0.06
PC(%) = 0.95
TOC(%) = 1.94
RC(%) = 0.99
HI = 570
OICO = 3
OI = 9
MINC(%) = 3.19
0
3
6
9
12
15
18
21
TIME (min)

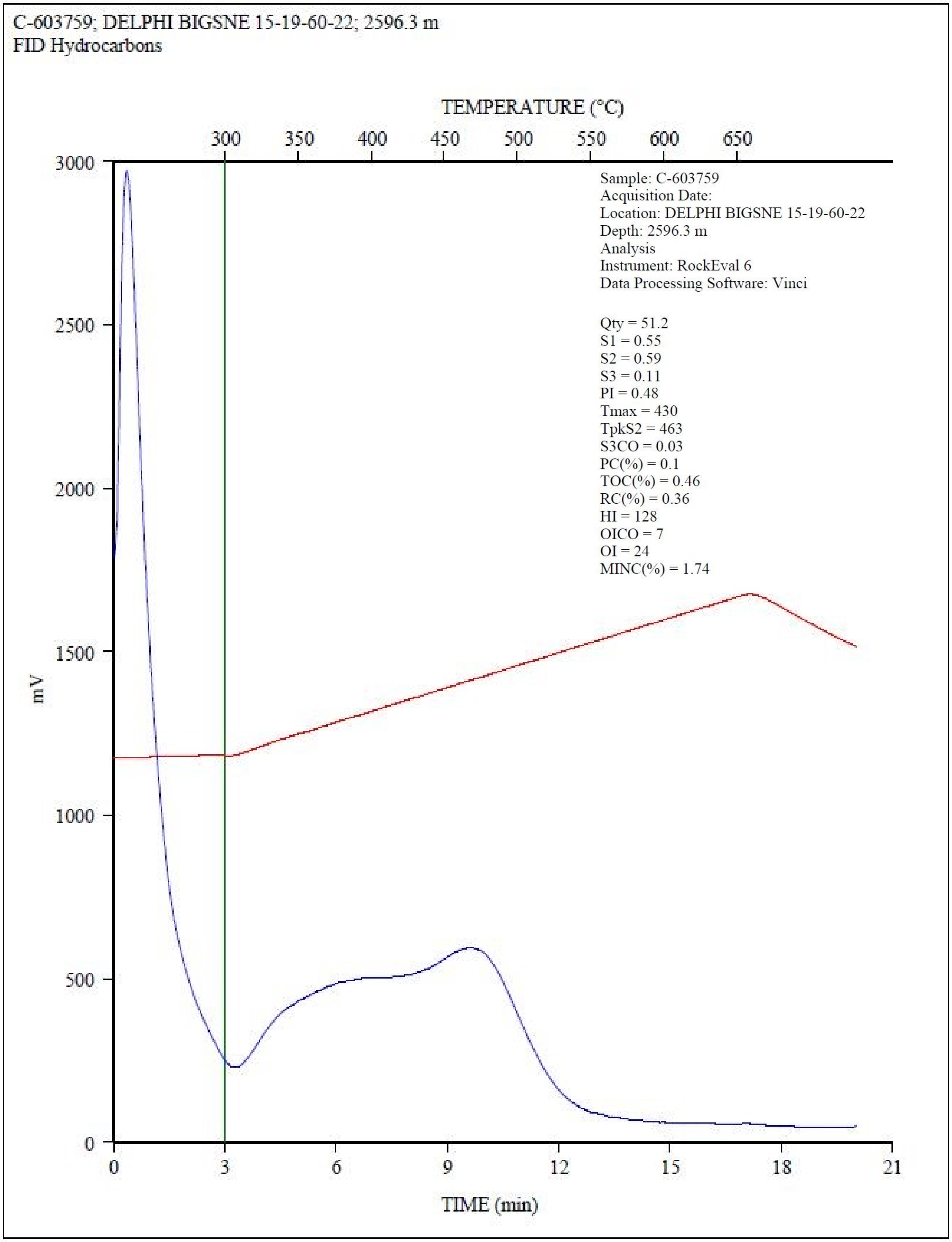

C-603755; BIRCHCLIFF BEZAN 11-28-71-3; 1852.6 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
mV
Sample: C-603755
Acquisition Date:
Location: BIRCHCLIFF BEZAN 11-28-71-3
Depth: 1852.6 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.45
S2 = 14.45
S3 = 0.16
PI = 0.03
Tmax = 439
TpkS2 = 472
S3CO = 0.08
PC(%) = 1.26
TOC(%) = 2.56
RC(%) = 1.3
HI = 564
OICO = 3
OI = 6
MINC(%) = 1.57
0
3
6
9
12
15
18
21
TIME (min)

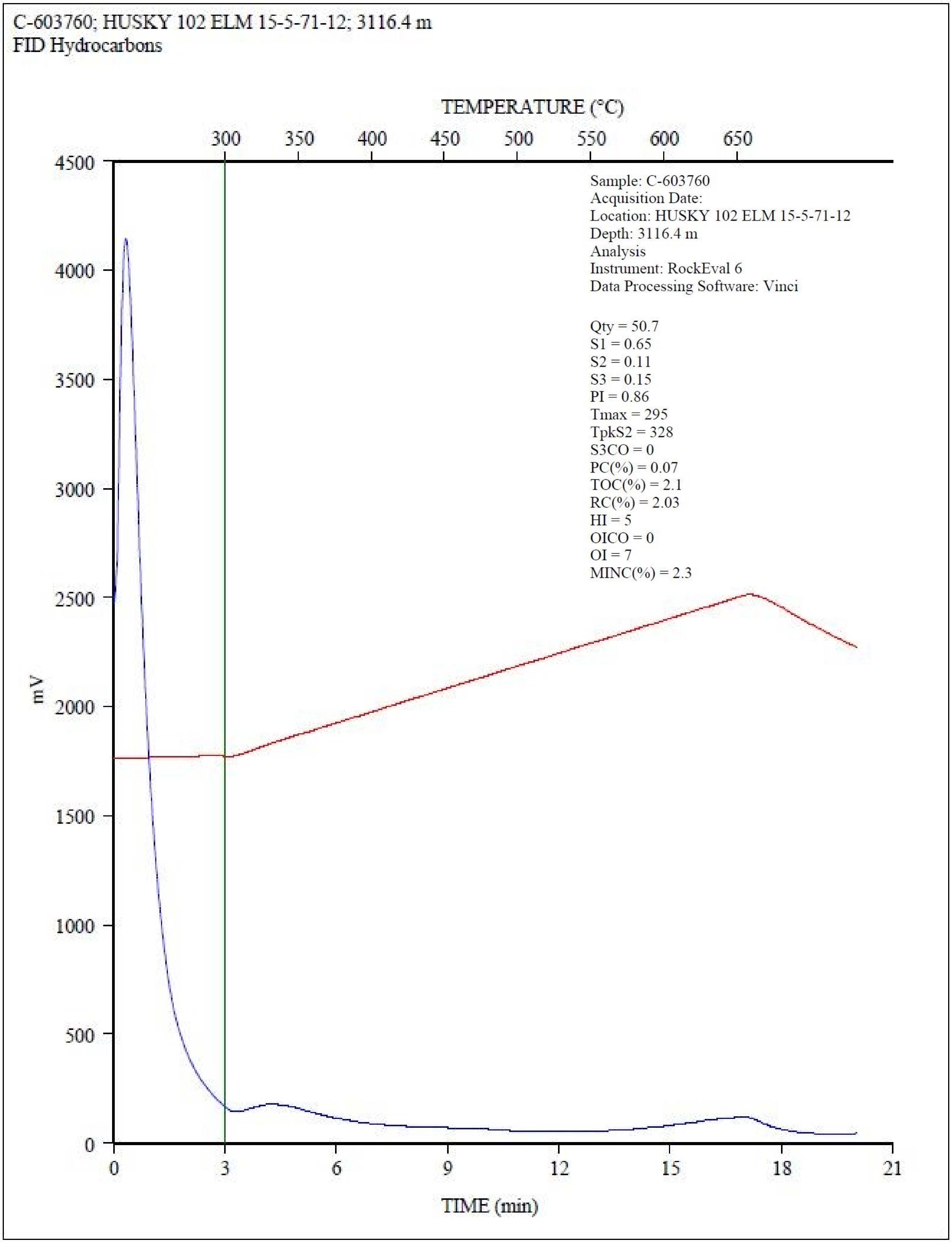

C-603756; BIRCHCLIFF BEZAN 11-28-71-3; 1853.95 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
60000
50000
40000
30000
20000
10000
0
mV
Sample: C-603756
Acquisition Date:
Location: BIRCHCLIFF BEZAN 11-28-71-3
Depth: 1853.95 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.59
S2 = 19.47
S3 = 0.16
PI = 0.03
Tmax = 436
TpkS2 = 469
S3CO = 0.06
PC(%) = 1.68
TOC(%) = 3.27
RC(%) = 1.59
HI = 595
OICO = 2
OI = 5
MINC(%) = 1.12
0
3
6
9
12
15
18
21
TIME (min)


C-603757; DELPHI BIGSNE 15-19-60-22; 2583.1 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603757
Acquisition Date:
Location: DELPHI BIGSNE 15-19-60-22
Depth: 2583.1 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.3
S1 = 0.44
S2 = 0.65
S3 = 0.14
PI = 0.4
Tmax = 405
TpkS2 = 438
S3CO = 0.04
PC(%) = 0.1
TOC(%) = 0.29
RC(%) = 0.19
HI = 224
OICO = 14
OI = 48
MINC(%) = 1.26
0
3
6
9
12
15
18
21
TIME (min)

C-603758; DELPHI BIGSNE 15-19-60-22; 2589 m
FID Hydrocarbons




C-603759; DELPHI BIGSNE 15-19-60-22; 2596.3 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603759
Acquisition Date:
Location: DELPHI BIGSNE 15-19-60-22
Depth: 2596.3 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 51.2
S1 = 0.55
S2 = 0.59
S3 = 0.11
PI = 0.48
Tmax = 430
TpkS2 = 463
S3CO = 0.03
PC(%) = 0.1
TOC(%) = 0.46
RC(%) = 0.36
HI = 128
OICO = 7
OI = 24
MINC(%) = 1.74
0
3
6
9
12
15
18
21
TIME (min)



C-603760; HUSKY 102 ELM 15-5-71-12; 3116.4 m
FID Hydrocarbons
TEMPERATURE (°C)
300
350
400
450
500
550
600
650
4500
4000
3500
3000
2500
2000
1500
1000
500
0
mV
Sample: C-603760
Acquisition Date:
Location: HUSKY 102 ELM 15-5-71-12
Depth: 3116.4 m
Analysis
Instrument: RockEval 6
Data Processing Software: Vinci
Qty = 50.7
S1 = 0.65
S2 = 0.11
S3 = 0.15
PI = 0.86
Tmax = 295
TpkS2 = 328
S3CO = 0
PC(%) = 0.07
TOC(%) = 2.1
RC(%) = 2.03
HI = 5
OICO = 0
OI = 7
MINC(%) = 2.3
0
3
6
9
12
15
18
21
TIME (min)

APPENDIX 3-3

Measured TOC and Calculated TOC in Montney Formation

Calculated TOC values are obtained according to GR-TOC relationship ($GR=107.81*TOC\ (\%)^{0.2034}$)

Montney Rock-eval TOC and Calculated TOC from GR-TOC relationship ($GR=107.81*TOC(\%)^{0.2034}$)

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
1	14	11-1-75-11W6	2499.01	0.25	0.14	72.6	GSC Internal data
2	14	11-1-75-11W6	2502.67	0.19	0.15	73.4	GSC Internal data
3	2	1-14-75-11W6	2495.1	0.37	0.16	73.98	GSC Internal data
4	22	15-31-77-10W6	2041.35	0.22	0.17	75.51	GSC Internal data
5	22	15-31-77-10W6	2038.6	0.25	0.18	76.13	GSC Internal data
6	22	15-31-77-10W6	2225.9	0.27	0.18	75.96	GSC Internal data
7	22	15-31-77-10W6	2007.2	0.32	0.18	75.72	GSC Internal data
8	22	15-31-77-10W6	2044.45	0.23	0.19	76.83	GSC Internal data
9	18	13-33-67-4W6	2372.5	0.25	0.2	77.5	GSC Internal data
10	8	6-14-77-11W6	2193.9	0.27	0.2	78.1	GSC Internal data
11	22	15-31-77-10W6	2036	0.31	0.21	78.2	GSC Internal data
12	8	6-14-77-11W6	2198.1	0.28	0.24	80.8	GSC Internal data
13	32	C-15-L/93-P-7	3841.13	0.39	0.27	82.45	GSC Internal data
14	32	C-15-L/93-P-7	3841.13	0.48	0.27	82.45	GSC Internal data
15	22	15-31-77-10W6	2041	0.68	0.3	84.2	GSC Internal data
16	37	C-85-H/93-P-7	3554.2	0.48	0.31	85.2	GSC Internal data
17	37	C-85-H/93-P-7	3554.2	0.5	0.31	85.2	GSC Internal data
18	19	13-5-68-1W6	2055.35	0.37	0.33	86.04	GSC Internal data
19	39	D-21-G/93-P-9	2542.1	0.41	0.34	86.7	GSC Internal data
20	22	15-31-77-10W6	2226	0.45	0.37	87.84	GSC Internal data
21	22	15-31-77-10W6	2046	0.54	0.41	90.09	GSC Internal data
22	32	C-15-L/93-P-7	3838.9	0.55	0.41	90.01	GSC Internal data
23	32	C-15-L/93-P-7	3838.9	0.6	0.41	90.01	GSC Internal data
24	6	3-6-78-22W6	3350.38	0.44	0.43	90.89	GSC Internal data
25	22	15-31-77-10W6	2044.2	0.65	0.43	90.8	GSC Internal data
26	22	15-31-77-10W6	2032.7	0.61	0.45	91.6	GSC Internal data
27	11	6-36-71-4W6	1888.15	0.61	0.46	92.1	New Analyzed
28	17	13-12-78-11W6	2197.379	0.79	0.46	92.05	GSC Internal data
29	26	16-34-74-11W6	2524.4	0.37	0.47	92.6	GSC Internal data
30	4	2-5-79-11W6	2107.01	0.53	0.48	92.9	GSC Internal data
31	4	2-5-79-11W6	2111.22	0.49	0.49	93.1	GSC Internal data
32	11	6-36-71-4W6	1890.6	0.84	0.49	93.2	New Analyzed
33	11	6-36-71-4W6	1892	0.83	0.5	93.8	New Analyzed
34	29	B-15-I/94-B-1	2484.2	1.37	0.5	93.8	GSC Internal data
35	17	13-12-78-11W6	2197.708	0.49	0.51	93.91	GSC Internal data
36	18	13-33-67-4W6	2358.2	0.49	0.51	93.99	GSC Internal data
37	7	6-3-76-12W6	2617	0.55	0.51	94.19	ERCB/AGS Open File 2010-05
38	21	15-19-60-22W5	2589	0.63	0.52	94.53	New Analyzed
39	11	6-36-71-4W6	1902.5	1.31	0.52	94.49	New Analyzed
40	4	2-5-79-11W6	2049.09	0.37	0.54	95.06	GSC Internal data

Measured Rock-Eval TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$)

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
41	22	15-31-77-10W6	2048	0.56	0.54	95.03	GSC Internal data
42	27	A-10-J/94-B-9	2327.9	1.88	0.54	95.13	GSC Internal data
43	27	A-10-J/94-B-9	2323.6	1.91	0.55	95.5	GSC Internal data
44	7	6-3-76-12W6	2619.8	0.93	0.56	95.8	GSC Open File 2308
45	7	6-3-76-12W6	2619.8	0.95	0.56	95.8	GSC Open File 2308
46	11	6-36-71-4W6	1930.3	1.11	0.56	95.71	New Analyzed
47	7	6-3-76-12W6	2619.8	1.14	0.56	95.8	GSC Open File 2308
48	7	6-3-76-12W6	2619.8	1.16	0.56	95.8	GSC Open File 2308
49	39	D-21-G/93-P-9	2534.3	0.71	0.57	96.2	GSC Internal data
50	11	6-36-71-4W6	1888.6	0.84	0.57	96.2	New Analyzed
51	11	6-36-71-4W6	1903	1.49	0.57	96	New Analyzed
52	29	B-15-I/94-B-1	2528.4	1.55	0.57	96.13	GSC Internal data
53	7	6-3-76-12W6	2629.1	0.88	0.58	96.5	ERCB/AGS Open File 2010-05
54	28	A-20-H/93-P-9	2460.57	0.94	0.58	96.4	GSC Internal data
55	18	13-33-67-4W6	2366.2	0.55	0.59	97	GSC Internal data
56	7	6-3-76-12W6	2634.3	0.92	0.59	96.93	GSC Open File 2308
57	7	6-3-76-12W6	2634.3	0.93	0.59	96.93	GSC Open File 2308
58	7	6-3-76-12W6	2629.7	0.96	0.59	96.68	GSC Open File 2308
59	7	6-3-76-12W6	2629.7	1.01	0.59	96.68	GSC Open File 2308
60	27	A-10-J/94-B-9	2319.56	1.62	0.59	96.7	GSC Internal data
61	18	13-33-67-4W6	2379.4	0.72	0.6	97.3	GSC Internal data
62	39	D-21-G/93-P-9	2530.9	0.83	0.6	97.1	GSC Internal data
63	11	6-36-71-4W6	1931.6	0.89	0.6	97.07	New Analyzed
64	32	C-15-L/93-P-7	3855.21	1.07	0.6	97.23	GSC Internal data
65	32	C-15-L/93-P-7	3855.21	1.1	0.6	97.23	GSC Internal data
66	26	16-34-74-11W6	2535.49	0.99	0.61	97.4	GSC Internal data
67	27	A-10-J/94-B-9	2324.39	1.31	0.61	97.42	GSC Internal data
68	11	6-36-71-4W6	1911.1	1.47	0.61	97.44	GSC Internal data
69	7	6-3-76-12W6	2622.5	0.54	0.62	97.9	GSC Open File 2308
70	7	6-3-76-12W6	2622.5	0.55	0.62	97.9	GSC Open File 2308
71	7	6-3-76-12W6	2622.5	0.68	0.62	97.9	ERCB/AGS Open File 2010-05
72	26	16-34-74-11W6	2533.21	0.84	0.63	98.1	GSC Internal data
73	11	6-36-71-4W6	1893.3	1.01	0.63	98.1	New Analyzed
74	27	A-10-J/94-B-9	2328.2	1.98	0.63	98.08	GSC Internal data
75	27	A-10-J/94-B-9	2328.2	2.09	0.63	98.08	GSC Internal data
76	8	6-14-77-11W6	2190.15	0.38	0.64	98.3	GSC Internal data
77	11	6-36-71-4W6	1890.1	0.91	0.64	98.4	New Analyzed
78	27	A-10-J/94-B-9	2320.81	1.25	0.64	98.3	GSC Internal data
79	7	6-3-76-12W6	2628.14	1.32	0.65	98.63	New Analyzed
80	27	A-10-J/94-B-9	2321.48	1.83	0.65	98.63	GSC Internal data
81	11	6-36-71-4W6	1940	0.7	0.66	99	New Analyzed
82	29	B-15-I/94-B-1	2477.95	1.15	0.67	99.47	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
83	7	6-3-76-12W6	2605.77	0.87	0.68	99.68	New Analyzed
84	4	2-5-79-11W6	2043.63	0.57	0.69	99.96	GSC Internal data
85	27	A-10-J/94-B-9	2315.68	1.35	0.69	100.01	GSC Internal data
86	7	6-3-76-12W6	2605.38	1.21	0.7	100.31	New Analyzed
87	27	A-10-J/94-B-9	2317.52	1.56	0.7	100.2	GSC Internal data
88	27	A-10-J/94-B-9	2317.52	1.56	0.7	100.2	GSC Internal data
89	7	6-3-76-12W6	2606.4	0.8	0.71	100.68	ERCB/AGS Open File 2010-05
90	20	14-27-67-8W6	3024	1.18	0.71	100.63	New Analyzed
91	3	1-36-79-15W6	2052.6	1.09	0.72	100.87	GSC Internal data
92	33	C-21-L/94-A-13	1936.87	0.96	0.73	101	GSC Internal data
93	11	6-36-71-4W6	1894.5	1.02	0.73	101.2	New Analyzed
94	33	C-21-L/94-A-13	1936.87	1.08	0.73	101	GSC Internal data
95	25	16-27-78-18W6	2371.3	1.44	0.73	101.03	GSC Internal data
96	7	6-3-76-12W6	2605	0.93	0.74	101.3	New Analyzed
97	11	6-36-71-4W6	1931.3	0.8	0.75	101.58	New Analyzed
98	7	6-3-76-12W6	2637.7	1.16	0.75	101.55	GSC Open File 2308
99	32	C-15-L/93-P-7	3863.52	1.17	0.75	101.68	GSC Internal data
100	32	C-15-L/93-P-7	3863.52	1.18	0.75	101.68	GSC Internal data
101	7	6-3-76-12W6	2637.7	1.19	0.75	101.55	GSC Open File 2308
102	13	10-8-79-14W6	2066.4	0.49	0.76	102	GSC Internal data
103	26	16-34-74-11W6	2530.59	1.2	0.76	101.9	GSC Internal data
104	33	C-21-L/94-A-13	1991.9	1.67	0.76	102	GSC Internal data
105	33	C-21-L/94-A-13	1991.9	1.77	0.76	102	GSC Internal data
106	7	6-3-76-12W6	2613.6	0.65	0.77	102.2	GSC Open File 2308
107	7	6-3-76-12W6	2613.6	0.65	0.77	102.2	GSC Open File 2308
108	19	13-5-68-1W6	2057.35	1.05	0.77	102.35	GSC Internal data
109	4	2-5-79-11W6	2113.06	0.44	0.78	102.4	GSC Internal data
110	11	6-36-71-4W6	1903.6	1.53	0.79	102.83	GSC Internal data
111	22	15-31-77-10W6	2222.2	0.83	0.8	102.92	GSC Internal data
112	7	6-3-76-12W6	2627.37	1.13	0.8	103.05	New Analyzed
113	32	C-15-L/93-P-7	3850.27	1.26	0.81	103.38	GSC Internal data
114	32	C-15-L/93-P-7	3850.27	1.47	0.81	103.38	GSC Internal data
115	11	6-36-71-4W6	1919.2	1.55	0.82	103.47	GSC Internal data
116	7	6-3-76-12W6	2625.6	0.96	0.83	103.74	GSC Open File 2308
117	27	A-10-J/94-B-9	2312.57	0.99	0.83	103.68	GSC Internal data
118	7	6-3-76-12W6	2625.6	1	0.83	103.74	GSC Open File 2308
119	11	6-36-71-4W6	1943	1.03	0.83	103.7	GSC Internal data
120	27	A-10-J/94-B-9	2311.41	1.33	0.83	103.84	GSC Internal data
121	11	6-36-71-4W6	1895.4	1.41	0.83	103.85	New Analyzed
122	22	15-31-77-10W6	2221.1	0.54	0.84	104.07	GSC Internal data
123	7	6-3-76-12W6	2641.2	0.76	0.84	104.12	GSC Open File 2308
124	7	6-3-76-12W6	2641.2	0.8	0.84	104.12	GSC Open File 2308

Measured TOC and Calculated TOC from GR-TOC relationship ($GR=107.81*TOC(\%)^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
125	27	A-10-J/94-B-9	2313.67	1.02	0.84	104.04	GSC Internal data
126	22	15-31-77-10W6	2228.85	0.8	0.85	104.27	GSC Internal data
127	13	10-8-79-14W6	2021.9	0.81	0.85	104.2	GSC Internal data
128	32	C-15-L/93-P-7	3848.14	0.89	0.85	104.3	GSC Internal data
129	39	D-21-G/93-P-9	2539.3	0.93	0.85	104.2	GSC Internal data
130	32	C-15-L/93-P-7	3848.14	1.11	0.85	104.3	GSC Internal data
131	4	2-5-79-11W6	2114	1.23	0.85	104.4	New Analyzed
132	17	13-12-78-11W6	2199.895	0.77	0.86	104.62	GSC Internal data
133	39	D-21-G/93-P-9	2540.2	1.94	0.86	104.5	GSC Internal data
134	33	C-21-L/94-A-13	1824.4	0.49	0.87	104.9	GSC Internal data
135	33	C-21-L/94-A-13	1824.4	0.57	0.87	104.9	GSC Internal data
136	3	1-36-79-15W6	2051	0.8	0.87	104.74	GSC Internal data
137	11	6-36-71-4W6	1938.7	0.78	0.88	104.94	GSC Internal data
138	6	3-6-78-22W6	3354.1	0.85	0.88	105.14	GSC Internal data
139	7	6-3-76-12W6	2620.4	1.23	0.88	105	GSC Open File 2308
140	7	6-3-76-12W6	2620.4	1.31	0.88	105	GSC Open File 2308
141	39	D-21-G/93-P-9	2538.3	1	0.9	105.6	GSC Internal data
142	32	C-15-L/93-P-7	3859.26	1.05	0.9	105.59	GSC Internal data
143	32	C-15-L/93-P-7	3859.26	1.13	0.9	105.59	GSC Internal data
144	11	6-36-71-4W6	1931.2	1.34	0.91	105.84	GSC Internal data
145	17	13-12-78-11W6	2199.515	0.74	0.92	105.99	GSC Internal data
146	38	C-85-I/94-B-1	2447.07	1.49	0.92	105.9	GSC Internal data
147	5	2-19-79-14W6	2045.1	0.93	0.93	106.34	GSC Internal data
148	17	13-12-78-11W6	2207.521	0.61	0.94	106.44	GSC Internal data
149	17	13-12-78-11W6	2198.565	0.61	0.94	106.54	GSC Internal data
150	6	3-6-78-22W6	3489.39	0.93	0.94	106.49	GSC Internal data
151	7	6-3-76-12W6	2639.9	0.75	0.95	106.68	ERCB/AGS Open File 2010-05
152	7	6-3-76-12W6	2626.82	1.08	0.95	106.62	New Analyzed
153	13	10-8-79-14W6	2023.3	1.11	0.95	106.8	GSC Internal data
154	19	13-5-68-1W6	2044.4	0.57	0.96	106.9	GSC Internal data
155	41	D-85-A/93-P-10	2795.52	0.6	0.96	106.92	GSC Internal data
156	39	D-21-G/93-P-9	2536.5	1.49	0.96	107	GSC Internal data
157	33	C-21-L/94-A-13	1858.28	1.3	0.97	107.2	GSC Internal data
158	33	C-21-L/94-A-13	1858.28	1.41	0.97	107.2	GSC Internal data
159	11	6-36-71-4W6	1899	0.76	0.98	107.34	New Analyzed
160	5	2-19-79-14W6	2049.6	1.44	0.98	107.39	GSC Internal data
161	39	D-21-G/93-P-9	2532.9	0.64	0.99	107.6	GSC Internal data
162	25	16-27-78-18W6	2383.4	1.36	0.99	107.7	GSC Internal data
163	22	15-31-77-10W6	2200.8	0.56	1	107.85	GSC Internal data
164	5	2-19-79-14W6	2039	0.84	1	107.9	GSC Internal data
165	37	C-85-H/93-P-7	3552.3	1.21	1	107.8	GSC Internal data
166	11	6-36-71-4W6	1889.2	1.1	1.02	108.15	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
167	13	10-8-79-14W6	2054	0.79	1.03	108.4	GSC Internal data
168	38	C-85-I/94-B-1	2449.81	1.71	1.03	108.5	GSC Internal data
169	17	13-12-78-11W6	2201.839	0.6	1.04	108.63	GSC Internal data
170	3	1-36-79-15W6	2016.9	0.87	1.04	108.59	GSC Internal data
171	11	6-36-71-4W6	1900.4	1.27	1.04	108.75	New Analyzed
172	17	13-12-78-11W6	2210.358	0.76	1.05	108.88	GSC Internal data
173	29	B-15-I/94-B-1	2459.1	1.11	1.05	108.95	GSC Internal data
174	11	6-36-71-4W6	1899.4	1.39	1.05	108.96	GSC Internal data
175	27	A-10-J/94-B-9	2310.5	1.42	1.05	108.97	GSC Internal data
176	39	D-21-G/93-P-9	2532.8	1.15	1.06	109.1	GSC Internal data
177	34	C-25-G/93-P-9	2753.09	0.91	1.07	109.4	GSC Internal data
178	8	6-14-77-11W6	2189.1	0.93	1.07	109.2	GSC Internal data
179	17	13-12-78-11W6	2210.721	0.94	1.07	109.27	GSC Internal data
180	5	2-19-79-14W6	2043.3	1.18	1.07	109.3	GSC Internal data
181	16	13-11-81-20W6	2150.39	1.28	1.08	109.43	GSC Internal data
182	16	13-11-81-20W6	2149.25	1.29	1.08	109.54	GSC Internal data
183	11	6-36-71-4W6	1907.5	1.76	1.08	109.46	GSC Internal data
184	11	6-36-71-4W6	1936.8	0.69	1.09	109.7	New Analyzed
185	27	A-10-J/94-B-9	2314.9	1.07	1.1	109.99	GSC Internal data
186	25	16-27-78-18W6	2383.2	1.34	1.1	110	GSC Internal data
187	16	13-11-81-20W6	2306.37	1.36	1.1	110	GSC Internal data
188	5	2-19-79-14W6	2091.4	0.58	1.11	110.2	GSC Internal data
189	16	13-11-81-20W6	2157.27	0.87	1.11	110.09	GSC Internal data
190	21	15-19-60-22W5	2590.6	1.44	1.11	110.22	GSC Internal data
191	29	B-15-I/94-B-1	2464.1	0.95	1.14	110.81	GSC Internal data
192	5	2-19-79-14W6	2048	1.43	1.14	110.71	GSC Internal data
193	16	13-11-81-20W6	2154.02	1.45	1.14	110.7	GSC Internal data
194	3	1-36-79-15W6	2009	1.49	1.14	110.8	GSC Internal data
195	11	6-36-71-4W6	1932.1	1	1.15	110.9	New Analyzed
196	22	15-31-77-10W6	2206.5	0.6	1.17	111.35	GSC Internal data
197	26	16-34-74-11W6	2525.01	1.24	1.17	111.4	GSC Internal data
198	20	14-27-67-8W6	3032	1.28	1.18	111.43	GSC Internal data
199	38	C-85-I/94-B-1	2444.82	1.61	1.18	111.5	GSC Internal data
200	5	2-19-79-14W6	2079.9	0.95	1.19	111.7	GSC Internal data
201	13	10-8-79-14W6	2021	1.15	1.2	111.8	GSC Internal data
202	21	15-19-60-22W5	2599	1.16	1.21	112	GSC Internal data
203	9	6-26-80-20W6	2385	1.75	1.21	112	GSC Internal data
204	4	2-5-79-11W6	2041.55	0.76	1.22	112.31	New Analyzed
205	35	C-33-B/94-G-7	1849.8	1.61	1.22	112.2	GSC Internal data
206	16	13-11-81-20W6	2151.37	1.69	1.22	112.22	GSC Internal data
207	3	1-36-79-15W6	2029.8	0.76	1.24	112.72	GSC Internal data
208	8	6-14-77-11W6	2205.2	0.77	1.24	112.7	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship ($GR=107.81*TOC (\%)^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
209	17	13-12-78-11W6	2207.937	0.81	1.24	112.59	GSC Internal data
210	33	C-21-L/94-A-13	1805.4	0.83	1.24	112.6	GSC Internal data
211	33	C-21-L/94-A-13	1805.4	0.92	1.24	112.6	GSC Internal data
212	37	C-85-H/93-P-7	3575	1.08	1.24	112.7	GSC Internal data
213	37	C-85-H/93-P-7	3575	1.11	1.24	112.7	GSC Internal data
214	4	2-5-79-11W6	2041.15	0.68	1.25	112.79	New Analyzed
215	36	C-49-H/93-P-10	2981.4	1.91	1.25	112.8	GSC Internal data
216	25	16-27-78-18W6	2377.2	1.09	1.26	113.07	GSC Internal data
217	29	B-15-I/94-B-1	2558.25	1.3	1.26	113.01	GSC Internal data
218	25	16-27-78-18W6	2385.3	1.14	1.27	113.25	GSC Internal data
219	29	B-15-I/94-B-1	2427.35	2.02	1.27	113.26	GSC Internal data
220	4	2-5-79-11W6	2041.9	0.82	1.28	113.3	New Analyzed
221	3	1-36-79-15W6	2012.3	1.01	1.28	113.31	GSC Internal data
222	25	16-27-78-18W6	2524.3	1.36	1.28	113.4	GSC Internal data
223	5	2-19-79-14W6	2072	0.66	1.29	113.52	GSC Internal data
224	22	15-31-77-10W6	2231.35	0.69	1.29	113.54	GSC Internal data
225	3	1-36-79-15W6	2011.2	0.79	1.29	113.5	GSC Internal data
226	6	3-6-78-22W6	3483.12	1.73	1.29	113.62	GSC Internal data
227	38	C-85-I/94-B-1	2445.75	1.15	1.3	113.8	GSC Internal data
228	37	C-85-H/93-P-7	3571.5	1.31	1.3	113.8	GSC Internal data
229	37	C-85-H/93-P-7	3571.5	1.31	1.3	113.8	GSC Internal data
230	34	C-25-G/93-P-9	2742.95	1.66	1.3	113.8	GSC Internal data
231	17	13-12-78-11W6	2200.977	0.7	1.31	113.88	GSC Internal data
232	17	13-12-78-11W6	2208.54	0.79	1.31	113.92	GSC Internal data
233	31	C-10-E/93-P-10	3743.87	1.07	1.31	113.86	GSC Internal data
234	31	C-10-E/93-P-10	3743.87	1.13	1.31	113.86	GSC Internal data
235	31	C-10-E/93-P-10	3743.76	1.33	1.31	113.86	GSC Internal data
236	31	C-10-E/93-P-10	3743.76	1.37	1.31	113.86	GSC Internal data
237	6	3-6-78-22W6	3486.53	1.75	1.32	114.16	GSC Internal data
238	36	C-49-H/93-P-10	2984.3	1.54	1.33	114.17	GSC Internal data
239	17	13-12-78-11W6	2200.749	0.95	1.34	114.34	GSC Internal data
240	41	D-85-A/93-P-10	2778.49	1.26	1.35	114.6	GSC Internal data
241	30	B-30-H/93-P-9	2538.8	1.82	1.35	114.6	GSC Internal data
242	33	C-21-L/94-A-13	2034.4	0.64	1.36	114.82	GSC Internal data
243	1	1-10-82-23W6	1995.3	0.72	1.37	114.9	GSC Internal data
244	1	1-10-82-23W6	1995.3	1.28	1.37	114.9	GSC Internal data
245	19	13-5-68-1W6	2240.88	0.75	1.38	115.17	GSC Internal data
246	19	13-5-68-1W6	2240.88	0.93	1.38	115.17	GSC Internal data
247	3	1-36-79-15W6	2019	0.96	1.38	115.11	GSC Internal data
248	20	14-27-67-8W6	3021.5	1.12	1.39	115.26	GSC Internal data
249	19	13-5-68-1W6	2235.25	0.65	1.4	115.49	GSC Internal data
250	38	C-85-I/94-B-1	2446.1	1.36	1.4	115.4	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
251	20	14-27-67-8W6	3018.7	1.06	1.42	115.86	New Analyzed
252	16	13-11-81-20W6	2152.03	1.6	1.42	115.82	GSC Internal data
253	36	C-49-H/93-P-10	2973	2.1	1.43	116	GSC Internal data
254	14	11-1-75-11W6	2491.04	1.12	1.44	116.16	GSC Internal data
255	8	6-14-77-11W6	2202.35	0.83	1.45	116.29	GSC Internal data
256	5	2-19-79-14W6	2048.5	0.84	1.46	116.38	GSC Internal data
257	6	3-6-78-22W6	3357.44	1.14	1.46	116.37	GSC Internal data
258	7	6-3-76-12W6	2618.8	0.79	1.47	116.63	ERCB/AGS Open File 2010-05
259	5	2-19-79-14W6	2056.8	0.71	1.48	116.74	GSC Internal data
260	41	D-85-A/93-P-10	2792.27	0.72	1.48	116.71	GSC Internal data
261	33	C-21-L/94-A-13	1877.1	1.21	1.48	116.7	GSC Internal data
262	33	C-21-L/94-A-13	1877.1	1.38	1.48	116.7	GSC Internal data
263	17	13-12-78-11W6	2202.674	1.08	1.49	116.97	GSC Internal data
264	5	2-19-79-14W6	2075.7	1.22	1.49	116.91	GSC Internal data
265	3	1-36-79-15W6	2041.6	1.36	1.52	117.47	GSC Internal data
266	3	1-36-79-15W6	2013.7	0.77	1.56	118.08	GSC Internal data
267	11	6-36-71-4W6	1922.6	1.95	1.56	118.07	GSC Internal data
268	24	15-5-71-12W6	3116.4	2.1	1.56	118	New Analyzed
269	5	2-19-79-14W6	2055.2	0.68	1.58	118.34	GSC Internal data
270	16	13-11-81-20W6	2316.03	1.19	1.58	118.31	GSC Internal data
271	16	13-11-81-20W6	2318.05	1.7	1.59	118.5	GSC Internal data
272	41	D-85-A/93-P-10	2795.78	1.11	1.6	118.63	GSC Internal data
273	16	13-11-81-20W6	2322.61	1.59	1.63	119.05	GSC Internal data
274	13	10-8-79-14W6	2031	0.65	1.65	119.3	GSC Internal data
275	34	C-25-G/93-P-9	2758.72	1.16	1.65	119.4	GSC Internal data
276	3	1-36-79-15W6	2023	1	1.69	119.95	GSC Internal data
277	17	13-12-78-11W6	2209.457	1.2	1.69	119.89	GSC Internal data
278	3	1-36-79-15W6	2048.8	2.27	1.69	119.92	GSC Internal data
279	3	1-36-79-15W6	2047	1.01	1.73	120.5	GSC Internal data
280	27	A-10-J/94-B-9	2150.8	1.76	1.74	120.6	GSC Internal data
281	16	13-11-81-20W6	2147.76	1.85	1.74	120.7	GSC Internal data
282	38	C-85-I/94-B-1	2450.85	1.96	1.76	120.9	GSC Internal data
283	38	C-85-I/94-B-1	2451.2	2.03	1.76	121	GSC Internal data
284	30	B-30-H/93-P-9	2540.6	1.44	1.77	121.1	GSC Internal data
285	30	B-30-H/93-P-9	2553.7	1.94	1.77	121.1	GSC Internal data
286	35	C-33-B/94-G-7	1726.1	2.3	1.77	121.1	GSC Internal data
287	31	C-10-E/93-P-10	3749.69	1.85	1.78	121.25	GSC Internal data
288	31	C-10-E/93-P-10	3749.69	2.02	1.78	121.25	GSC Internal data
289	41	D-85-A/93-P-10	2784.79	1.32	1.8	121.47	GSC Internal data
290	13	10-8-79-14W6	2035.9	1.68	1.8	121.5	GSC Internal data
291	29	B-15-I/94-B-1	2585.3	1.68	1.82	121.76	GSC Internal data
292	13	10-8-79-14W6	2029.2	1.87	1.84	122.1	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
293	16	13-11-81-20W6	2159.03	1.94	1.84	122.06	GSC Internal data
294	38	C-85-I/94-B-1	2456.7	2.43	1.87	122.4	GSC Internal data
295	12	7-5-87-20W6	1946	1.18	1.88	122.63	GSC Open File 2308
296	12	7-5-87-20W6	1946	1.2	1.88	122.63	GSC Open File 2308
297	15	12-29-78-18W6	2494.4	1.78	1.88	122.58	GSC Internal data
298	16	13-11-81-20W6	2320.51	1.83	1.88	122.6	GSC Internal data
299	34	C-25-G/93-P-9	2729.62	1.07	1.9	122.8	GSC Internal data
300	37	C-85-H/93-P-7	3616	1.48	1.9	122.9	GSC Internal data
301	37	C-85-H/93-P-7	3616	1.54	1.9	122.9	GSC Internal data
302	5	2-19-79-14W6	2087.7	2.25	1.92	123.1	GSC Internal data
303	16	13-11-81-20W6	2310.88	2.3	1.93	123.2	GSC Internal data
304	30	B-30-H/93-P-9	2556	1.1	1.97	123.79	GSC Internal data
305	16	13-11-81-20W6	2153.02	1.23	1.97	123.81	GSC Internal data
306	13	10-8-79-14W6	2052	2.15	1.97	123.7	GSC Internal data
307	16	13-11-81-20W6	2158.26	2.17	1.97	123.8	GSC Internal data
308	27	A-10-J/94-B-9	2155.14	2.99	1.98	123.9	GSC Internal data
309	37	C-85-H/93-P-7	3624	1.68	2.01	124.2	GSC Internal data
310	37	C-85-H/93-P-7	3624	1.69	2.01	124.2	GSC Internal data
311	30	B-30-H/93-P-9	2542.2	2.03	2.02	124.44	GSC Internal data
312	31	C-10-E/93-P-10	3733.65	1.99	2.03	124.57	GSC Internal data
313	31	C-10-E/93-P-10	3733.65	2.1	2.03	124.57	GSC Internal data
314	14	11-1-75-11W6	2495.99	1.22	2.05	124.76	GSC Internal data
315	16	13-11-81-20W6	2160.24	1.3	2.06	124.91	GSC Internal data
316	40	D-65-G/93-P-8	3124.6	1.64	2.08	125.1	GSC Internal data
317	15	12-29-78-18W6	2500.2	1.33	2.09	125.19	GSC Internal data
318	5	2-19-79-14W6	2085	2.07	2.11	125.5	GSC Internal data
319	5	2-19-79-14W6	2085	2.13	2.11	125.5	GSC Internal data
320	34	C-25-G/93-P-9	2732.35	1.28	2.12	125.6	GSC Internal data
321	41	D-85-A/93-P-10	2793.47	1.52	2.12	125.59	GSC Internal data
322	29	B-15-I/94-B-1	2393.15	1.18	2.16	126.1	GSC Internal data
323	30	B-30-H/93-P-9	2556.9	3.15	2.19	126.4	GSC Internal data
324	15	12-29-78-18W6	2505.1	1.17	2.21	126.68	GSC Internal data
325	36	C-49-H/93-P-10	3028	1.32	2.21	126.7	GSC Internal data
326	25	16-27-78-18W6	2522.8	2.12	2.21	126.7	GSC Internal data
327	41	D-85-A/93-P-10	2780.72	1.34	2.25	127.1	GSC Internal data
328	31	C-10-E/93-P-10	3740.81	1.86	2.26	127.29	GSC Internal data
329	31	C-10-E/93-P-10	3740.81	1.87	2.26	127.29	GSC Internal data
330	31	C-10-E/93-P-10	3724.89	2.18	2.27	127.38	GSC Internal data
331	31	C-10-E/93-P-10	3724.89	2.27	2.27	127.38	GSC Internal data
332	14	11-1-75-11W6	2491.91	1.61	2.3	127.67	GSC Internal data
333	16	13-11-81-20W6	2156.39	2.1	2.3	127.7	GSC Internal data
334	35	C-33-B/94-G-7	1716.6	2.31	2.31	127.8	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
335	30	B-30-H/93-P-9	2551.3	2.1	2.32	127.9	GSC Internal data
336	15	12-29-78-18W6	2497.3	1.8	2.34	128.14	GSC Internal data
337	41	D-85-A/93-P-10	2787.04	1.2	2.38	128.56	GSC Internal data
338	15	12-29-78-18W6	2492.2	2.12	2.38	128.6	GSC Internal data
339	15	12-29-78-18W6	2502.6	1.31	2.41	128.97	GSC Internal data
340	3	1-36-79-15W6	2037.1	1.23	2.42	128.99	GSC Internal data
341	14	11-1-75-11W6	2487.2	1.47	2.43	129.2	GSC Internal data
342	12	7-5-87-20W6	1941.7	1.69	2.43	129.13	GSC Open File 2308
343	12	7-5-87-20W6	1941.7	1.69	2.43	129.13	GSC Open File 2308
344	16	13-11-81-20W6	2308.51	2.26	2.43	129.2	GSC Internal data
345	5	2-19-79-14W6	2054.2	1.15	2.44	129.28	GSC Internal data
346	12	7-5-87-20W6	1947.4	1.63	2.47	129.62	GSC Open File 2308
347	12	7-5-87-20W6	1947.4	1.64	2.47	129.62	GSC Open File 2308
348	12	7-5-87-20W6	1944.6	1.58	2.48	129.73	GSC Open File 2308
349	12	7-5-87-20W6	1944.6	1.63	2.48	129.73	GSC Open File 2308
350	38	C-85-I/94-B-1	2458.1	2.84	2.49	129.8	GSC Internal data
351	27	A-10-J/94-B-9	2149.7	1.65	2.52	130.1	GSC Internal data
352	27	A-10-J/94-B-9	2149.7	1.65	2.52	130.1	GSC Internal data
353	6	3-6-78-22W6	3352.6	3.87	2.52	130.1	GSC Internal data
354	16	13-11-81-20W6	2155.37	1.98	2.55	130.37	GSC Internal data
355	14	11-1-75-11W6	2494.01	1.7	2.59	130.8	GSC Internal data
356	38	C-85-I/94-B-1	2463.85	2.88	2.59	130.8	GSC Internal data
357	5	2-19-79-14W6	2068.9	0.67	2.61	131	GSC Internal data
358	5	2-19-79-14W6	2066.9	1.71	2.61	131	GSC Internal data
359	30	B-30-H/93-P-9	2545.5	2.98	2.62	131.1	GSC Internal data
360	6	3-6-78-22W6	3360.34	2.31	2.66	131.56	GSC Internal data
361	40	D-65-G/93-P-8	3126.8	3.29	2.68	131.7	GSC Internal data
362	27	A-10-J/94-B-9	2148.55	2.07	2.74	132.3	GSC Internal data
363	35	C-33-B/94-G-7	1787.6	2.54	2.79	132.8	GSC Internal data
364	14	11-1-75-11W6	2492.41	1.64	2.81	133	GSC Internal data
365	28	A-20-H/93-P-9	2455	2.42	2.86	133.5	GSC Internal data
366	25	16-27-78-18W6	2535.2	3.18	2.88	133.68	GSC Internal data
367	5	2-19-79-14W6	2052.5	1.97	2.92	134.08	GSC Internal data
368	27	A-10-J/94-B-9	2143.8	3.92	3.1	135.7	GSC Internal data
369	27	A-10-J/94-B-9	2143.8	4.39	3.1	135.7	GSC Internal data
370	31	C-10-E/93-P-10	3726.01	2.33	3.12	135.87	GSC Internal data
371	31	C-10-E/93-P-10	3726.01	2.36	3.12	135.87	GSC Internal data
372	1	1-10-82-23W6	2001	2.28	3.28	137.3	GSC Internal data
373	16	13-11-81-20W6	2162.53	2.14	3.46	138.77	GSC Internal data
374	38	C-85-I/94-B-1	2464.2	3.12	3.49	139	GSC Internal data
375	23	15-34-80-18W6	2072.39	2.49	3.61	140	GSC Internal data
376	30	B-30-H/93-P-9	2555.1	2.59	3.66	140.4	GSC Internal data

Measured TOC and Calculated TOC from GR-TOC relationship (GR=107.81*TOC (%) $^{0.2034}$) continued

Sample number	Map No.	Well Location	Depth (m)	TOC%	Calculated TOC (%)	GR (GAPI)	Data source
377	37	C-85-H/93-P-7	3587	3.35	3.82	141.6	GSC Internal data
378	37	C-85-H/93-P-7	3587	3.37	3.82	141.6	GSC Internal data
379	31	C-10-E/93-P-10	3727.09	2.45	3.86	141.9	GSC Internal data
380	31	C-10-E/93-P-10	3727.03	2.5	3.86	141.9	GSC Internal data
381	27	A-10-J/94-B-9	2137.42	1.22	3.93	142.39	GSC Internal data
382	27	A-10-J/94-B-9	2137.42	1.34	3.93	142.39	GSC Internal data
383	30	B-30-H/93-P-9	2547.2	2.19	4	142.94	GSC Internal data
384	12	7-5-87-20W6	1948.1	2.77	4	142.9	GSC Open File 2308
385	12	7-5-87-20W6	1948.1	2.78	4	142.9	GSC Open File 2308
386	29	B-15-I/94-B-1	2410.65	2.86	4.05	143.3	GSC Internal data
387	35	C-33-B/94-G-7	1746.2	3.08	4.05	143.3	GSC Internal data
388	6	3-6-78-22W6	3361.06	2.87	4.34	145.3	GSC Internal data
389	1	1-10-82-23W6	2011.2	3.88	4.4	145.7	GSC Internal data
390	3	1-36-79-15W6	2039.4	1.71	4.46	146.14	GSC Internal data
391	1	1-10-82-23W6	2010.9	2.84	4.46	146.1	GSC Internal data
392	27	A-10-J/94-B-9	2138.1	3.19	4.56	146.8	GSC Internal data
393	25	16-27-78-18W6	2526.7	2.53	4.58	146.9	GSC Internal data
394	33	C-21-L/94-A-13	1844.7	4.32	4.61	147.1	GSC Internal data
395	33	C-21-L/94-A-13	1844.7	4.53	4.61	147.1	GSC Internal data
396	29	B-15-I/94-B-1	2360.05	3.82	4.94	149.2	GSC Internal data
397	13	10-8-79-14W6	2040.4	2.14	4.96	149.3	GSC Internal data
398	27	A-10-J/94-B-9	2154.58	3.55	5.2	150.74	GSC Internal data
399	27	A-10-J/94-B-9	2154.58	3.61	5.2	150.74	GSC Internal data
400	27	A-10-J/94-B-9	2139.11	4.33	5.47	152.34	GSC Internal data
401	6	3-6-78-22W6	3345.22	7.88	5.47	152.3	GSC Internal data
402	27	A-10-J/94-B-9	2139.77	4.32	5.99	155.18	GSC Internal data
403	27	A-10-J/94-B-9	2139.77	4.37	5.99	155.18	GSC Internal data
404	16	13-11-81-20W6	2309.39	5.08	6.08	155.64	GSC Internal data
405	6	3-6-78-22W6	3348.6	3.94	6.13	155.9	GSC Internal data
406	38	C-85-I/94-B-1	2461.68	4.29	6.65	158.5	GSC Internal data
407	35	C-33-B/94-G-7	1776.6	4.86	7.2	161.1	GSC Internal data
408	1	1-10-82-23W6	2009	6.74	8.3	165.8	GSC Internal data
409	29	B-15-I/94-B-1	2435.85	5.41	9.12	169	GSC Internal data
410	40	D-65-G/93-P-8	3129.6	5.93	9.49	170.4	GSC Internal data

APPENDIX 3-4

Source Rock Thickness of Montney Formation Based on calculation of GR readings in GR Logs and source rock thickness, TOC and Tmax of Doig phosphate

Montney thickness: statistical thickness based on ratio of certain range of recorded GR readings (e.g. 108≤GR (GAPI) <127) in the whole GR readings from GR log of Montney Fm.

Average GR: Average value of all recorded GR readings in certain range (e.g. 108≤GR (GAPI) <127) from GR log

Average TOC (%): Calculated according to average GR (TOC<2%, GR=107.81(TOC %)$^{0.2034}$; TOC≥2%, GR=109.25(TOC %)$^{0.2146}$)

Average Density: Average value of recorded densities in certain range (e.g. 108≤GR (GAPI) <127) from density log in Montney Fm.

Doig thickness: Based on high GR interval of Doig phosphate

Doig TOC values: interpolated values according to Figure 5-1

Tmax values: interpolated values according to Figure 3-15

UWI	Caliper	Montney Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
5-14-77-20W5	194	0				0				0			
3-34-58-16W5	195	0				0				0			
7-23-83-3W6	195	3.8	113.12	2533.02	1.27	0				0			
10-29-88-20W6	195	118	118.61	2659.92	1.6	56.4	134.2	2658.15	2.61	0			
14-20-78-1W6	195	1.8	111.88	2485.43	1.2	0				0			
1-18-77-21W5	197	0				0				0			
16-2-78-22W6	198	79	119.55	2588.37	1.66	68	137.87	2583.22	2.96	52.6	164.95	2550.15	5.95
16-31-80-21W6	198	74.8	119.11	2617.31	1.63	79.8	137.38	2591.99	2.91	55	167.58	2551.01	6.37
6-15-76-24W5	200	3.6	117.17	2530.21	1.51	0				0			
1-27-80-24W5	200	0				0				0			
2-36-75-20W5	200	0				0				0			
4-11-82-2W6	200	0				0				0			
4-26-85-20W6	200	118	118.66	2628.96	1.6	56.2	137.21	2620.87	2.89	15	172.41	2589.57	7.2
6-22-57-20W5	200	0.6	116.42	2712.7	1.46	0				0			
6-35-77-2W6	200	9	113.52	2549.2	1.29	0				0			
7-16-81-22W5	200	3	116.78	2543.56	1.48	0				0			
11-31-53-20W5	200	1.8	112.22	2767.37	1.22	0				0			
11-34-86-16W6	200	128	118.42	2650.03	1.59	30.2	133.49	2644.51	2.54	0.4	161.74	2659.56	5.46
13-3-63-16W5	200	0				0				0			
15-7-82-7W6	200	61	116.35	2637.64	1.45	1.8	135.16	2650.27	2.7	0			
A-10-J/94-B-9	200	150	118.67	2632.43	1.6	46.6	135.98	2629.62	2.77	12.4	164.18	2592.76	5.83
A-62-K/94-H-2	200	89.2	117.61	2620.71	1.53	24.4	131.74	2634.63	2.39	0			
D-8-F/94-B-16	200	66.4	117.54	2639.67	1.53	21.4	135.73	2609.73	2.75	7.6	179.74	2550.7	8.62
D-31-L/94-I-3	200	21	117.08	2662.12	1.5	1	130.93	2669.1	2.32	0			
D-83-L/94-A-12	200	104.2	118.92	2670.45	1.62	97.8	136.33	2666.57	2.81	18.4	162.76	2625.38	5.61
C-13-H/94-A-16	200	66.2	117.19	2623.54	1.51	9.6	133.71	2654.16	2.56	0			

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
C-82-F/94-H-1	200	57.8	117.66	2621.58	1.54	14.6	133.09	2663.62	2.51	0			
C-98-H/94-H-2	200	86.4	118.32	2608.9	1.58	46.6	136.49	2620.71	2.82	0			
4-36-77-1W6	202	0				0				0			
6-26-82-18W6	202	120	119.35	2637.74	1.65	52	134.13	2640.55	2.6	0.6	159.06	2641.13	5.08
B-4-D/94-H-13	203	91.4	118.34	2670.09	1.58	33.4	133.88	2687.34	2.58	0			
5-4-78-2W6	205	6.4	114.69	2571.11	1.36	0				0			
5-7-59-20W5	205	0				0				0			
11-7-83-22W5	205	0				0				0			
1-20-79-5W6	205	61.4	117.04	2618.71	1.5	2.2	134.87	2620.49	2.67	0.4	174.39	2553.28	7.57
2-8-80-23W5	205	1.6	114.11	2496.25	1.32	0				0			
3-29-78-9W6	205	58	115.89	2652.83	1.43	2.6	131.97	2679.36	2.41	0			
6-7-71-3W6	205	16.4	113.03	2734.24	1.26	0				0			
7-8-89-10W6	205	5.6	111.74		1.19	0				0			
16-10-87-22W6	205	130.6	117.42	2635.25	1.52	21	134.51	2611.2	2.64	11.4	166.91	2581.34	6.26
A-10-J/94-B-9	205	145	117.61	2632.63	1.53	39.4	136.22	2621.97	2.8	7.6	167.58	2596.52	6.37
A-45-F/93-P-7	205	84.8	119.7	2614.6	1.67	77.2	137.36	2597.83	2.91	30.4	160.77	2577.55	5.32
B-55-K/94-G-9	205	81.8	119.11	2662.81	1.63	31.4	134.31	2652.1	2.62	3.8	161.03	2594.84	5.36
C-74-J/94-A-14	205	86.4	118.31	2636.09	1.58	28	134.52	2642.86	2.64	5.8	155.9	2633.72	4.66
D-69-F/94-I-1	205	0				0				0			
13-1-86-11W6	207	76.6	118.47	2590.66	1.59	27.8	133.49	2623.46	2.54	0.6	157.18	2600.63	4.83
7-11-74-10W6	208	98	120.09	2661.13	1.7	55.2	134.98	2660.32	2.68	2.6	154.12	2643.49	4.43
3-33-82-10W6	210	112.6	117.49	2637	1.53	17.4	131.9	2650.15	2.41	0			
4-2-75-7W6	210	44.8	114.9	2667.93	1.37	2	134.48	2668.97	2.63	0.8	191.96	2658.61	11.46
8-4-63-20W5	210	0				0				0			
C-75-J/94-A-9	210	58.4	117.71	2645.86	1.54	13.6	132.85	2668.26	2.49	0			
A-45-F/93-P-7	210	83.6	119.7	2615.11	1.67	77.6	137.45	2598.85	2.92	30.4	160.77	2577.55	5.32

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
2-11-55-26W5	215	1	117.13	2731.65	1.5	0.6	130.69	2752.69	2.3	0			
6-30-83-16W6	215	155.4	118.51	2652.16	1.59	55	133.74	2653.95	2.57	0			
1-10-75-25W5	215	0				0				0			
7-12-87-17W6	215	89.6	118.54	2643.99	1.59	17.6	132.71	2658	2.48	0.6	151.93	2753.77	4.17
7-31-60-5W6	215	71.2	116.11	2684.64	1.44	1	128.87	2682.99	2.16	0			
8-29-64-10W6	215	66.8	118.65	2697.19	1.6	28	136.39	2693.07	2.81	5.4	158.45	2691.23	5
9-25-73-2W6	215	9.6	113.26	2651.25	1.27	0				0			
10-18-79-14W6	215	158.6	119.18	2606.15	1.64	42	132.93	2630.16	2.49	1.6	163.1	2640.48	5.66
10-32-62-21W5	215	0				0				0			
11-10-91-8W6	215	3.6	112.69	2472.76	1.24	0				0			
11-15-83-8W6	215	63	115.79	2609.61	1.42	2	129.96	2592.15	2.25	0			
11-16-87-11W6	215	104.2	116.31		1.45	3.4	130.8		2.31	0			
11-19-79-7W6	215	33.8	115.02	2679.86	1.37	0				0			
A-31-B/94-B-15	215	148	119.88	2654.77	1.68	127	137.08	2653.45	2.88	35.8	163.41	2629.47	5.71
B-60-L/94-H-10	215	34.2	114.25	2540.66	1.33	0				0			
C-18-D/94-G-9	215	82	120.88	2648.65	1.76	89.4	138.64	2659.04	3.03	22.4	155.22	2662.96	4.57
C-43-H/94-H-7	215	45.8	118.25	2647.86	1.58	9	133.17	2677.57	2.52				
D-6-H/93-P-10	215	108.8	119.83	2630.23	1.68	100	137.33	2622.4	2.9	33.4	162.74	2610.38	5.61
D-82-K/94-G-15	215	87	117.66	2633.8	1.54	24.4	135.22	2638.45	2.7	1	174.07	2596.7	7.51
A-1-J/94-B-9	215	109.2	120.11	2642.37	1.7	101.8	134.97	2631.09	2.68	25.2	163.01	2609.25	5.65
2-2-77-3W6	220	20	113.86	2494.94	1.31	0				0			
2-21-92-10W6	220	0				0				0			
4-32-71-23W5	220	0				0				0			
5-28-61-21W5	220	2.4	113.53	2693.68	1.29	0				0			
7-11-64-25W5	220	5.8	111.92	2682.99	1.2	0				0			
7-18-52-24W5	220	0				0				0			

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
14-34-80-1W6	220	0				0				0			
C-12-A/94-J-7	220	16.8	113.5	2614.7	1.29	0				0			
D-3-F/94-G-8	220	75.8	118.77	2615.73	1.61	32	134.35	2608.99	2.62	0			
D-54-F/94-A-16	220	55	117.65	2653.03	1.54	8.4	132.36	2642.2	2.45	1.2	163.3	2607.68	5.69
B-62-I/94-B-8	220	111.8	118.44	2621.57	1.59	38	135.05	2623.23	2.69	4.8	155.72	2631.64	4.63
D-75-F/93-P-8	220	117.8	118.19	2647.65	1.57	45.6	136.09	2626.22	2.78	12.8	167.73	2620.25	6.39
2-26-58-25W5	222	1.8	116.13	2708.2	1.44	0				0			
2-22-87-5W6	222	0				0				0			
4-35-67-13W6	222	84	117.79	2671.97	1.55	28.8	134.38	2664.42	2.62	3	161.99	2651.56	5.5
5-9-63-5W6	222	2	112.34	2665.77	1.22	0				0			
D-67-J/94-B-9	223	129.2	118.65	2644.42	1.6	43.2	137.14	2625.4	2.88	8.2	163.7	2597.59	5.75
1-15-85-9W6	225	57.6	114.75	2585.39	1.36	2	136.83	2582.15	2.85	0.6	158.08	2554.84	4.95
3-32-80-3W6	225	8.8	113.56	2573.89	1.29	0				0			
6-7-78-10W6	225	133.6	118.22	2620.46	1.57	20.2	131.44	2632.21	2.37	0			
6-14-69-20W5	225	1.2	114.34	2483.67	1.34	0				0			
7-29-94-5W6	225	0				0				0			
16-16-82-12W6	225	138.8	116.68	2627.09	1.48	6.4	131.25	2633.49	2.35	0			
1-14-87-4W6	225									0			
1-18-60-24W5	225	2	113.51	2657.29	1.29	0				0			
2-11-72-24W5	225	0				0				0			
2-11-76-4W6	225	48.2	115.62	2624.5	1.41	1.2	129.78	2556.22	2.23	0			
2-13-65-24W5	225	0				0				0			
3-3-75-4W6	225	16.6	114.95	2631.73	1.37	0				0			
4-24-68-25W5	225	3.6	114.02	2656.98	1.32	0				0			
4-30-66-20W5	225	0.6	112.3	2693.77	1.22	0				0			
5-14-62-27W5	225	1.2	111.65	2632.53	1.19	0				0			

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
5-30-65-6W6	225	23.4	114.82	2631.95	1.36	0				0			
5-33-89-5W6	225	0				0				0			
6-3-68-4W6	225	46.2	115.72	2683.98	1.42	0				0			
6-3-70-2W6	225	0				0				0			
6-3-82-24W6	225	82	118.93	2672.8	1.62	85	137.82	2633.48	2.95	50.4	169.77	2596.76	6.74
6-8-81-9W6	225	102.8	119.06	2621.84	1.63	55.2	135.53	2651.66	2.73	3.4	156.02	2660.65	4.67
6-12-85-10W6	225	80.8	116.95	2625.13	1.49	6.6	134.17	2621.76	2.61	0			
6-13-80-6W6	225	27.2	114.86	2636.52	1.37	0				0			
6-21-76-5W6	225	50.6	117.02	2589.64	1.5	3.2	132.36	2594.28	2.45	0			
6-21-76-26W5	225	0				0				0			
6-24-85-5W6	225	4.6	112.59	2413.02	1.24	0				0			
6-29-79-2W6	225	2.2	112.86	2548.87	1.25	0				0			
6-32-71-26W5	225	13.4	112.95	2608.83	1.26	0				0			
6-34-82-11W6	225	105.2	116.81	2626.42	1.48	6.4	134.22	2621.6	2.61	0			
7-6-57-23W5	225	0				0				0			
7-23-59-21W5	225	0				0				0			
7-33-61-4W6	225	8.4	114.45	2676.44	1.34	1	133.44	2695.84	2.54	0			
9-26-80-8W6	225	28.3	114.95	2650.18	1.37	0.8	131.48	2669.18	2.37	0			
10-19-66-9W6	225	70.2	118.59	2678.8	1.6	24	136.73	2667.49	2.84	6.6	158.69	2662.77	5.03
10-23-65-20W5	225	0				0				0			
10-25-70-14W6	225	69.2	120.16	2633.88	1.7	73.4	137.2	2625.19	2.89	31.2	166.48	2598.53	6.19
11-9-73-6W6	225	12	113.62		1.29	0				0			
11-26-82-20W6	225	115.8	118.76	2635.19	1.61	81.6	136.22	2617.44	2.8	17.6	162.93	2596.93	5.64
12-12-84-21W6	225	114.8	118.97	2655.13	1.62	79.8	136.98	2642.3	2.87	20.6	174.7	2607.02	7.62
14-3-57-26W5	225	0				0				0			
14-6-85-6W6	225	0				0				0			

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
15-10-94-13W6	225	36.8	116.26	2472.02	1.45	2.6	131.62	2531.81	2.38	0			
15-16-80-4W6	225	27	113.43	2553.59	1.28	0				0			
15-28-77-13W6	225	137.8	119.68	2626.25	1.67	68.4	134.39	2633.99	2.63	1.4	151.63	2623.16	4.13
16-20-87-23W5	225	0				0				0			
16-36-83-25W6	225	107.4	118.32	2646.73	1.58	81.2	137.2	2626.28	2.89	30.4	167.14	2612.17	6.3
A-85-A/94-G-15	225	37.8	116.27	2679.42	1.45	2.4	131.57	2677.36	2.38	0			
B-66-C/94-H-6	225	75.4	117.51	2666.42	1.53	19.4	132.3	2667.39	2.44	0			
B-71-F/94-H-11	225	74.6	118.54	2652.53	1.59	24.8	132.11	2620.29	2.42	0			
B-92-G/94-J-2	225	61.6	117.99	2645.63	1.56	23	132.69	2648.05	2.47	1	154.36	2630.63	4.46
C-1-C/94-J-7	225	8.6	115.32	2677.73	1.39	0				0			
C-2-A/94-H-8	225	6	114.43		1.34	0				0			
C-74-I/94-A-16	225	33	116.17	2552.11	1.44	1.4	130.18	2581.12	2.26	0			
D-39-F/93-P-9	225	128.8	118.27	2625.97	1.58	69.8	135.54	2630.11	2.73	19.8	164.61	2601.86	5.89
A-79-B/94-H-4	225	104.4	117.26	2652.86	1.51	22.2	135.47	2607.09	2.72	7	168.2	2587.96	6.47
B-92-F/93-P-1	225	68.8	119.62	2642.93	1.67	56.6	137.92	2628.77	2.96	28.4	166.97	2572.08	6.27
D-33-L/94-J-2	225	44.2	116.89	2647.7	1.49	2.2	132.46	2615.67	2.45	0			
1-24-63-20W5	230	0				0				0			
2-16-57-21W5	230	0				0				0			
2-30-54-18W5	230	0				0				0			
5-7-56-24W5	230	0				0				0			
1-18-79-23W5	235	1	112.44	2464.5	1.23	0				0			
4-30-75-12W6	235	94	117.39	2633.05	1.52	25.8	134.56	2625.89	2.64	0.6	152.45	2625.64	4.23
7-34-83-15W6	235	140.8	118.39	2643.5	1.58	47.4	133.71	2648.45	2.56	0			
11-17-80-11W6	235	147.4	118.18	2659.62	1.57	18	134.05	2668.72	2.59	0			
1-36-69-19W5	235	0.6	113.73	2641.6	1.3	0				0			
4-11-64-2W6	235	17.2	113.4	2687.4	1.28	0				0			

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
5-7-54-23W5	235	0				0				0			
5-8-60-26W5	235	4	112.97	2648.99	1.26	0				0			
6-10-84-10W6	235	59.4	114.3	2625.3	1.33	0.2	129.72	2668.43	2.23	0			
6-14-77-11W6	235	93.4	115.89	2637.85	1.43	5.8	131.76	2644.1	2.39	0			
6-28-73-3W6	235	4.6	113.14	2555.55	1.27	0				0			
7-32-69-12W6	235	99.4	119.36		1.65	52.2	136.46		2.82	9.6	168.01		6.44
9-36-89-9W6	235					0				0			
12-34-62-1W6	235	9	113.58	2684.28	1.29	0.6	130.66	2678.37	2.3	0			
13-19-81-4W6	235	0.6	112.79	2593.73	1.25	0							
14-15-87-10W6	235	14.6	114.57	2489.06	1.35	0				0			
C-95-B/93-P-1	150	46.8	120.79	2631.08	1.75	77.6	138.27	2626.43	3	52	166.66	2604.07	6.22
5-5-83-24W6	155	82.4	118.97	2628.41	1.62	65.4	138.57	2613.4	3.03	55.6	167.41	2578.74	6.34
2-25-78-21W5	160	0.2	113.18	2504.56	1.27	0				0			
10-11-64-21W5	180	0				0				0			
1-28-65-17W5	240	0				0				0			
4-2-70-5W6	245	25	114.55	2666.88	1.35	0				0			
4-20-66-22W5	245	0				0				0			
3-6-79-24W5	245	0				0				0			
4-16-74-20W5	245	0				0				0			
4-18-69-21W5	245	0				0				0			
4-28-74-2W6	245	2.8	111.73	2566.36	1.19	0				0			
7-30-83-12W6	245	130	117.28	2602.93	1.51	14.8	133.6	2601.92	2.55	0			
9-25-64-27W5	245	4	113.51	2695.27	1.29	0				0			
9-28-67-4W6	245	15	113.38		1.28	0				0			
12-21-82-14W6	245	141.4	117.86	2626.68	1.55	19.2	131.88	2621.57	2.4	0			
13-14-80-18W6	245	131.2	118.19	2602.5	1.57	51.2	135.38	2584.43	2.72	15	168.14	2576.82	6.46

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
C-24-F/94-H-3	245	89.6	116.95	2636.01	1.49	13.6	135.63	2623.97	2.74	1	153.42	2604.06	4.35
D-8-H/94-A-14	245	119.6	118.08	2564.84	1.56	34.8	133.3	2559.62	2.53	1.2	172.89	2565.76	7.29
5-21-69-3W6	250	9.6	113.96	2657.84	1.31	0				0			
6-12-61-20W5	250	1.8	117.16	2673.41	1.51	0				0			
7-6-67-20W5	255	0				0				0			
7-9-68-18W5	255	0				0				0			
8-24-65-25W5	255	0				0				0			
12-13-63-2W6	255	2.2	116.52		1.47	0.4	131.6		2.38	0			
15-30-56-16W5	255	0				0				0			
1-26-62-18W5	260	0				0				0			
1-6-77-22W5	265	0				0				0			
7-33-68-21W5	265	0				0				0			
9-13-96-10W6	265	0				0				0			
3-13-66-1W6	265	21.8	115.92	2640.03	1.43	0.8	131		2.33	0			
4-25-72-3W6	265	18.8	113.37	2599.64	1.28	1	134.65	2544.18	2.65	0			
8-9-73-21W5	265	0				0				0			
11-34-78-4W6	265	7	113.1	2604.56	1.27	0				0			
D-93-J/94-J-1	265	29.8	115.68		1.41					0			
6-10-62-16W5	270	0				0				0			
8-20-71-18W5	275	0				0				0			
1-13-79-25W5	275	0				0				0			
10-13-67-19W5	275	0				0				0			
1-20-75-19W5	280	0				0				0			
1-2-88-1W6	280	0.8	113.68	2358.64	1.3	0				0			
1-19-79-22W5	280	0				0				0			
1-26-74-1W6	280	0				0				0			

UWI	Caliper	Montney source rock with 1≤TOC%<2 (108≤GR (GAPI)<127)				Montney source rock with 2≤TOC%<4 (127≤GR (GAPI)<147)				Montney source rock with TOC%>4 (GR (GAPI)>147)			
		Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)	Thickness (m)	Average GR(GAPI)	Average Density (kg/m^3)	Average TOC(%)
A-26-A/94-G-9	280	55.4	116.62	2597.31	1.47	23.8	133.45	2627.64	2.54	0			
6-23-75-2W6	285	2	115.01	2589.9	1.37	0				0			
14-17-74-23W5	285	0				0				0			
1-5-75-21W5	300	0				0				0			
9-9-85-24W5	300	0				0				0			
6-14-58-1W6	310	5.6	118.97	2630.92	1.62	0.6	128.75	2607.27	2.15	0			
7-35-68-7W6	315	80.4	118.74	2653.4	1.61	12.6	133.35	2649.39	2.53	0			
9-2-89-4W6	315	0				0				0			
12-36-53-23W5	315	0				0				0			
7-23-84-24W5	315	0				0				0			
7-20-68-17W5	320	0				0				0			
A-44-J/94-H-13	325	41.6	116.06		1.44	0.6	129.47		2.21	0			
C-57-G/94-H-15	330	0				0				0			
3-2-97-11W6	355	0				0				0			

UWI	Montney top (m)	Doig phosphate top (m)	Doig phosphate thickness (m)	Doig phosphate TOC (%)	Tmax(℃)
1-15-85-9W6	1176	1157.6	18.4	1.5	440
2-7-85-23W6	1772.4	1727.2	45.2	3.4	465
4-2-70-5W6	2122	2102.4	19.6	1.5	447
6-3-77-11W6	2154.8	2112	42.8	3.5	449
6-7-78-10W6	1995	1964.4	30.6	4	445
7-34-83-15W6	1577	1531	46	1.8	450
7-35-68-7W6	2539	2525	14	1.5	450
8-8-80-17W6	2151.5	2125	26.5	3	465
10-10-71-8W6	2366.5	2344.2	22.3	2.6	450
11-17-80-11W6	1754.6	1718.8	35.8	2.4	447.5
13-1-86-11W6	1305.4	1281	24.4	1.8	440
13-11-87-14W6	1448	1413	35	2	447.5
13-21-78-20W6	2692	2661	31	4.5	470
13-32-88-13W6	1351	1331	20	2.7	447.5
13-36-82-22W6	1666	1640	26	3	470
16-11-59-4W6	3966.2	3948.2	18	1.5	441
16-16-82-12W6	1561.5	1522.2	39.3	1.9	447.5
1-1-73-4W6	1672	1670	2	1.5	442
1-14-75-11W6	2331	2290.4	40.6	3	452
1-30-84-22W6	1667	1635.4	31.6	3.25	462.5
2-2-78-11W6	2005	1972	33	3.5	446
4-1-76-8W6	1982.7	1955	27.7	3.75	444
4-2-75-7W6	2008	1982	26	3.5	444
4-3-75-6W6	1993	1963.4	29.6	3	443
4-11-64-2W6	2729.5	2723	6.5	0.5	440
4-15-85-23W6	1736.2	1695	41.2	3.25	465
4-35-67-13W6	3738.2	3718.8	19.4	2.75	475
5-9-63-5W6	3333.5	3321.6	11.9	0.5	443
5-21-69-3W6	1996	1986	10	1	443
5-24-73-8W6	2093.5	2067	26.5	4.5	445
5-30-65-6W6	3147.5	3130	17.5	0.5	447.5
5-32-72-13W6	3018	2976	42	1.8	462.5
5-32-86-23W6	1807	1775	32	2.8	462.5
6-6-86-14W6	1505.4	1455.6	49.8	1.8	447.5
6-7-71-3W6	1825.5	1813	12.5	1	442
6-8-81-9W6	1478	1439	39	1.8	446
6-10-84-10W6	1311.2	1295.8	15.4	1.5	441
6-12-81-11W6	1700	1664	36	2	447
6-12-85-10W6	1227.5	1206	21.5	1.5	441
6-13-80-6W6	1191	1170	21	1.8	442

UWI	Montney top (m)	Doig phosphate top (m)	Doig phosphate thickness (m)	Doig phosphate TOC (%)	Tmax(℃)
6-14-77-11W6	1976.4	1939.4	37	3.75	447.5
6-18-67-2W6	2283	2280	3	0.9	442
6-21-76-5W6	1536	1519.6	16.4	2.6	442
7-8-89-10W6	1471.3	1457.4	13.9	1.8	440
7-12-87-17W6	1464	1428	36	2.5	451
7-30-83-12W6	1503	1462	41	1.8	446
7-31-60-5W6	3886	3858	28	1.5	443
7-32-69-12W6	3159	3126	33	2.6	465
7-32-79-10W6	1780	1742	38	2.5	448
7-33-61-4W6	3404.8	3381	23.8	0.5	442
8-19-66-12W6	3937	3896	41	2.6	475
8-20-84-7W6	1086	1076	10	1.8	440
8-29-64-10W6	4253.8	4232.4	21.4	1.8	460
8-30-77-20W6	2950.8	2918	32.8	4.5	475
8-31-81-9W6	1450.5	1428	22.5	1.8	445
9-7-66-2W6	2376.5	2365.8	10.7	0.9	440
9-23-79-9W6	1619	1581.8	37.2	2.2	445
9-26-80-8W6	1343.5	1323	20.5	1.9	442
9-27-89-12W6	1403	1391.2	11.8	2.6	446
9-34-86-25W6	1621.2	1586	35.2	2.5	465
10-1-68-9W6	2960	2946.2	13.8	2	455
10-9-81-12W6	1682.6	1651	31.6	2	447.5
10-18-81-13W6	1750	1726.6	23.4	2	450
10-19-66-9W6	3433.5	3405.6	27.9	1.6	460
10-21-87-15W6	1408.8	1371.4	37.4	2.6	447.5
10-23-79-13W6	1856	1829.6	26.4	2.5	452
10-25-70-14W6	3327	3274	53	2.5	465
10-29-88-20W6	1585	1542.2	42.8	2.75	455
10-36-83-14W6	1580.2	1535	45.2	1.8	447.5
11-9-73-6W6	1981.6	1963.2	18.4	3	445
11-15-83-8W6	1255	1231	24	1.8	440
11-16-87-11W6	1238.4	1224	14.4	1.8	441
11-18-83-9W6	1337	1316.6	20.4	1.8	442
11-19-79-7W6	1461.8	1440	21.8	2	442
11-22-81-14W6	1741	1712	29	2	451
11-34-86-16W6	1489.9	1442.5	47.4	2.5	449
12-21-82-14W6	1674	1642.8	31.2	1.9	450
12-25-79-16W6	2163	2145	18	2.8	462.5
13-12-81-23W6	2173.8	2130.5	43.3	4.6	475
13-14-75-10W6	2185	2144.4	40.6	3.75	450

UWI	Montney top (m)	Doig phosphate top (m)	Doig phosphate thickness (m)	Doig phosphate TOC (%)	Tmax(℃)
13-31-79-13W6	1858.4	1831	27.4	2.6	455
13-33-78-17W6	2288	2269	19	3	465
13-34-80-14W6	1817.2	1789	28.2	2.2	455
14-15-87-10W6	1197.8	1181	16.8	1.7	440
14-19-66-4W6	2581.7	2577	4.7	0.5	445
15-7-82-7W6	1219.2	1193.4	25.8	1.8	440
15-10-94-13W6	1028	1011.2	16.8	2	440
15-26-79-17W6	2097	2084.5	12.5	3	465
15-28-77-13W6	2270	2230	40	2.75	455
15-34-77-7W6	1593	1548	45	2.4	442
15-34-80-18W6	2064.5	2043	21.5	2.5	462.5
15-35-76-7W6	1723.6	1688.6	35	3	442
16-7-63-4W6	3078.8	3065	13.8	0.5	443
16-18-86-9W6	1175.8	1153.6	22.2	1.7	440
16-36-83-25W6	1967.6	1923.8	43.8	4	475
6-10-79-19W6	2478.5	2452.8	25.7	3	470
A-71-J/93-P-8	2698	2663.2	34.8	2	462.5
A-78-C/94-G-1	1878	1850	28	3.5	475
B-4--/94-H-13	1238.8	1206	32.8	2	447.5
B-65-J/94-B-16	1890	1856	34	3.5	470
B-69-E/93-P-9	2571.8	2540	31.8	3.7	465
B-95-C/93-P-9	2689	2653	36	3	462.5
C-82-F/94-H-1	1064.6	1043	21.6	2.1	442
C-95-B/93-P-1	3675	3627	48	2.6	470
C-97-B/94-H-12	1240.6	1206.4	34.2	2.1	447.5
C-98-H/94-H-2	1144.8	1118	26.8	2.2	443
D-94-L/93-P-7	3581	3527	54	4	475
A-5-B/94-A-13	1709.8	1673	36.8	2.6	462.5
A-10-A/93-P-10	3098	3045.4	52.6	2.75	475
A-10-J/94-B-9	2065	2028	37	3.5	475
A-10-J/94-B-9	2060	2031	29	3.5	475
A-26-A/94-G-9	1555.2	1491	64.2	2.1	455
A-31-B/94-B-15	2289.2	2242	47.2	3.5	475
A-43-E/94-A-15	1366.8	1319.2	47.6	2.5	449
A-45-F/93-P-7	3604	3550	54	3.5	475
A-62-K/94-H-2	1181.5	1154.5	27	3	442
A-70-A/93-P-10	3034	2997	37	3.25	470
A-78-L/94-H-7	1151	1127.2	23.8	2.1	442
A-85-A/94-G-15	1435.4	1395.8	39.6	2	455
B-66-C/94-H-6	1343	1307.6	35.4	3	447.5

UWI	Montney top (m)	Doig phosphate top (m)	Doig phosphate thickness (m)	Doig phosphate TOC (%)	Tmax(℃)
B-76-I/94-A-15	1182	1166.4	15.6	2.2	446
B-95-E/94-H-6	1353.6	1322.6	31	2.5	447.5
C-21-L/94-A-13	1800	1764	36	3.5	462.5
C-56-A/93-P-9	2454.2	2428.4	25.8	2	462
C-68-I/94-B-16	1780.5	1752.8	27.7	3.5	465
C-74-I/94-A-16	1079.4	1068.4	11	2	440
C-75-J/94-A-9	1267.4	1233	34.4	2.6	447
D-3-F/94-P-8	1750	1685	65	2.6	462.5
D-6-H/93-P-10	2952.3	2918.2	34.1	3.5	465
D-8-F/94-B-16	2090	2059.4	30.6	3.5	475
D-22-L/94-B-8	2358	2309.5	48.5	3.5	475
D-38-J/94-B-16	1825.7	1789.6	36.1	3.5	475
D-39-L/93-P-9	2657	2633.6	23.4	3.5	465
D-67-J/94-B-9	1881	1850	31	3.5	475
D-75-F/93-P-8	2972	2928.4	43.6	2.6	465
D-82-I/94-A-A5	1153.8	1140.7	13.1	2.3	446
D-88-J/94-A-16	1140	1127	13	2.3	442
A-79-B/94-H-4	1632	1606	26	3.5	457.5

APPENDIX 3-5

Vitrinite Reflectance and Vitrinite Reflectance Equivalent (Based on Bitumen Reflectance) in Montney Source Rock, and Calculated Vitrinite Reflectance based on Tmax

Vitrinite Reflectances Equivalent are calculated by the following equation (Jacob, 1999):

BRo (%) ---Solid bitumen reflectance,

Ro (%) equivalent=0.618×BRo (%) +0.4

Samples in green colors are relatively reliable

Vitrinite Reflectances based on Tmax are calculated from following equation (as shown in Figure 3-26)

Tmax=45.809×Ro (%) +406.51,

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-439671	100020609711W600	Cuttings	AB	930	0.15	0.49	0.04	4	Bitumen (Jacob, 1985)
C-439671	100020609711W600	Cuttings	AB	930	0.26		0.03	4	Amorphinite
C-439671	100020609711W600	Cuttings	AB	930	0.43		0.05	9	Vitrinite/Huminite
C-439671	100020609711W600	Cuttings	AB	930	0.59		0.04	17	Vitrinite/Huminite
C-439671	100020609711W600	Cuttings	AB	930	0.94		0.15	4	Vitrinite/Huminite
C-469746	100110307307W600	Core	AB	2044.1	0.12		0.01	7	Amorphinite
C-469746	100110307307W600	Core	AB	2044.1	0.49		0.03	8	Pyrobitumen (PB) Isotropic
C-469746	100110307307W600	Core	AB	2044.1	0.71		0.04	24	Pyrobitumen (PB) Isotropic
C-469746	100110307307W600	Core	AB	2044.1	0.92		0.05	8	Pyrobitumen (PB) Isotropic
C-469746	100110307307W600	Core	AB	2044.1	1.19		0.12	11	Pyrobitumen (PB) Isotropic
C-470898	200D049E093P0500	Cuttings	BC	4135	4.14	2.96	0.18	11	Bitumen (Jacob, 1985)
C-470899	200D049E093P0500	Cuttings	BC	4550	3.11	2.32	0.19	17	Bitumen (Jacob, 1985)
C-470899	200D049E093P0500	Cuttings	BC	4550	4.4	3.12	0.18	3	Bitumen (Jacob, 1985)
C-475606	100100807914W600	Core	BC	2018.5	0.92		0.12	28	Vitrinite/Huminite
C-475606	100100807914W600	Core	BC	2018.5	1.23		0.07	8	Vitrinite/Huminite
C-475606	100100807914W600	Core	BC	2018.5	1.5		0.05	5	Vitrinite/Huminite
C-475606	100100807914W600	Core	BC	2018.5	1.75			1	Vitrinite/Huminite
C-475607	100100807914W600	Core	BC	2021	0.96		0.07	17	Vitrinite/Huminite
C-475607	100100807914W600	Core	BC	2021	1.14		0.17	46	Vitrinite/Huminite
C-475607	100100807914W600	Core	BC	2021	1.25		0.1	29	Vitrinite/Huminite
C-475608	100100807914W600	Core	BC	2021.9	0.7		0.06	5	Vitrinite/Huminite
C-475608	100100807914W600	Core	BC	2021.9	0.97		0.1	15	Vitrinite/Huminite
C-475608	100100807914W600	Core	BC	2021.9	1.46	1.3	0.06	4	Bitumen (Jacob, 1985)
C-475609	100100807914W600	Core	BC	2023.3	0.79		0.04	3	Vitrinite/Huminite
C-475609	100100807914W600	Core	BC	2023.3	1.1		0.11	47	Vitrinite/Huminite
C-475609	100100807914W600	Core	BC	2023.3	1.4	1.27	0.04	6	Bitumen (Jacob, 1985)
C-475610	100100807914W600	Core	BC	2026.3	0.96		0.09	9	Vitrinite/Huminite
C-475610	100100807914W600	Core	BC	2026.3	1.27	1.18	0.1	18	Bitumen (Jacob, 1985)
C-475610	100100807914W600	Core	BC	2026.3	1.64	1.41		1	Bitumen (Jacob, 1985)

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-475611	100100807914W600	Core	BC	2029.2	0.96		0.09	14	Vitrinite/Huminite
C-475611	100100807914W600	Core	BC	2029.2	1.26	1.18	0.09	29	Bitumen (Jacob, 1985)
C-475611	100100807914W600	Core	BC	2029.2	1.52	1.34	0.04	7	Bitumen (Jacob, 1985)
C-475612	100100807914W600	Core	BC	2031	0.98		0.12	18	Vitrinite/Huminite
C-475612	100100807914W600	Core	BC	2031	1.36	1.24	0.09	7	Bitumen (Jacob, 1985)
C-475612	100100807914W600	Core	BC	2031	1.74		0.07	7	Vitrinite/Huminite
C-475613	100100807914W600	Core	BC	2033.3	0.19		0.01	2	Vitrinite/Huminite
C-475613	100100807914W600	Core	BC	2033.3	0.82			1	Vitrinite/Huminite
C-475613	100100807914W600	Core	BC	2033.3	1.19		0.13	17	Vitrinite/Huminite
C-475613	100100807914W600	Core	BC	2033.3	1.56	1.36	0.09	5	Bitumen (Jacob, 1985)
C-475614	100100807914W600	Core	BC	2035.9	0.98		0.07	19	Vitrinite/Huminite
C-475614	100100807914W600	Core	BC	2035.9	1.3	1.2	0.1	16	Bitumen (Jacob, 1985)
C-475614	100100807914W600	Core	BC	2035.9	1.53	1.35	0.01	3	Bitumen (Jacob, 1985)
C-475615	100100807914W600	Core	BC	2040.4	0.98		0.05	9	Vitrinite/Huminite
C-475615	100100807914W600	Core	BC	2040.4	1.18	1.13	0.06	40	Bitumen (Jacob, 1985)
C-475615	100100807914W600	Core	BC	2040.4	1.38	1.25	0.03		Bitumen (Jacob, 1985)
C-475616	100100807914W600	Core	BC	2048	0.85		0.04	6	Vitrinite/Huminite
C-475616	100100807914W600	Core	BC	2048	1.14		0.12	38	Vitrinite/Huminite
C-475616	100100807914W600	Core	BC	2048	1.44	1.29	0.03	4	Bitumen (Jacob, 1985)
C-475616	100100807914W600	Core	BC	2048	1.69	1.44	0.11	4	Bitumen (Jacob, 1985)
C-475617	100100807914W600	Core	BC	2048.7	0.91		0.04	9	Vitrinite/Huminite
C-475617	100100807914W600	Core	BC	2048.7	1.17		0.09	28	Vitrinite/Huminite
C-475617	100100807914W600	Core	BC	2048.7	1.36	1.24	0.04	13	Bitumen (Jacob, 1985)
C-475618	100100807914W600	Core	BC	2050.5	1.17		0.1	23	Vitrinite/Huminite
C-475618	100100807914W600	Core	BC	2050.5	1.41	1.27	0.06	31	Bitumen (Jacob, 1985)
C-475619	100100807914W600	Core	BC	2052	1.21		0.07	12	Vitrinite/Huminite
C-475619	100100807914W600	Core	BC	2052	1.38	1.25	0.03	20	Bitumen (Jacob, 1985)
C-475619	100100807914W600	Core	BC	2052	1.54	1.35	0.06	22	Bitumen (Jacob, 1985)
C-475620	100100807914W600	Core	BC	2054	1.04		0.14	6	Vitrinite/Huminite

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-475621	100100807914W600	Core	BC	2056.4	1.36		0.07	17	Vitrinite/Huminite
C-475621	100100807914W600	Core	BC	2056.4	1.55	1.36	0.07	38	Bitumen (Jacob, 1985)
C-475623	100100807914W600	Core	BC	2059	1.11		0.1	28	Vitrinite/Huminite
C-475623	100100807914W600	Core	BC	2059	1.37	1.25	0.08	22	Bitumen (Jacob, 1985)
C-475624	100100807914W600	Core	BC	2061.5	1.25		0.09	35	Vitrinite/Huminite
C-475624	100100807914W600	Core	BC	2061.5	1.46	1.3	0.05	19	Bitumen (Jacob, 1985)
C-475625	100100807914W600	Core	BC	2064.1	1.09		0.12	40	Vitrinite/Huminite
C-475625	100100807914W600	Core	BC	2064.1	1.44	1.29	0.1	10	Bitumen (Jacob, 1985)
C-475627	100100807914W600	Core	BC	2068.1	1.14		0.06	19	Vitrinite/Huminite
C-475627	100100807914W600	Core	BC	2068.1	1.36	1.24	0.06	23	Bitumen (Jacob, 1985)
C-475627	100100807914W600	Core	BC	2068.1	1.57	1.37	0.07	8	Bitumen (Jacob, 1985)
C-485165	100060307612W600	Core	AB	2629.1	0.69	0.83	0	2	Bitumen (Jacob, 1985)
C-485165	100060307612W600	Core	AB	2629.1	1.02		0.06	5	Vitrinite/Huminite
C-485165	100060307612W600	Core	AB	2629.1	1.45		0.18	7	Vitrinite/Huminite
C-485165	100060307612W600	Core	AB	2629.1	1.78		0.06	3	Vitrinite/Huminite
C-485170	100133306704W600	Core	AB	2379.4	0.43	0.67	0.04	4	Bitumen (Jacob, 1985)
C-485170	100133306704W600	Core	AB	2379.4	0.6	0.77	0.05	8	Bitumen (Jacob, 1985)
C-485170	100133306704W600	Core	AB	2379.4	0.83		0.05	7	Vitrinite/Huminite
C-485619	200C021L094A1300	Core	BC	1805.4	1.12		0.05	5	Vitrinite/Huminite
C-485619	200C021L094A1300	Core	BC	1805.4	1.28		0.06	14	Vitrinite/Huminite
C-485619	200C021L094A1300	Core	BC	1805.4	1.54	1.35	0.07	20	Bitumen (Jacob, 1985)
C-485619	200C021L094A1300	Core	BC	1805.4	1.95		0.04	3	Vitrinite/Huminite
C-485620	200C021L094A1300	Core	BC	1824.4	1.08		0.13	8	Vitrinite/Huminite
C-485620	200C021L094A1300	Core	BC	1824.4	1.33		0.07	9	Vitrinite/Huminite
C-485620	200C021L094A1300	Core	BC	1824.4	1.58	1.38		1	Bitumen (Jacob, 1985)
C-485620	200C021L094A1300	Core	BC	1824.4	1.13		0.01	2	Vitrinite/Huminite
C-485620	200C021L094A1300	Core	BC	1824.4	1.32		0.04	21	Vitrinite/Huminite
C-485620	200C021L094A1300	Core	BC	1824.4	1.47	1.31	0.04	18	Bitumen (Jacob, 1985)

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-485620	200C021L094A1300	Core	BC	1824.4	1.61	1.39	0.03	10	Bitumen (Jacob, 1985)
C-485622	200C021L094A1300	Core	BC	1848.6	1.12			1	Vitrinite/Huminite
C-485622	200C021L094A1300	Core	BC	1848.6	1.36		0.07	11	Vitrinite/Huminite
C-485622	200C021L094A1300	Core	BC	1848.6	1.55	1.36	0.03	18	Bitumen (Jacob, 1985)
C-485622	200C021L094A1300	Core	BC	1848.6	1.89		0.1	2	Vitrinite/Huminite
C-485623	200C021L094A1300	Core	BC	1858.28	1.24		0.01	3	Vitrinite/Huminite
C-485623	200C021L094A1300	Core	BC	1858.28	1.46		0.03	6	Vitrinite/Huminite
C-485623	200C021L094A1300	Core	BC	1858.28	1.69	1.44	0.05	3	Bitumen (Jacob, 1985)
C-485623	200C021L094A1300	Core	BC	1858.28	1.91		0.09	3	Vitrinite/Huminite
C-485624	200C021L094A1300	Core	BC	1862.6	1.36		0.05	13	Vitrinite/Huminite
C-485624	200C021L094A1300	Core	BC	1862.6	1.49		0.03	15	Vitrinite/Huminite
C-485624	200C021L094A1300	Core	BC	1862.6	1.65	1.42	0.06	19	Bitumen (Jacob, 1985)
C-485624	200C021L094A1300	Core	BC	1862.6	1.91		0.06	4	Vitrinite/Huminite
C-485624	200C021L094A1300	Core	BC	1862.6	1.31		0.03	4	Vitrinite/Huminite
C-485624	200C021L094A1300	Core	BC	1862.6	1.49		0.08	7	Vitrinite/Huminite
C-485624	200C021L094A1300	Core	BC	1862.6	1.71	1.46	0.04	10	Bitumen (Jacob, 1985)
C-485626	200C021L094A1300	Core	BC	1936.87	1.41		0.02	3	Vitrinite/Huminite
C-485626	200C021L094A1300	Core	BC	1936.87	1.53		0.04	12	Vitrinite/Huminite
C-485626	200C021L094A1300	Core	BC	1936.87	1.69	1.44	0.06	6	Bitumen (Jacob, 1985)
C-485627	200C021L094A1300	Core	BC	1968.53	1.49		0.06	3	Vitrinite/Huminite
C-485627	200C021L094A1300	Core	BC	1968.53	1.63	1.41		1	Bitumen (Jacob, 1985)
C-485628	200C021L094A1300	Core	BC	1991.9	1.37		0.01	2	Vitrinite/Huminite
C-485628	200C021L094A1300	Core	BC	1991.9	1.49		0.06	5	Vitrinite/Huminite
C-485628	200C021L094A1300	Core	BC	1991.9	1.65	1.42	0.11	3	Bitumen (Jacob, 1985)
C-485628	200C021L094A1300	Core	BC	1991.9	1.87	1.56		1	Bitumen (Jacob, 1985)
C-485629	200C021L094A1300	Core	BC	2034.4	1.34		0.05	3	Vitrinite/Huminite
C-485629	200C021L094A1300	Core	BC	2034.4	1.58		0.05	18	Vitrinite/Huminite
C-485629	200C021L094A1300	Core	BC	2034.4	1.8	1.51	0.05	24	Bitumen (Jacob, 1985)

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-485629	200C021L094A1300	Core	BC	2034.4	2.09		0.1	6	Vitrinite/Huminite
C-529065	200D040C094J0200	Cuttings	BC	1020	2.63		0.23	19	Vitrinite/Huminite
C-529065	200D040C094J0200	Cuttings	BC	1020	3.35	2.47	0.28	27	Bitumen (Jacob, 1985)
C-529065	200D040C094J0200	Cuttings	BC	1020	3.79	2.74	0.11	6	Bitumen (Jacob, 1985)
C-530327	200D040C094J0200	Cuttings	BC	1070	2.61		0.25	7	Vitrinite/Huminite
C-530327	200D040C094J0200	Cuttings	BC	1070	3.62	2.64	0.2	10	Bitumen (Jacob, 1985)
C-530327	200D040C094J0200	Cuttings	BC	1070	4.22	3.01	0.38	3	Bitumen (Jacob, 1985)
C-530328	200D040C094J0200	Cuttings	BC	1085	1.97		0.2	5	Vitrinite/Huminite
C-530328	200D040C094J0200	Cuttings	BC	1085	2.65		0.18	12	Vitrinite/Huminite
C-530328	200D040C094J0200	Cuttings	BC	1085	2.86		0.07	4	Vitrinite/Huminite
C-530328	200D040C094J0200	Cuttings	BC	1085	3.62		0.18	3	Pyrobitumen (PB) Isotropic
C-533132	100122708013W600	Core	AB	1743.9	0.77	0.88	0.08	62	Bitumen (Jacob, 1985)
C-533132	100122708013W600	Core	AB	1743.9	1.1		0.26	2	Vitrinite/Huminite
C-533939	100140907711W600	Core	AB	2276	0.94		0.05	8	Vitrinite/Huminite
C-533939	100140907711W600	Core	AB	2276	1.2		0.17	3	Vitrinite/Huminite
C-533942	100112707706W600	Core	AB	1741.2	0.56	0.75	0.09	7	Bitumen (Jacob, 1985)
C-533942	100112707706W600	Core	AB	1741.2	0.83		0.09	2	Vitrinite/Huminite
C-533942	100112707706W600	Core	AB	1741.2	1.06				Vitrinite/Huminite
C-533942	100112707706W600	Core	AB	1741.2	1.77		0.23		Vitrinite/Huminite
C-533946	100051407811W600	Core	AB	2189.9	0.55	0.74		1	Bitumen (Jacob, 1985)
C-533946	100051407811W600	Core	AB	2189.9	0.71	0.84	0.04	3	Bitumen (Jacob, 1985)
C-533946	100051407811W600	Core	AB	2189.9	0.96			1	Vitrinite/Huminite
C-533950	100051407811W600	Core	AB	2220.85	0.73	0.85	0.05	14	Bitumen (Jacob, 1985)
C-533950	100051407811W600	Core	AB	2220.85	0.93		0.04	2	Vitrinite/Huminite
C-533950	100051407811W600	Core	AB	2220.85	1.35			2	Vitrinite/Huminite
C-533959	100063607104W600	Core	AB	1922.6	0.35	0.62		1	Bitumen (Jacob, 1985)
C-533959	100063607104W600	Core	AB	1922.6	0.52	0.72	0.04	50	Bitumen (Jacob, 1985)
C-533959	100063607104W600	Core	AB	1922.6	0.7			1	Vitrinite/Huminite

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-533959	100063607104W600	Core	AB	1922.6	0.9			1	Vitrinite/Huminite
C-533962	100063607104W600	Core	AB	1943	0.59	0.76	0.02	6	Bitumen (Jacob, 1985)
C-533962	100063607104W600	Core	AB	1943	2.45		0.21	3	Vitrinite/Huminite
C-533964	100053207312W600	Core	AB	2817.9	1.16		0.1	13	Vitrinite/Huminite
C-533964	100053207312W600	Core	AB	2817.9	1.39	1.26	0.05	8	Bitumen (Jacob, 1985)
C-533964	100053207312W600	Core	AB	2817.9	1.56		0.07	6	Vitrinite/Huminite
C-533964	100053207312W600	Core	AB	2817.9	1.81		0.04	2	Vitrinite/Huminite
C-533968	103103406419W500	Core	AB	1776.2	0.69	0.83	0.05	8	Bitumen (Jacob, 1985)
C-533968	103103406419W500	Core	AB	1776.2	0.82			1	Vitrinite/Huminite
C-533968	103103406419W500	Core	AB	1776.2	1.03			1	Vitrinite/Huminite
C-533970	102113406119W500	Core	AB	2166.3	0.73	0.85	0.06	3	Bitumen (Jacob, 1985)
C-533970	102113406119W500	Core	AB	2166.3	1.15		0.05	3	Vitrinite/Huminite
C-533973	100070506707W600	Core	AB	3076.35	0.69	0.83		1	Bitumen (Jacob, 1985)
C-533973	100070506707W600	Core	AB	3076.35	0.84	0.92	0.04	8	Bitumen (Jacob, 1985)
C-533973	100070506707W600	Core	AB	3076.35	1.12		0.08	5	Vitrinite/Huminite
C-533976	100070506707W600	Core	AB	3084.48	0.8		0.03		Vitrinite/Huminite
C-533976	100070506707W600	Core	AB	3084.48	1.07		0.13		Vitrinite/Huminite
C-533976	100070506707W600	Core	AB	3084.48	1.5	1.33	0.15		Bitumen (Jacob, 1985)
C-533978	100070506707W600	Core	AB	3093.72	0.86	0.93		1	Bitumen (Jacob, 1985)
C-533978	100070506707W600	Core	AB	3093.72	1.12		0.07	5	Vitrinite/Huminite
C-533978	100070506707W600	Core	AB	3093.72	0.4	0.65	0.03	5	Bitumen (Jacob, 1985)
C-533978	100070506707W600	Core	AB	3093.72	0.57	0.75	0.06	6	Bitumen (Jacob, 1985)
C-533978	100070506707W600	Core	AB	3093.72	0.82		0.07	4	Vitrinite/Huminite
C-533984	100112807103W600	Core	AB	1845.8	0.37		0.06	2	Vitrinite/Huminite
C-533984	100112807103W600	Core	AB	1845.8	0.56	0.75	0.05	2	Bitumen (Jacob, 1985)
C-533984	100112807103W600	Core	AB	1845.8	0.74		0	8	Vitrinite/Huminite
C-533984	100112807103W600	Core	AB	1845.8	1.25		0.02	3	Vitrinite/Huminite
C-533995	100130506801W600	Core	AB	2057.35	0.48	0.7	0.07	7	Bitumen (Jacob, 1985)

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-533995	100130506801W600	Core	AB	2057.35	0.75		0.08	14	Vitrinite/Huminite
C-533995	100130506801W600	Core	AB	2057.35	1.02		0.02	3	Vitrinite/Huminite
C-533995	100130506801W600	Core	AB	2057.35	1.18			1	Vitrinite/Huminite
C-533997	100130506801W600	Core	AB	2240.88	0.49	0.7	0.05	22	Bitumen (Jacob, 1985)
C-533997	100130506801W600	Core	AB	2240.88	0.93		0.05	3	Vitrinite/Huminite
C-533997	100130506801W600	Core	AB	2240.88	1.41		0.03	2	Vitrinite/Huminite
C-533998	100130506801W600	Core	AB	2245.75	0.4	0.65	0.02	2	Bitumen (Jacob, 1985)
C-533998	100130506801W600	Core	AB	2245.75	0.67	0.81	0.07	55	Bitumen (Jacob, 1985)
C-533998	100130506801W600	Core	AB	2245.75	0.89		0.03	3	Vitrinite/Huminite
C-534001	100133106718W500	Core	AB	1665.85	0.98			1	Vitrinite/Huminite
C-534003	102142007922W500	Core	AB	866.6	0.49	0.7	0.05	9	Bitumen (Jacob, 1985)
C-534003	102142007922W500	Core	AB	866.6	0.68		0.07	42	Vitrinite/Huminite
C-534007	100112406220W500	Core	AB	2105.1	1.05			1	Vitrinite/Huminite
C-534009	100040605920W500	Core	AB	2656.35	0.89	0.95		1	Bitumen (Jacob, 1985)
C-534131	100063307225W500	Core	AB	1595.5	0.5		0.06	15	Vitrinite/Huminite
C-534131	100063307225W500	Core	AB	1595.5	0.72			1	Vitrinite/Huminite
C-534131	100063307225W500	Core	AB	1595.5	1.05		0.03	4	Vitrinite/Huminite
C-534131	100063307225W500	Core	AB	1595.5	1.64			1	Vitrinite/Huminite
C-534135	100063407225W500	Core	AB	1542.5	0.55		0.05	6	Vitrinite/Huminite
C-534135	100063407225W500	Core	AB	1542.5	0.66		0.01	2	Vitrinite/Huminite
C-534145	100162305706W600	Core	AB	2646.58	0.97		0.12	3	Vitrinite/Huminite
C-534150	100162305706W600	Core	AB	2689.56	0.66	0.81	0.13	2	Bitumen (Jacob, 1985)
C-534150	100162305706W600	Core	AB	2689.56	0.93	0.97	0.08	6	Bitumen (Jacob, 1985)
C-534150	100162305706W600	Core	AB	2689.56	1.17			1	Vitrinite/Huminite
C-534157	102113407802W600	Core	AB	1779.9	0.36	0.62		1	Bitumen (Jacob, 1985)
C-534157	102113407802W600	Core	AB	1779.9	0.6		0.06		Vitrinite/Huminite
C-534161	100150607603W600	Core	AB	1458.9	0.36	0.62	0.02	2	Bitumen (Jacob, 1985)
C-534161	100150607603W600	Core	AB	1458.9	0.54	0.73	0.05	7	Bitumen (Jacob, 1985)

C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-534161	100150607603W600	Core	AB	1458.9	0.74		0.06	11	Vitrinite/Huminite
C-534161	100150607603W600	Core	AB	1458.9	1.08			1	Vitrinite/Huminite
C-534162	100163106623W500	Core	AB	1708.55	0.41	0.65		1	Bitumen (Jacob, 1985)
C-534162	100163106623W500	Core	AB	1708.55	0.52		0.01	2	Vitrinite/Huminite
C-534162	100163106623W500	Core	AB	1708.55	0.72	0.84	0.05	4	Bitumen (Jacob, 1985)
C-534172	100120706724W500	Core	AB	1917.6	0.53	0.73	0.04	6	Bitumen (Jacob, 1985)
C-534172	100120706724W500	Core	AB	1917.6	0.71		0.03	2	Vitrinite/Huminite
C-534172	100120706724W500	Core	AB	1917.6	0.95		0.09	4	Vitrinite/Huminite
C-534172	100120706724W500	Core	AB	1917.6	1.61			1	Vitrinite/Huminite
C-534178	100071406425W500	Core	AB	2304	0.43	0.67	0.05	18	Bitumen (Jacob, 1985)
C-534178	100071406425W500	Core	AB	2304	0.65		0.04	6	Vitrinite/Huminite
C-534178	100071406425W500	Core	AB	2304	0.85		0.02	2	Vitrinite/Huminite
C-534183	100061406606W600	Core	AB	3037.8	0.82	0.91		1	Bitumen (Jacob, 1985)
C-534183	100061406606W600	Core	AB	3037.8	1.03		0.06	2	Vitrinite/Huminite
C-534183	100061406606W600	Core	AB	3037.8	2.3			1	Vitrinite/Huminite
C-534188	102011409112W600	Core	AB	1118.15	0.36	0.62	0.03	5	Bitumen (Jacob, 1985)
C-534188	102011409112W600	Core	AB	1118.15	0.43	0.67	0.02	4	Bitumen (Jacob, 1985)
C-534189	100043208412W600	Core	AB	1581.3	0.4	0.65	0.09	8	Bitumen (Jacob, 1985)
C-534189	100043208412W600	Core	AB	1581.3	0.56		0.04	18	Vitrinite/Huminite
C-534189	100043208412W600	Core	AB	1581.3	0.68		0.03	6	Vitrinite/Huminite
C-534189	100043208412W600	Core	AB	1581.3	1.69			1	Vitrinite/Huminite
C-534197	100143008207W600	Core	AB	1245.7	0.31	0.59	0.04	12	Bitumen (Jacob, 1985)
C-534197	100143008207W600	Core	AB	1245.7	0.41	0.65	0.03	28	Bitumen (Jacob, 1985)
C-534197	100143008207W600	Core	AB	1245.7	0.65		0.04	6	Vitrinite/Huminite
C-534200	100150808112W600	Core	AB	1833.1	0.39	0.64	0.01	4	Bitumen (Jacob, 1985)
C-534200	100150808112W600	Core	AB	1833.1	0.53	0.73	0.06	42	Bitumen (Jacob, 1985)
C-534200	100150808112W600	Core	AB	1833.1	0.71		0.02	4	Vitrinite/Huminite
C-534200	100150808112W600	Core	AB	1833.1	0.79			1	Vitrinite/Huminite

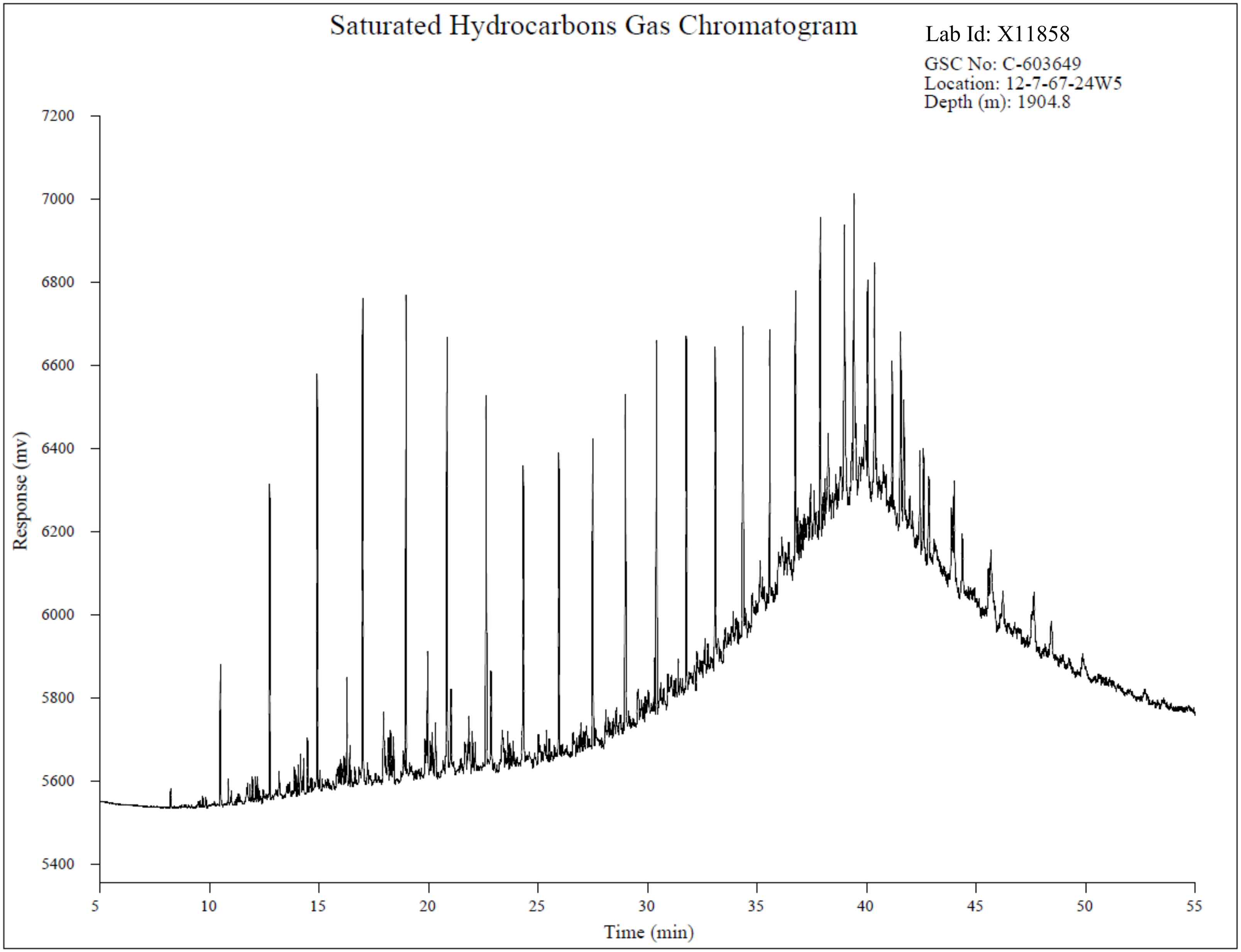
C Number	UWI	Sample type	Province	depth(m)	Ro (%)	VRO_Equiv	St_Dev	Num	Organic _Type
C-534204	100113208225W500	Core	AB	929	0.79			1	Vitrinite/Huminite
C-534214	100142706708W600	Core	AB	3032	0.44	0.67	0.05	2	Bitumen (Jacob, 1985)
C-534214	100142706708W600	Core	AB	3032	0.63	0.79	0.01	2	Bitumen (Jacob, 1985)
C-534214	100142706708W600	Core	AB	3032	0.78	0.88		1	Bitumen (Jacob, 1985)
C-534214	100142706708W600	Core	AB	3032	1.36			1	Vitrinite/Huminite
C-534219	100061207912W600	Core	AB	2013.56	0.55	0.74	0.04	21	Bitumen (Jacob, 1985)
C-534219	100061207912W600	Core	AB	2013.56	0.68	0.82	0.04	12	Bitumen (Jacob, 1985)
C-534223	100061207912W600	Core	AB	2028.5	0.47	0.69	0.01	8	Bitumen (Jacob, 1985)
C-534223	100061207912W600	Core	AB	2028.5	0.56	0.75	0.04	24	Bitumen (Jacob, 1985)
C-534223	100061207912W600	Core	AB	2028.5	0.72		0.07	18	Vitrinite/Huminite
C-534225	100011407511W600	Core	AB	2480.25	0.8	0.89	0.04	9	Bitumen (Jacob, 1985)
C-534225	100011407511W600	Core	AB	2480.25	1		0.08	24	Vitrinite/Huminite
C-534225	100011407511W600	Core	AB	2480.25	1.25	1.17	0.03	2	Bitumen (Jacob, 1985)
C-534225	100011407511W600	Core	AB	2480.25	1.44		0.11	2	Vitrinite/Huminite
C-534231	100052406822W500	Core	AB	1559.23	0.31	0.59	0.04	2	Bitumen (Jacob, 1985)
C-534231	100052406822W500	Core	AB	1559.23	0.46	0.68	0.03	15	Bitumen (Jacob, 1985)
C-534231	100052406822W500	Core	AB	1559.23	0.57	0.75	0.04	17	Bitumen (Jacob, 1985)
C-537215	100052608013W600	Core	AB	1938.1	0.74	0.86	0.05	4	Bitumen (Jacob, 1985)
C-537215	100052608013W600	Core	AB	1938.1	0.85	0.93	0.04	2	Bitumen (Jacob, 1985)
C-537218	100052608013W600	Core	AB	1944.8	0.52		0.02	2	Vitrinite/Huminite
C-537218	100052608013W600	Core	AB	1944.8	0.78	0.88	0.02	8	Bitumen (Jacob, 1985)
C-537218	100052608013W600	Core	AB	1944.8	0.85	0.93	0.02	3	Bitumen (Jacob, 1985)
C-537218	100052608013W600	Core	AB	1944.8	0.93		0.01	4	Vitrinite/Huminite
C-537218	100052608013W600	Core	AB	1944.8	1.14			1	Vitrinite/Huminite
C-537225	100052608013W600	Core	AB	1958	0.72	0.84	0.03	5	Bitumen (Jacob, 1985)
C-537225	100052608013W600	Core	AB	1958	0.83	0.91		1	Bitumen (Jacob, 1985)
C-537225	100052608013W600	Core	AB	1958	0.96		0.05	3	Vitrinite/Huminite

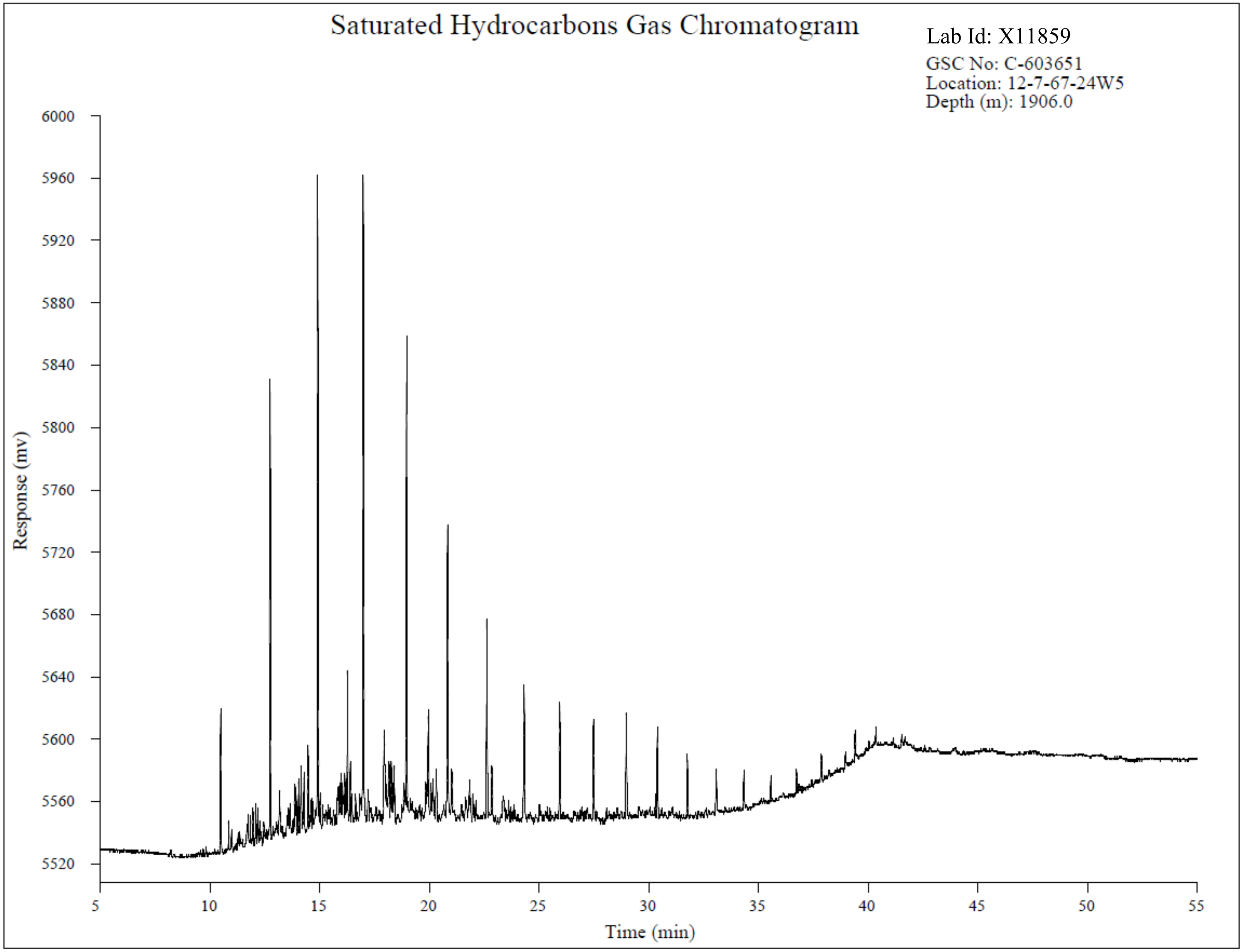
UWI	PROVINCE	SAMP_LAT	SAMP_LONG	Depth(m)	Tmax (℃)	Tmax converted Ro (%)
100063006723W500	AB	54.828037	-117.502384	1854.91	438.14	0.7
100060307612W600	AB	55.554748	-119.772466	1481.1	445.5	0.86
100140407310W600	AB	55.300982	-119.475254	2520	455	1.07
100110307307W600	AB	55.296975	-118.992106	2042.23	446.67	0.88
100060807502W600	AB	55.480118	-118.277359	1468.3	439	0.72
100153107710W600	AB	55.719862	-119.533707	2039.3	441.67	0.77
100081607410W600	AB	55.410051	-119.462701	2257.9	452.33	1.01
100110107511W600	AB	55.470603	-119.569927	2493.07	443.2	0.81
100083307913W600	AB	55.889496	-119.958608	1817.63	453	1.02
100033207801W600	AB	55.798037	-118.118802	1190	425	0.41
100060407909W600	AB	55.814822	-119.350054	1760	434	0.61
102101306022W500	AB	54.19219	-117.158179	2558	452	1
100020507911W600	AB	55.814255	-119.679767	2107.01	438	0.69
100110307307W600	AB	55.296975	-118.992106	2042.01	447	0.89
100020507911W600	AB	55.814255	-119.679767	2043.63	430	0.52
100081807810W600	AB	55.756788	-119.528648	2066.99	438.78	0.71
100083307913W600	AB	55.889496	-119.958608	1817.63	449	0.94
100122708013W600	AB	55.966741	-119.951873	1743.9	444	0.83
100140907711W600	AB	55.661697	-119.647407	2276	452	1
100063607104W600	AB	55.191458	-118.475576	1916.55	442	0.78
103103406419W500	AB	54.584939	-116.780432	1768.5	428	0.47
100112807103W600	AB	55.178561	-118.397958	1846.8	437.67	0.69
100130506801W600	AB	54.863574	-118.12466	2145.88	438.75	0.71
100150607603W600	AB	55.560493	-118.451169	1458.9	433	0.58
100071406425W500	AB	54.535527	-117.664971	2302.73	437	0.67
102011409112W600	AB	56.889103	-119.804026	1115.27	436.33	0.66
100043208412W600	AB	56.322282	-119.866791	1586.23	436.25	0.65
100143008207W600	AB	56.141755	-119.090025	1243.65	435	0.63
100061207912W600	AB	55.831614	-119.737661	1943.28	440.2	0.74
100011407511W600	AB	55.493813	-119.583206	2480.25	453	1.02
100131207811W600	AB	55.750492	-119.574055	2205.66	438	0.69
100082006422W500	AB	54.550585	-117.283487	2046.5	438	0.69

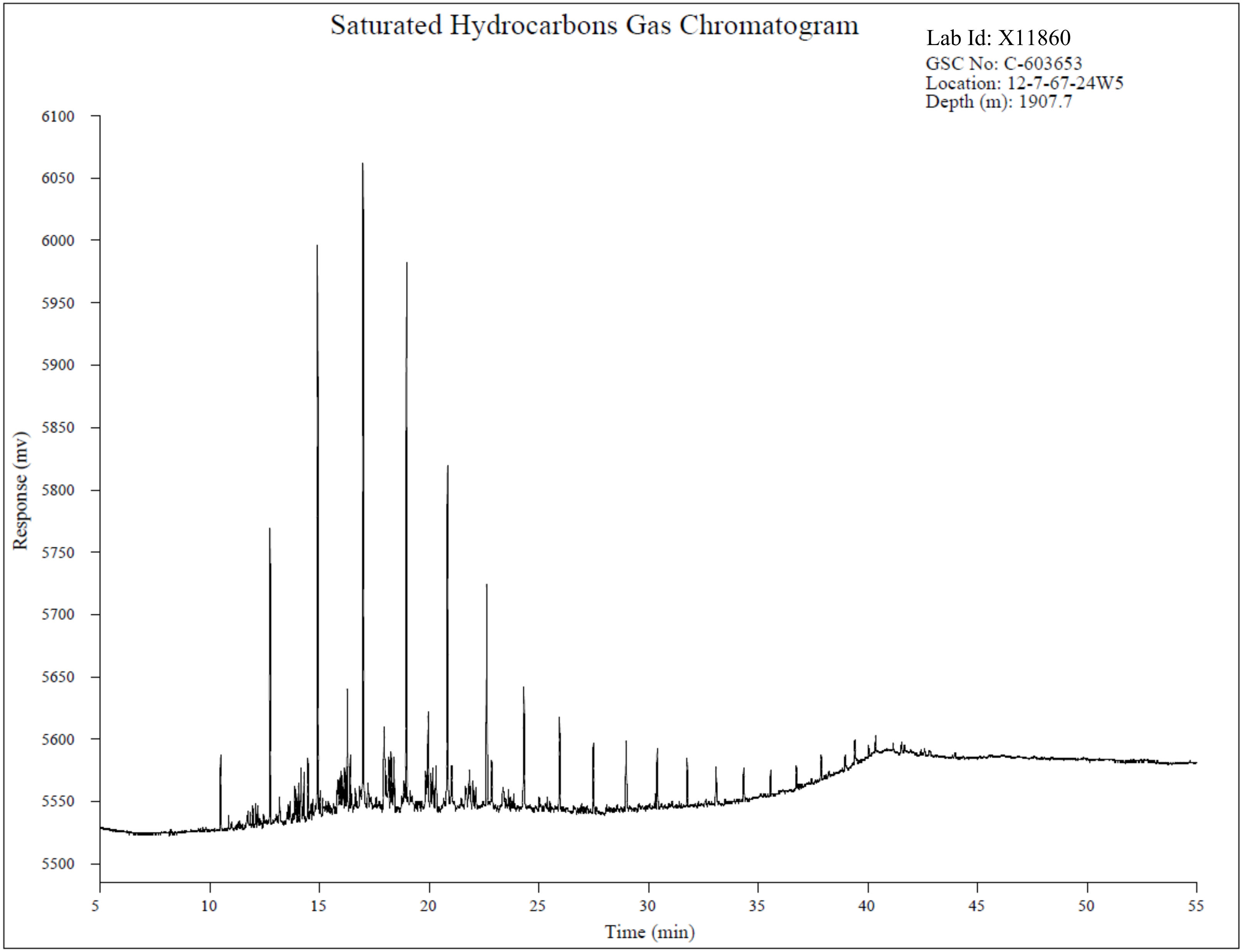
UWI	PROVINCE	SAMP_LAT	SAMP_LONG	Depth(m)	Tmax (℃)	Tmax converted Ro (%)
100071406425W500	AB	54.535527	-117.664971	2297.3	434	0.61
100150808112W600	AB	56.011206	-119.835581	1827.7	443	0.8
100112707706W600	AB	55.704273	-118.845833	1747.28	439.75	0.73
100063307225W501	AB	55.278609	-117.787914	1585.54	430	0.52
100143008207W600	AB	56.141571	-119.090112	1231.2	435	0.63
100101806723W500	AB	54.801731	-117.491943	1864.9	434	0.61
100063006723W500	AB	54.827962	-117.501253	1846.47	438	0.69
100060407203W600	AB	55.206503	-118.400407	1755.1	435.5	0.64
100062105608W500	AB	56.789921	-119.719045	1515.5	440	0.74
100070508720W600	BC	56.513422	-121.149531	1943.15	461.25	1.21
200D045G094H0900	BC	57.622439	-120.177969	911.73	434.5	0.62
100021907914W600	BC	55.854778	-120.178667	2052.5	463	1.24
100011008223W600	BC	56.090361	-121.502844	2009	478	1.58
100013607915W600	BC	55.883972	-120.194444	2038.5	463.25	1.25
200B030H093P0900	BC	55.601844	-120.126097	2556.9	467	1.33
100071307915W600	BC	55.846583	-120.20475	2108.6	465	1.29
100143408425W600	BC	56.329989	-121.867114	2080.19	466.56	1.32
100041408423W600	BC	56.277992	-121.526689	1818.43	463.72	1.26
100083008222W600	BC	56.137836	-121.423956	1814.81	472.75	1.46
100131108120W600	BC	56.0131	-121.024822	2309.39	467	1.33
102123507917W600	BC	55.891369	-120.551547	2131.71	464.5	1.28
100122907818W600	BC	55.789133	-120.762953	2493.4	475	1.51
200C021L094A1300	BC	56.938339	-121.882869	1852.64	483.2	1.69
200A010J094B0900	BC	56.667019	-122.241125	2140.89	490	1.84
200D052F094G0200	BC	57.132156	-122.76435	2120	467	1.33
200C033B094G0700	BC	57.284031	-122.659269	1791.1	490	1.84
100071307915W600		55.856596	-120.203317	2055.22	464	1.27

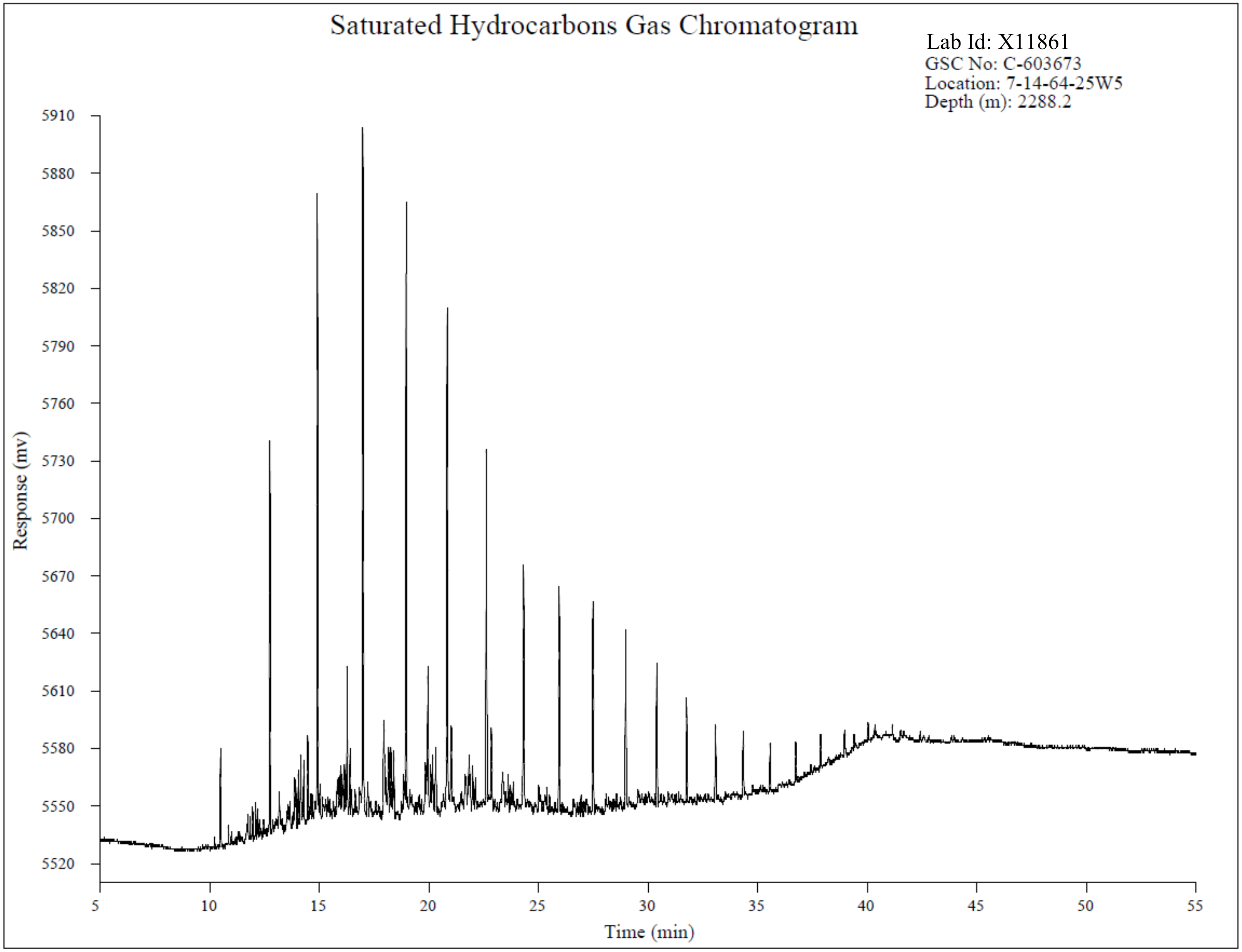
APPENDIX 4-1

GAS CHROMOTOGRAPHY OF ROCK EXTRACT (SATURATE FRACTION), OIL (SATURATE FRACTION) AND WHOLE OIL

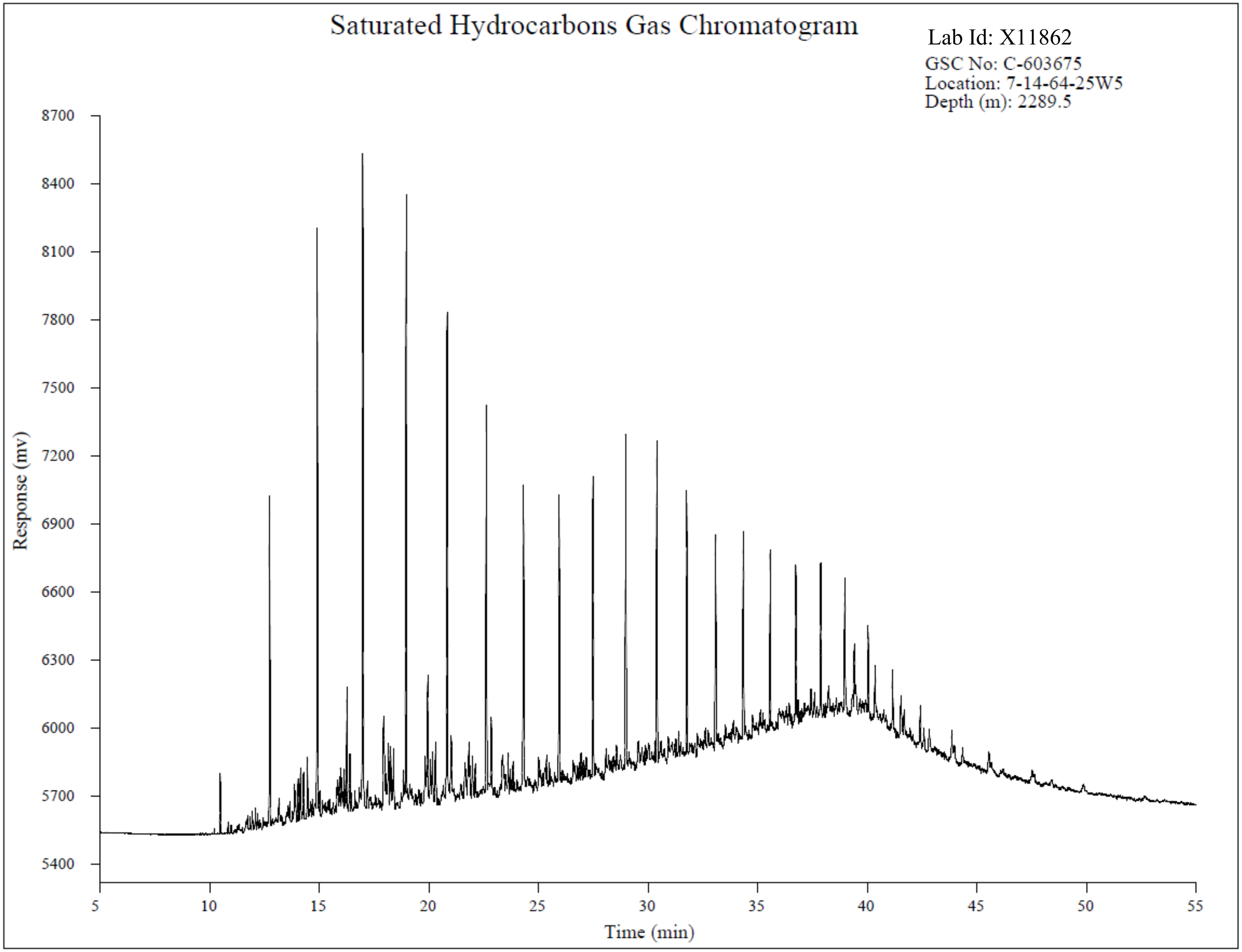

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11858
GSC No: C-603649
Location: 12-7-67-24W5
Depth (m): 1904.8
Response (mv)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

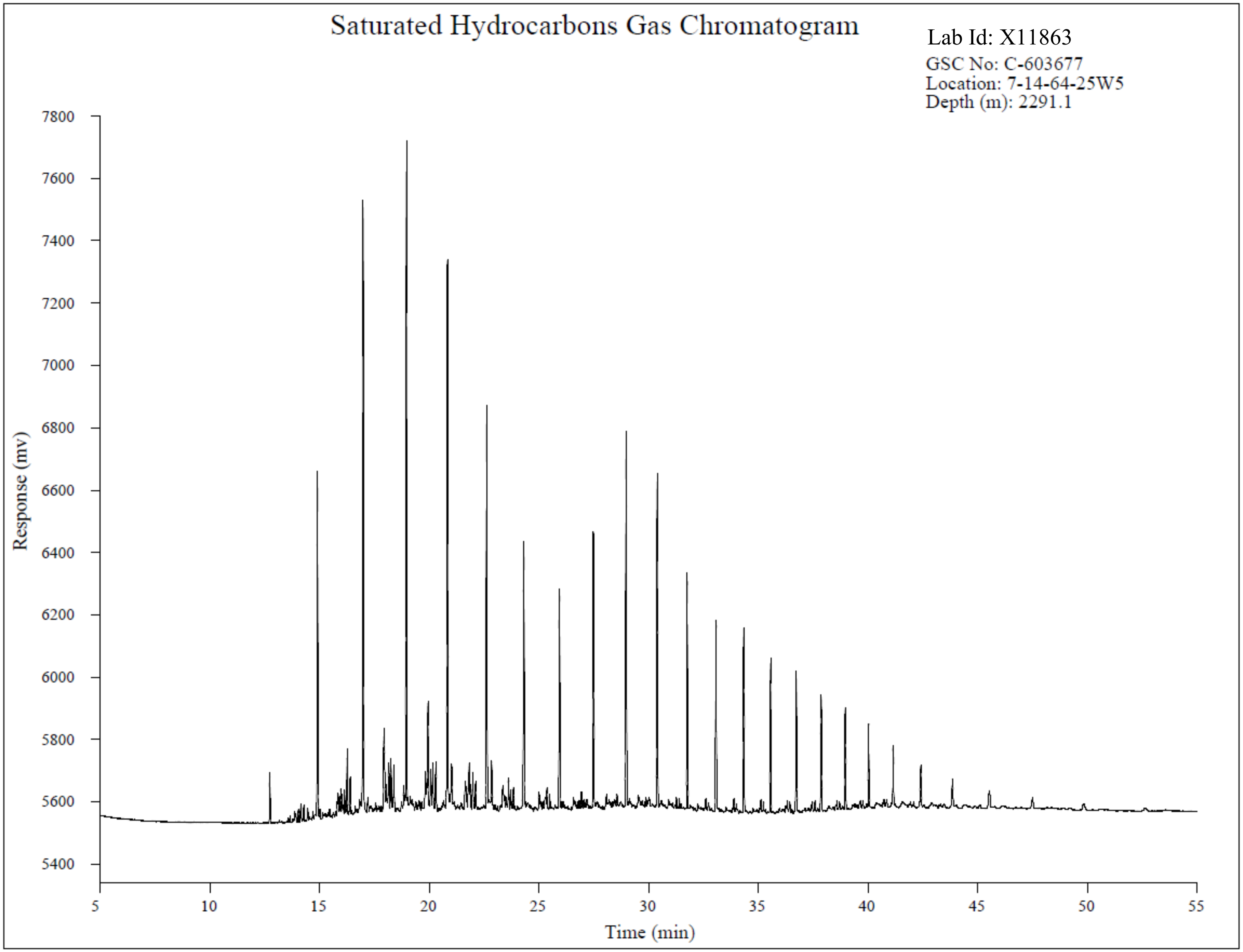

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11859
GSC No: C-603651
Location: 12-7-67-24W5
Depth (m): 1906.0
Response (mv)
6000
5960
5920
5880
5840
5800
5760
5720
5680
5640
5600
5560
5520
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11860
GSC No: C-603653
Location: 12-7-67-24W5
Depth (m): 1907.7
Response (mv)
6100
6050
6000
5950
5900
5850
5800
5750
5700
5650
5600
5550
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

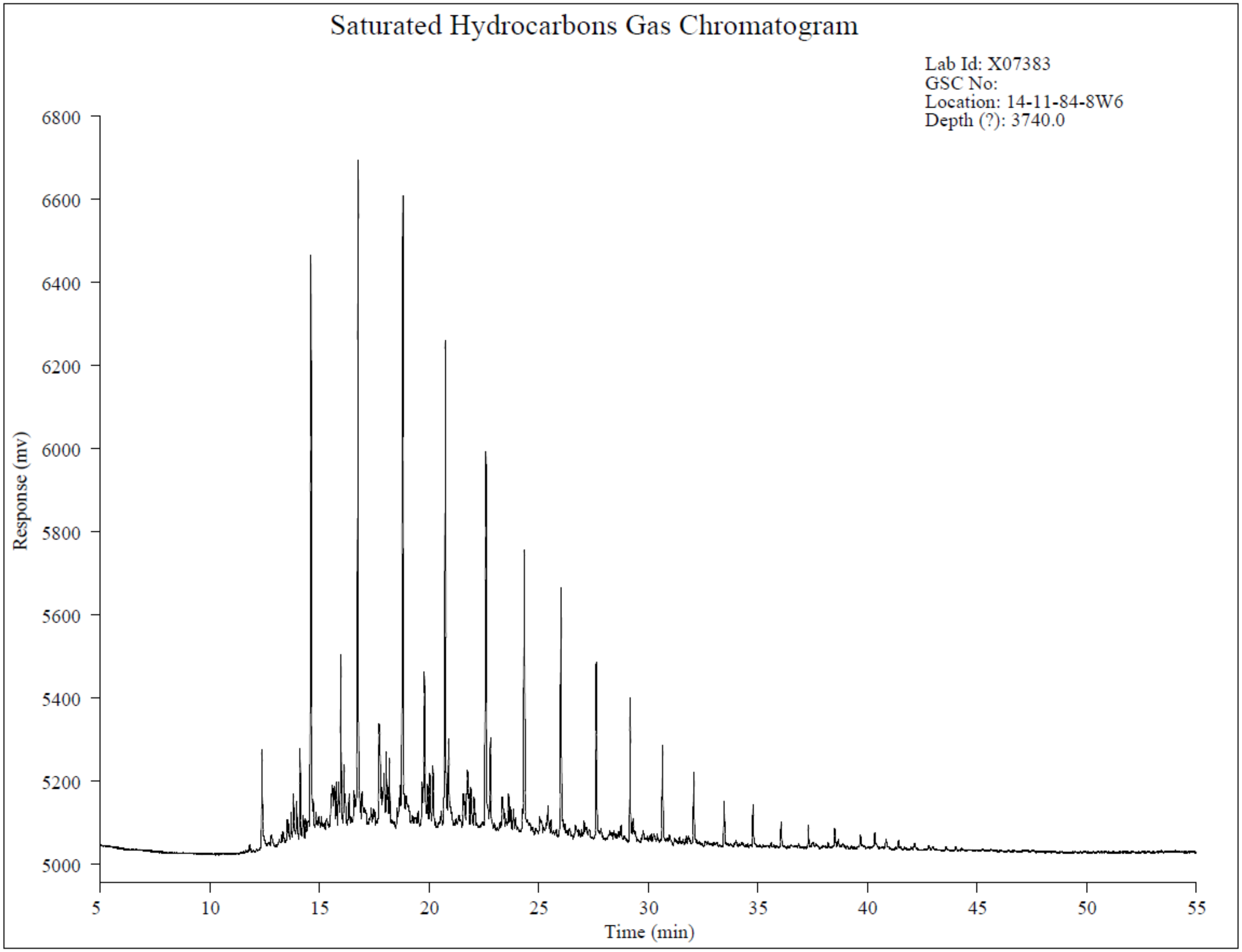


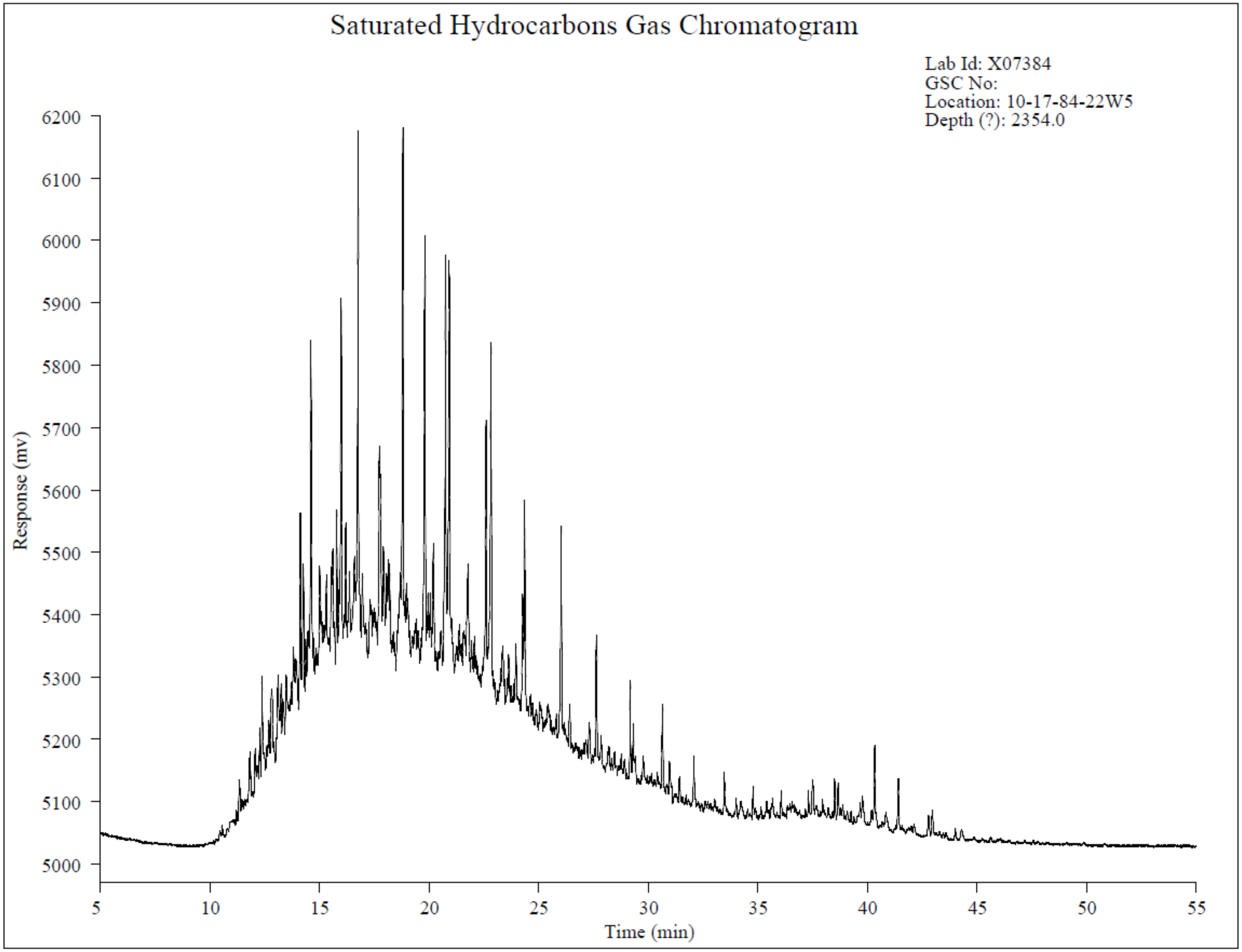
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11861
GSC No: C-603673
Location: 7-14-64-25W5
Depth (m): 2288.2
Response (mv)
5910
5880
5850
5820
5790
5760
5730
5700
5670
5640
5610
5580
5550
5520
5
10
15
20
25
30
35
40
45
50
55
Time (min)

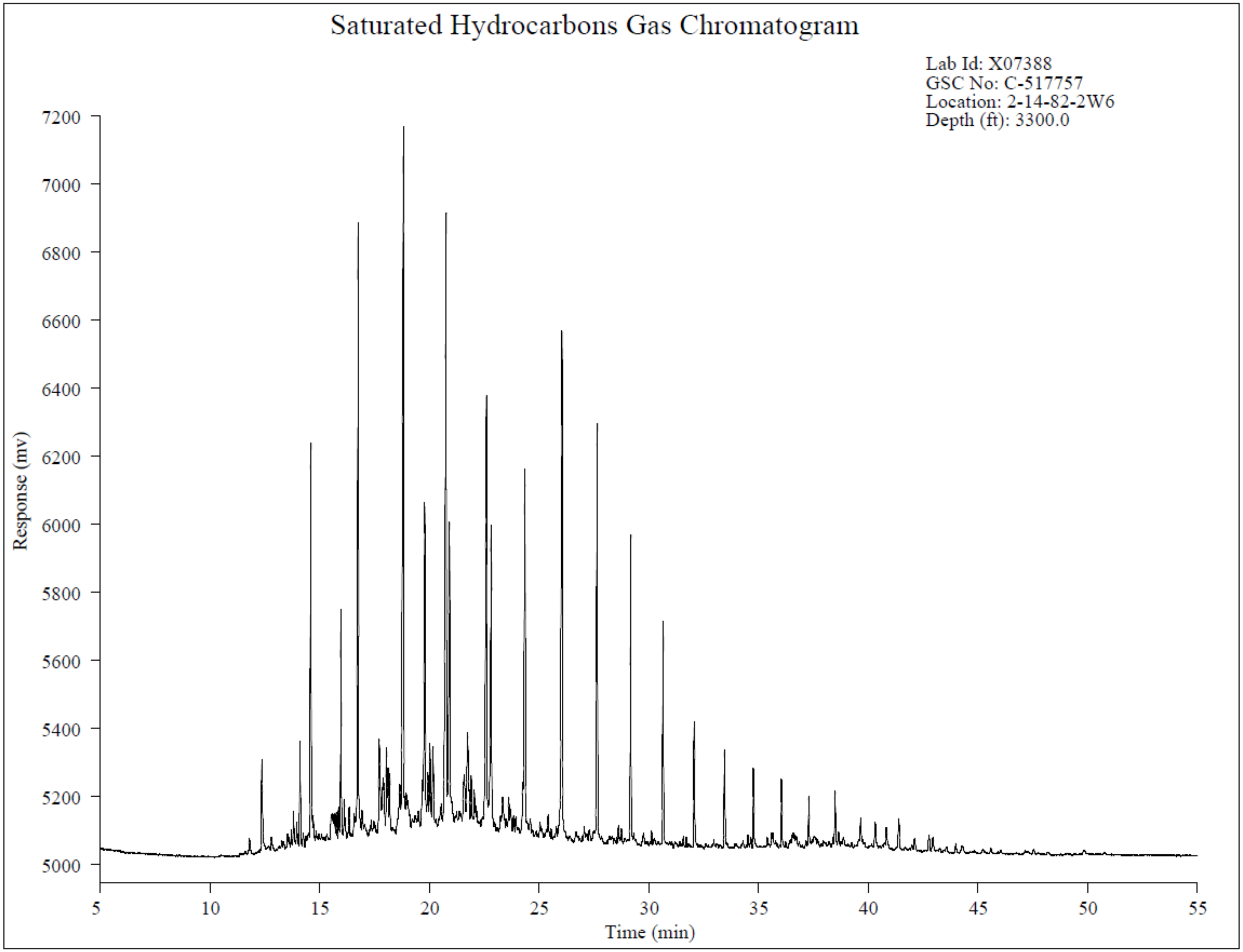

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11862
GSC No: C-603675
Location: 7-14-64-25W5
Depth (m): 2289.5
Response (mv)
8700
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

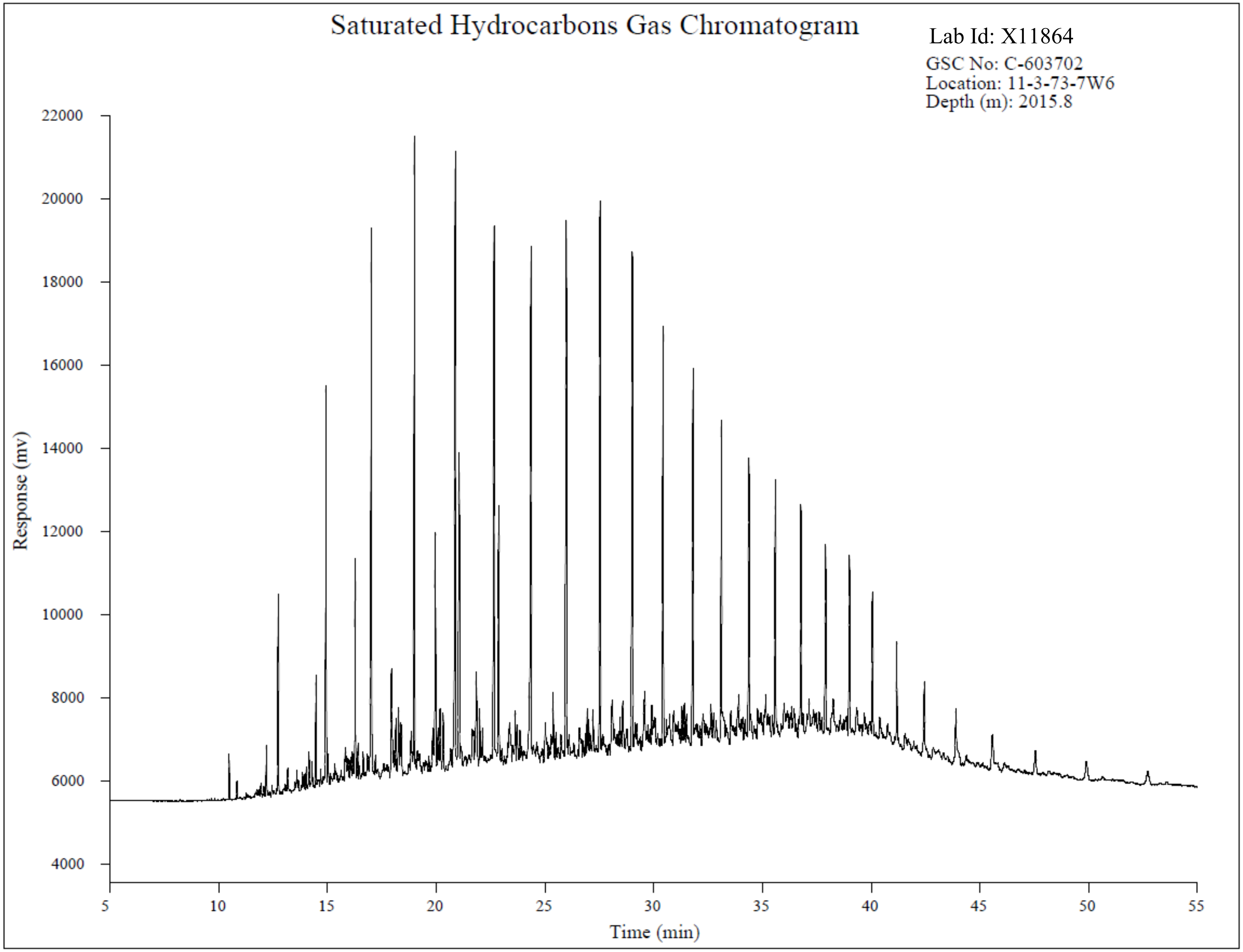


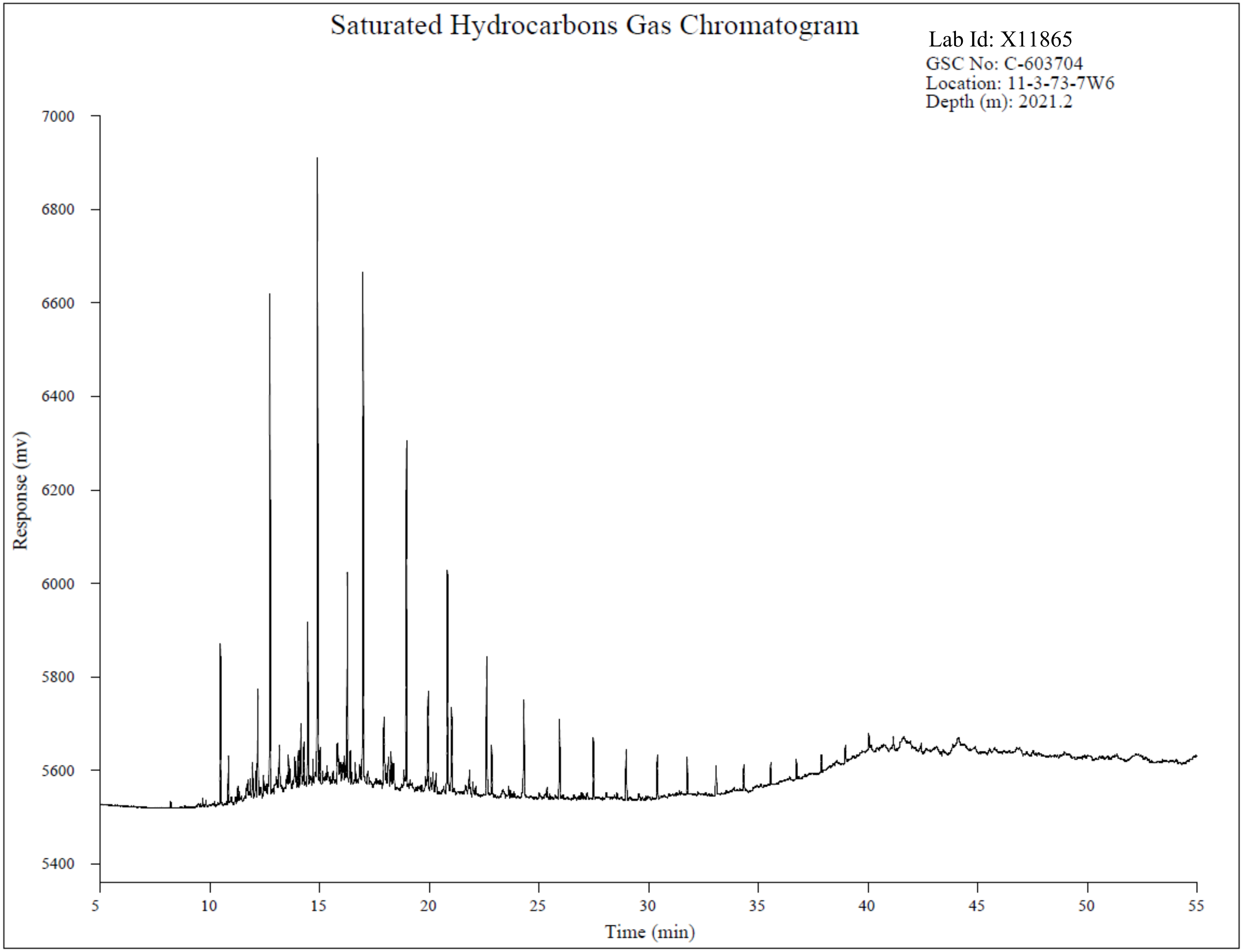
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11863
GSC No: C-603677
Location: 7-14-64-25W5
Depth (m): 2291.1
Response (mv)
7800
7600
7400
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07383
GSC No:
Location: 14-11-84-8W6
Depth (?): 3740.0
Response (mv)
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

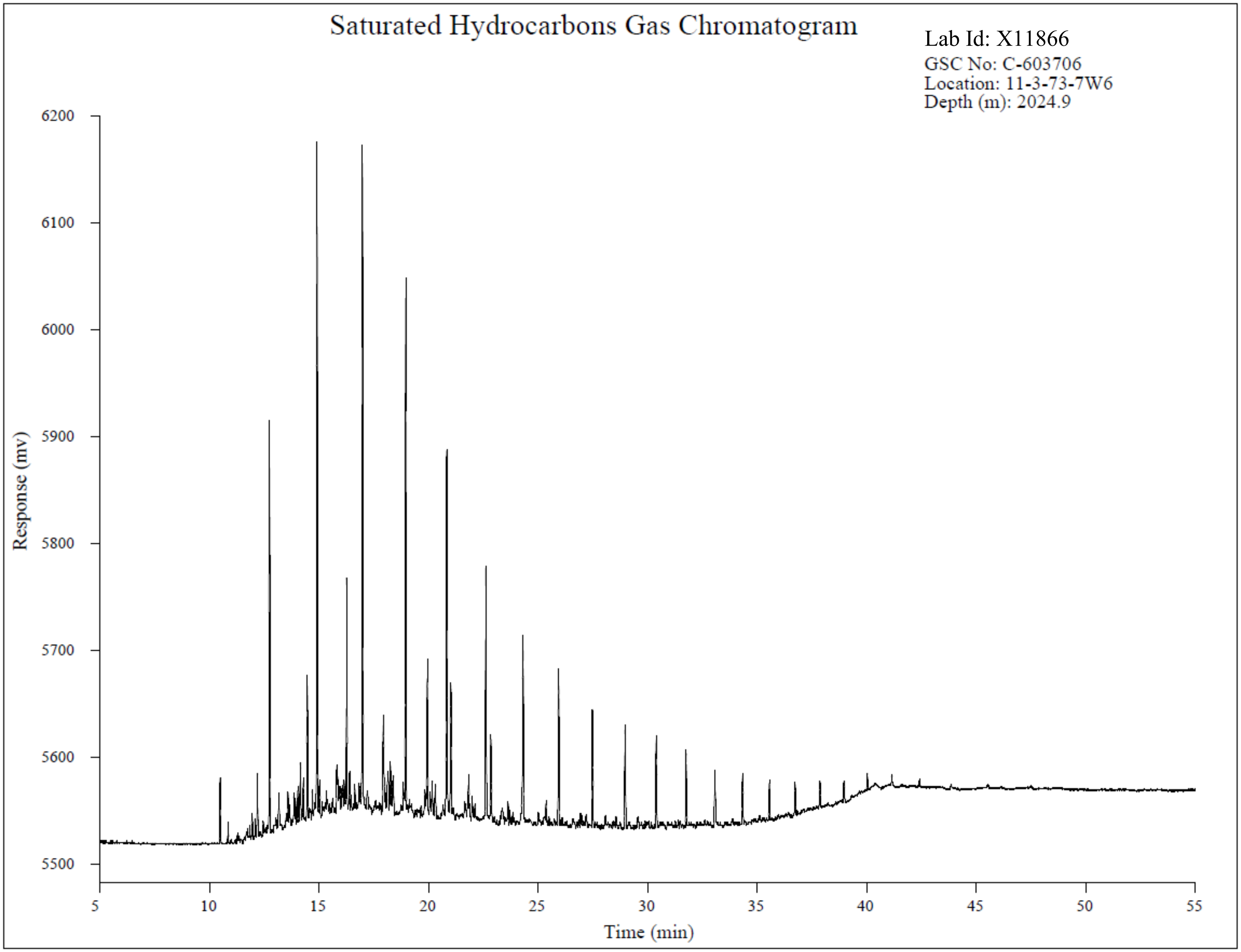

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07384
GSC No:
Location: 10-17-84-22W5
Depth (?): 2354.0
Response (mv)
6200
6100
6000
5900
5800
5700
5600
5500
5400
5300
5200
5100
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

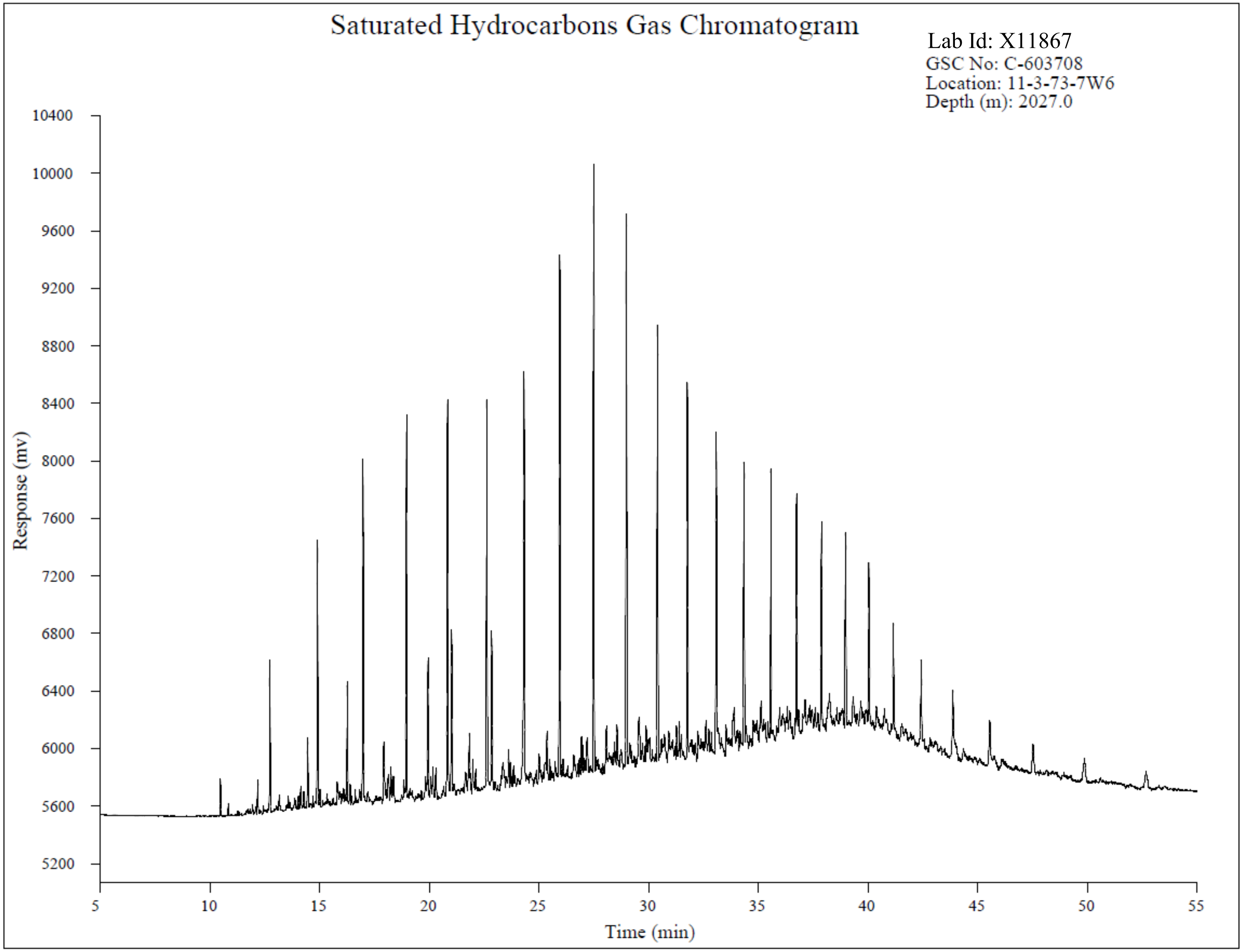

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07388
GSC No: C-517757
Location: 2-14-82-2W6
Depth (ft): 3300.0
Response (mv)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

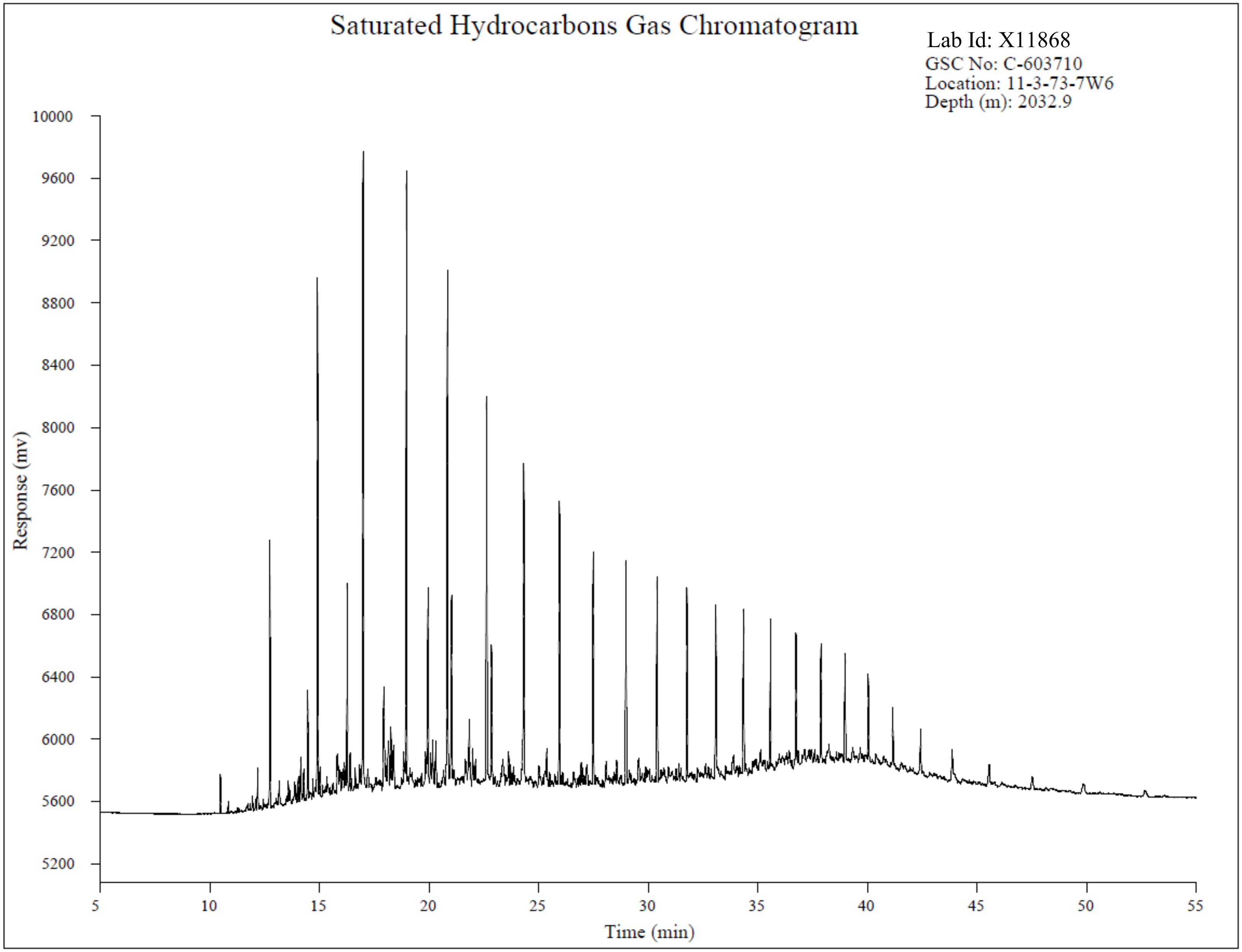

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11864
GSC No: C-603702
Location: 11-3-73-7W6
Depth (m): 2015.8
Response (mv)
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
5
10
15
20
25
30
35
40
45
50
55
Time (min)



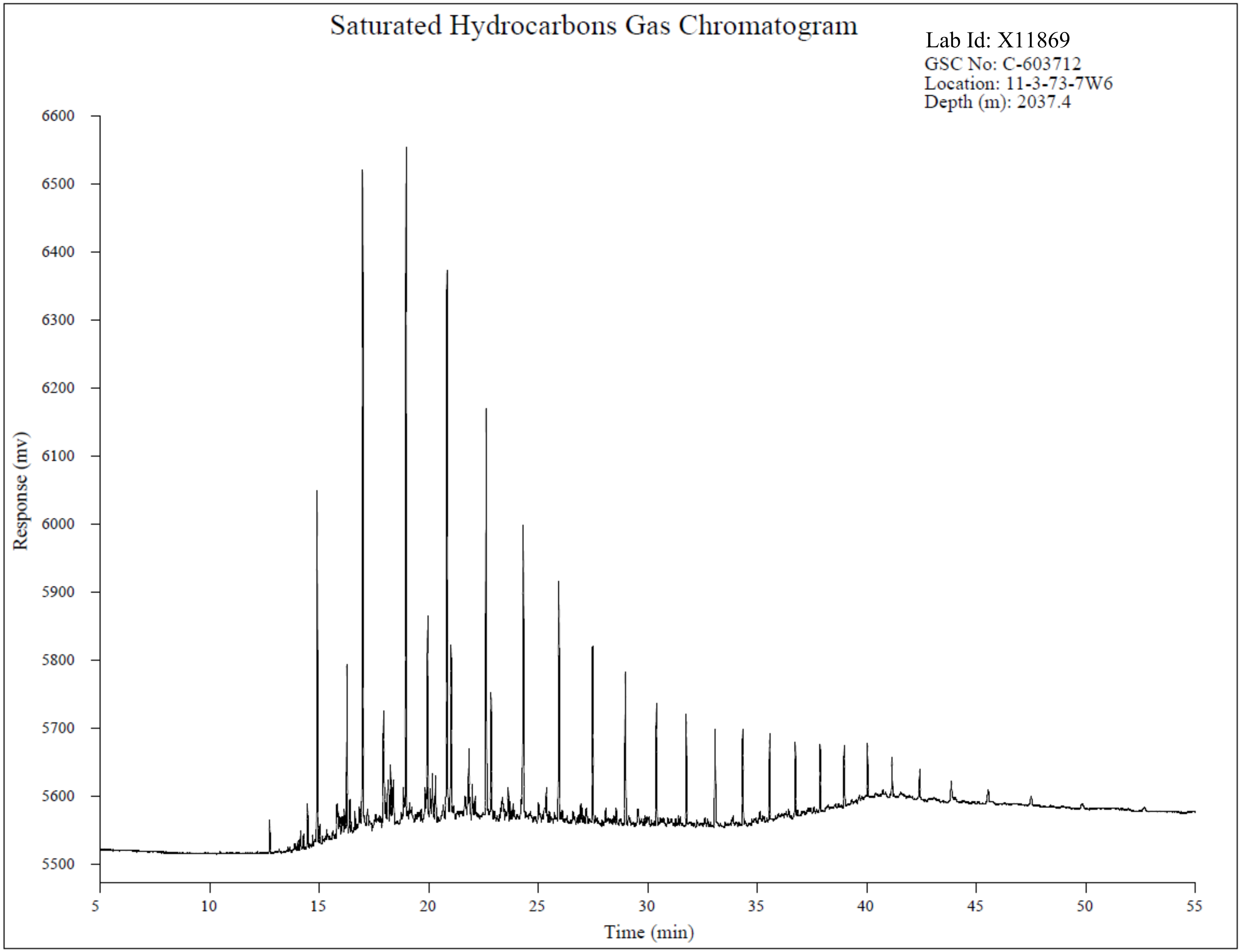
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11865
GSC No: C-603704
Location: 11-3-73-7W6
Depth (m): 2021.2
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

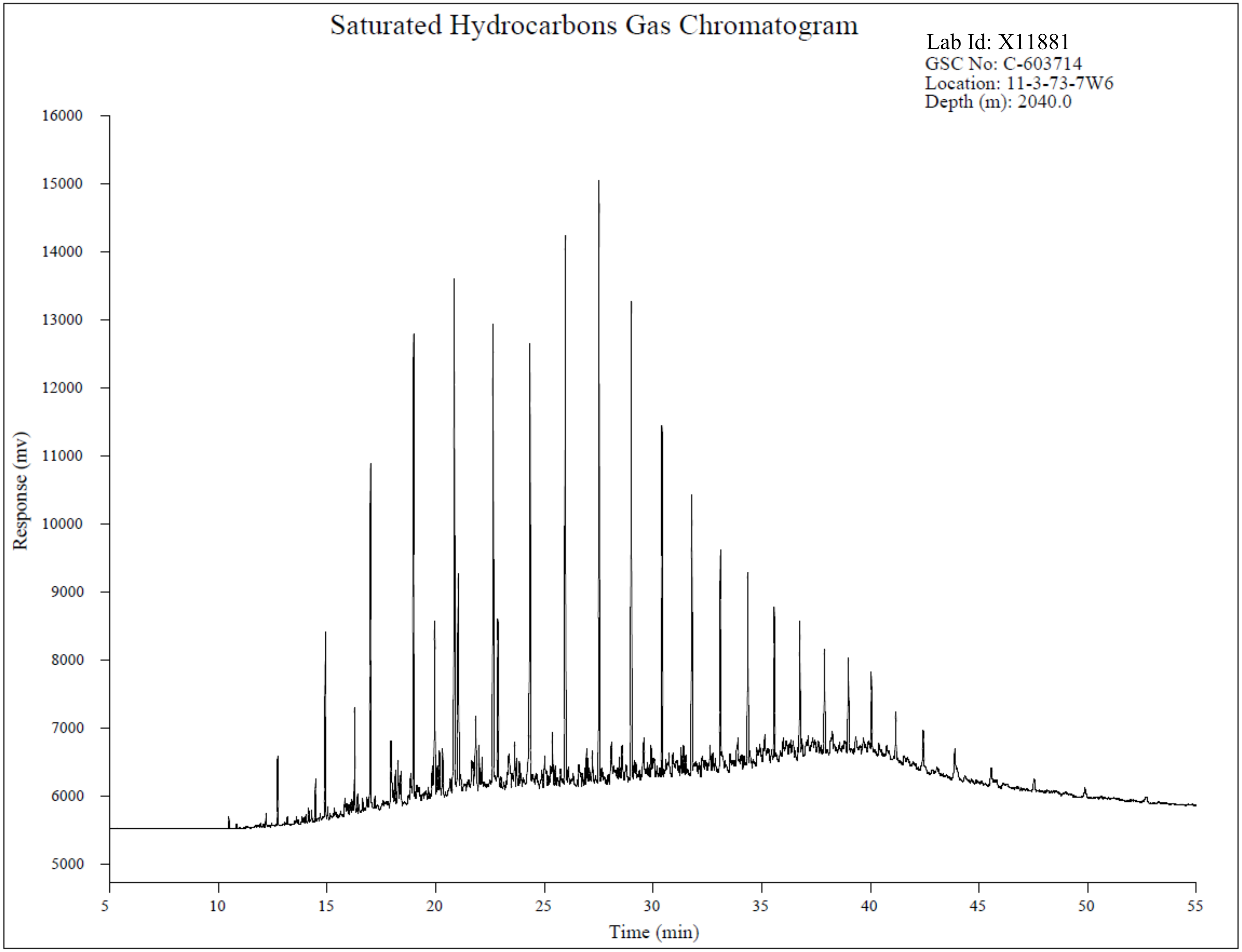

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11866
GSC No: C-603706
Location: 11-3-73-7W6
Depth (m): 2024.9
6200
6100
6000
5900
5800
5700
5600
5500
Response (mv)
5
10
15
20
25
30
35
40
45
50
55
Time (min)

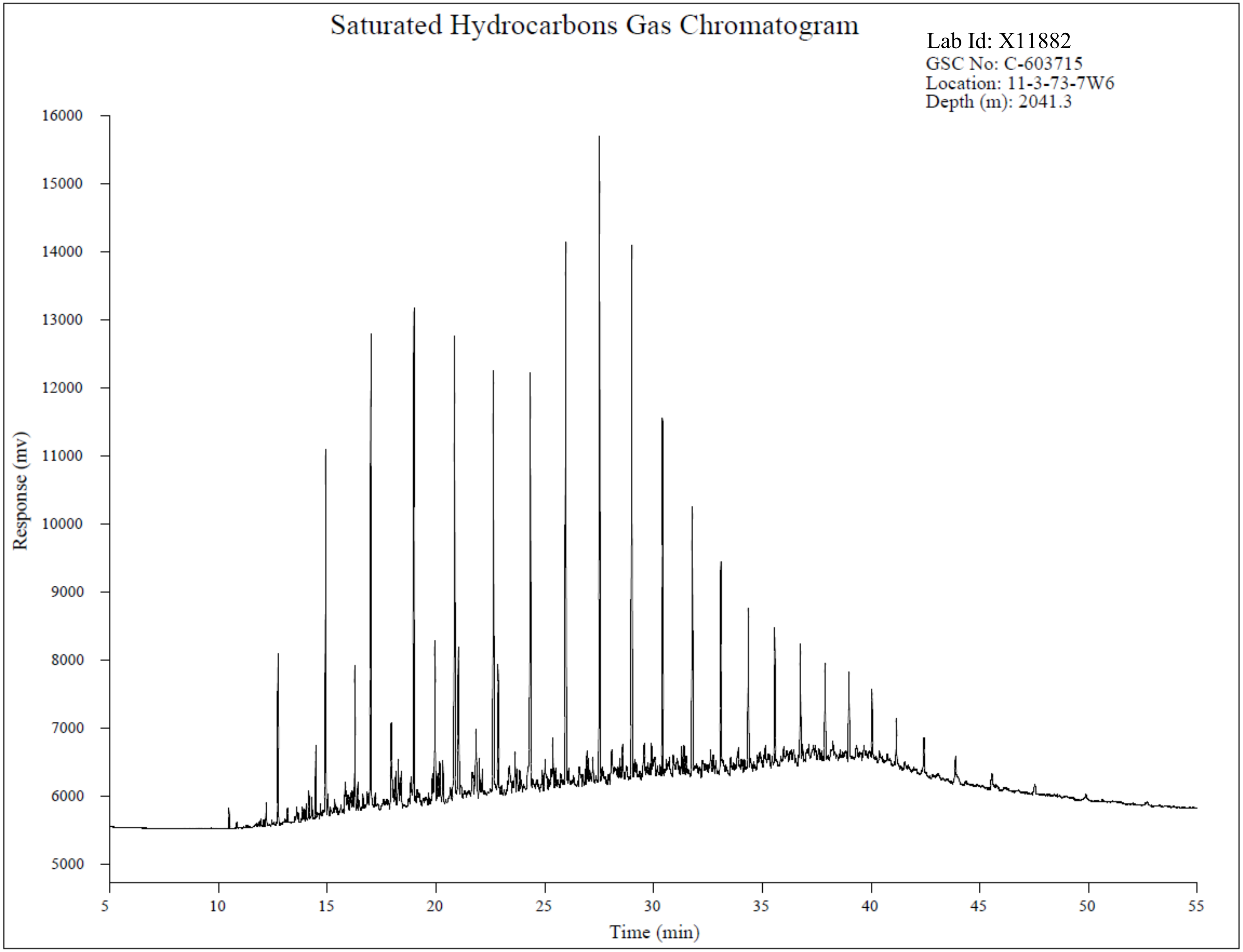

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11867
GSC No: C-603708
Location: 11-3-73-7W6
Depth (m): 2027.0
Response (mv)
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)



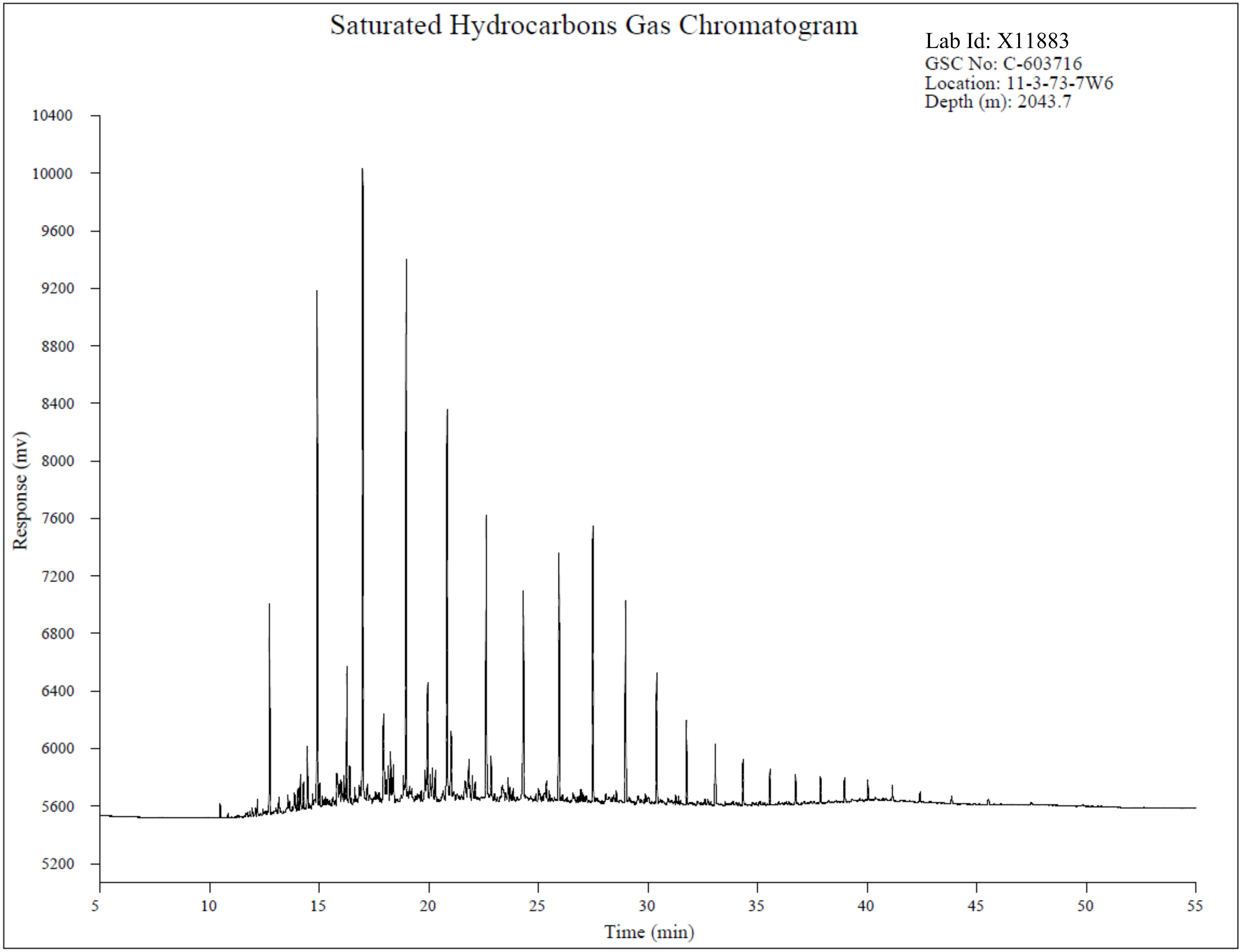
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11868
GSC No: C-603710
Location: 11-3-73-7W6
Depth (m): 2032.9
Response (mv)
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

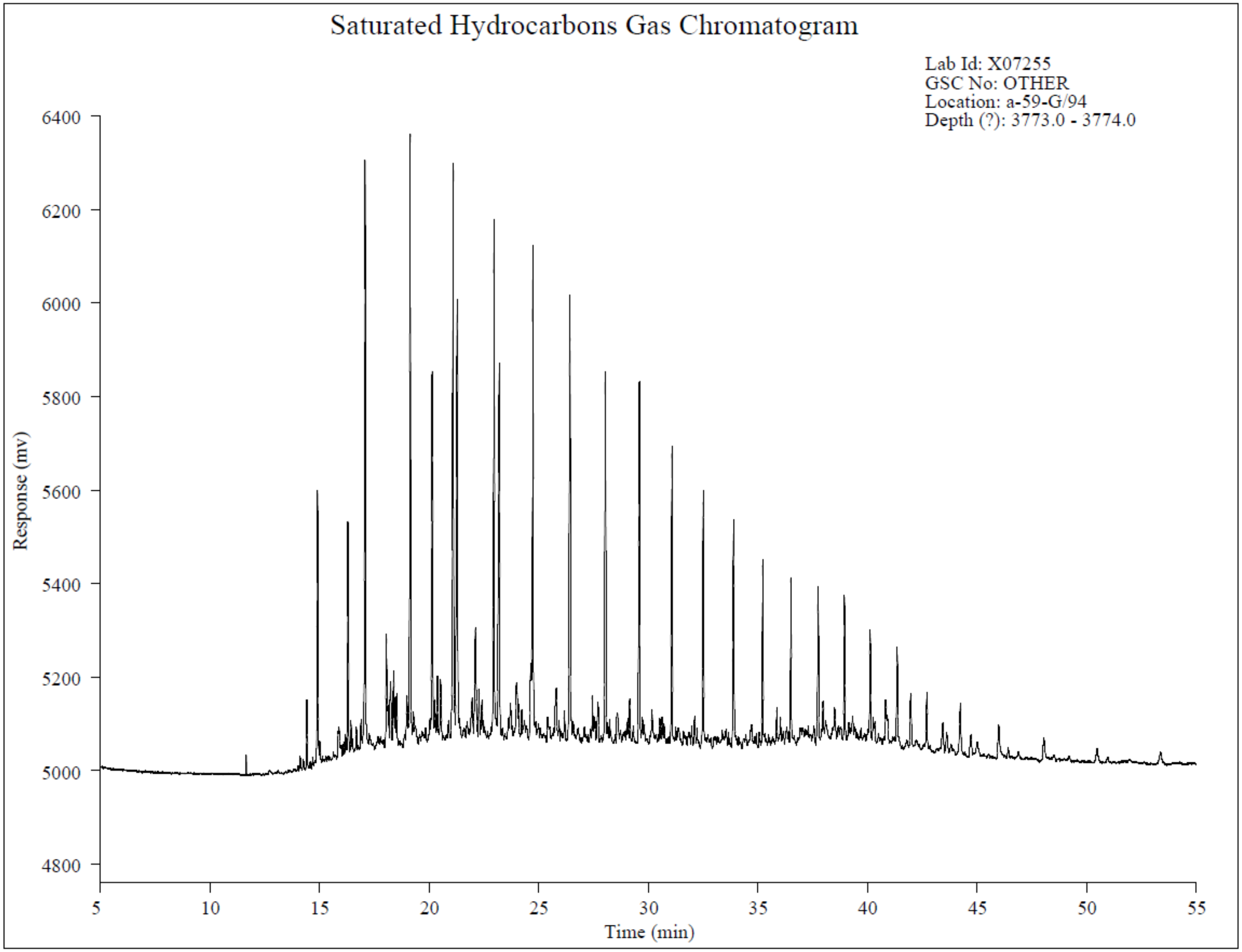

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11869
GSC No: C-603712
Location: 11-3-73-7W6
Depth (m): 2037.4
Response (mv)
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

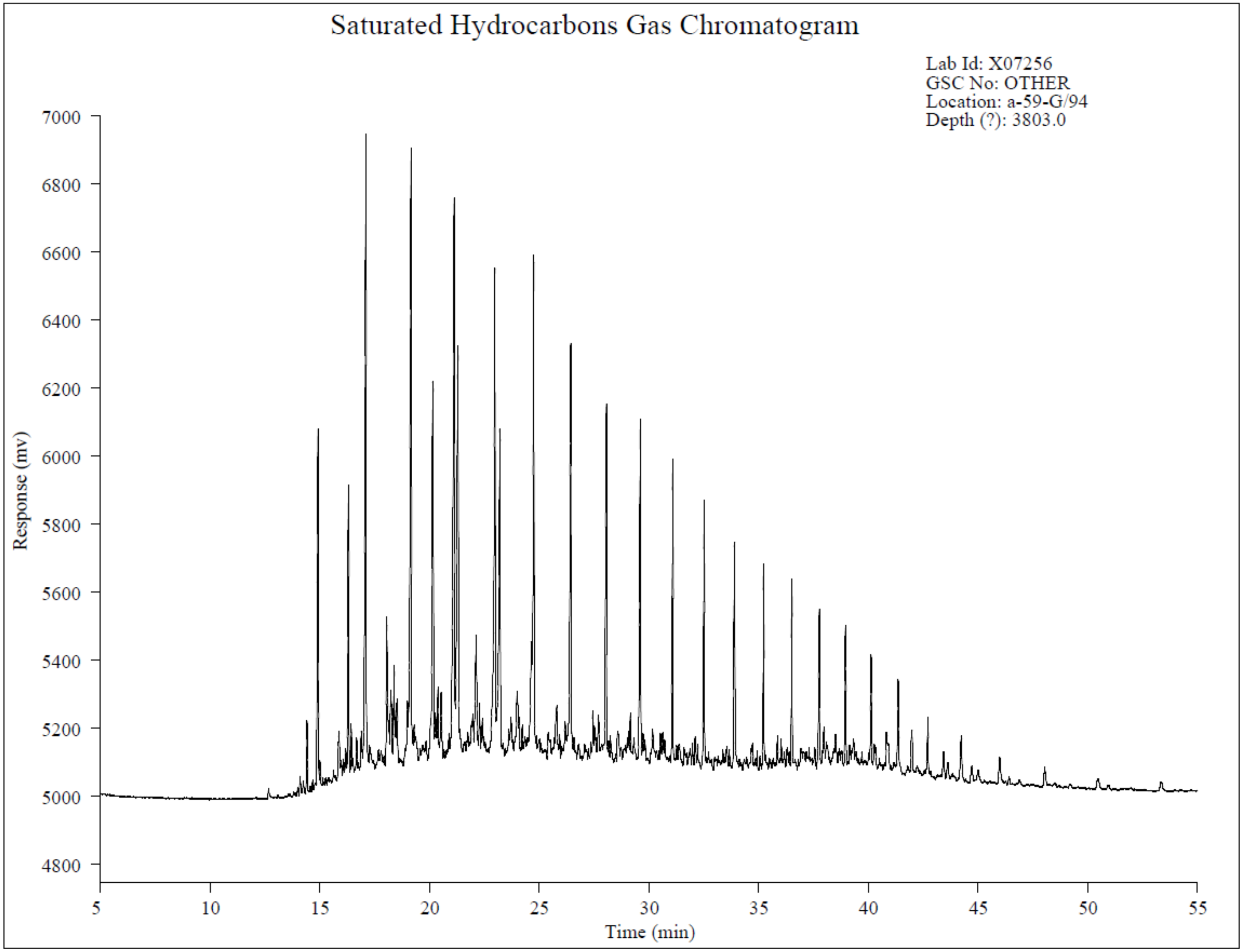

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11881
GSC No: C-603714
Location: 11-3-73-7W6
Depth (m): 2040.0
Response (mv)
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)



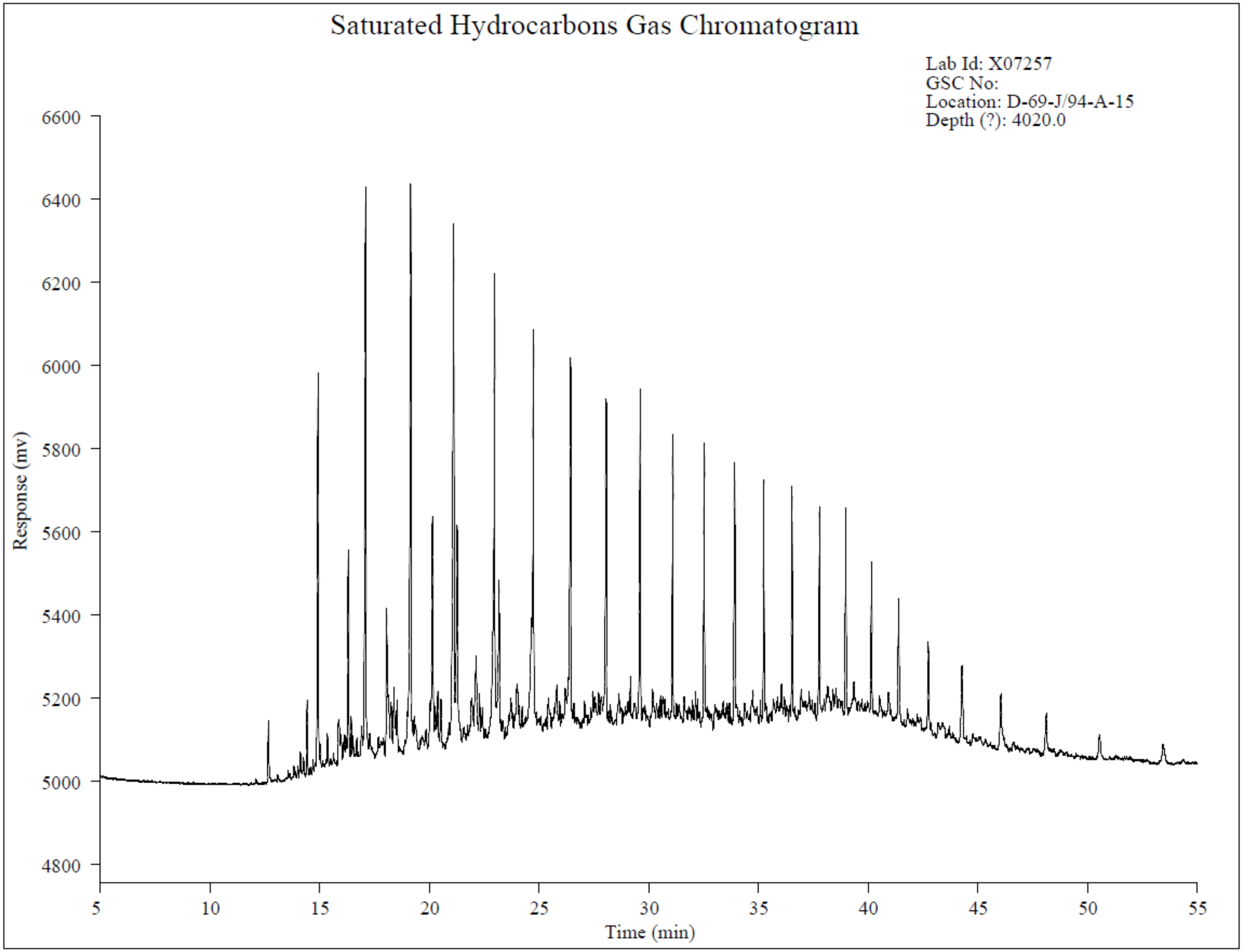
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11882
GSC No: C-603715
Location: 11-3-73-7W6
Depth (m): 2041.3
Response (mv)
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

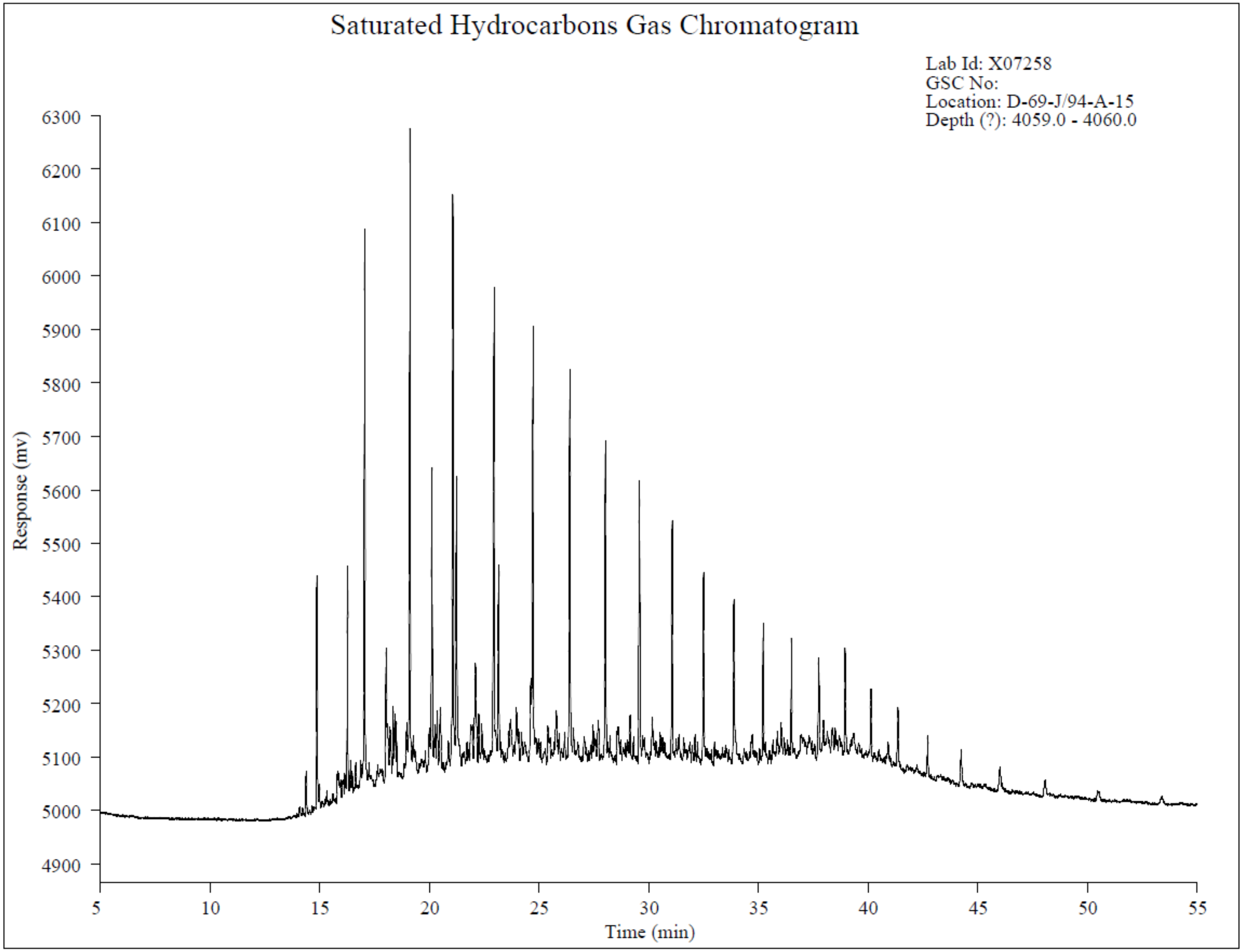

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11883
GSC No: C-603716
Location: 11-3-73-7W6
Depth (m): 2043.7
Response (mv)
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07255
GSC No: OTHER
Location: a-59-G/94
Depth (?): 3773.0 - 3774.0
Response (mv)
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

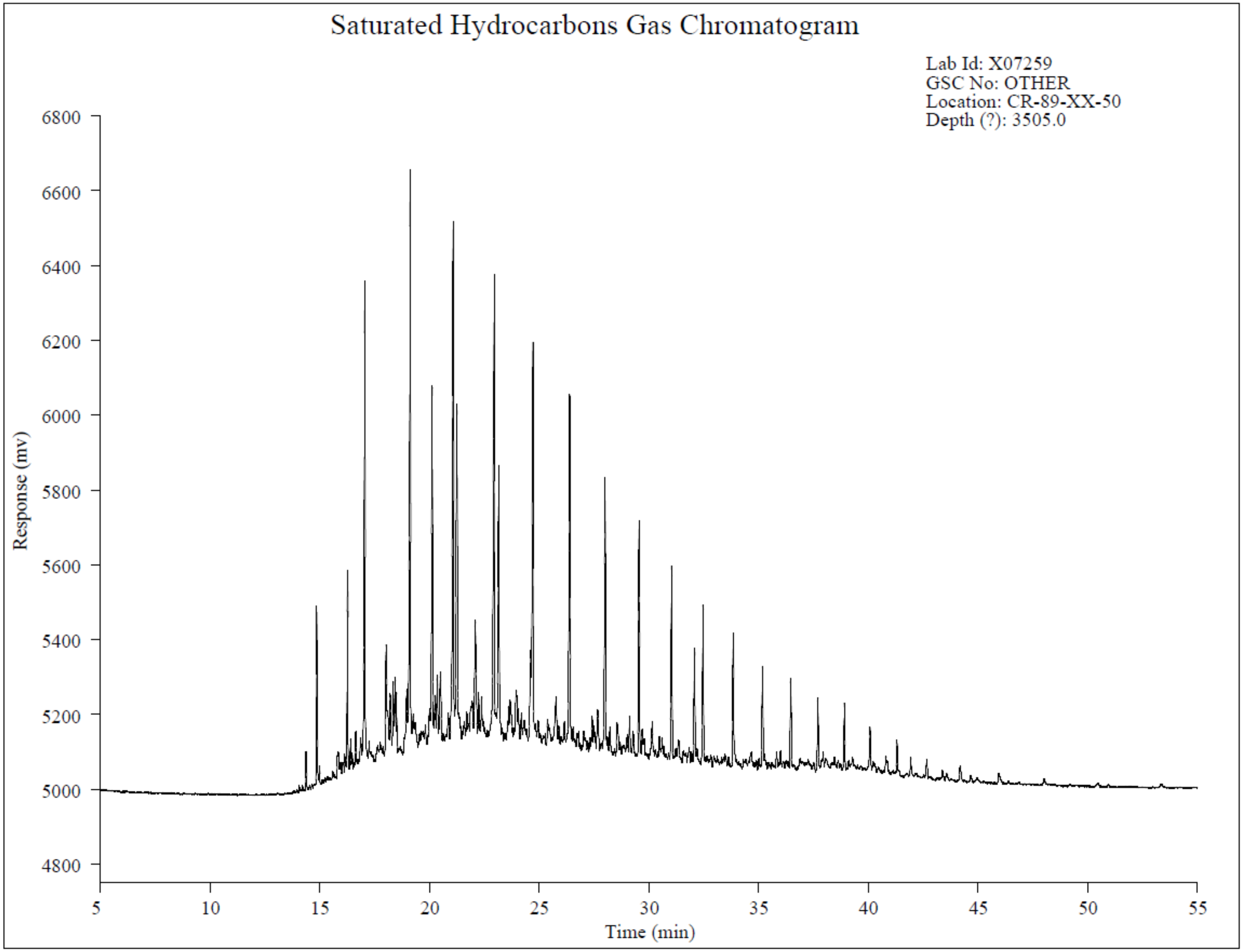


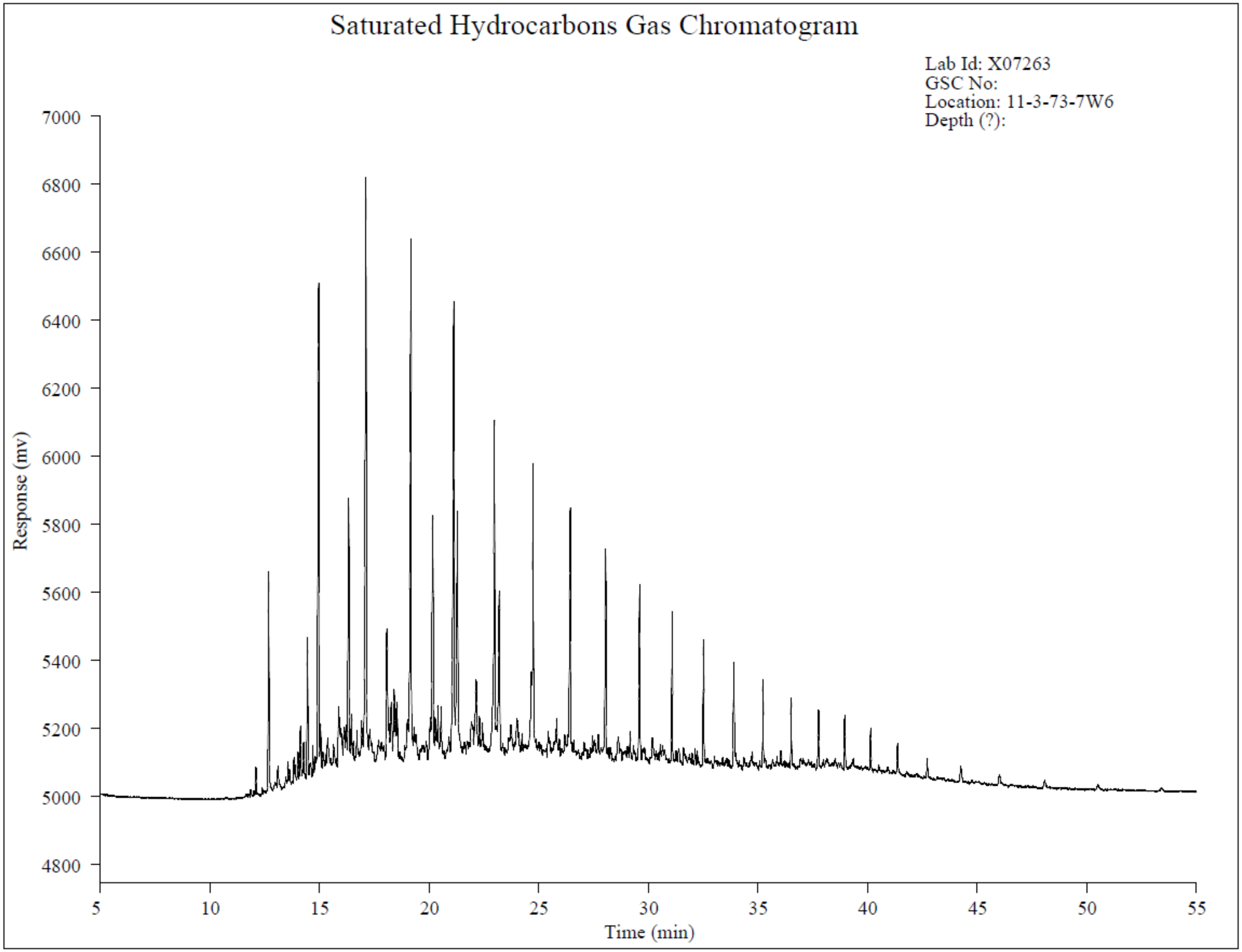
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07256
GSC No: OTHER
Location: a-59-G/94
Depth (?): 3803.0
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

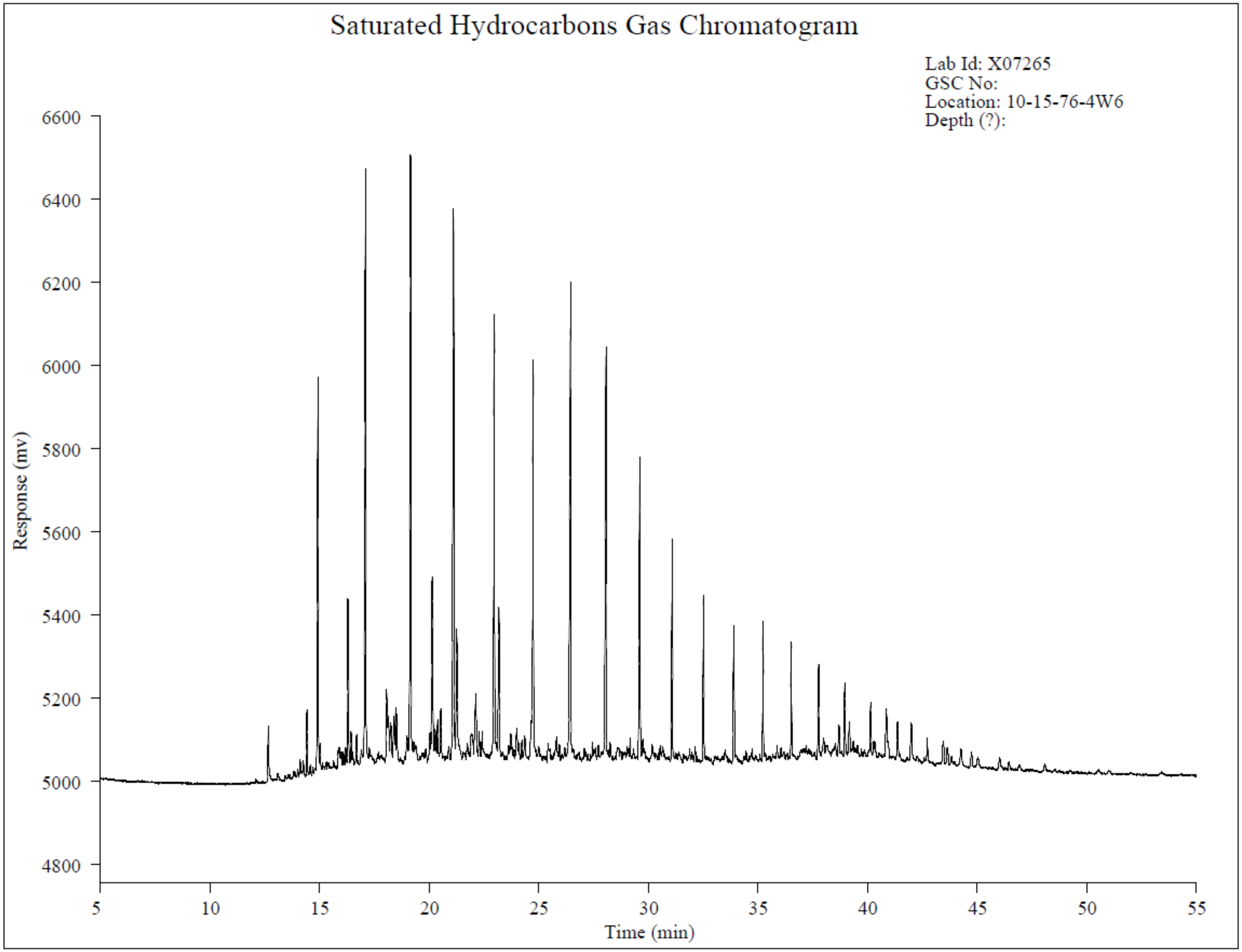

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07257
GSC No:
Location: D-69-J/94-A-15
Depth (?): 4020.0
Response (mv)
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

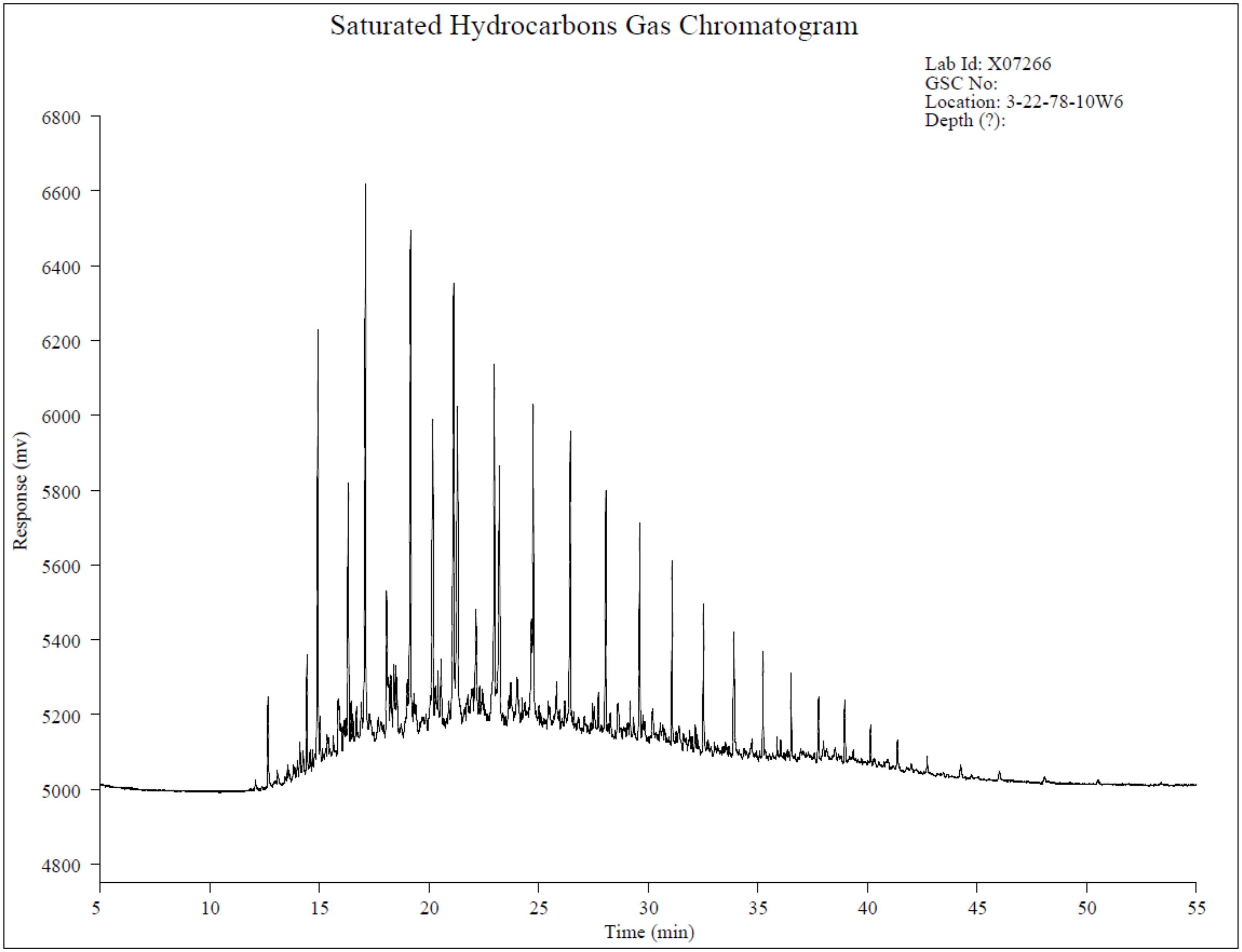


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07258
GSC No:
Location: D-69-J/94-A-15
Depth (?): 4059.0 - 4060.0
Response (mv)
6300
6200
6100
6000
5900
5800
5700
5600
5500
5400
5300
5200
5100
5000
4900
5
10
15
20
25
30
35
40
45
50
55
Time (min)

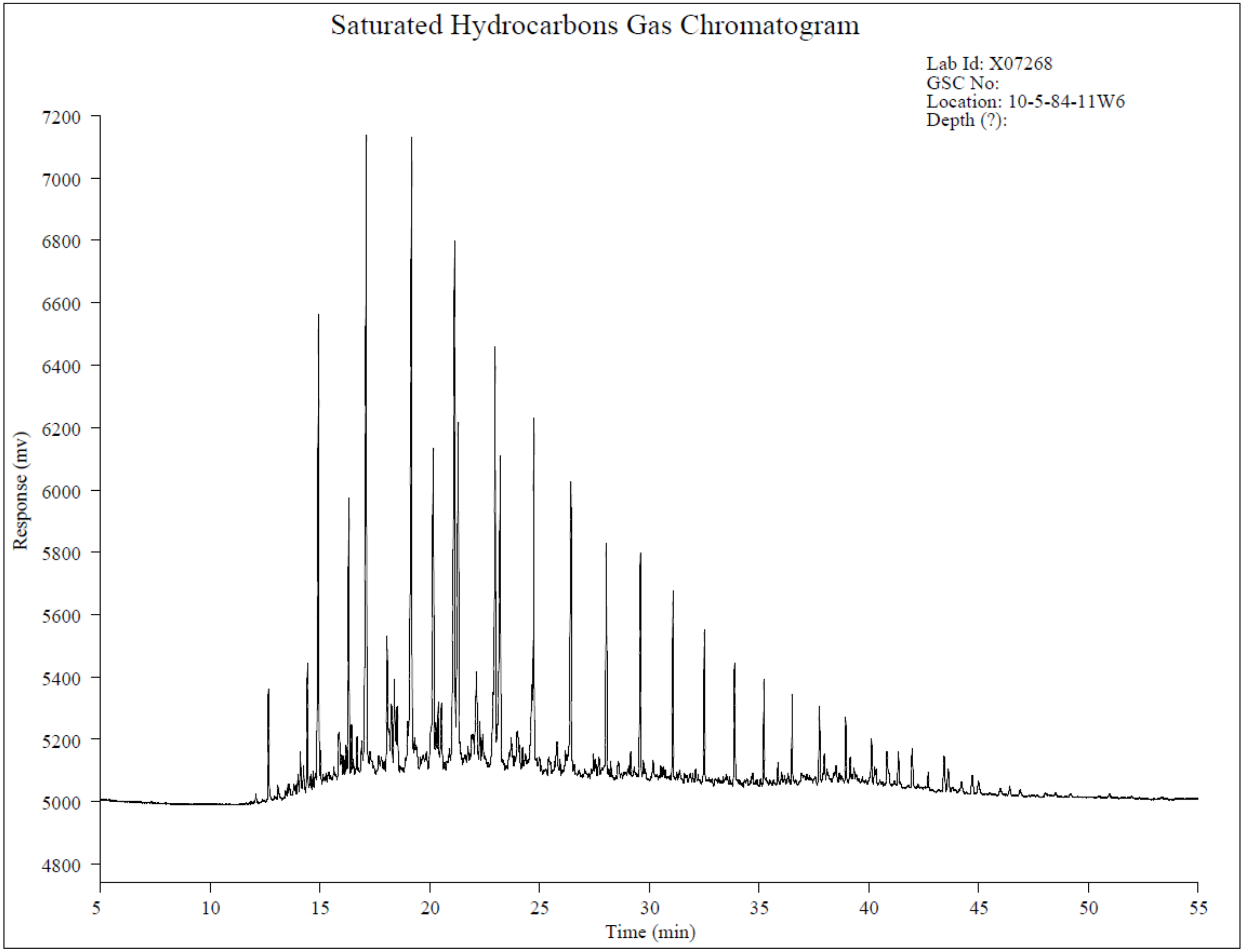

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07259
GSC No: OTHER
Location: CR-89-XX-50
Depth (?): 3505.0
Response (mv)
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

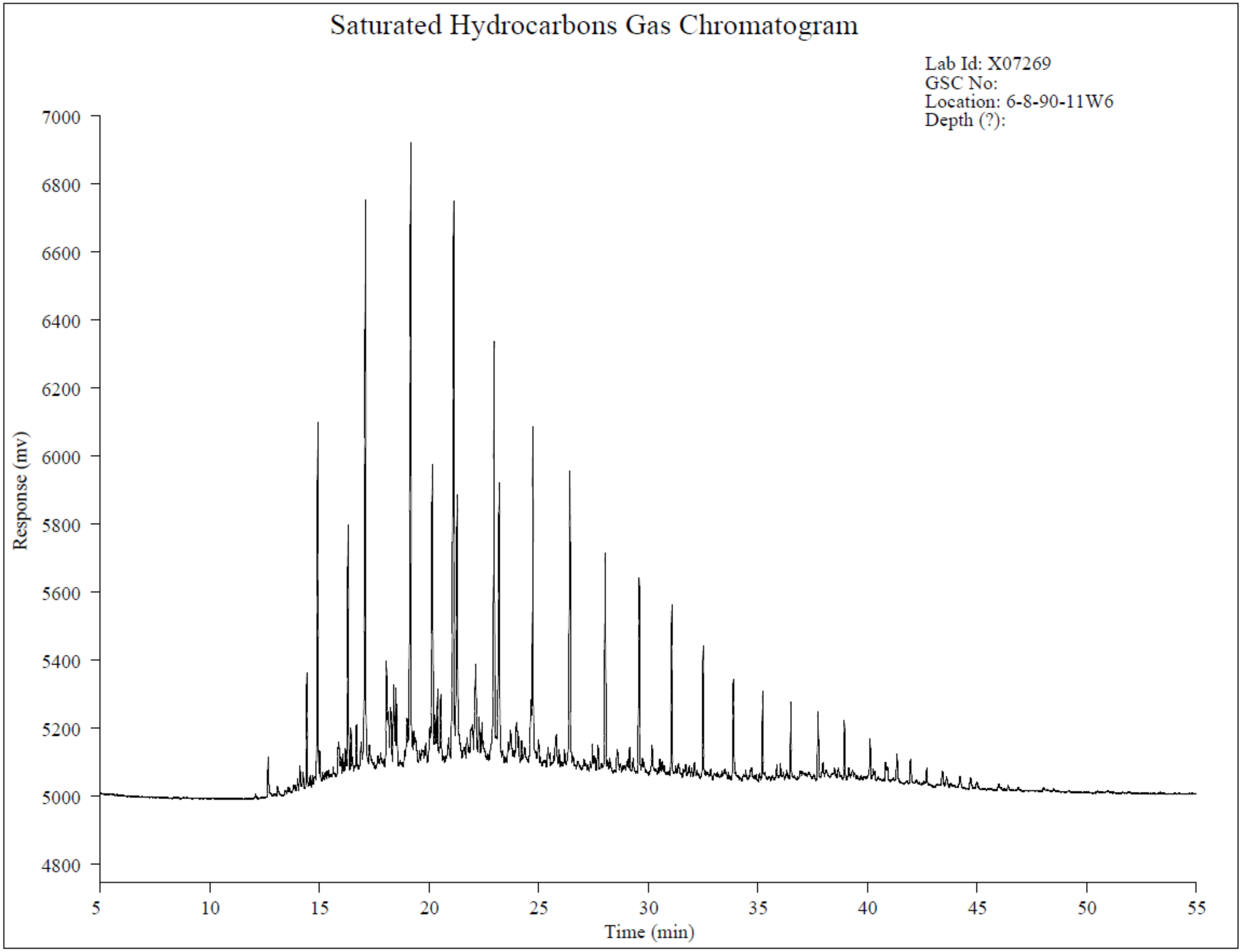

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07263
GSC No:
Location: 11-3-73-7W6
Depth (?):
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

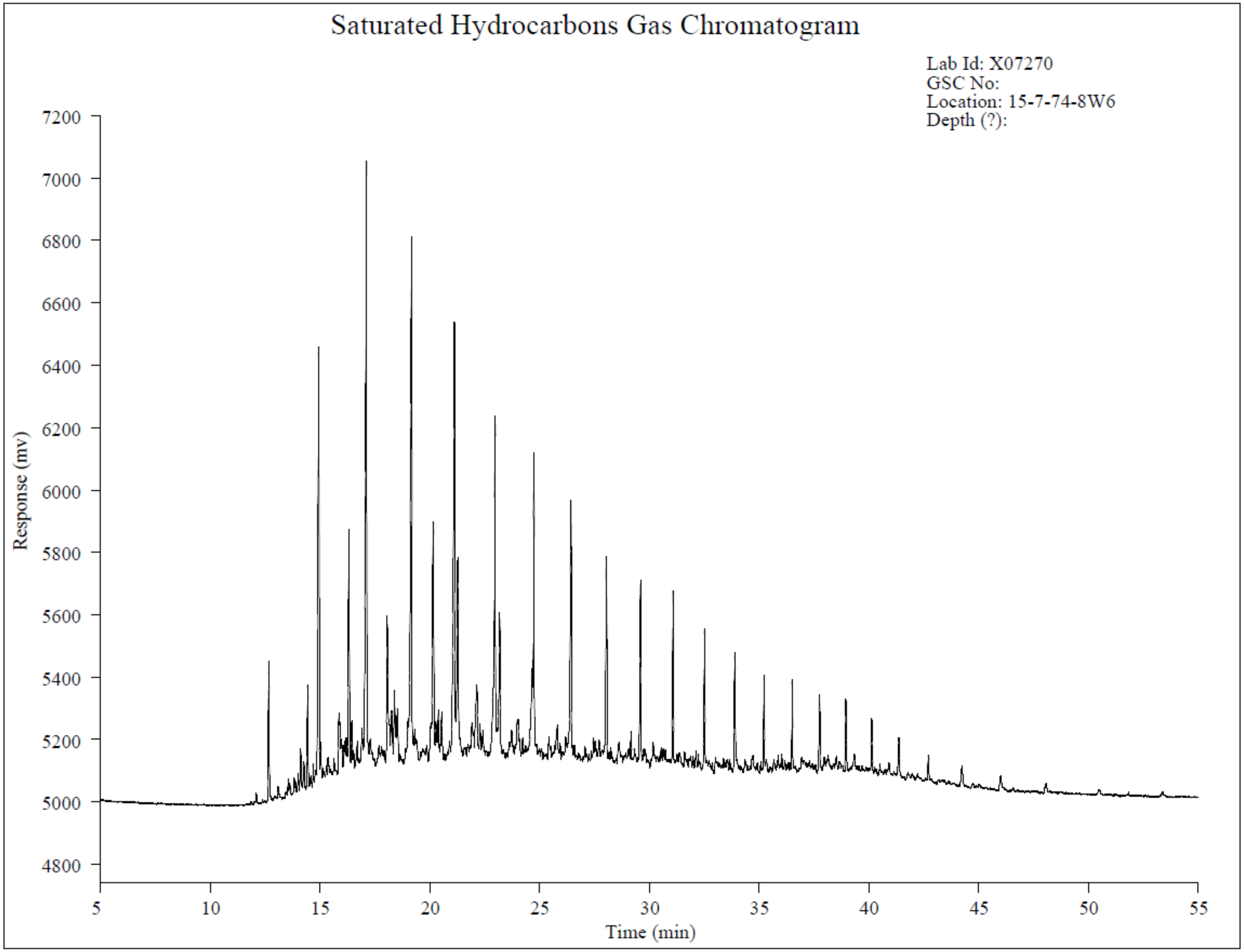

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07265
GSC No:
Location: 10-15-76-4W6
Depth (?):
Response (mv)
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

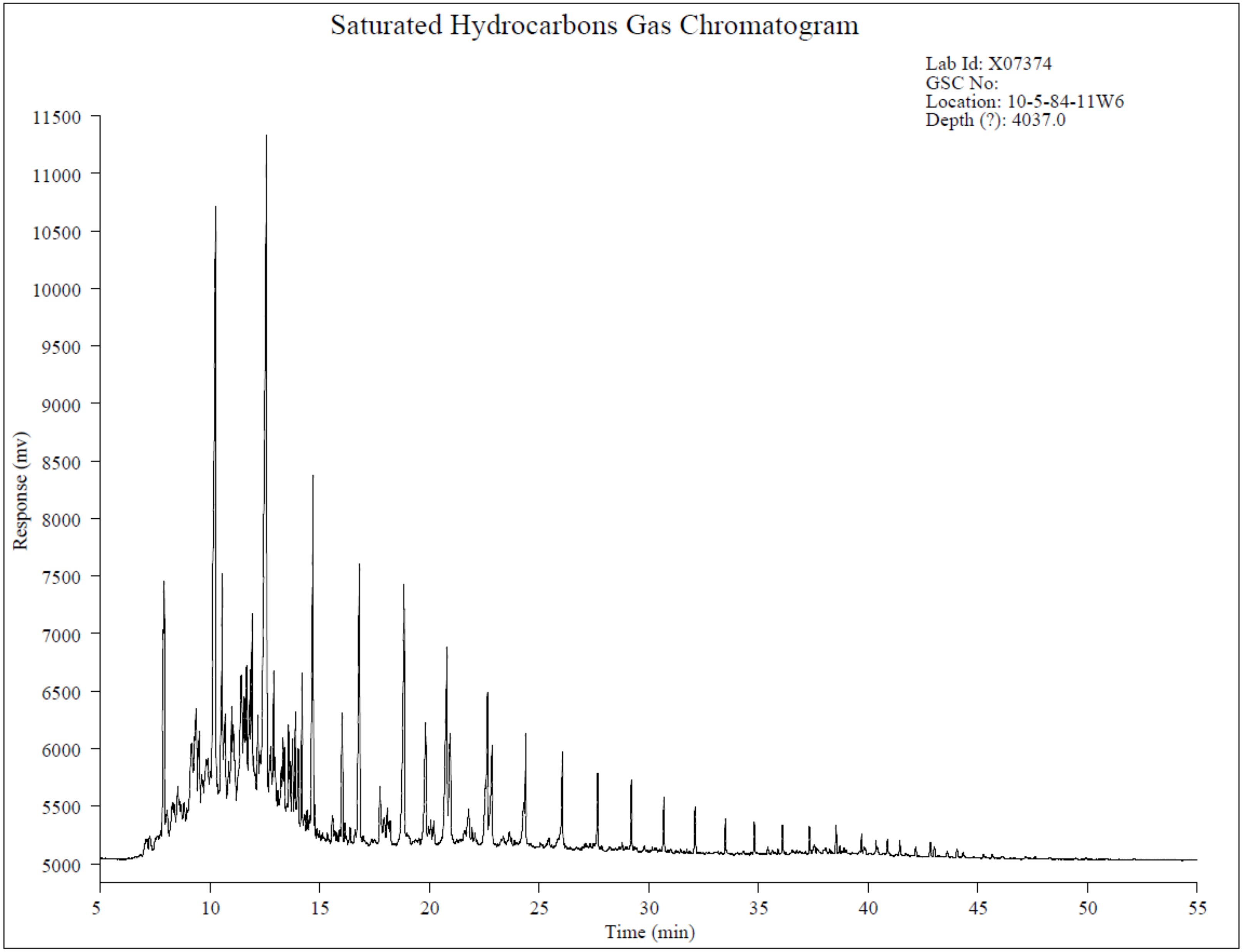


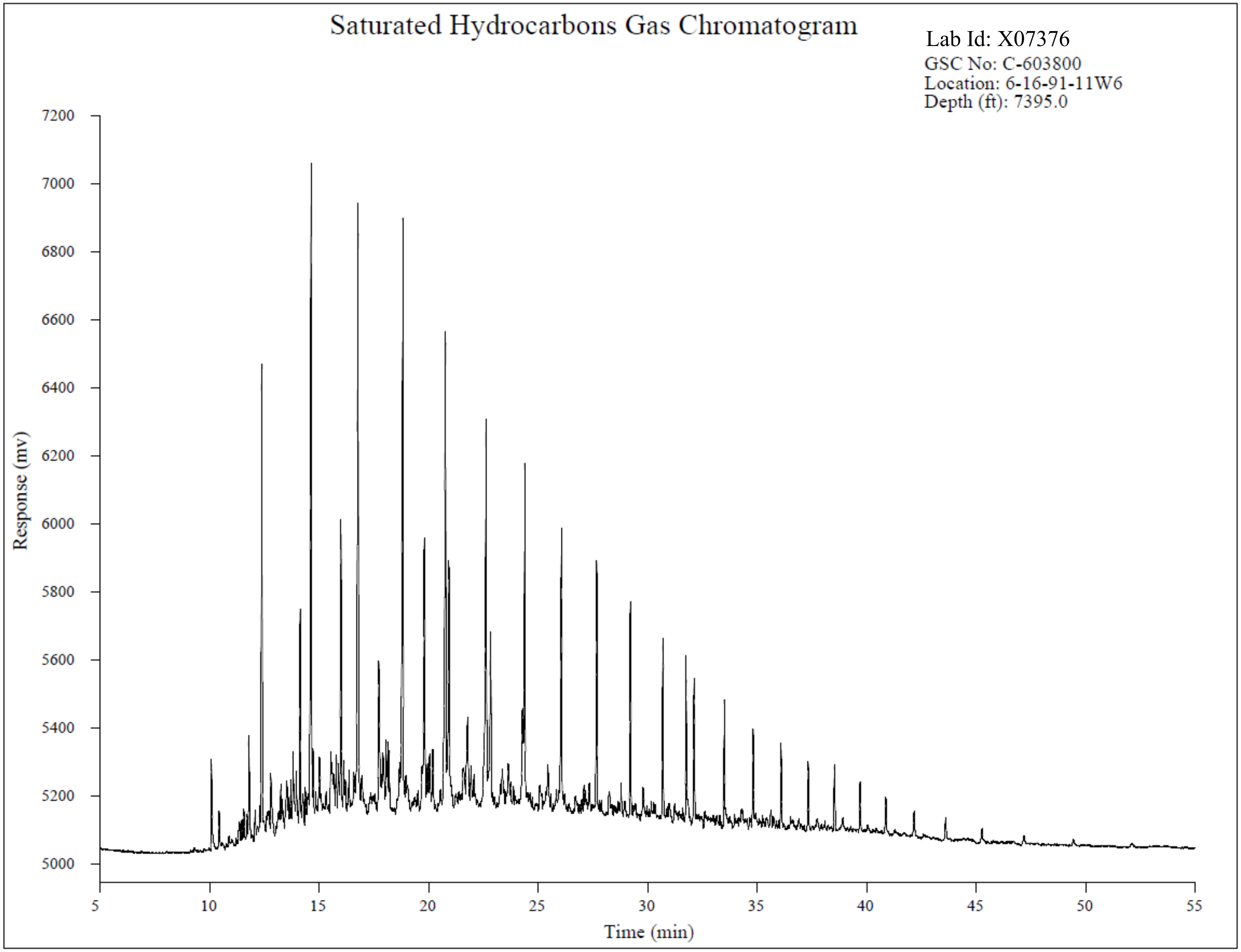
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07266
GSC No:
Location: 3-22-78-10W6
Depth (?):
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
Response (mv)
5
10
15
20
25
30
35
40
45
50
55
Time (min)

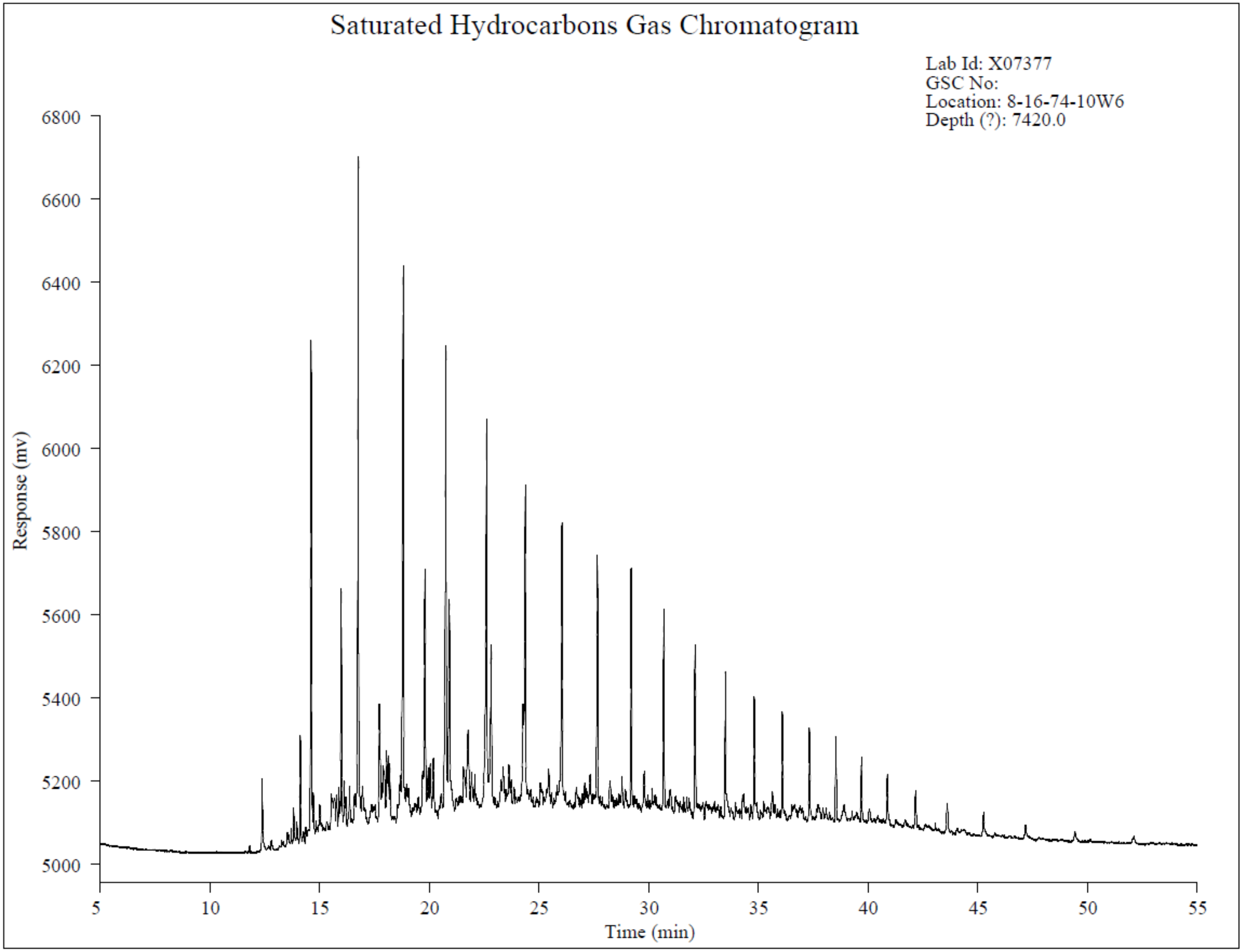

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07268
GSC No:
Location: 10-5-84-11W6
Depth (?):
Response (mv)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

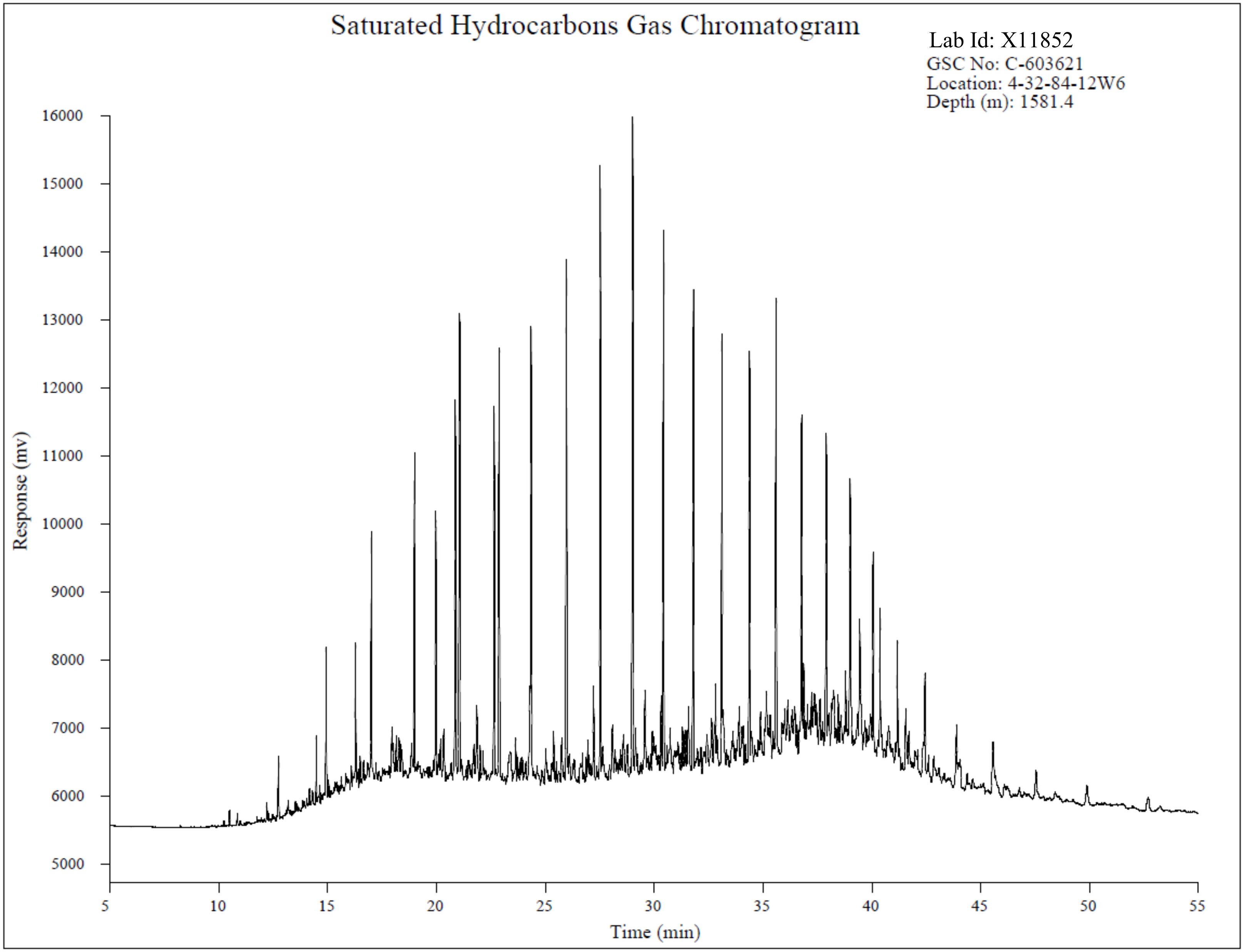

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07269
GSC No:
Location: 6-8-90-11W6
Depth (?):
Response (mv)
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07270
GSC No:
Location: 15-7-74-8W6
Depth (?):
Response (mv)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

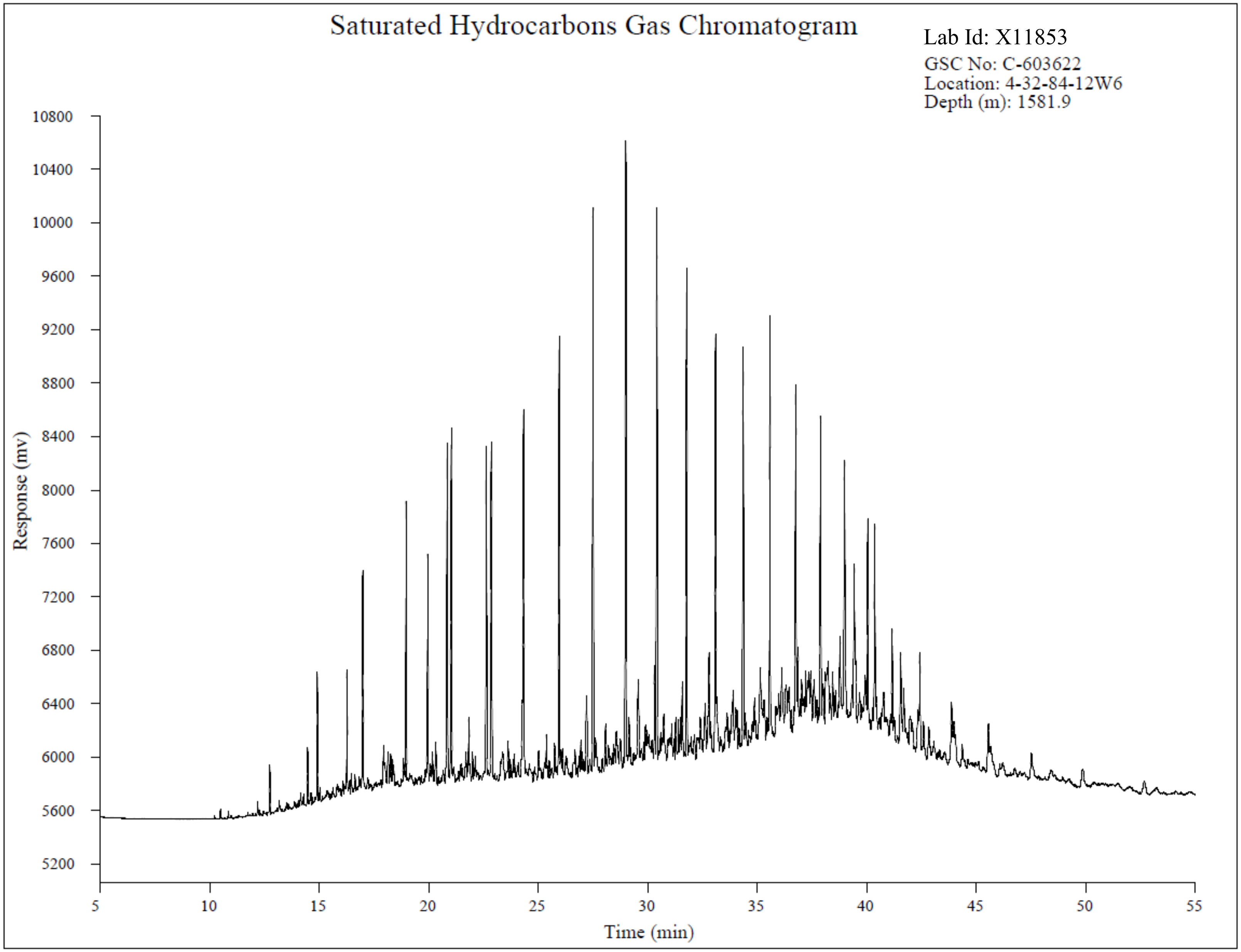

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07374
GSC No:
Location: 10-5-84-11W6
Depth (?): 4037.0
Response (mv)
11500
11000
10500
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07376
GSC No: C-603800
Location: 6-16-91-11W6
Depth (ft): 7395.0
Response (mv)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

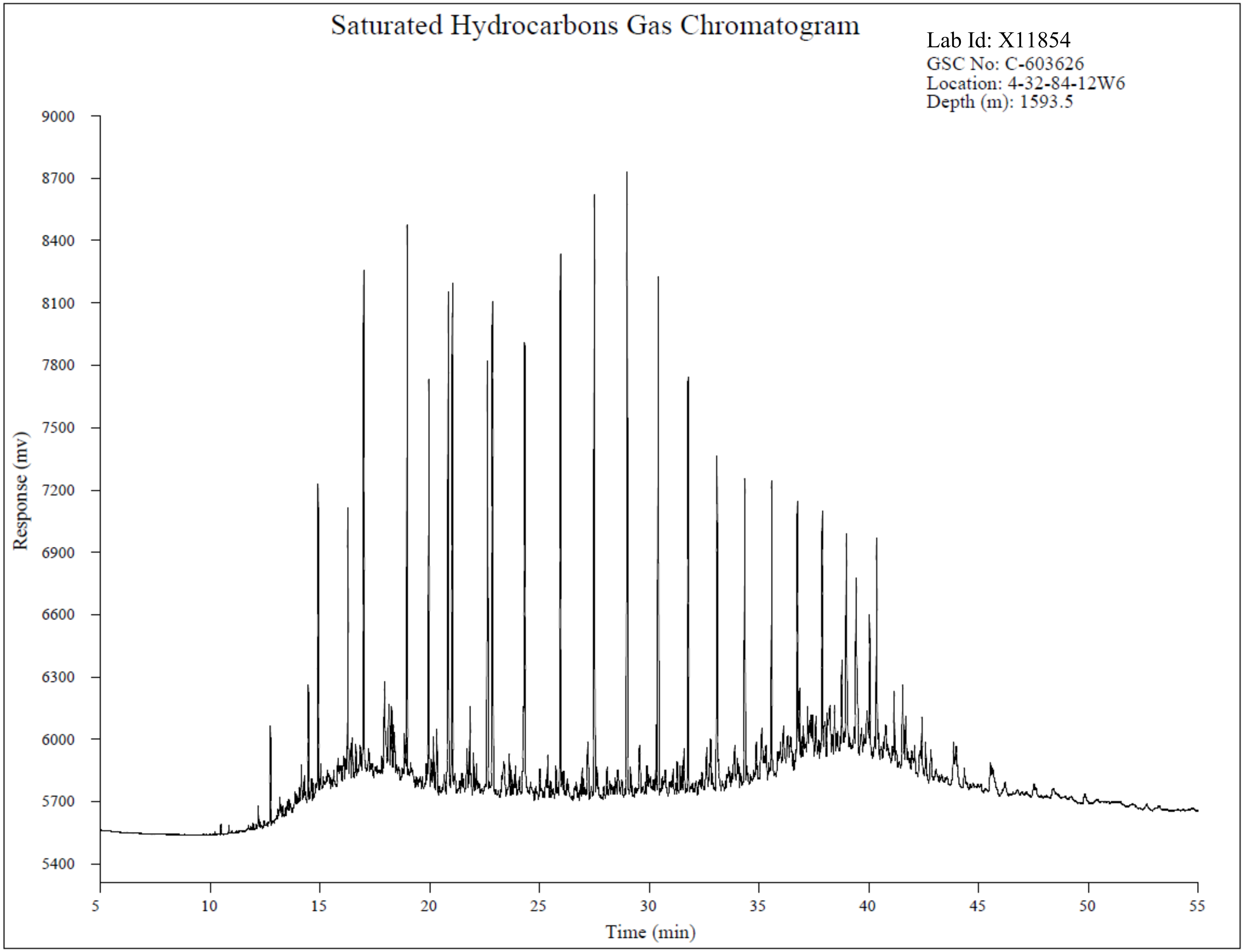

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X07377
GSC No:
Location: 8-16-74-10W6
Depth (?): 7420.0
Response (mv)
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

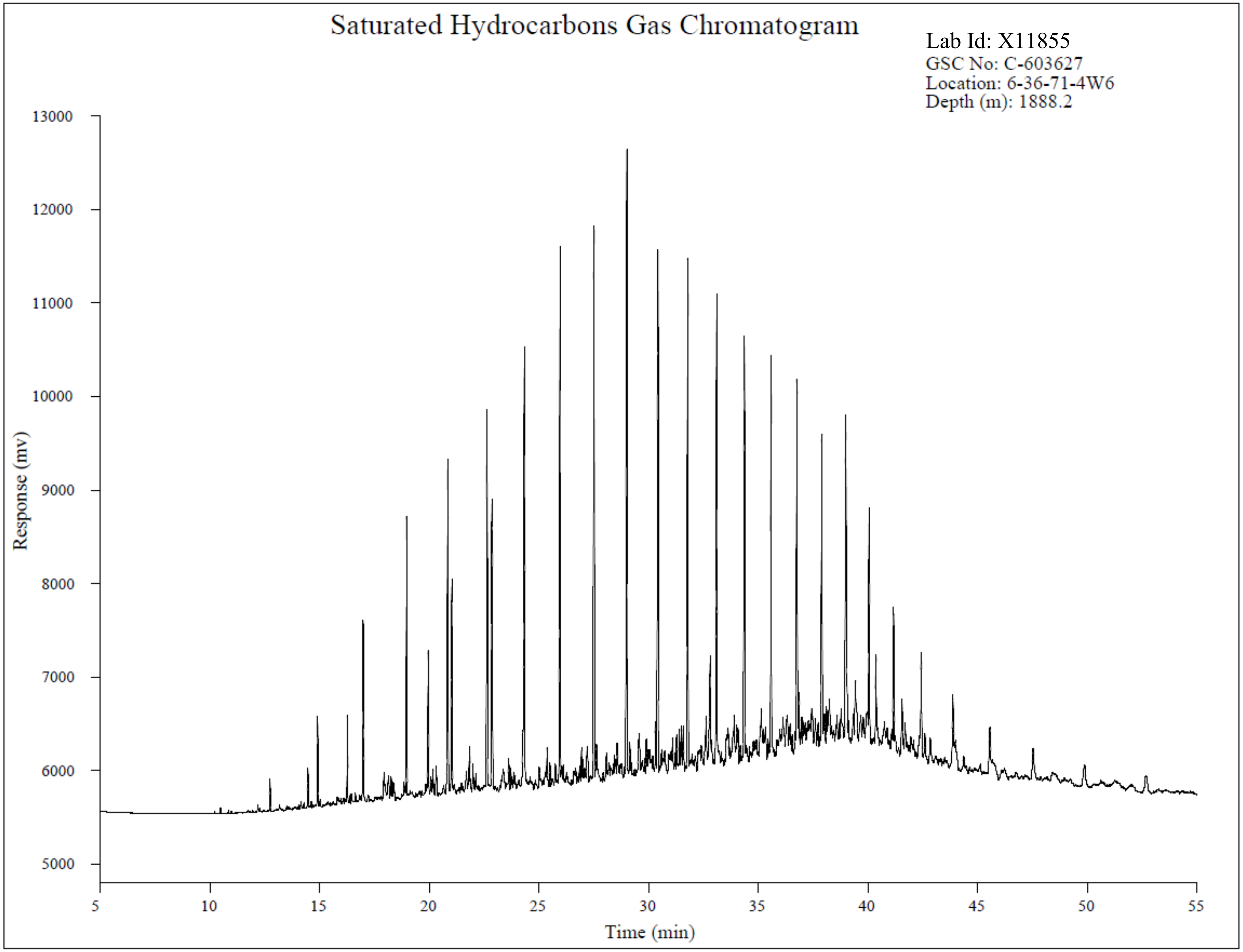


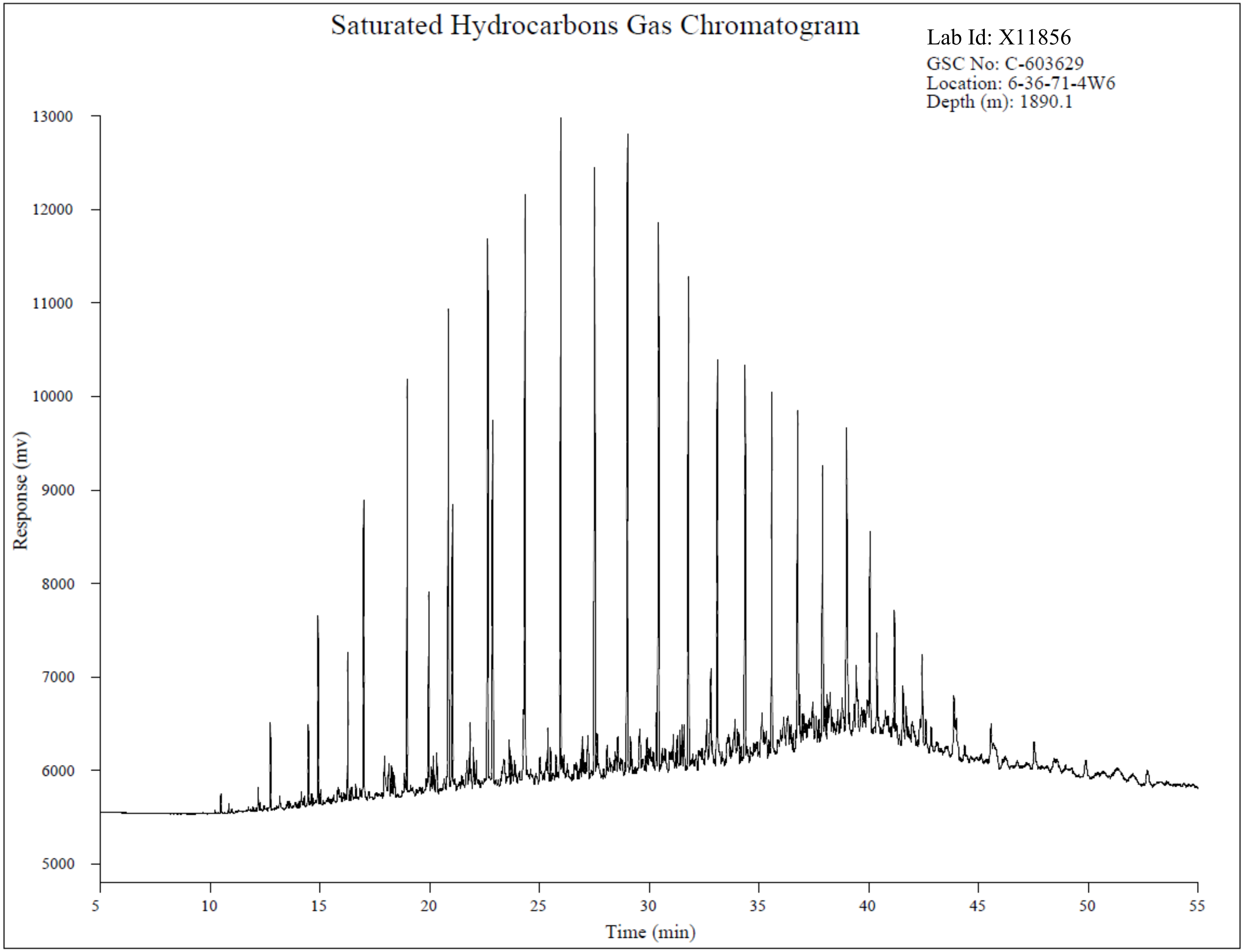
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11852
GSC No: C-603621
Location: 4-32-84-12W6
Depth (m): 1581.4
Response (mv)
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

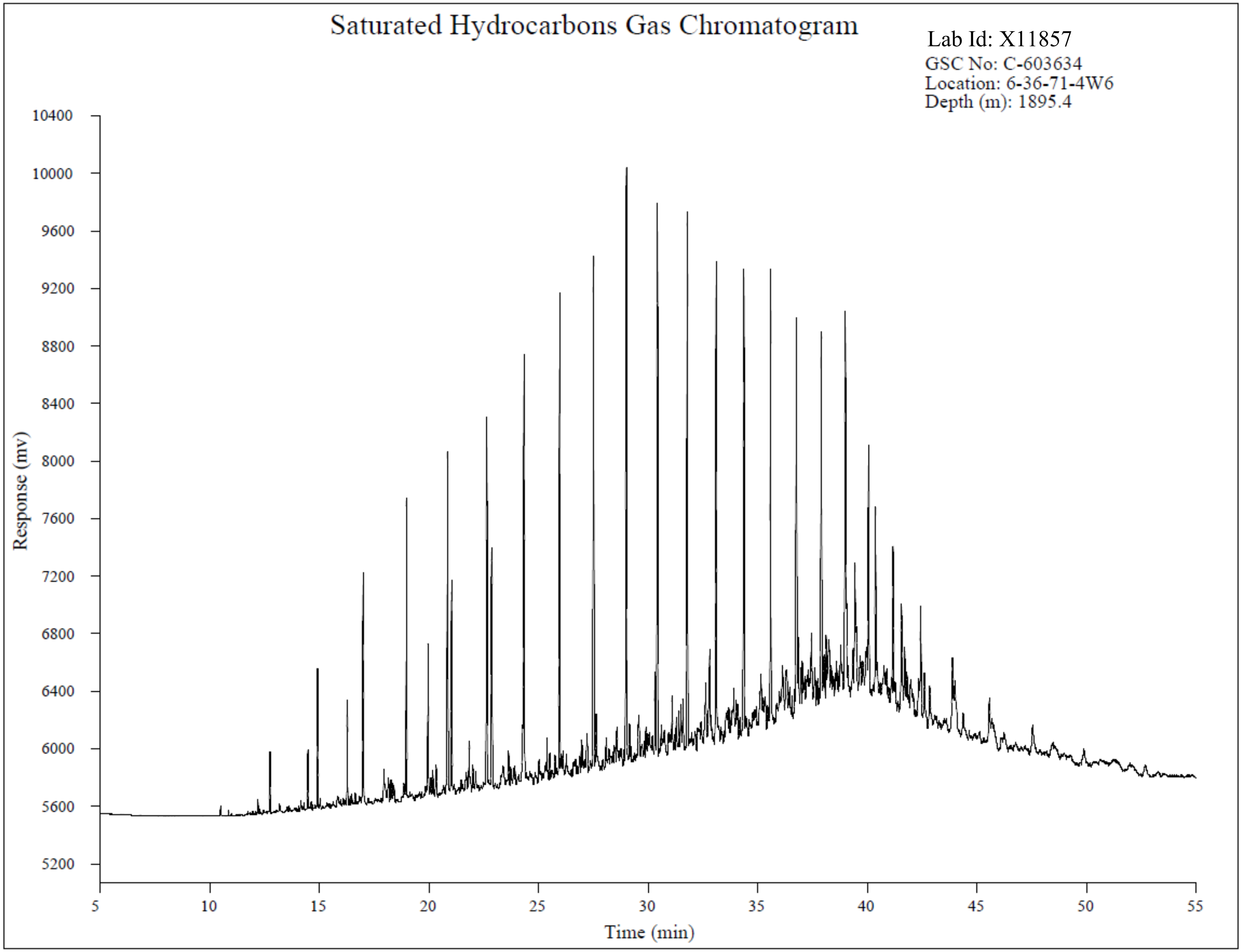


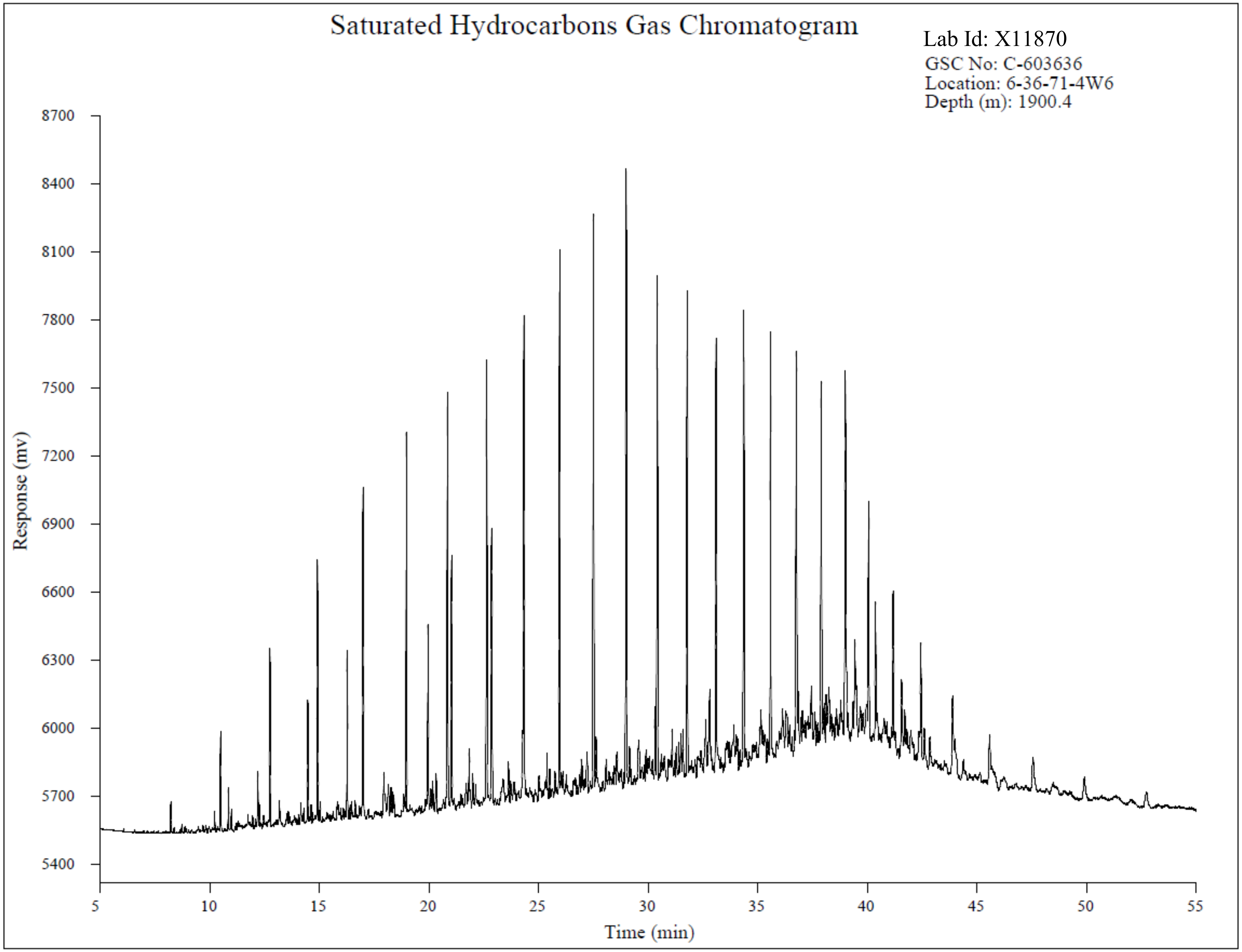
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11853
GSC No: C-603622
Location: 4-32-84-12W6
Depth (m): 1581.9
Response (mv)
10800
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

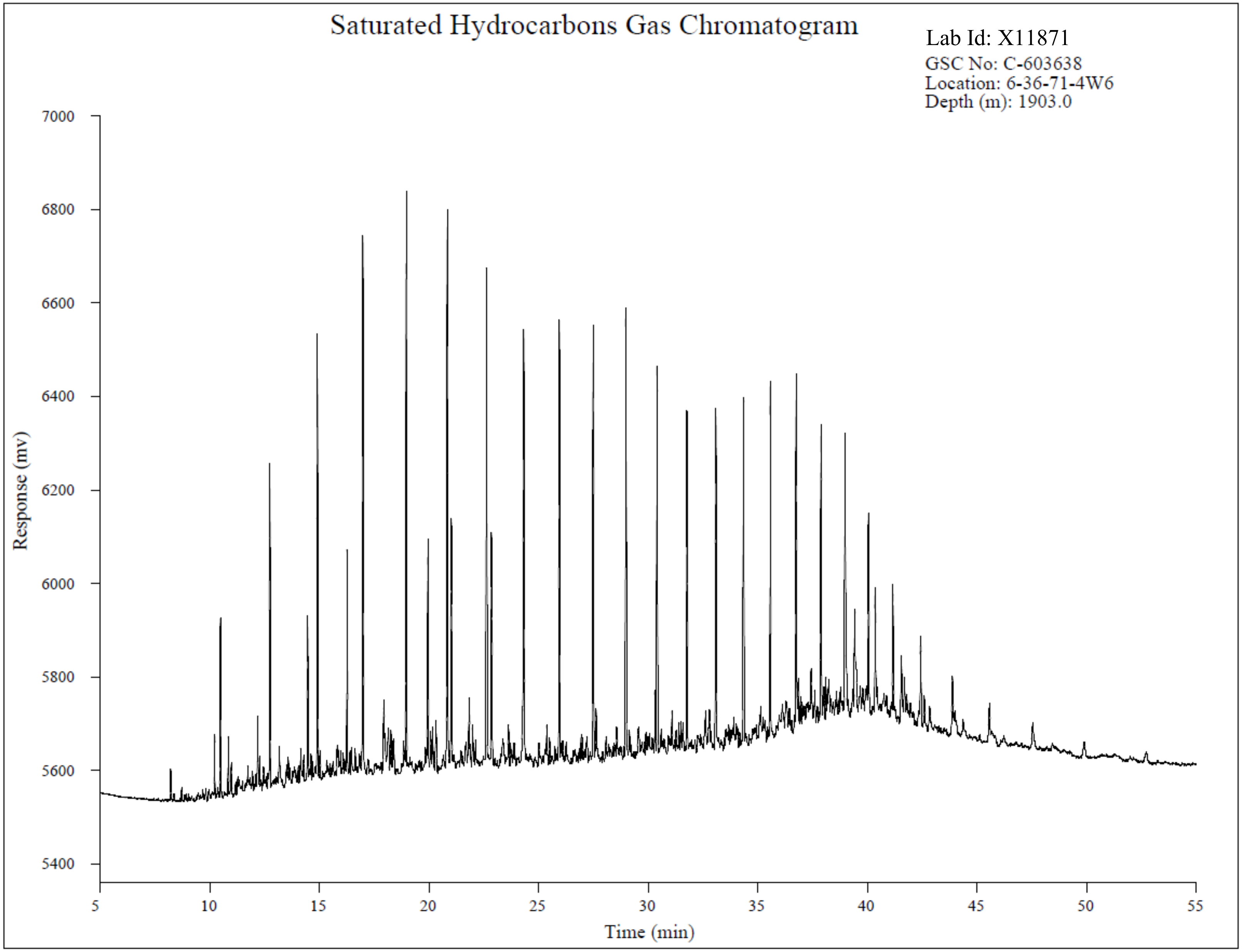

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11854
GSC No: C-603626
Location: 4-32-84-12W6
Depth (m): 1593.5
Response (mv)
9000
8700
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

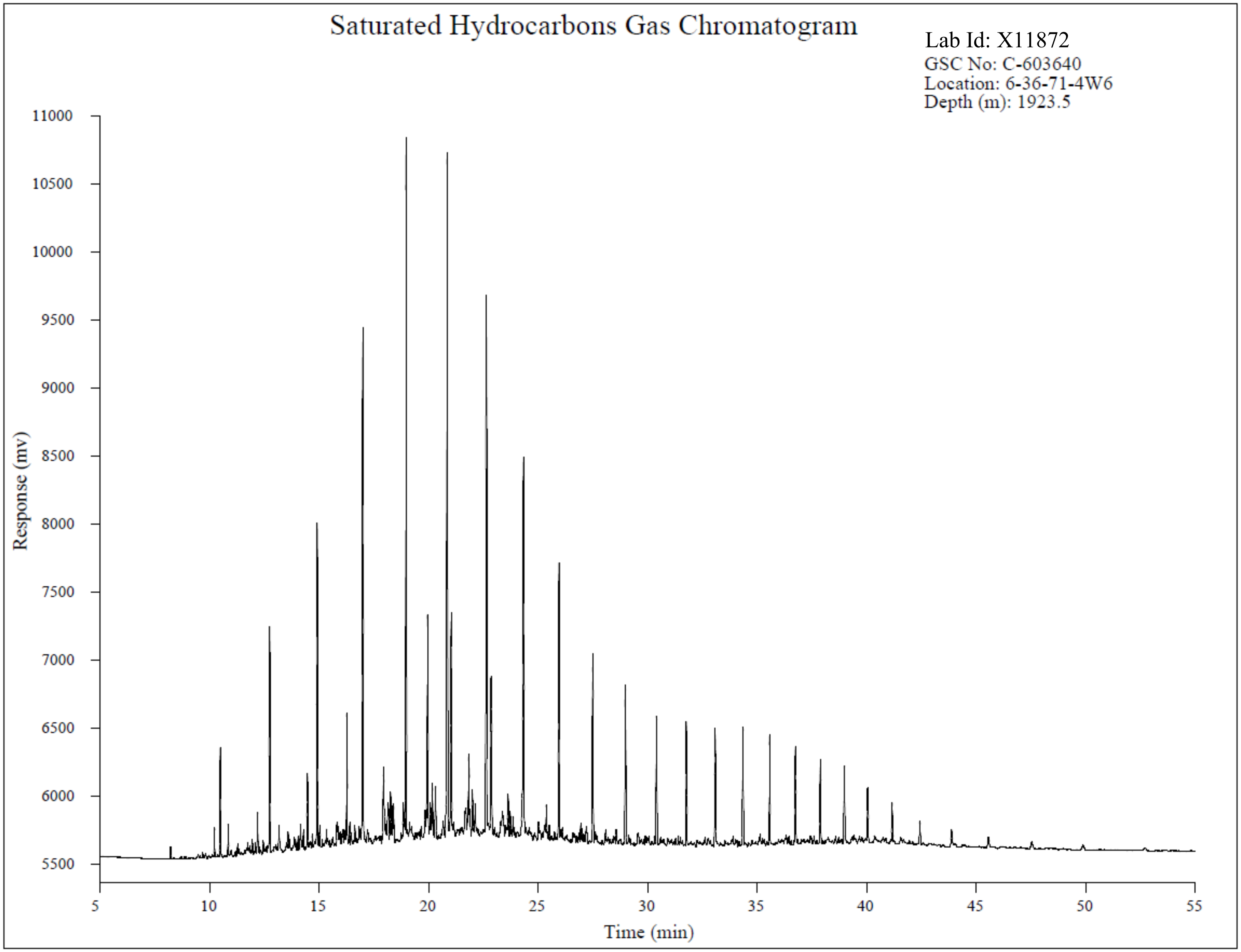

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11855
GSC No: C-603627
Location: 6-36-71-4W6
Depth (m): 1888.2
Response (mv)
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

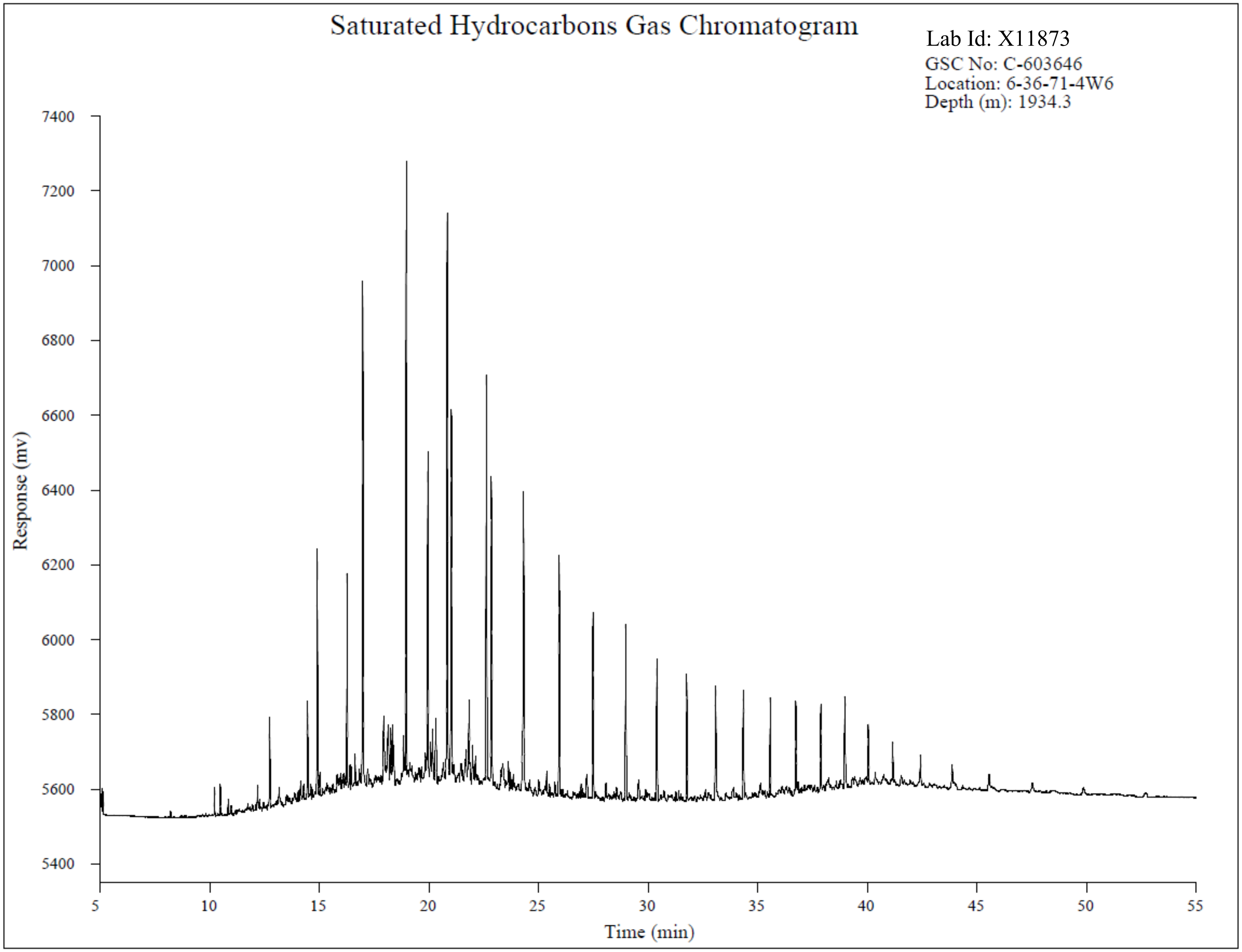

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11856
GSC No: C-603629
Location: 6-36-71-4W6
Depth (m): 1890.1
Response (mv)
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

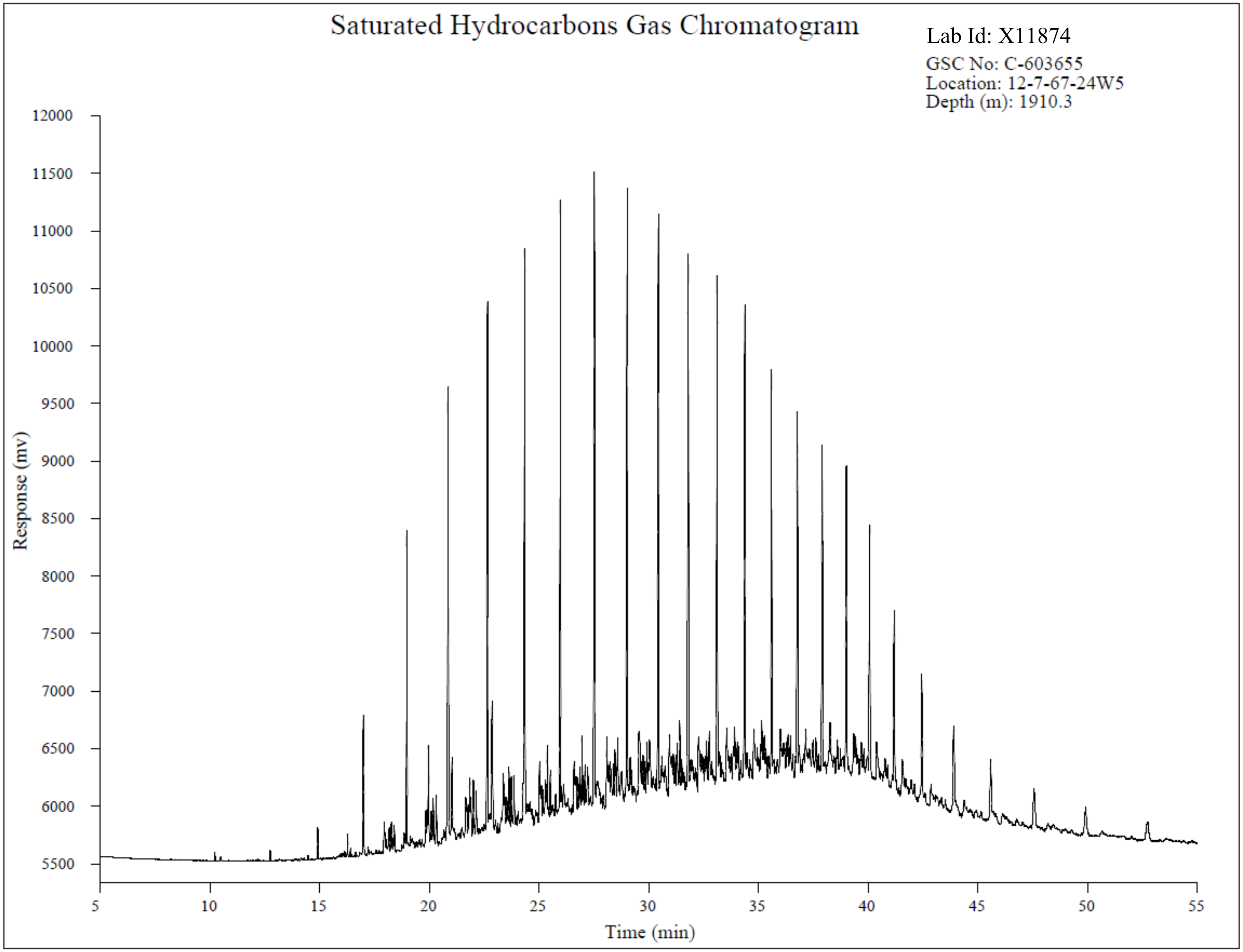

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11857
GSC No: C-603634
Location: 6-36-71-4W6
Depth (m): 1895.4
Response (mv)
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

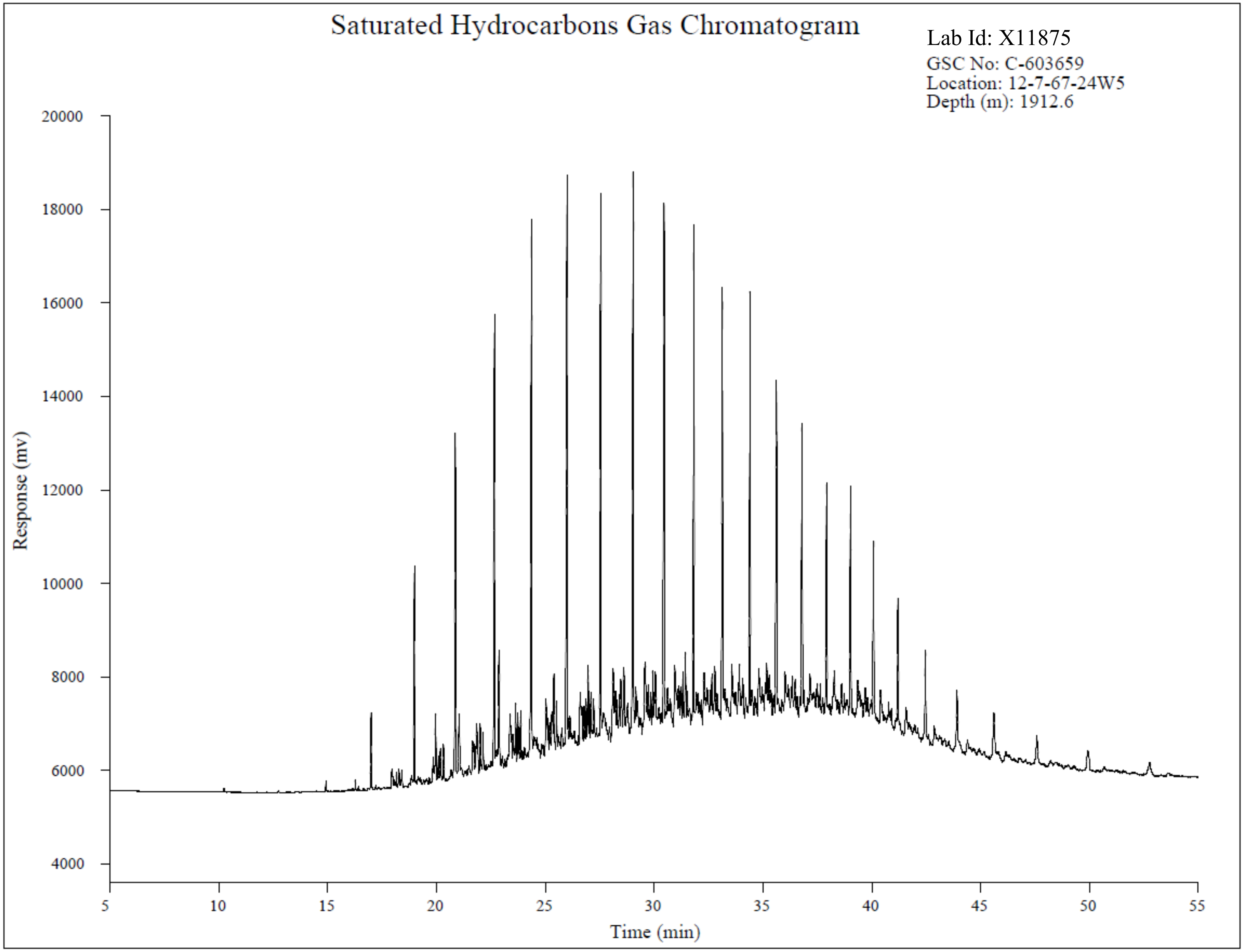

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11870
GSC No: C-603636
Location: 6-36-71-4W6
Depth (m): 1900.4
Response (mv)
8700
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

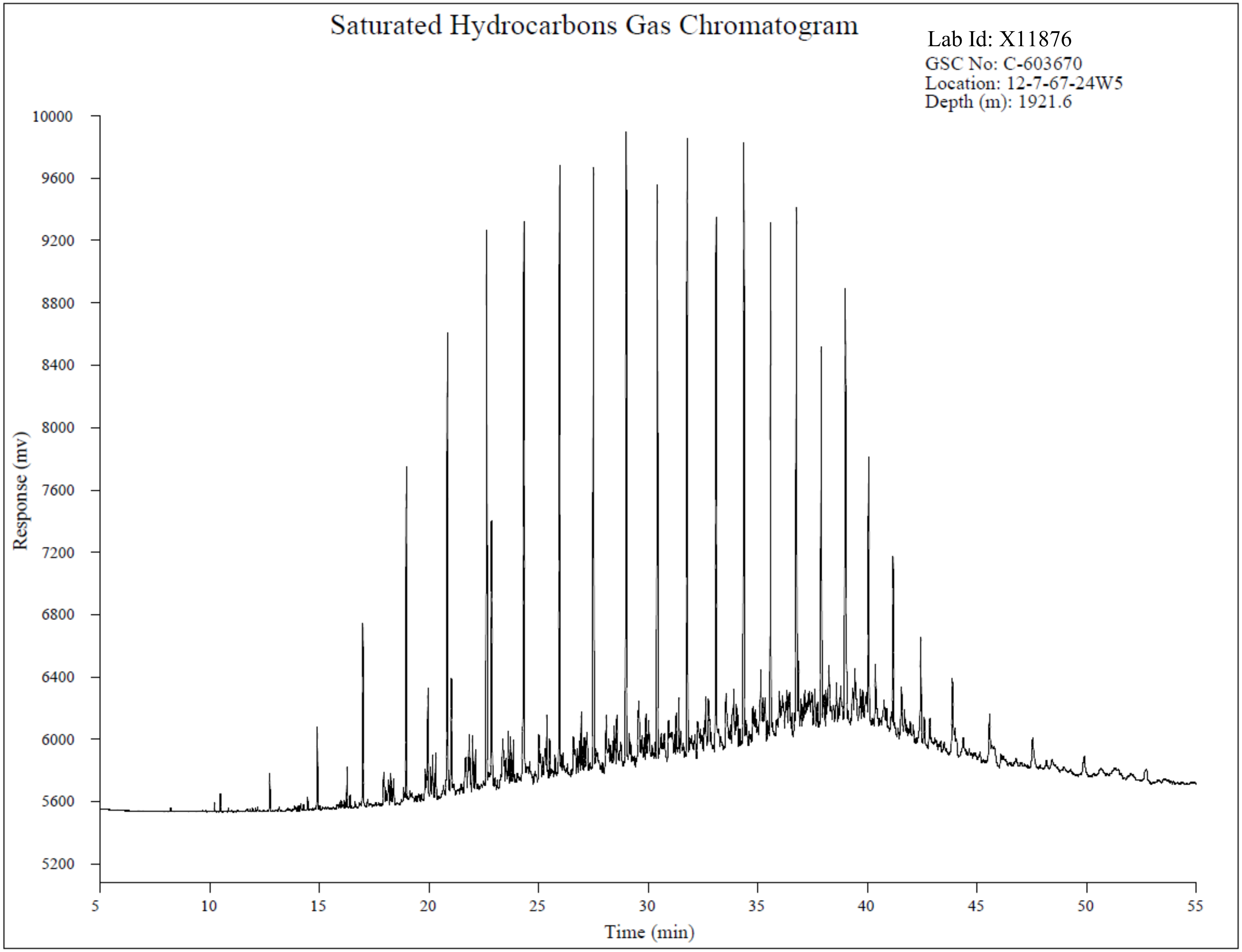

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11871
GSC No: C-603638
Location: 6-36-71-4W6
Depth (m): 1903.0
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11872
GSC No: C-603640
Location: 6-36-71-4W6
Depth (m): 1923.5
Response (mv)
11000
10500
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

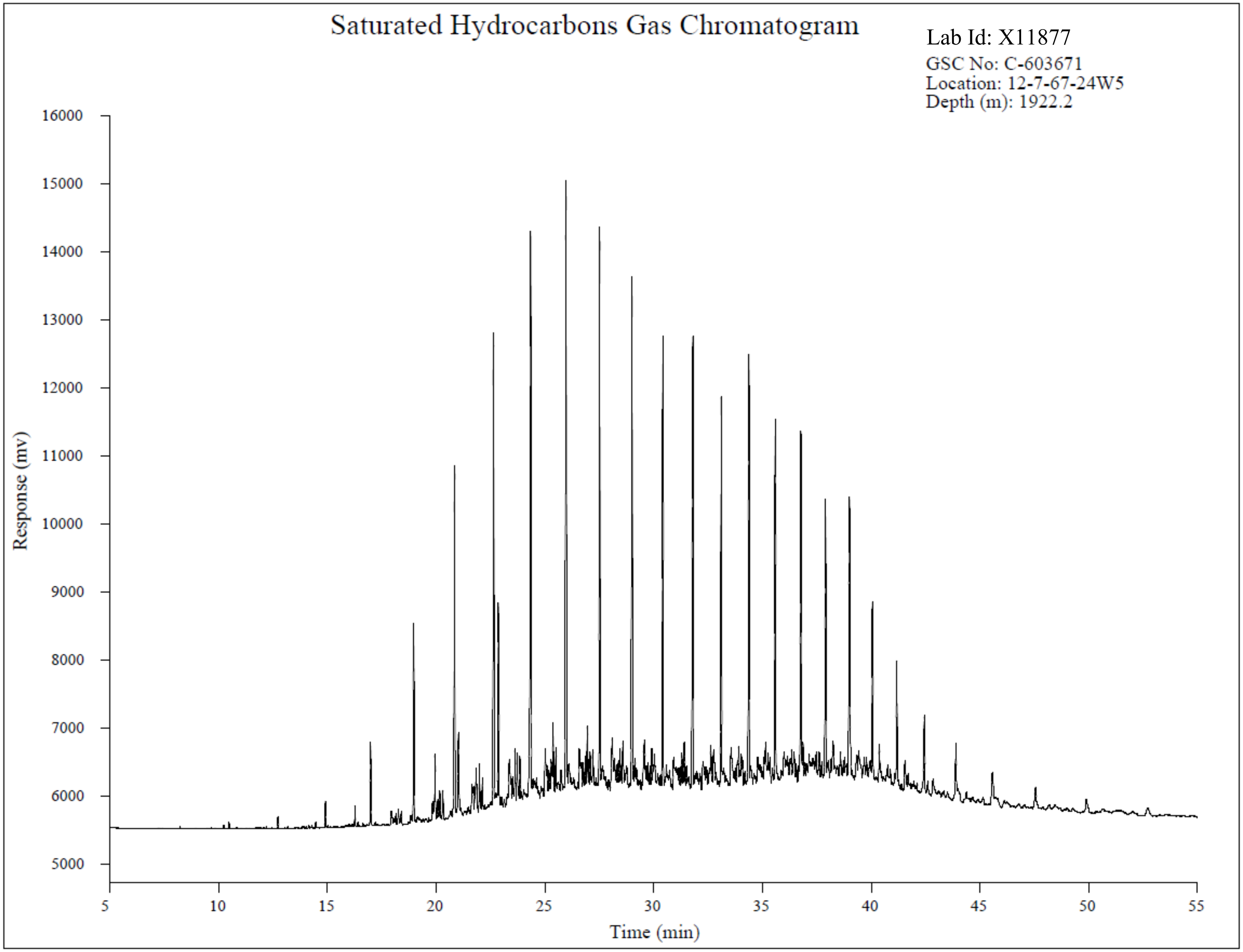

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11873
GSC No: C-603646
Location: 6-36-71-4W6
Depth (m): 1934.3
Response (mv)
7400
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11874
GSC No: C-603655
Location: 12-7-67-24W5
Depth (m): 1910.3
Response (mv)
Time (min)

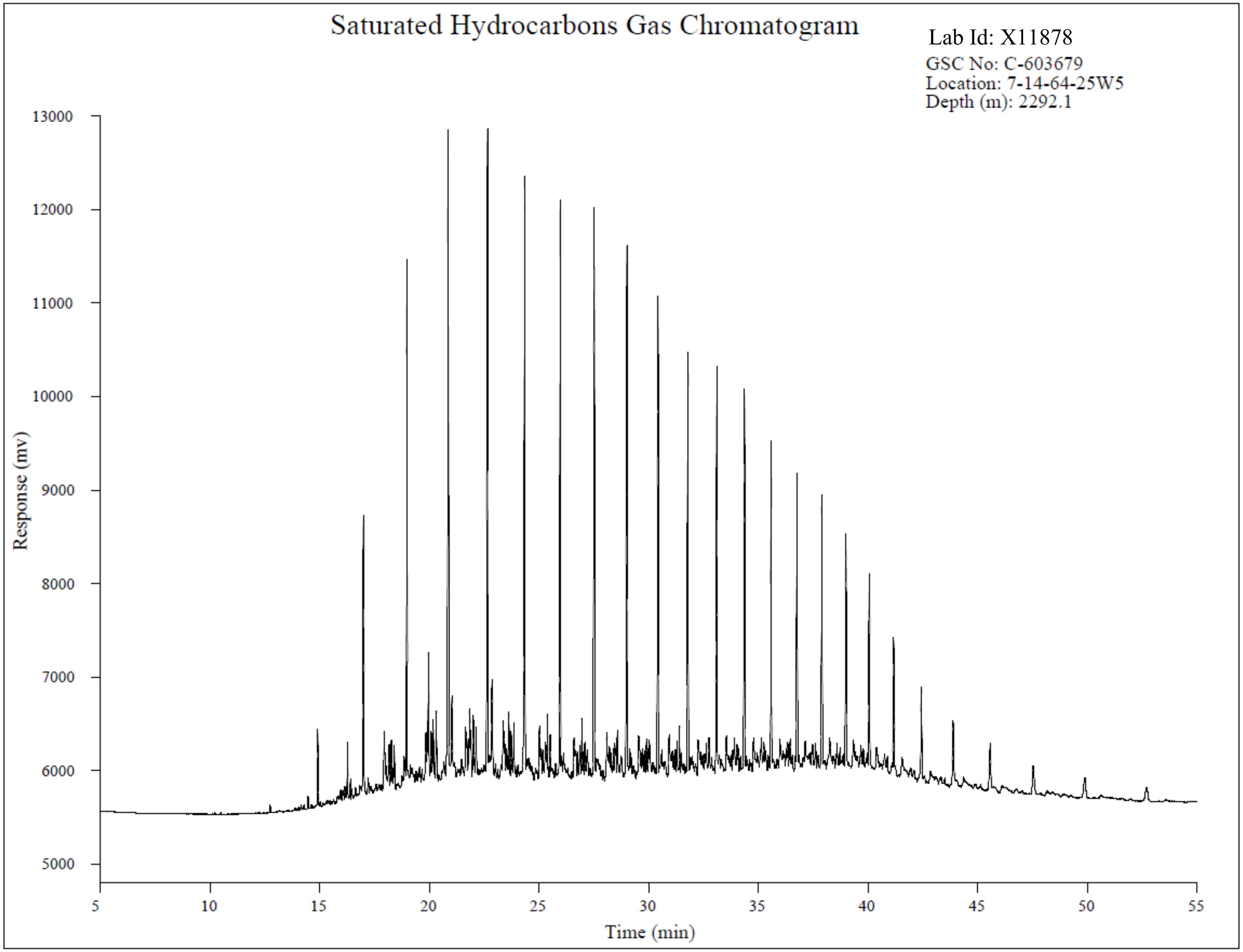

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11875
GSC No: C-603659
Location: 12-7-67-24W5
Depth (m): 1912.6
Response (mv)
20000
18000
16000
14000
12000
10000
8000
6000
4000
5
10
15
20
25
30
35
40
45
50
55
Time (min)



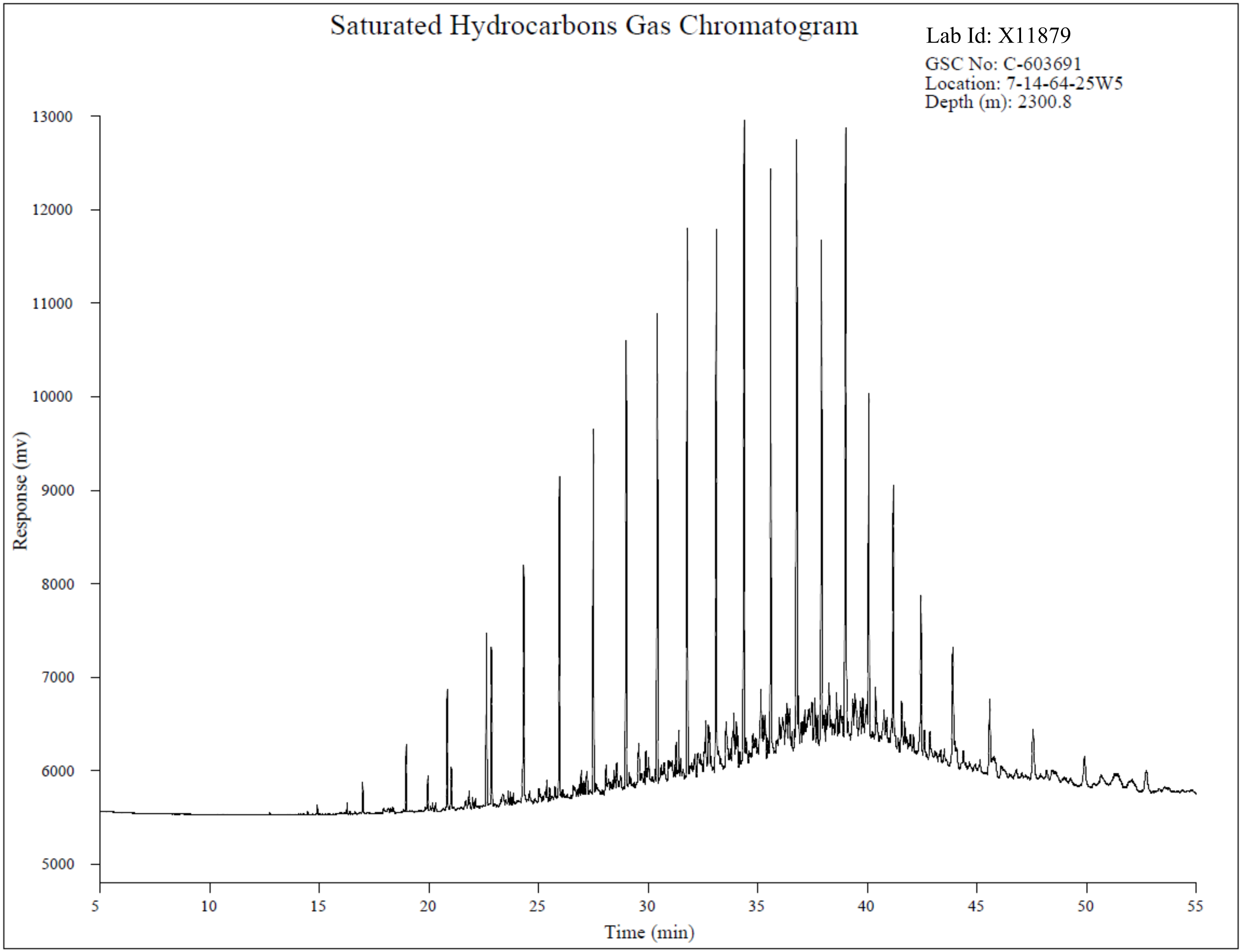
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11876
GSC No: C-603670
Location: 12-7-67-24W5
Depth (m): 1921.6
Response (mv)
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

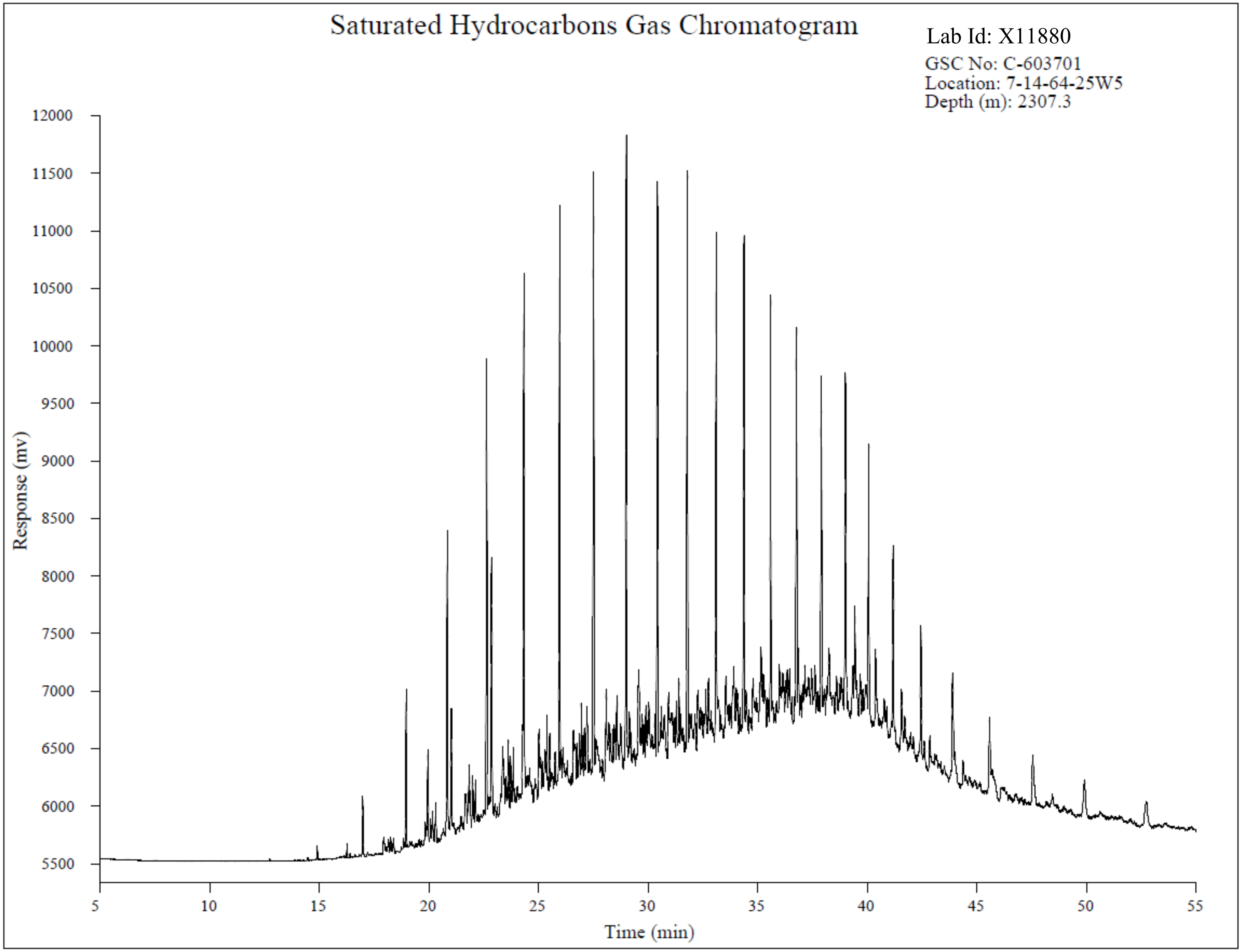


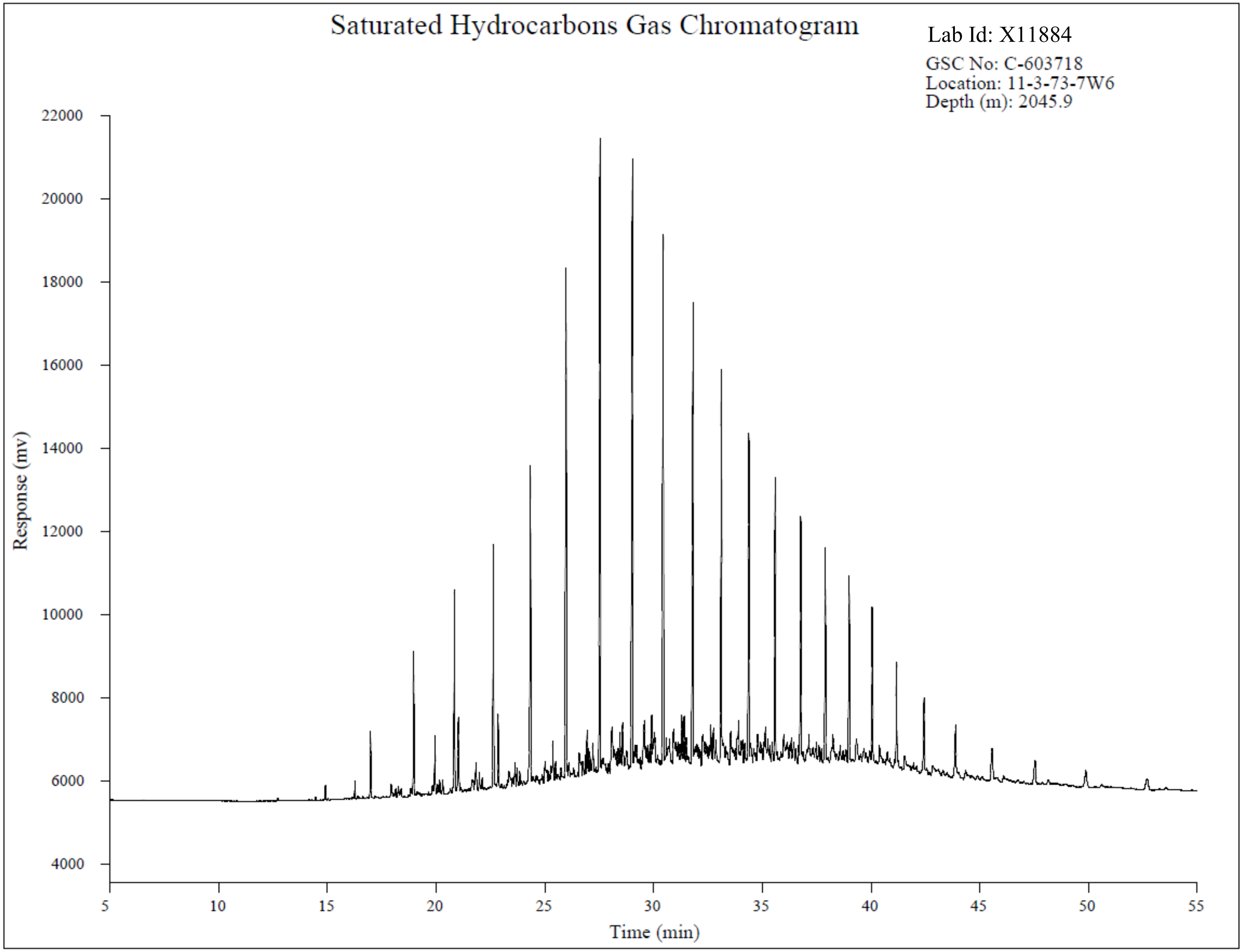
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11877
GSC No: C-603671
Location: 12-7-67-24W5
Depth (m): 1922.2
Response (mv)
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

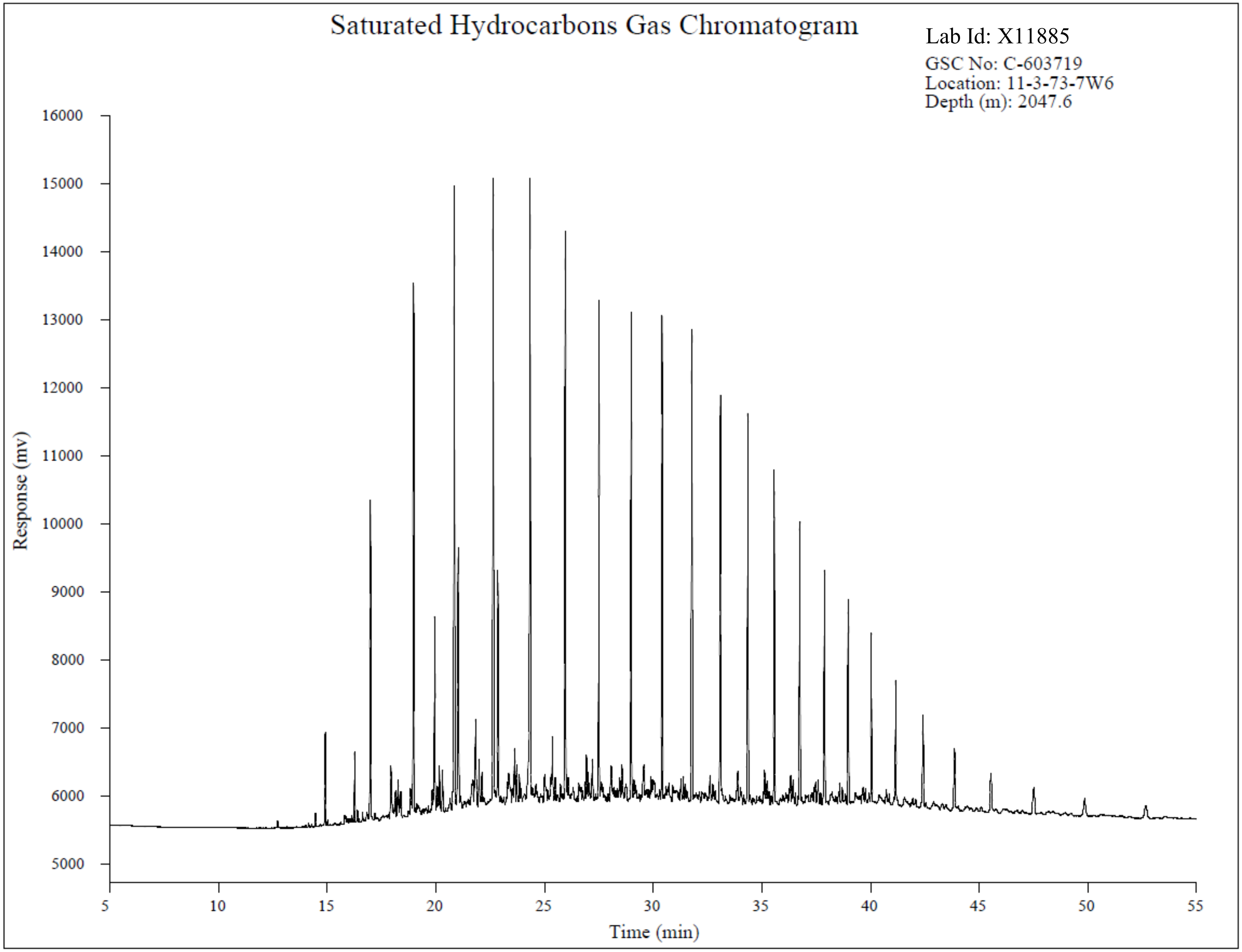


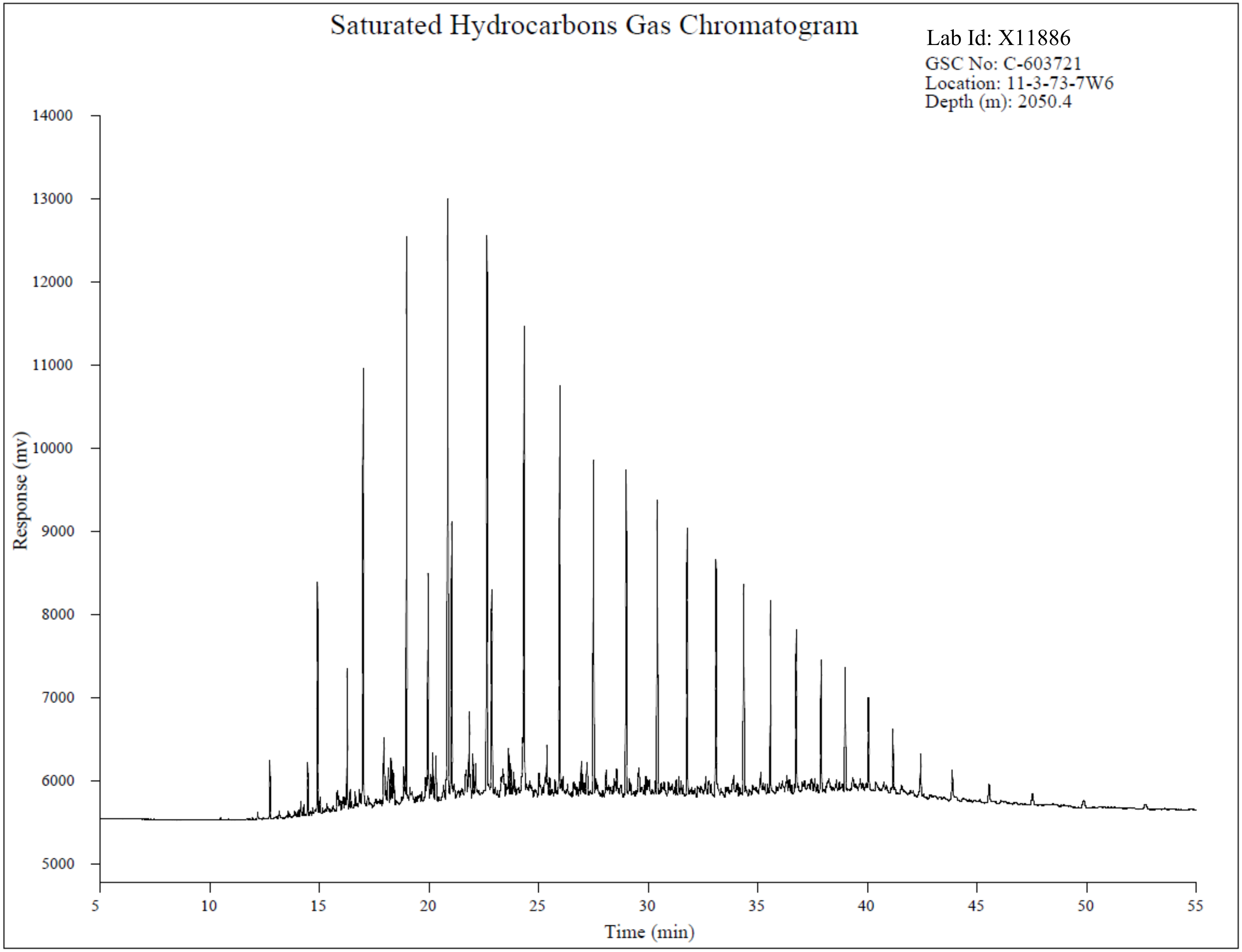
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11878
GSC No: C-603679
Location: 7-14-64-25W5
Depth (m): 2292.1
Response (mv)
Time (min)

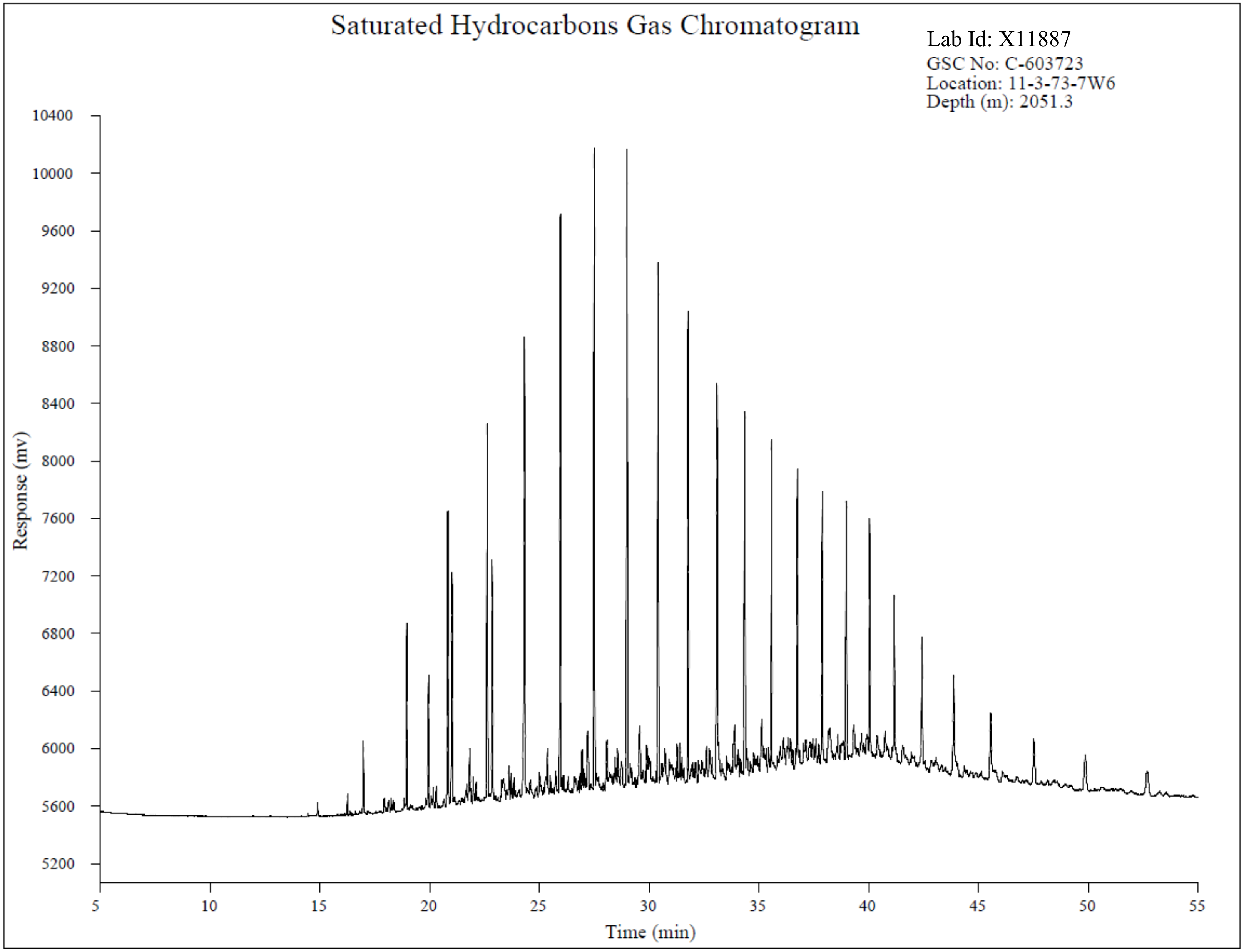

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11879
GSC No: C-603691
Location: 7-14-64-25W5
Depth (m): 2300.8
Response (mv)
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

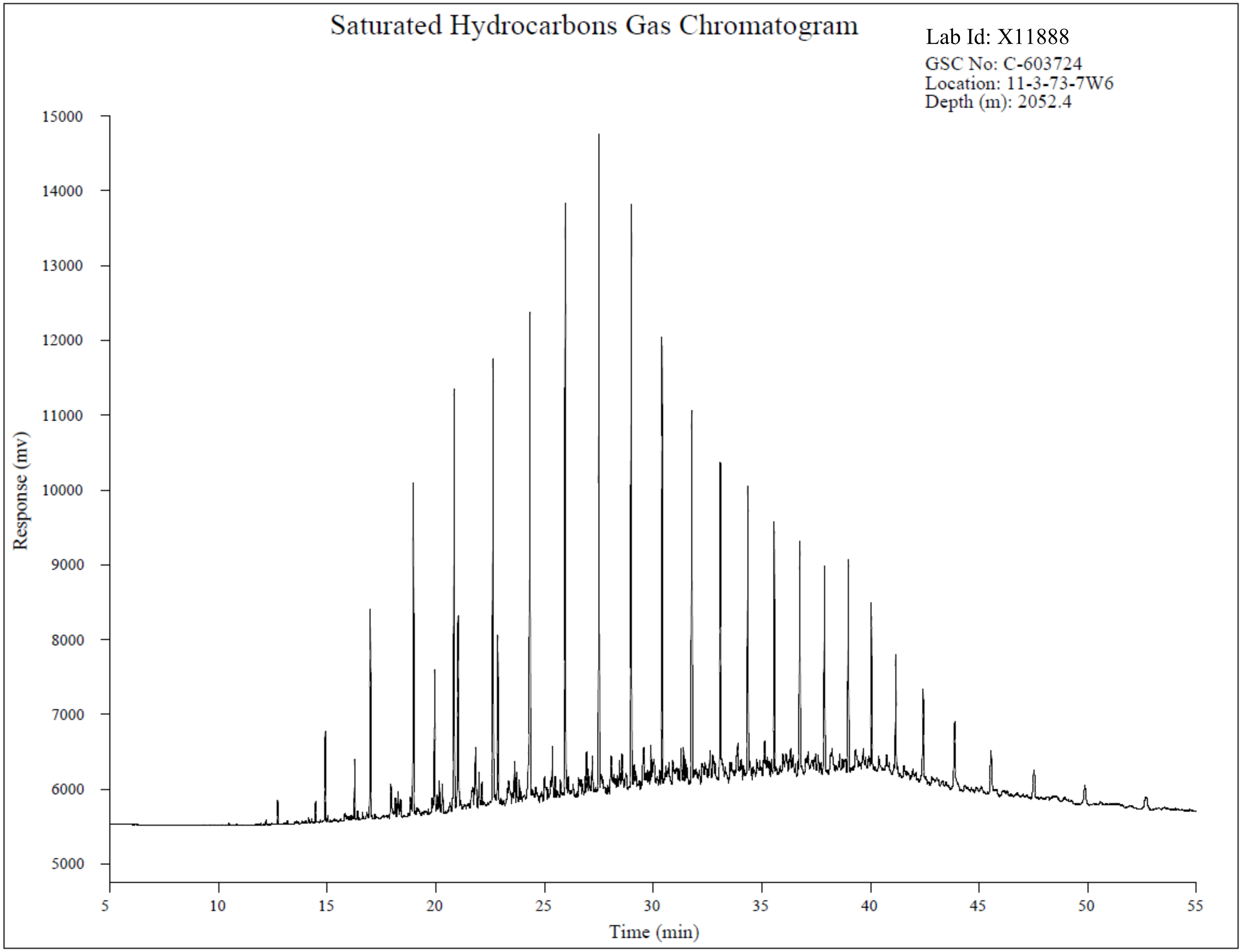

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11880
GSC No: C-603701
Location: 7-14-64-25W5
Depth (m): 2307.3
Response (mv)
Time (min)

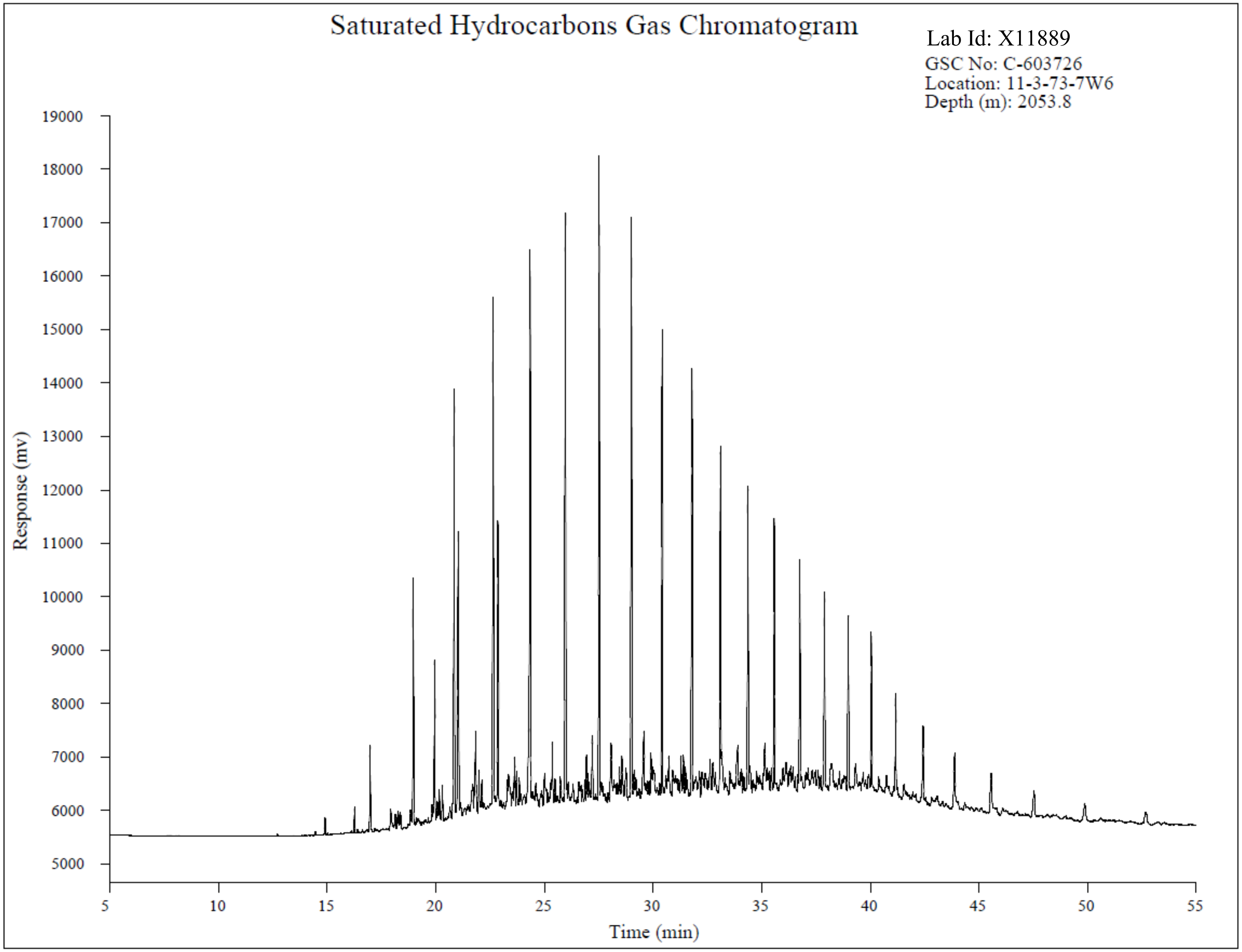

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11884
GSC No: C-603718
Location: 11-3-73-7W6
Depth (m): 2045.9
Response (mv)
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

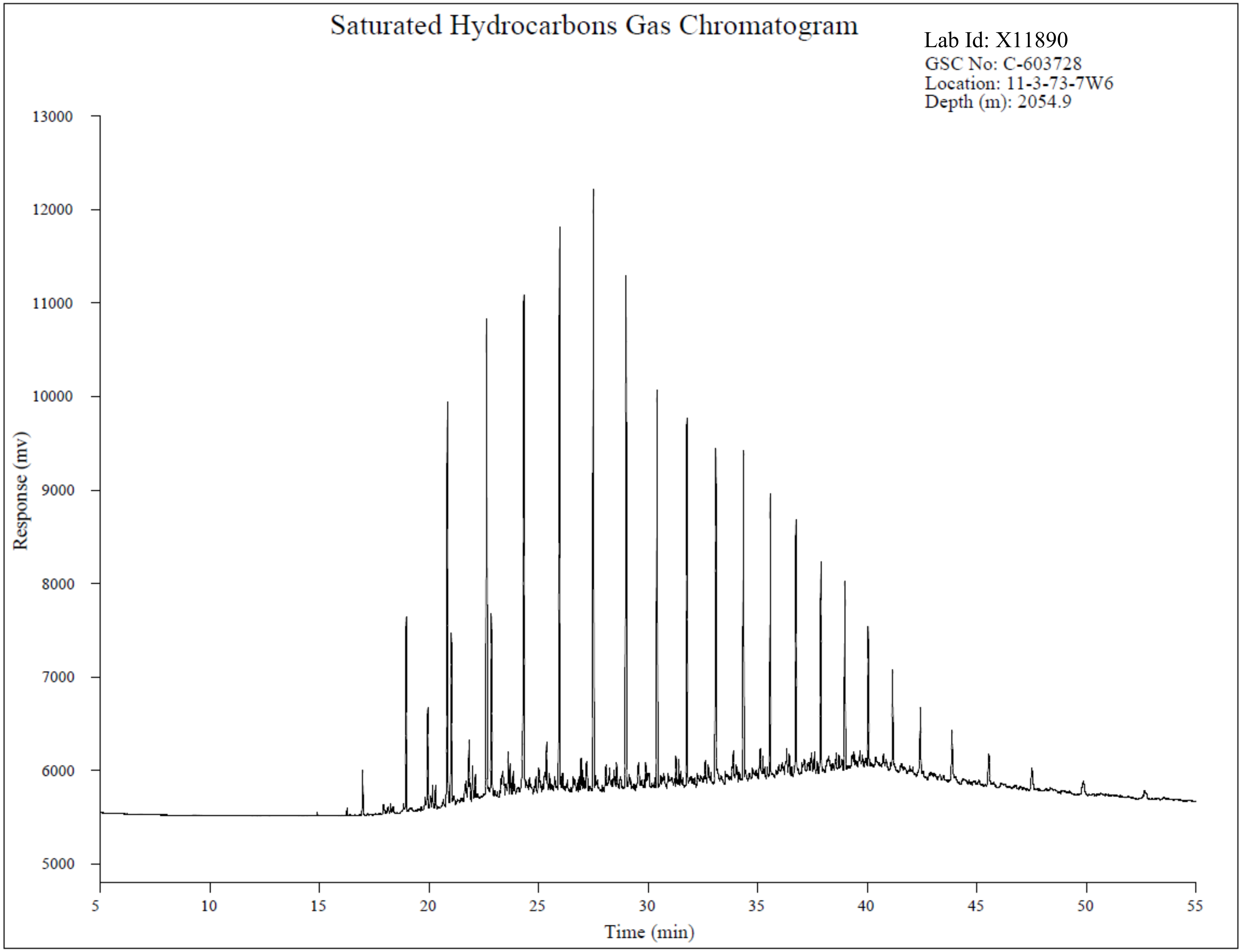

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11885
GSC No: C-603719
Location: 11-3-73-7W6
Depth (m): 2047.6
Response (mv)
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

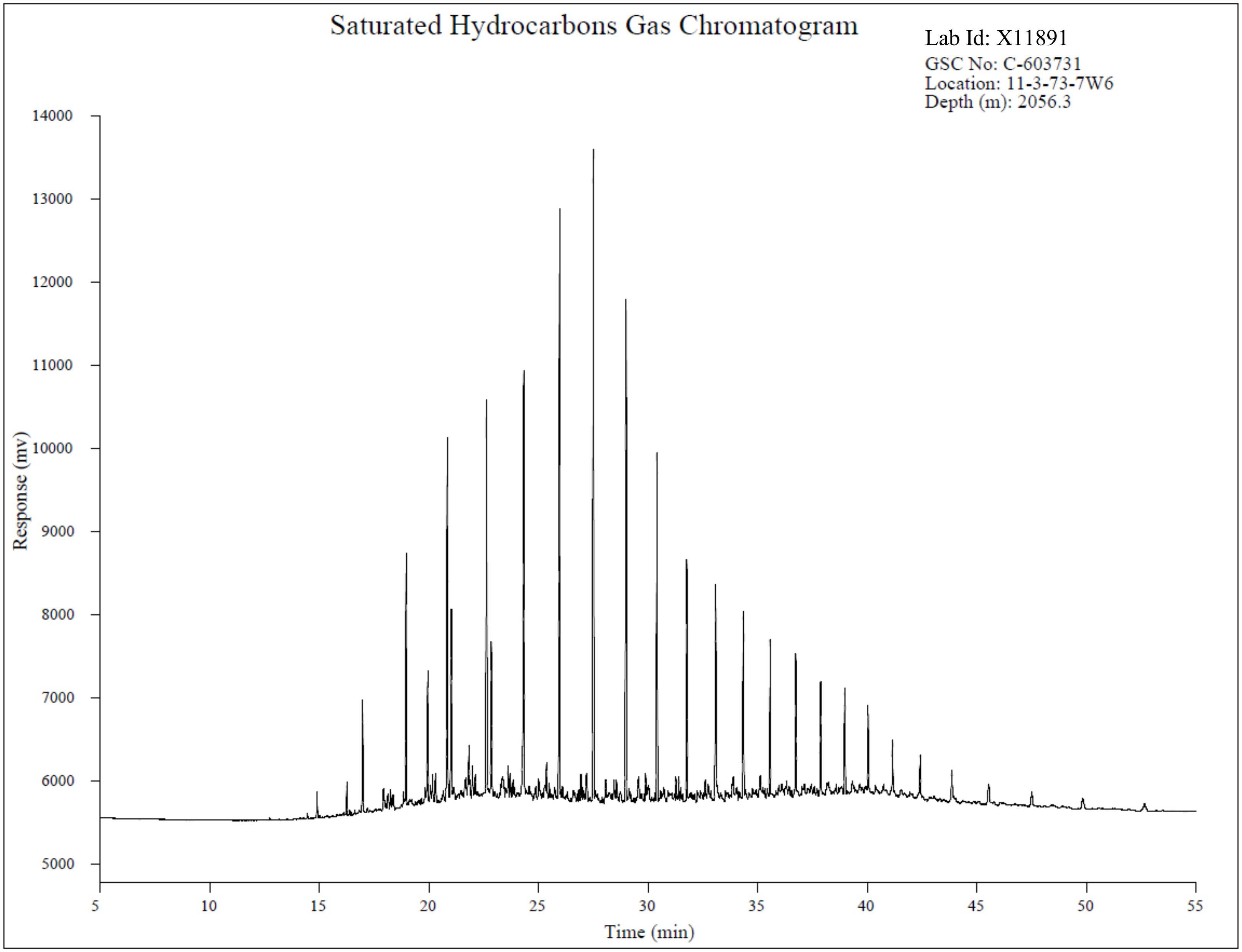

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11886
GSC No: C-603721
Location: 11-3-73-7W6
Depth (m): 2050.4
Response (mv)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

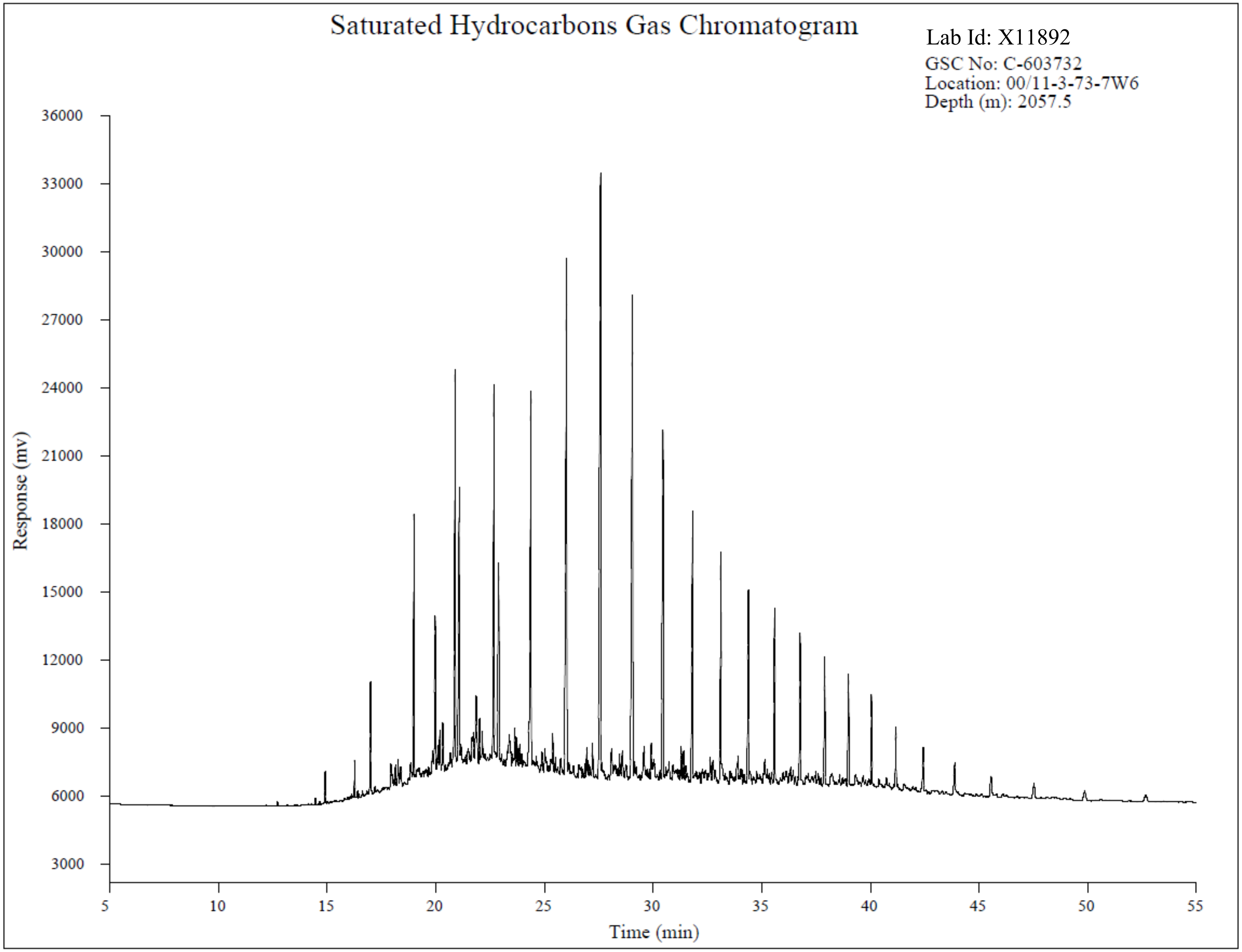

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11887
GSC No: C-603723
Location: 11-3-73-7W6
Depth (m): 2051.3
Response (mv)
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

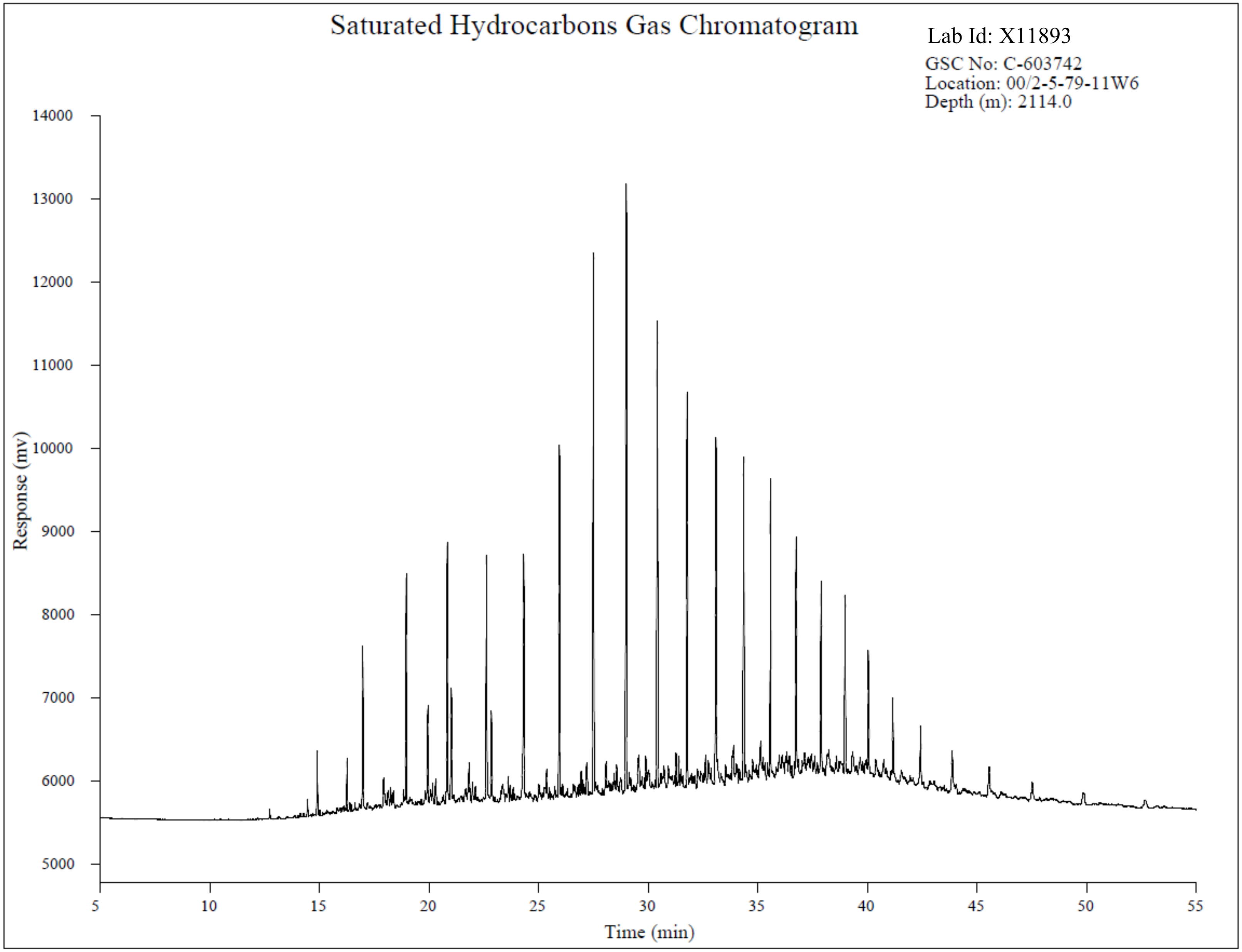

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11888
GSC No: C-603724
Location: 11-3-73-7W6
Depth (m): 2052.4
Response (mv)
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11889
GSC No: C-603726
Location: 11-3-73-7W6
Depth (m): 2053.8
Response (mv)
Time (min)
19000
18000
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55

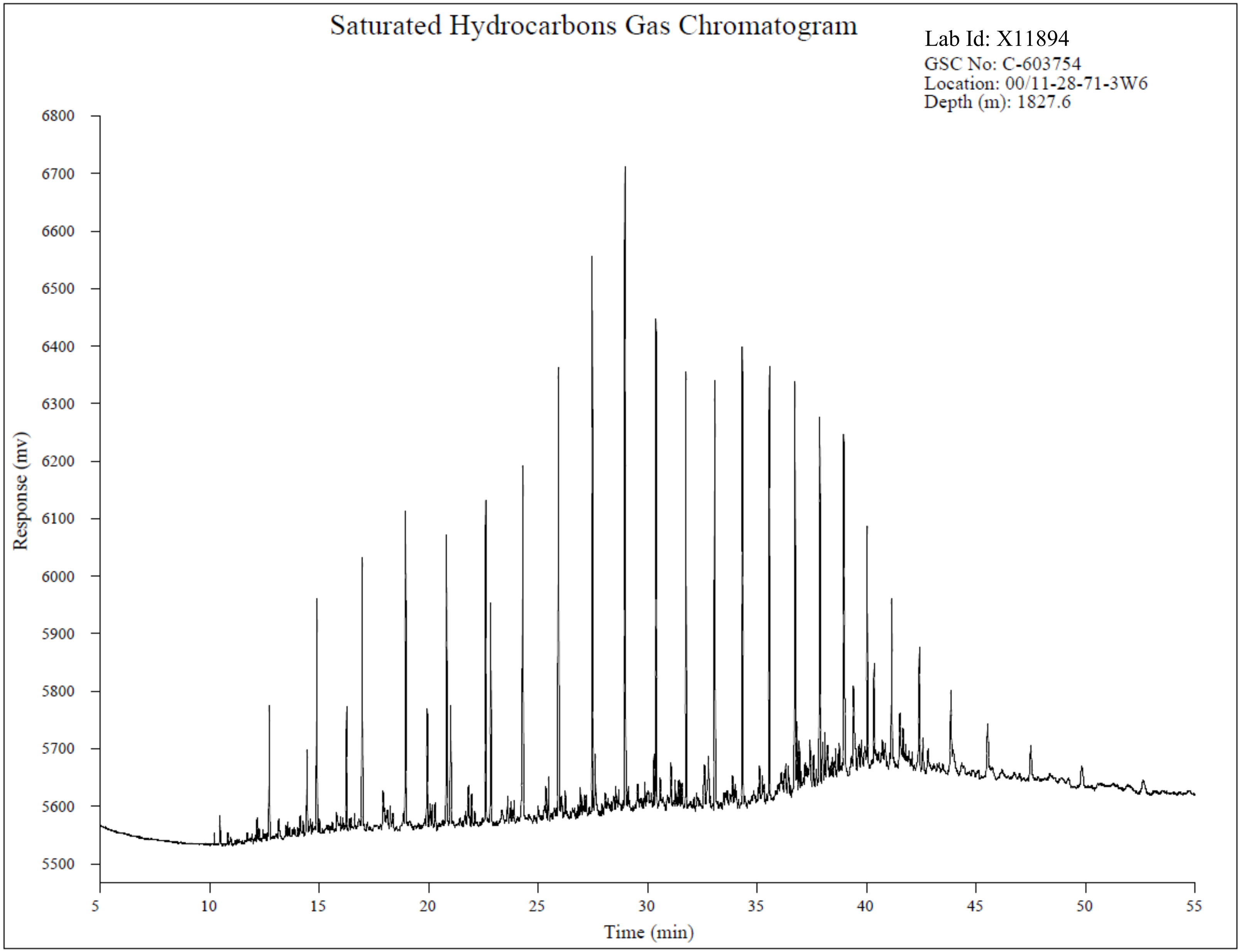

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11890
GSC No: C-603728
Location: 11-3-73-7W6
Depth (m): 2054.9
Response (mv)
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

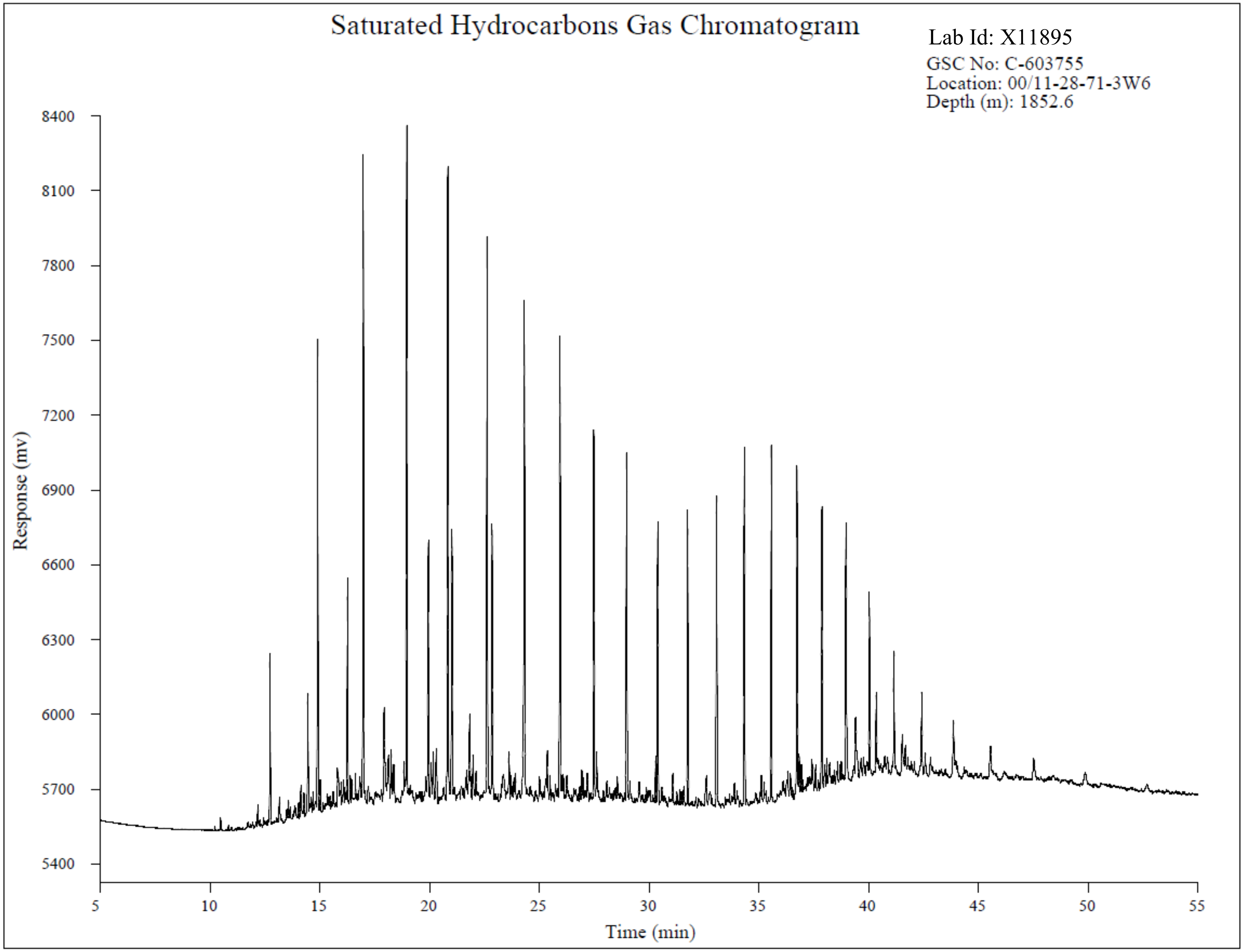

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11891
GSC No: C-603731
Location: 11-3-73-7W6
Depth (m): 2056.3
Response (mv)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

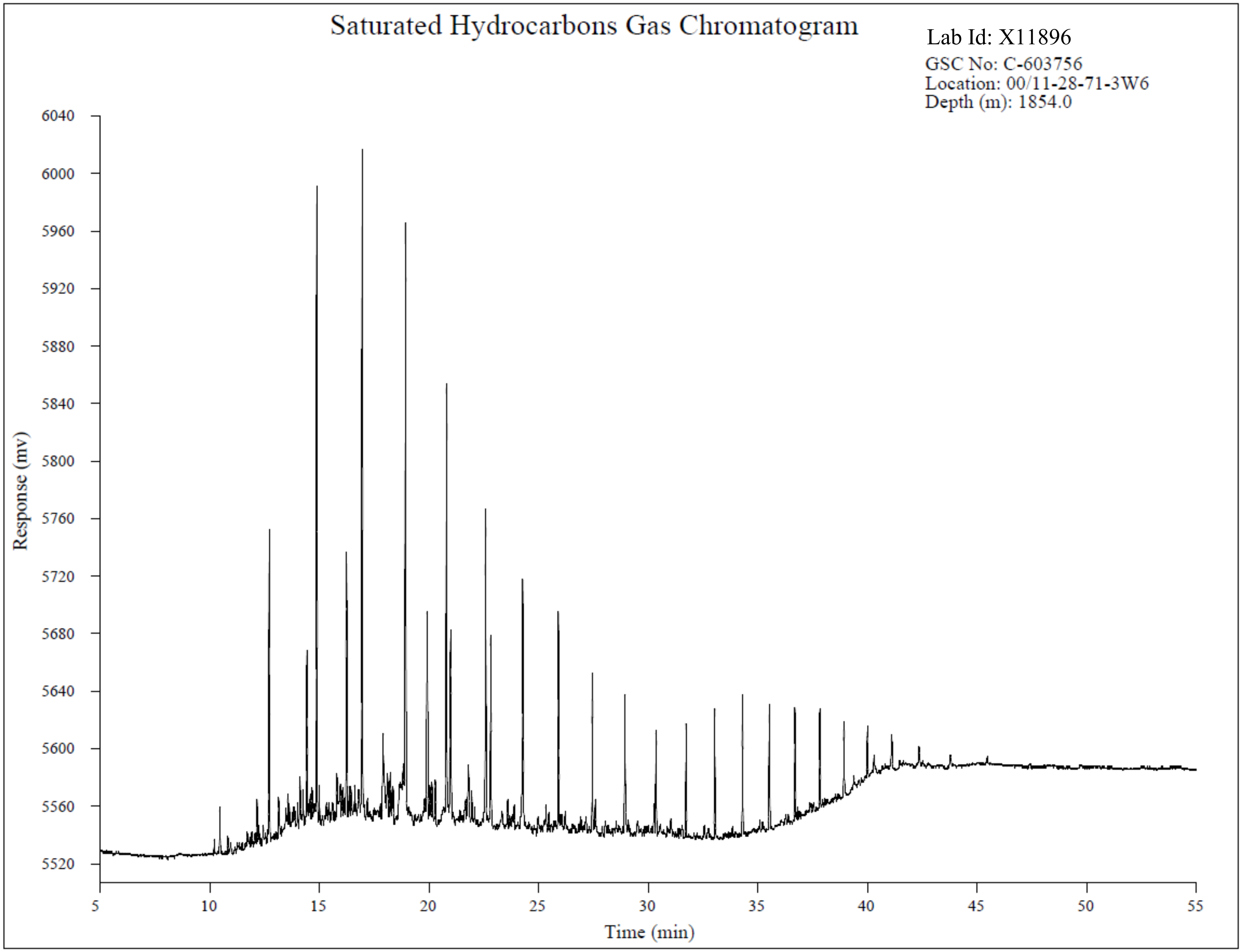

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11892
GSC No: C-603732
Location: 00/11-3-73-7W6
Depth (m): 2057.5
Response (mv)
36000
33000
30000
27000
24000
21000
18000
15000
12000
9000
6000
3000
5
10
15
20
25
30
35
40
45
50
55
Time (min)



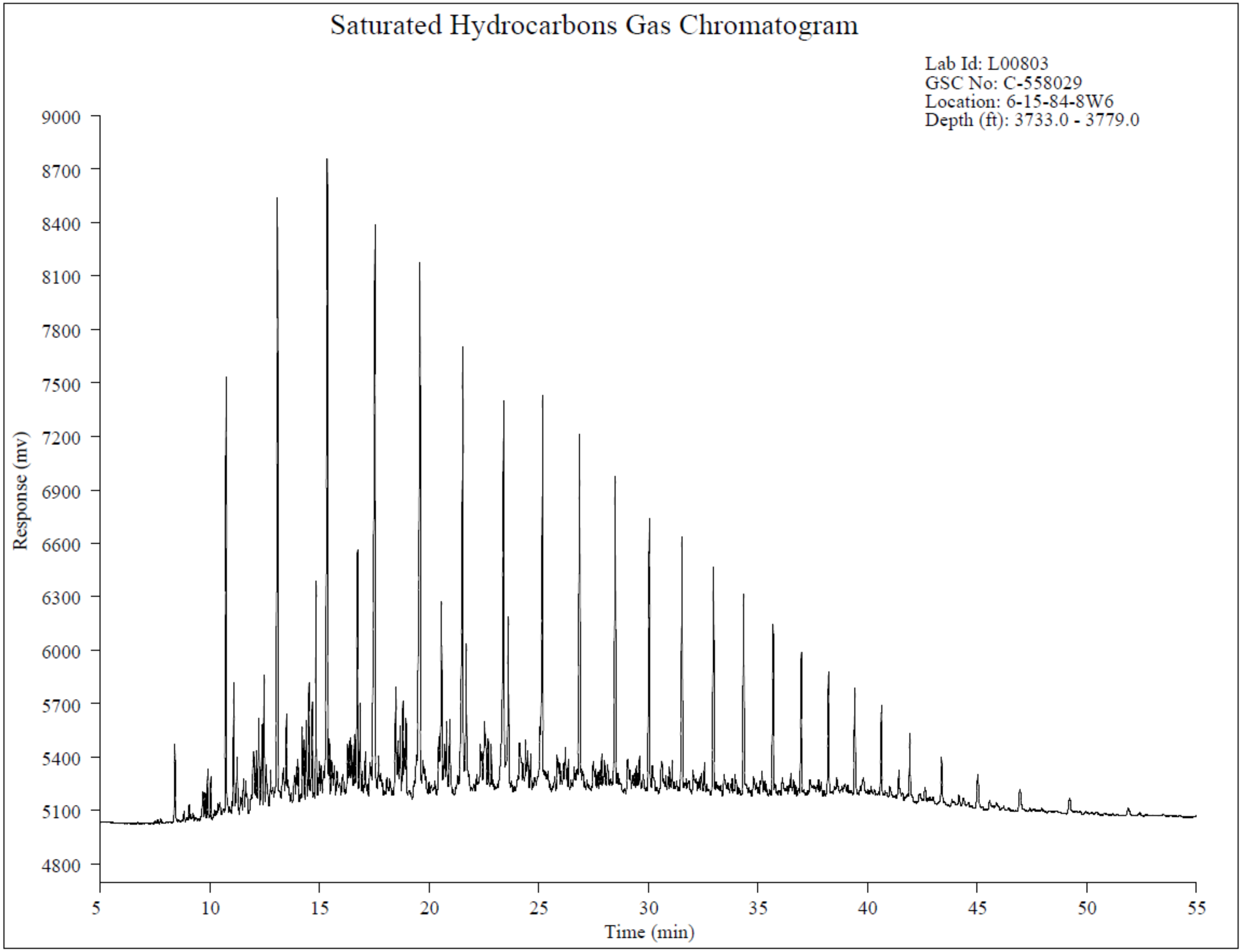
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11893
GSC No: C-603742
Location: 00/2-5-79-11W6
Depth (m): 2114.0
Response (mv)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

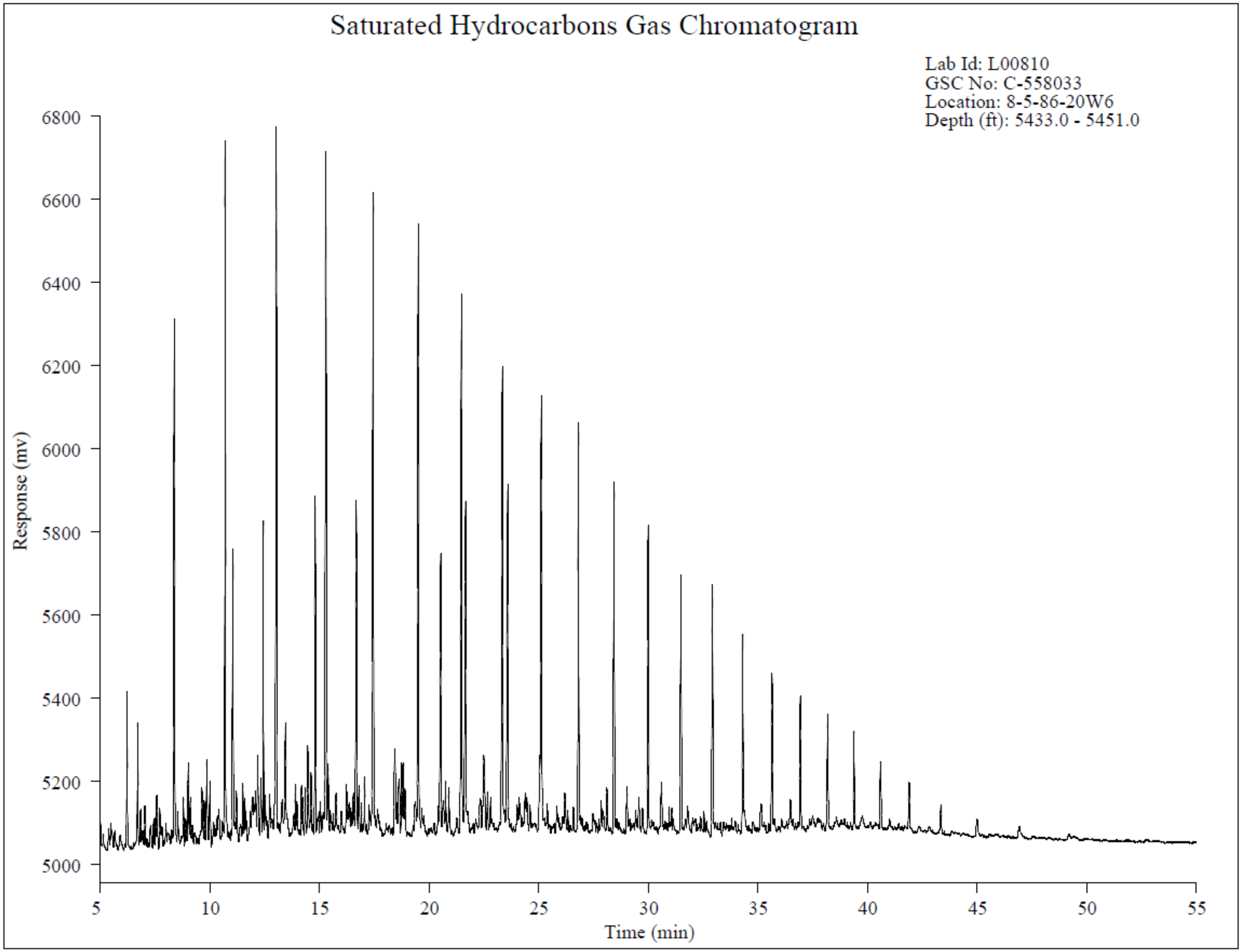

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11894
GSC No: C-603754
Location: 00/11-28-71-3W6
Depth (m): 1827.6
Response (mv)
6800
6700
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

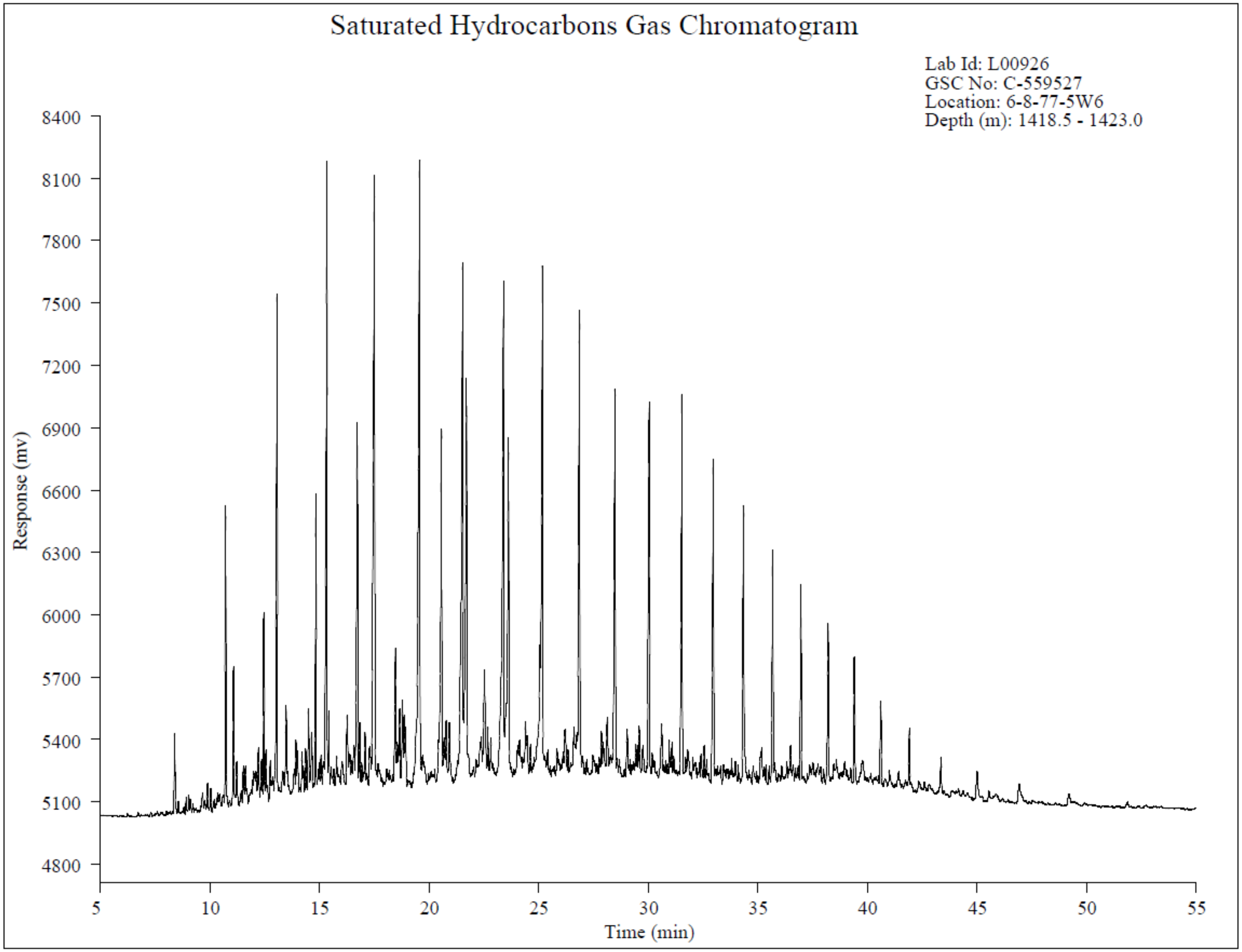

Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11895
GSC No: C-603755
Location: 00/11-28-71-3W6
Depth (m): 1852.6
Response (mv)
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

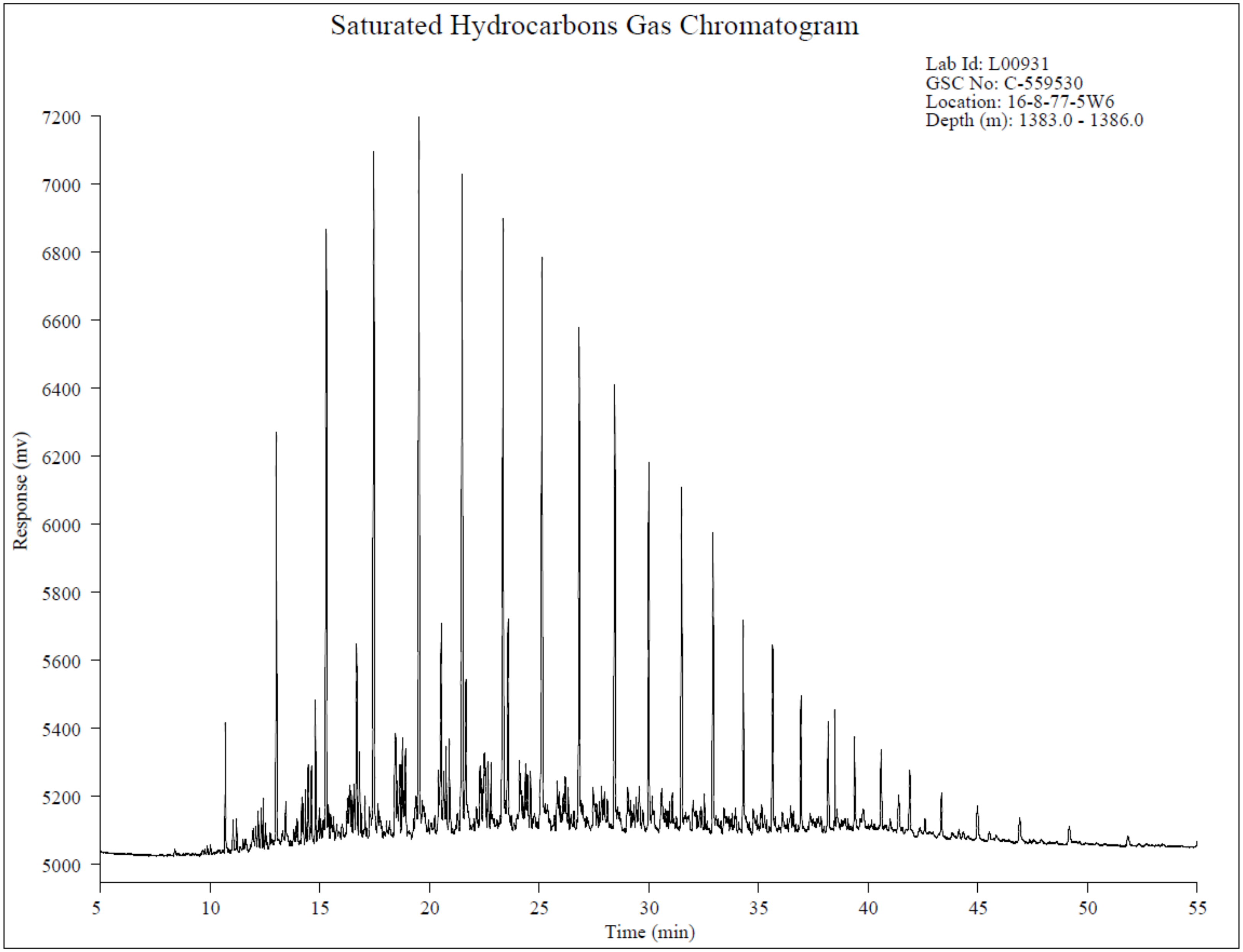


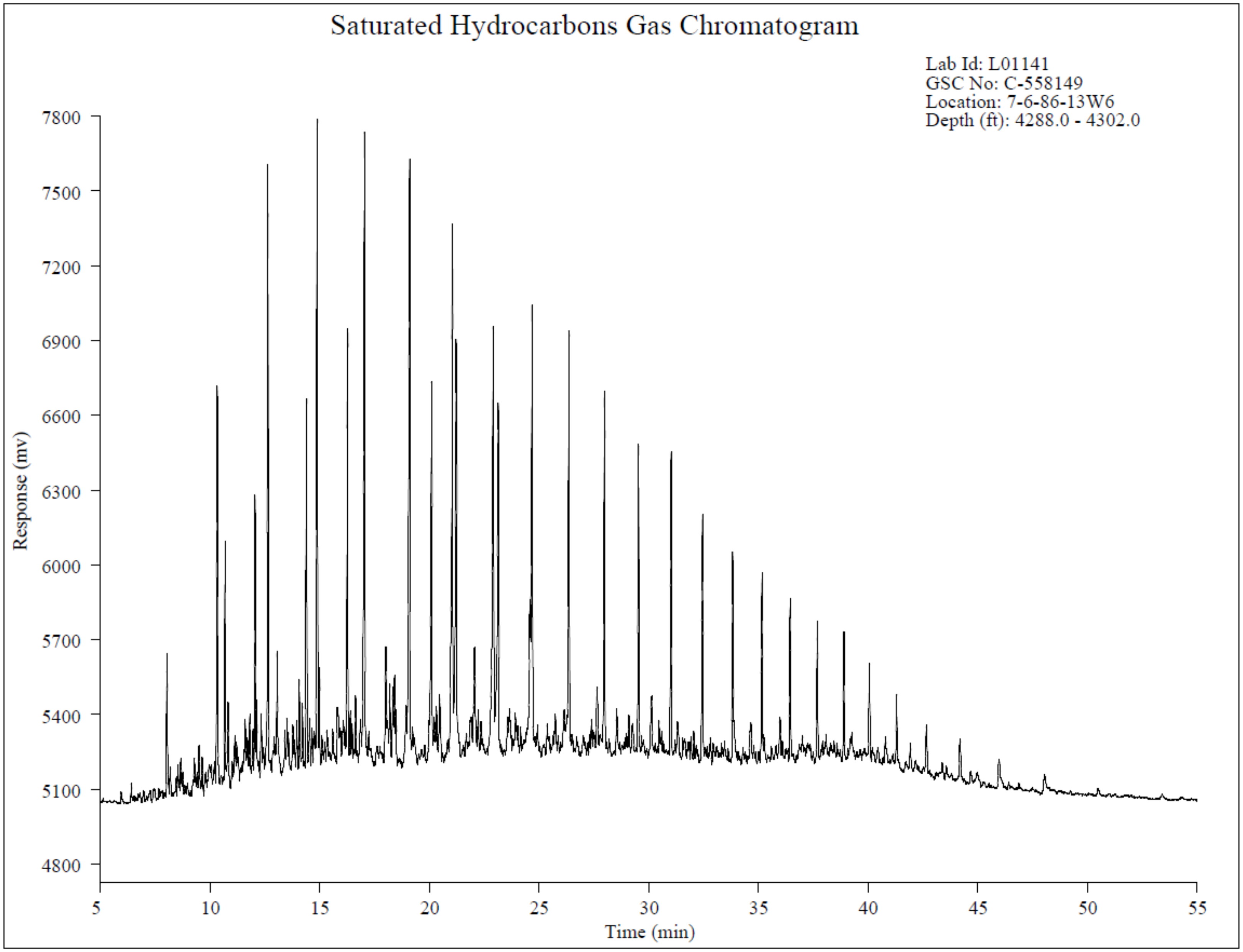
Saturated Hydrocarbons Gas Chromatogram
Lab Id: X11896
GSC No: C-603756
Location: 00/11-28-71-3W6
Depth (m): 1854.0
Response (mv)
6040
6000
5960
5920
5880
5840
5800
5760
5720
5680
5640
5600
5560
5520
5
10
15
20
25
30
35
40
45
50
55
Time (min)

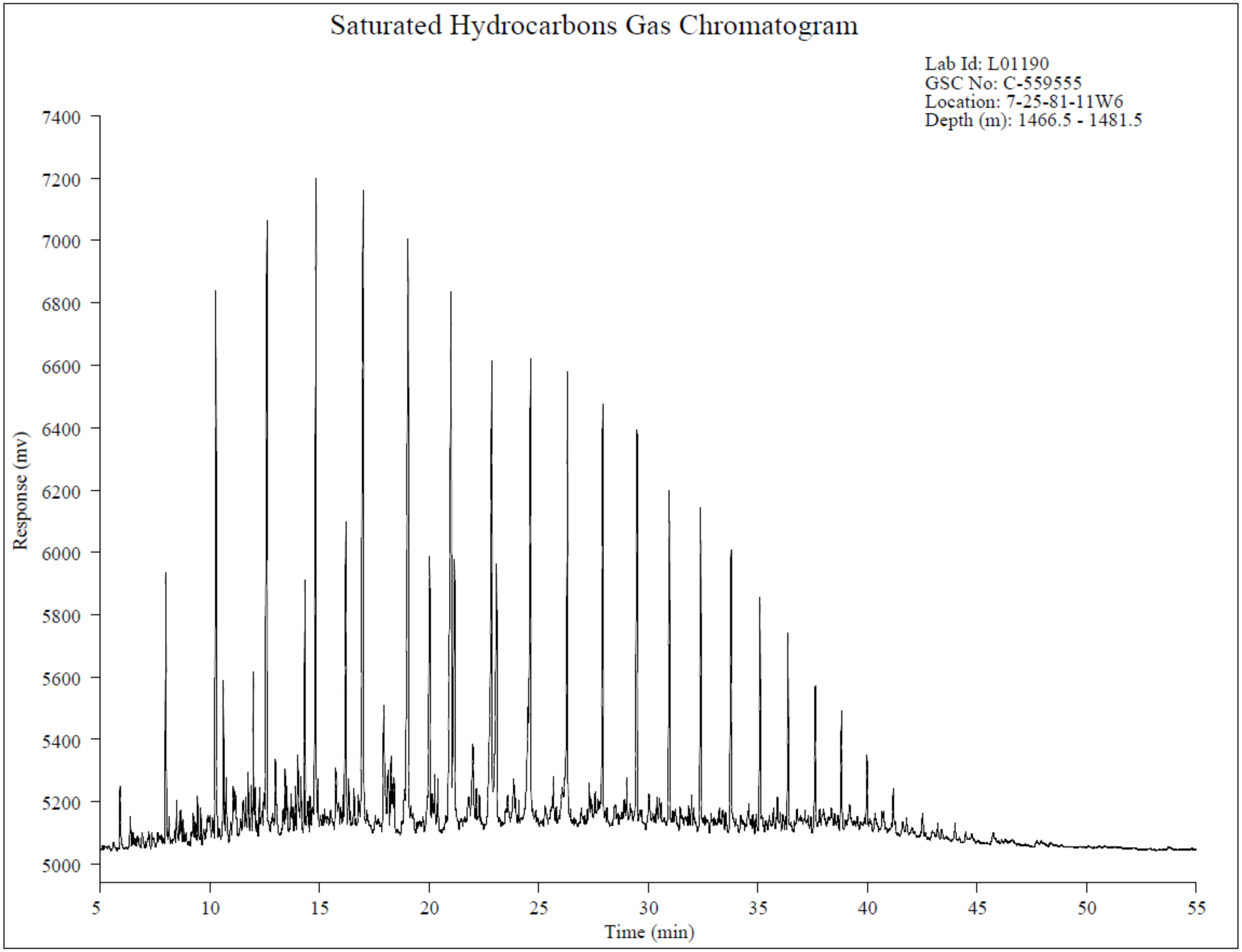

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L00803
GSC No: C-558029
Location: 6-15-84-8W6
Depth (ft): 3733.0 - 3779.0
Response (mv)
9000
8700
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5100
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

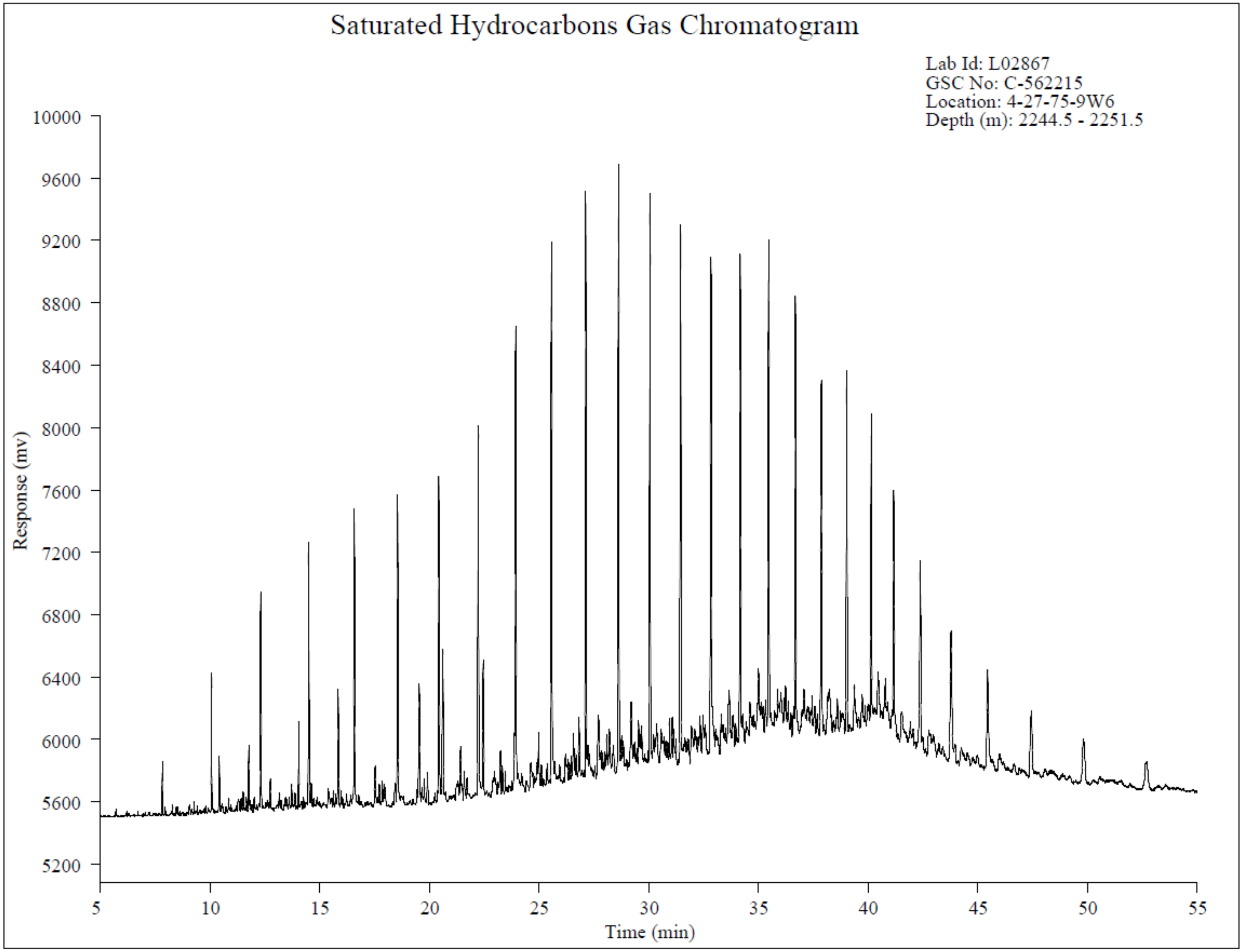

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L00810
GSC No: C-558033
Location: 8-5-86-20W6
Depth (ft): 5433.0 - 5451.0
Response (mv)
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: L00926
GSC No: C-559527
Location: 6-8-77-5W6
Depth (m): 1418.5 - 1423.0
Response (mv)
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5100
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

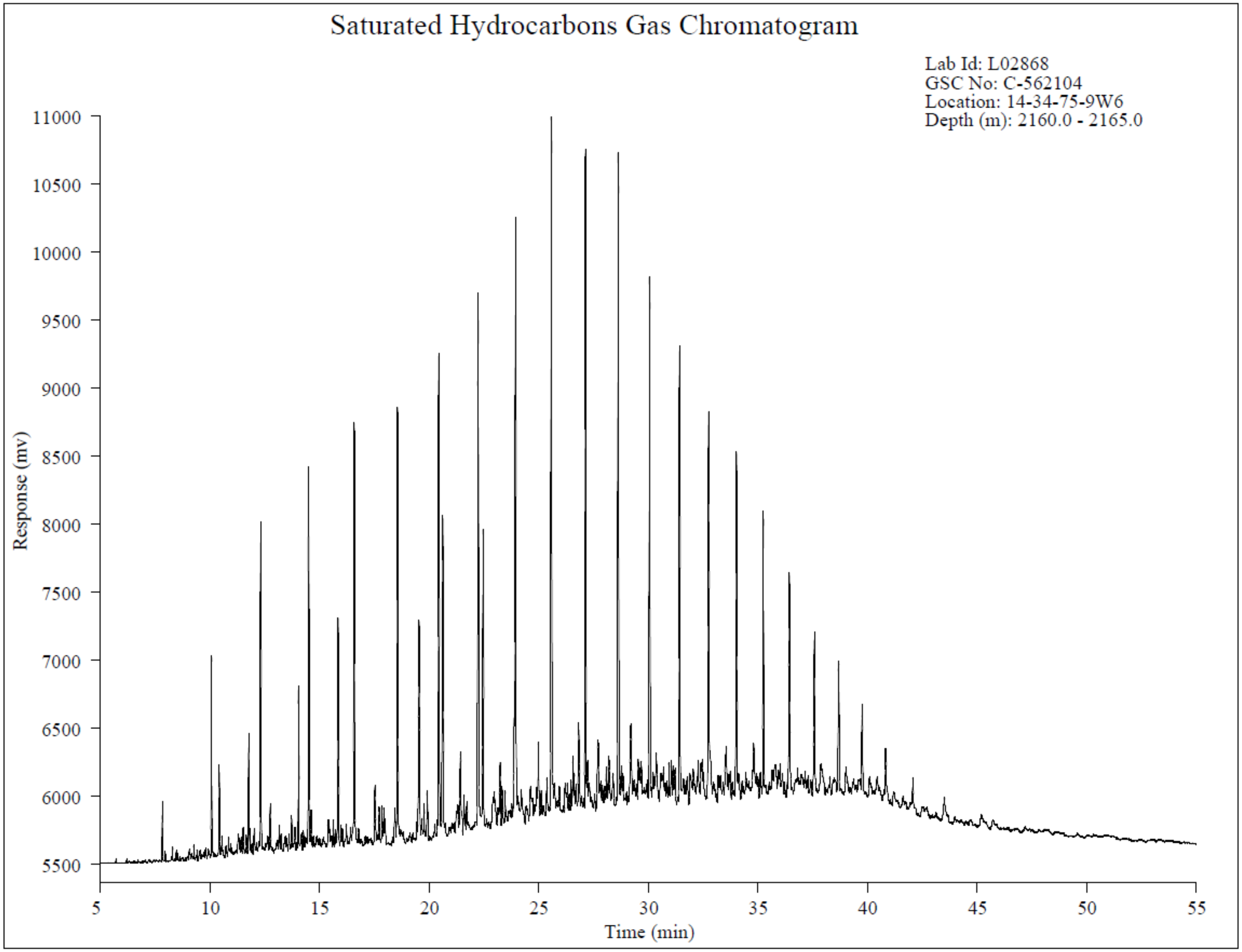

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L00931
GSC No: C-559530
Location: 16-8-77-5W6
Depth (m): 1383.0 - 1386.0
Response (mv)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

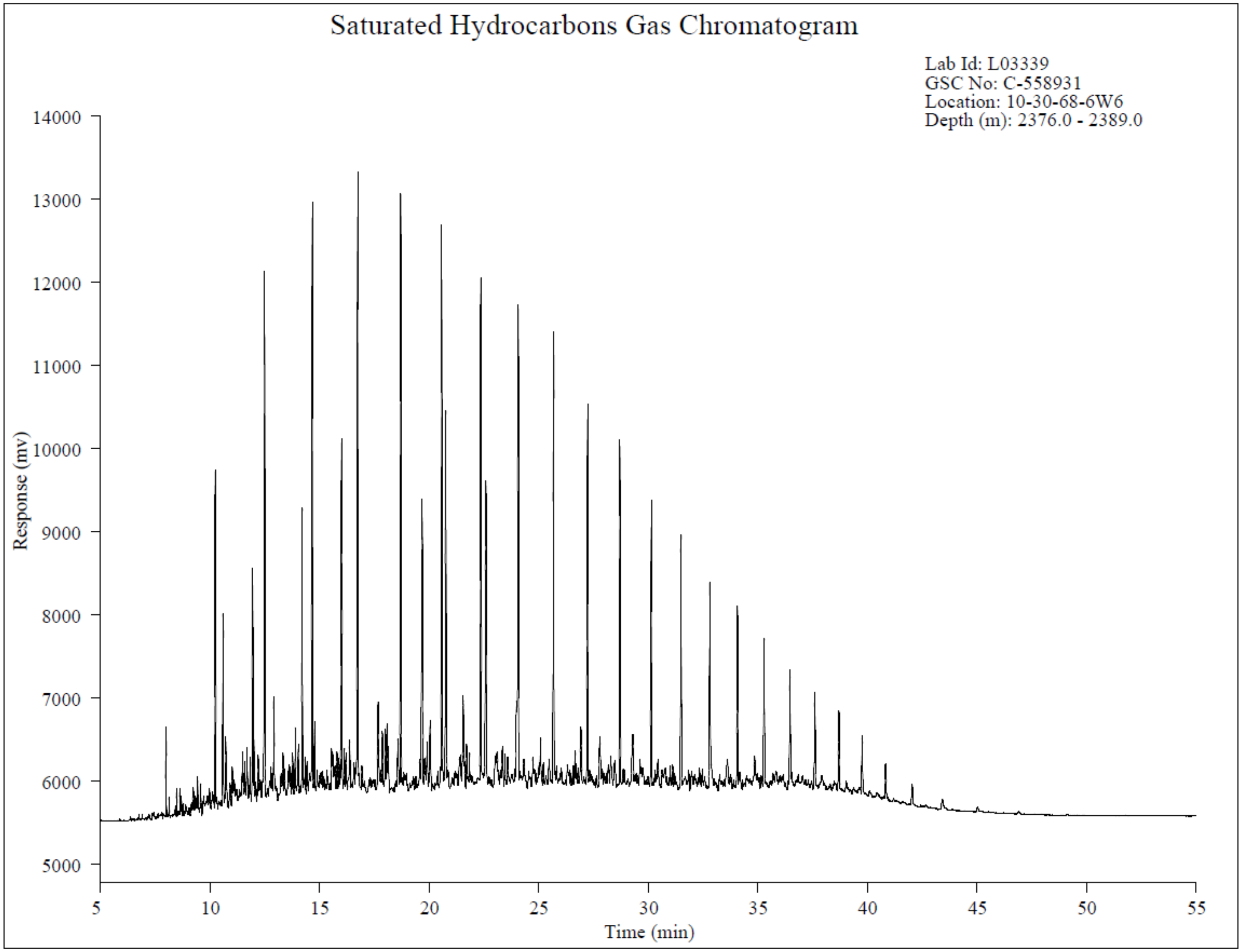

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L01141
GSC No: C-558149
Location: 7-6-86-13W6
Depth (ft): 4288.0 - 4302.0
Response (mv)
7800
7500
7200
6900
6600
6300
6000
5700
5400
5100
4800
5
10
15
20
25
30
35
40
45
50
55
Time (min)

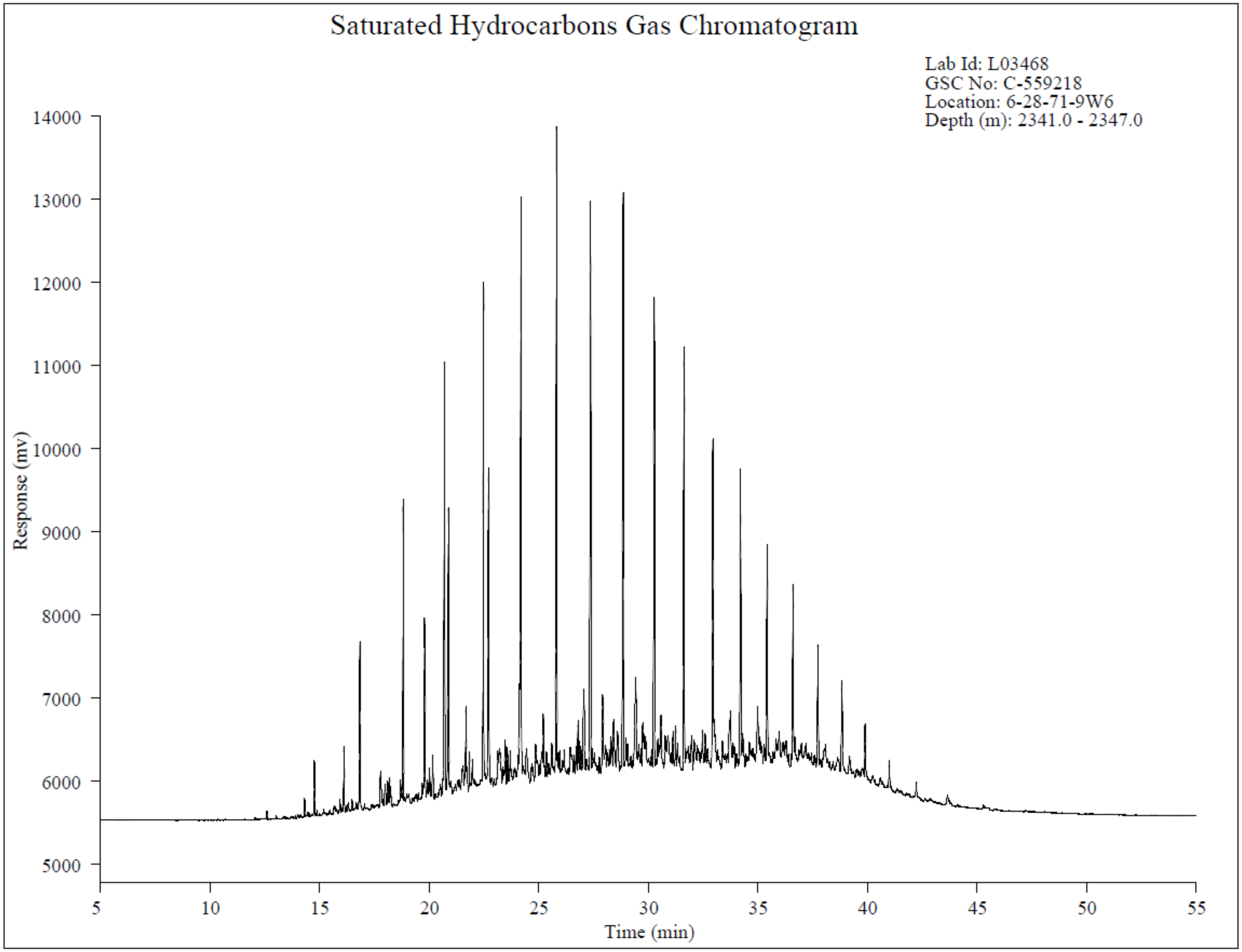

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L01190
GSC No: C-559555
Location: 7-25-81-11W6
Depth (m): 1466.5 - 1481.5
Response (mv)
7400
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5200
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

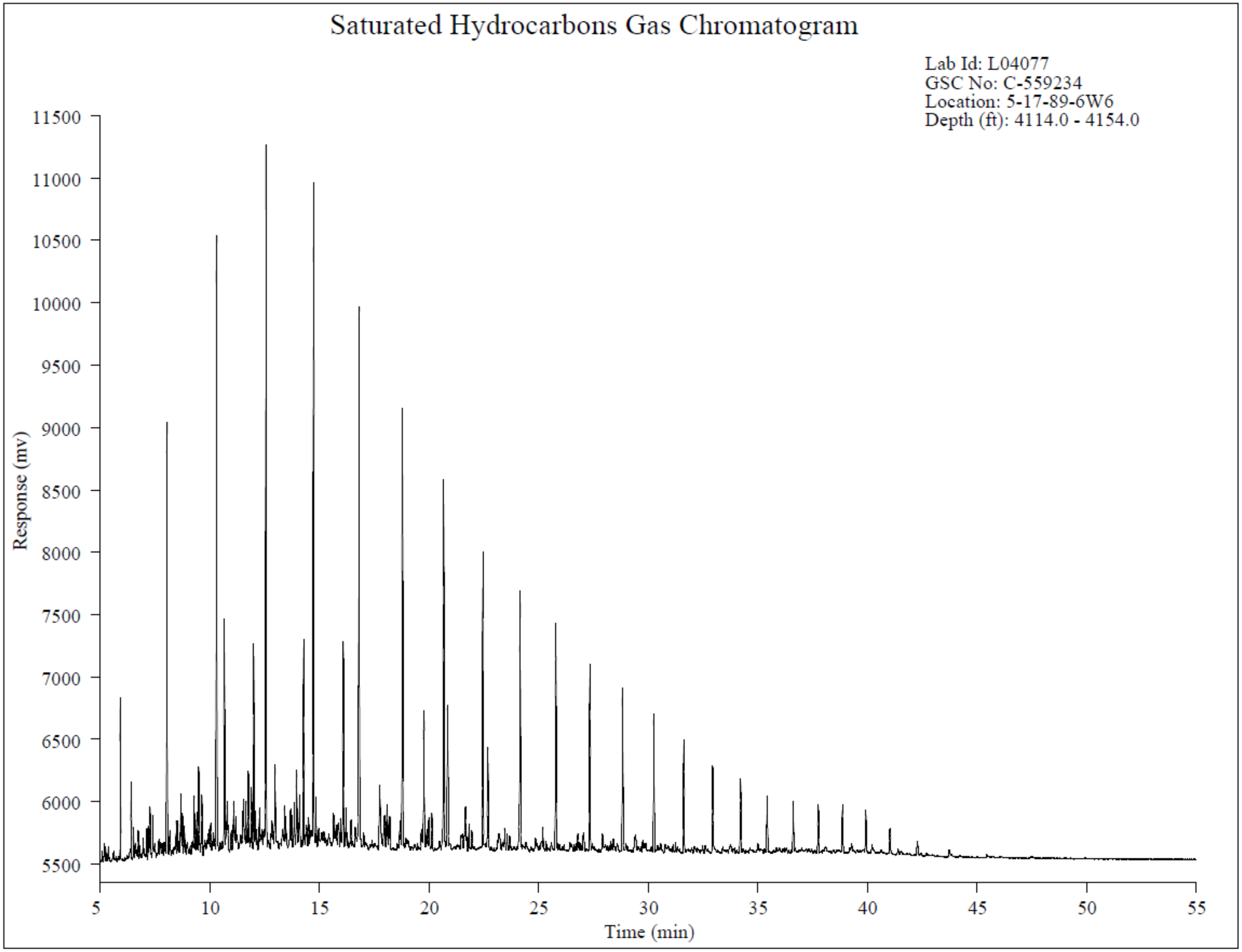


Saturated Hydrocarbons Gas Chromatogram
Lab Id: L02867
GSC No: C-562215
Location: 4-27-75-9W6
Depth (m): 2244.5 - 2251.5
Response (mv)
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

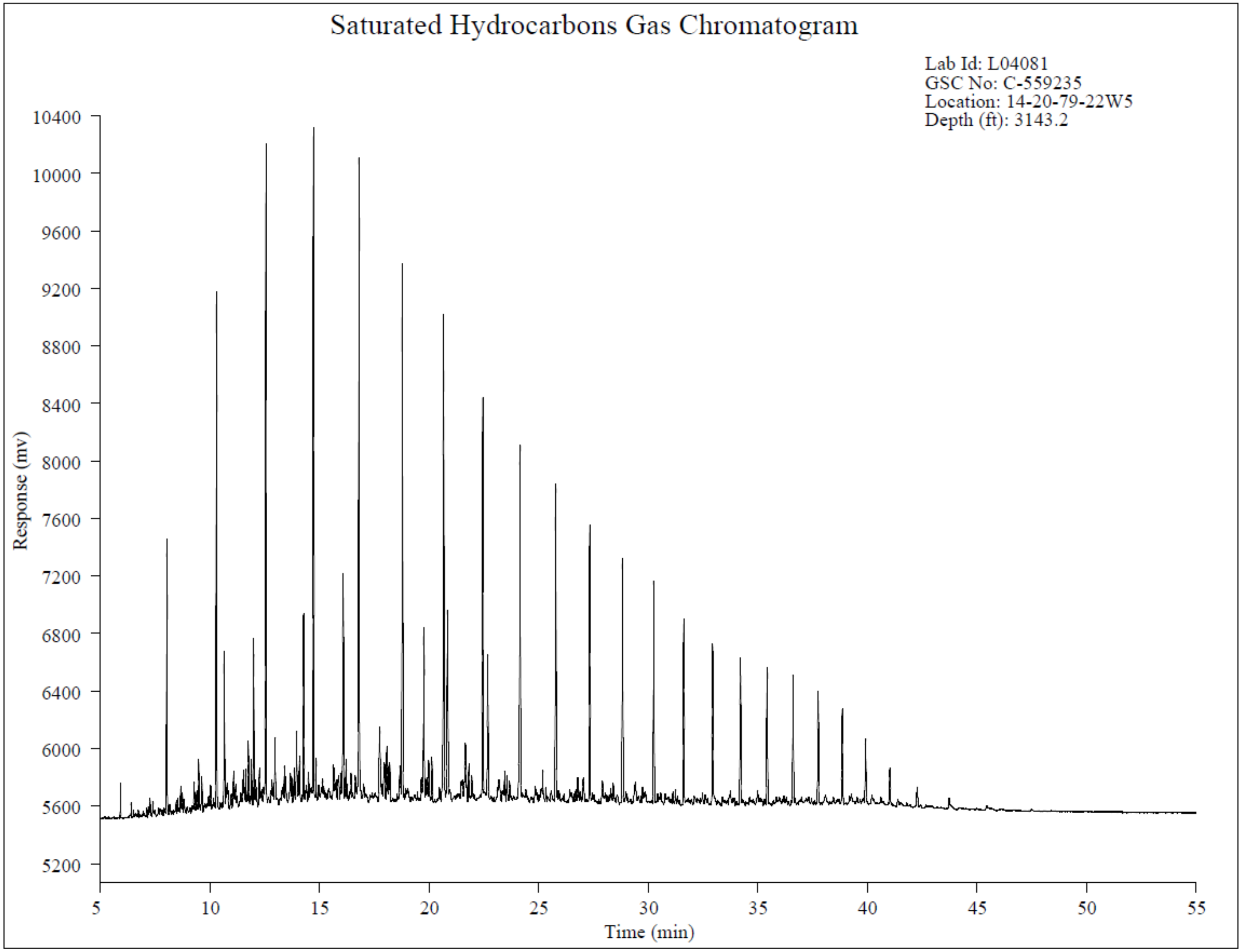

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L02868
GSC No: C-562104
Location: 14-34-75-9W6
Depth (m): 2160.0 - 2165.0
Response (mv)
11000
10500
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

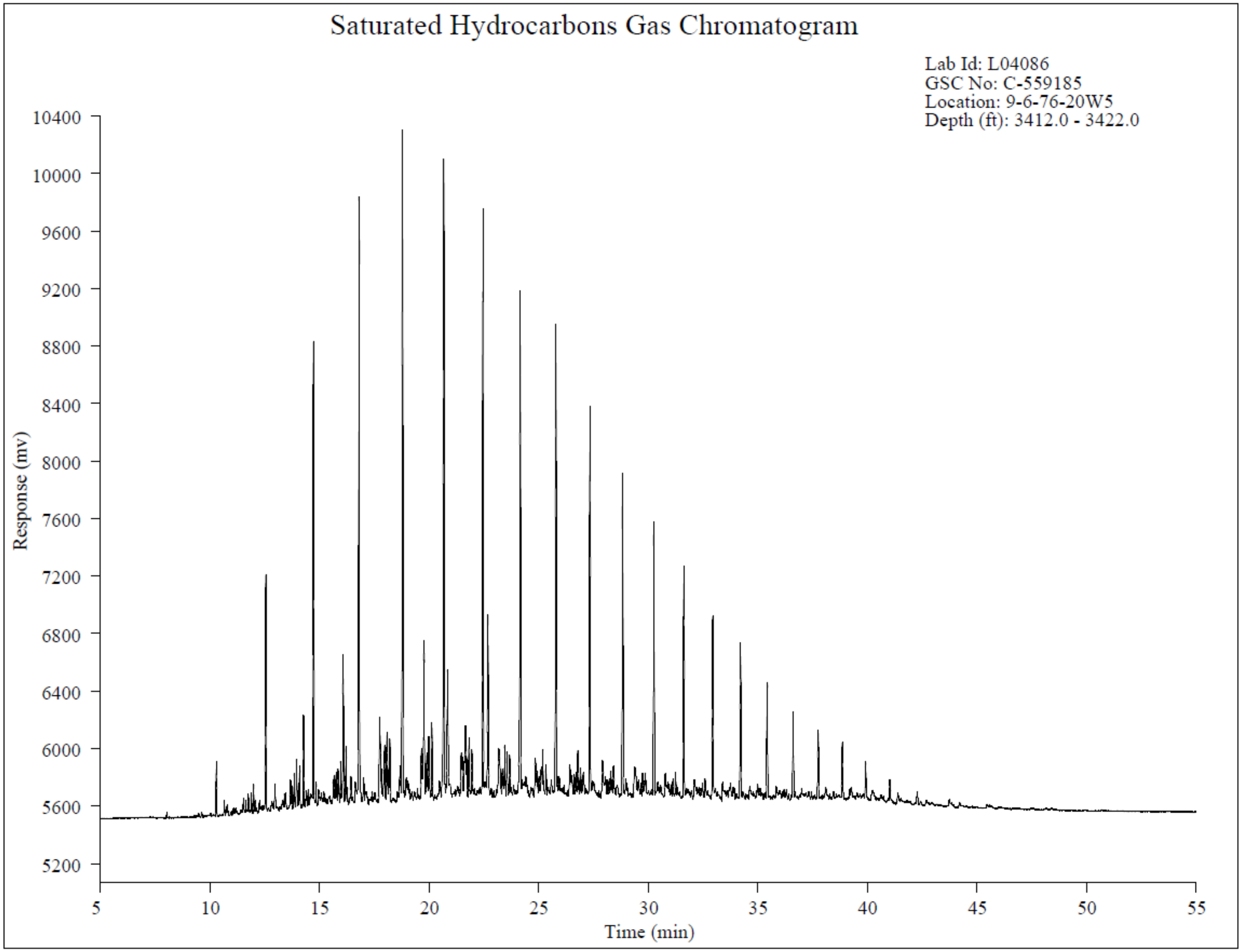

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L03339
GSC No: C-558931
Location: 10-30-68-6W6
Depth (m): 2376.0 - 2389.0
Response (mv)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: L03468
GSC No: C-559218
Location: 6-28-71-9W6
Depth (m): 2341.0 - 2347.0
Response (mv)
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
Time (min)

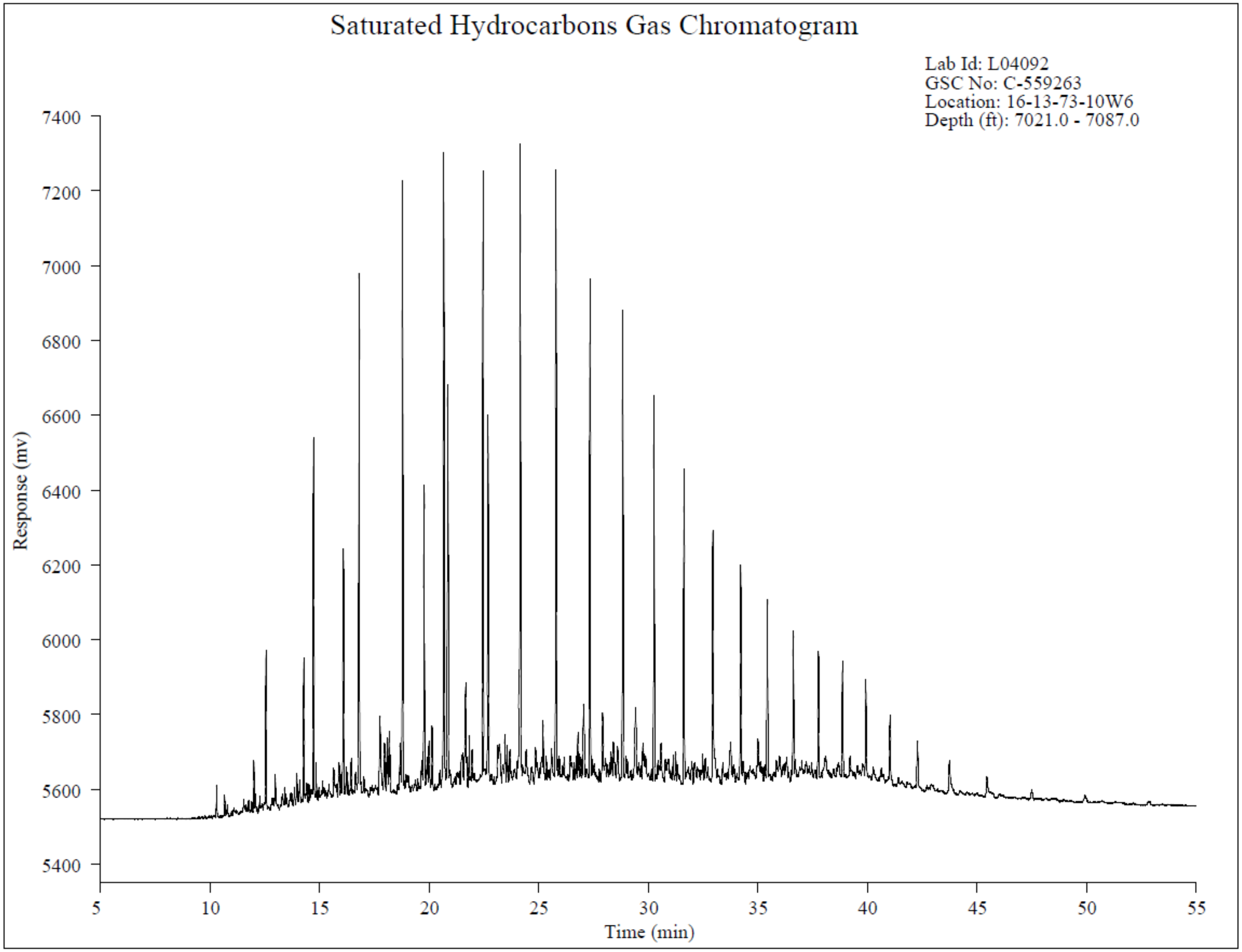


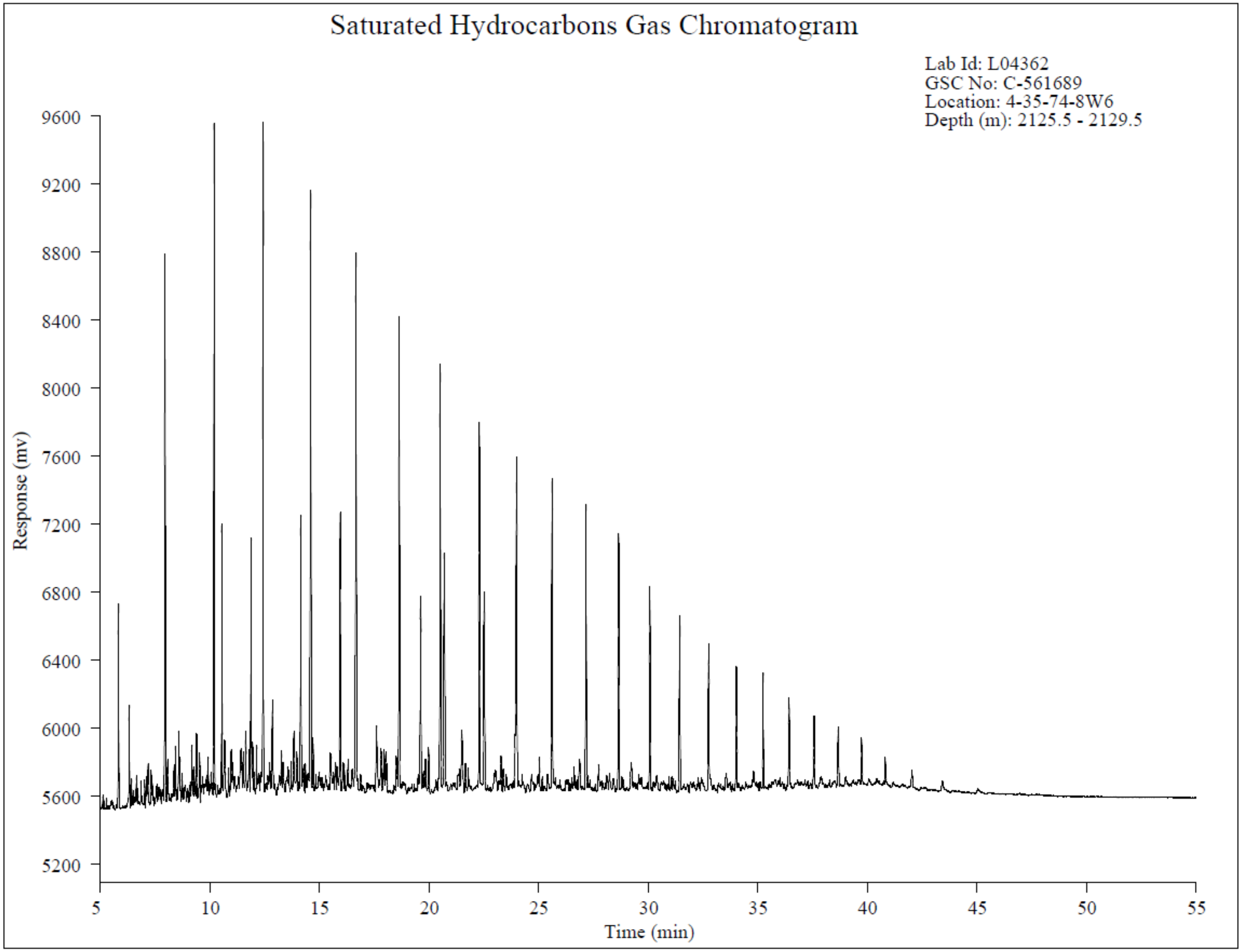
Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04077
GSC No: C-559234
Location: 5-17-89-6W6
Depth (ft): 4114.0 - 4154.0
Response (mv)
11500
11000
10500
10000
9500
9000
8500
8000
7500
7000
6500
6000
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

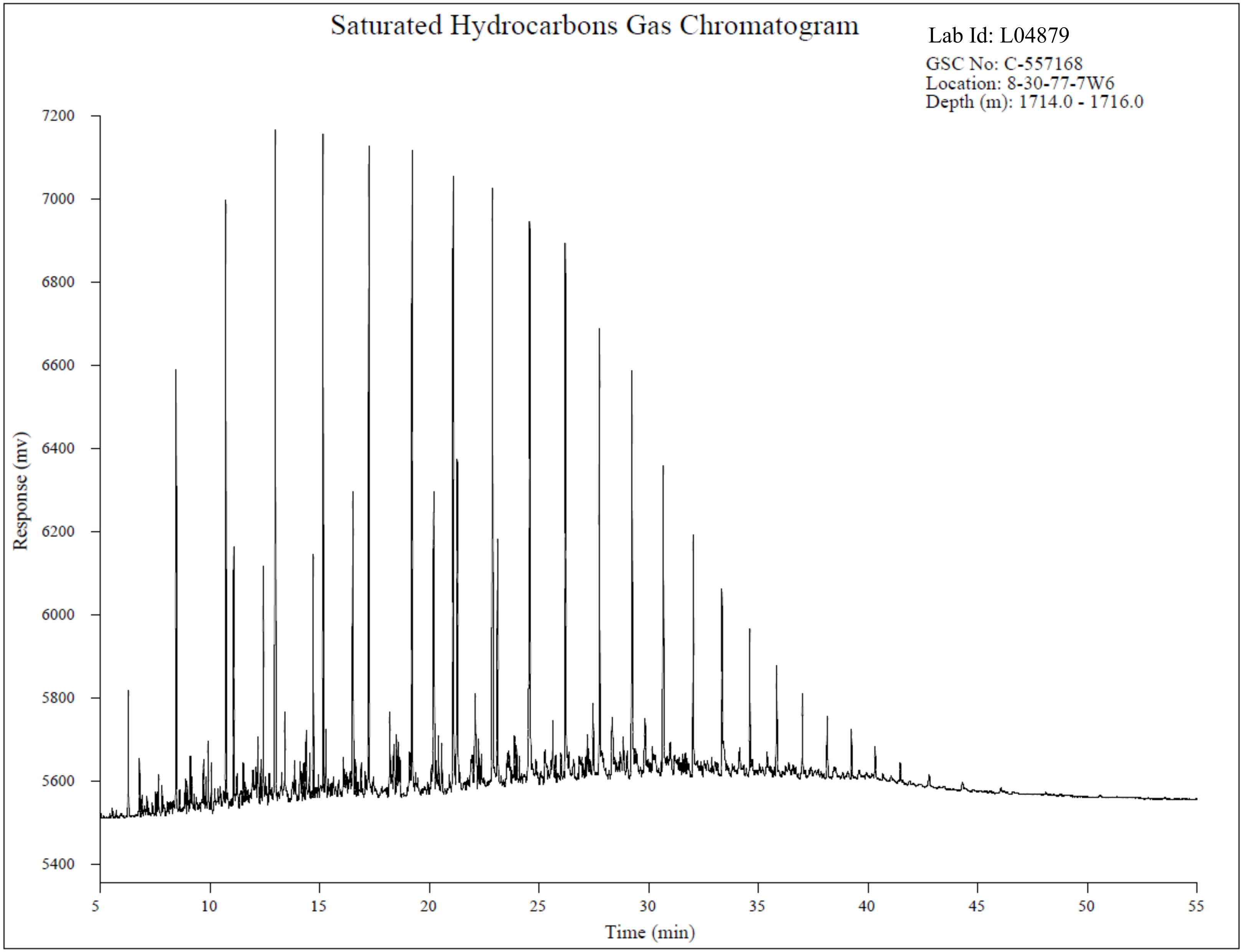

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04081
GSC No: C-559235
Location: 14-20-79-22W5
Depth (ft): 3143.2
Response (mv)
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

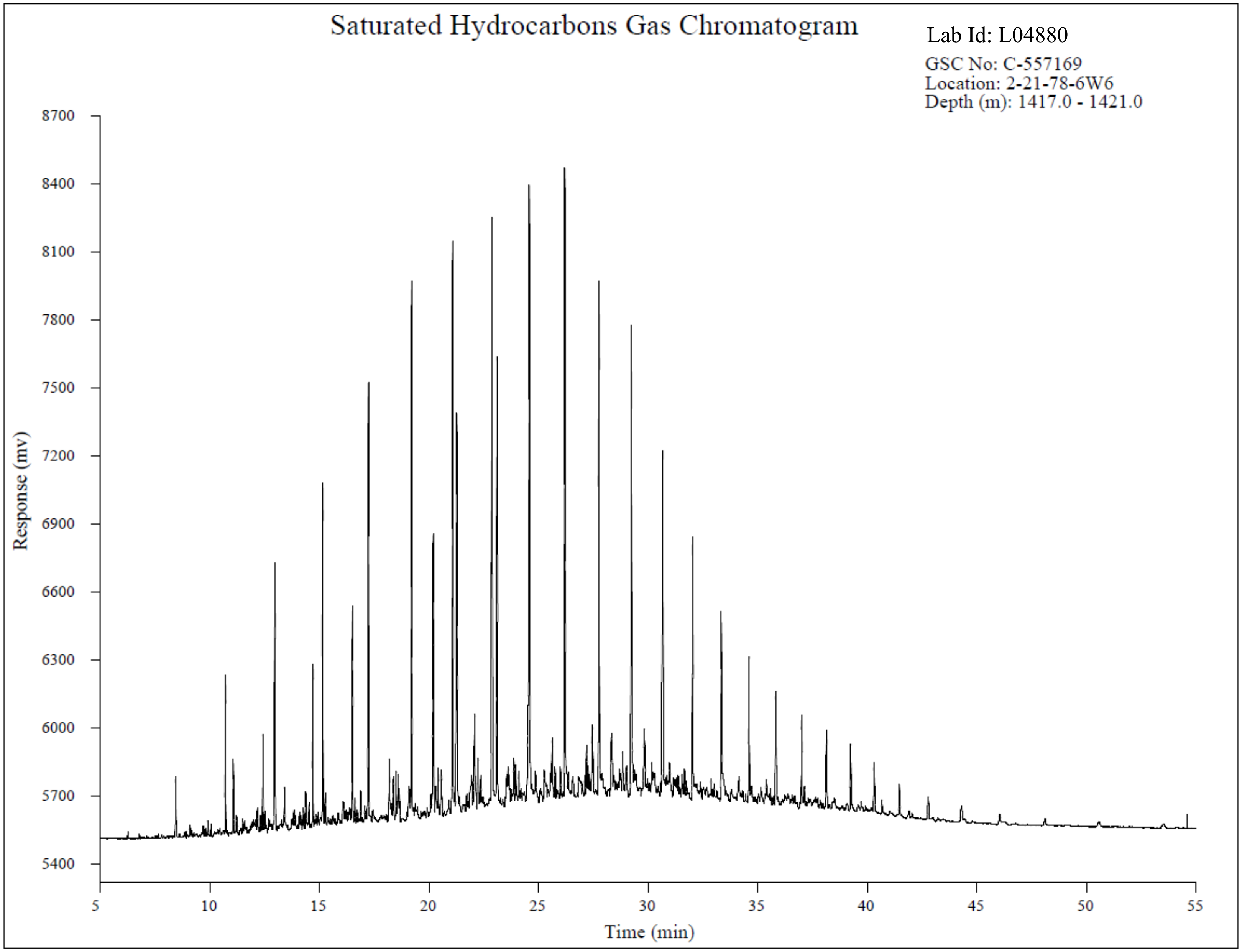


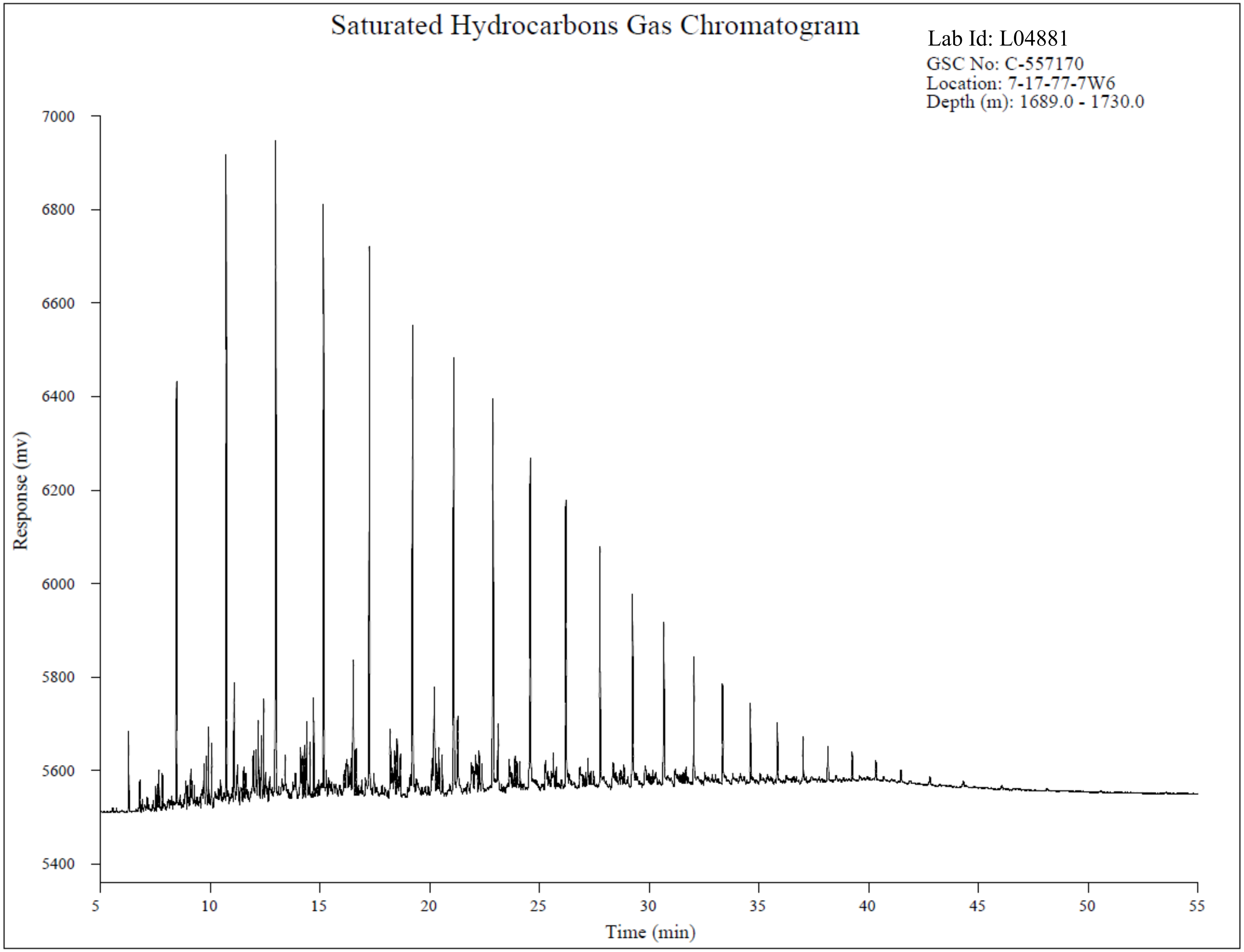
Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04086
GSC No: C-559185
Location: 9-6-76-20W5
Depth (ft): 3412.0 - 3422.0
Response (mv)
10400
10000
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04092
GSC No: C-559263
Location: 16-13-73-10W6
Depth (ft): 7021.0 - 7087.0
Response (mv)
7400
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

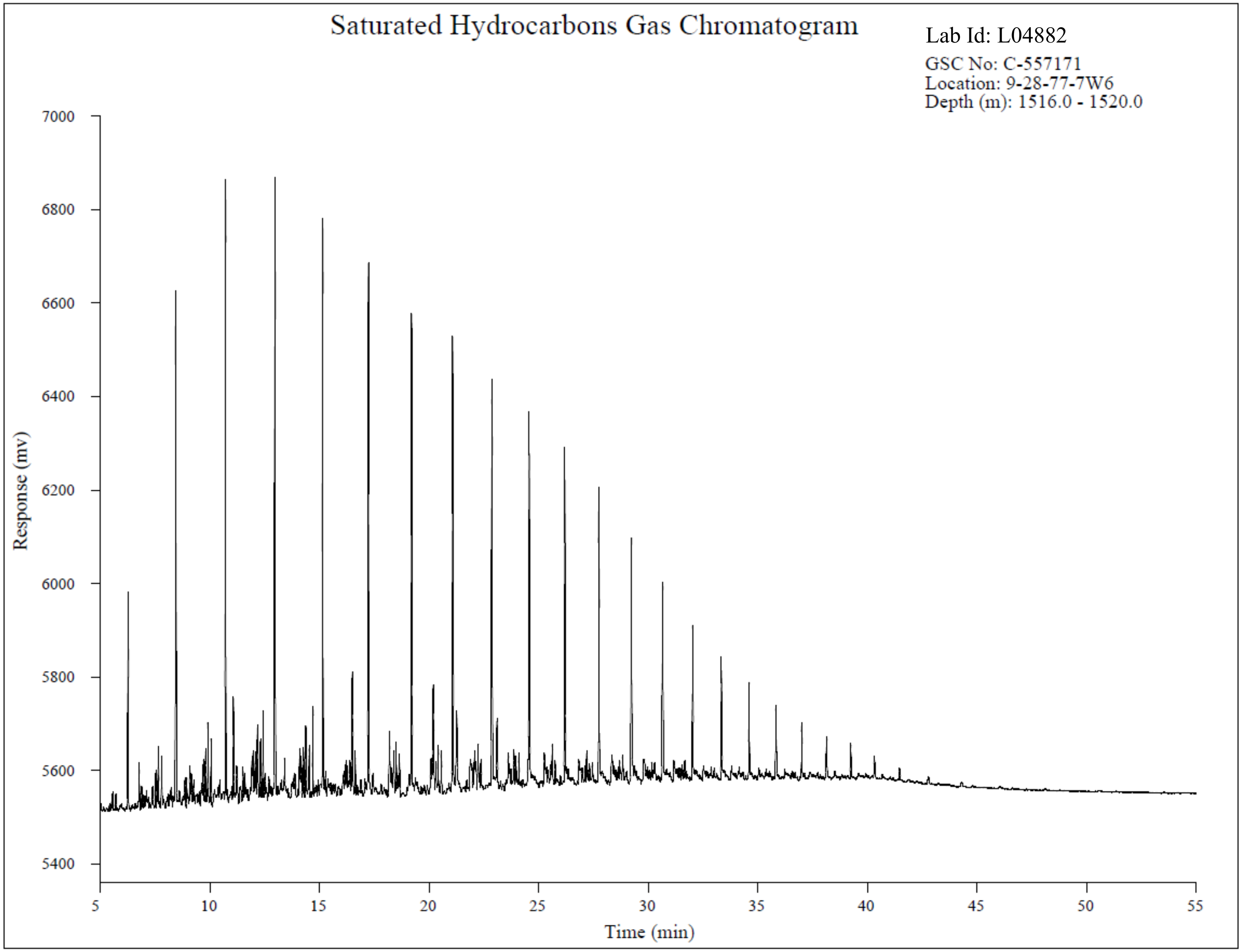

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04362
GSC No: C-561689
Location: 4-35-74-8W6
Depth (m): 2125.5 - 2129.5
Response (mv)
9600
9200
8800
8400
8000
7600
7200
6800
6400
6000
5600
5200
5
10
15
20
25
30
35
40
45
50
55
Time (min)

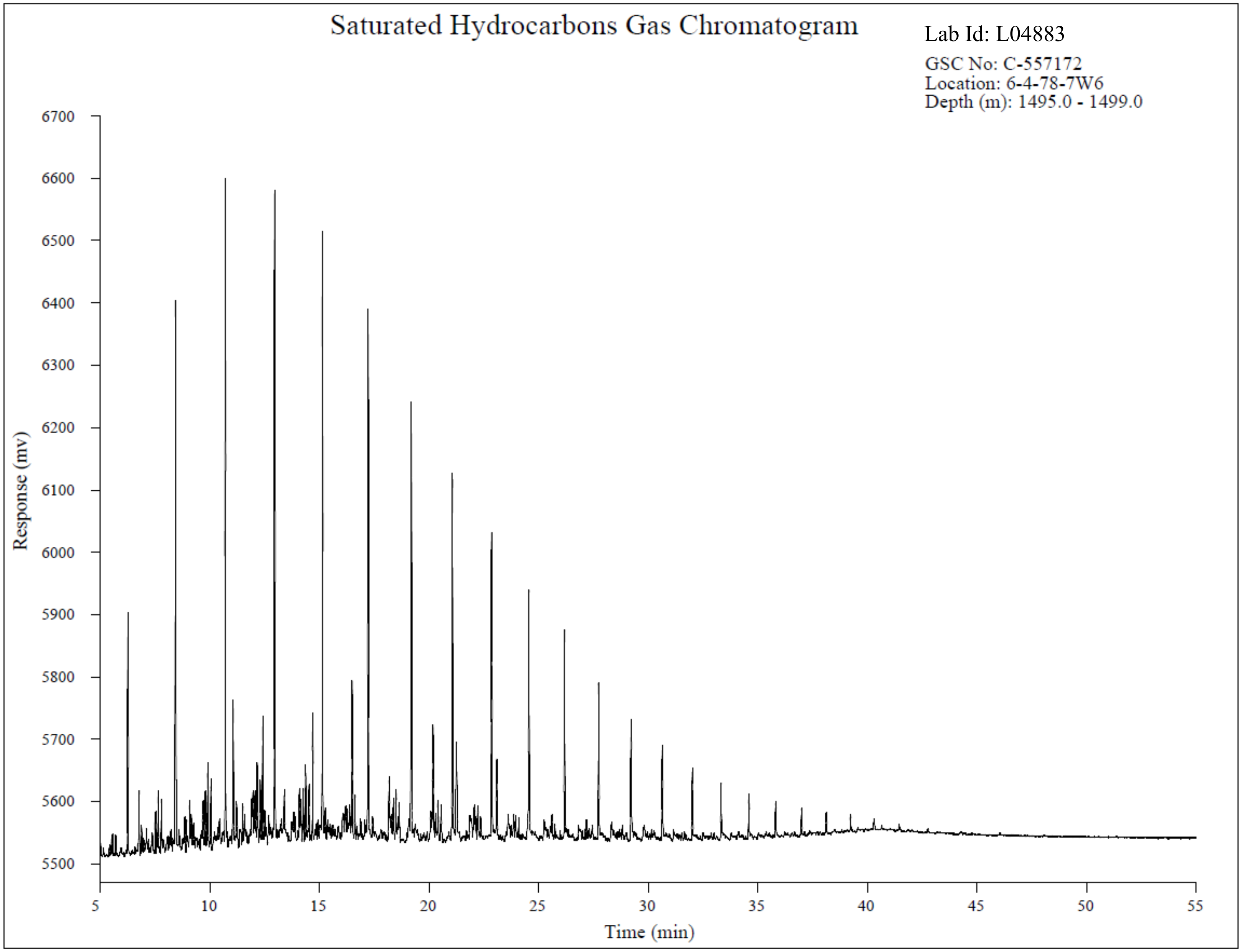

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04879
GSC No: C-557168
Location: 8-30-77-7W6
Depth (m): 1714.0 - 1716.0
Response (mv)
Time (min)
7200
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55

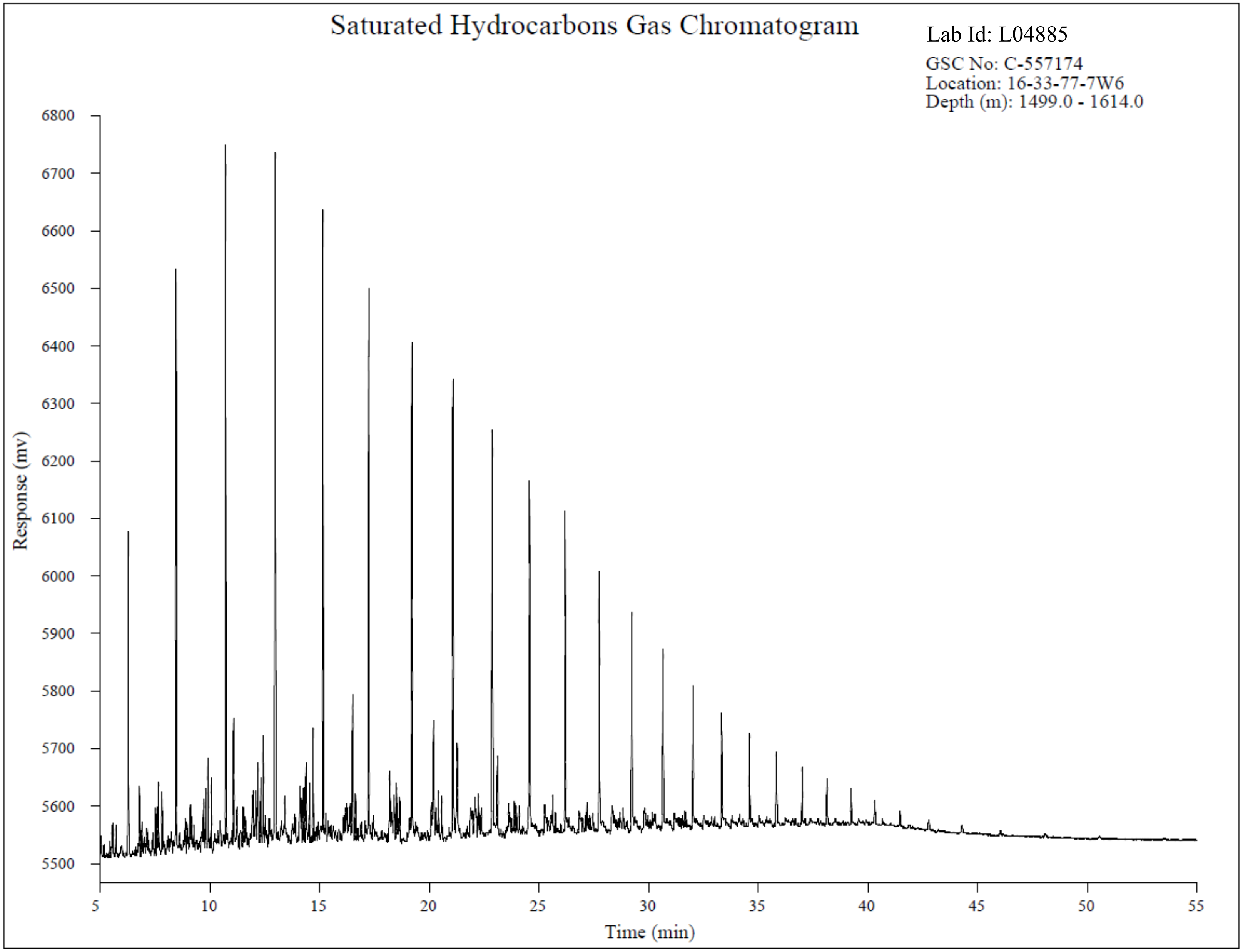

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04880
GSC No: C-557169
Location: 2-21-78-6W6
Depth (m): 1417.0 - 1421.0
Response (mv)
8700
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

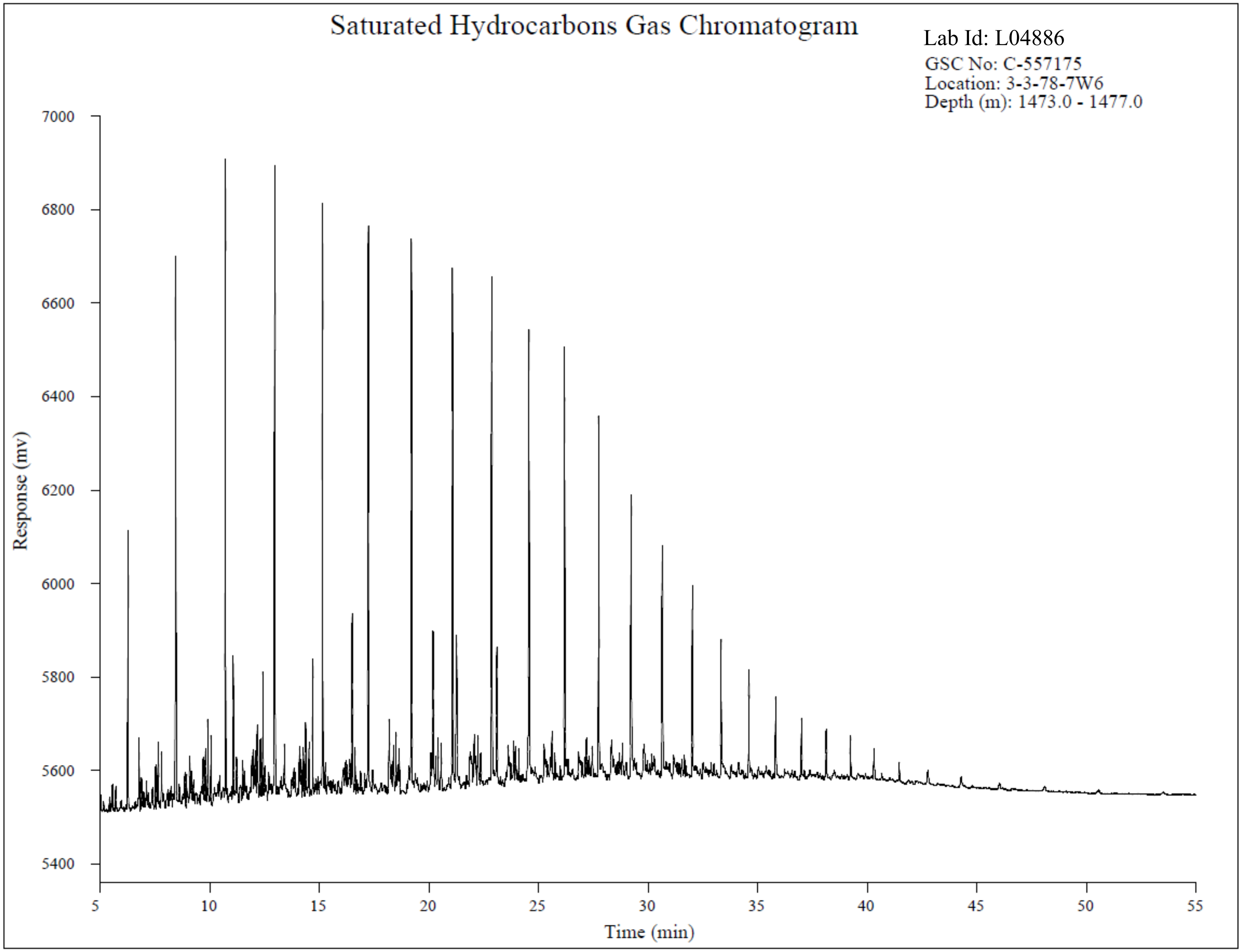


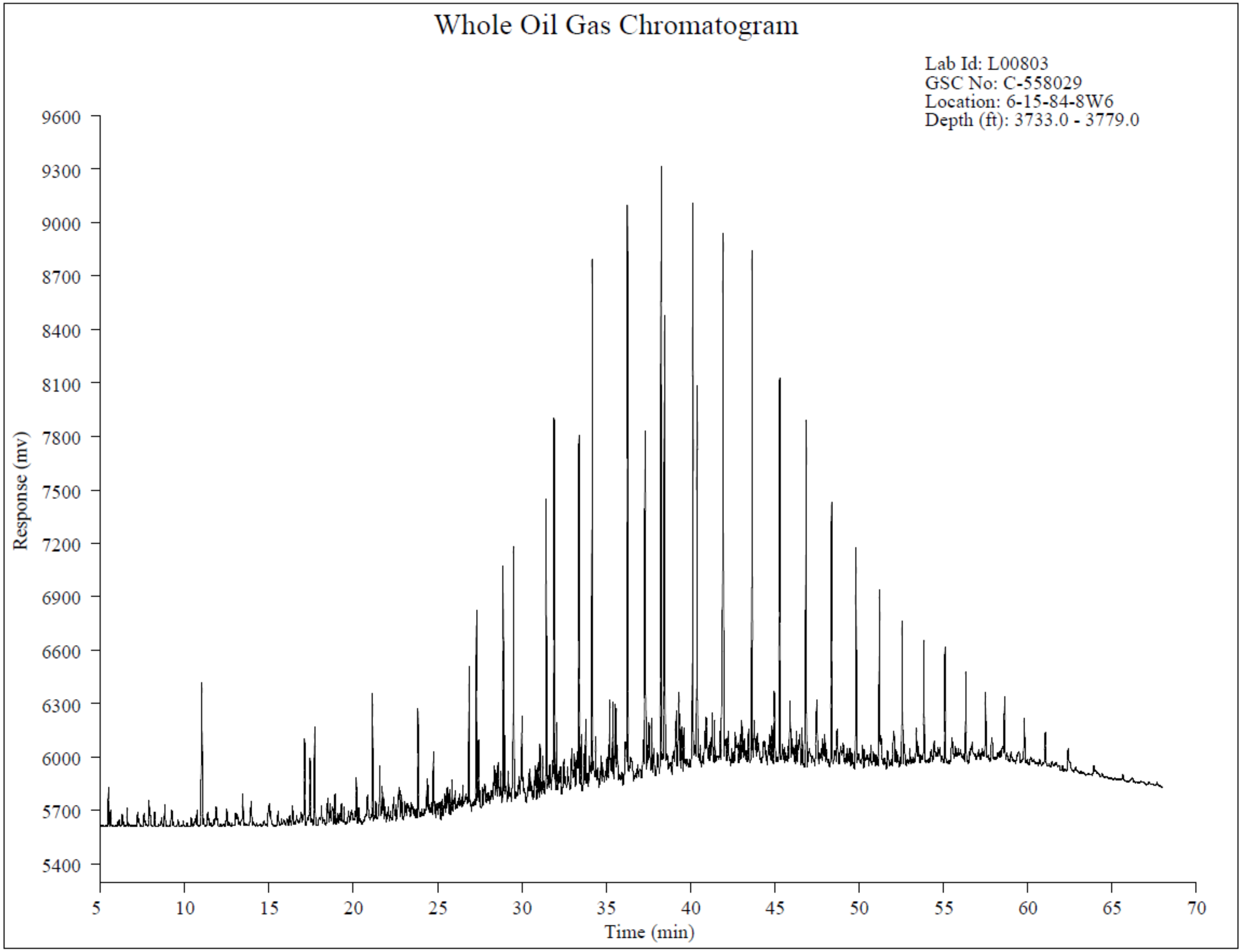
Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04881
GSC No: C-557170
Location: 7-17-77-7W6
Depth (m): 1689.0 - 1730.0
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)


Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04882
GSC No: C-557171
Location: 9-28-77-7W6
Depth (m): 1516.0 - 1520.0
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)

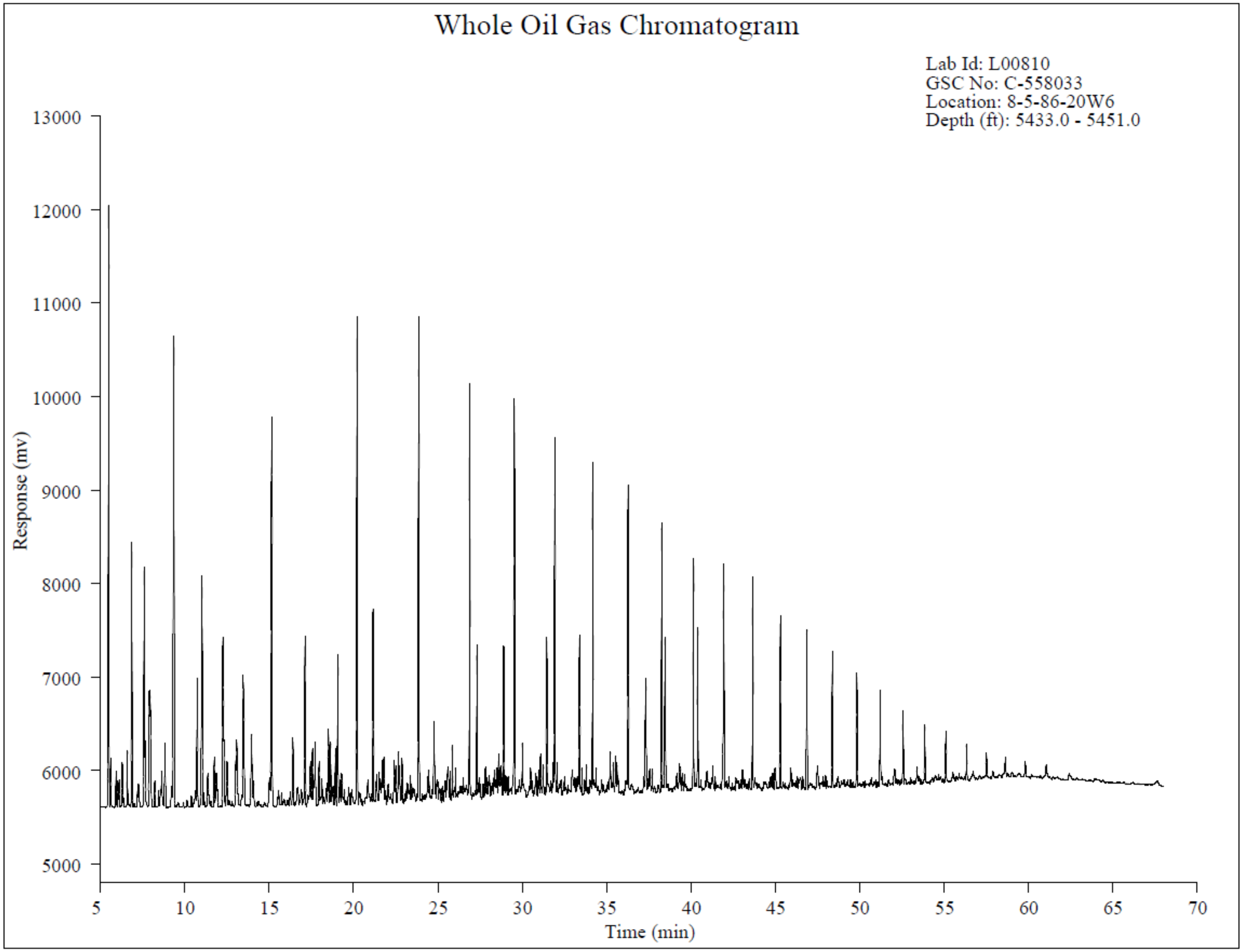

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04883
GSC No: C-557172
Location: 6-4-78-7W6
Depth (m): 1495.0 - 1499.0
Response (mv)
6700
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

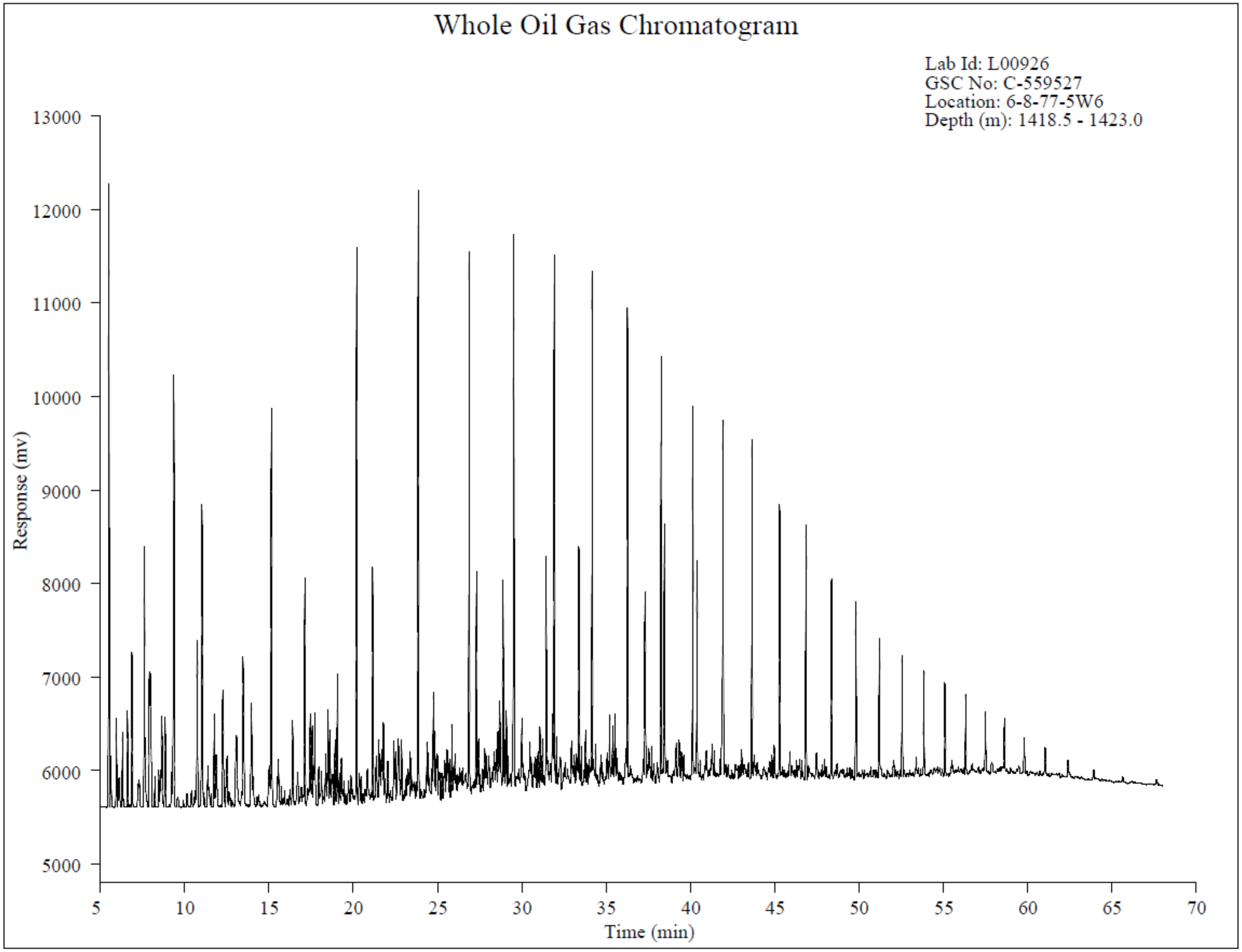

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04885
GSC No: C-557174
Location: 16-33-77-7W6
Depth (m): 1499.0 - 1614.0
Response (mv)
6800
6700
6600
6500
6400
6300
6200
6100
6000
5900
5800
5700
5600
5500
5
10
15
20
25
30
35
40
45
50
55
Time (min)

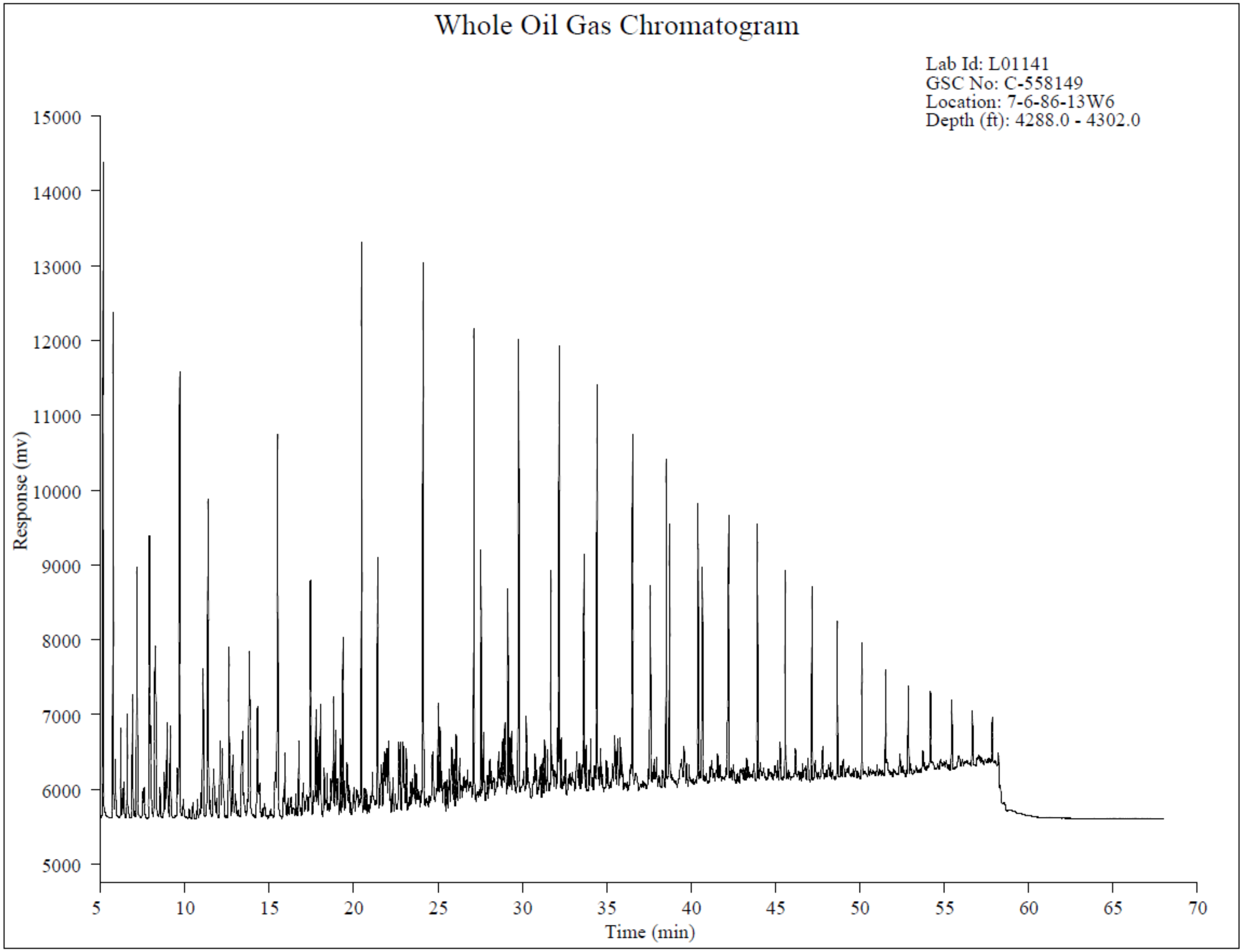

Saturated Hydrocarbons Gas Chromatogram
Lab Id: L04886
GSC No: C-557175
Location: 3-3-78-7W6
Depth (m): 1473.0 - 1477.0
Response (mv)
7000
6800
6600
6400
6200
6000
5800
5600
5400
5
10
15
20
25
30
35
40
45
50
55
Time (min)



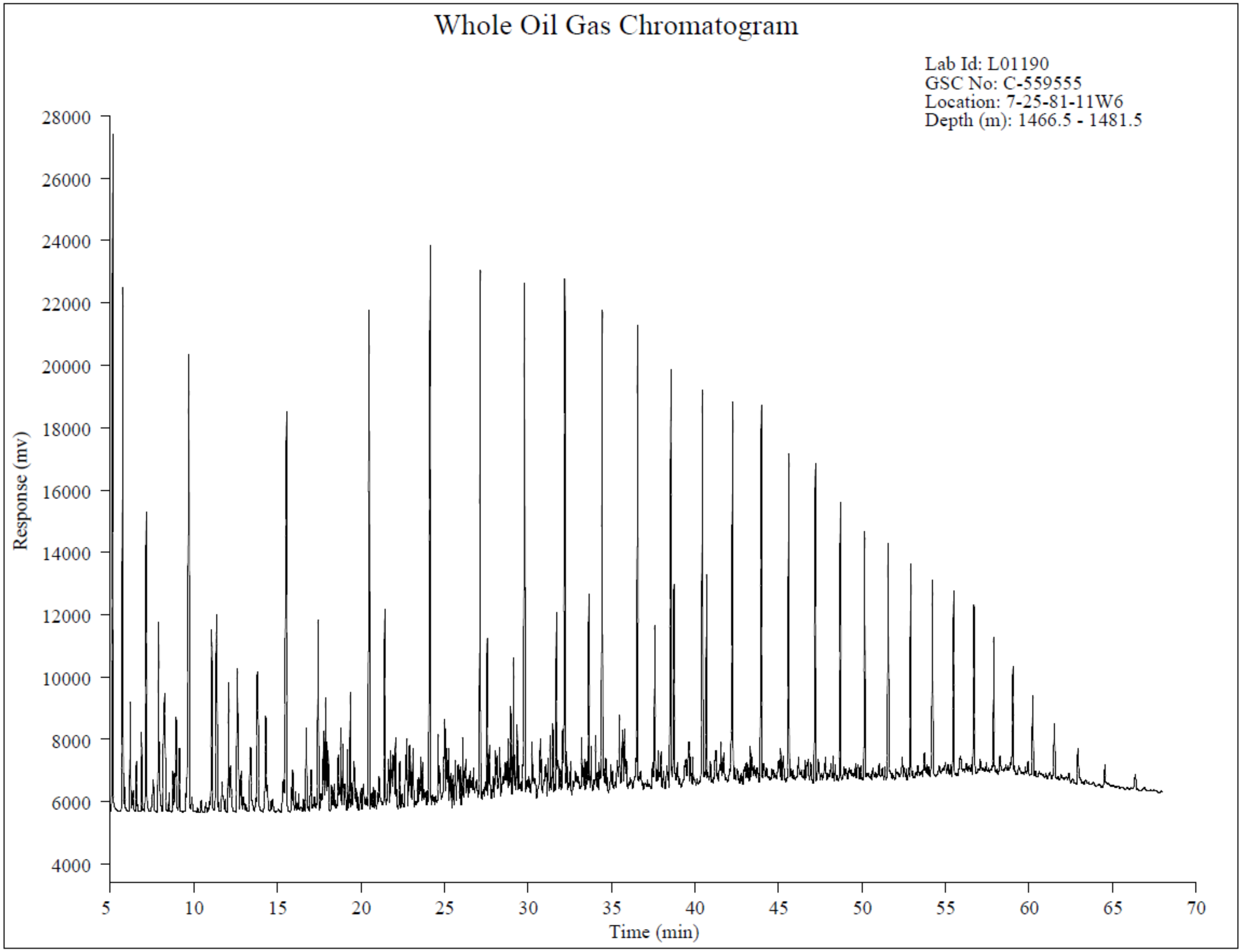
Whole Oil Gas Chromatogram
Lab Id: L00803
GSC No: C-558029
Location: 6-15-84-8W6
Depth (ft): 3733.0 - 3779.0
Response (mv)
9600
9300
9000
8700
8400
8100
7800
7500
7200
6900
6600
6300
6000
5700
5400
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)


Whole Oil Gas Chromatogram
Lab Id: L00810
GSC No: C-558033
Location: 8-5-86-20W6
Depth (ft): 5433.0 - 5451.0
Response (mv)
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

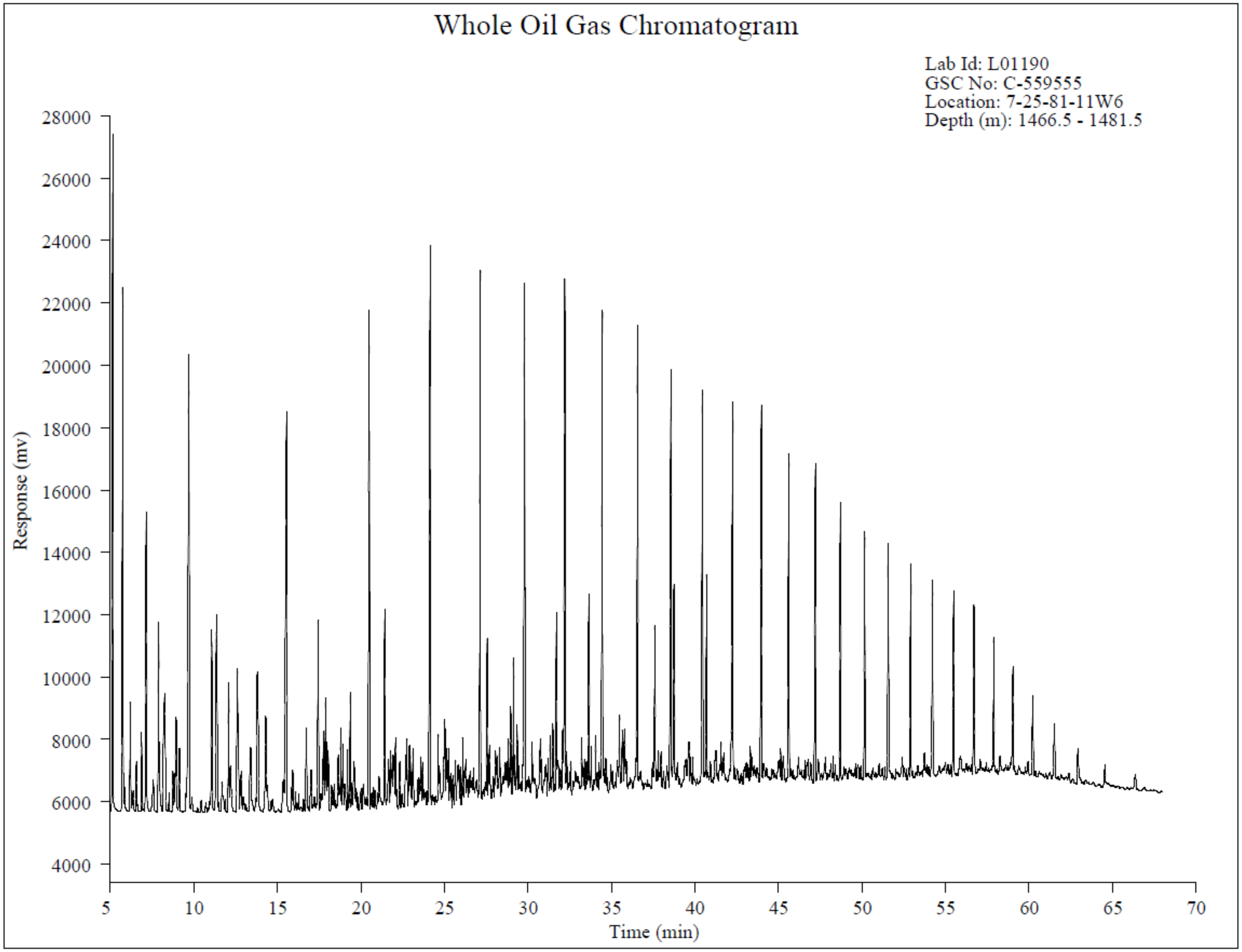

Whole Oil Gas Chromatogram
Lab Id: L00926
GSC No: C-559527
Location: 6-8-77-5W6
Depth (m): 1418.5 - 1423.0
Response (mv)
13000
12000
11000
10000
9000
8000
7000
6000
5000
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)



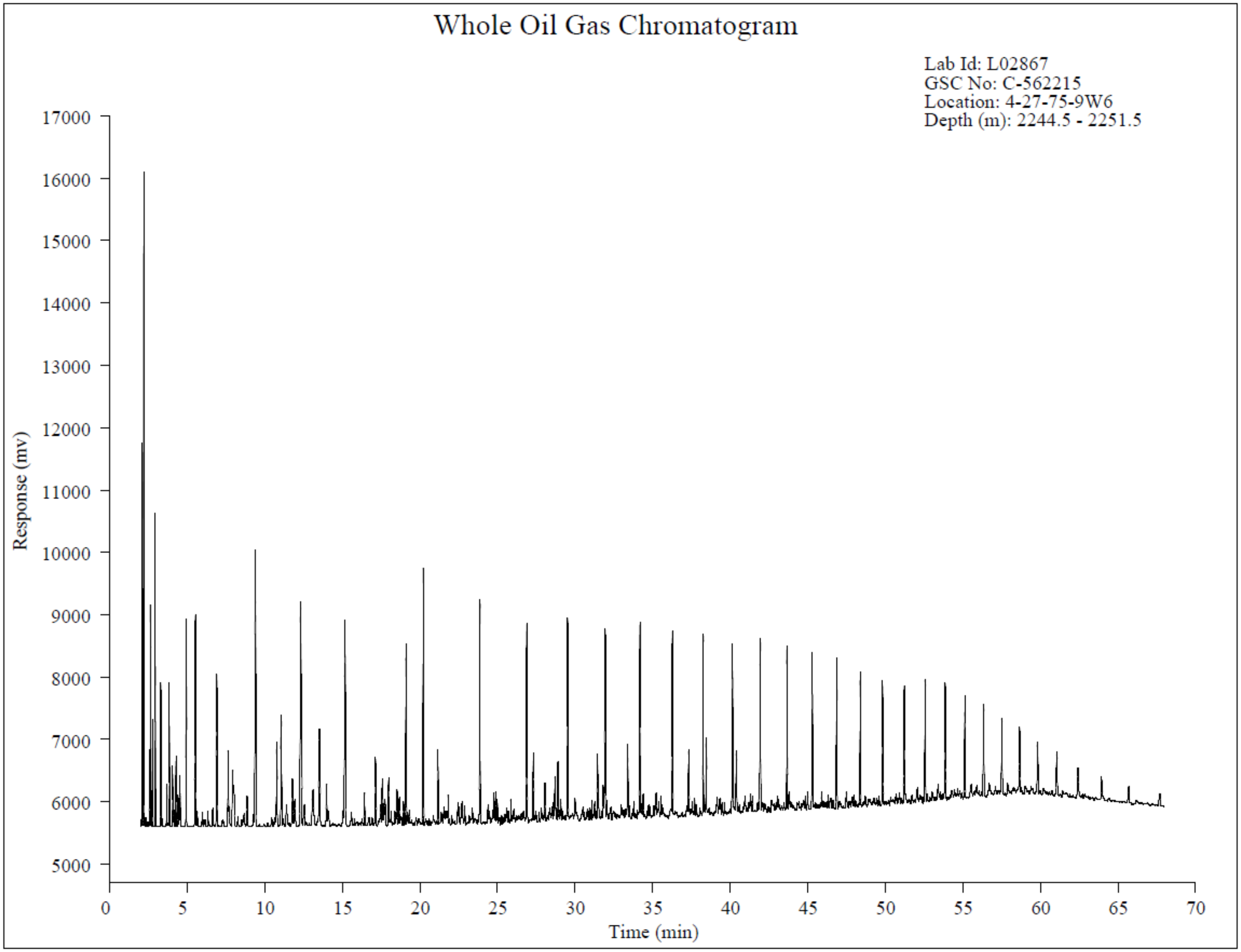
Whole Oil Gas Chromatogram
Lab Id: L01141
GSC No: C-558149
Location: 7-6-86-13W6
Depth (ft): 4288.0 - 4302.0
Response (mv)
Time (min)

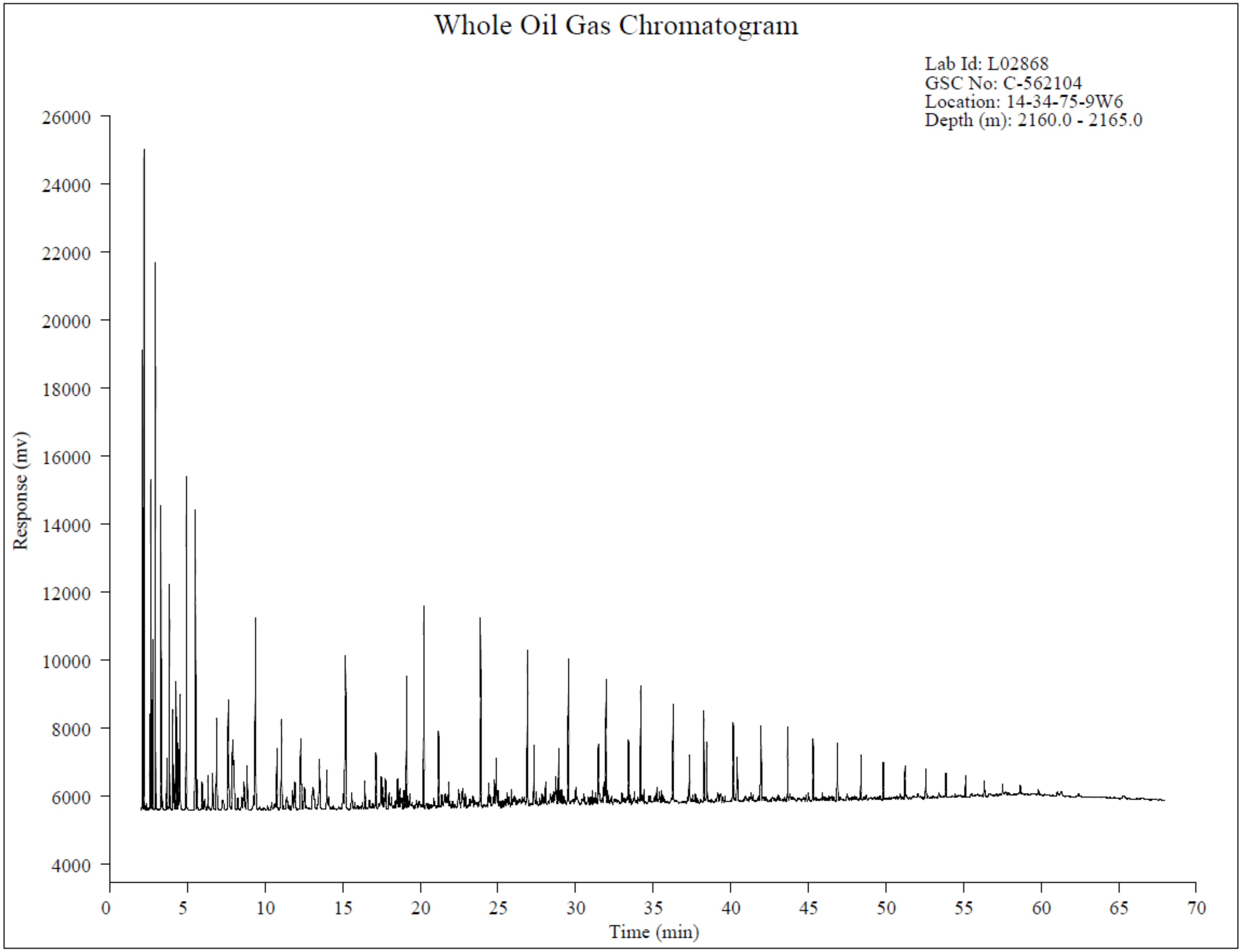


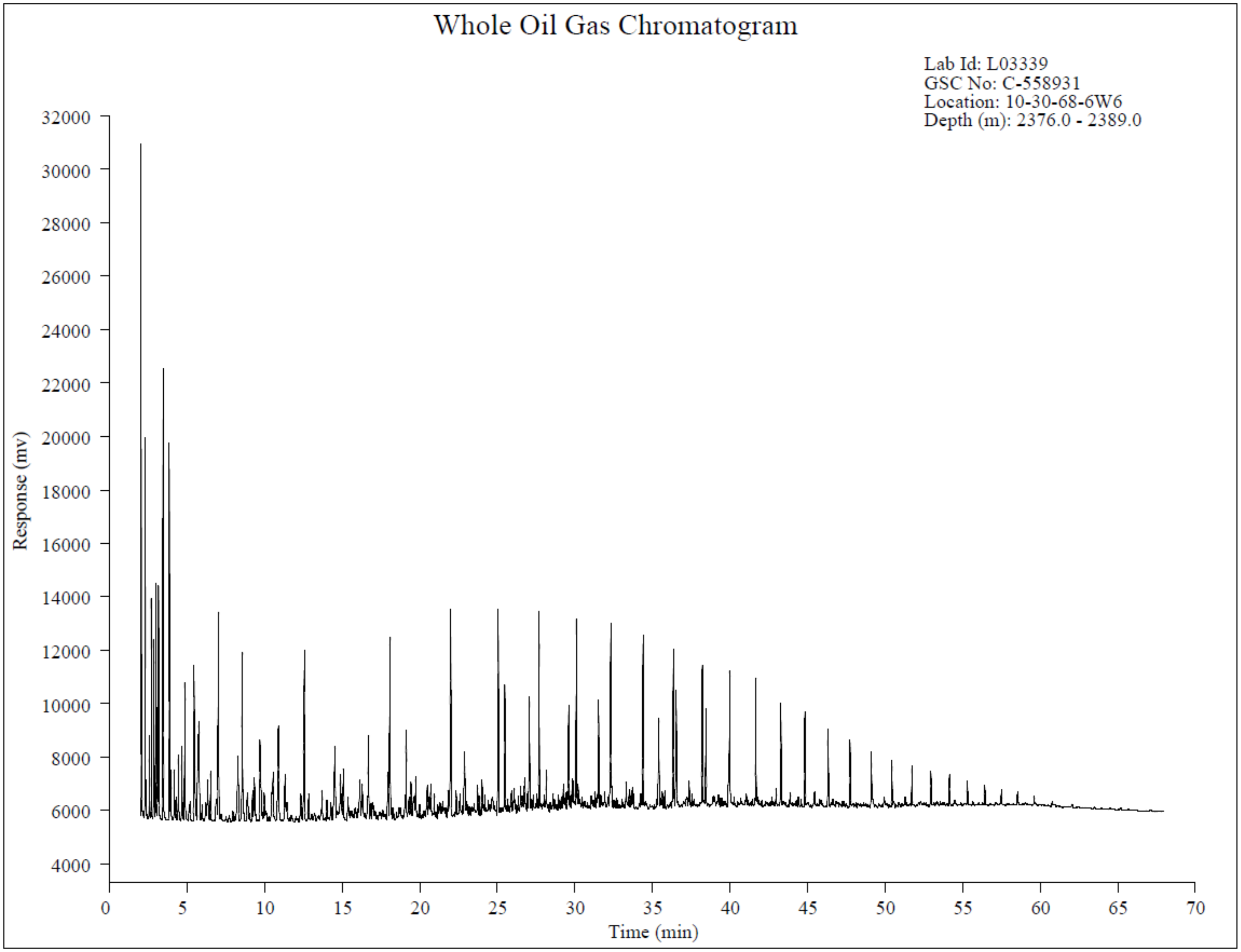
Whole Oil Gas Chromatogram
Lab Id: L01190
GSC No: C-559555
Location: 7-25-81-11W6
Depth (m): 1466.5 - 1481.5
Response (mv)
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

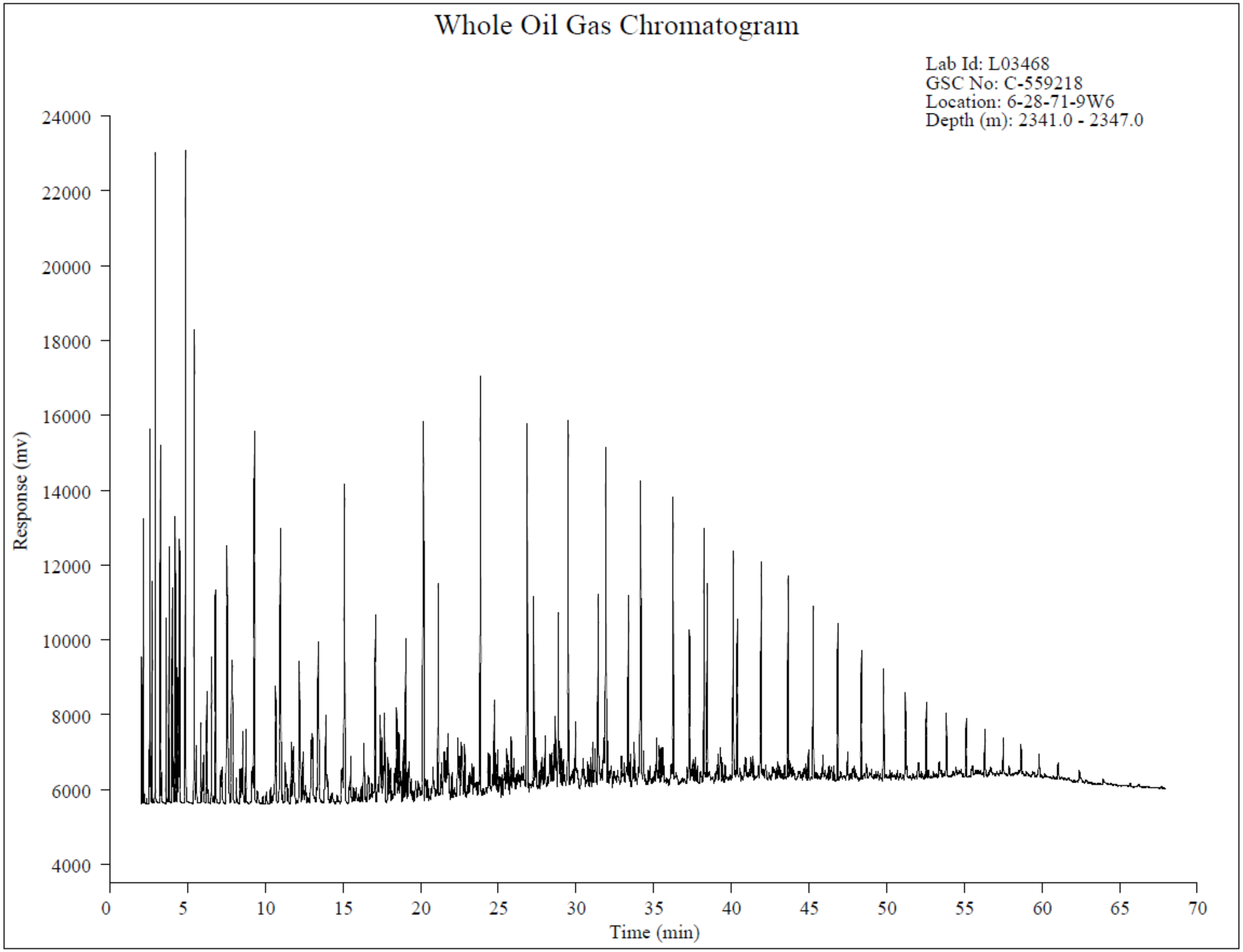


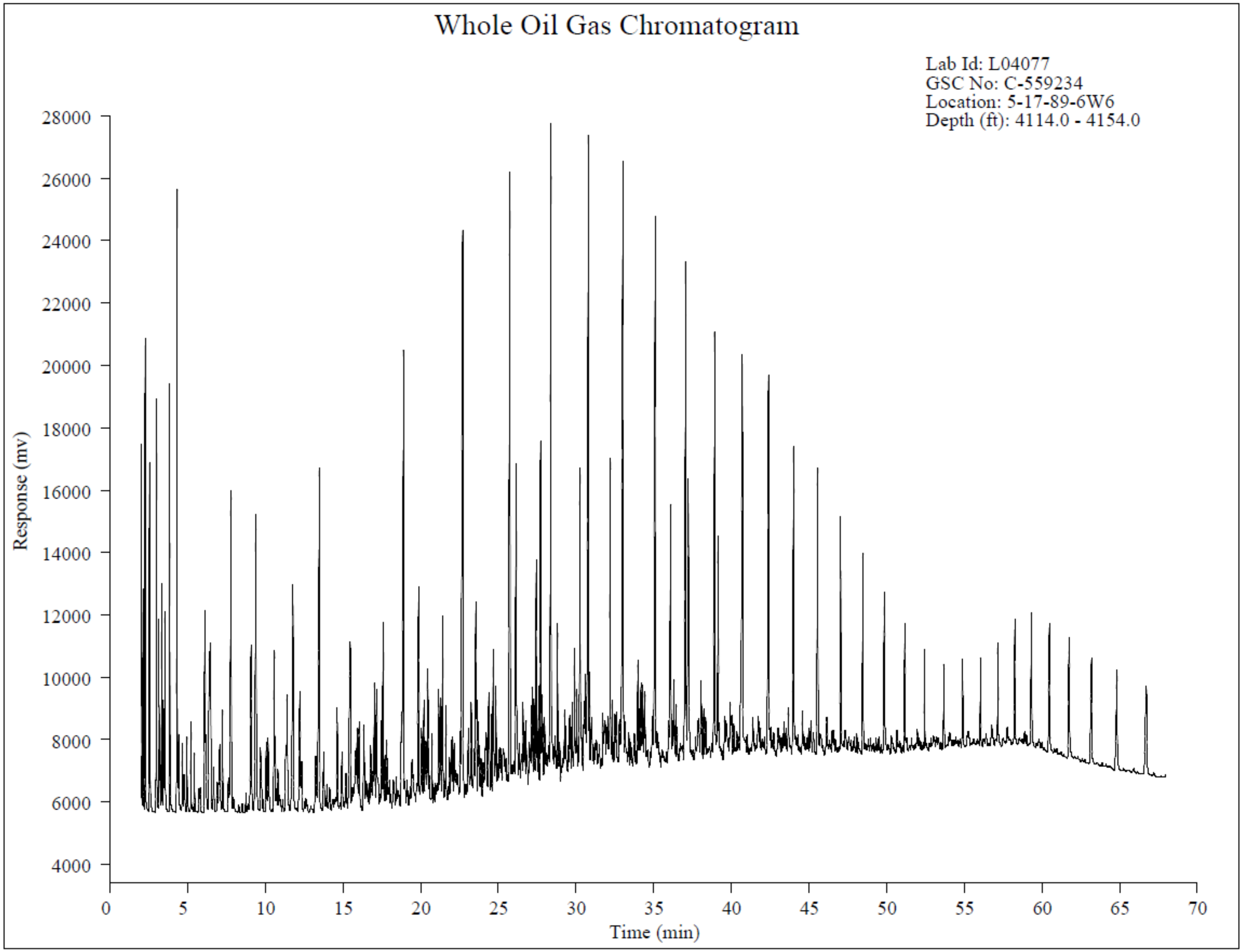
Whole Oil Gas Chromatogram
Lab Id: L01190
GSC No: C-559555
Location: 7-25-81-11W6
Depth (m): 1466.5 - 1481.5
Response (mv)
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

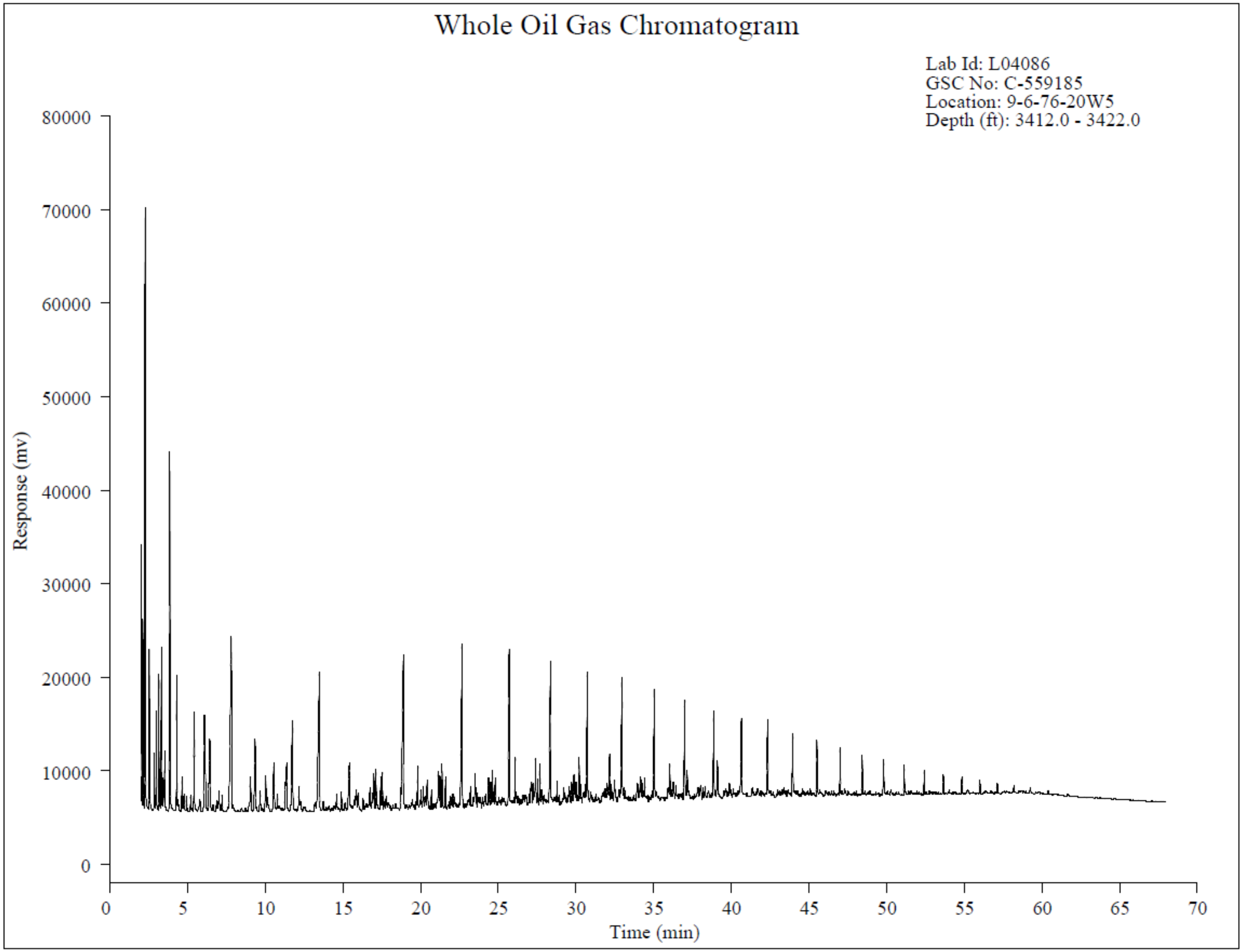

Whole Oil Gas Chromatogram
Lab Id: L02867
GSC No: C-562215
Location: 4-27-75-9W6
Depth (m): 2244.5 - 2251.5
Response (mv)
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

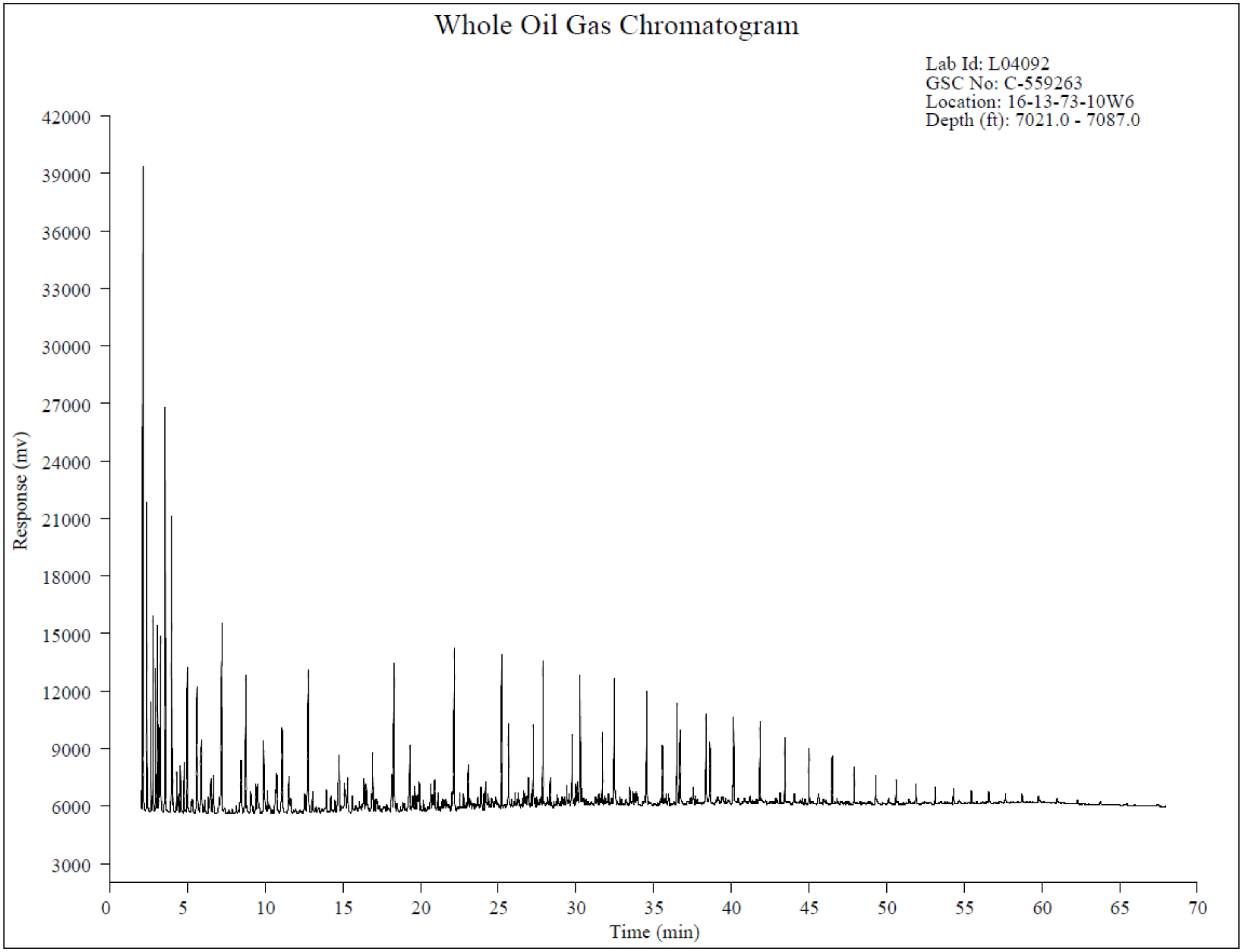

Whole Oil Gas Chromatogram
Lab Id: L02868
GSC No: C-562104
Location: 14-34-75-9W6
Depth (m): 2160.0 - 2165.0
Response (mv)
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

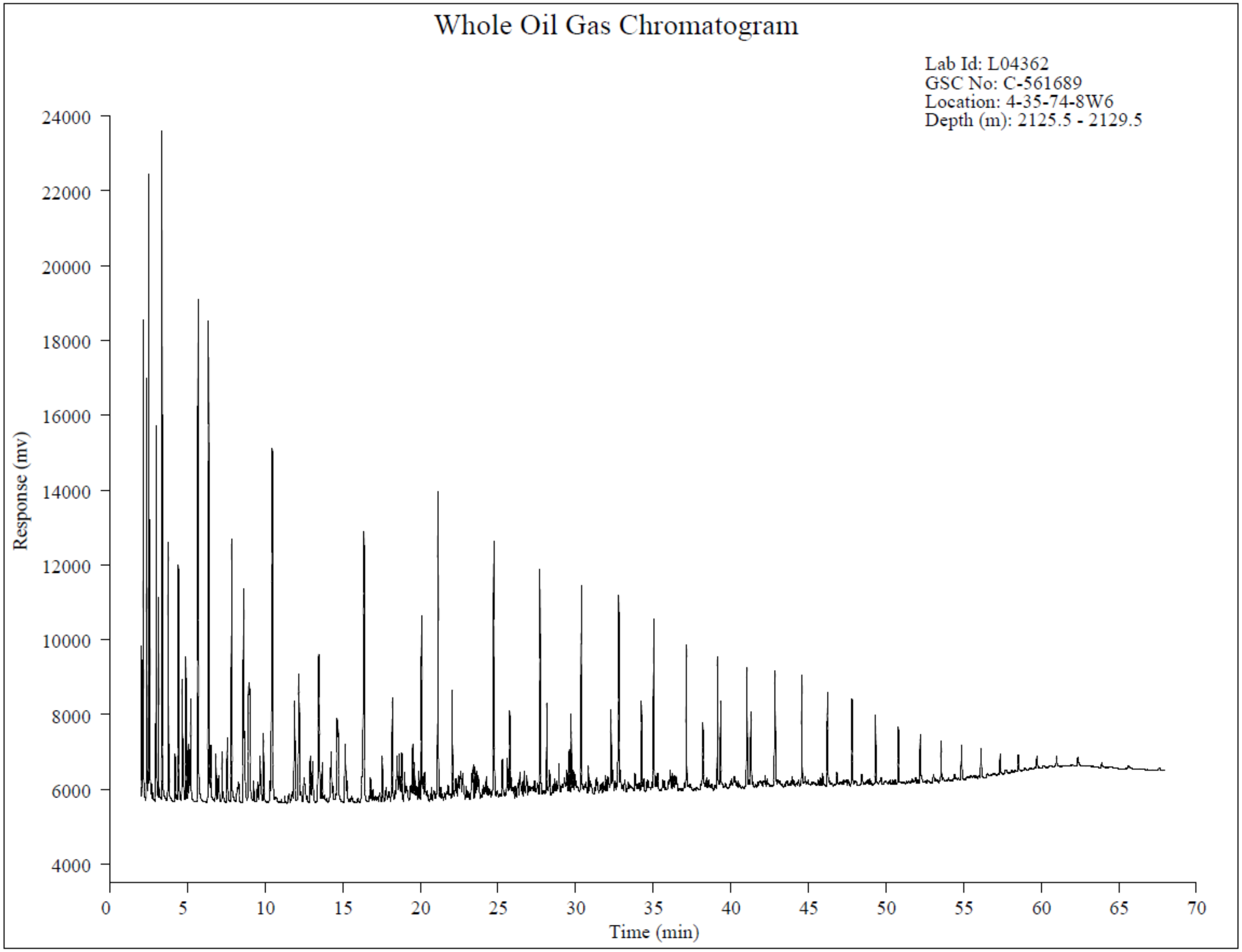

Whole Oil Gas Chromatogram
Lab Id: L03339
GSC No: C-558931
Location: 10-30-68-6W6
Depth (m): 2376.0 - 2389.0
Response (mv)
32000
30000
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

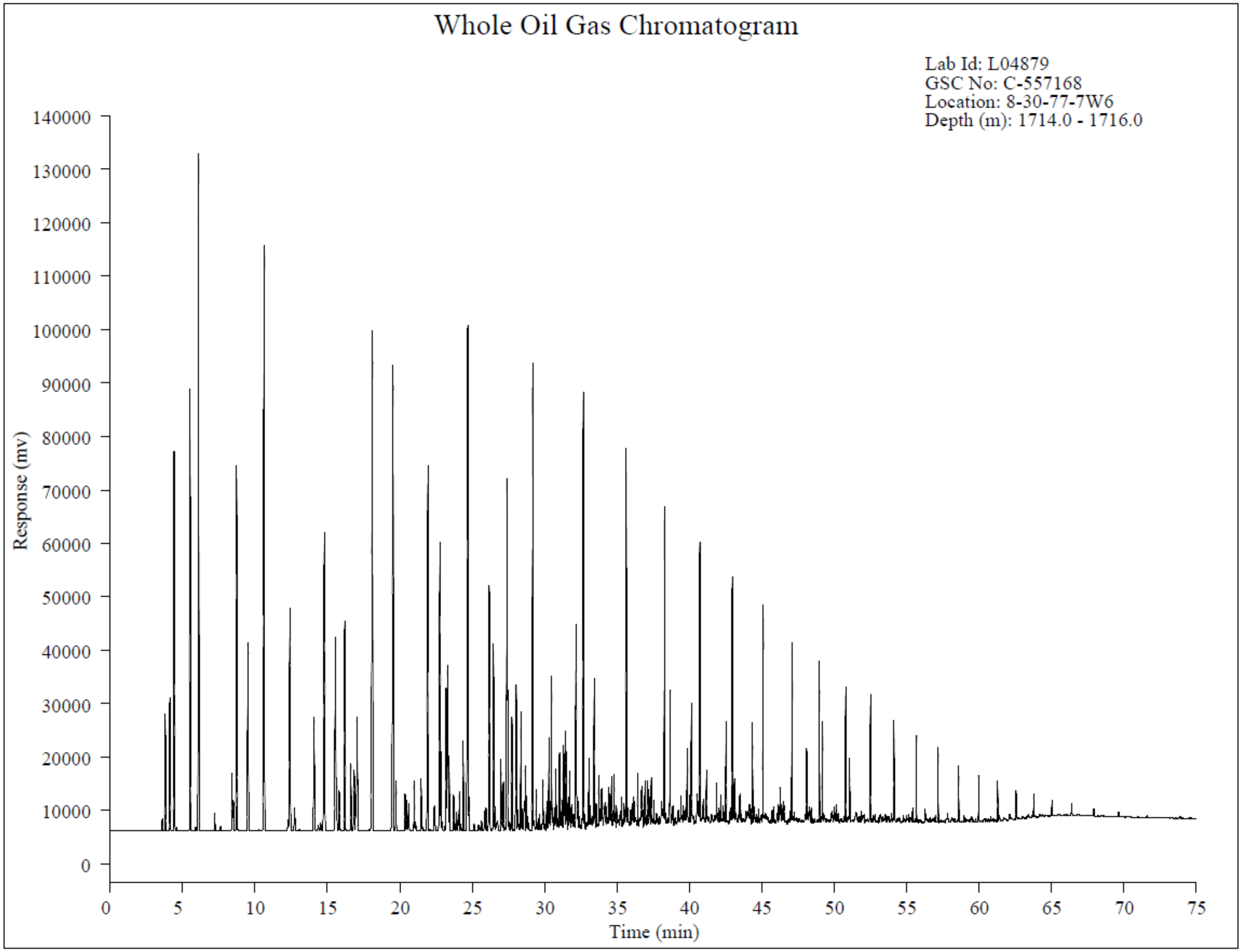

Whole Oil Gas Chromatogram
Lab Id: L03468
GSC No: C-559218
Location: 6-28-71-9W6
Depth (m): 2341.0 - 2347.0
Response (mv)
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)


Whole Oil Gas Chromatogram
Lab Id: L04077
GSC No: C-559234
Location: 5-17-89-6W6
Depth (ft): 4114.0 - 4154.0
Response (mv)
28000
26000
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

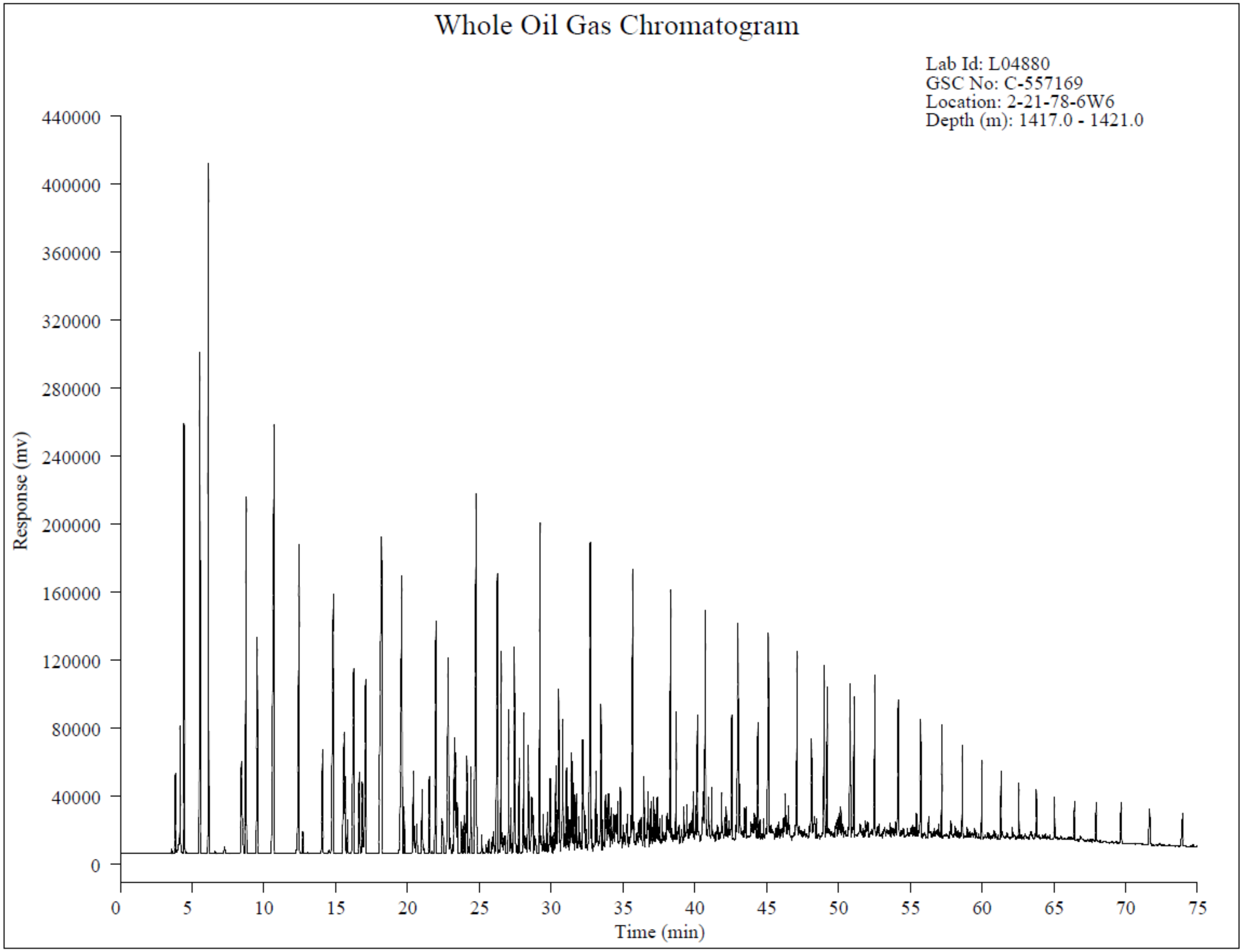

Whole Oil Gas Chromatogram
Lab Id: L04086
GSC No: C-559185
Location: 9-6-76-20W5
Depth (ft): 3412.0 - 3422.0
Response (mv)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)


Whole Oil Gas Chromatogram
Lab Id: L04092
GSC No: C-559263
Location: 16-13-73-10W6
Depth (ft): 7021.0 - 7087.0
Response (mv)
42000
39000
36000
33000
30000
27000
24000
21000
18000
15000
12000
9000
6000
3000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

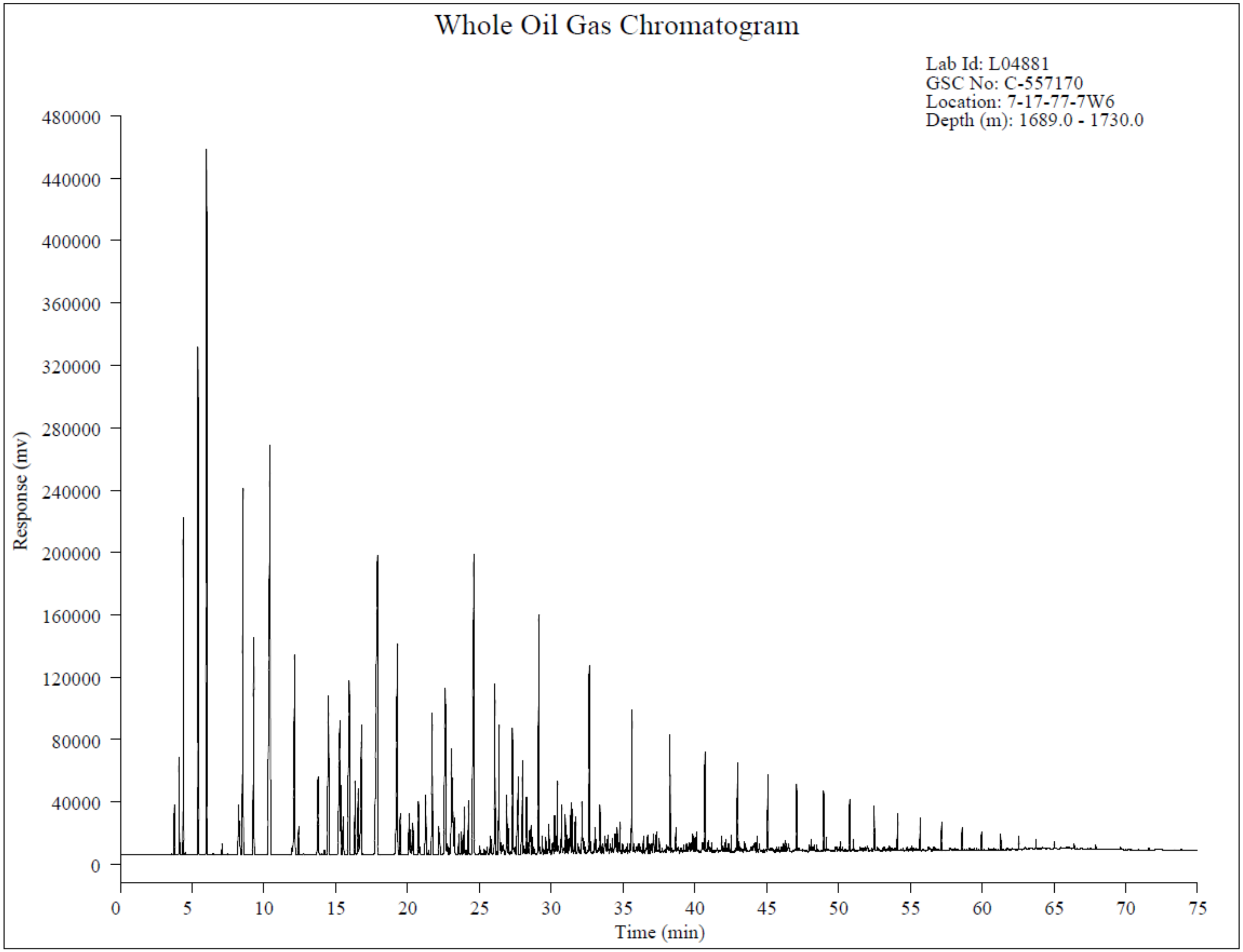

Whole Oil Gas Chromatogram
Lab Id: L04362
GSC No: C-561689
Location: 4-35-74-8W6
Depth (m): 2125.5 - 2129.5
Response (mv)
24000
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Time (min)

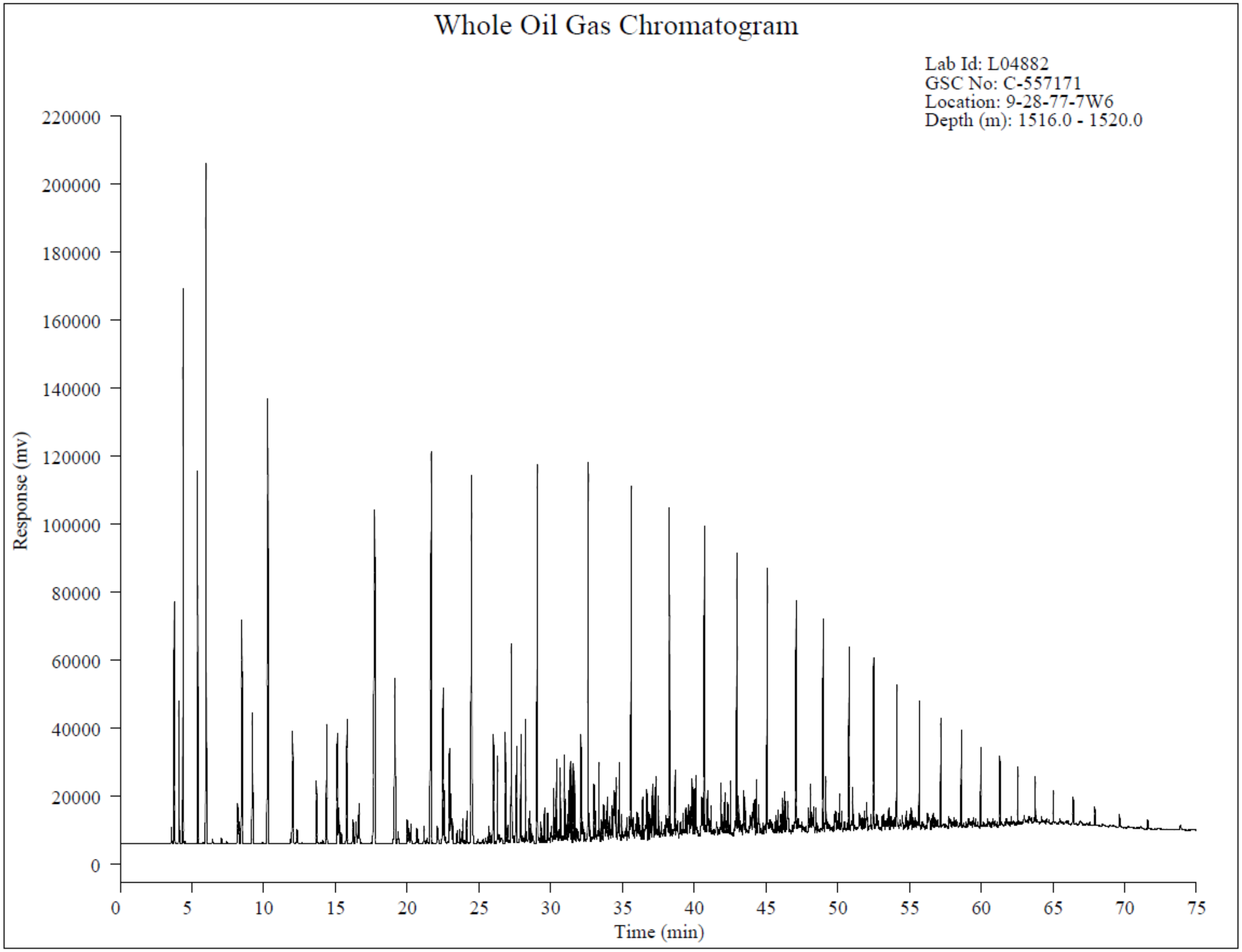


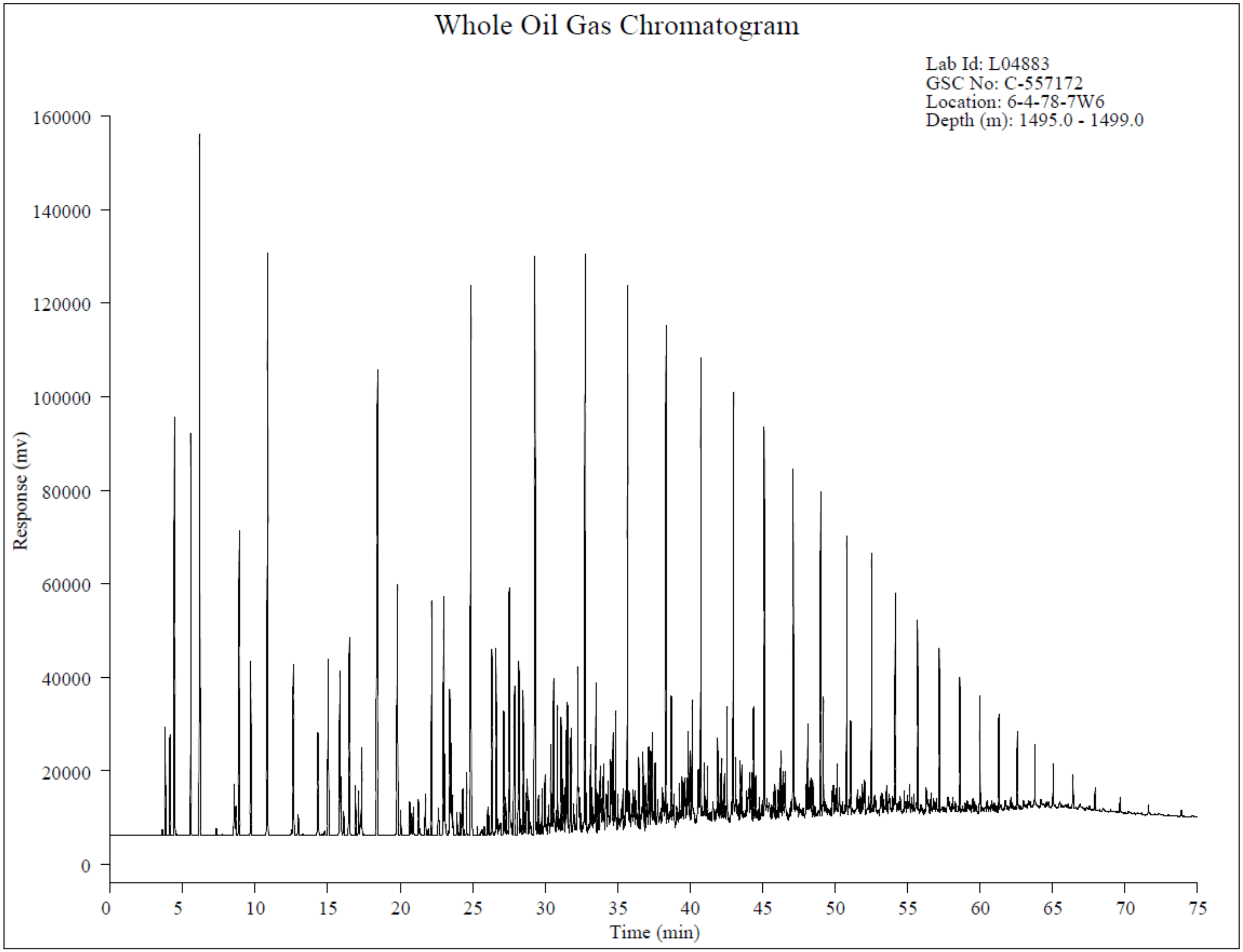
Whole Oil Gas Chromatogram
Lab Id: L04879
GSC No: C-557168
Location: 8-30-77-7W6
Depth (m): 1714.0 - 1716.0
Response (mv)
140000
130000
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
Time (min)

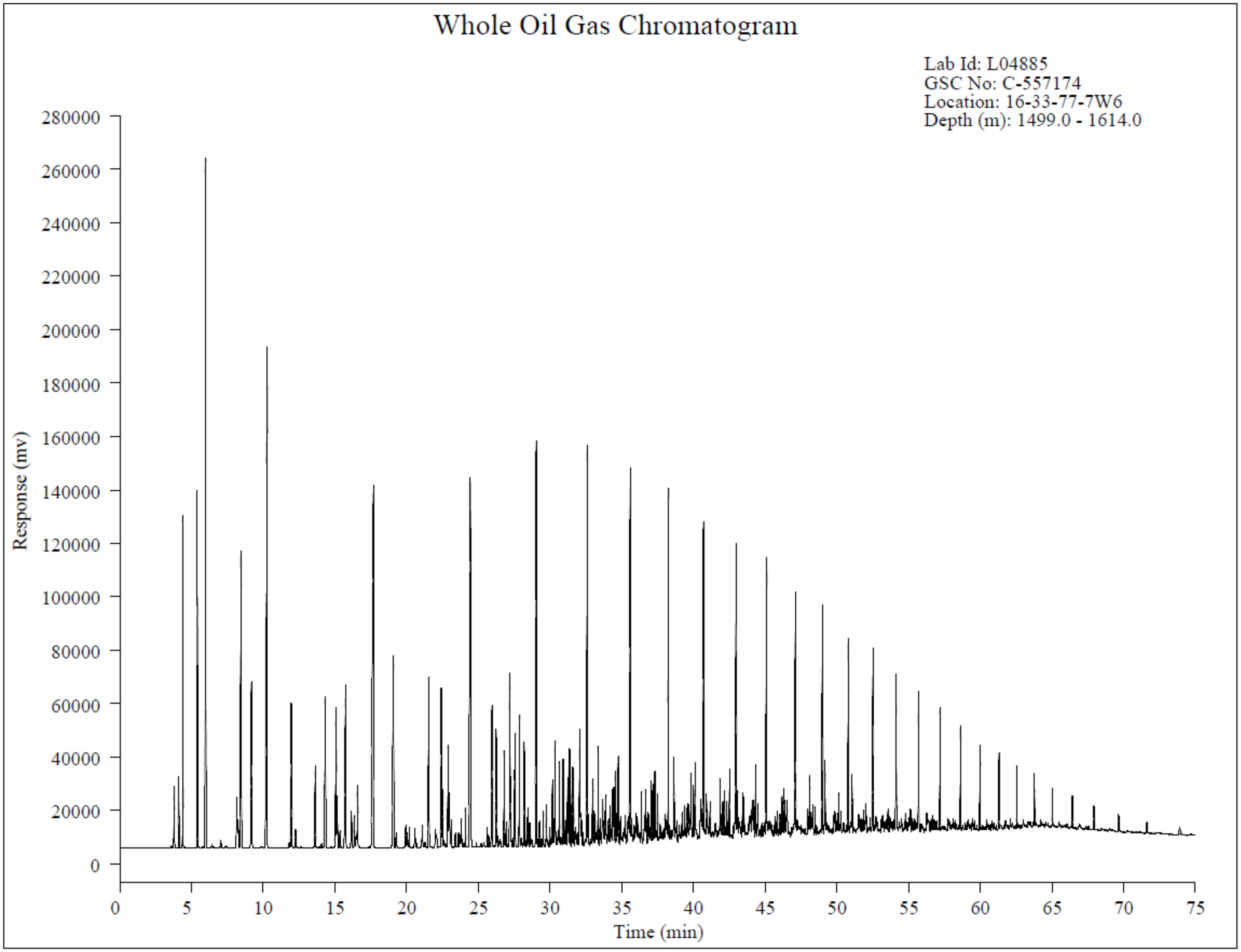


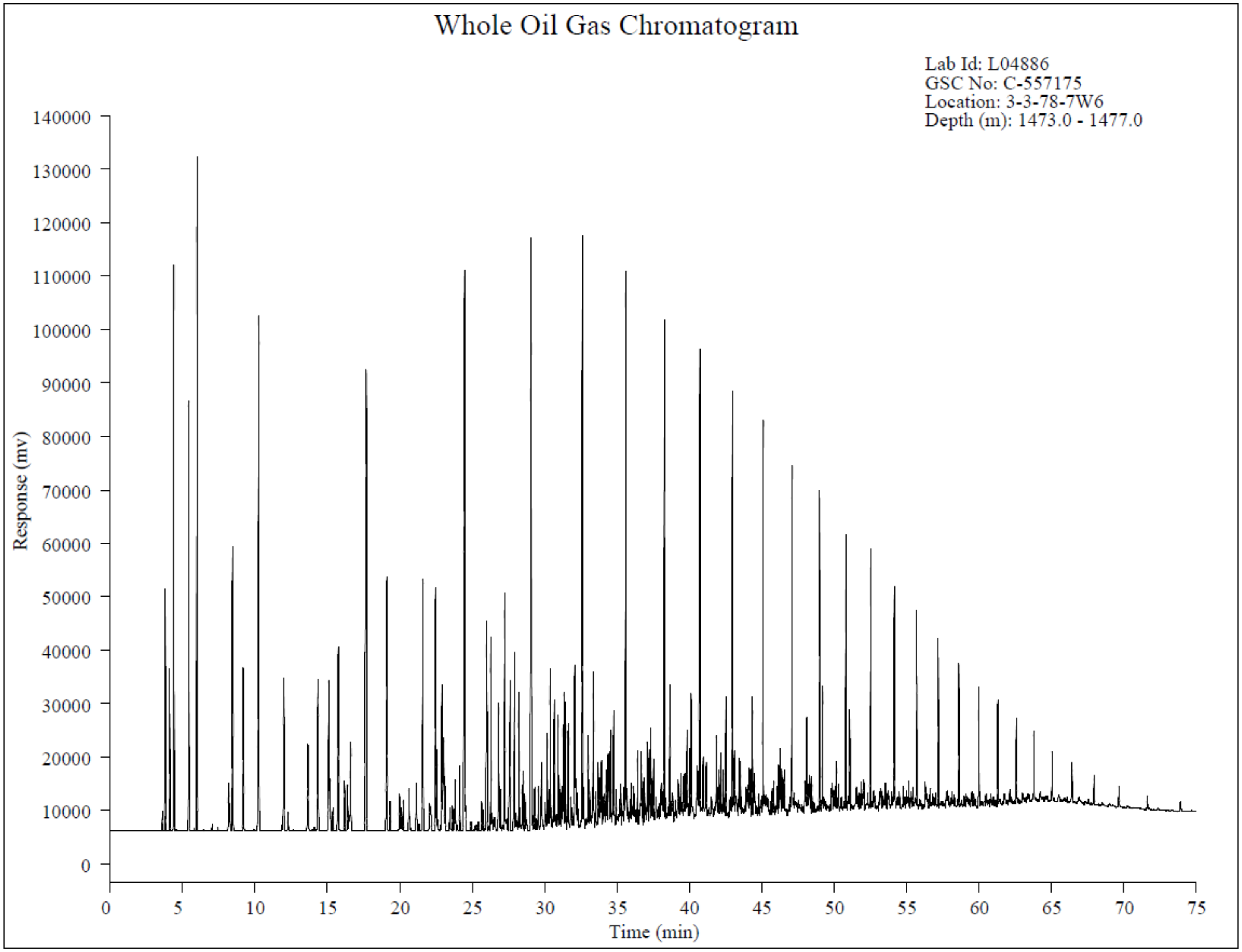
Whole Oil Gas Chromatogram
Lab Id: L04880
GSC No: C-557169
Location: 2-21-78-6W6
Depth (m): 1417.0 - 1421.0
Response (mv)
Time (min)


Whole Oil Gas Chromatogram
Lab Id: L04881
GSC No: C-557170
Location: 7-17-77-7W6
Depth (m): 1689.0 - 1730.0
Response (mv)
0
40000
80000
120000
160000
200000
240000
280000
320000
360000
400000
440000
480000
Time (min)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75


Whole Oil Gas Chromatogram
Lab Id: L04882
GSC No: C-557171
Location: 9-28-77-7W6
Depth (m): 1516.0 - 1520.0
Response (mv)
220000
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
Time (min)


Whole Oil Gas Chromatogram
Lab Id: L04883
GSC No: C-557172
Location: 6-4-78-7W6
Depth (m): 1495.0 - 1499.0
Response (mv)
160000
140000
120000
100000
80000
60000
40000
20000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
Time (min)

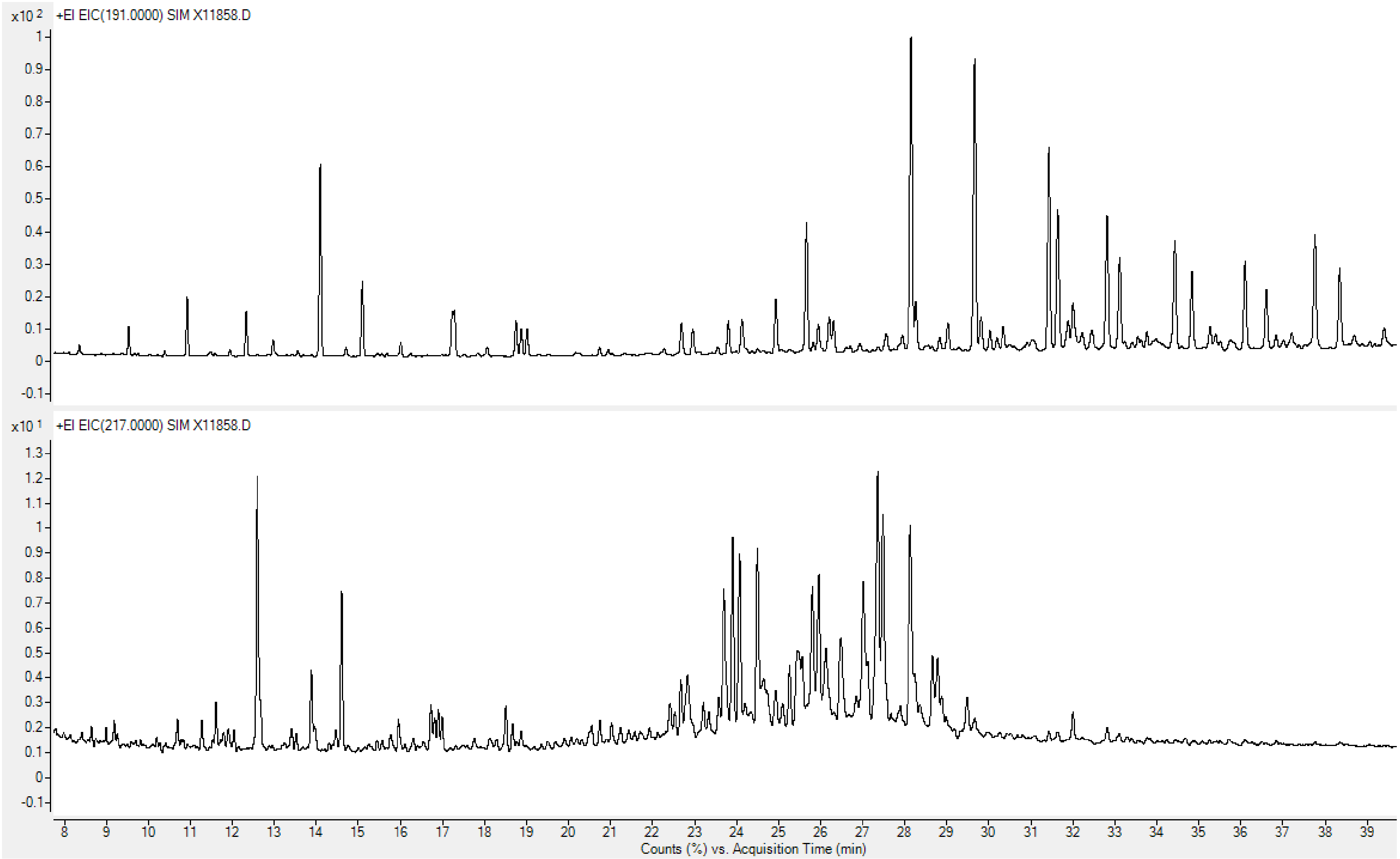

Whole Oil Gas Chromatogram
Lab Id: L04885
GSC No: C-557174
Location: 16-33-77-7W6
Depth (m): 1499.0 - 1614.0
Response (mv)
280000
260000
240000
220000
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
Time (min)


Whole Oil Gas Chromatogram
Lab Id: L04886
GSC No: C-557175
Location: 3-3-78-7W6
Depth (m): 1473.0 - 1477.0
Response (mv)
140000
130000
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
Time (min)

APPENDIX 4-2

Mass Fragmentograms (m/z: 191, m/z: 217) of saturated fraction of rock extracts and oil samples

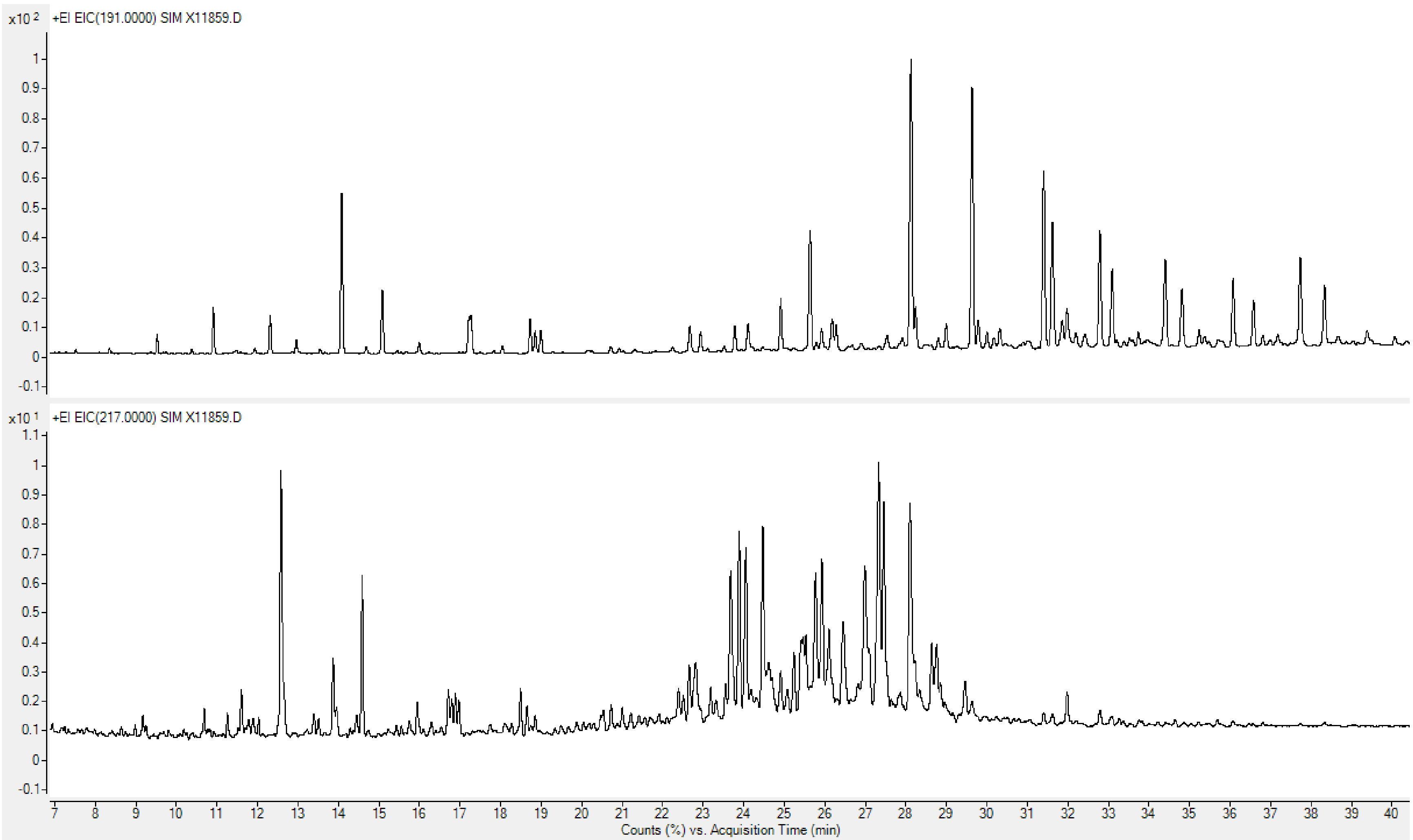
Lab. # X11858
12-7-67-24W5 (1904.8m)
(Gordondale rock extract)



Lab. # X11859

12-7-67-24W5 (1906m)

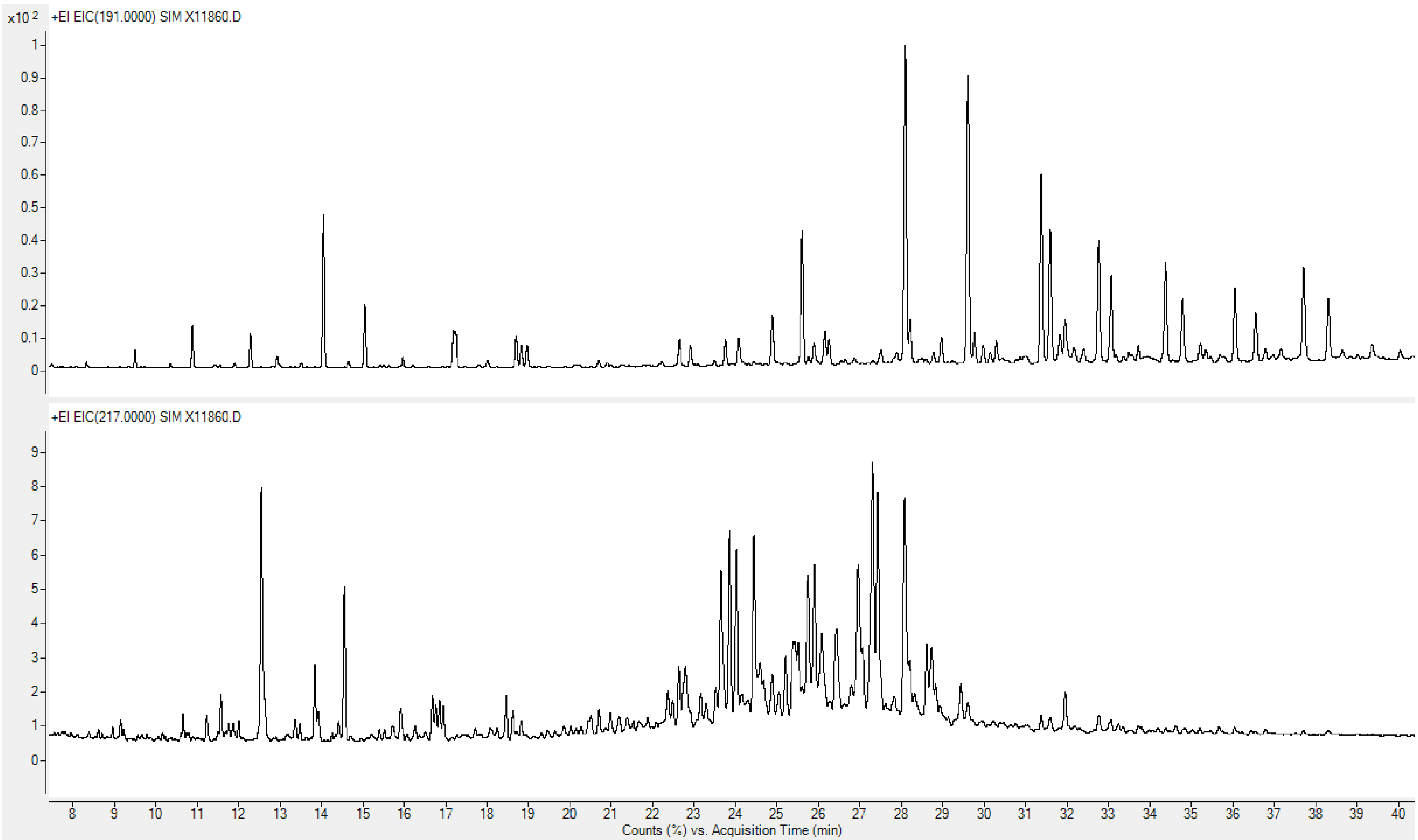
(Gordondale rock extract)



Lab. # X11860

12-7-67-24W5 (1907.7m)

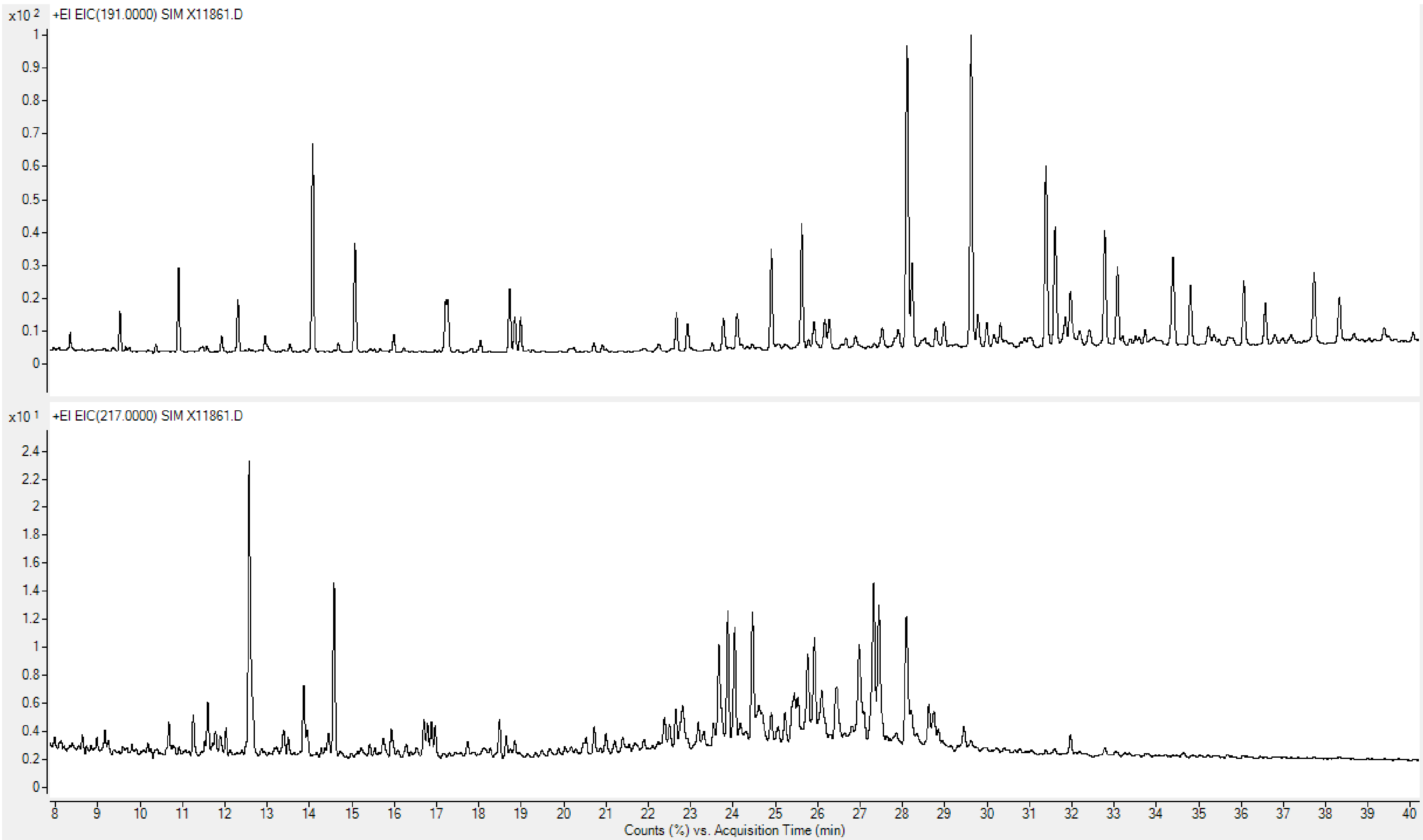
(Gordondale rock extract)



Lab. # X11861

7-14-64-25W5 (2288.16m)

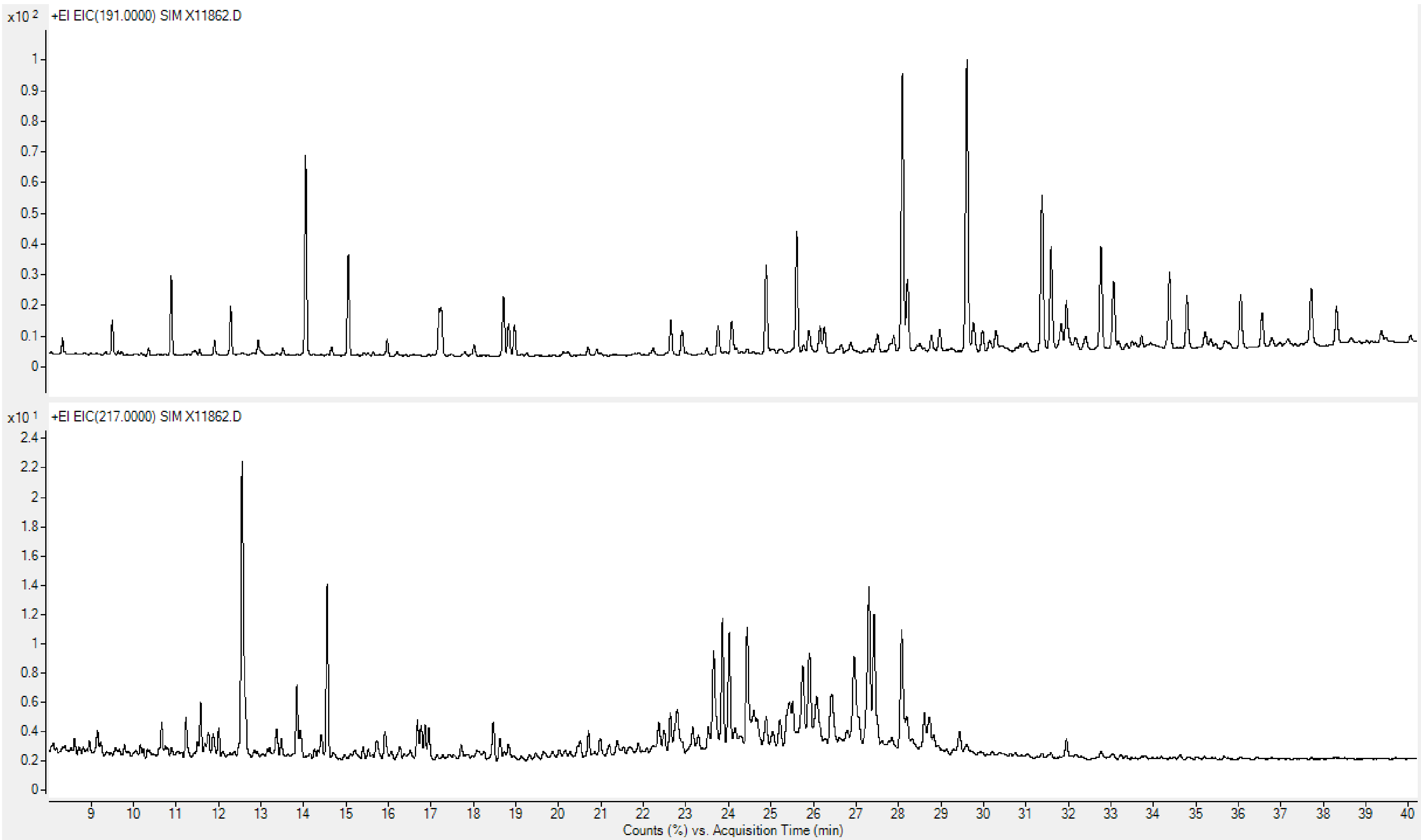
(Gordondale rock extract)



Lab. # X11862

7-14-64-25W5 (2289.5m)

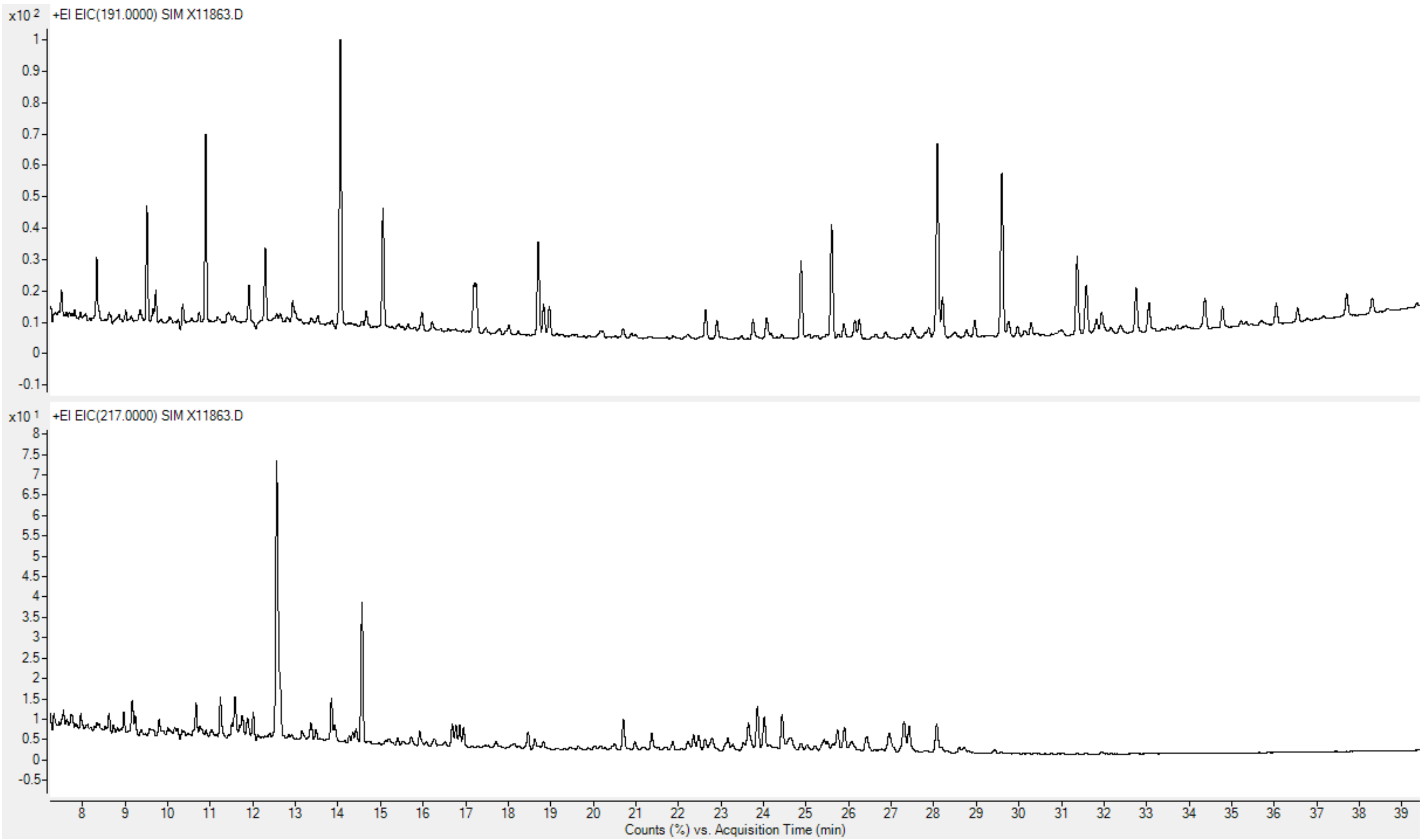
(Gordondale rock extract)



Lab. # X11863

12-7-67-24W5 (2291.1m)

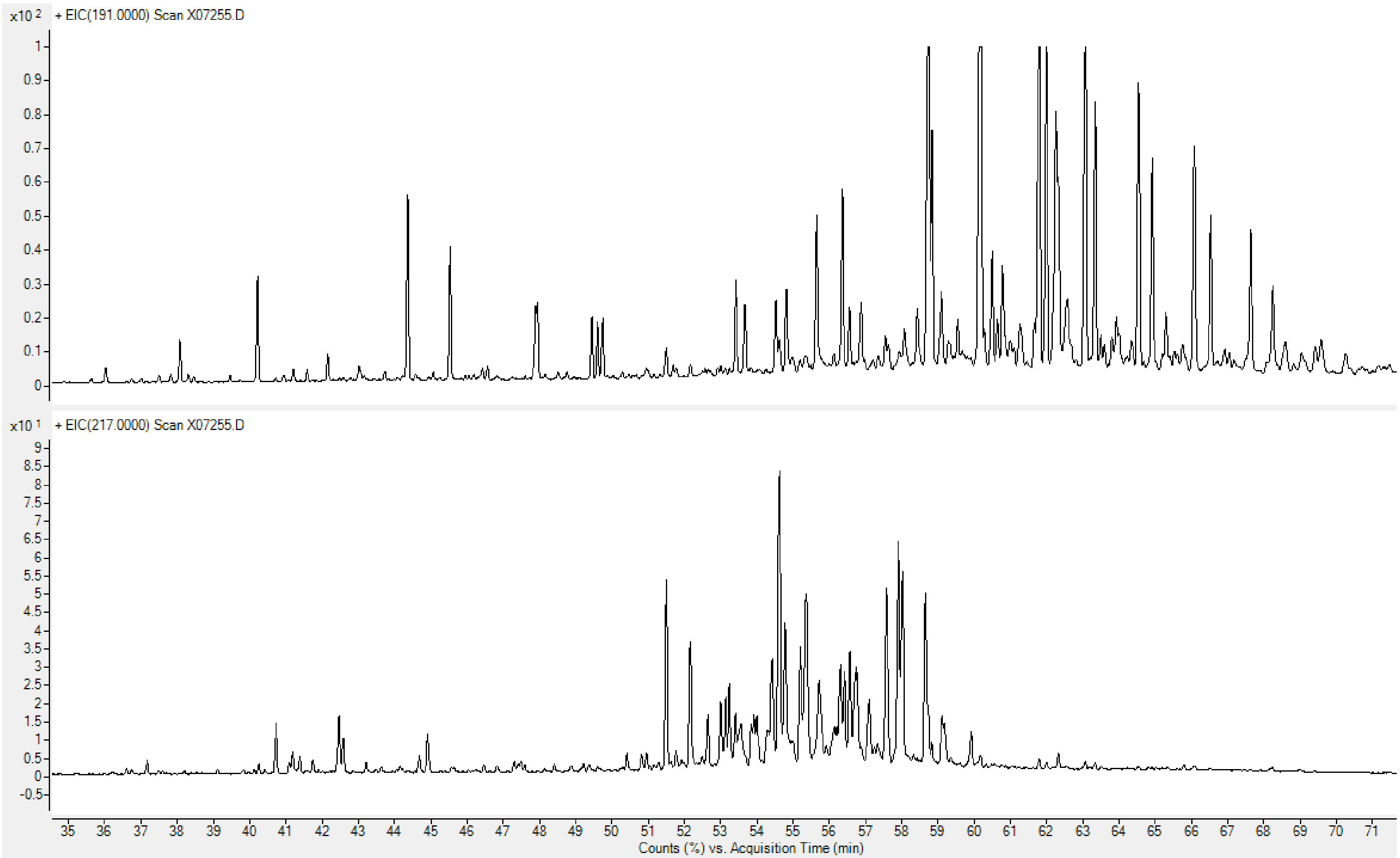
(Gordondale rock extract)



Lab. # X07255

A-59-G/94-A-16 (1150.2m)

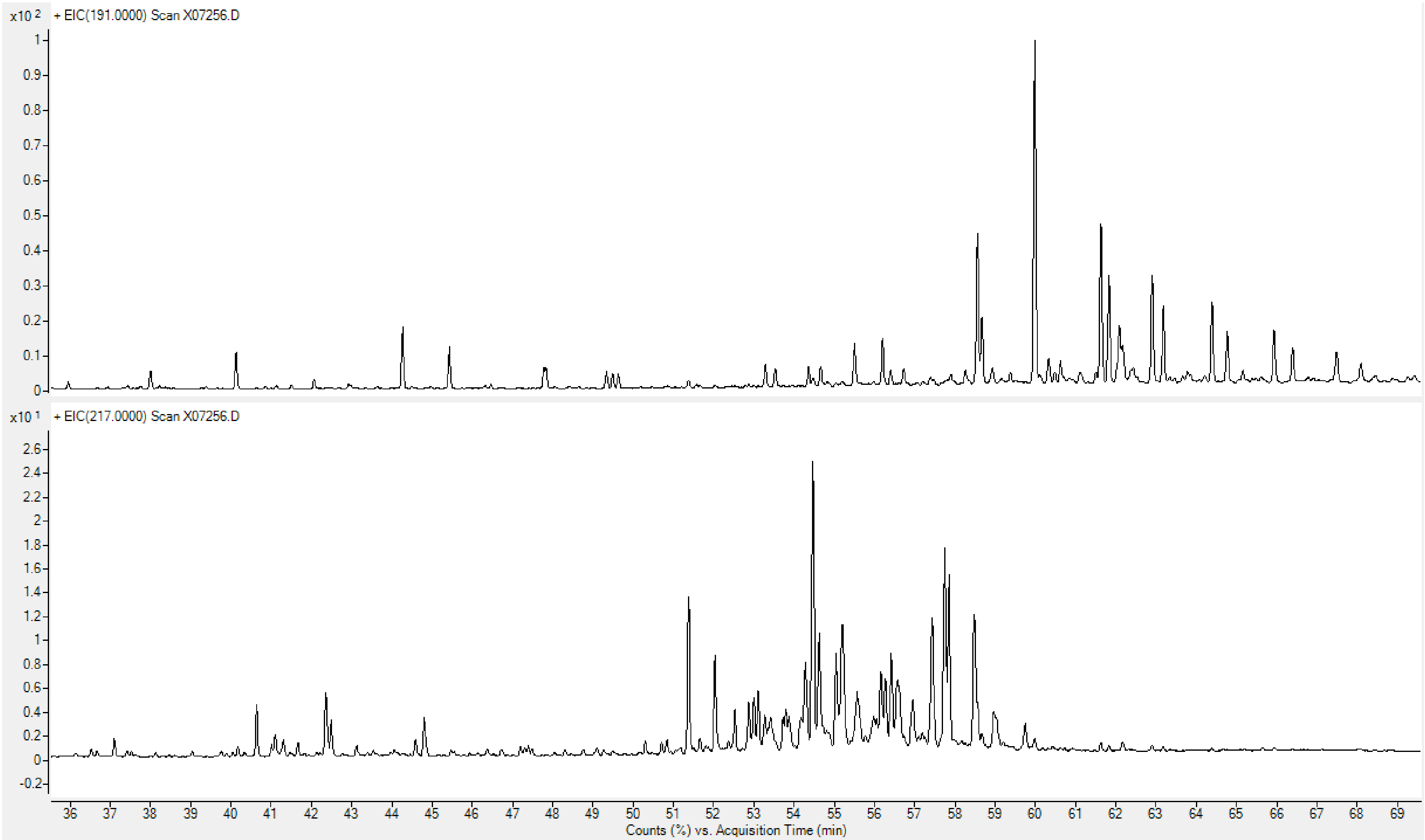
(Doig rock extract)



Lab. # X07256

A-59-G/94-A-16 (1159.2m)

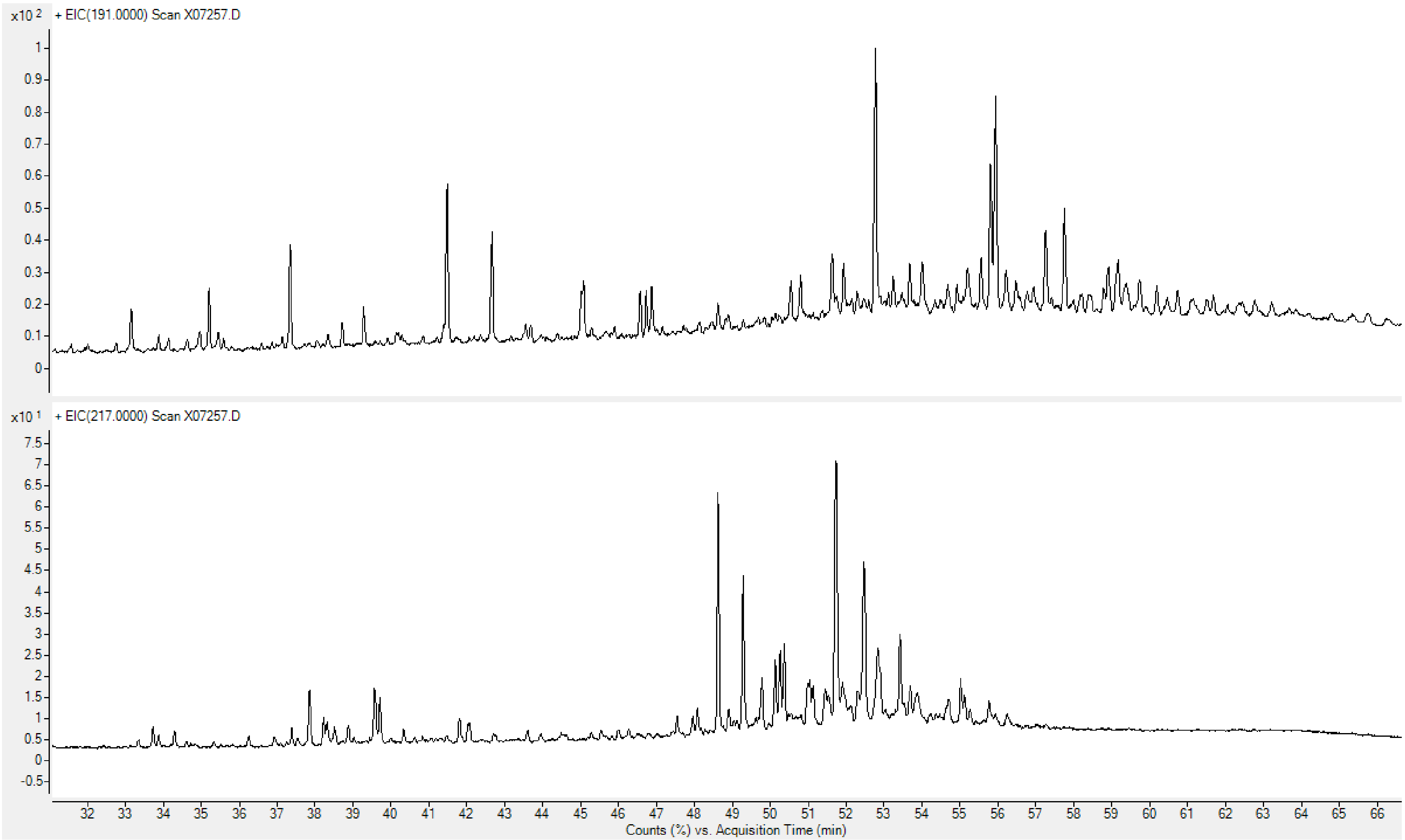
(Doig rock extract)



Lab. # X07257

D-69-J/94-A-15 (1225.4m)

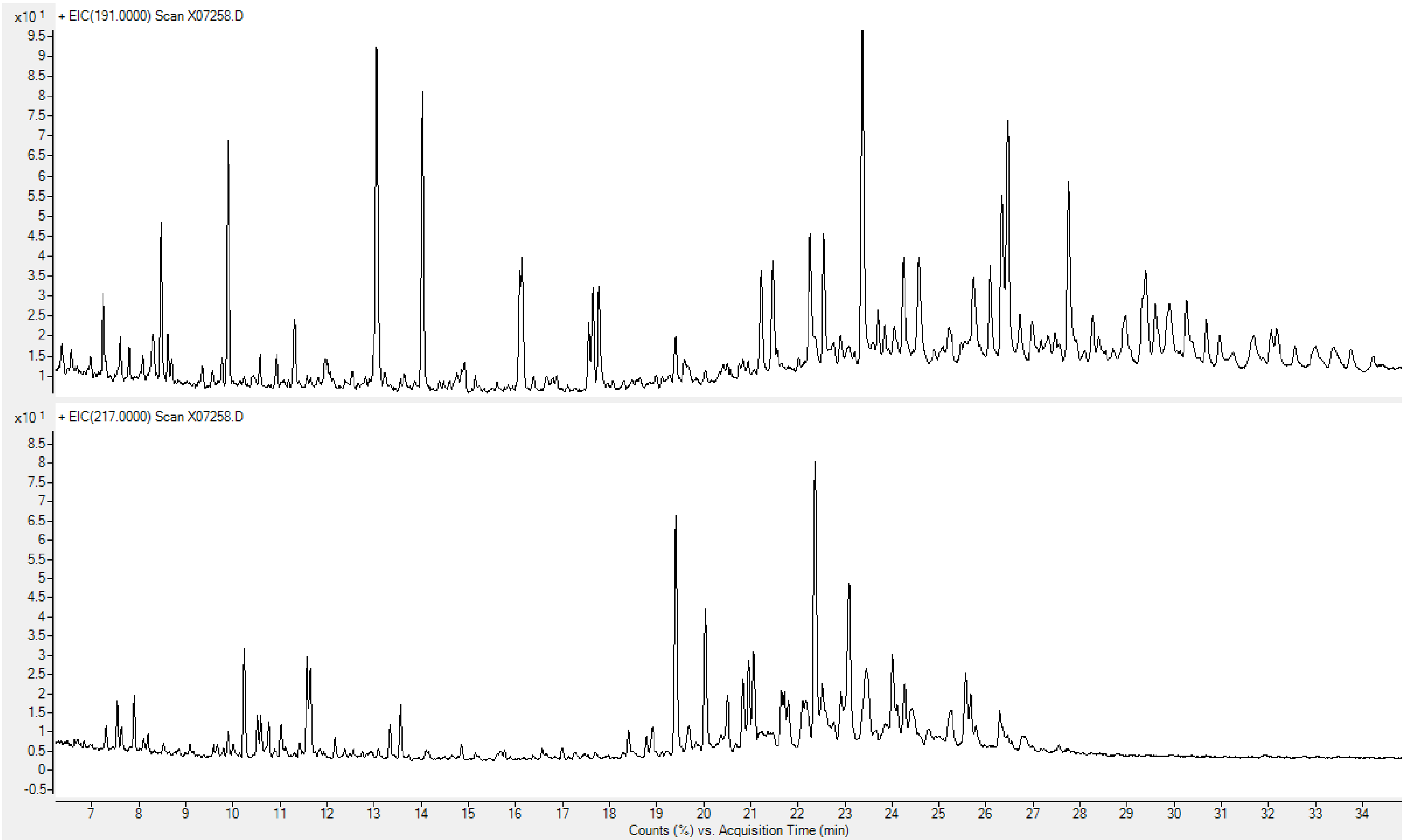
(Doig rock extract)



Lab. # X07258

D-69-J/94-A-15 (1237.2m)

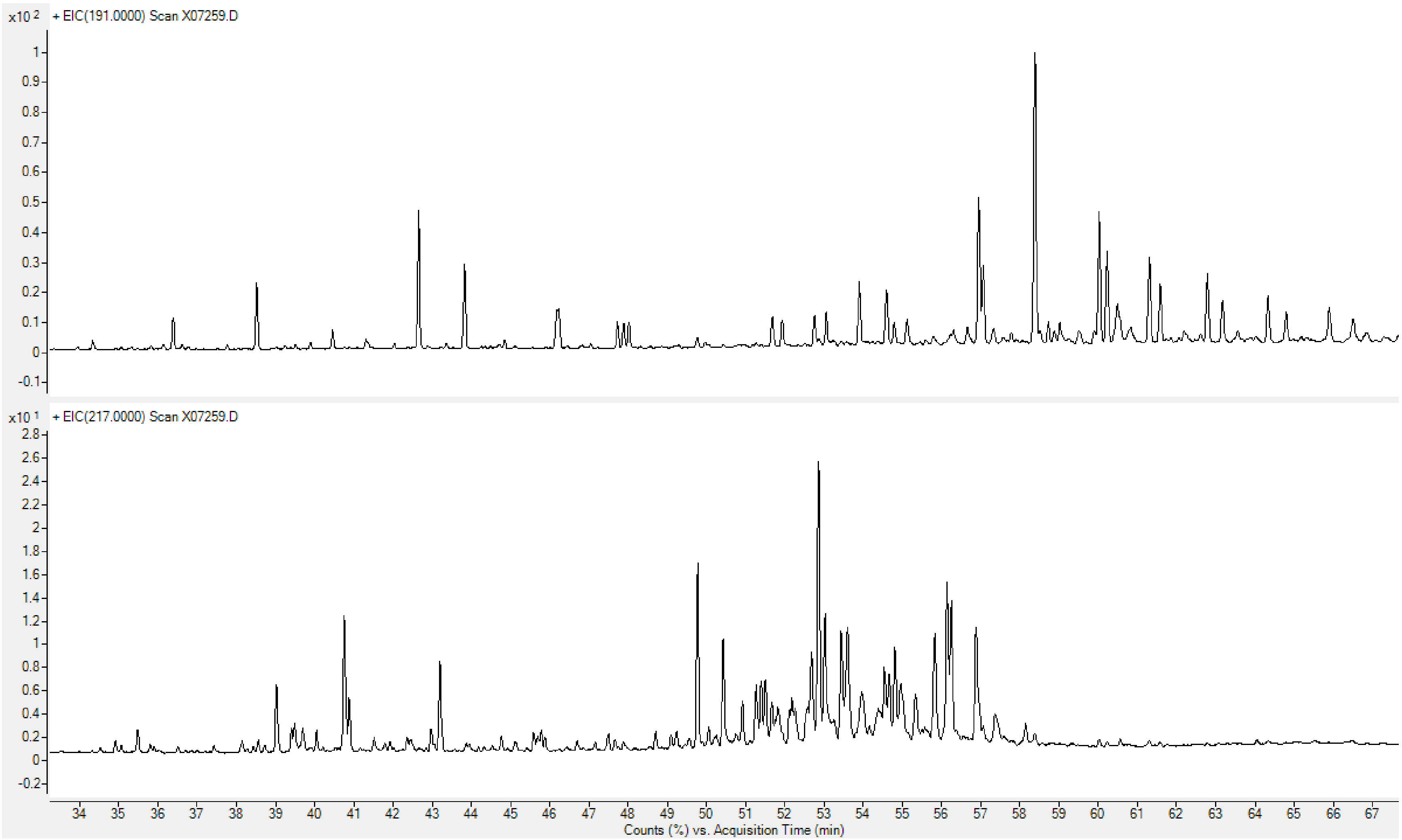
(Doig rock extract)



Lab. # X07259

D-81-E/94-H-10 (1068.3m)

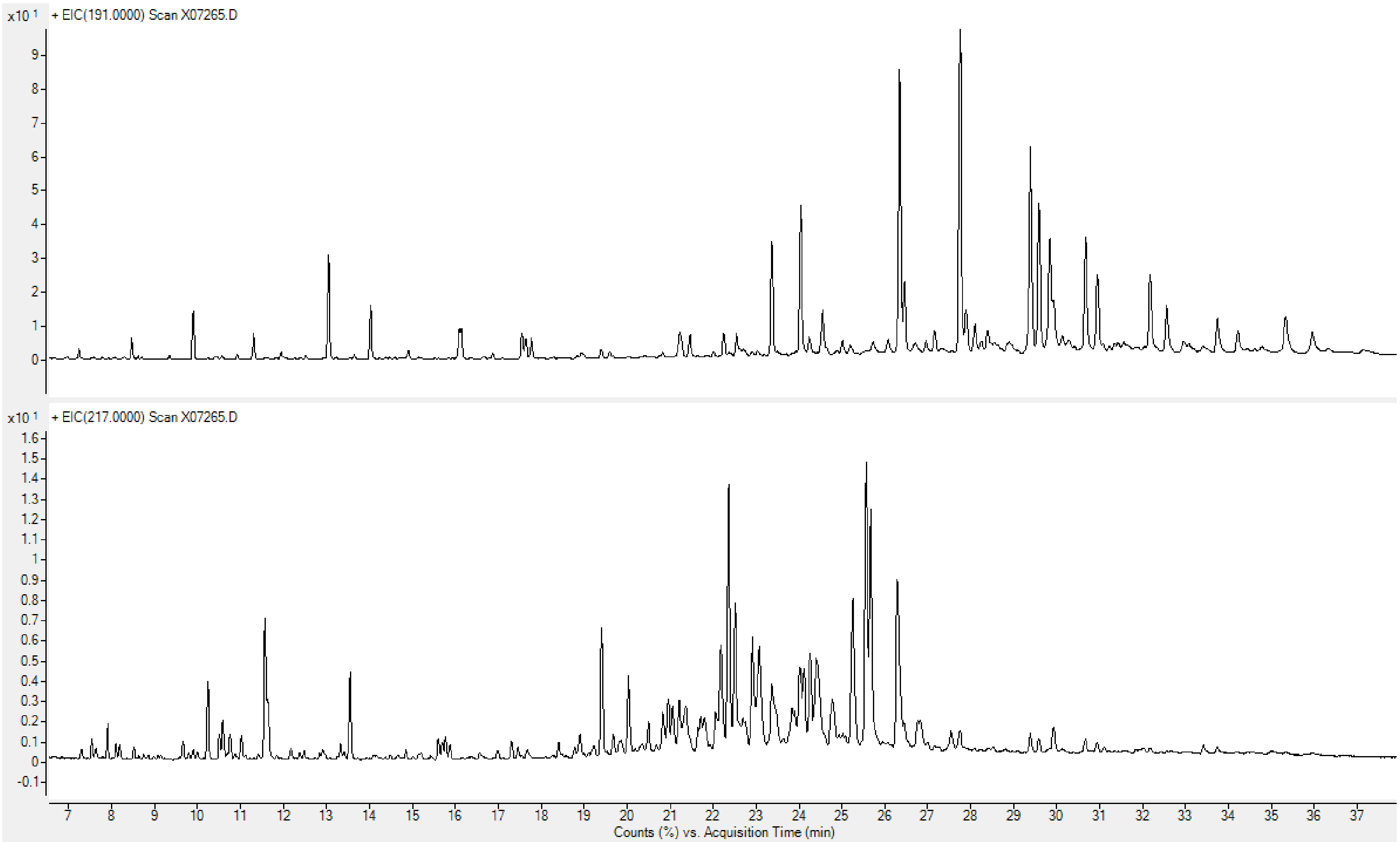
(Doig rock extract)



Lab. # X07265

10-15-76-4W6 (1482.5m)

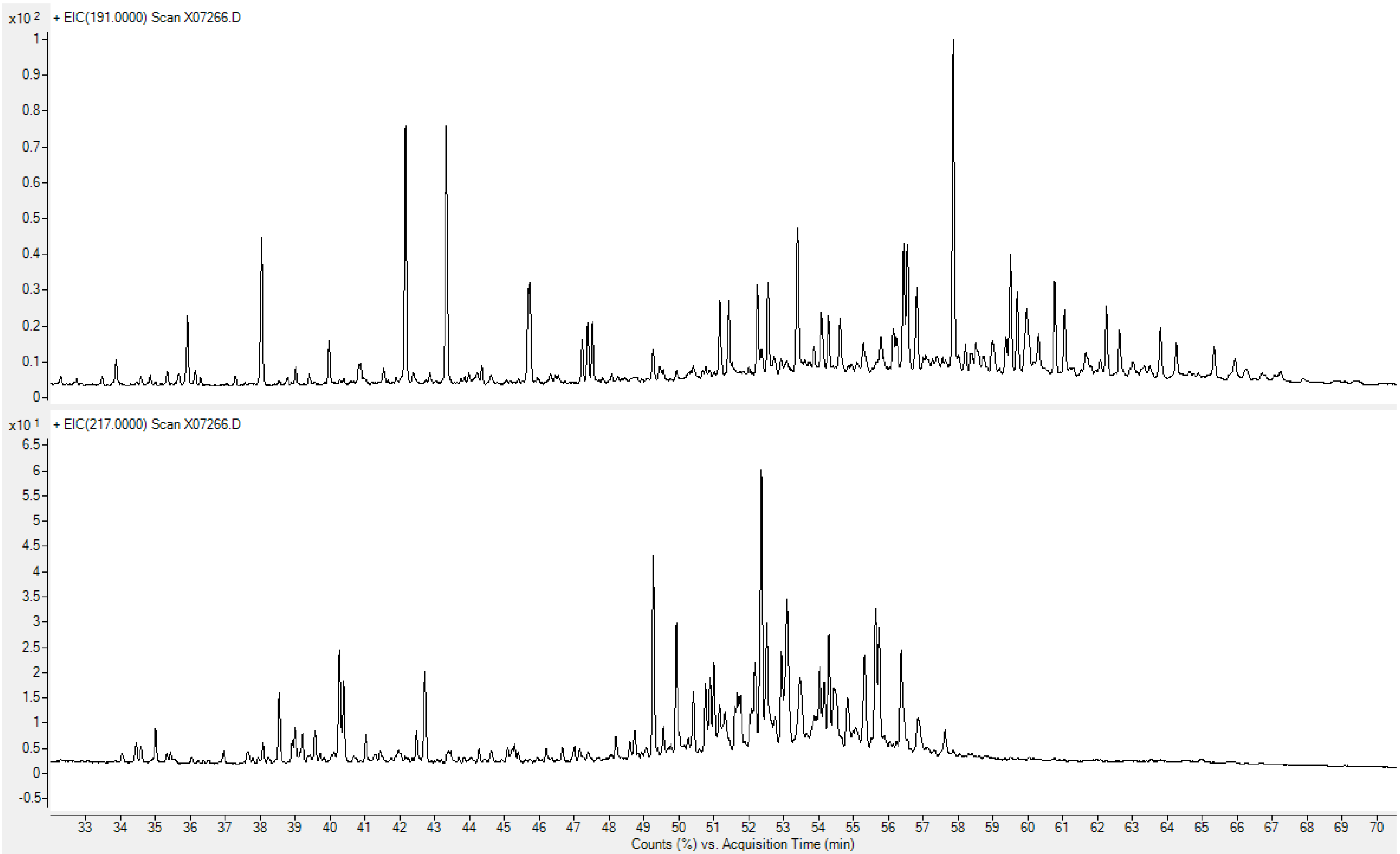
(Doig rock extract)



Lab. # X07266

3-22-78-10W6 (1833.2m)

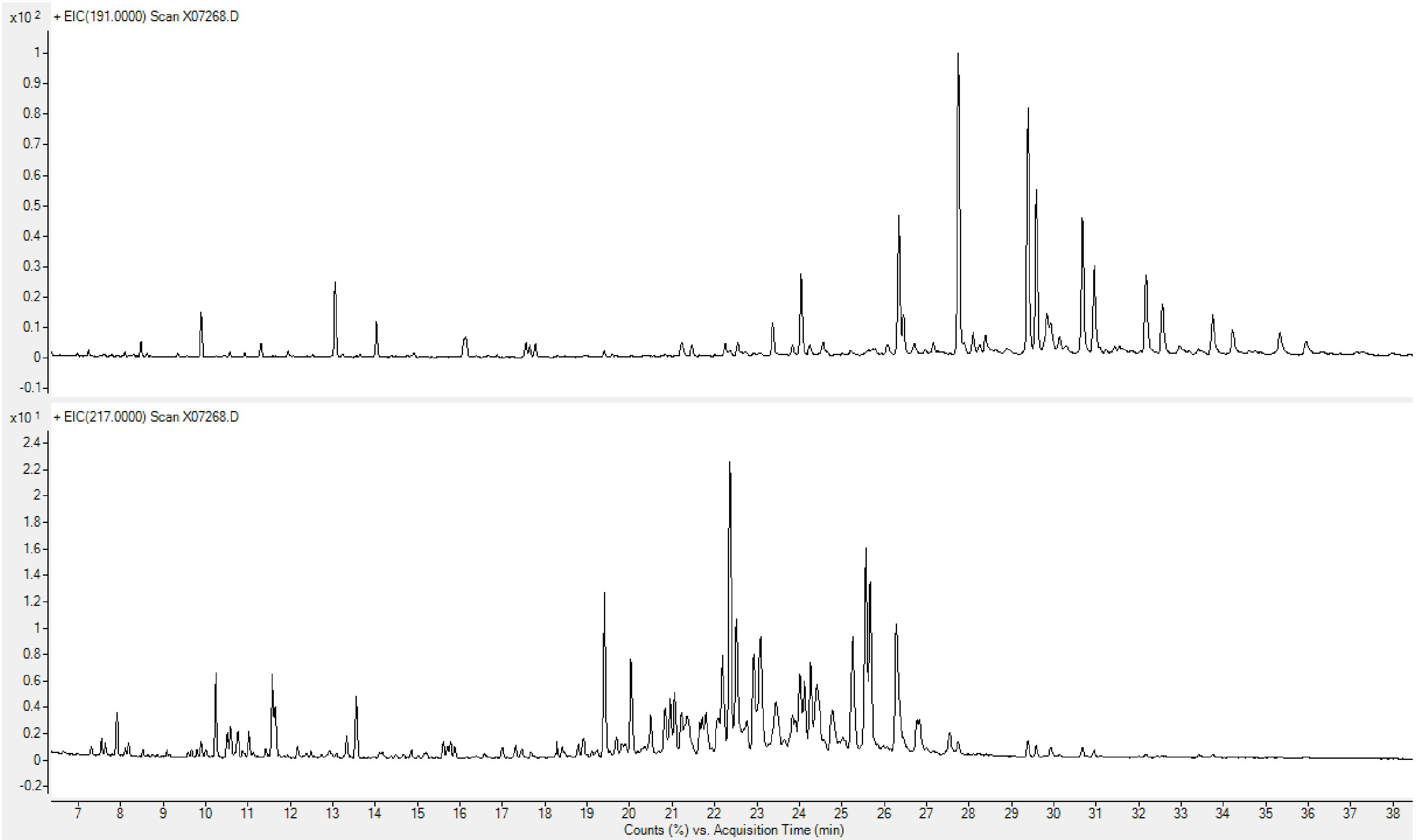
(Doig rock extract)



Lab. # X07268

10-5-84-11W6 (1231.6m)

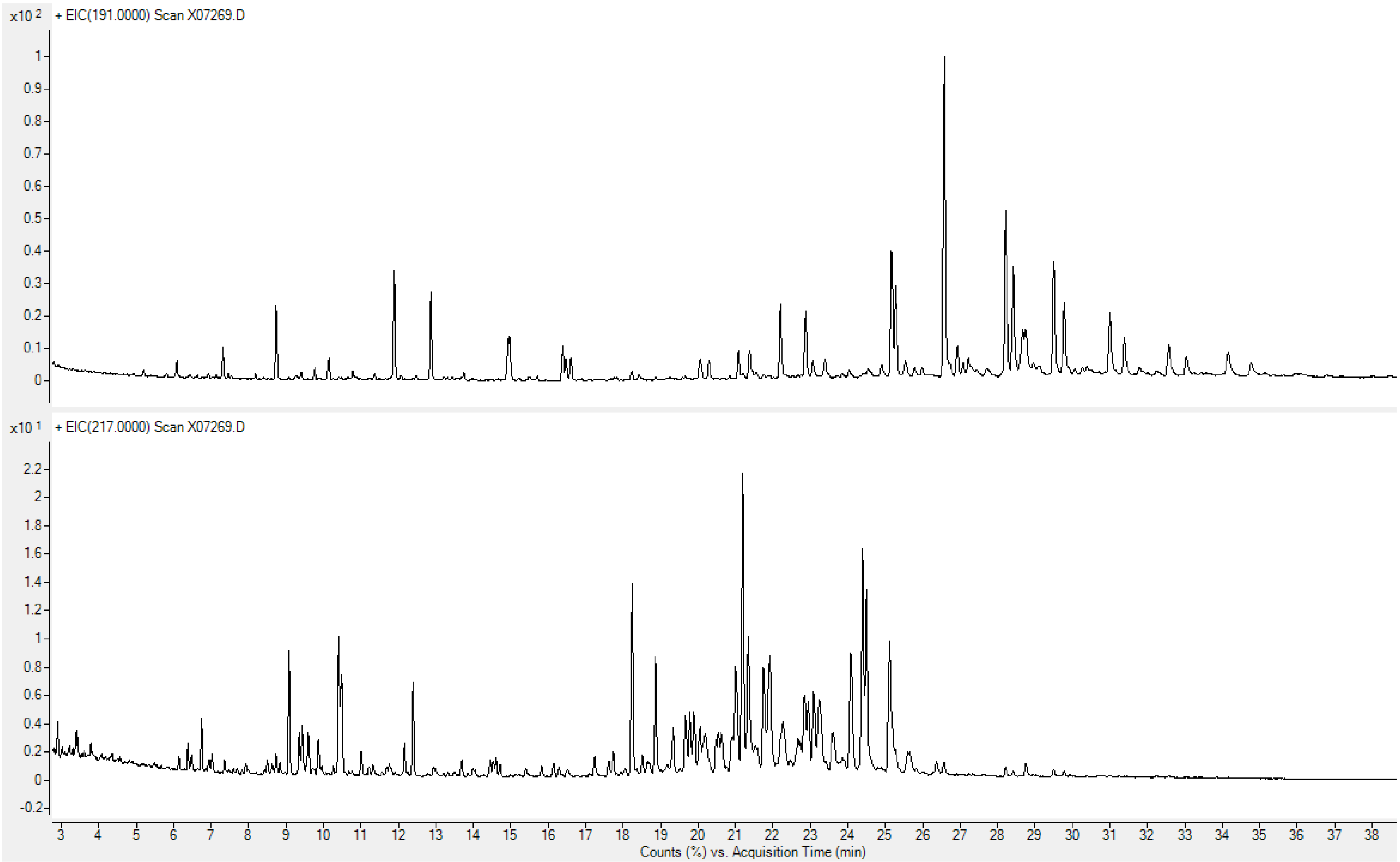
(Doig rock extract)



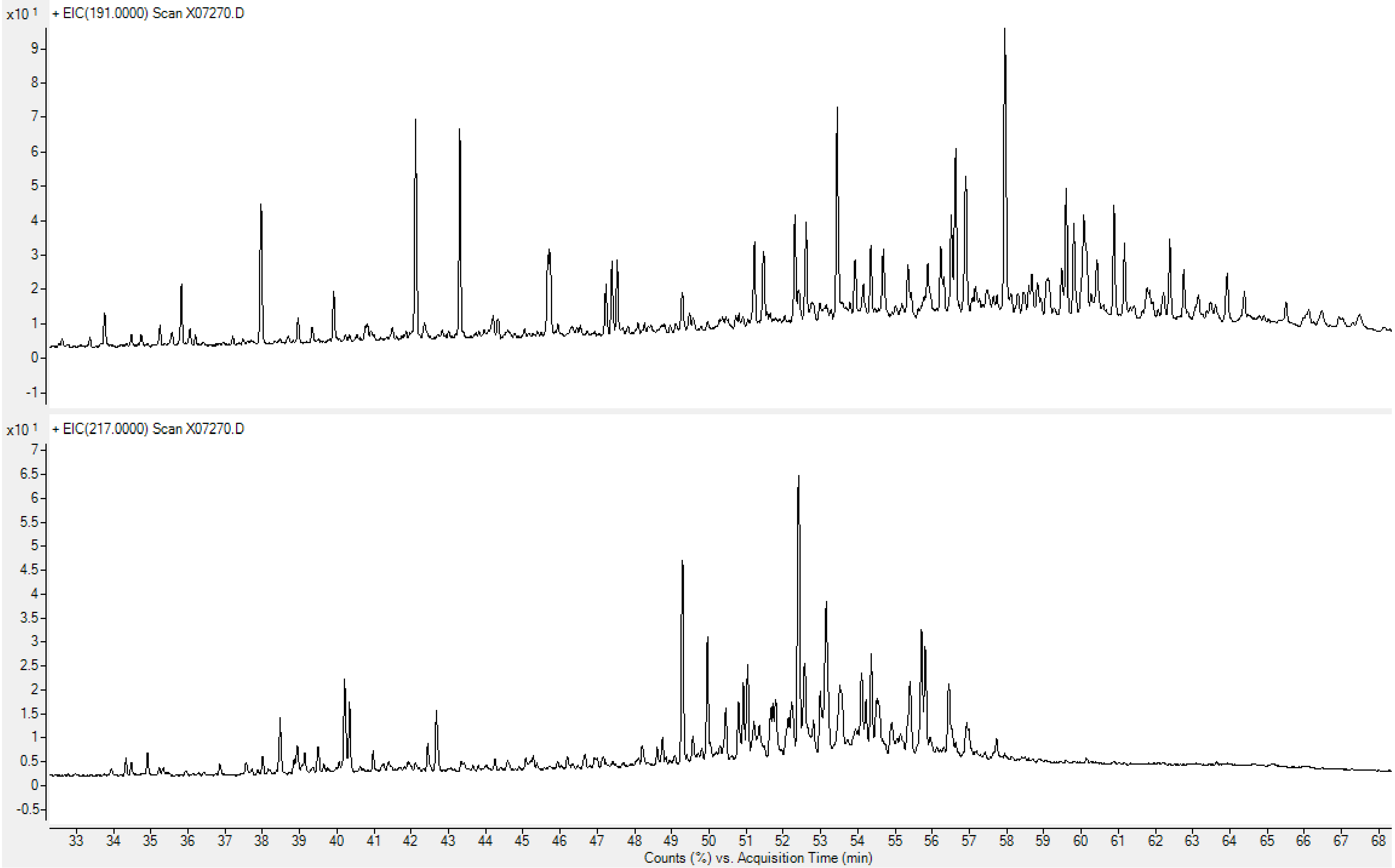
Lab. # X07269

6-8-90-11W6 (1354.7m)

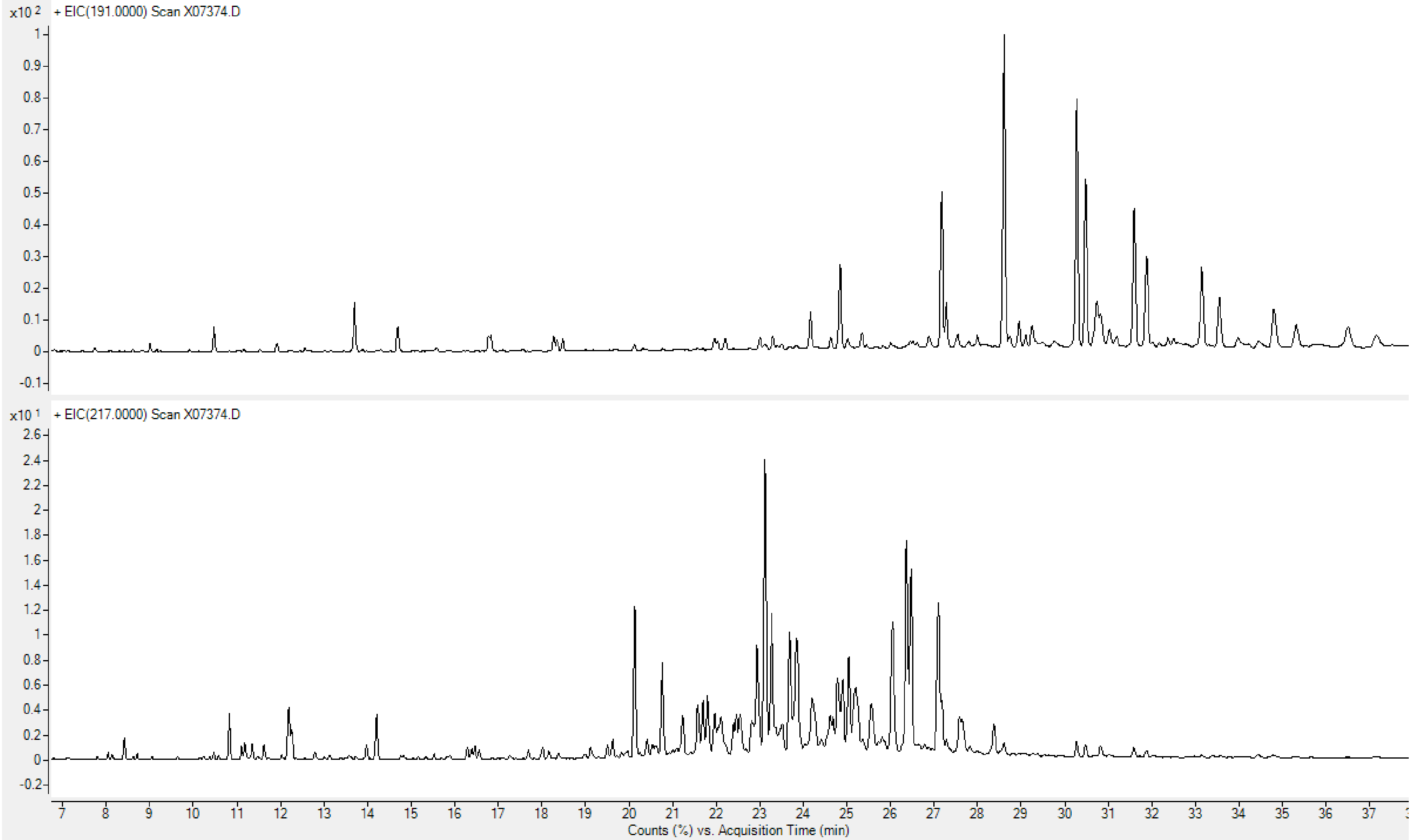
(Doig rock extract)



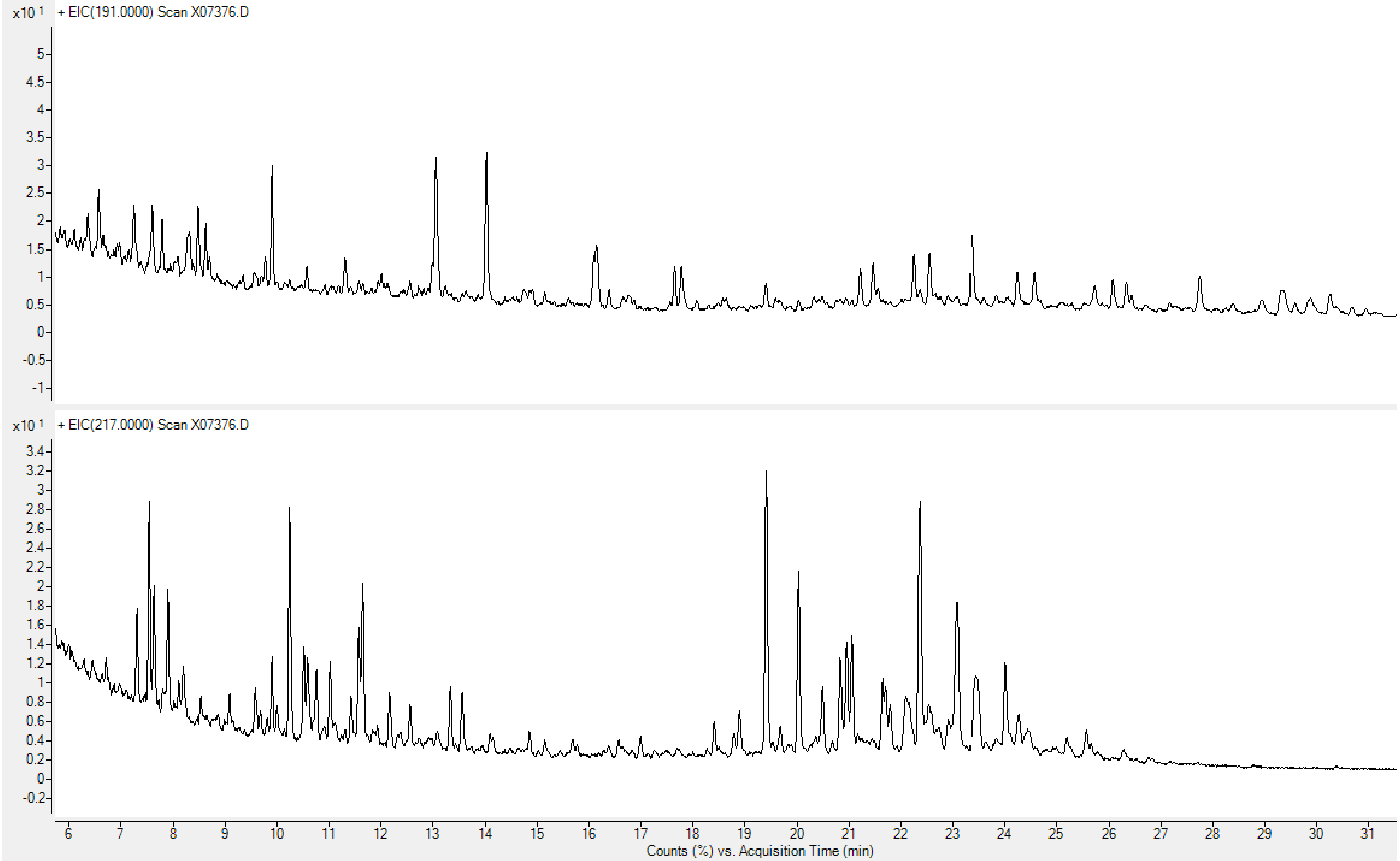
Lab. # X07270
15-7-74-8W6 (2060.3 m)
(Doig rock extract)



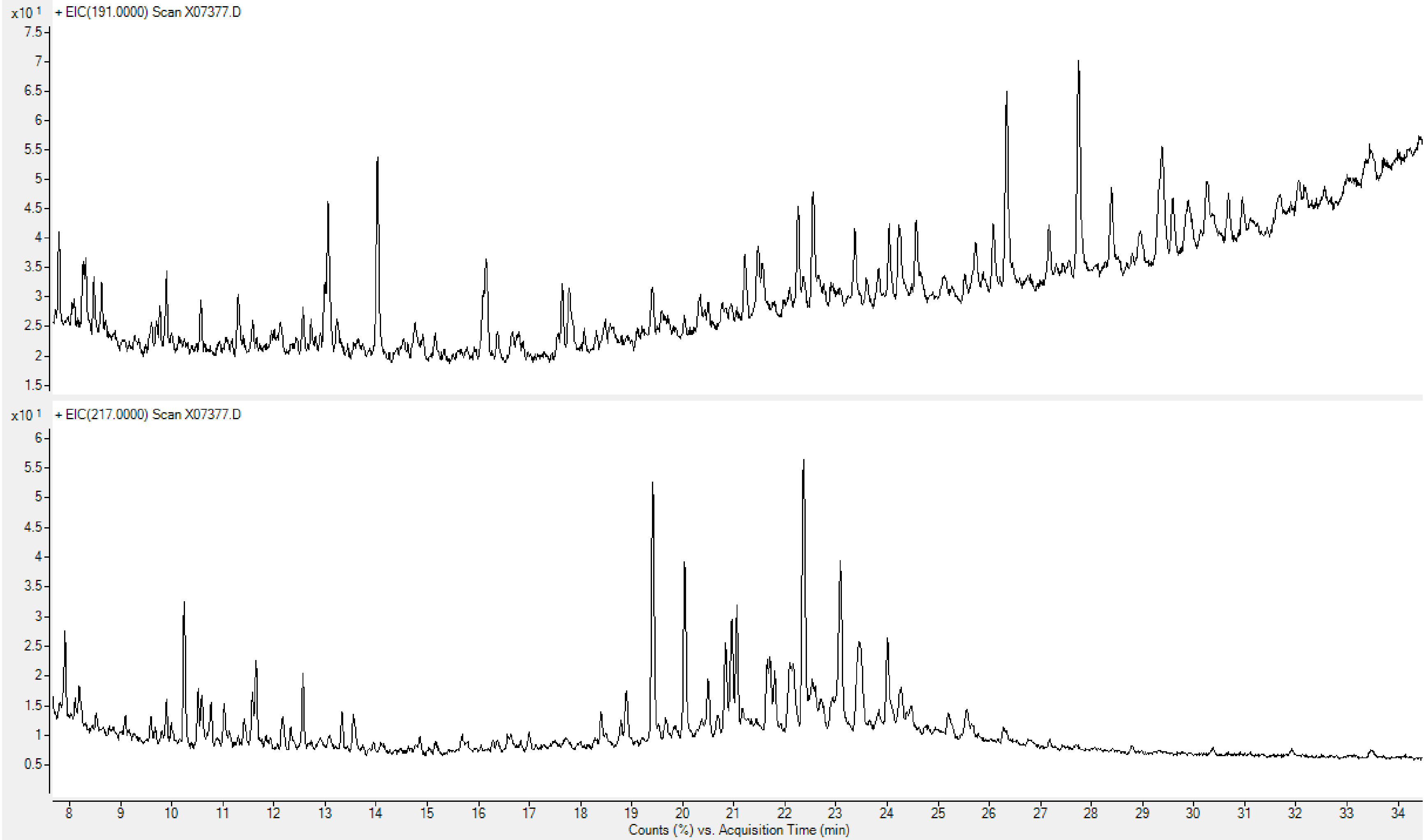
Lab. # X07374
10-5-84-11W6 (1230.6 m)
(Doig rock extract)



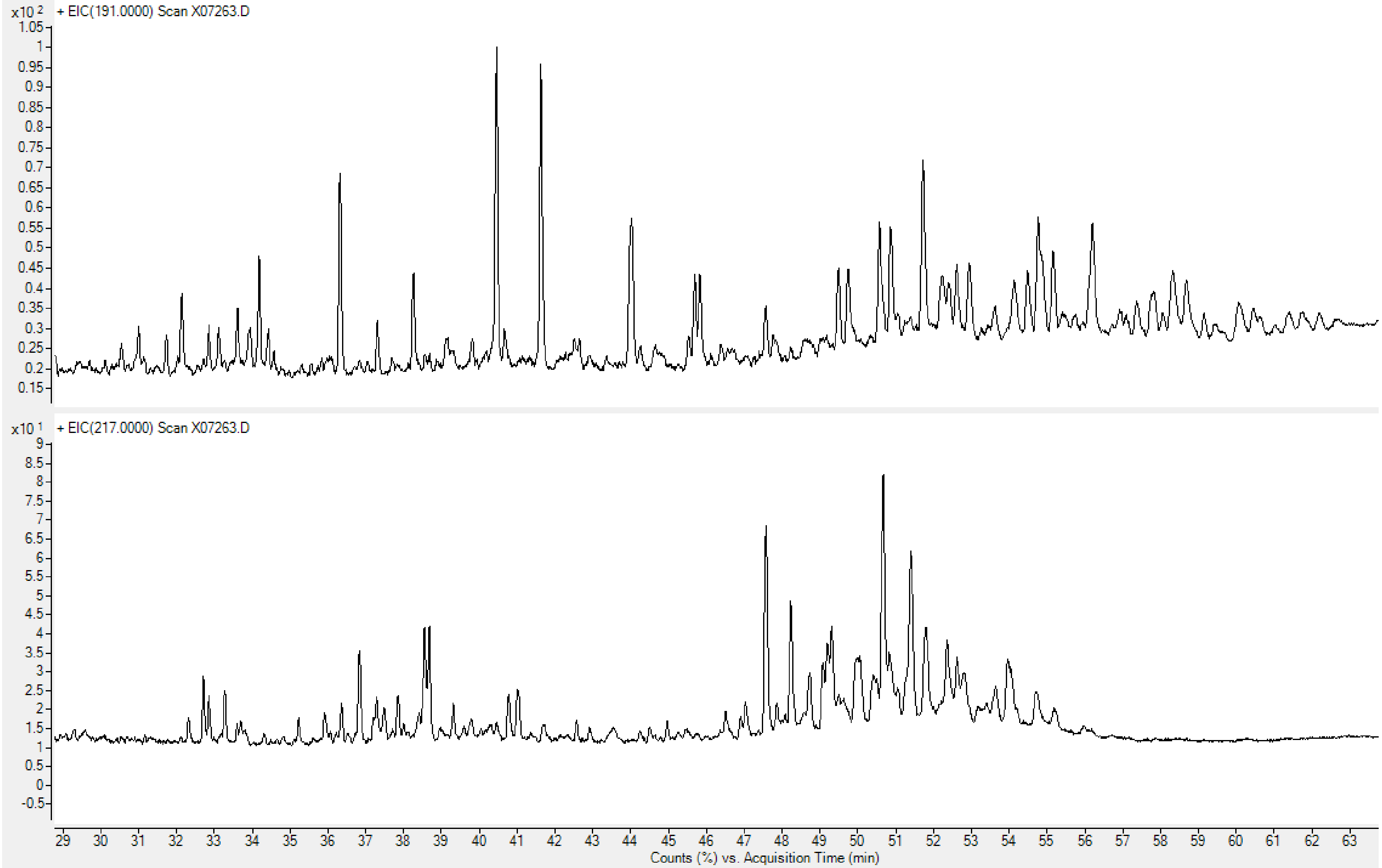
Lab. # X07376
8-16-74-10W6 (2255.7 m)
(Doig rock extract)



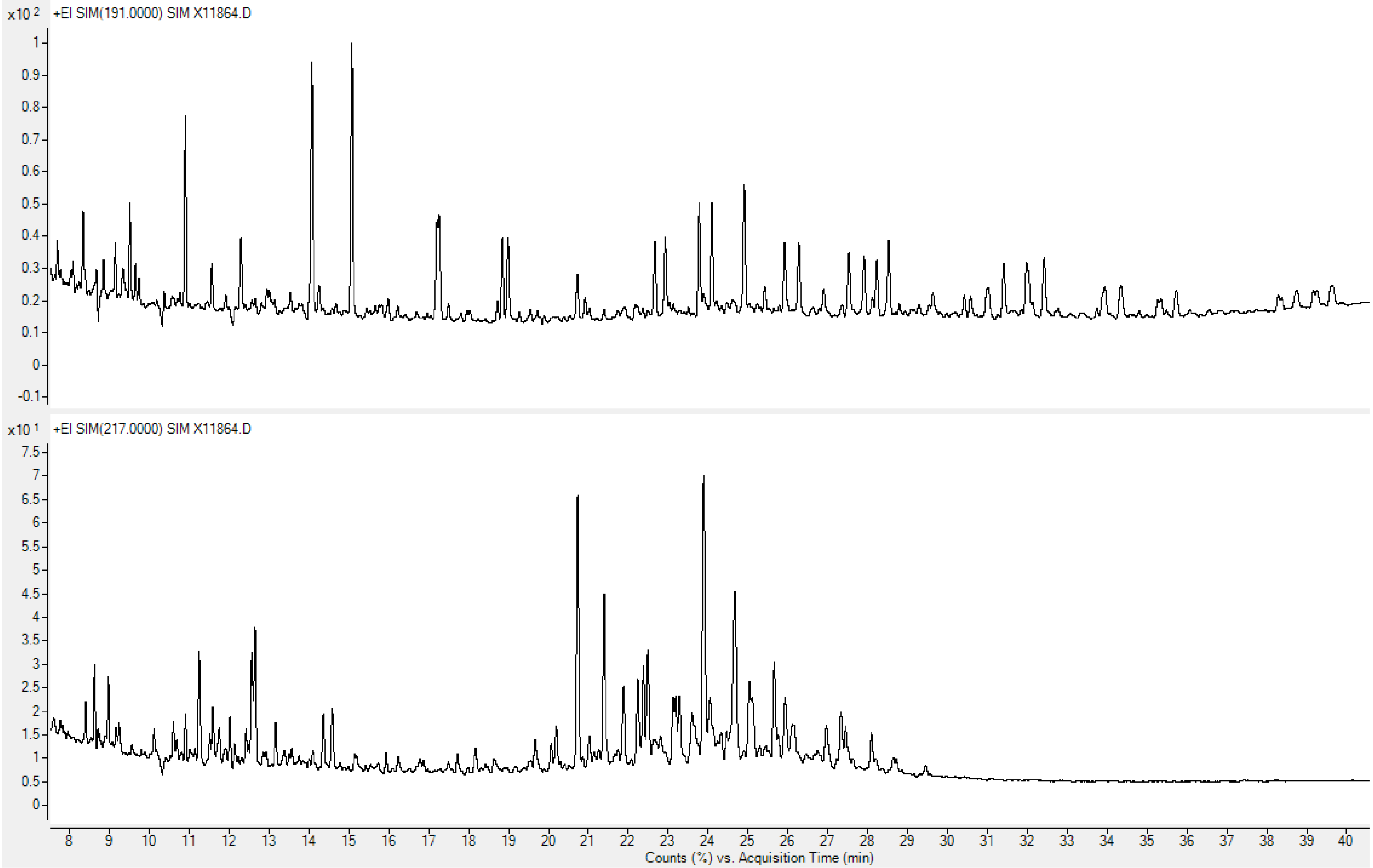
Lab. # X07377
8-16-74-10W6 (2261.9 m)
(Doig rock extract)



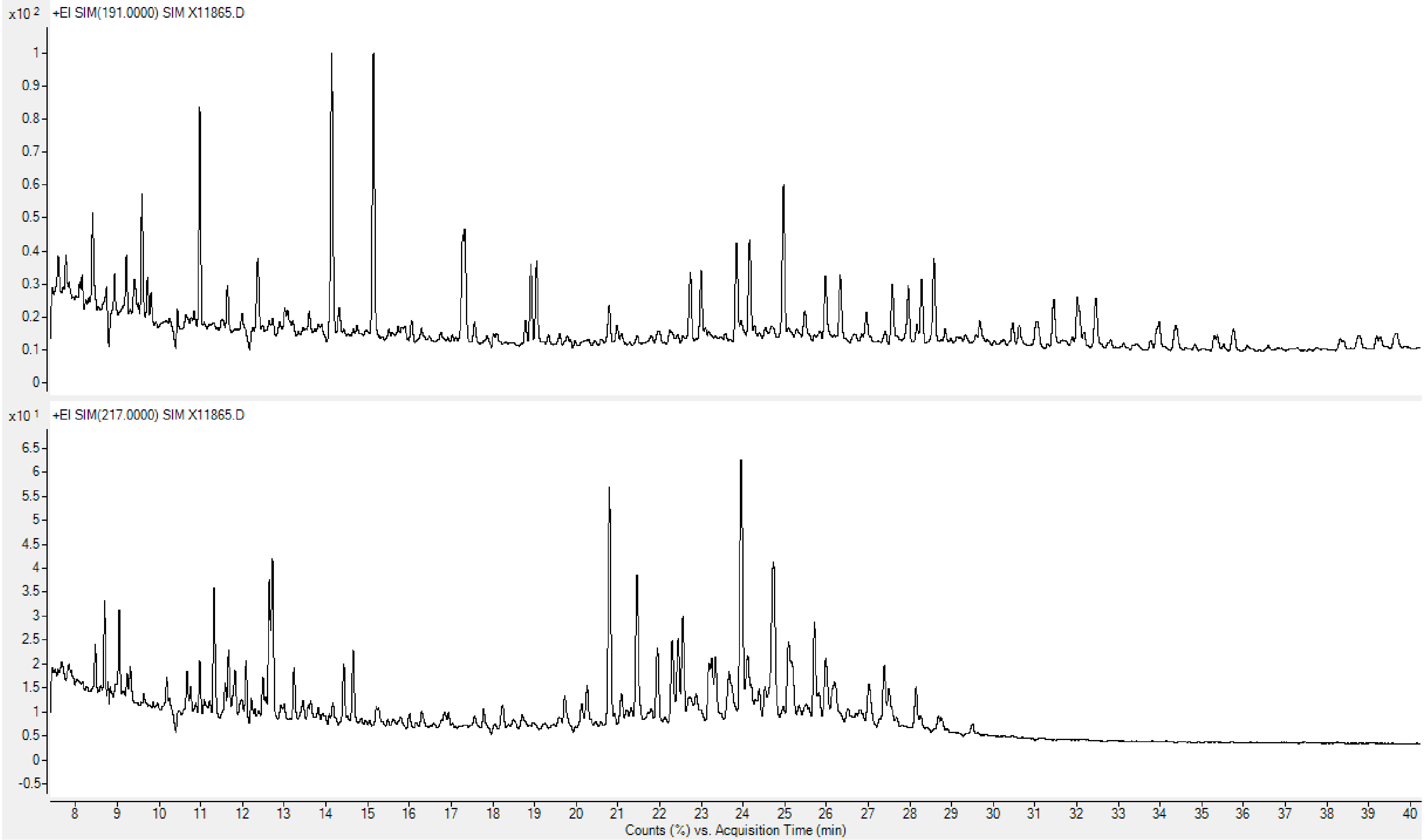
Lab. # X07263
11-3-73-7W6 (2018.3 m)
(Doig rock extract)



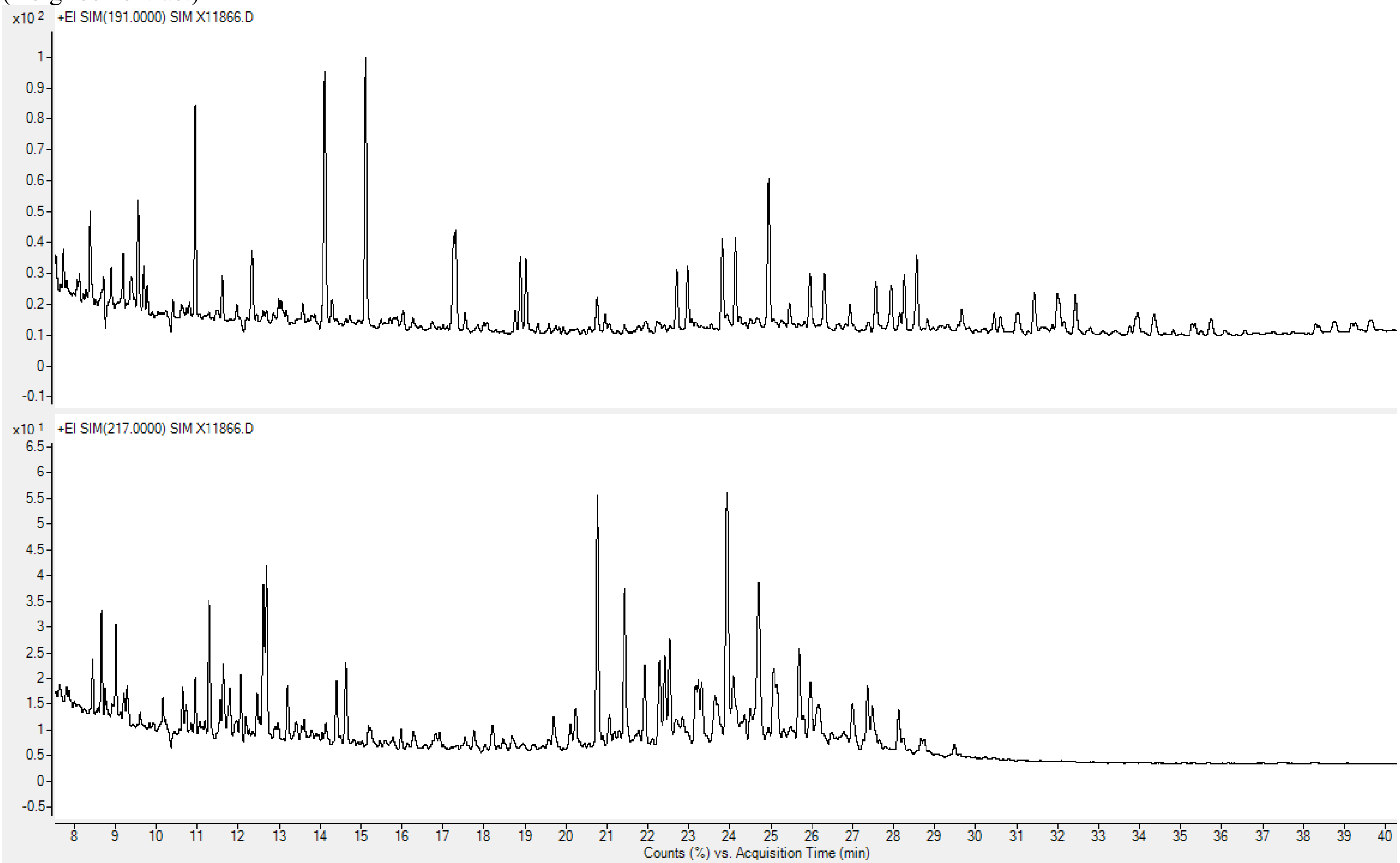
Lab. # X11864
11-3-73-7W6 (2015.75 m)
(Doig rock extract)



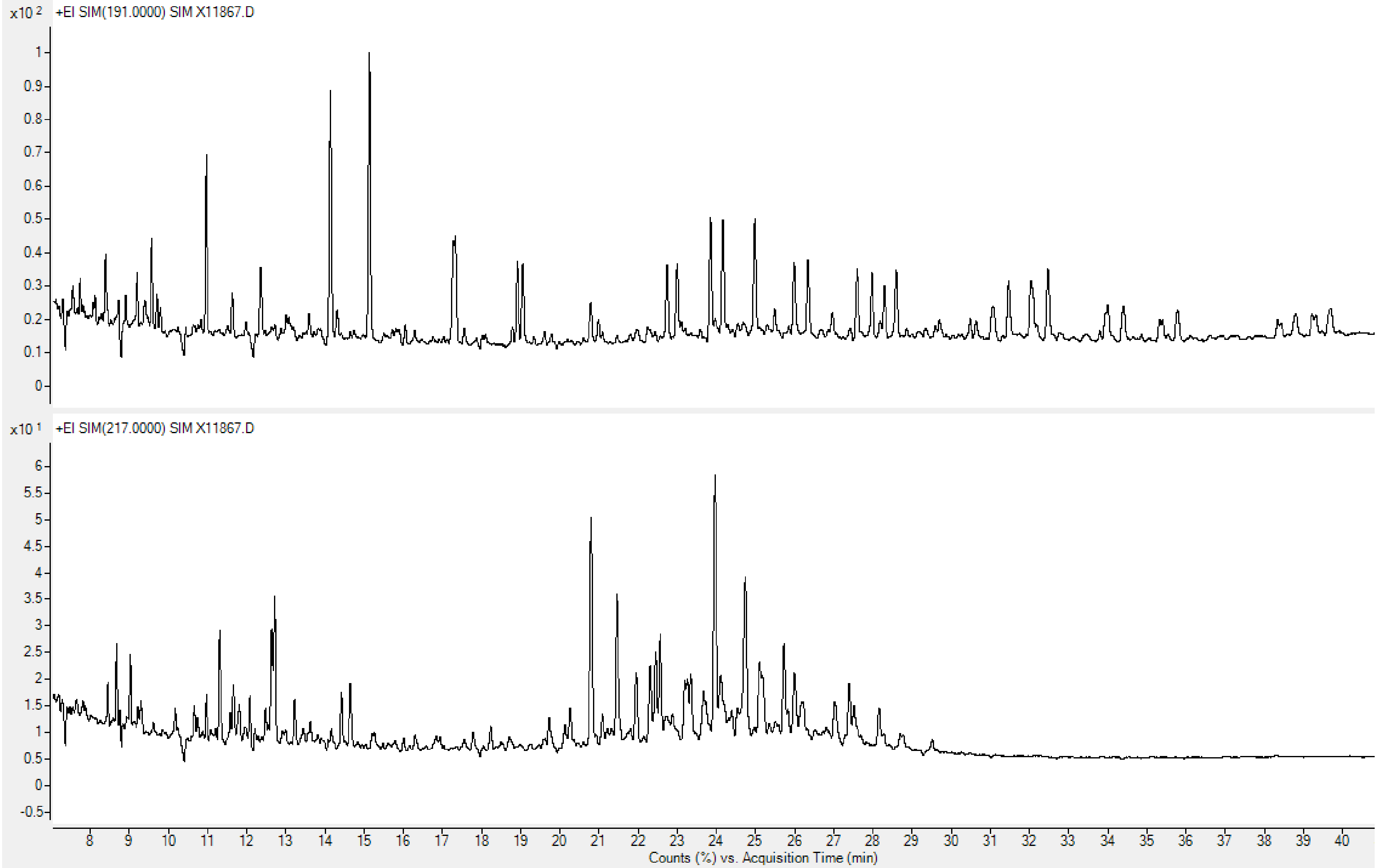
Lab. # X11865
11-3-73-7W6 (2021.2 m)
(Doig rock extract)



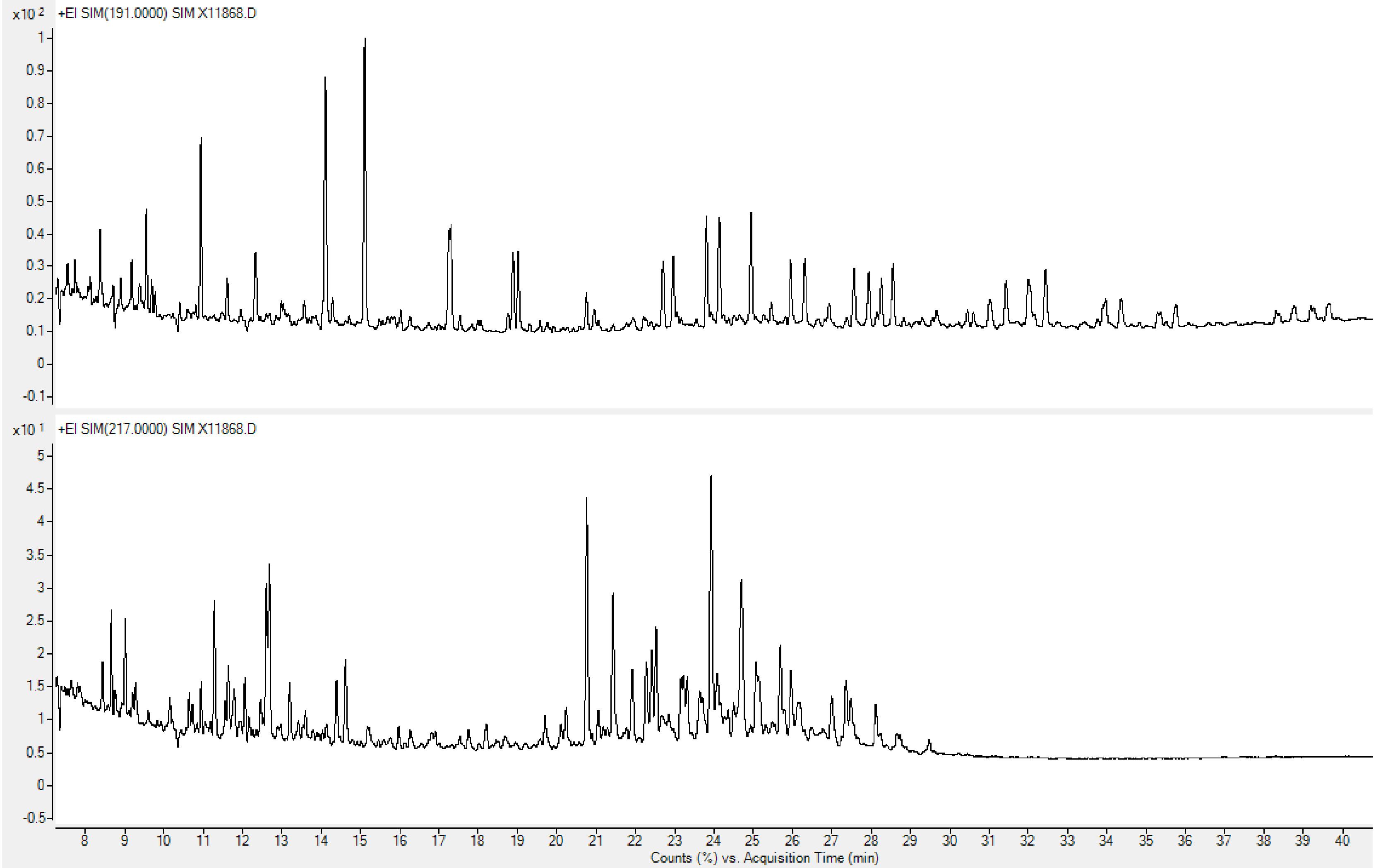
Lab. # X11866
11-3-73-7W6 (2024.85 m)
(Doig rock extract)



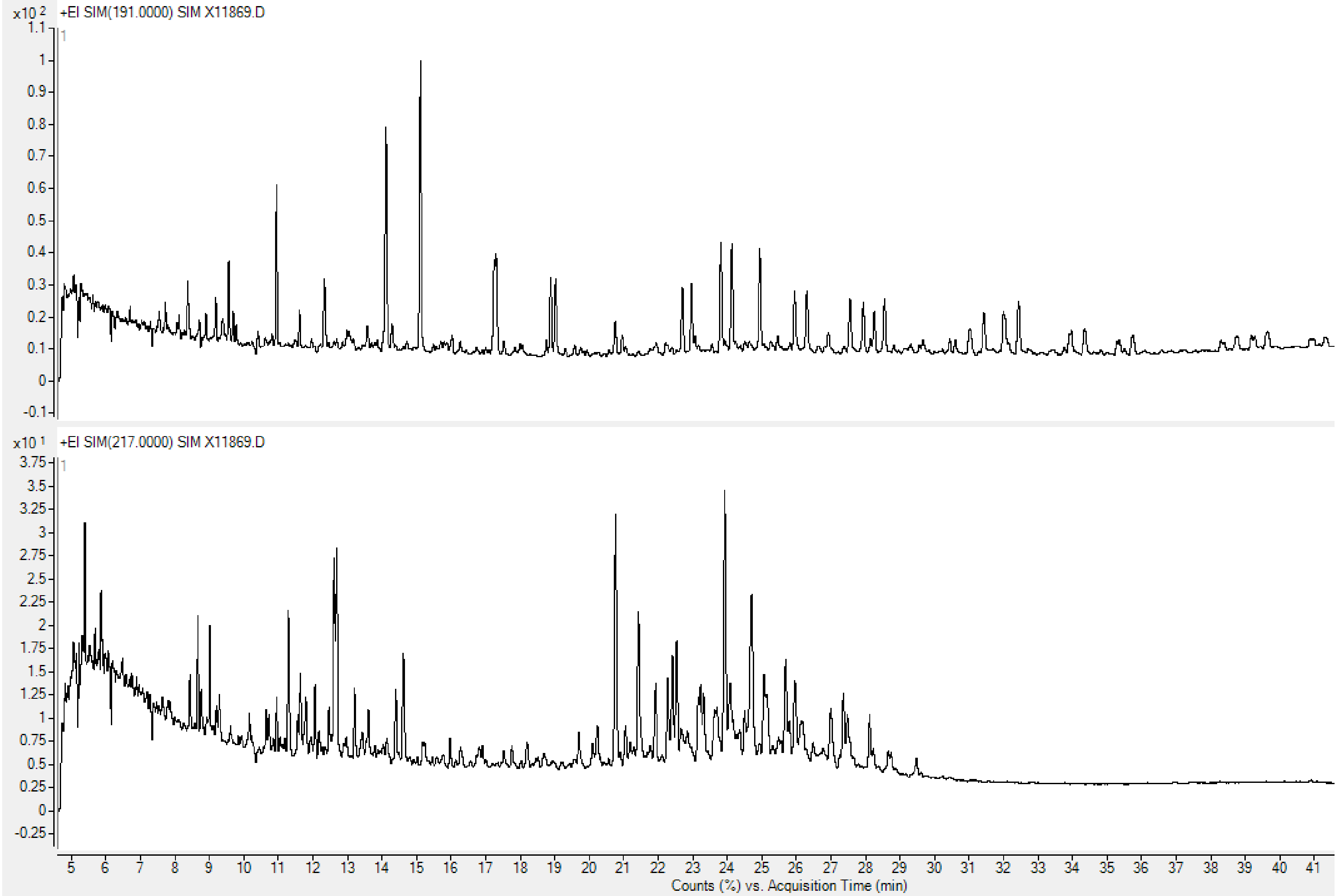
Lab. # X11867
11-3-73-7W6 (2027 m)
(Doig rock extract)



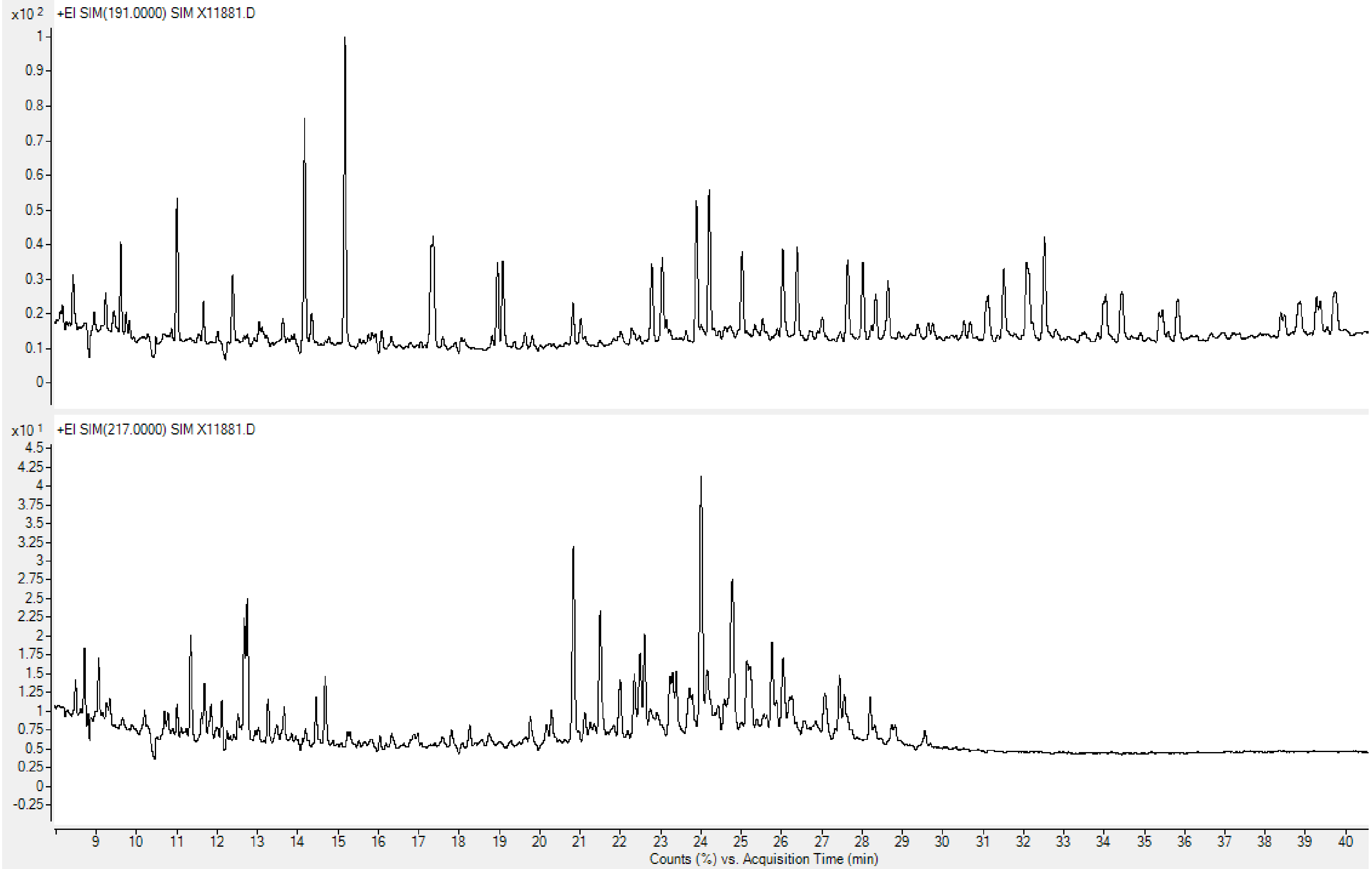
Lab. # X11868
11-3-73-7W6 (2032.9 m)
(Doig rock extract)



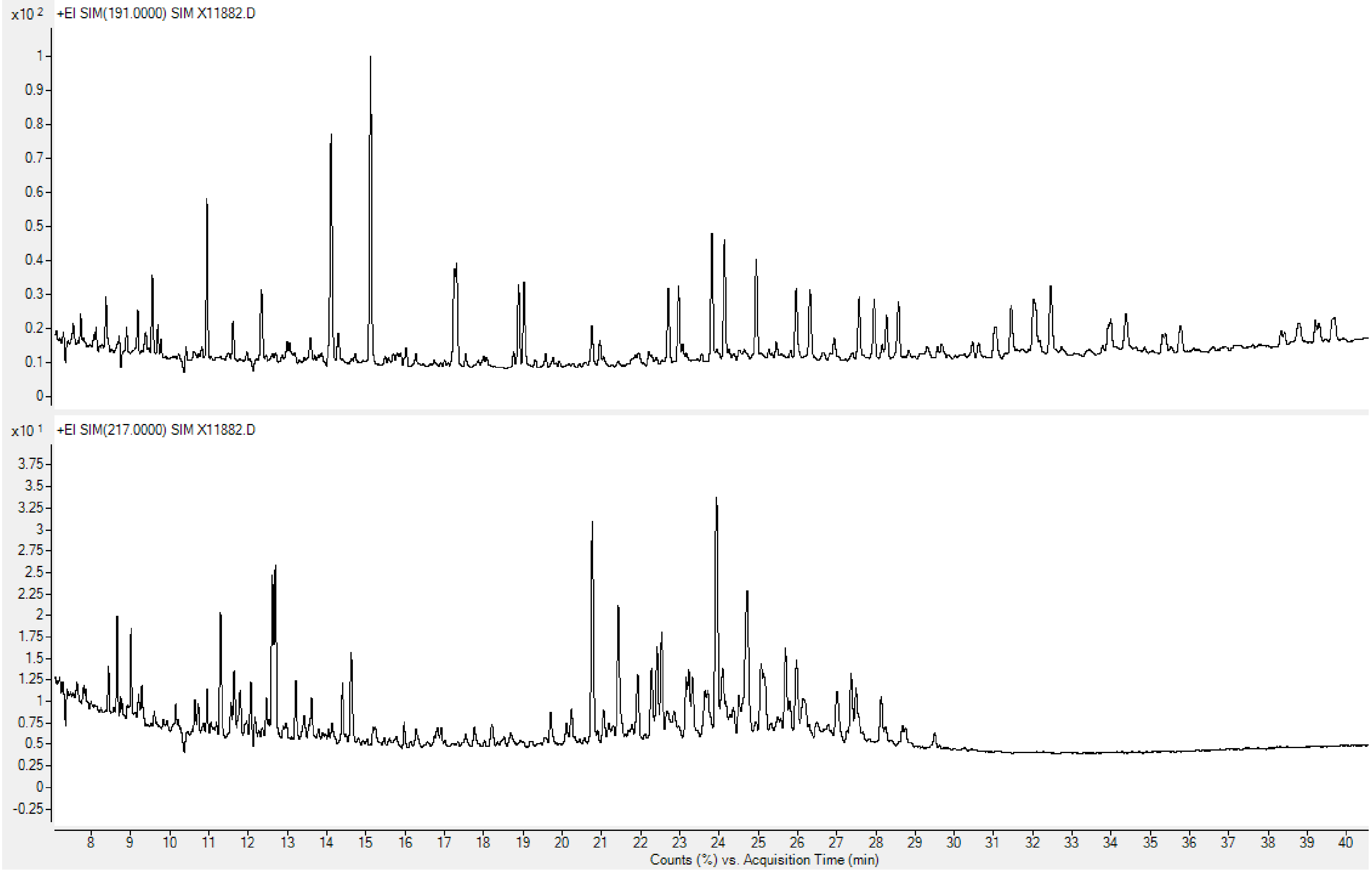
Lab. # X11869
11-3-73-7W6 (2037.4 m)
(Doig rock extract)



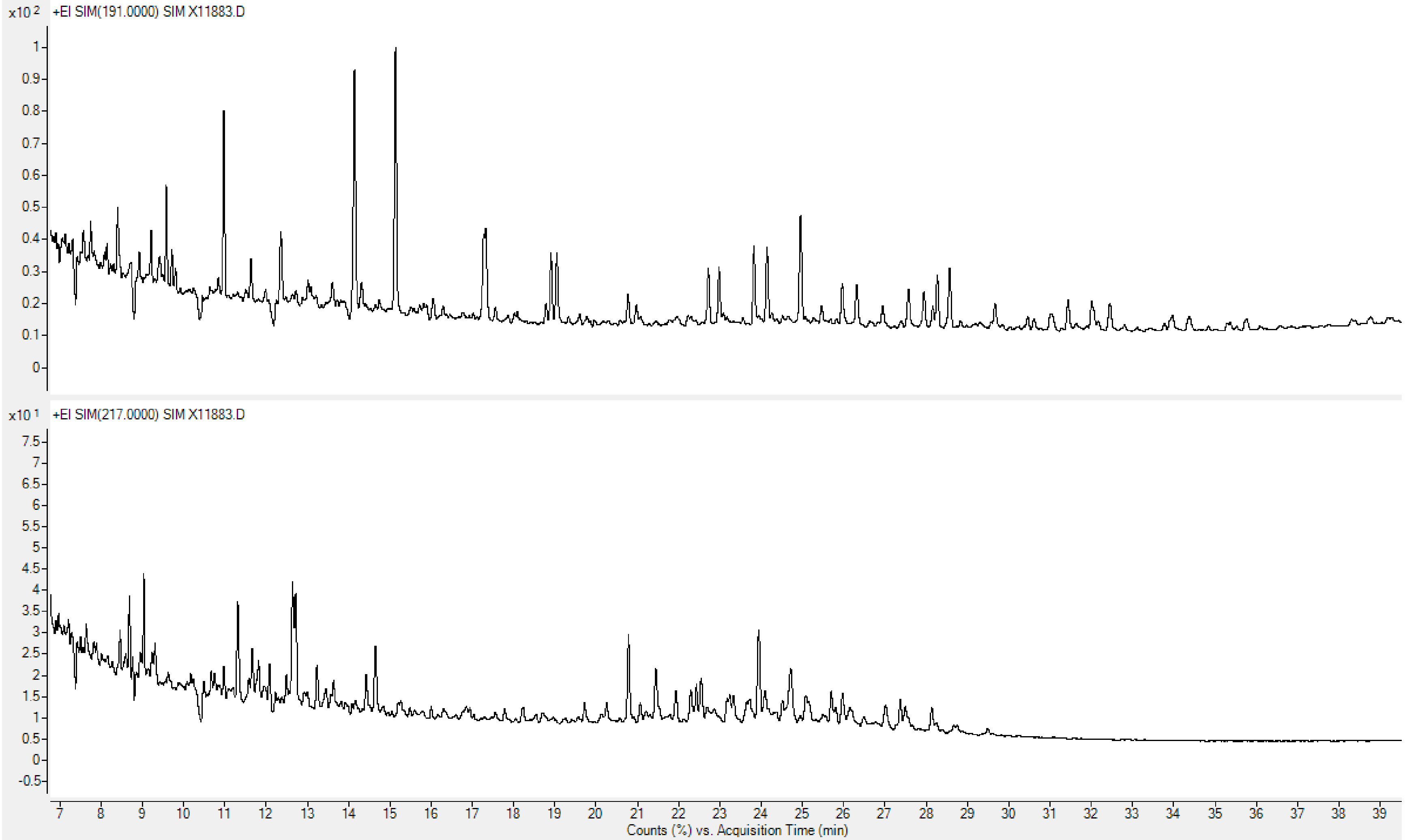
Lab. # X11881
11-3-73-7W6 (2040.3 m)
(Doig rock extract)



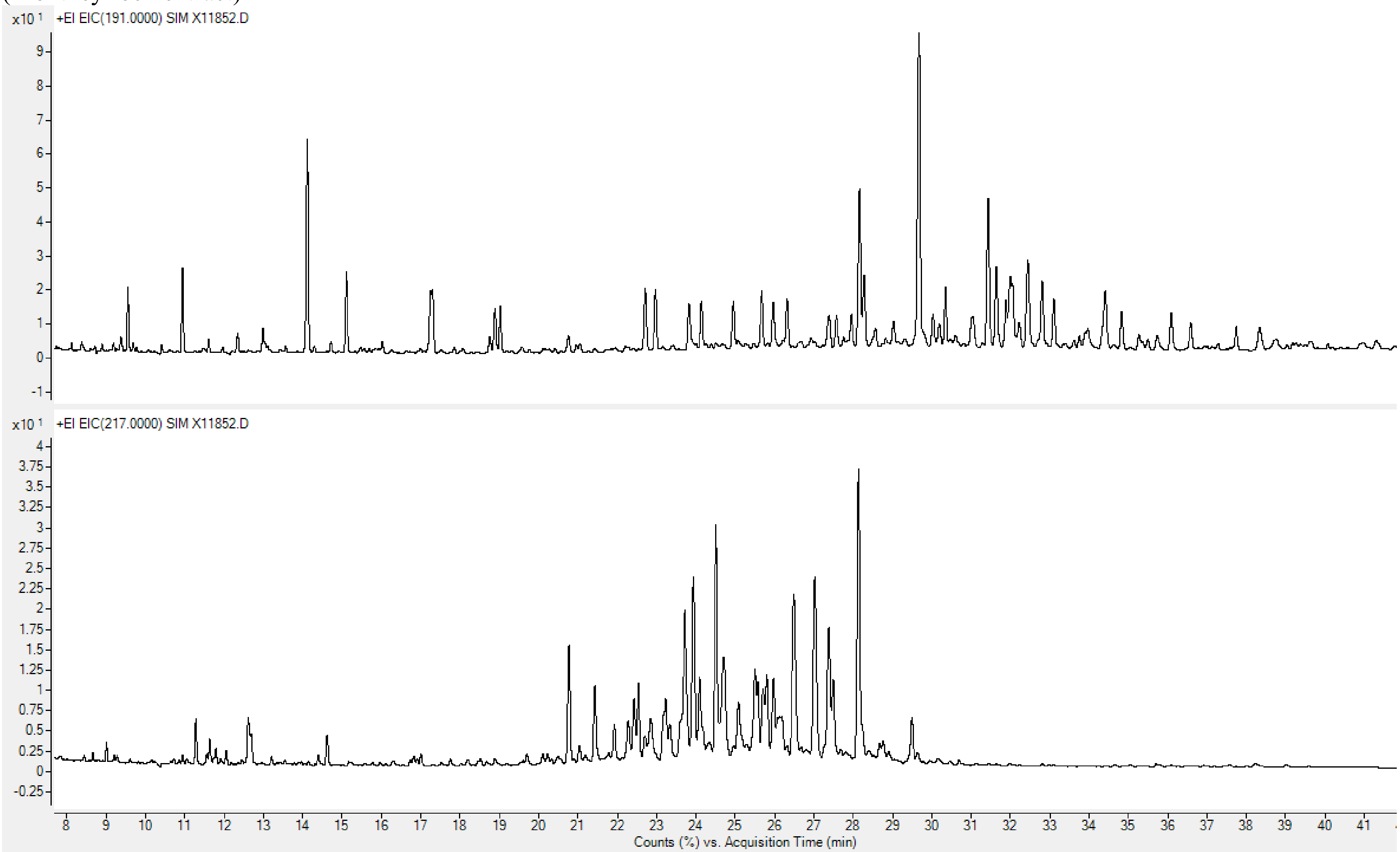
Lab. # X11882
11-3-73-7W6 (2041.35 m)
(Doig rock extract)



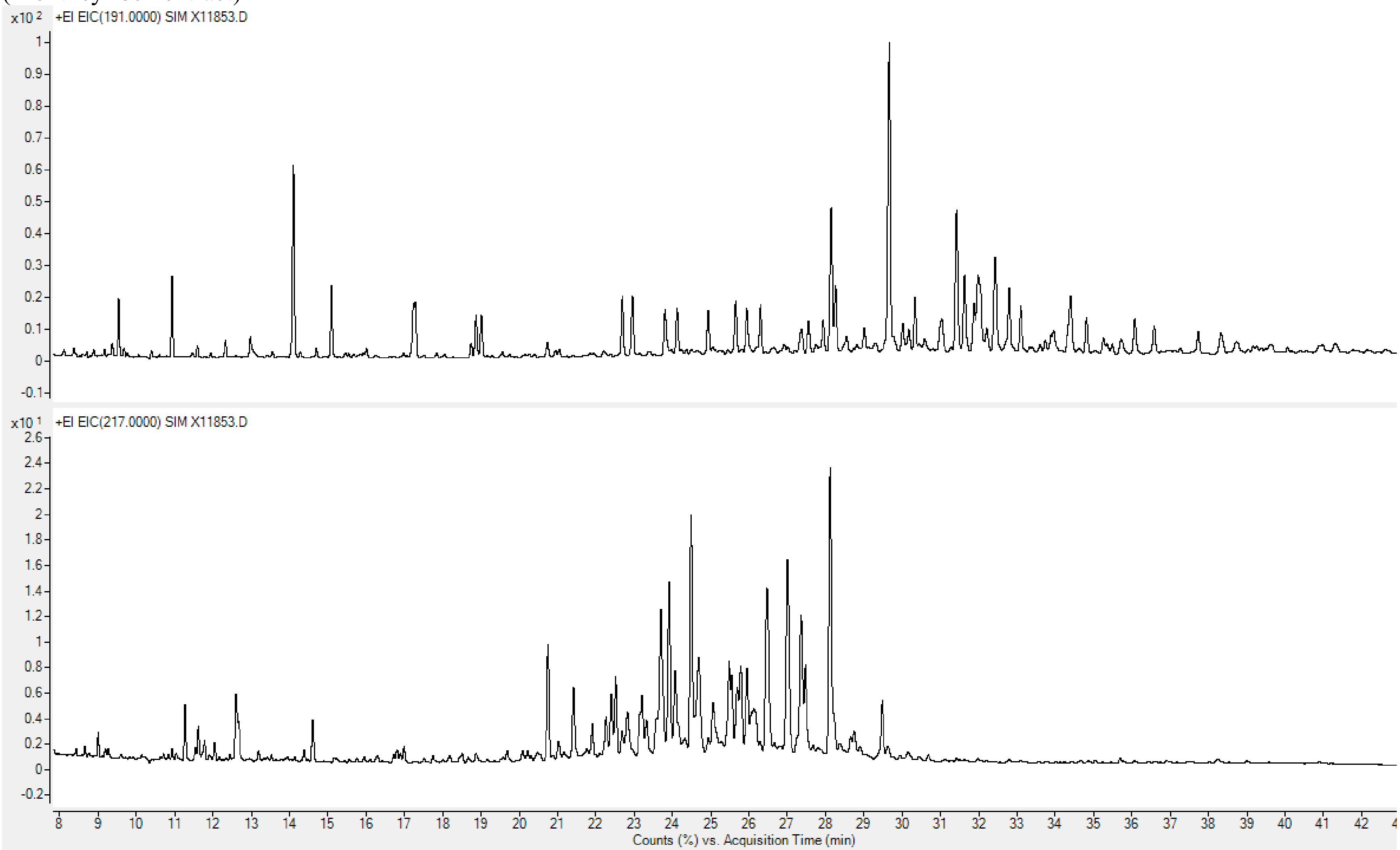
Lab. # X11883
11-3-73-7W6 (2043.7 m)
(Doig rock extract)



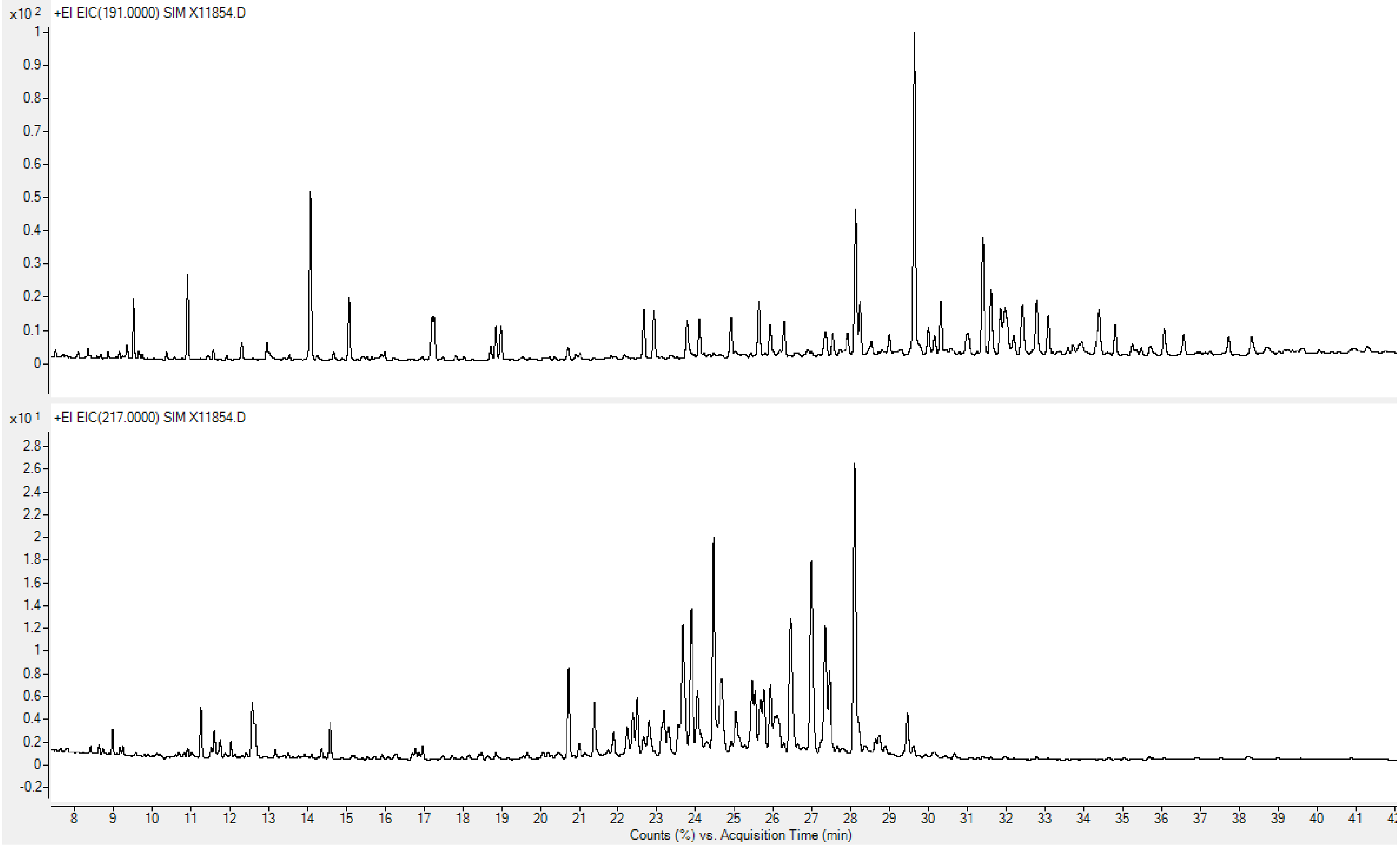
Lab. # X11852
4-32-84-12W6 (1581.4 m)
(Montney rock extract)



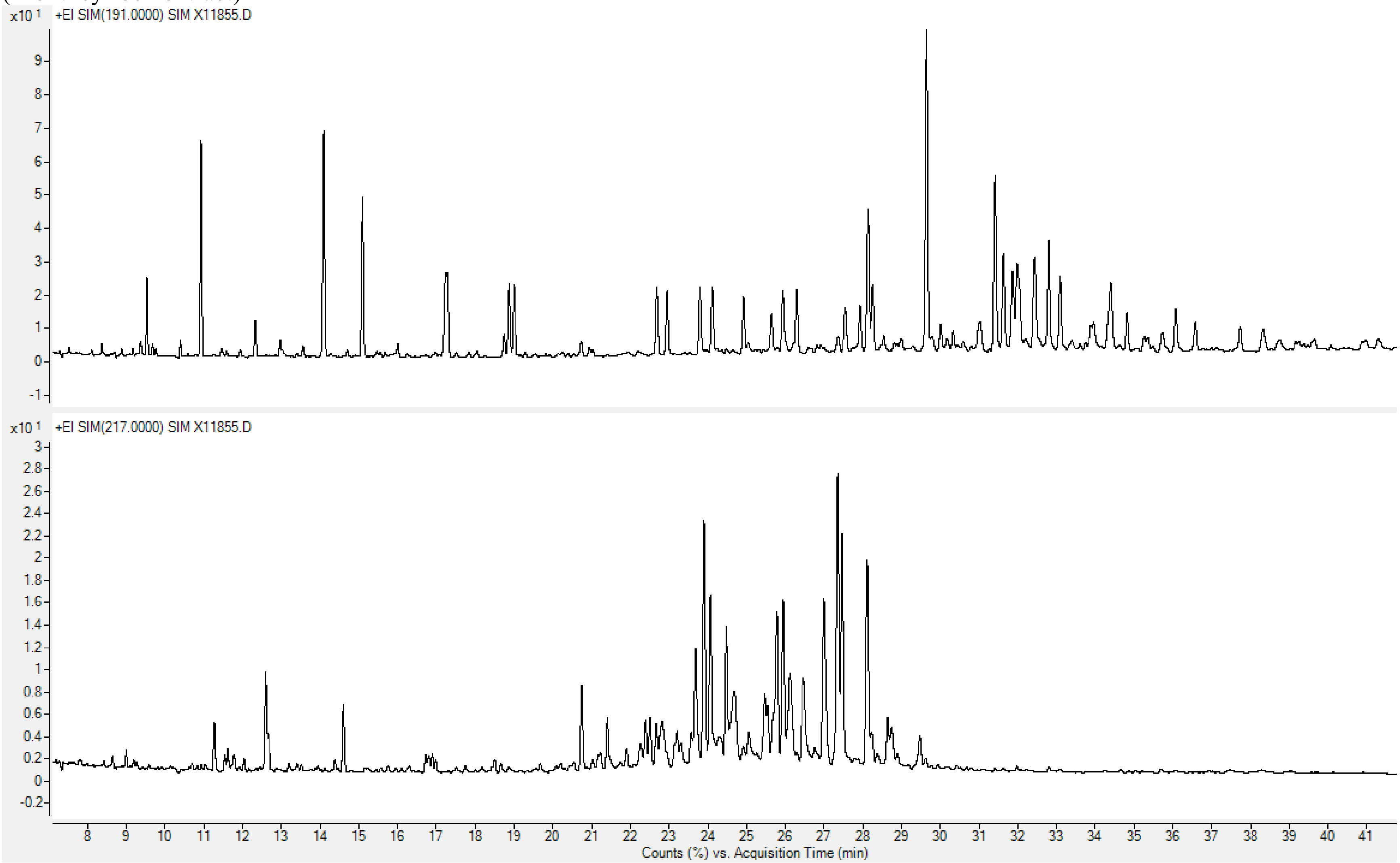
Lab. # X11853
4-32-84-12W6 (1581.9 m)
(Montney rock extract)



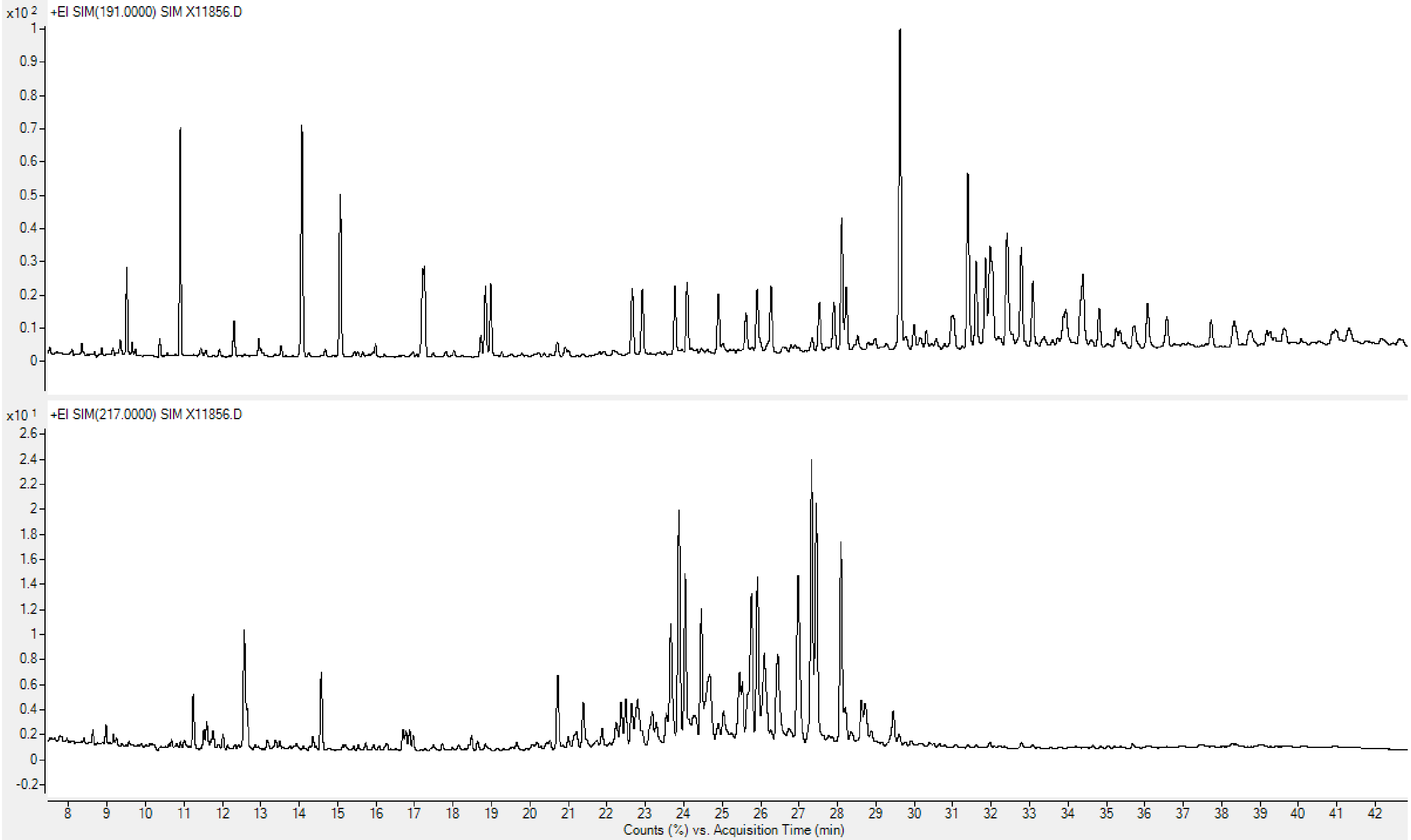
Lab. # X11854
4-32-84-12W6 (1593.5 m)
(Montney rock extract)



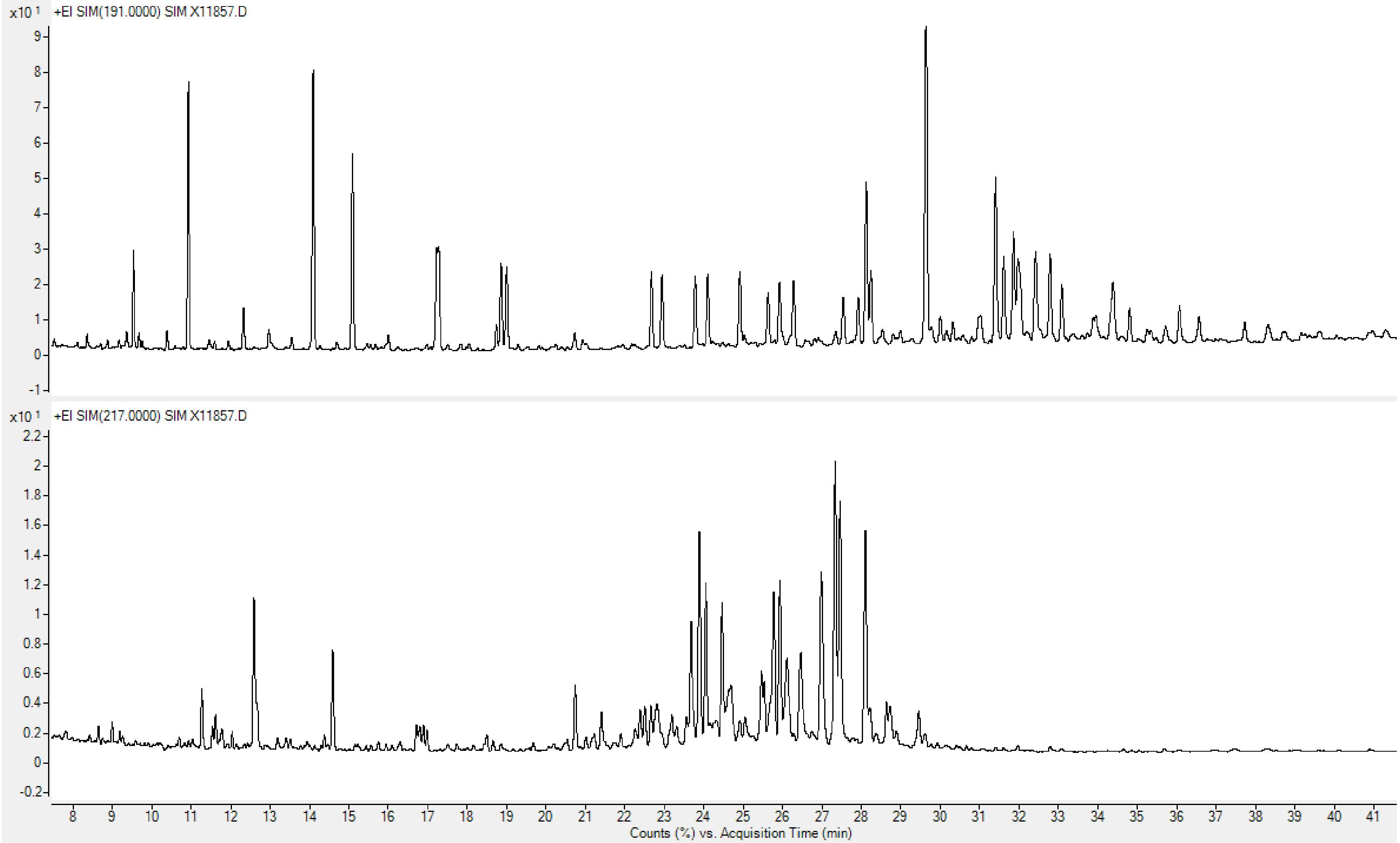
Lab. # X11855
6-36-71-4W6 (1888.15 m)
(Montney rock extract)



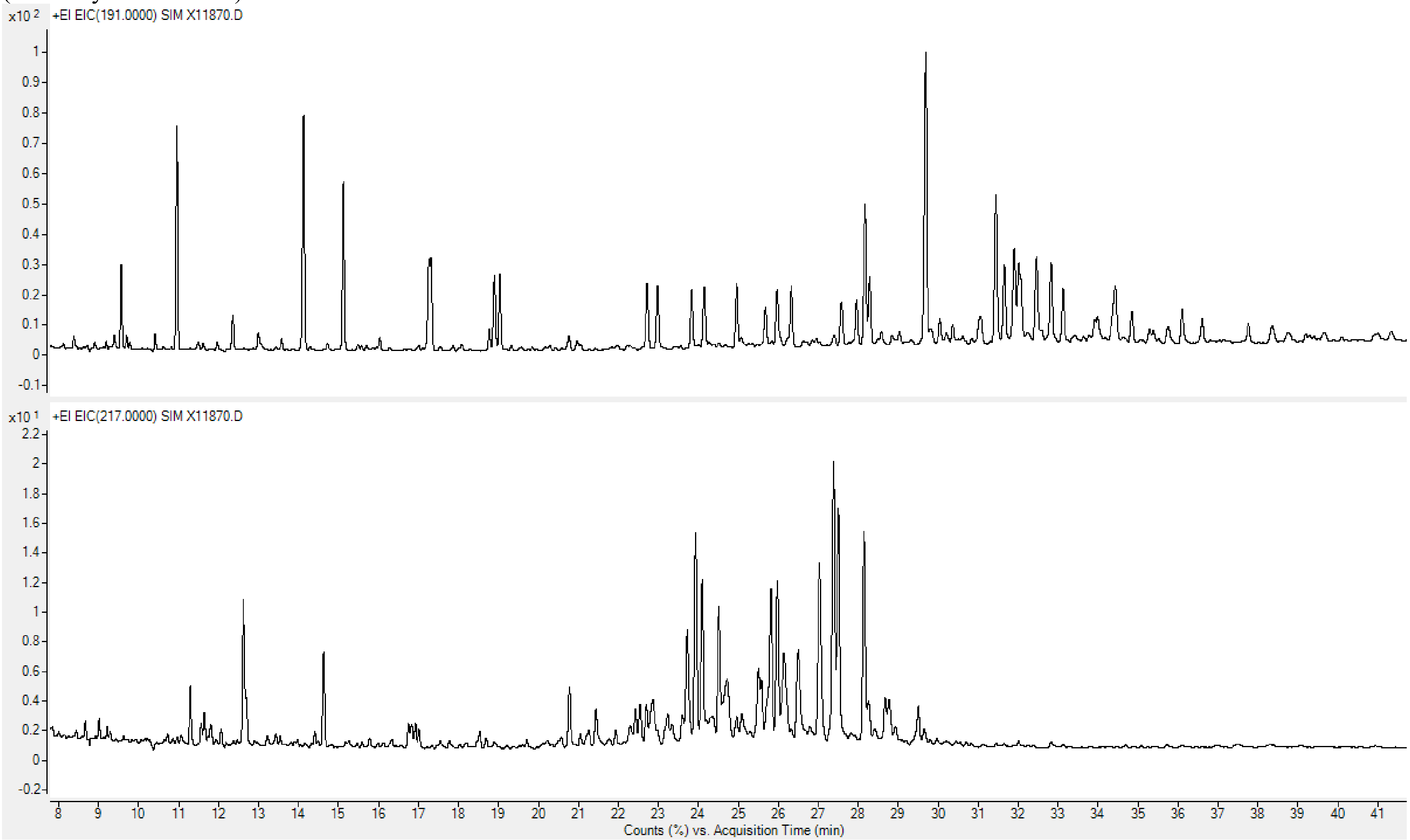
Lab. # X11856
6-36-71-4W6 (1890.1 m)
(Montney rock extract)



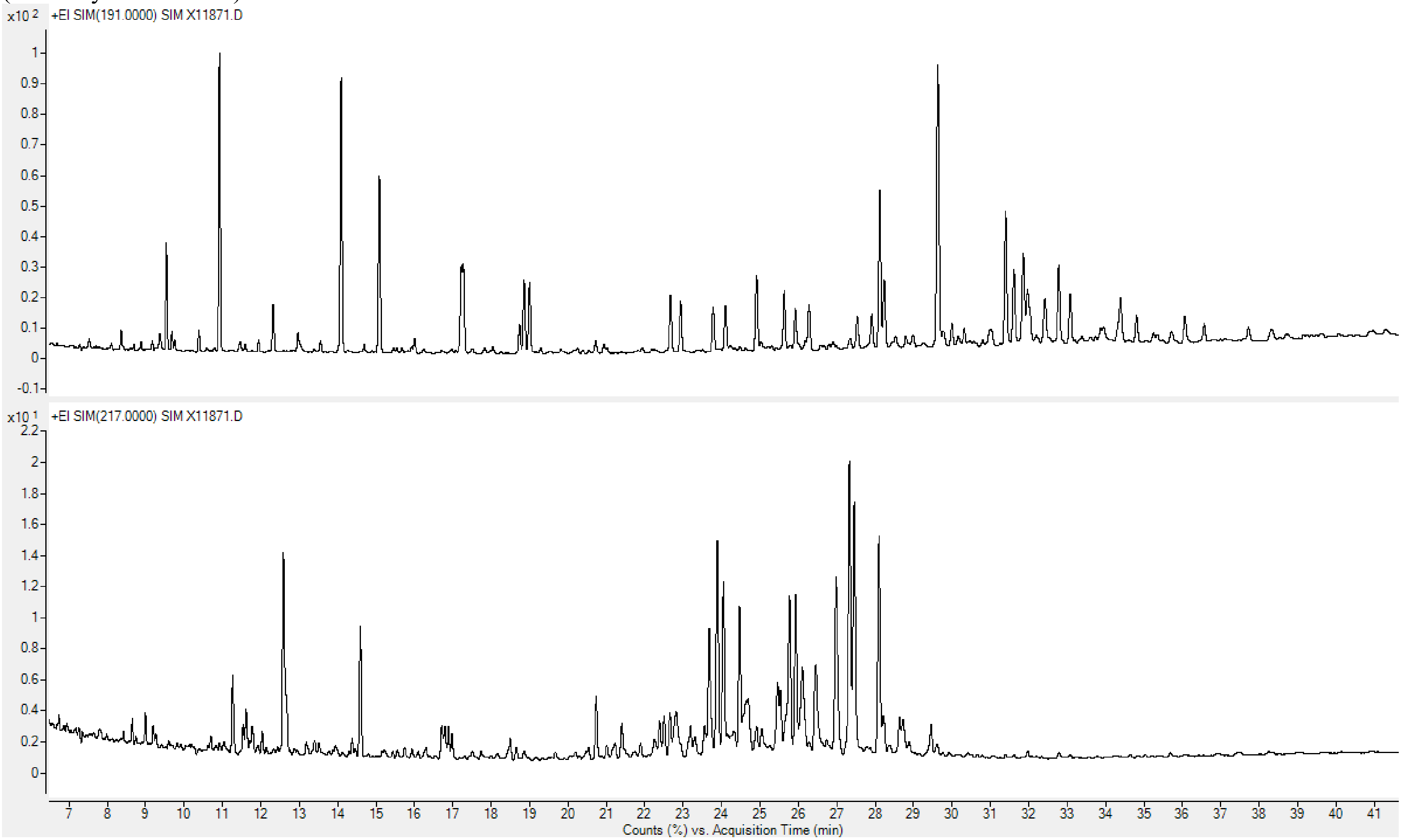
Lab. # X11857
6-36-71-4W6 (1895.4 m)
(Montney rock extract)



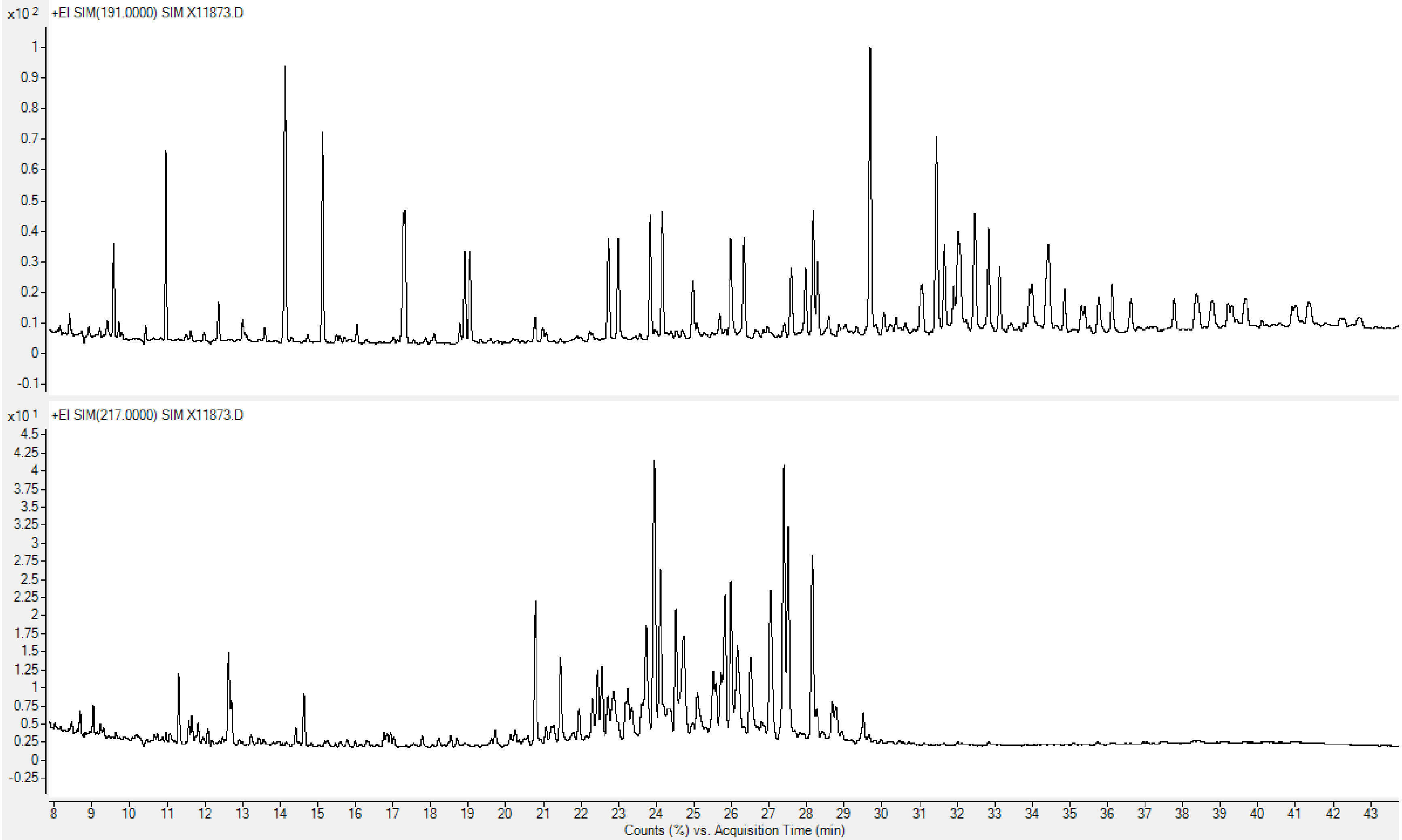
Lab. # X11870
6-36-71-4W6 (1900.4 m)
(Montney rock extract)



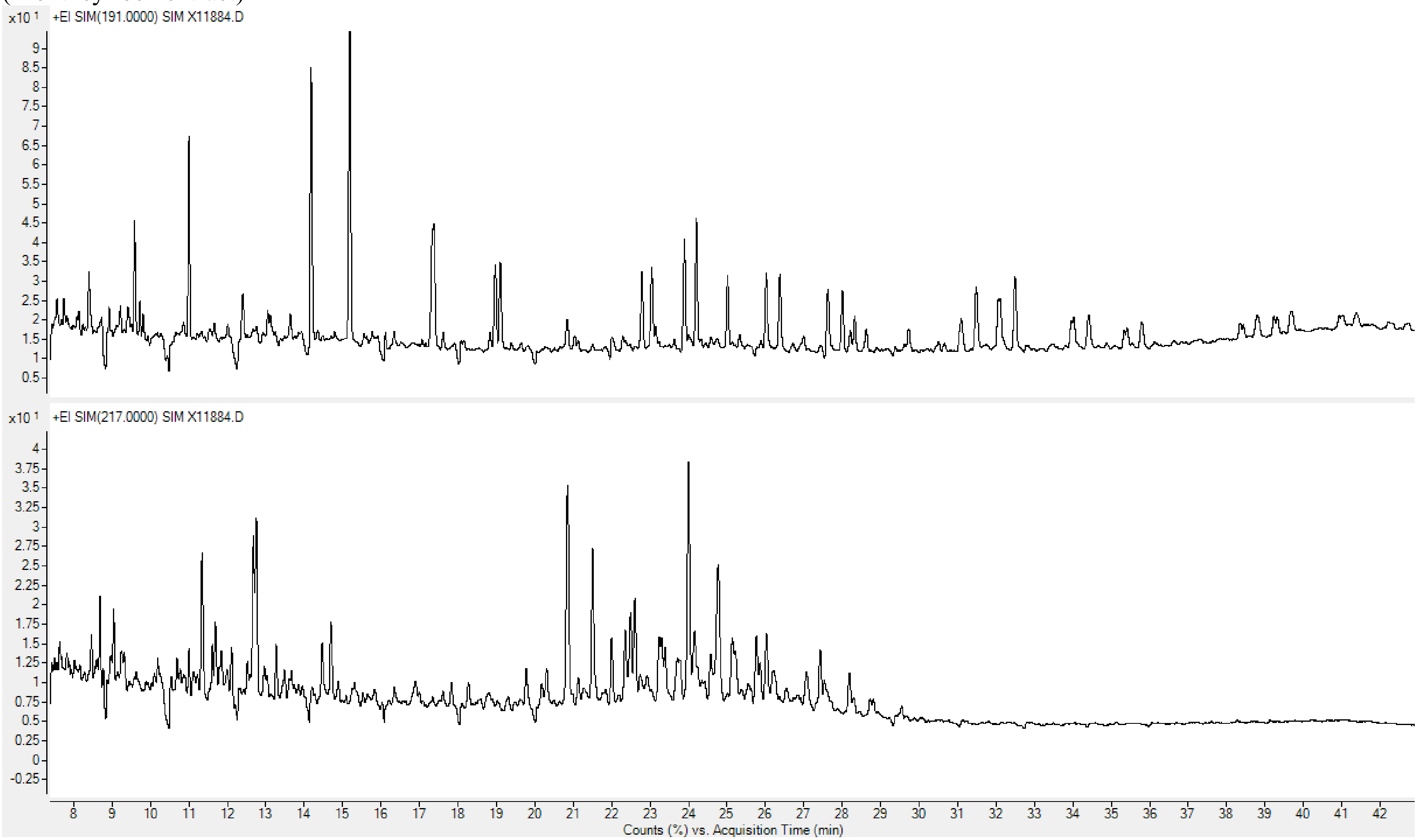
Lab. # X11871
6-36-71-4W6 (1903 m)
(Montney rock extract)



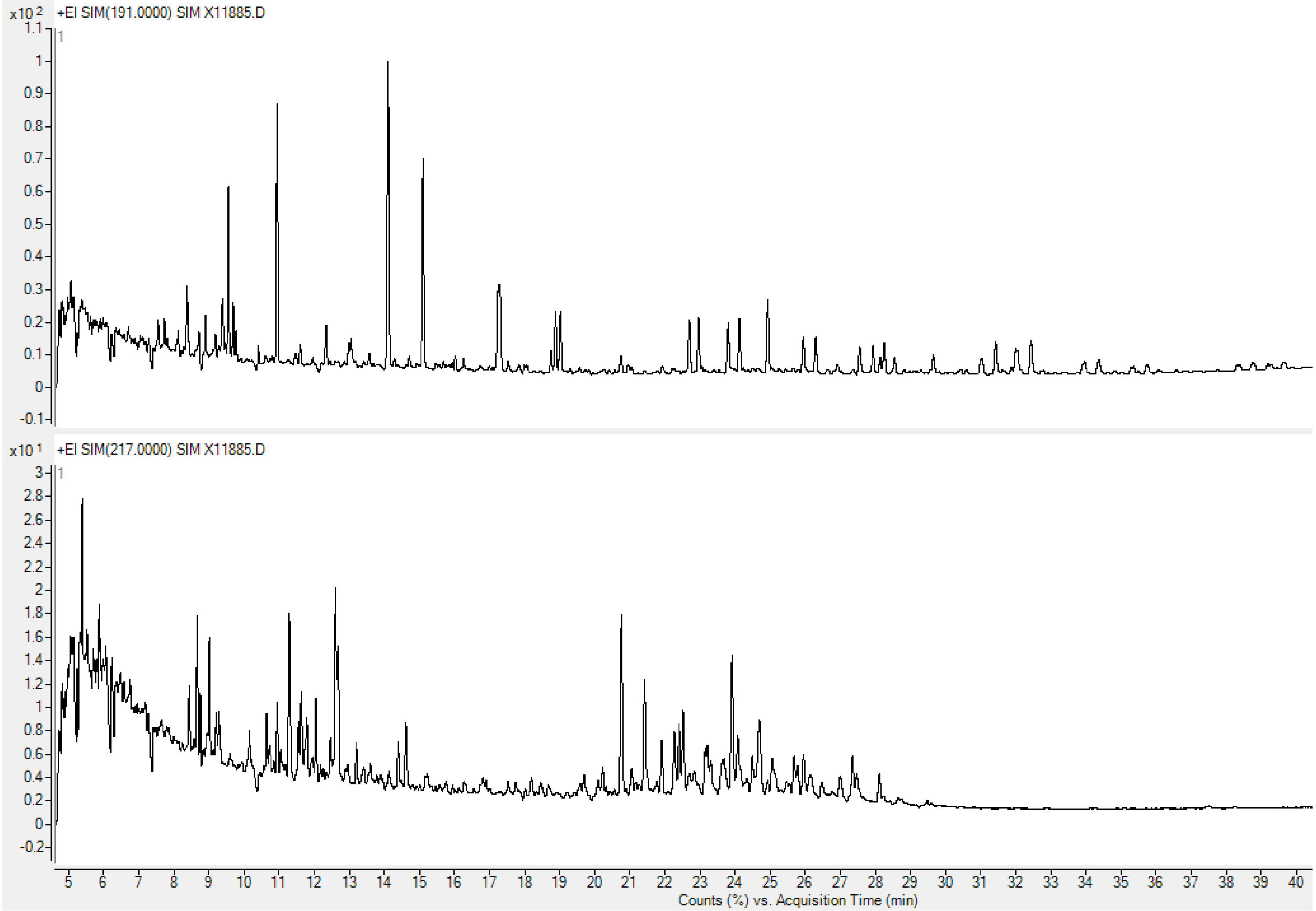
Lab. # X11873
6-36-71-4W6 (1934.3 m)
(Montney rock extract)



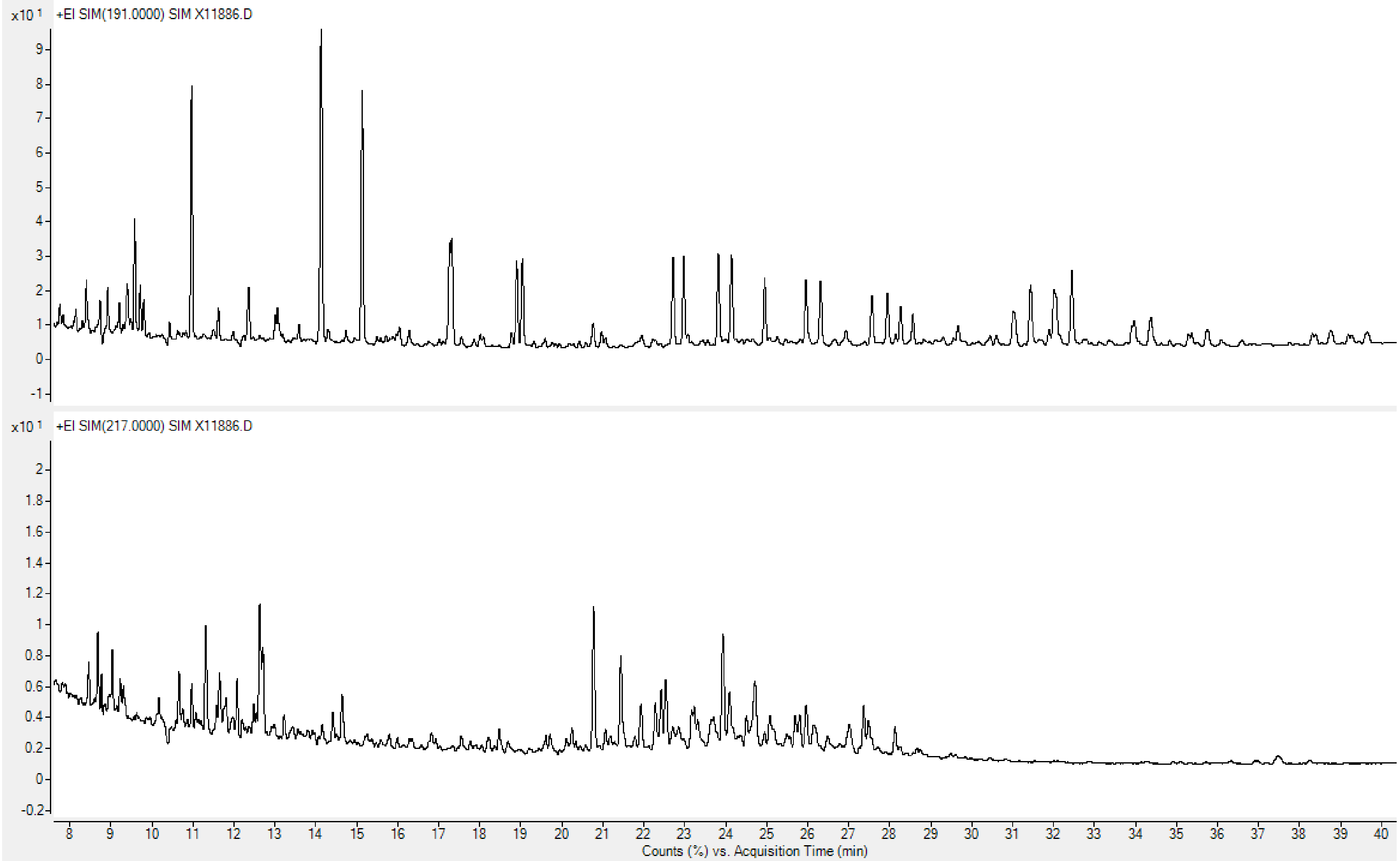
Lab. # X11884
11-3-73-7W6 (2045.5 m)
(Montney rock extract)



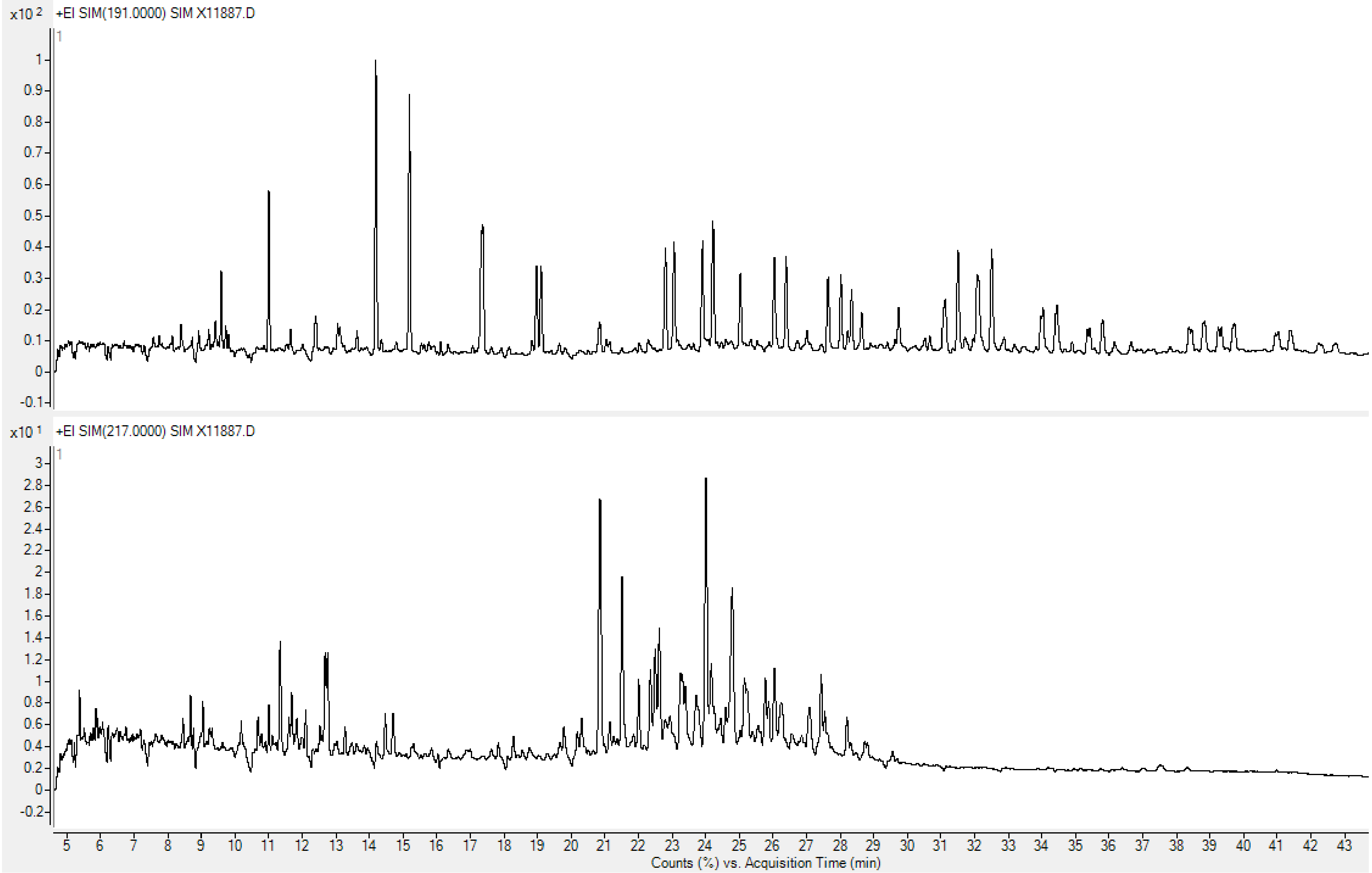
Lab. # X11885
11-3-73-7W6 (2047.55 m)
(Montney rock extract)



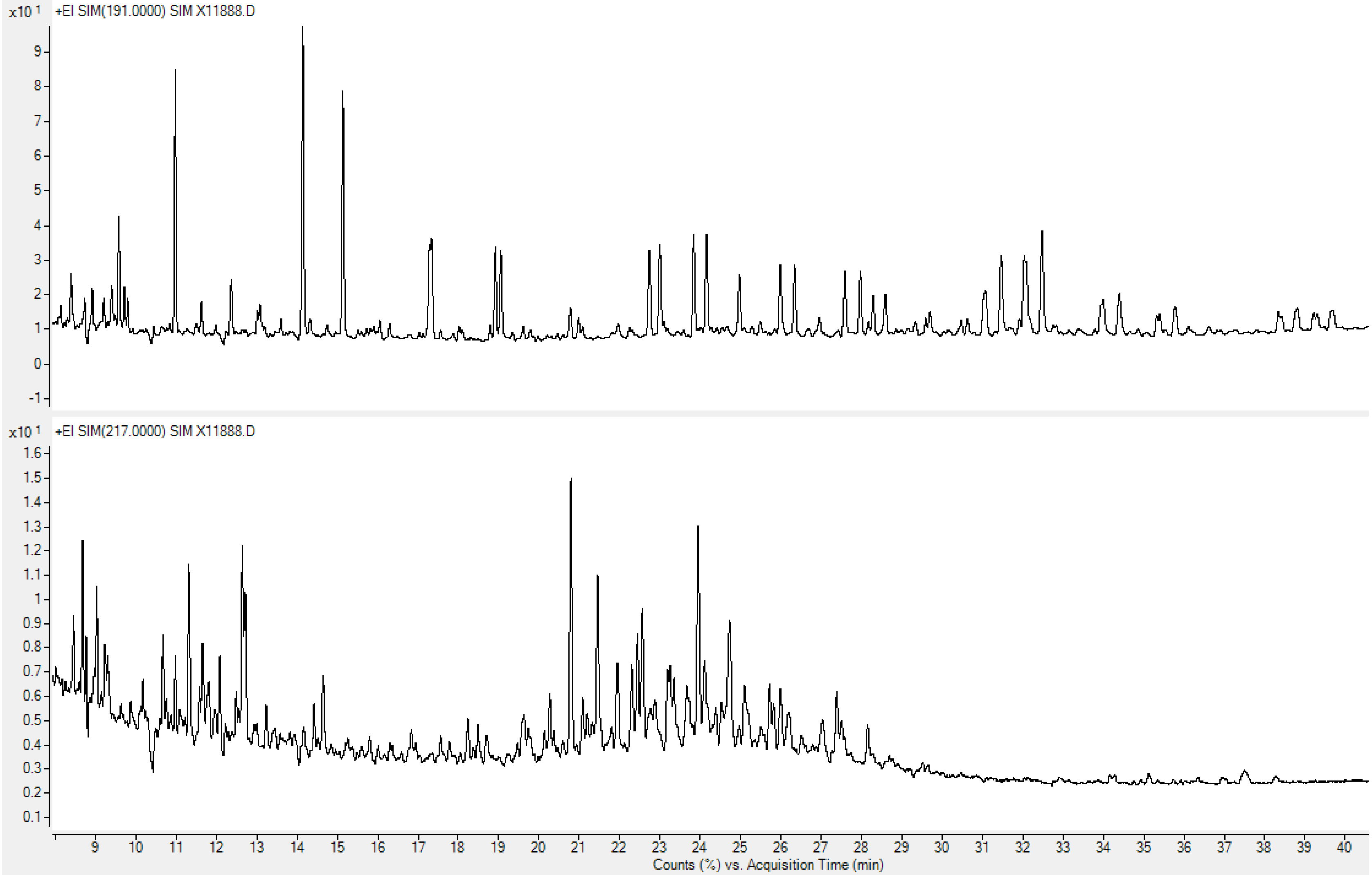
Lab. # X11886
11-3-73-7W6 (2050.35 m)
(Montney rock extract)



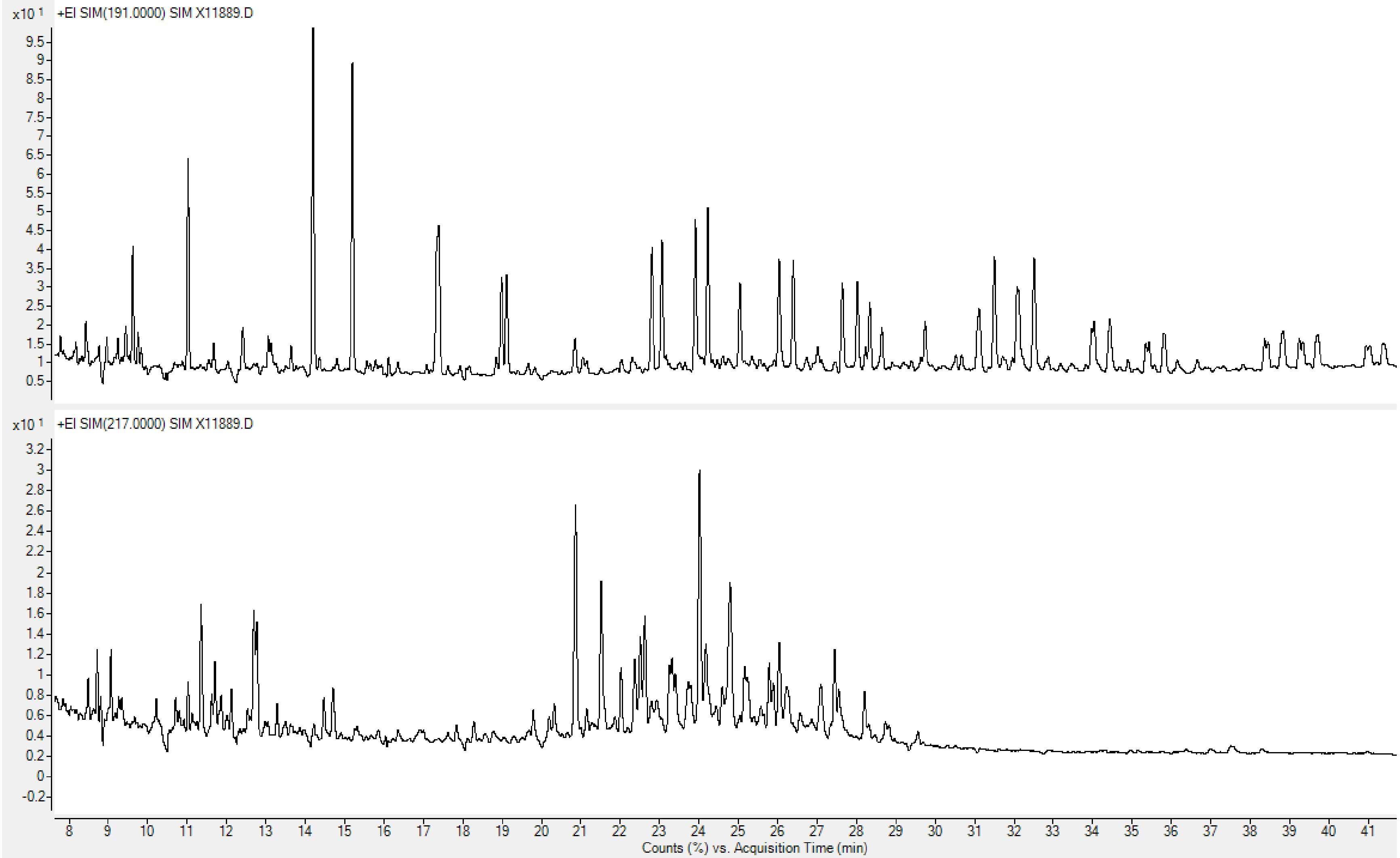
Lab. # X11887
11-3-73-7W6 (2051.3 m)
(Montney rock extract)



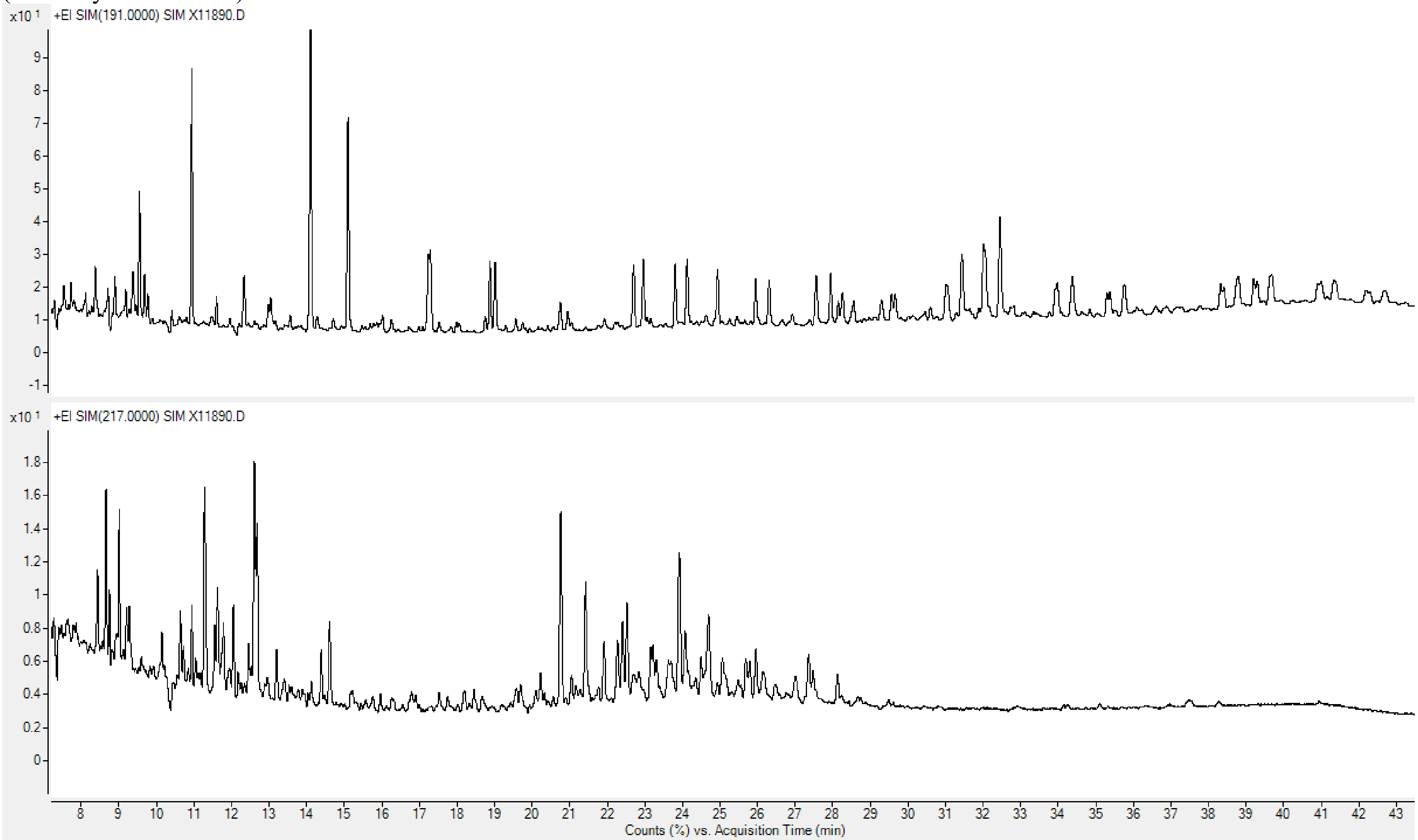
Lab. # X11888
11-3-73-7W6 (2052.4 m)
(Montney rock extract)



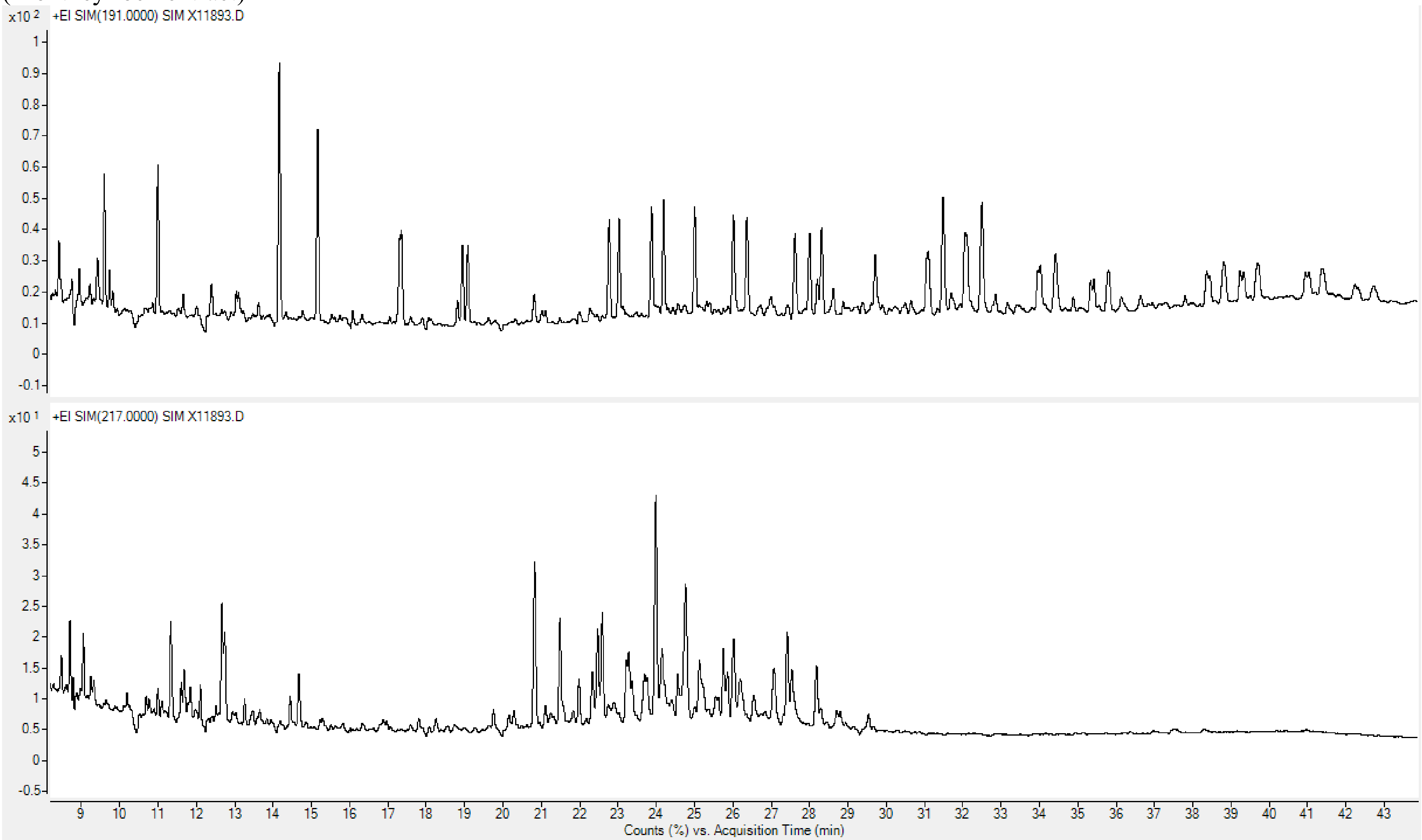
Lab. # X11889
11-3-73-7W6 (2053.75 m)
(Montney rock extract)



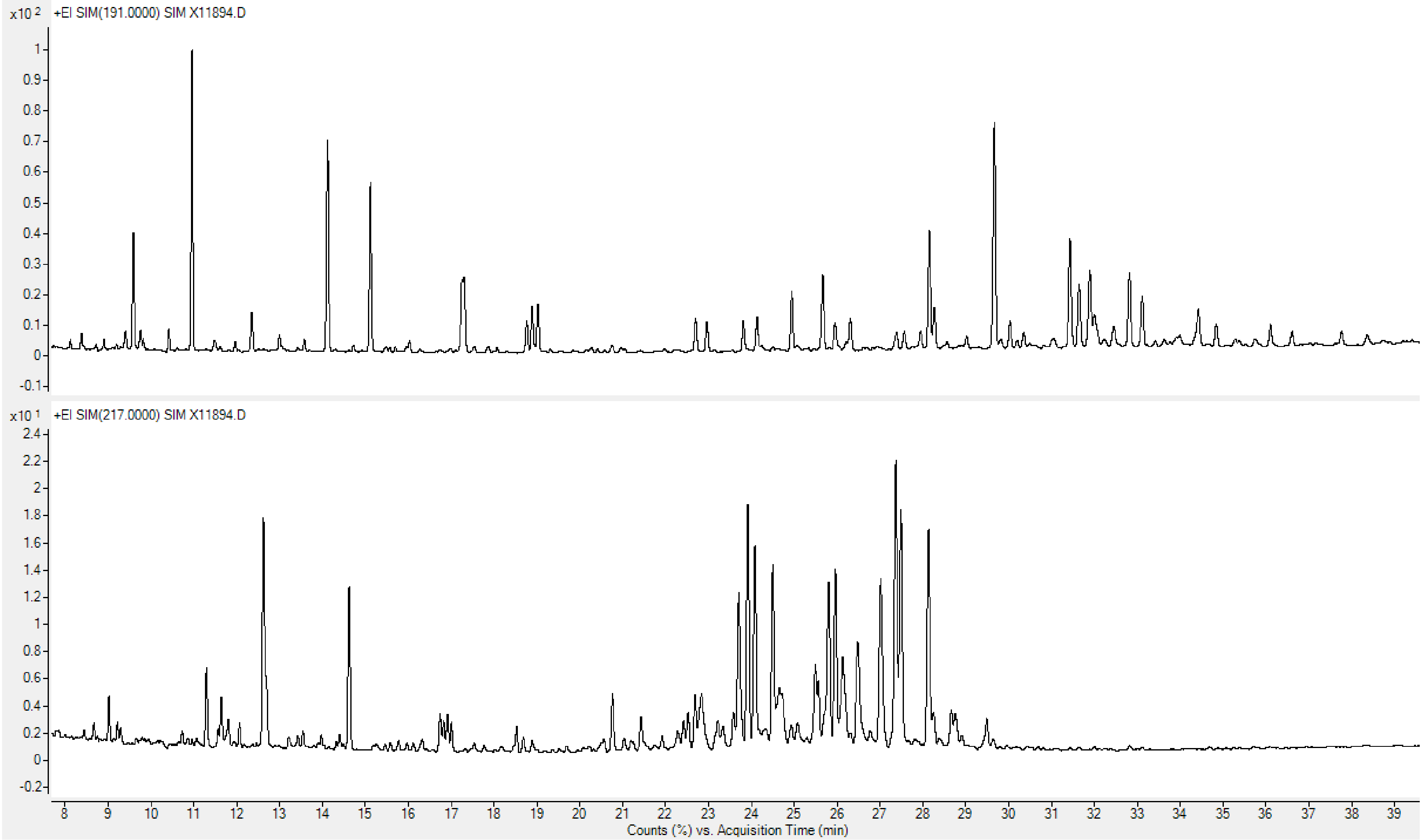
Lab. # X11890
11-3-73-7W6 (2054.9 m)
(Montney rock extract)



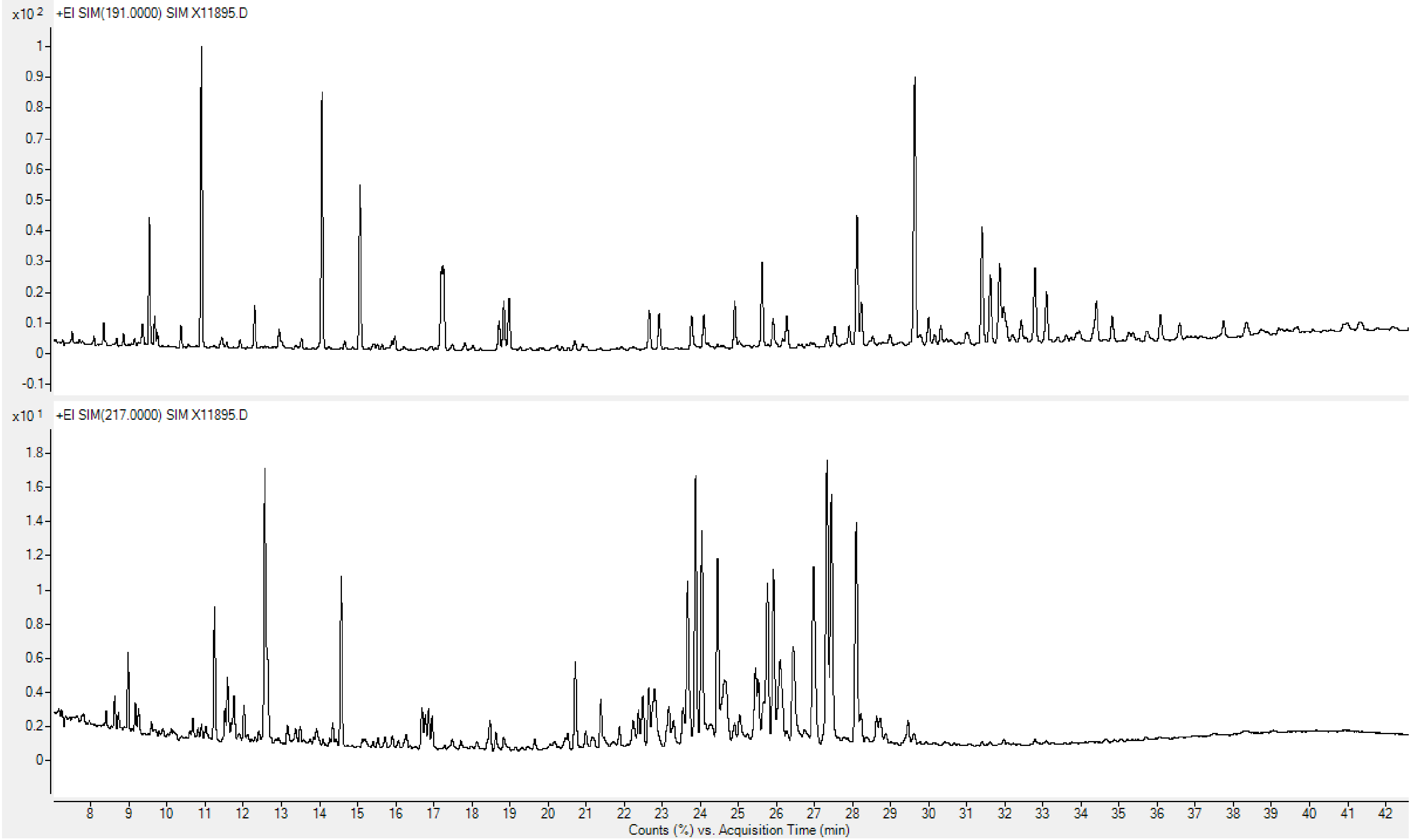
Lab. # X11893
2-5-79-11W6 (2114 m)
(Montney rock extract)



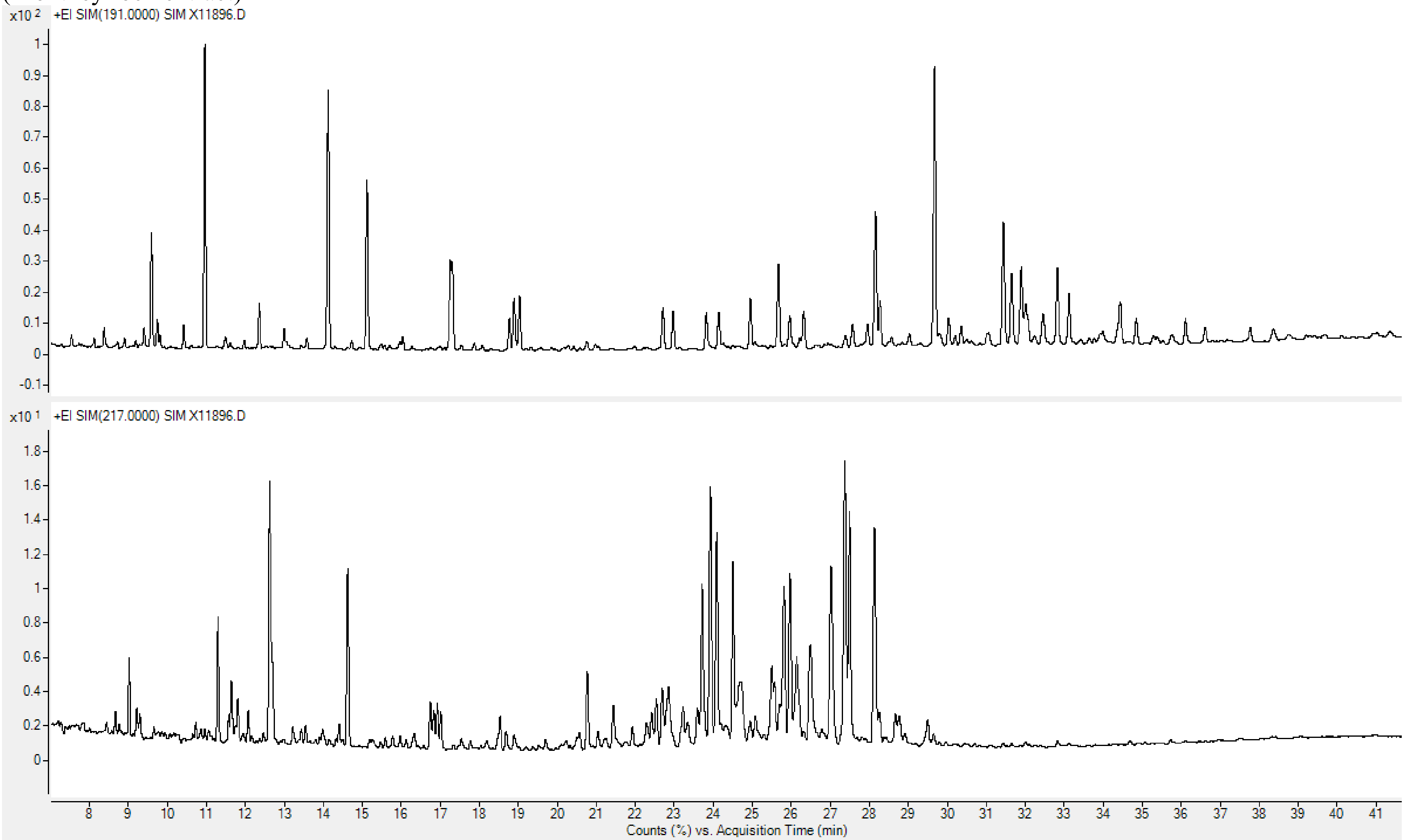
Lab. # X11894
11-28-71-3W6 (1827.6 m)
(Montney rock extract)



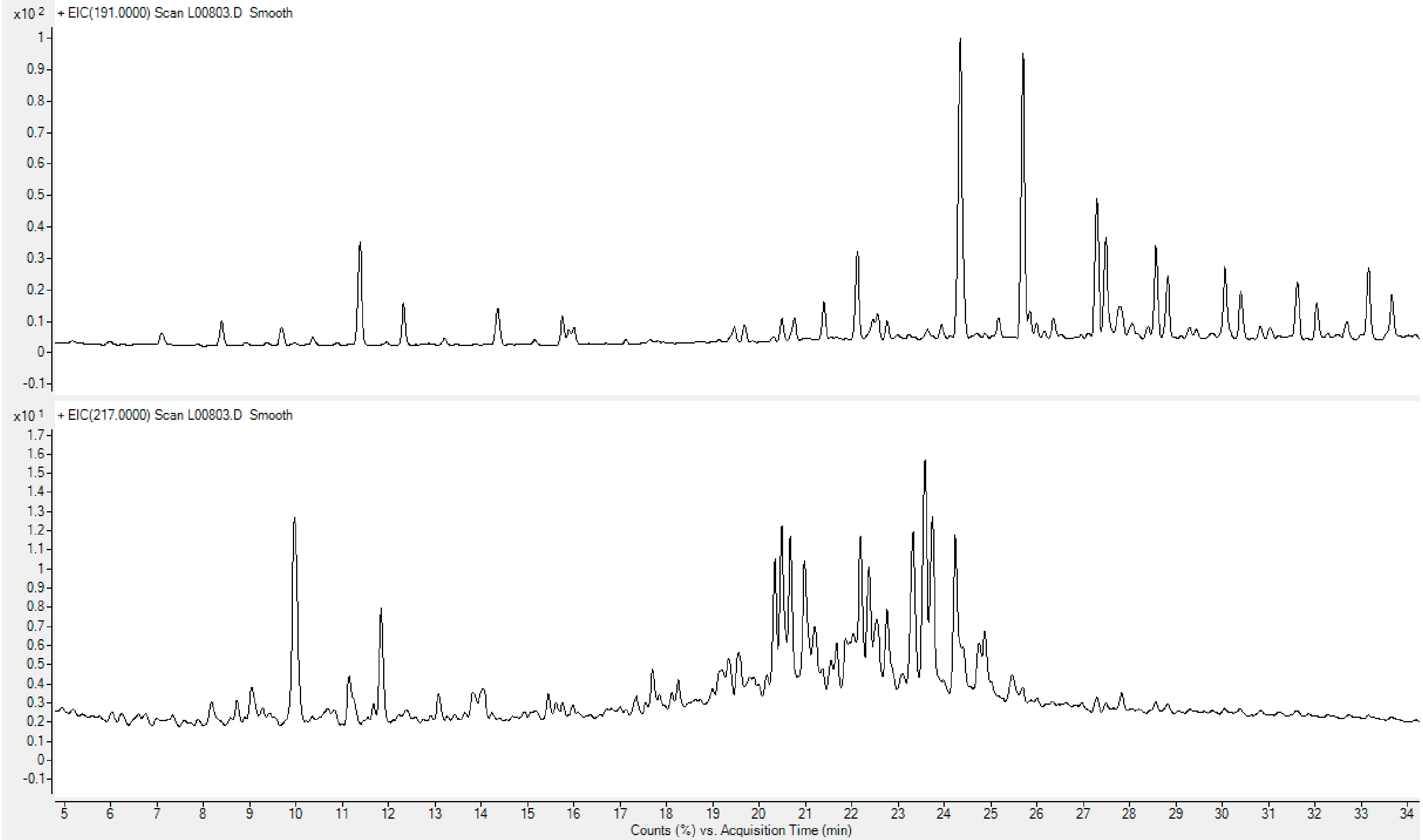
Lab. # X11895
11-28-71-3W6 (1852.6 m)
(Montney rock extract)



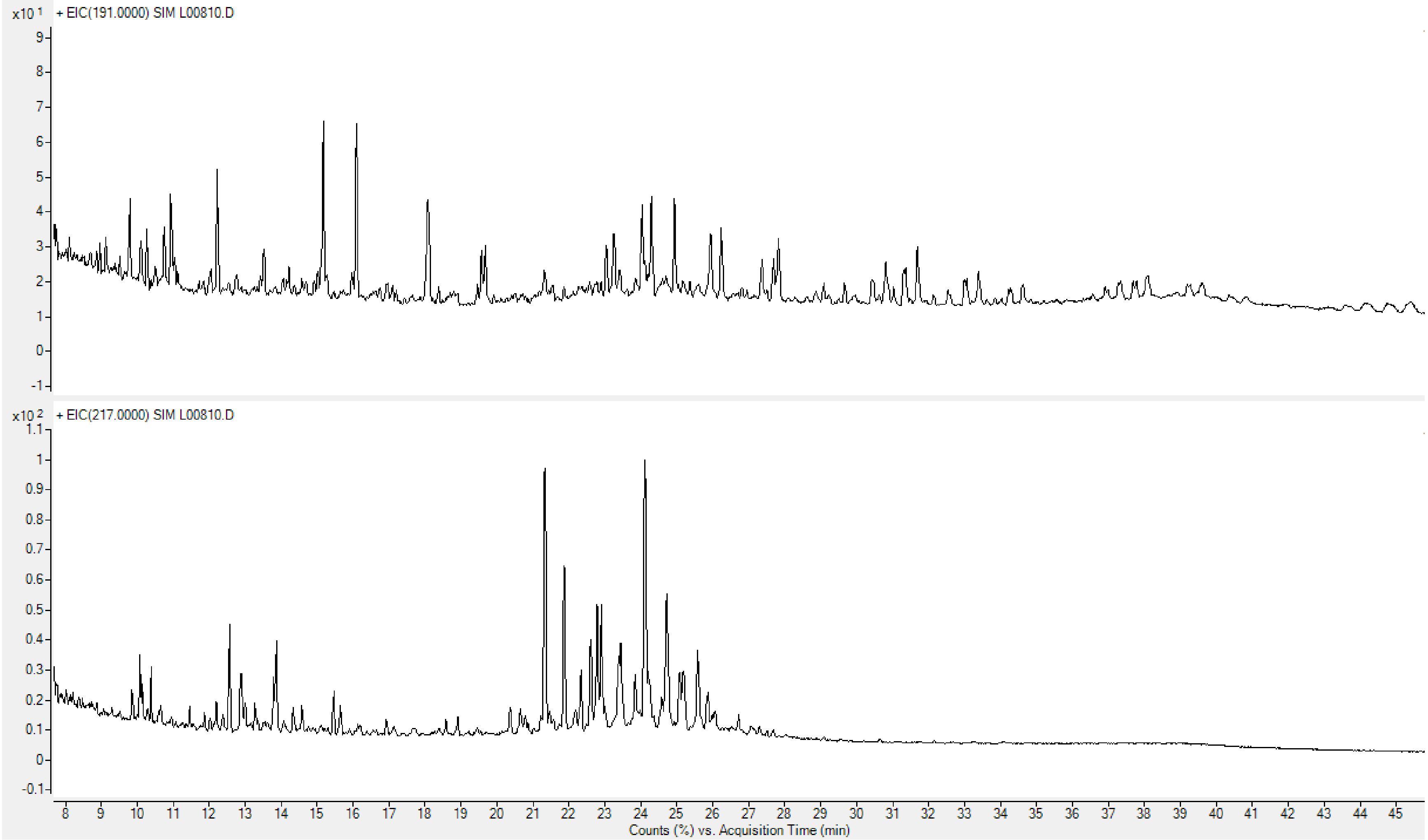
Lab. # X11896
11-28-71-3W6 (1853.95 m)
(Montney rock extract)



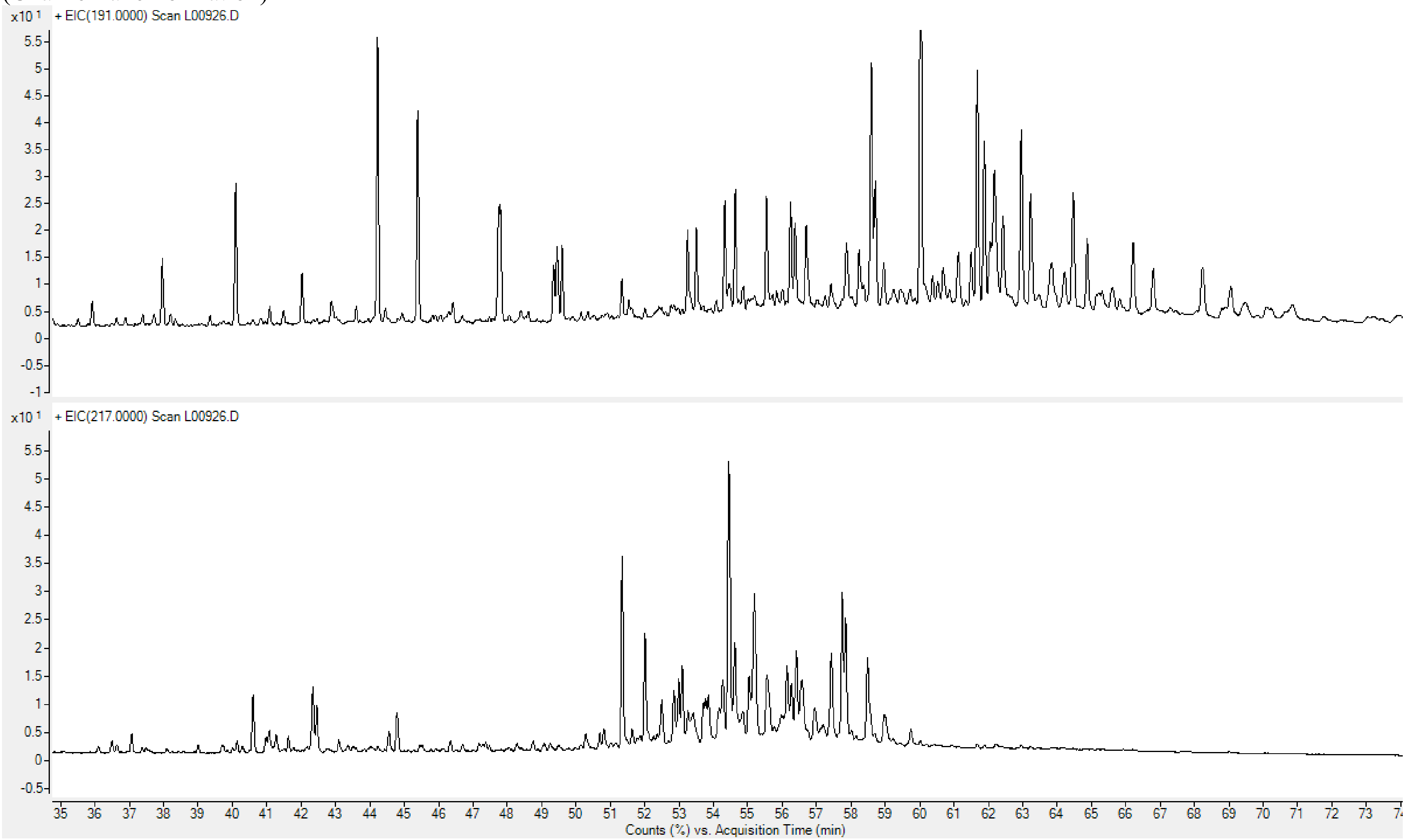
Lab. # L00803
6-15-84-8W6 (1138m-1152m)
(Charlie Lake Formation)



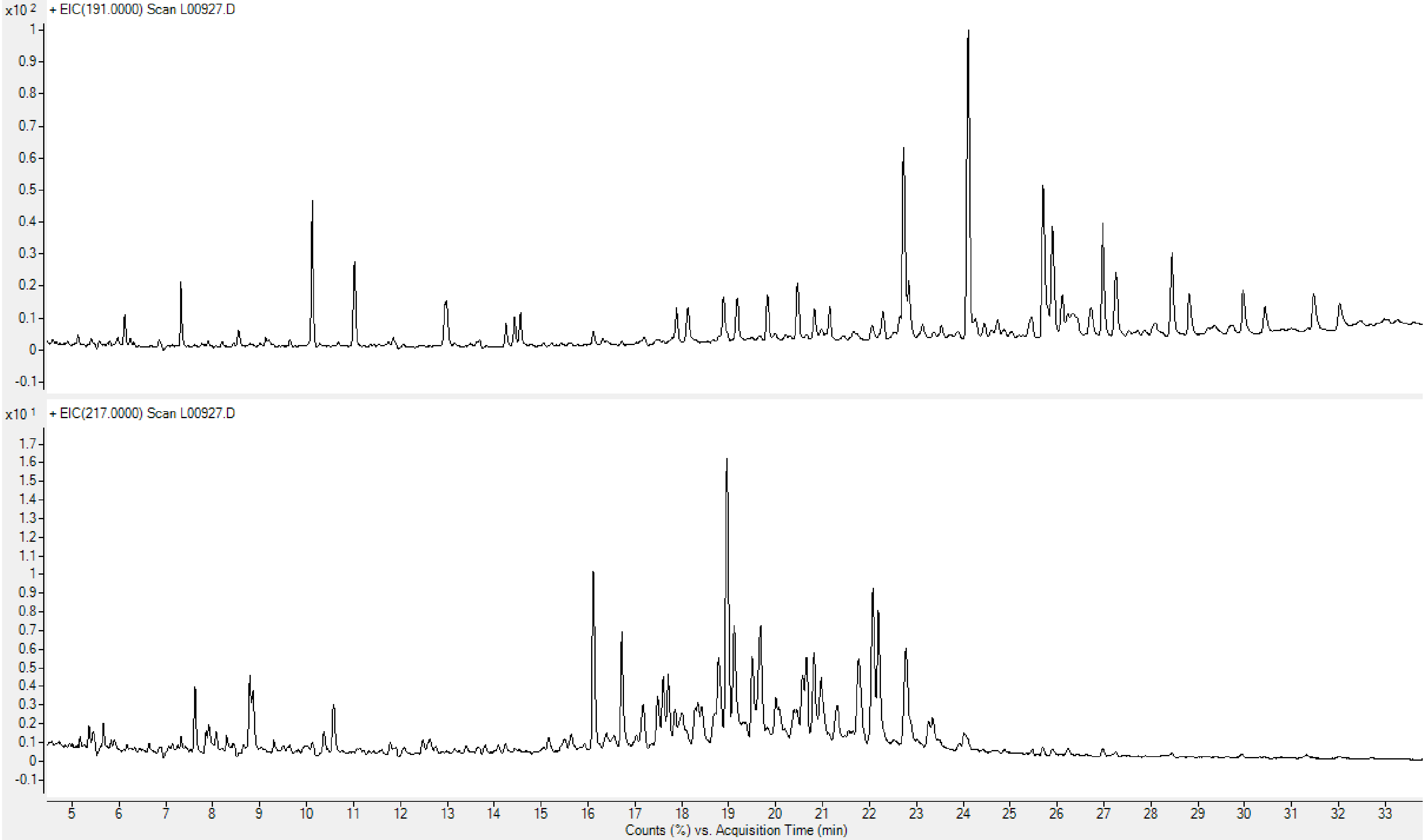
Lab. # L00810
8-5-86-20W6 (1656m-1661.5m)
(Doig Formation)



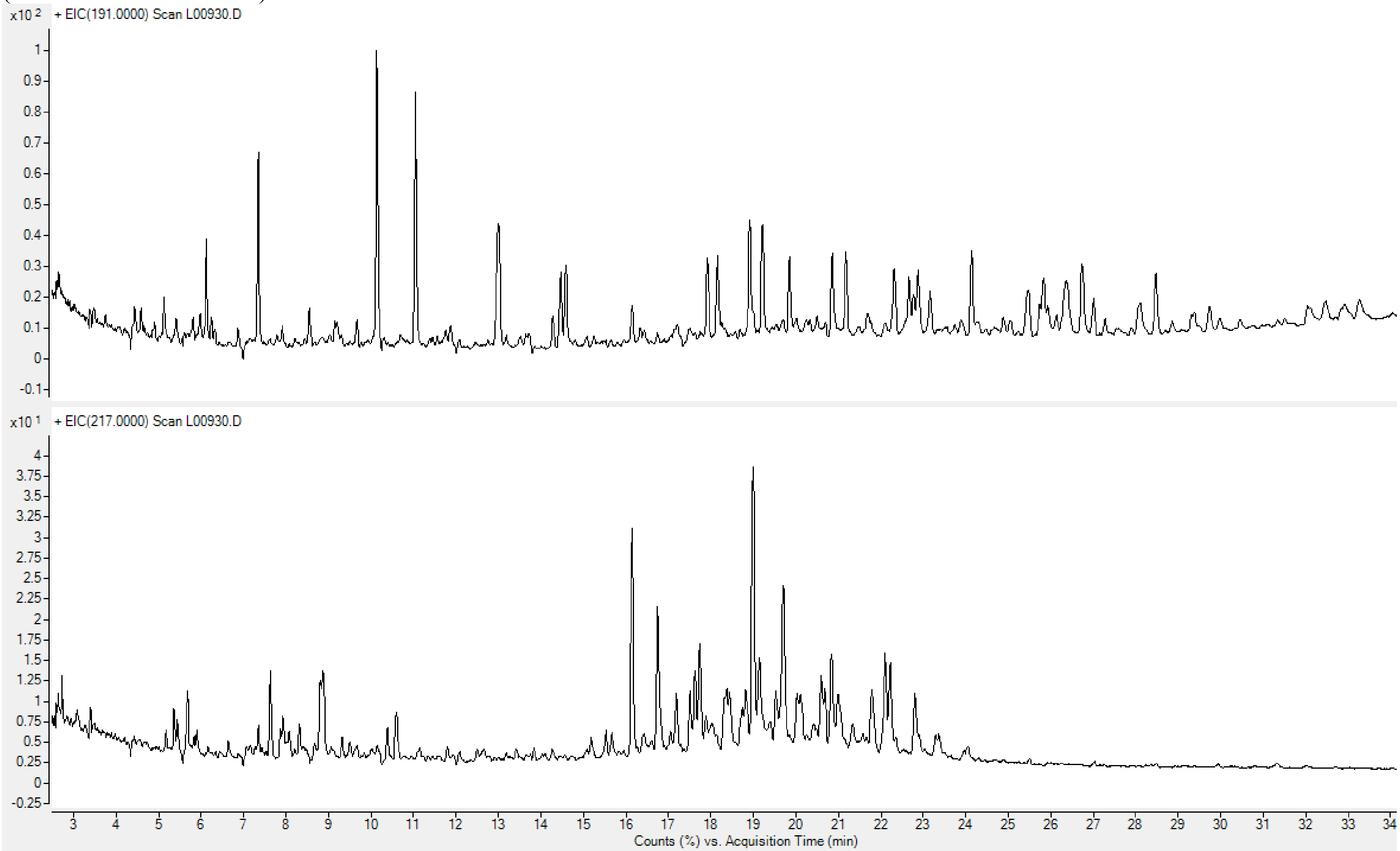
Lab. # L00926
6-8-77-5W6 (1418.5m-1423m)
(Charlie Lake Formation)



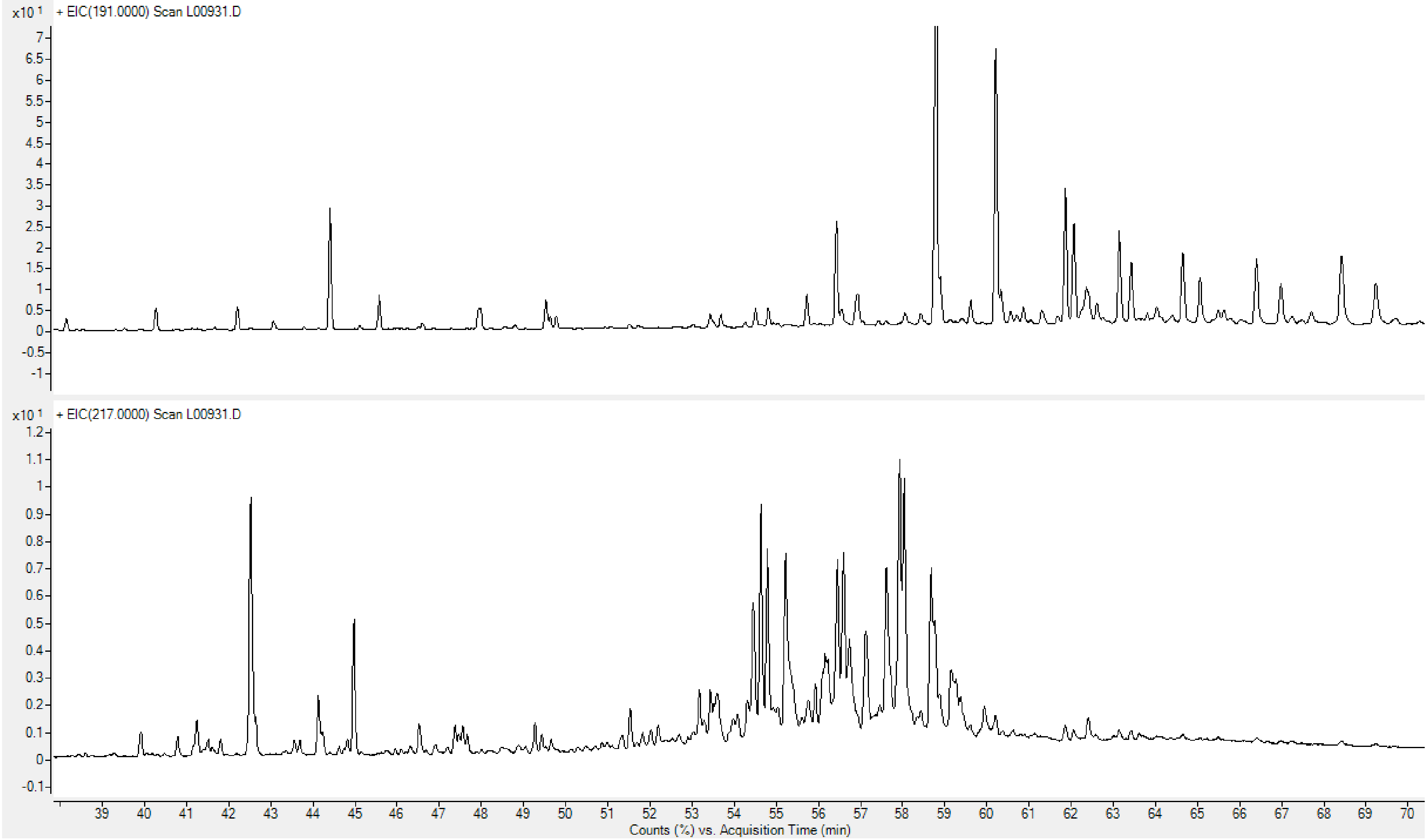
Lab. # L00927
6-6-85-17W6 (1213m-1246.6m)
(Charlie Lake Formation)



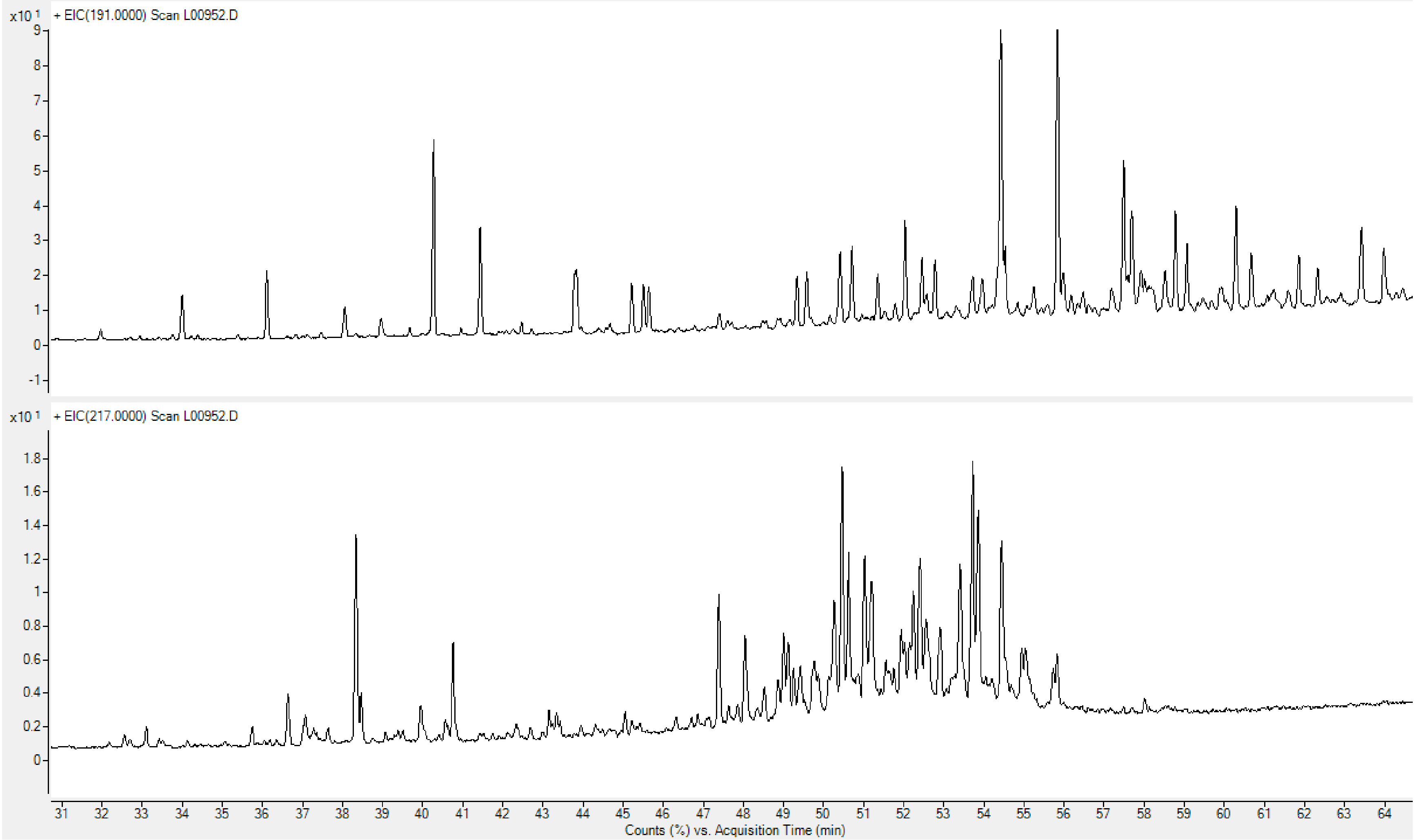
Lab. # L00930
8-19-73-8W6 (2106m-2113.5m)
(Charlie Lake Formation)



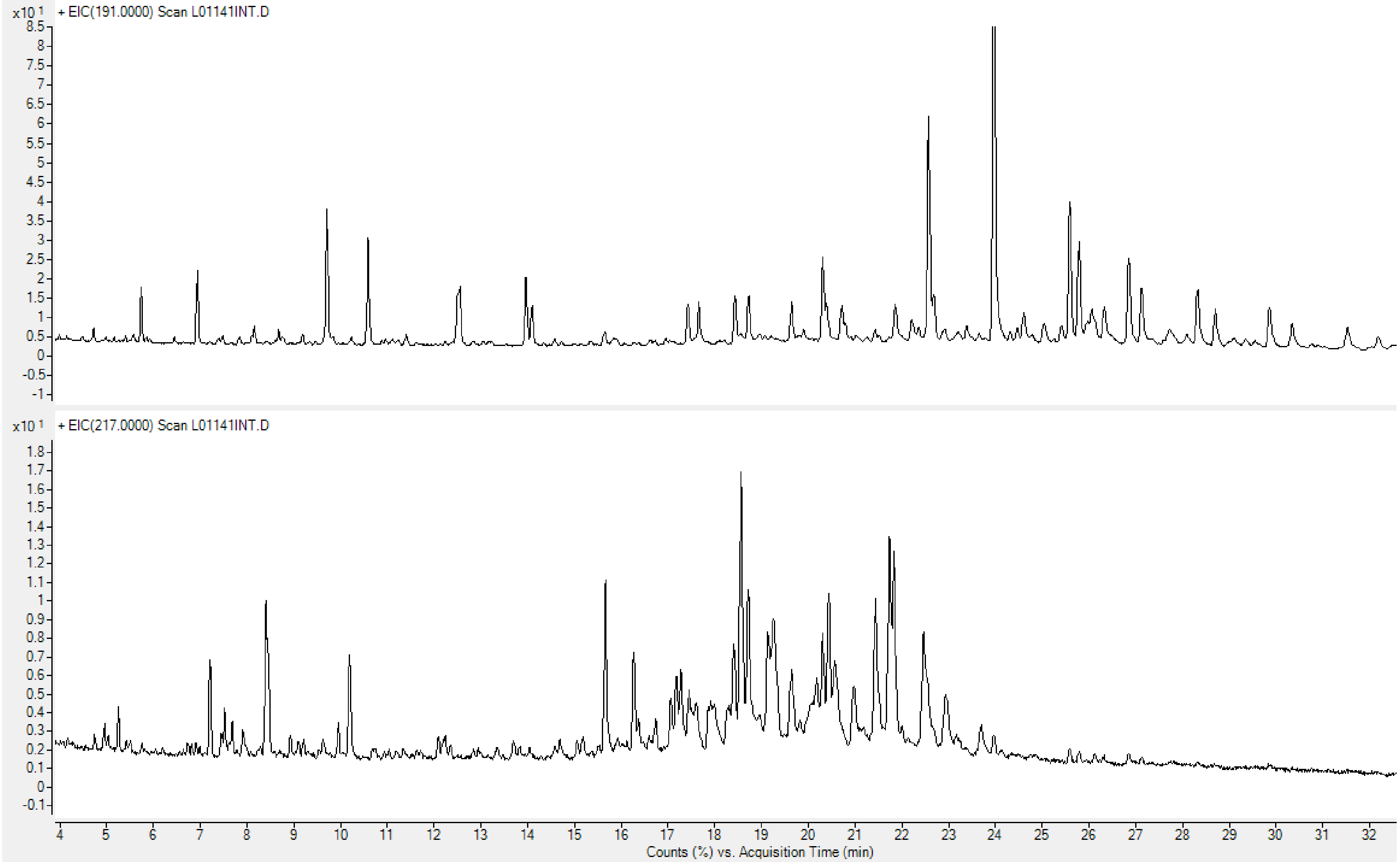
Lab. # L00931
16-8-77-5W6 (1383m-1386m)
(Charlie Lake Formation)



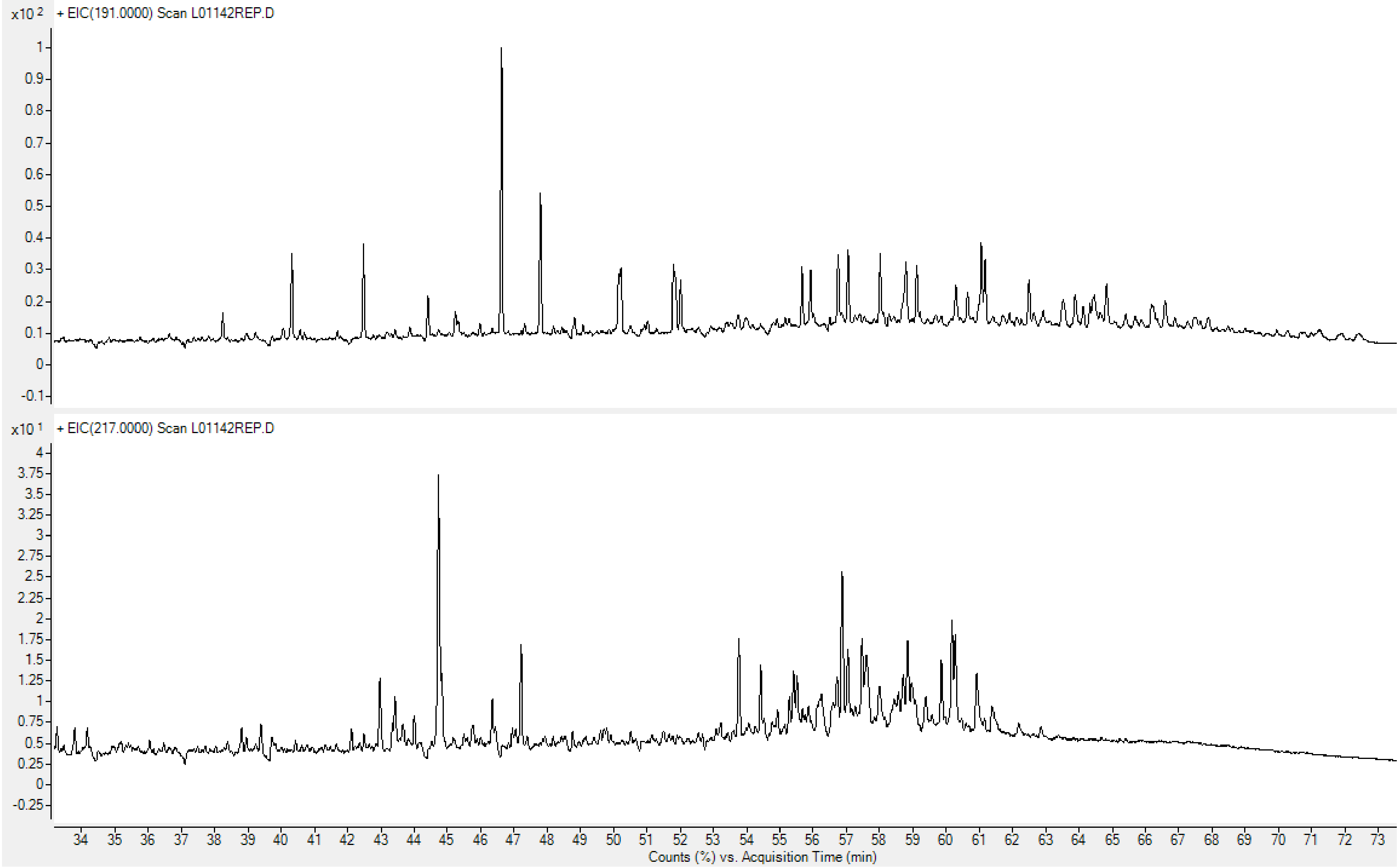
Lab. # L00952
6-14-49-6W5 (715m)
(Gordondale Member)



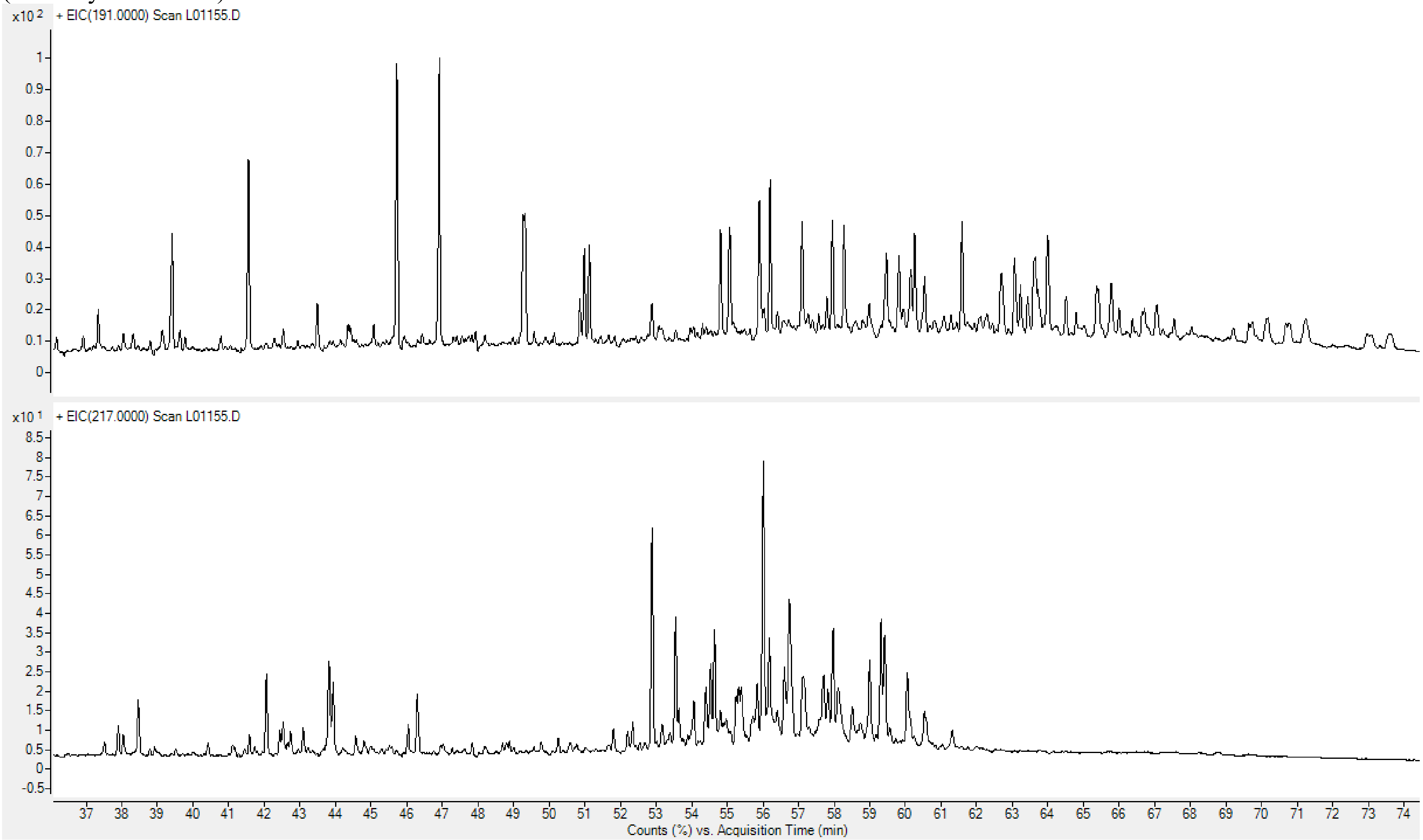
Lab. # L01141
7-6-86-13W6 (1307m-1311.3m)
(Charlie Lake Formation)



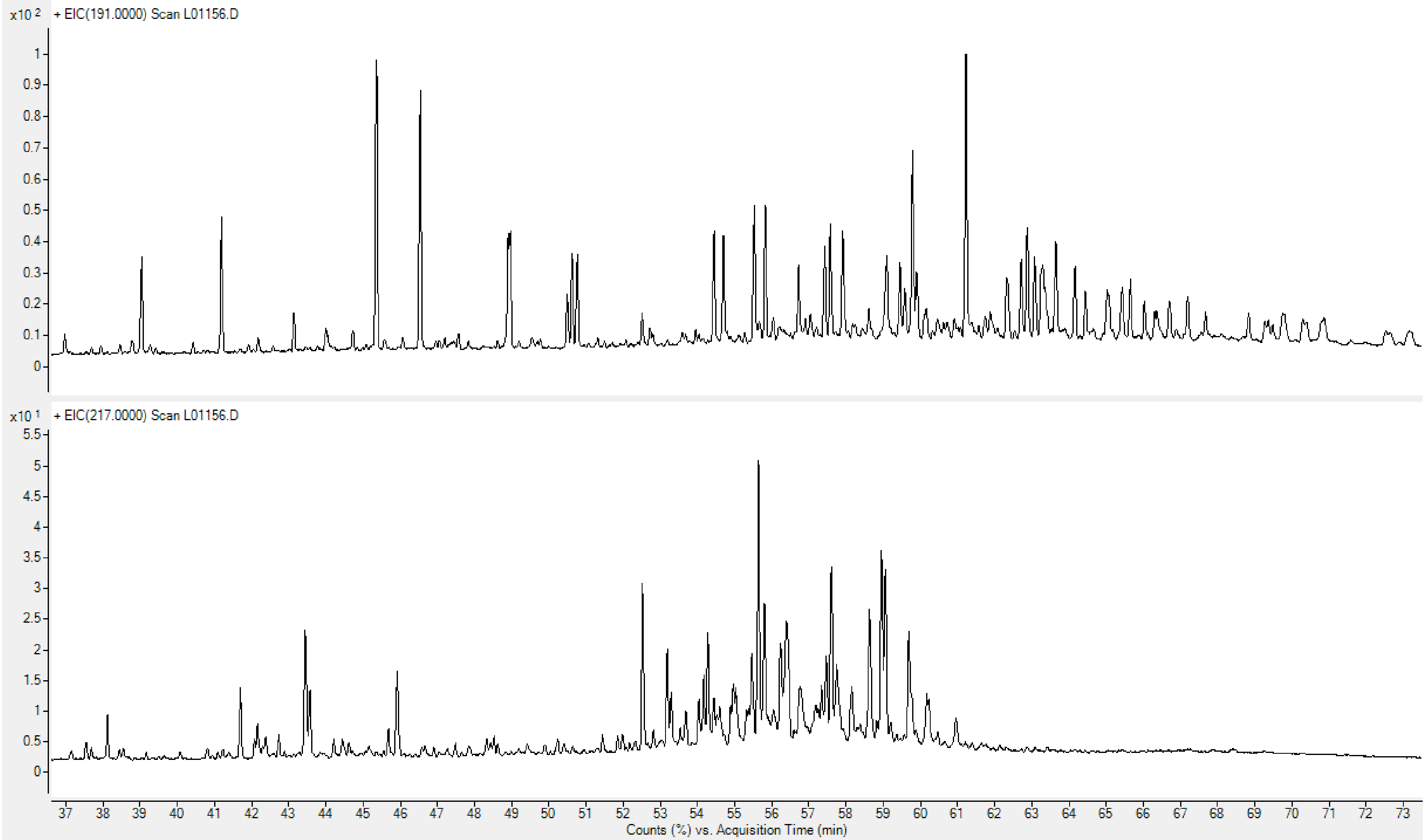
Lab. # L01142
10-20-62-20W5 (2100.7m-2106.8m)
(Montney Formation)



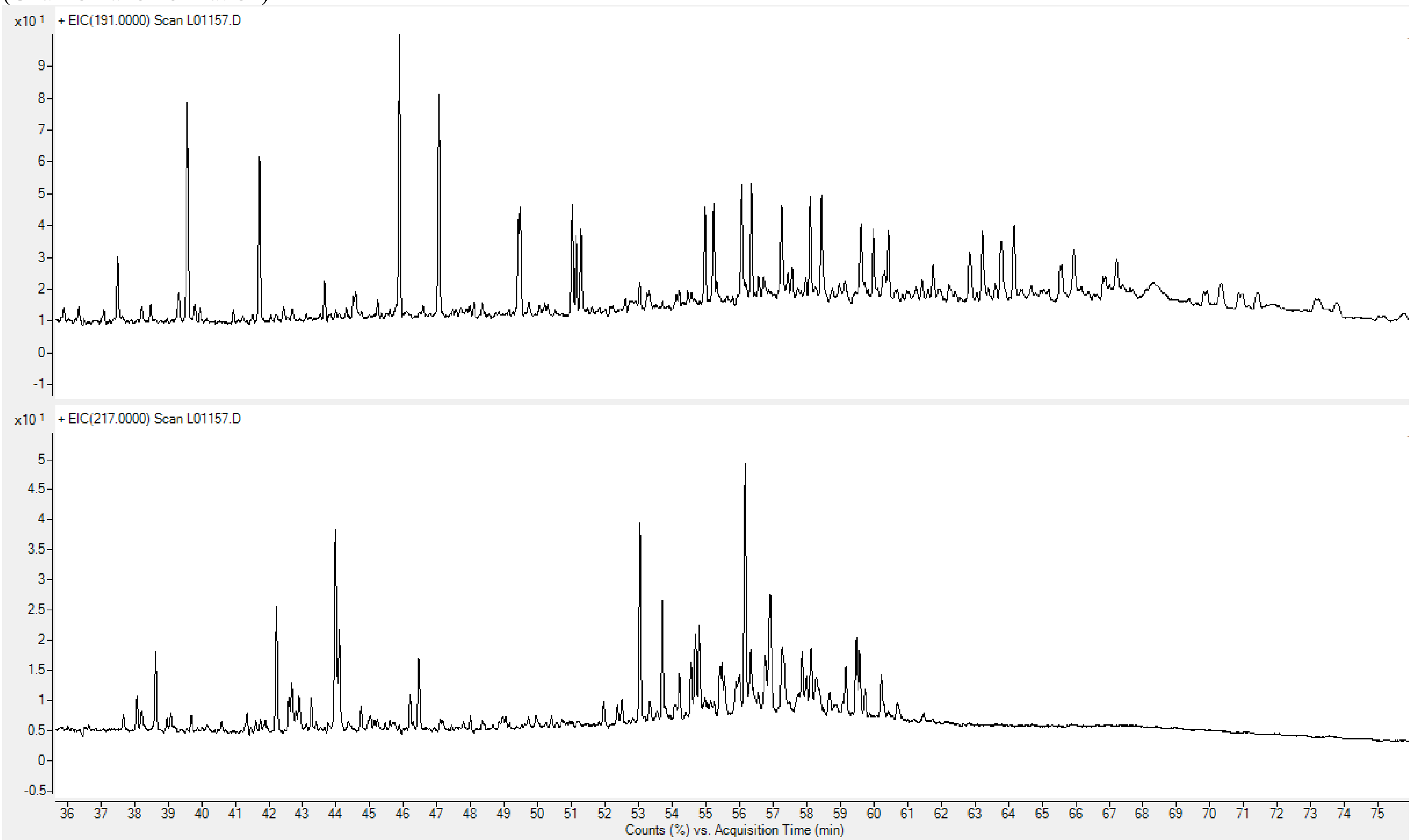
Lab. # L01155
16-31-72-8W6 (2141.5m-2155m)
(Halfway Formation)



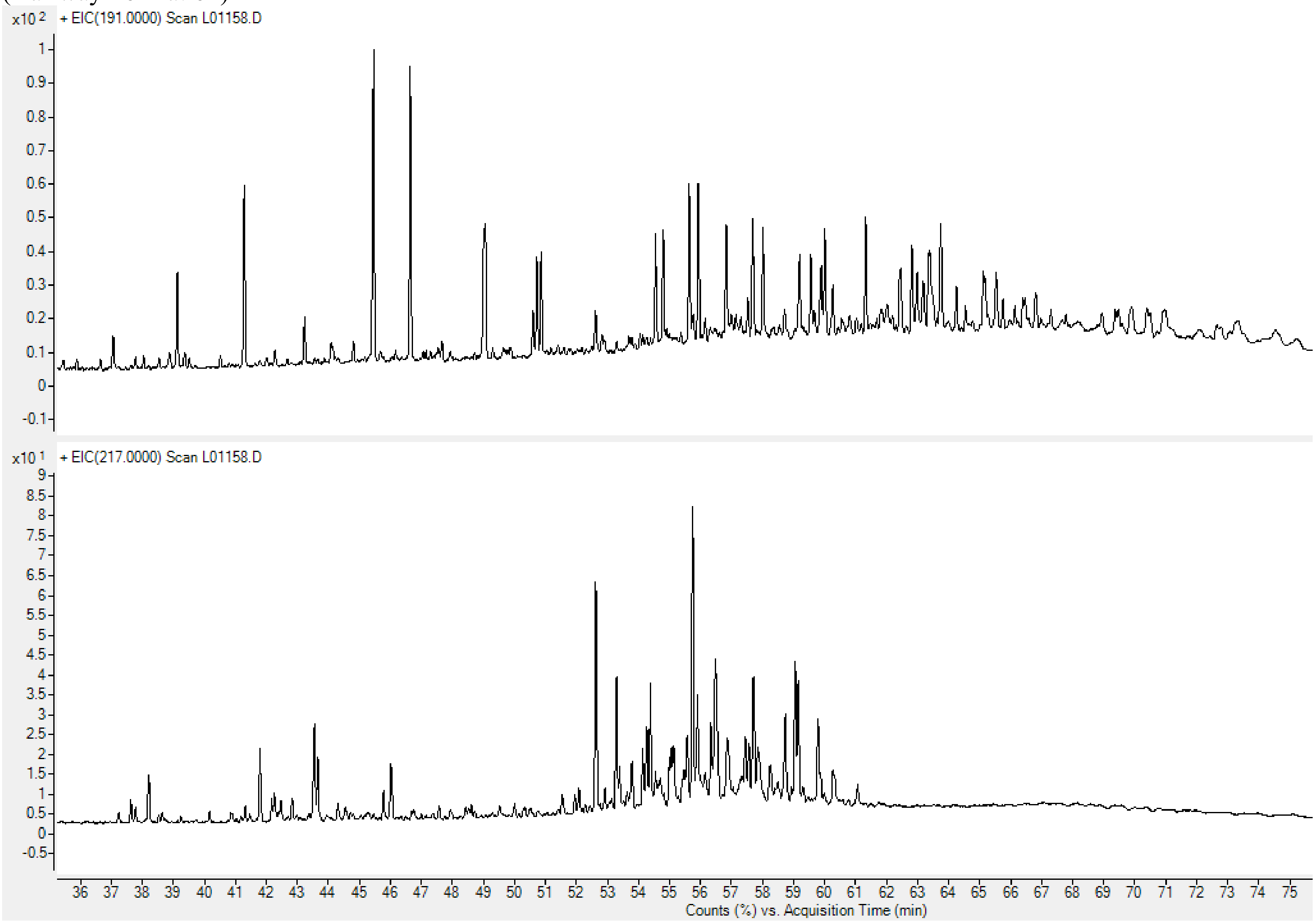
Lab. # L01156
16-31-72-8W6 (2141.5m-2155m)
(Halfway Formation)



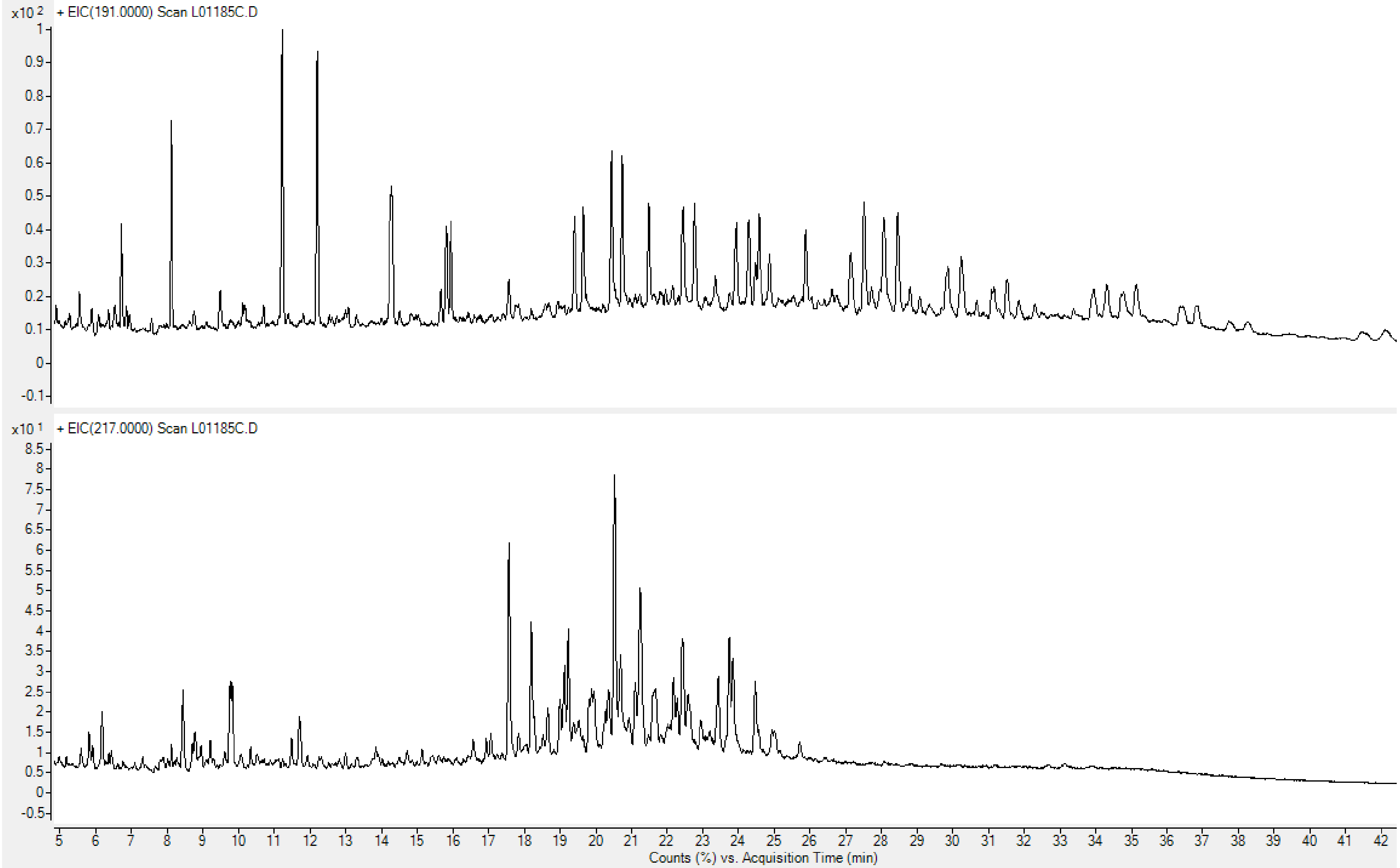
Lab. # L01157
16-20-72-8W6 (2128m-2159m)
(Charlie Lake Formation)



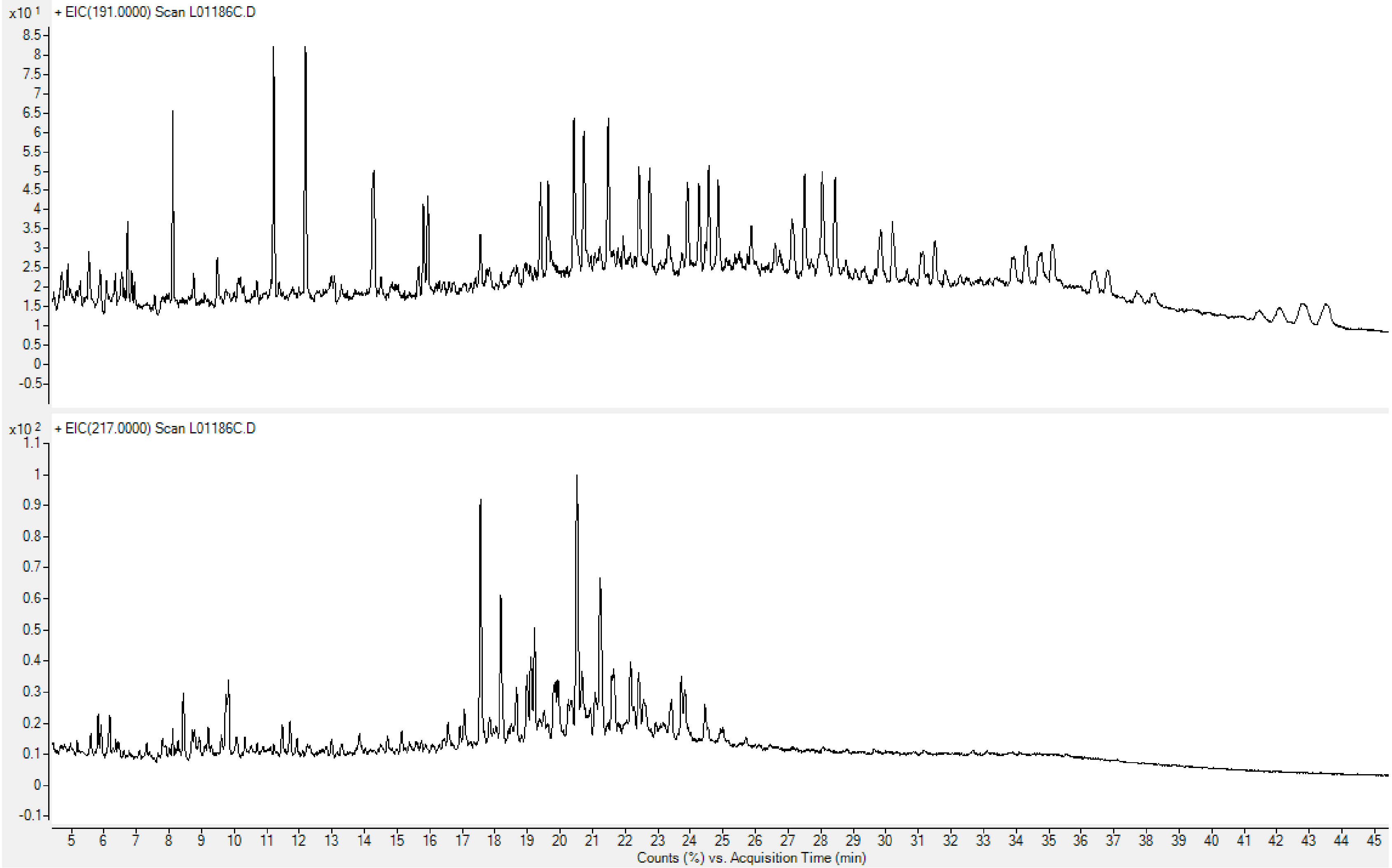
Lab. # L01158
14-32-72-8W6 (2133m-2144.8m)
(Halfway Formation)



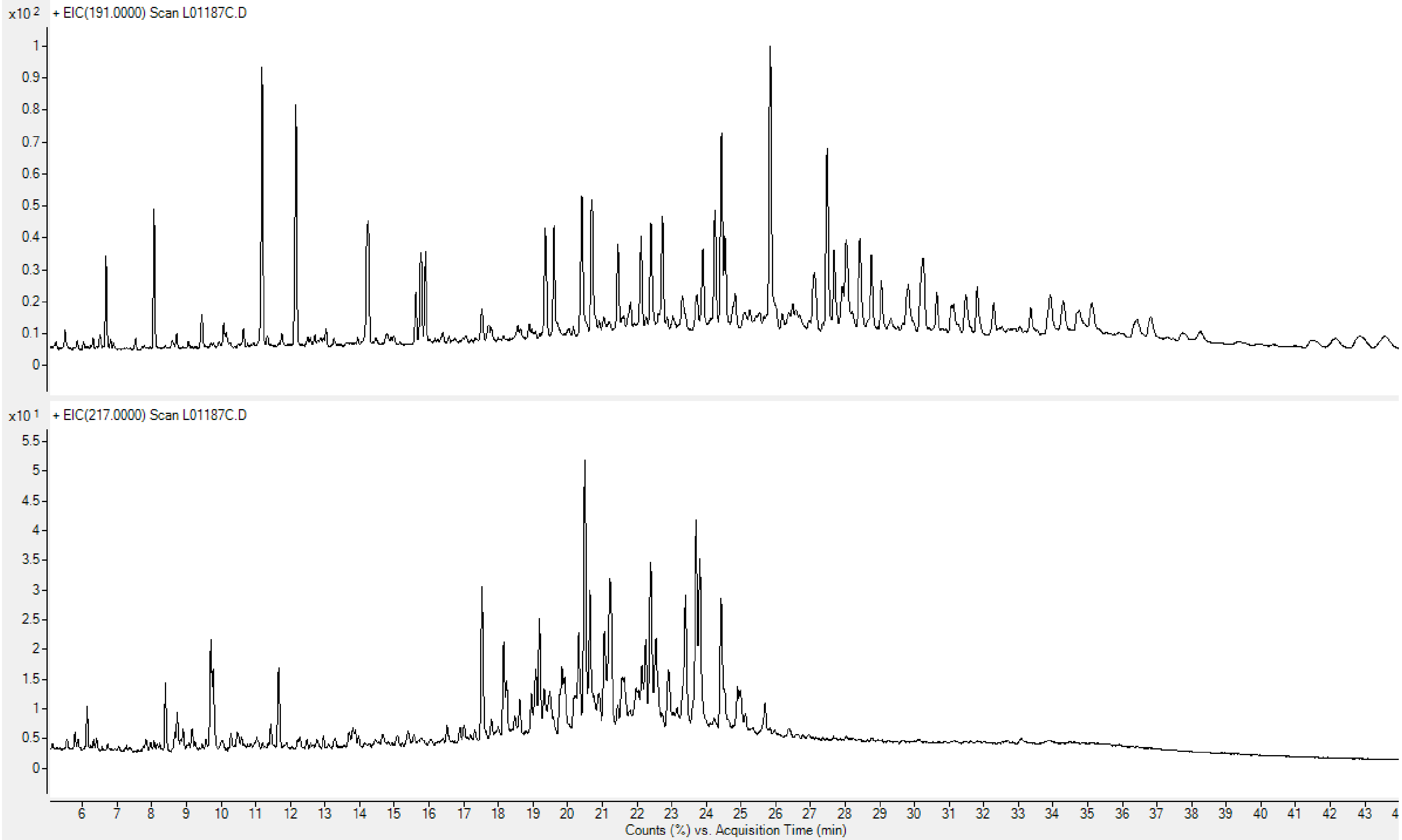
Lab. # L01185
6-15-84-8W6 (2152m-2170.7m)
(Halfway Formation)



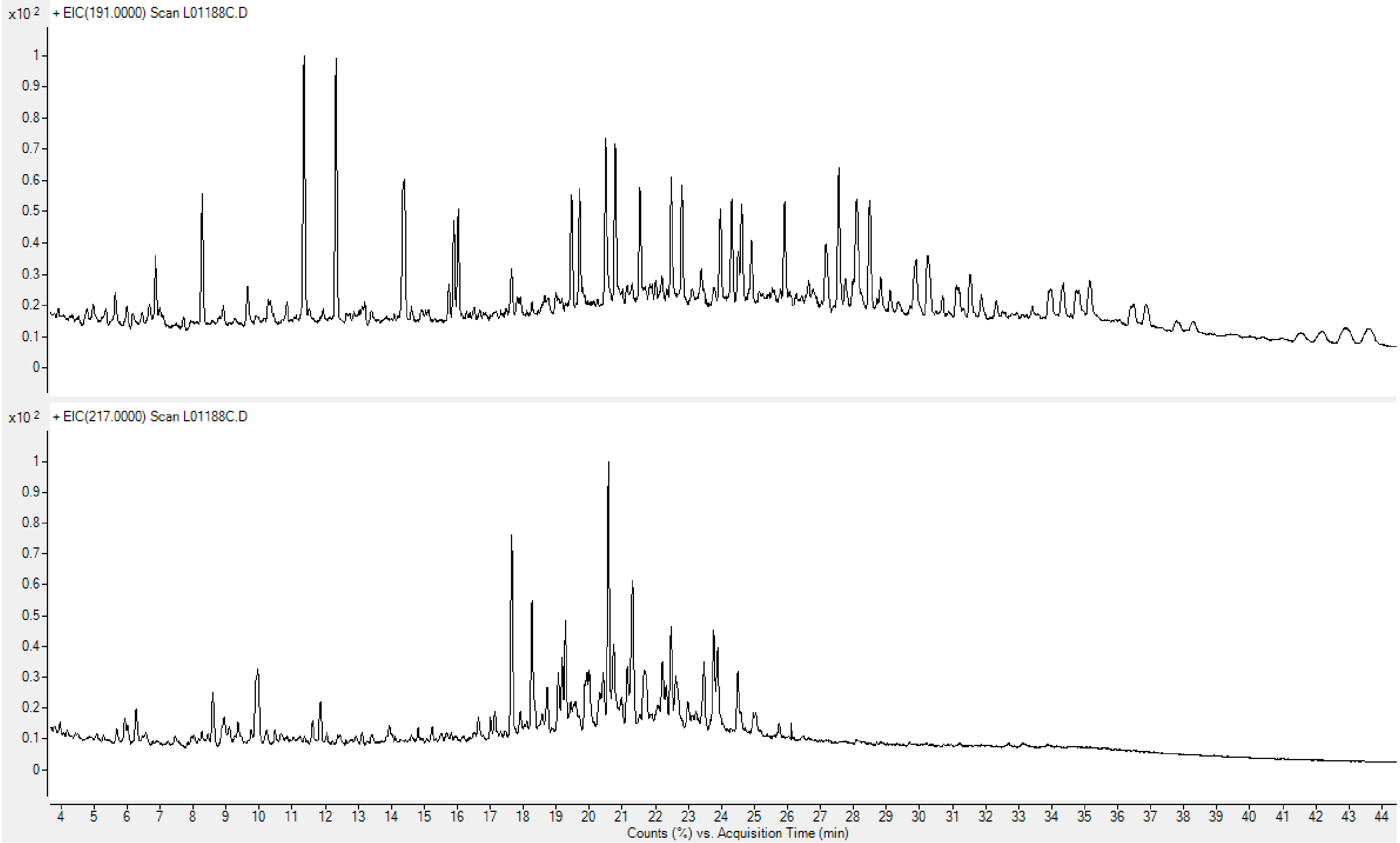
Lab. # L01186
16-28-72-8W6 (2128.5m-2165m)
(Doig Formation)



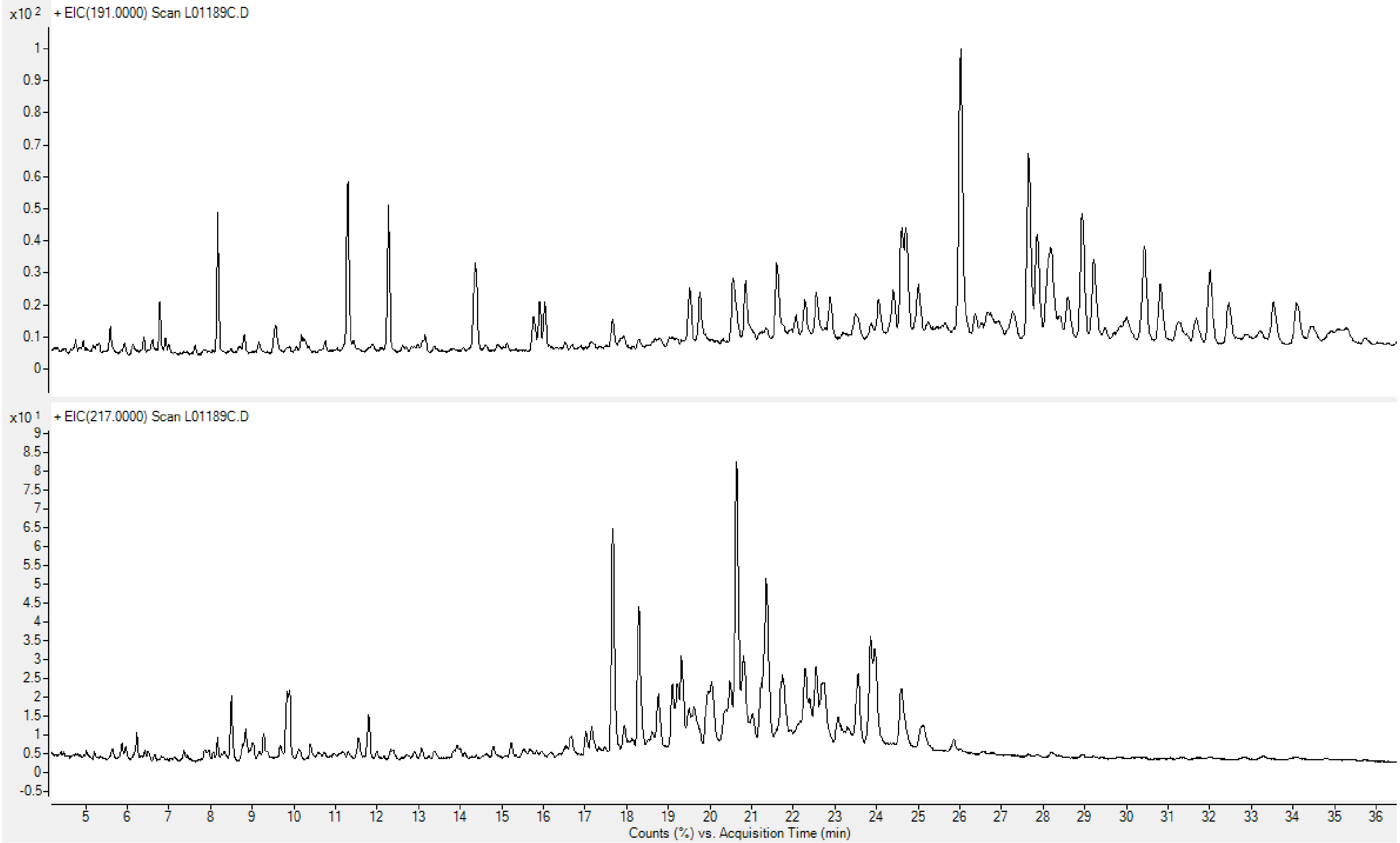
Lab. # L01187
8-6-73-8W6 (2053.5m-2148.2m)
(Charlie Lake Formation)



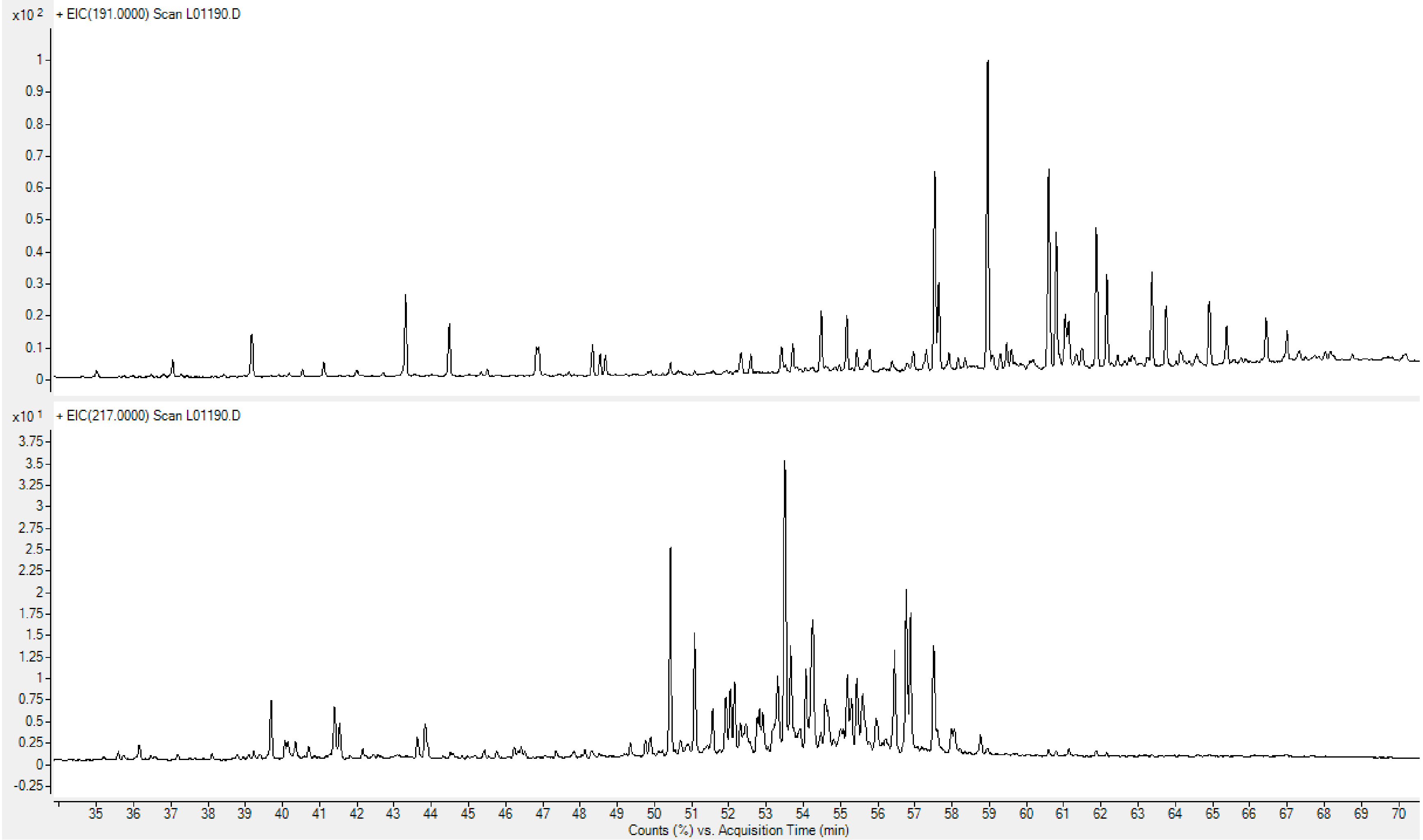
Lab. # L01188
16-8-73-8W6 (2121m-2130.6m)
(Halfway Formation)



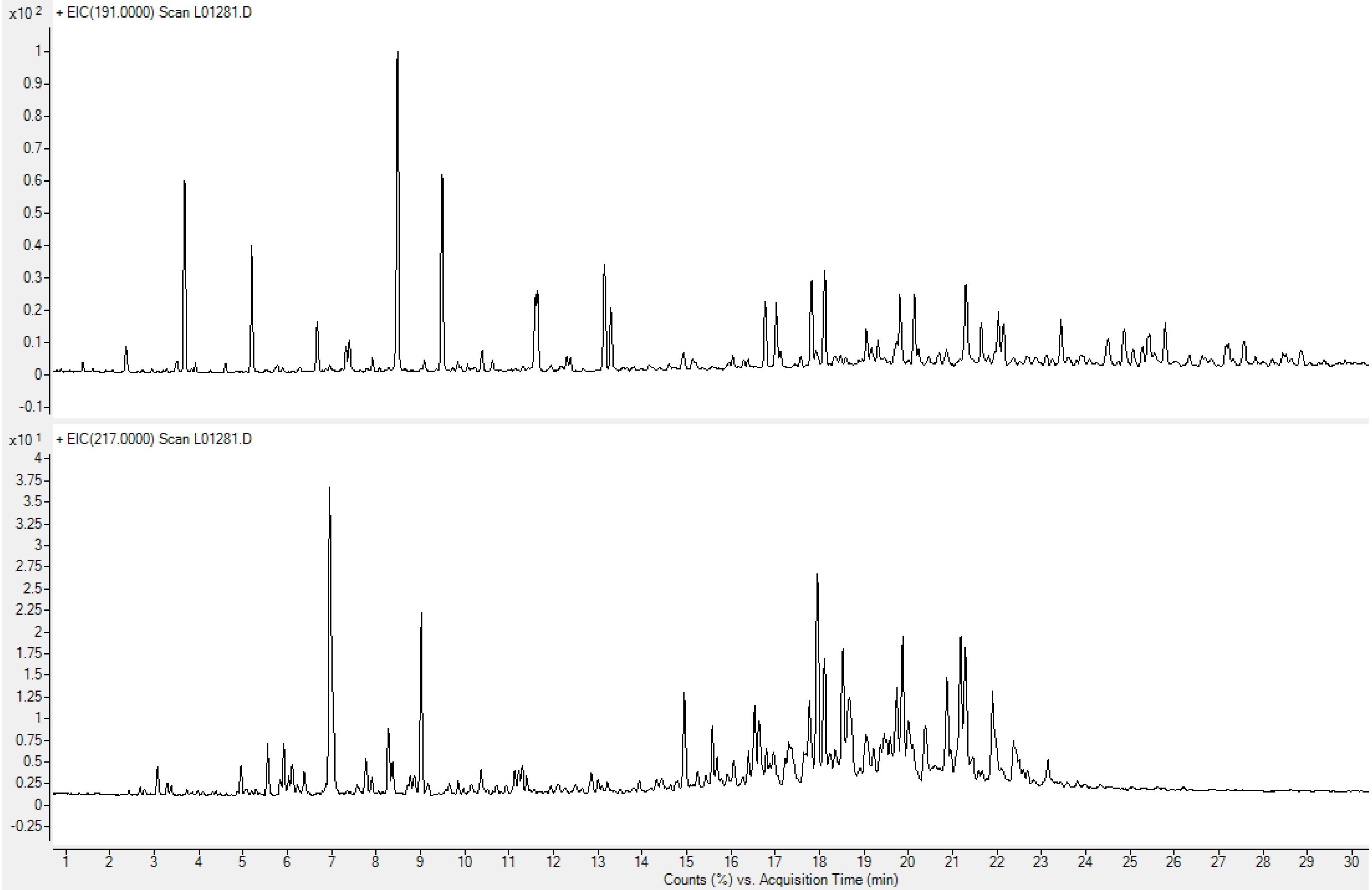
Lab. # L01189
7-22-78-9W6 (1695.5m-1700m)
(Halfway Formation)



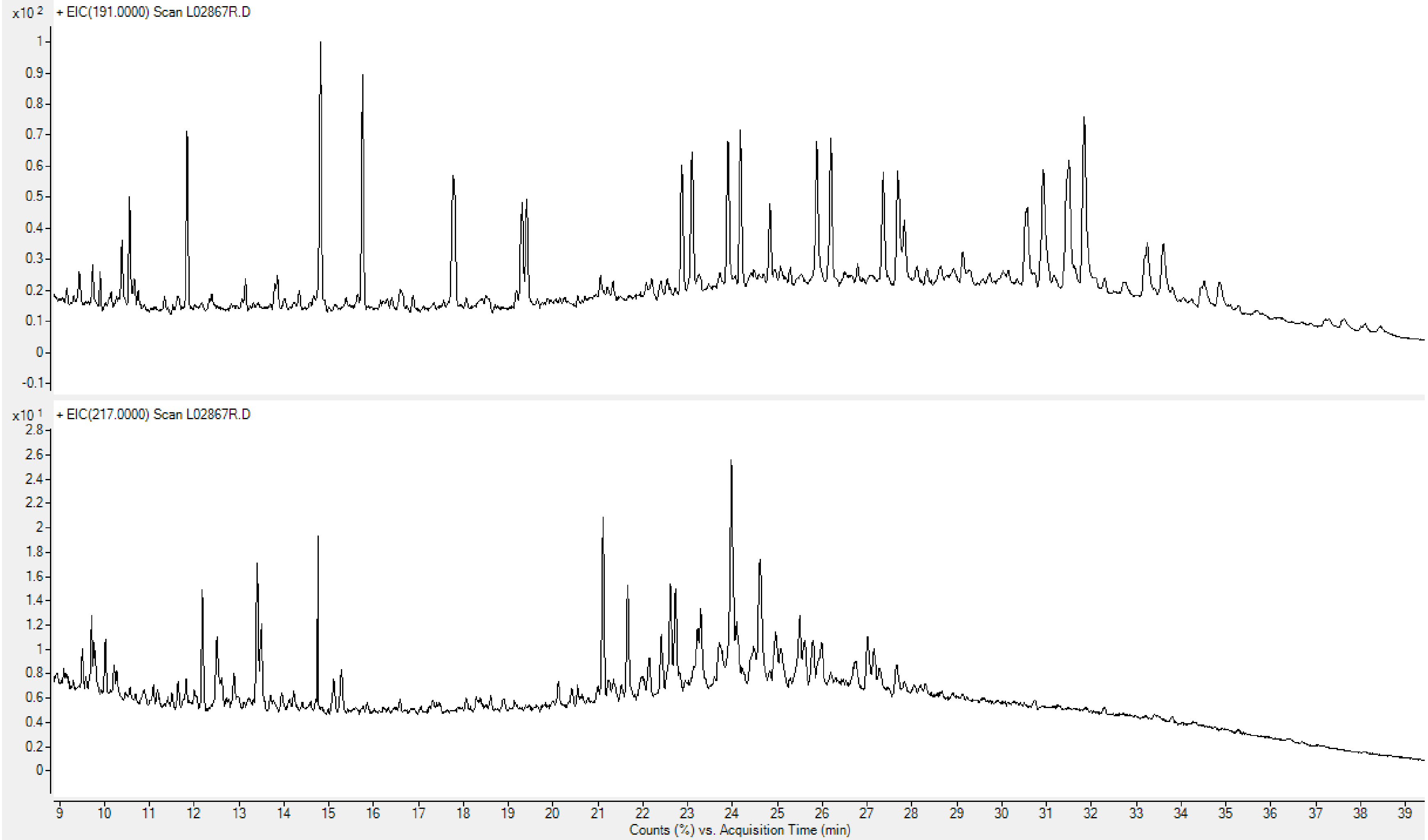
Lab. # L01190
7-25-81-11W6 (1466.5m-1481.5m)
(Doig Formation)



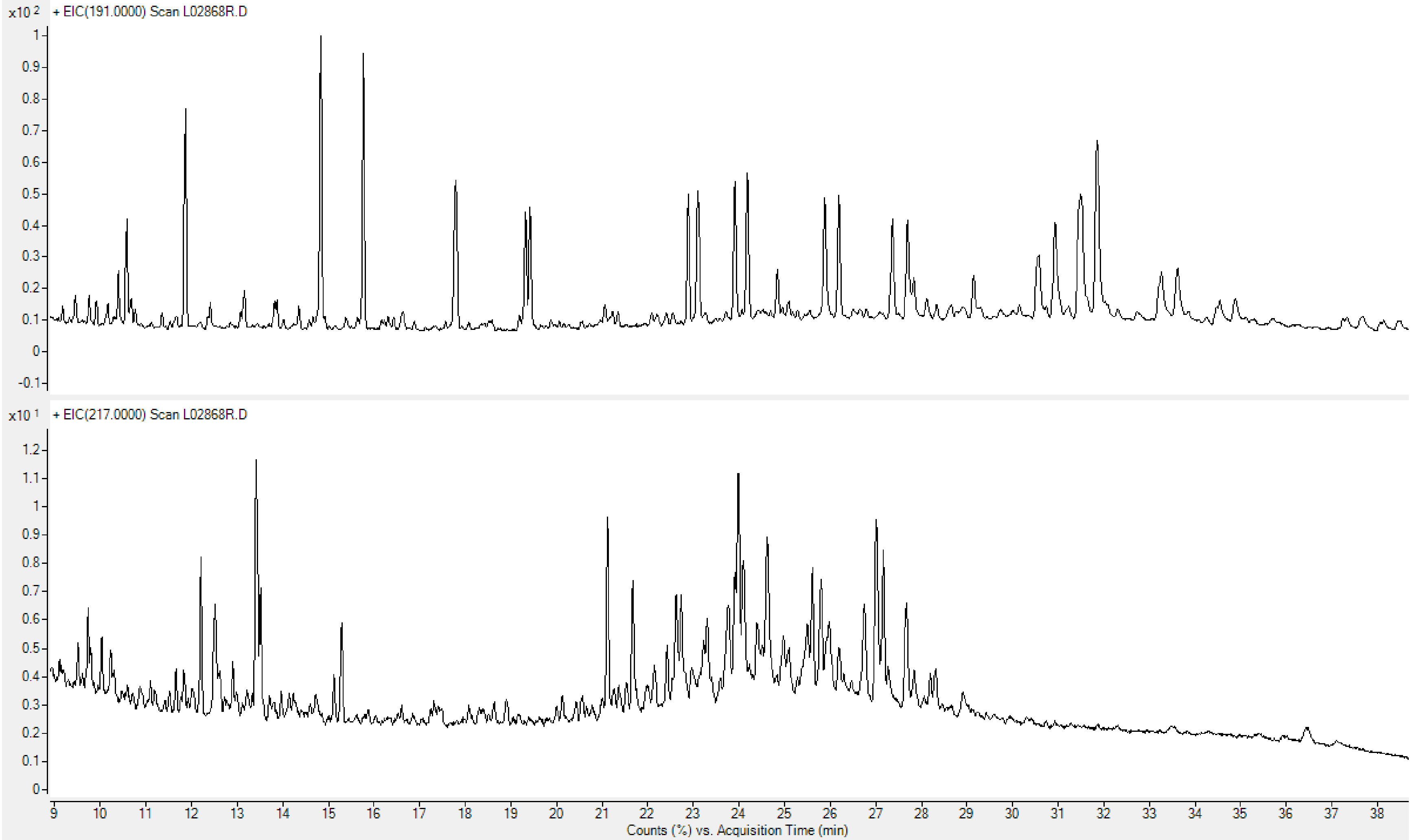
Lab. # L01281
4-6-85-17W6 (1263m-1265.5m)
(Charlie Lake Formation)



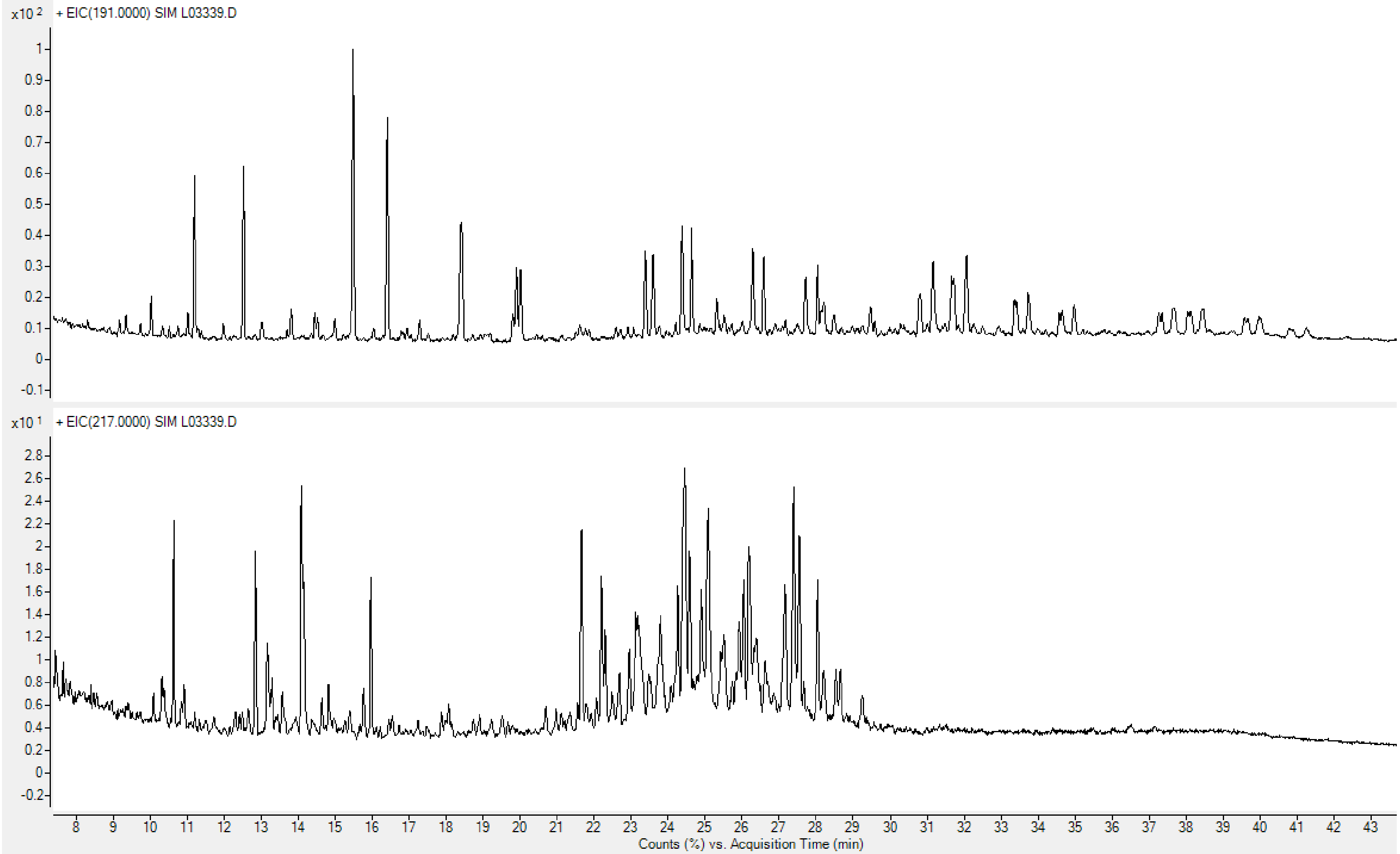
Lab. # L02867
4-27-75-9W6 (2244.5m-2251.5m)
(Montney Formation)



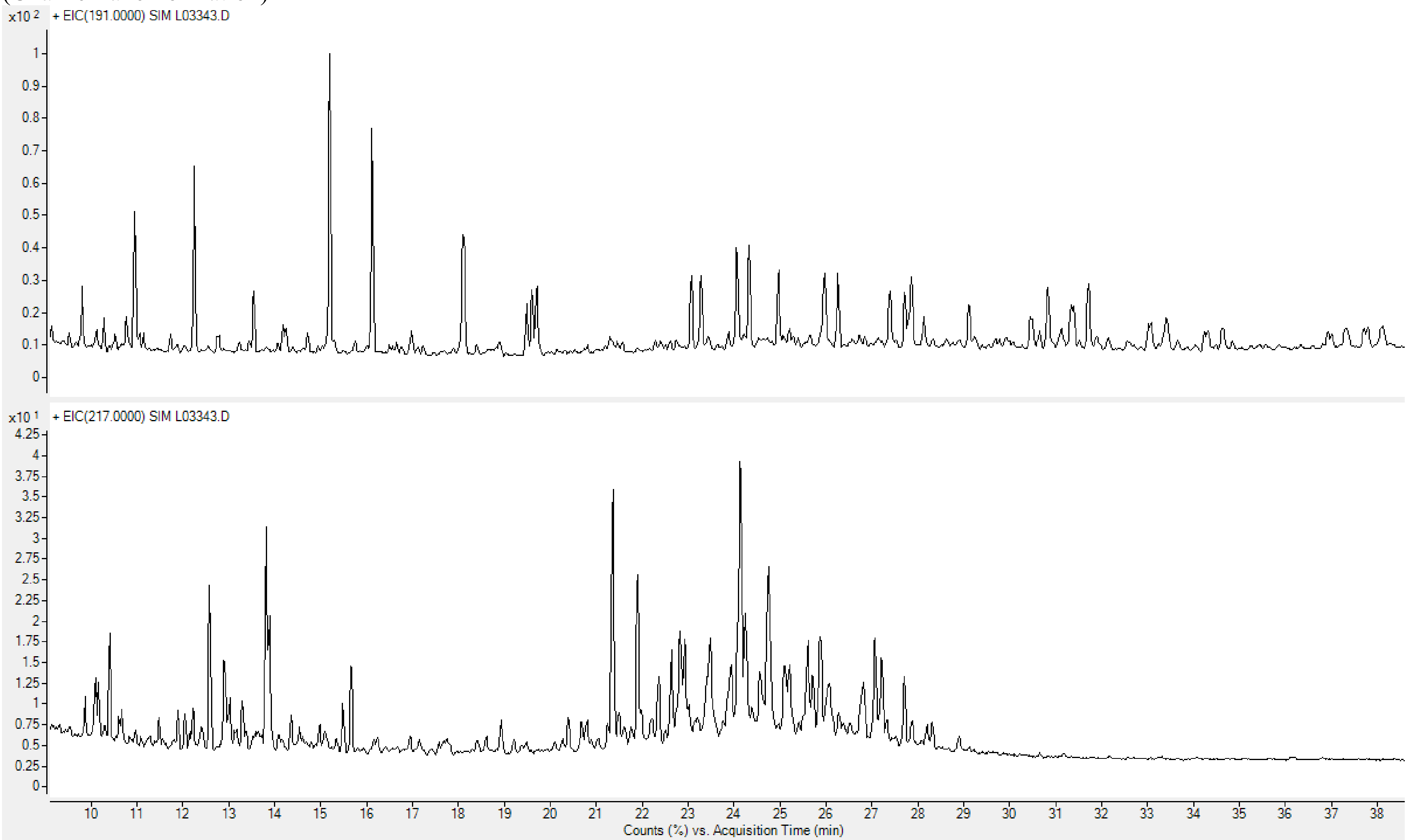
Lab. # L02868
14-34-75-9W6 (2160m-2165m)
(Montney Formation)



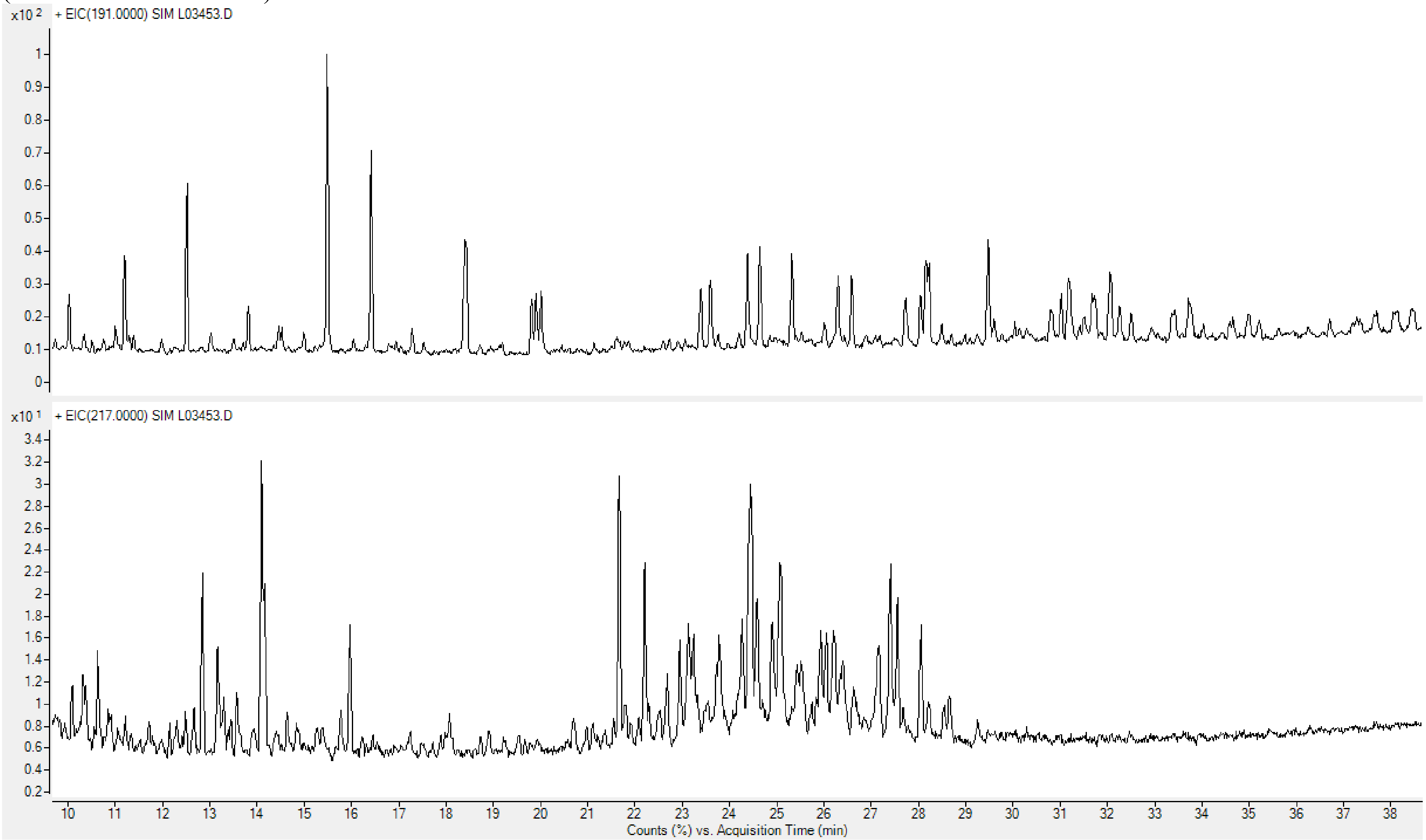
Lab. # L03339
10-30-68-6W6 (2376m-2389m)
(Charlie Lake Formation)



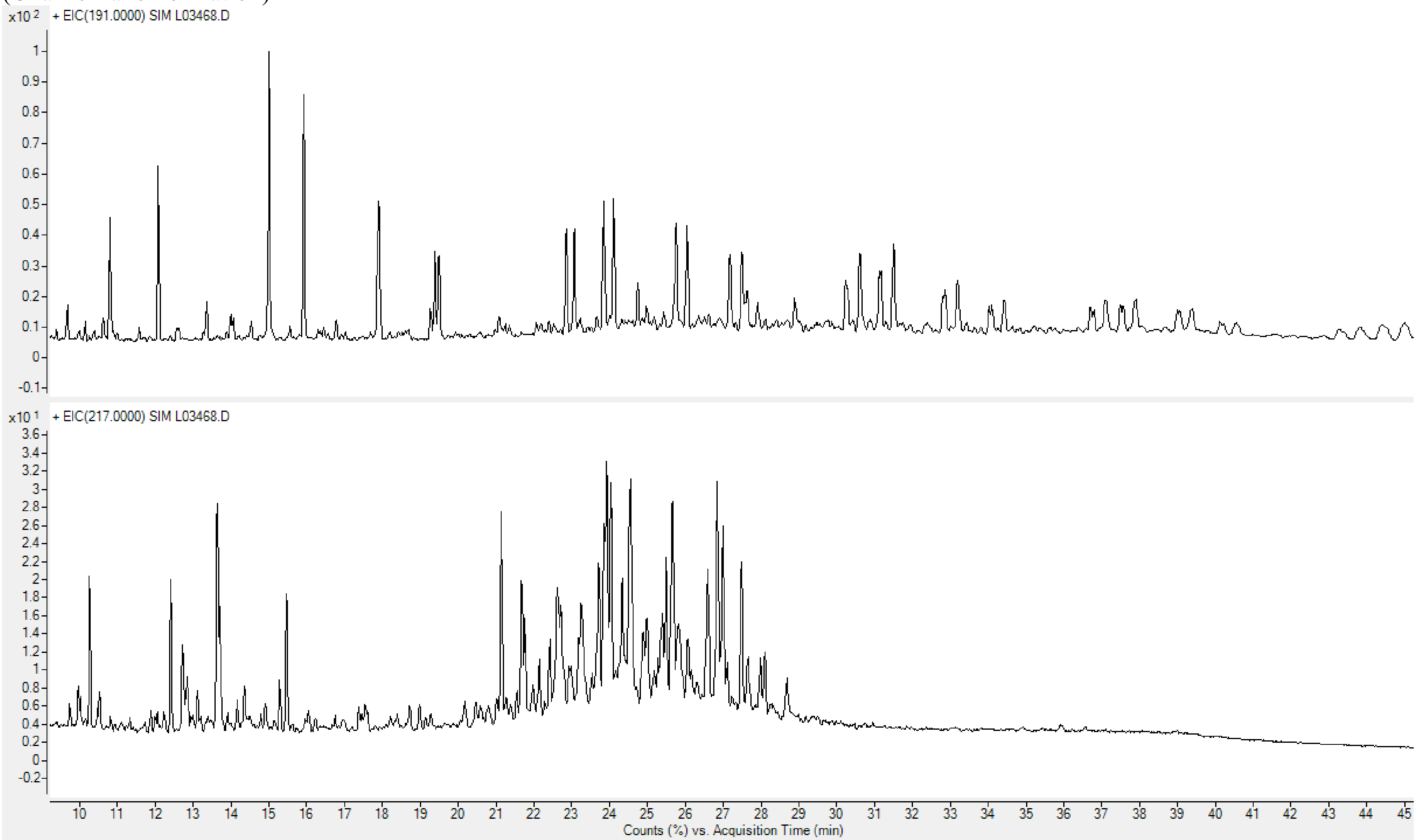
Lab. # L03342
3-14-83-18W6 (1142.7m-1150m)
(Charlie Lake Formation)



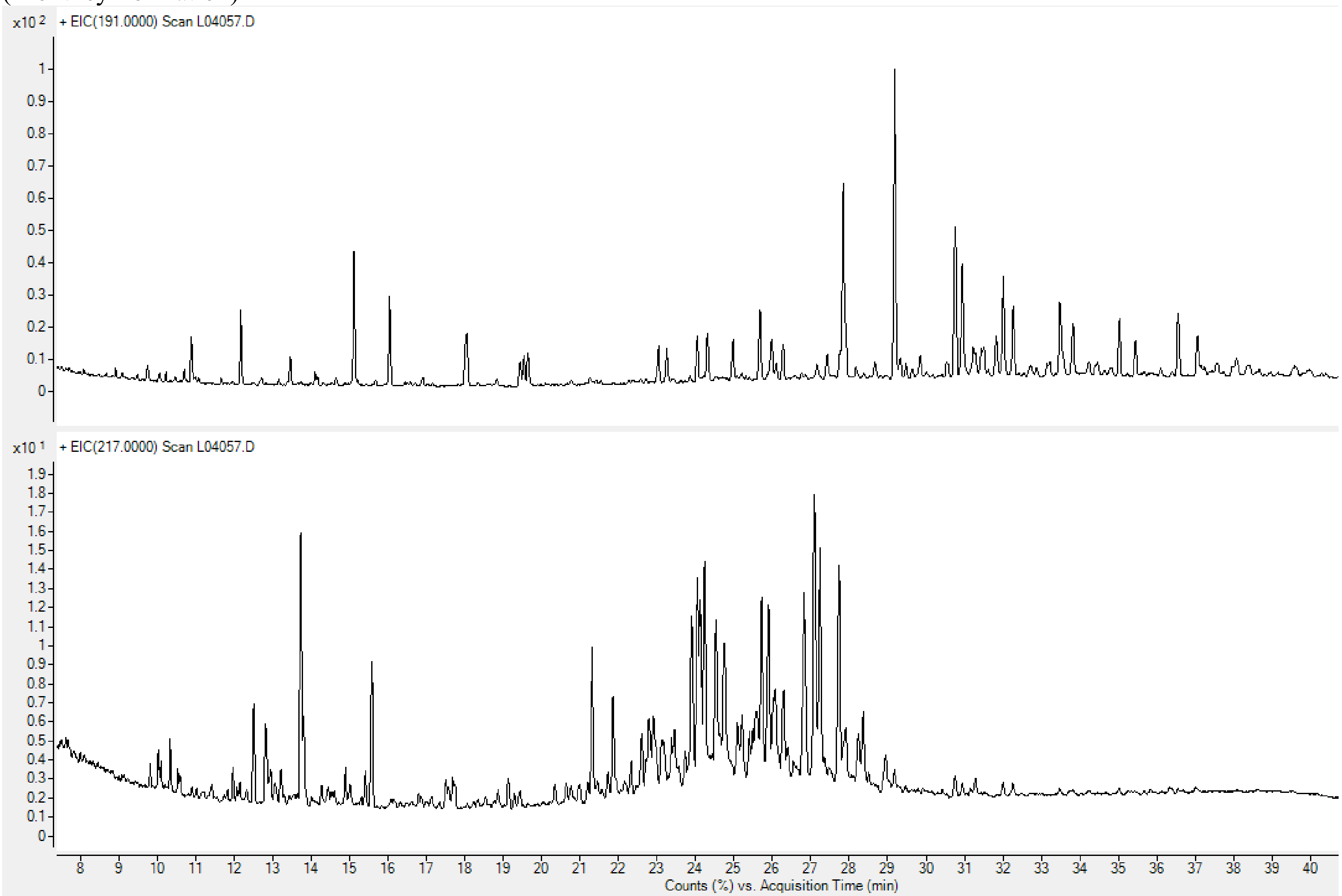
Lab. # L03453
1-23-68-4W6 (2184m-2187m)
(Charlie Lake Formation)



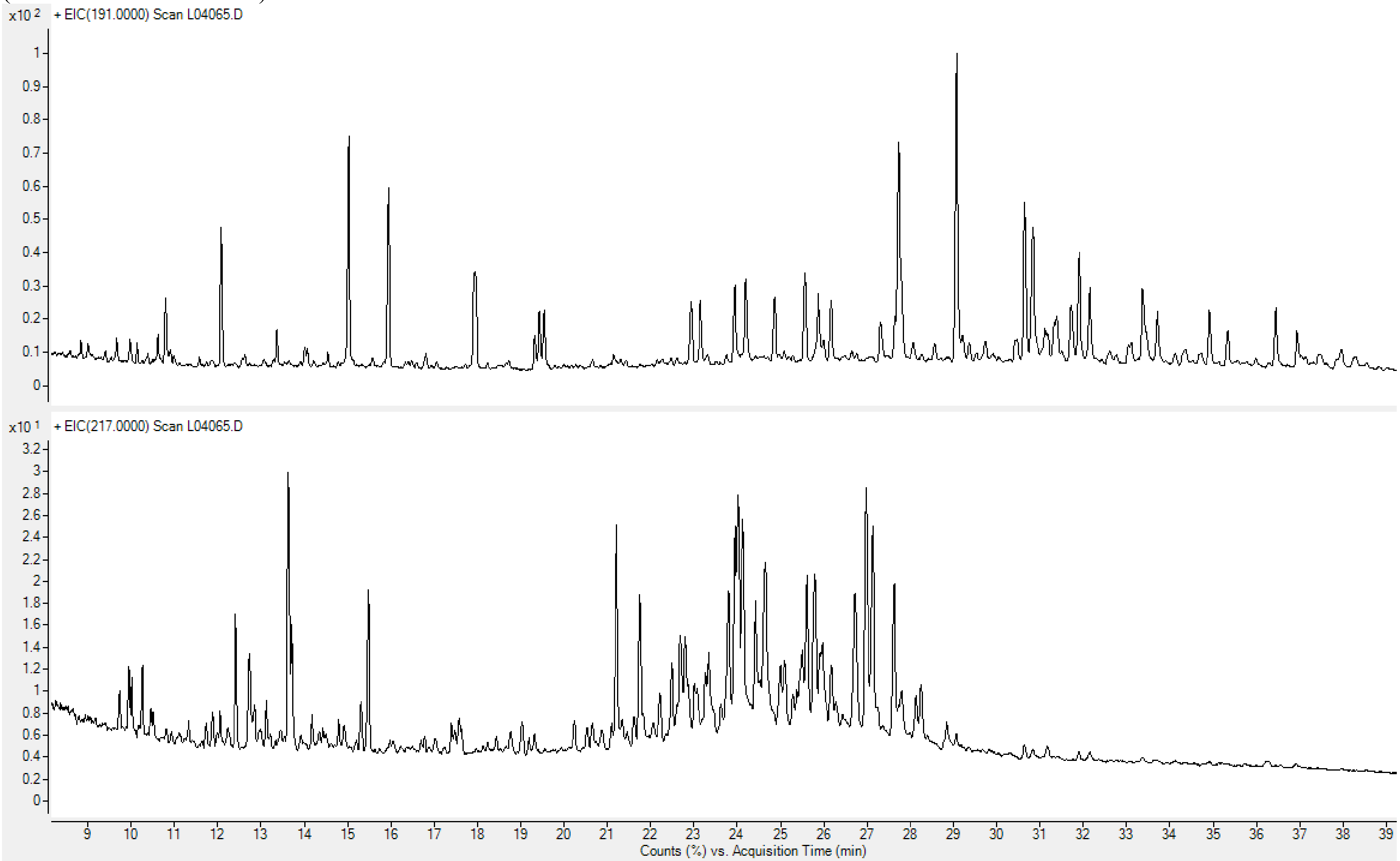
Lab. # L03468
6-28-71-9W6 (2341m-2347m)
(Charlie Lake Formation)



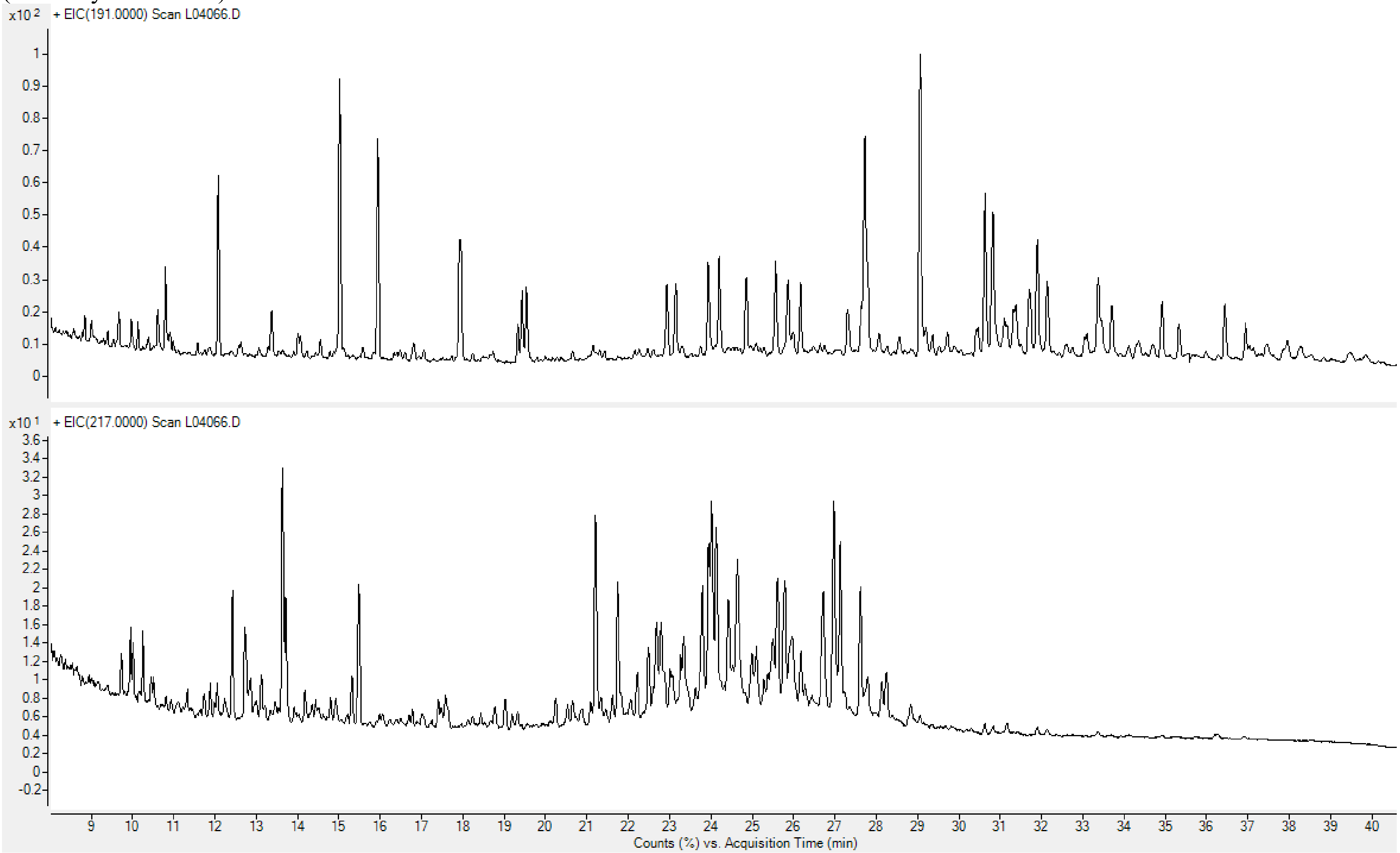
Lab. # L04057
16-6-86-1W6 (870m-873m)
(Montney Formation)



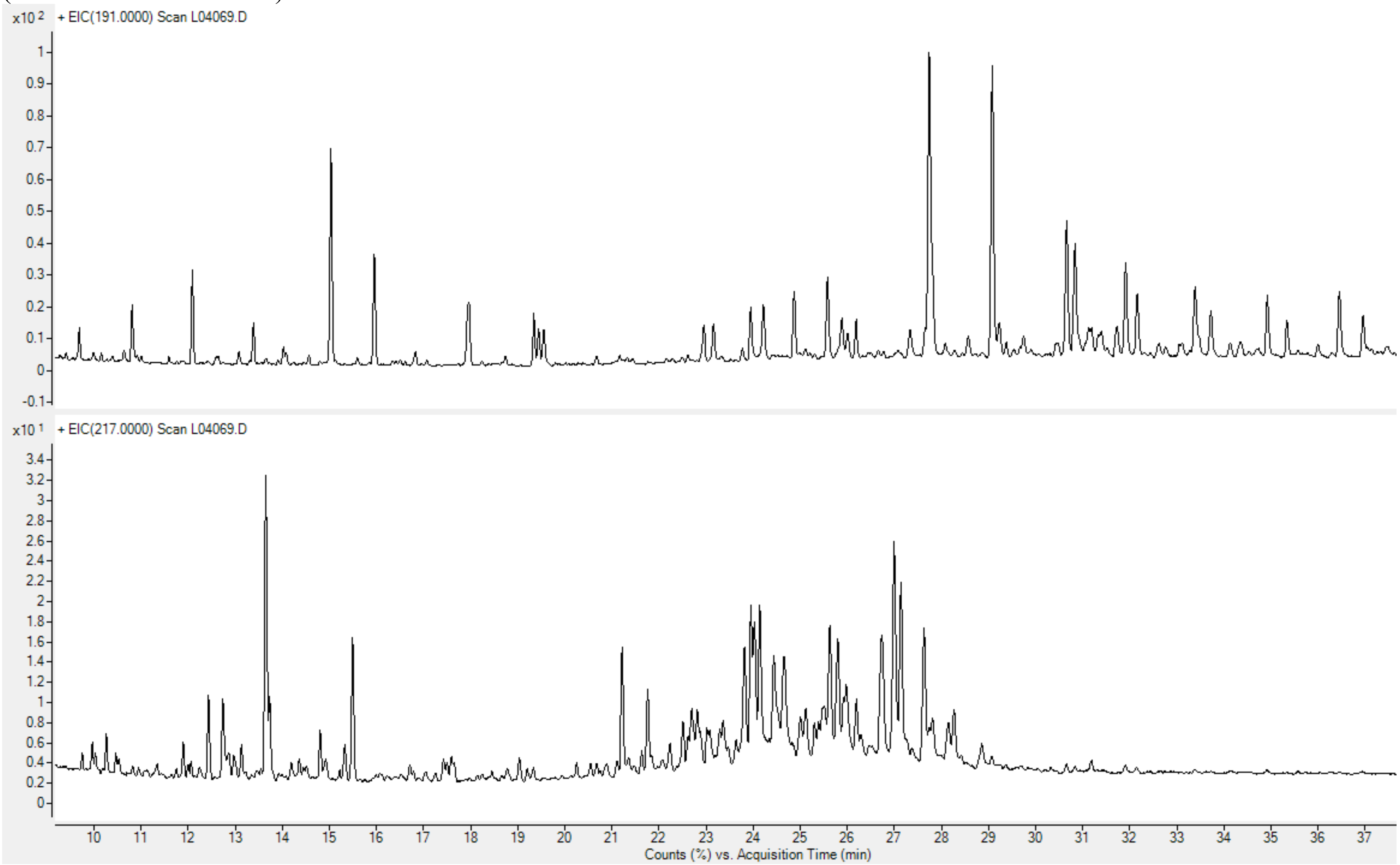
Lab. # L04065
14-12-75-3W6 (1426m-1428m)
(Charlie Lake Formation)



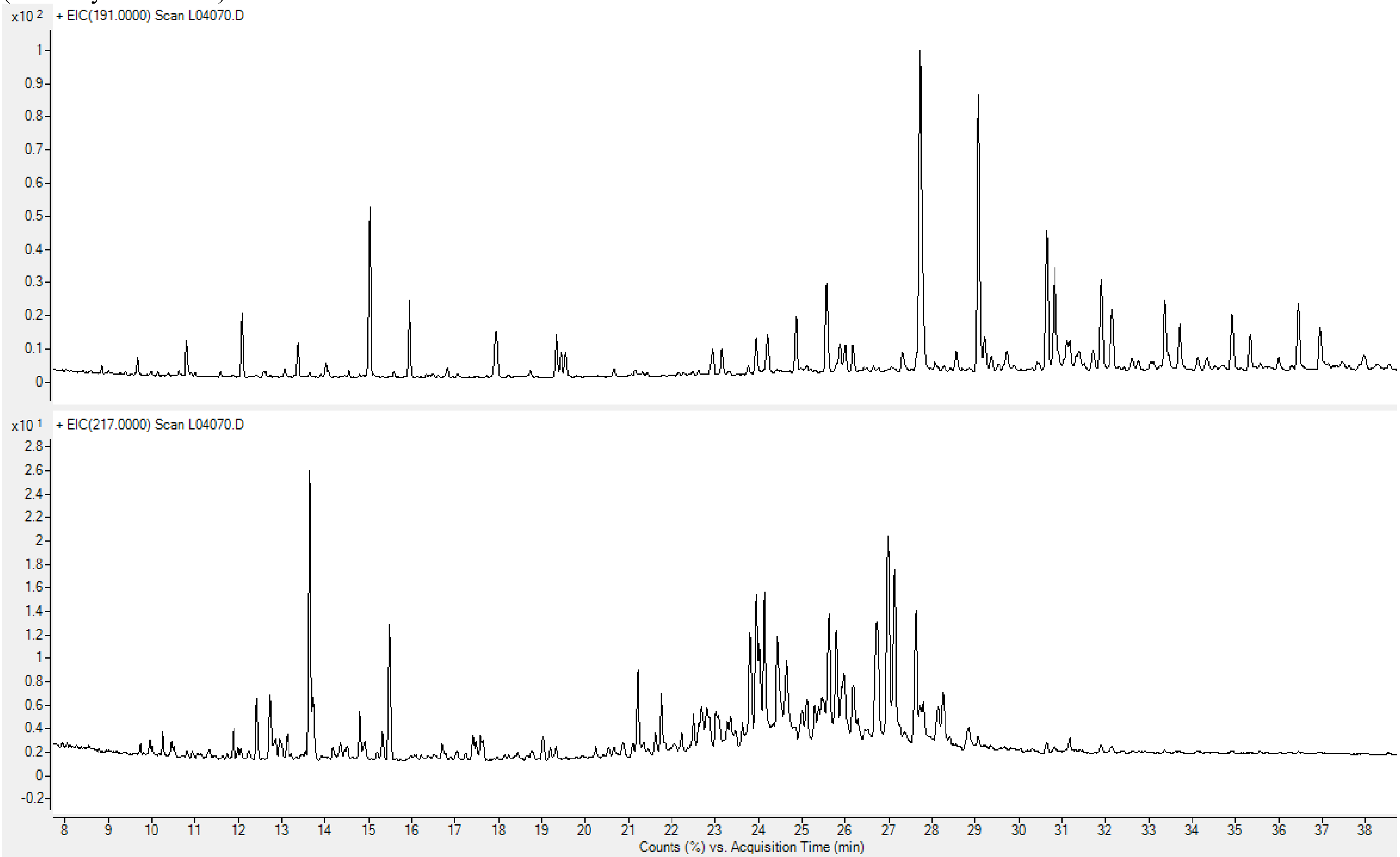
Lab. # L04066
1-13-75-3W6 (1416m-1418m)
(Montney Formation)



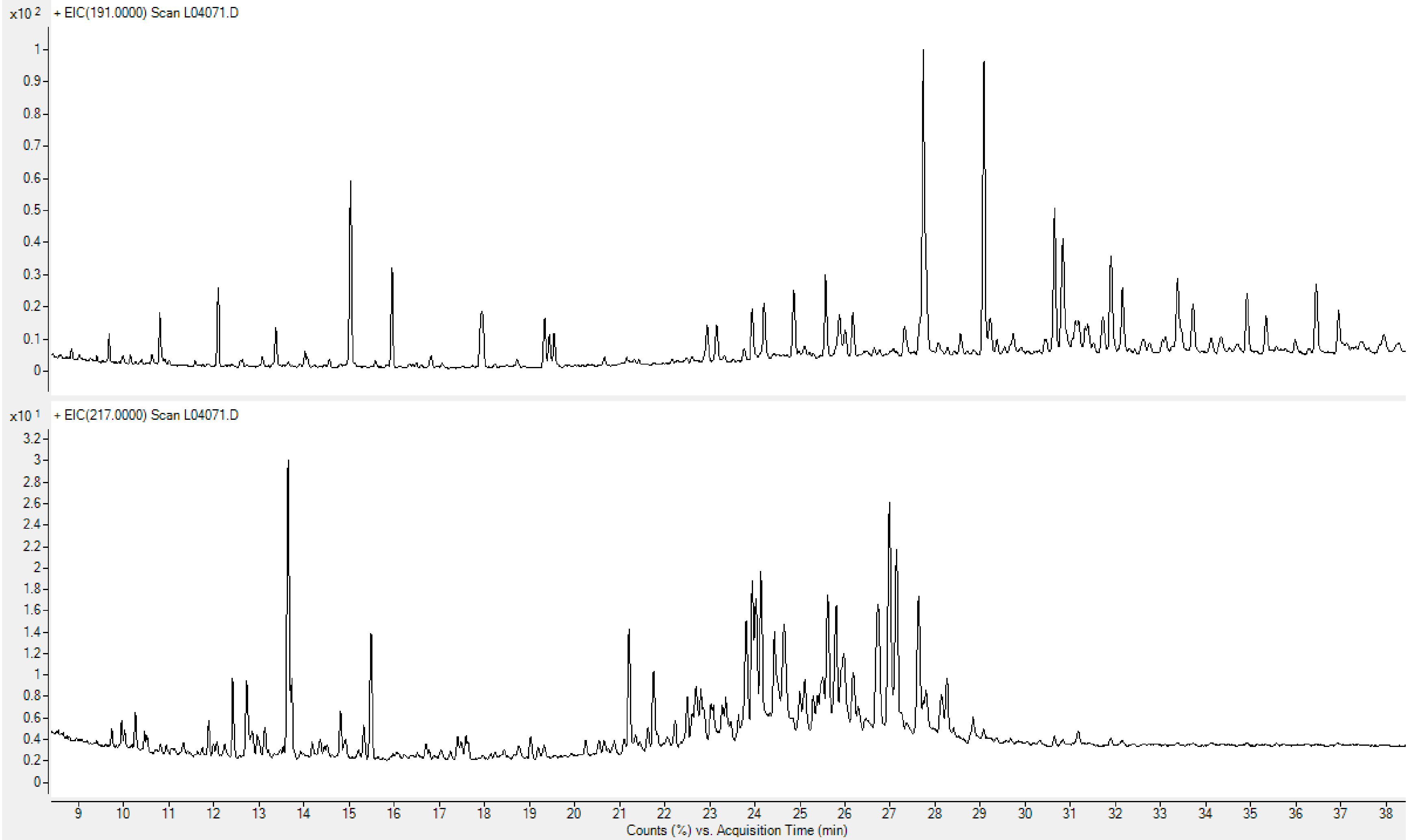
Lab. # L04069
2-21-72-3W6 (1692m-1693.5m)
(Charlie Lake Formation)



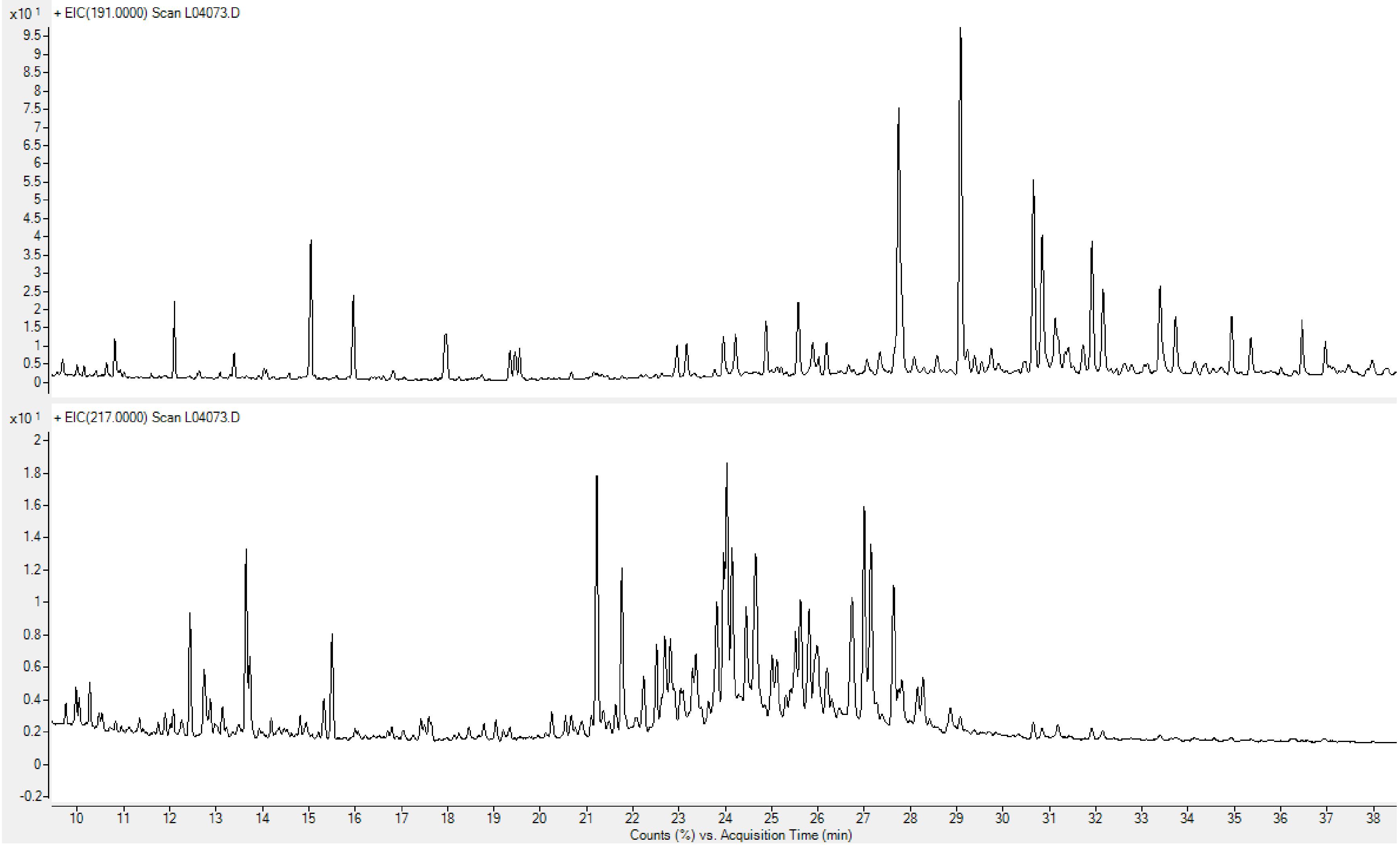
Lab. # L04070
6-11-72-3W6 (1665m-1675m)
(Montney Formation)



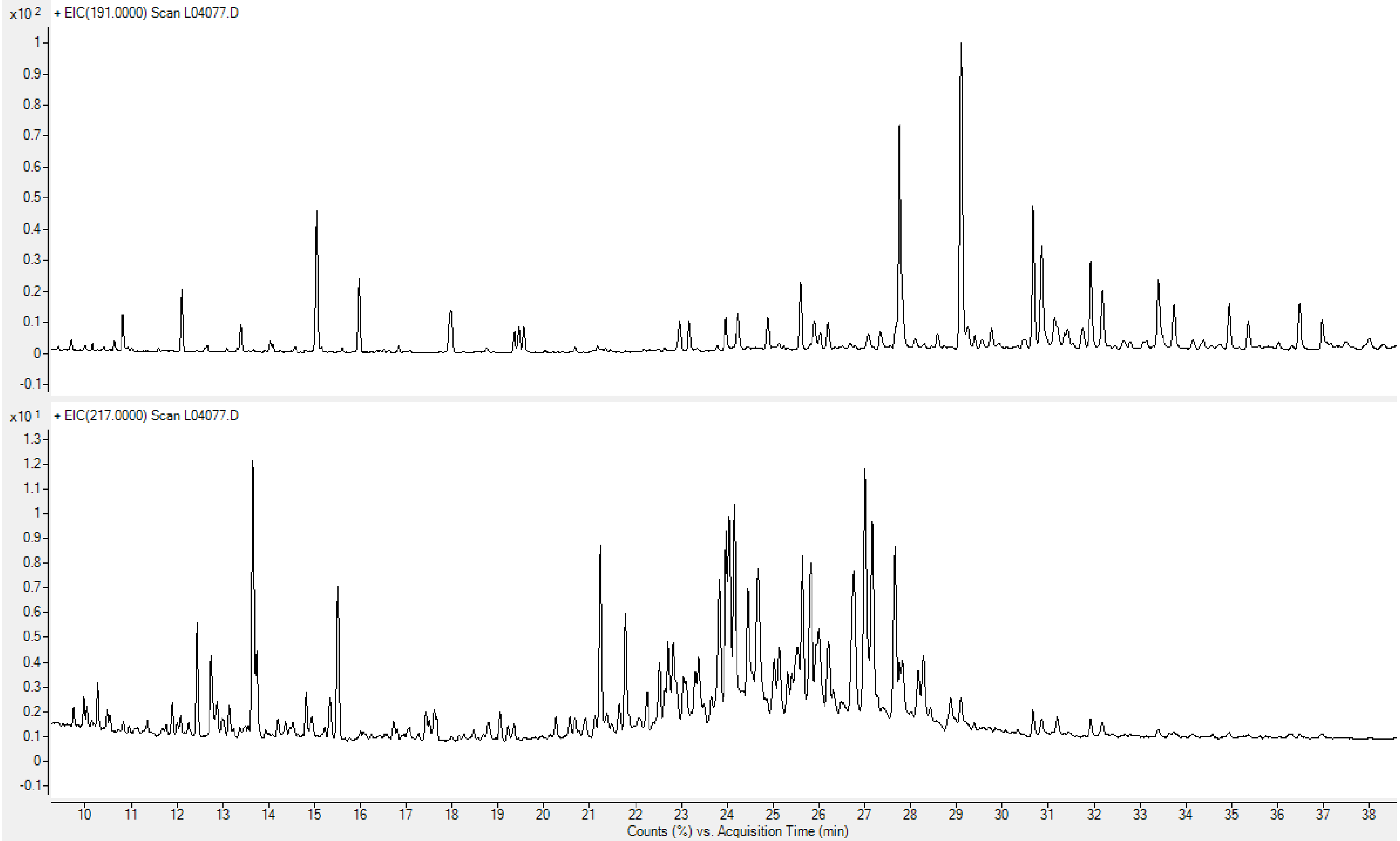
Lab. # L04071
14-15-72-3W6 (1674m-1684m)
(Charlie Lake Formation)



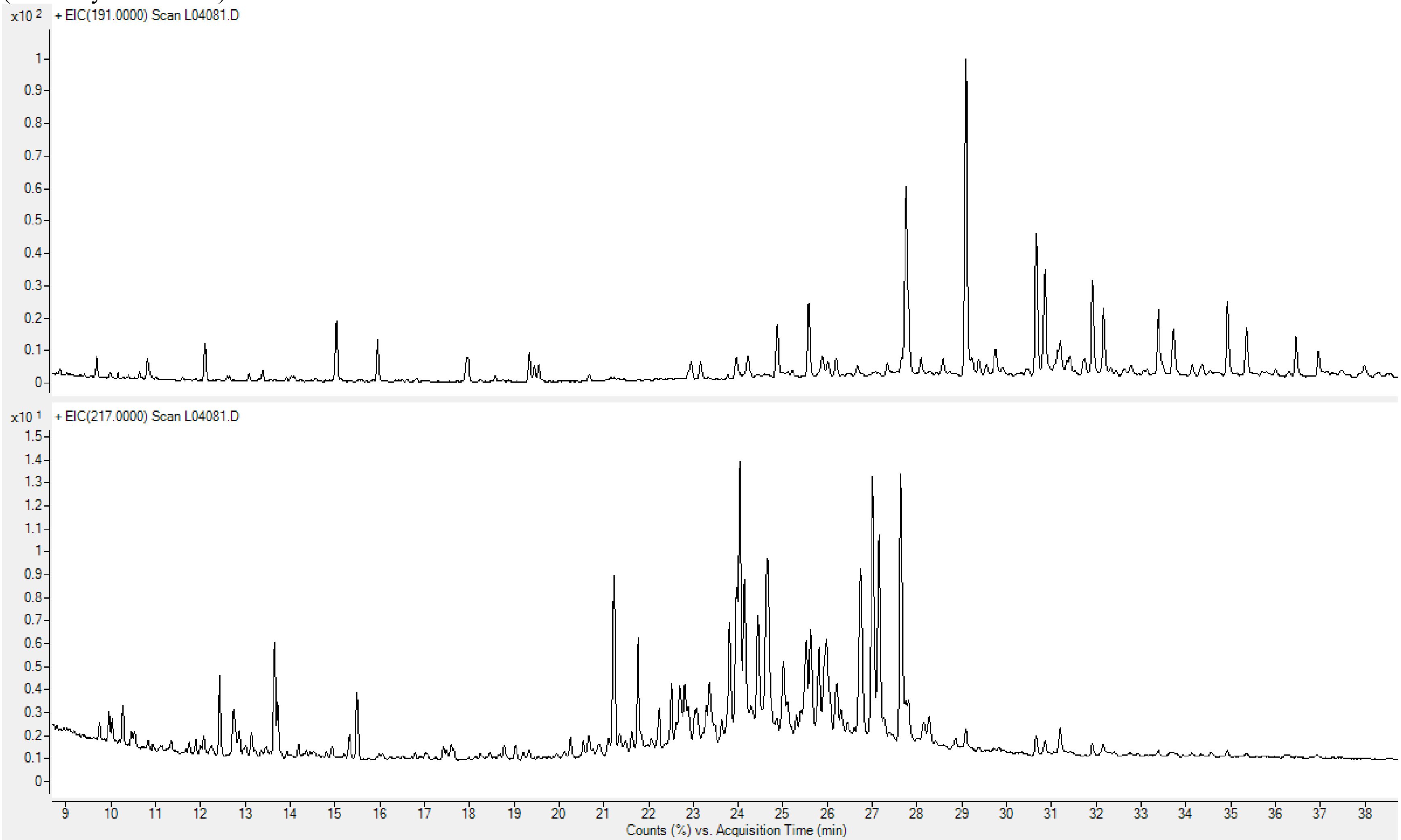
Lab. # L04073
1-8-89-6W6 (1166.2m-1174m)
(Triassic)



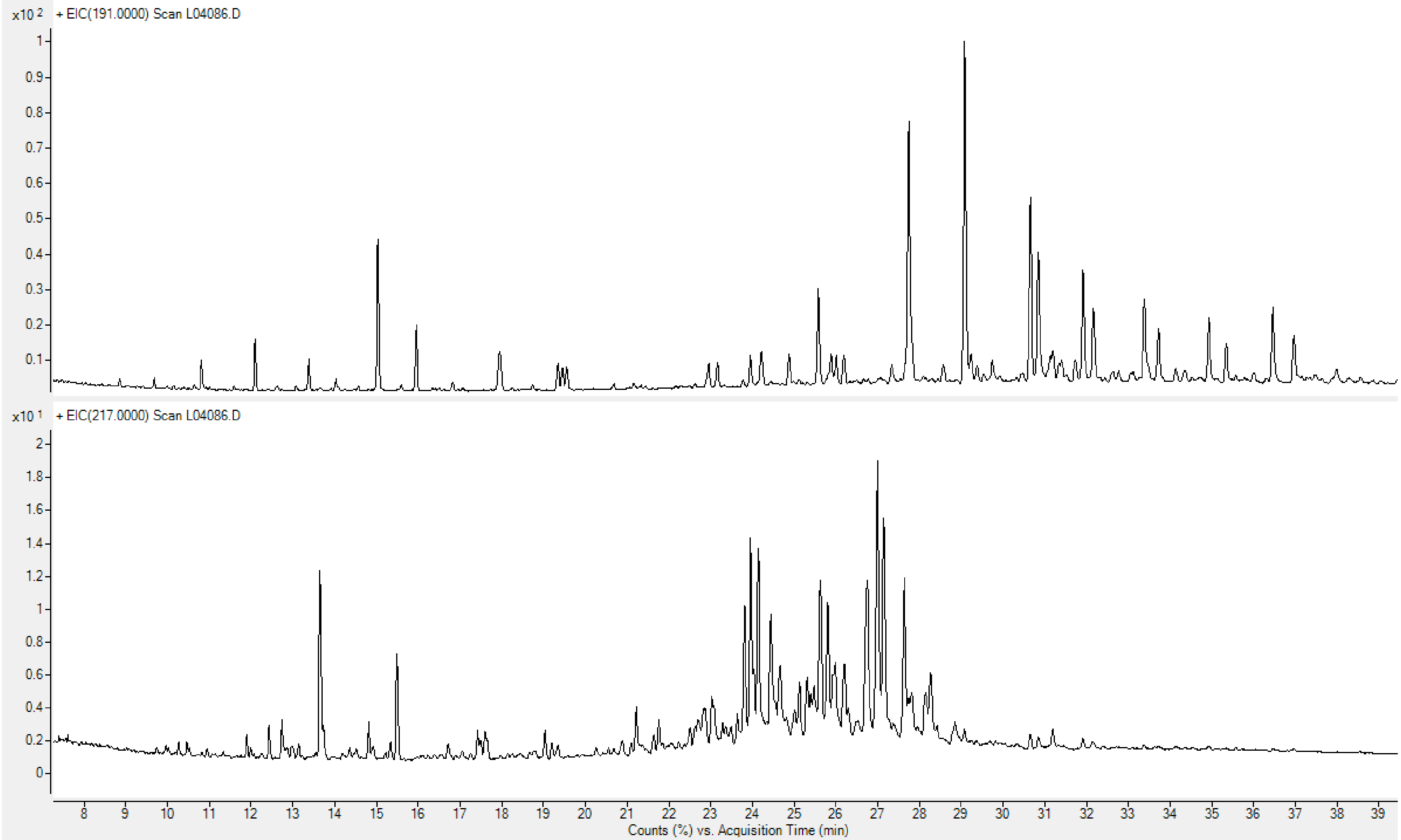
Lab. # L04077
5-5-89-6W6 (1254m-1266m)
(Triassic)



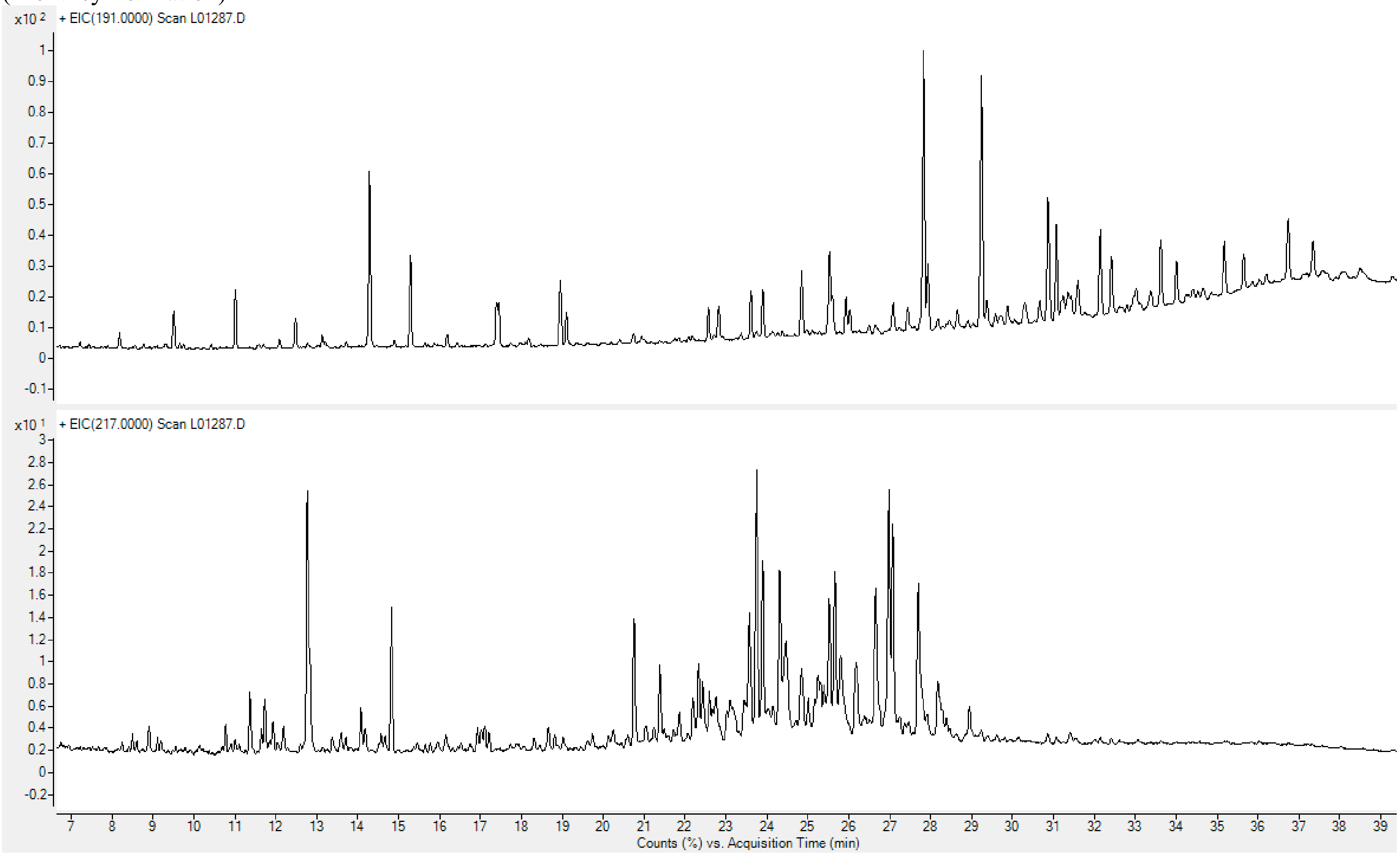
Lab. # L04081
14-4-79-2W5 (958m)
(Montney Formation)



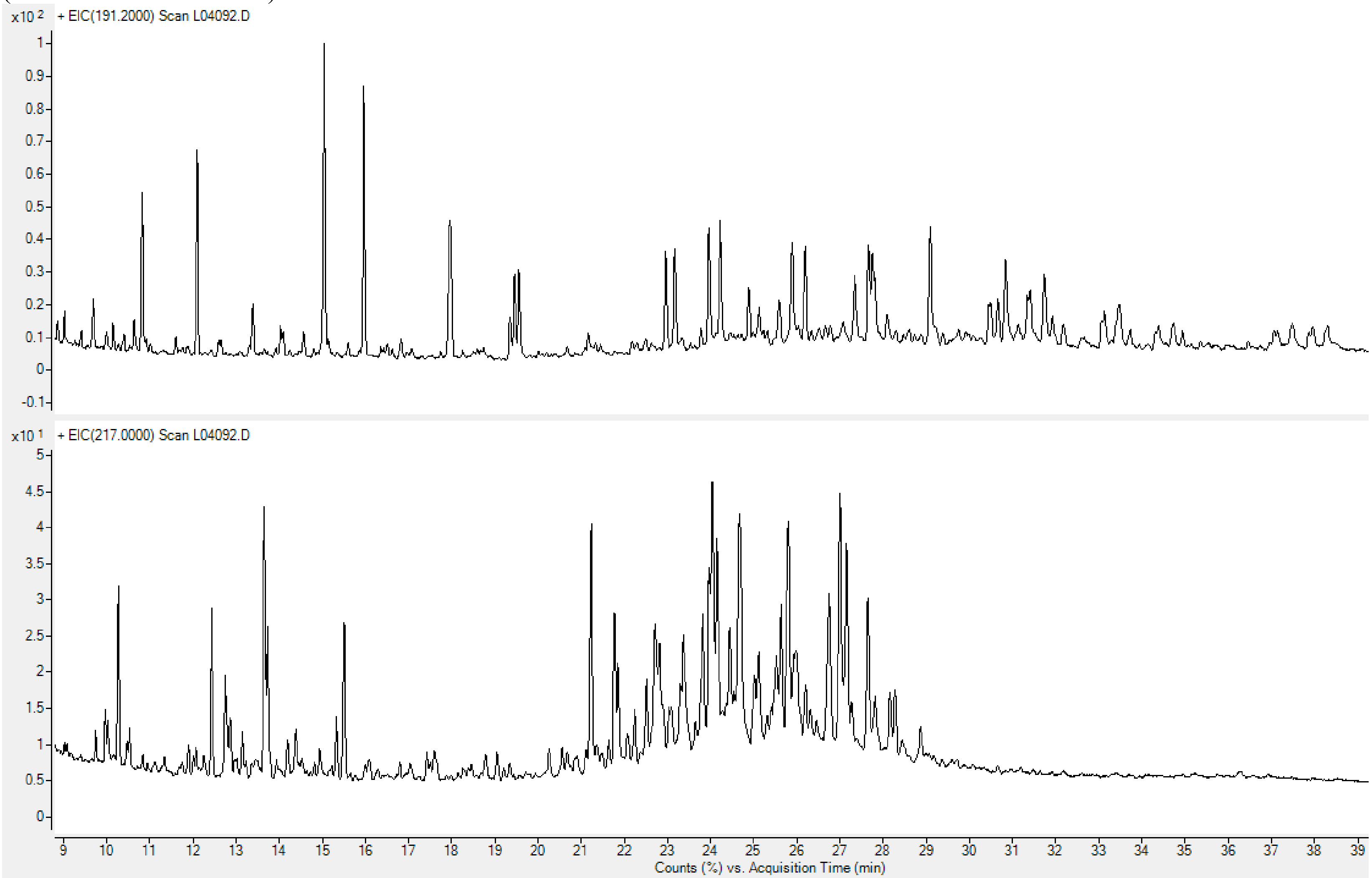
Lab. # L04086
9-6-76-20W5 (1040m-1043m)
(Montney Formation)



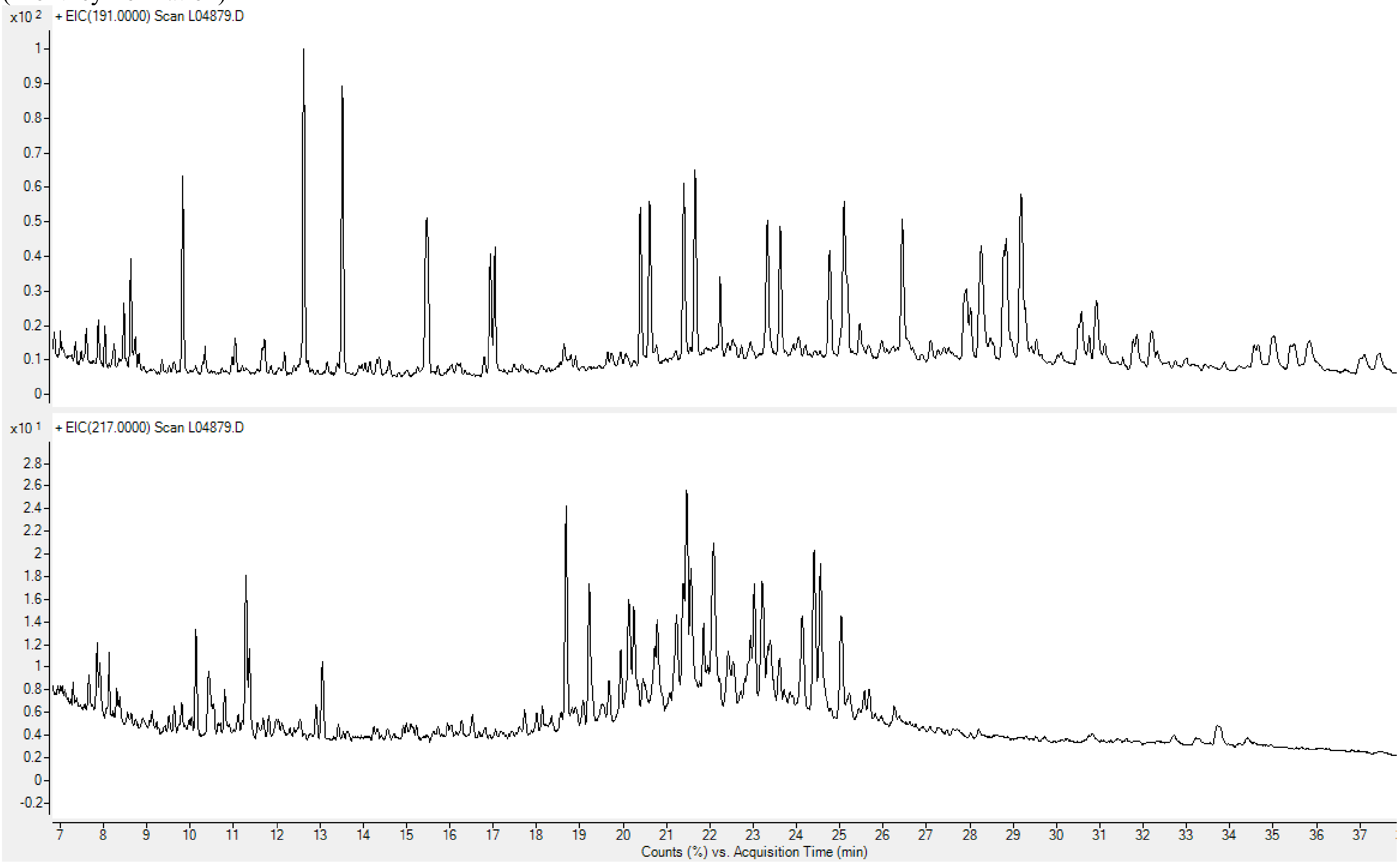
Lab. # L01287
4-20-75-10W6 (2423m-2429m)
(Montney Formation)



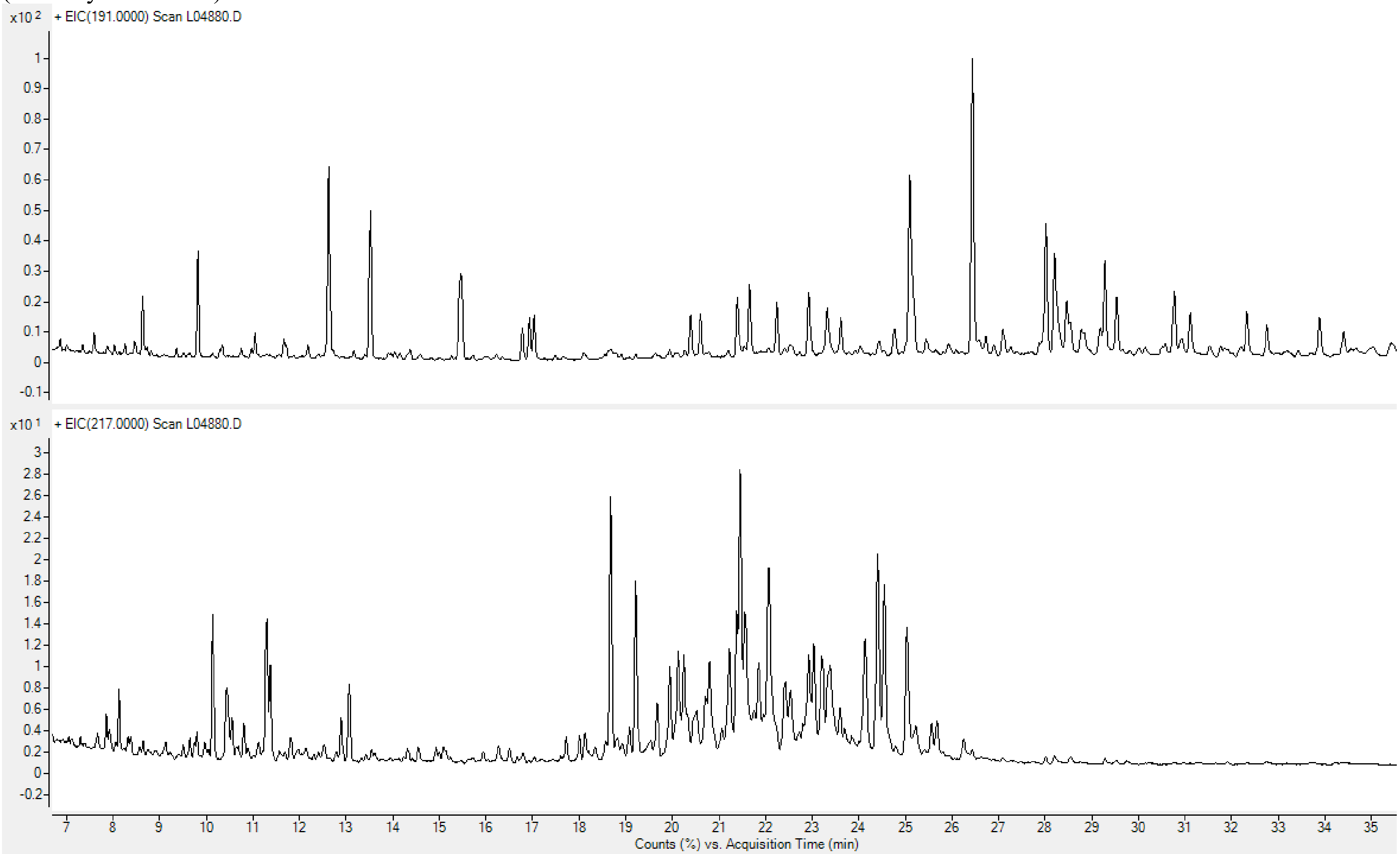
Lab. # L04092
16-6-73-0W6 (2140m-2160m)
(Charlie Lake Formation)



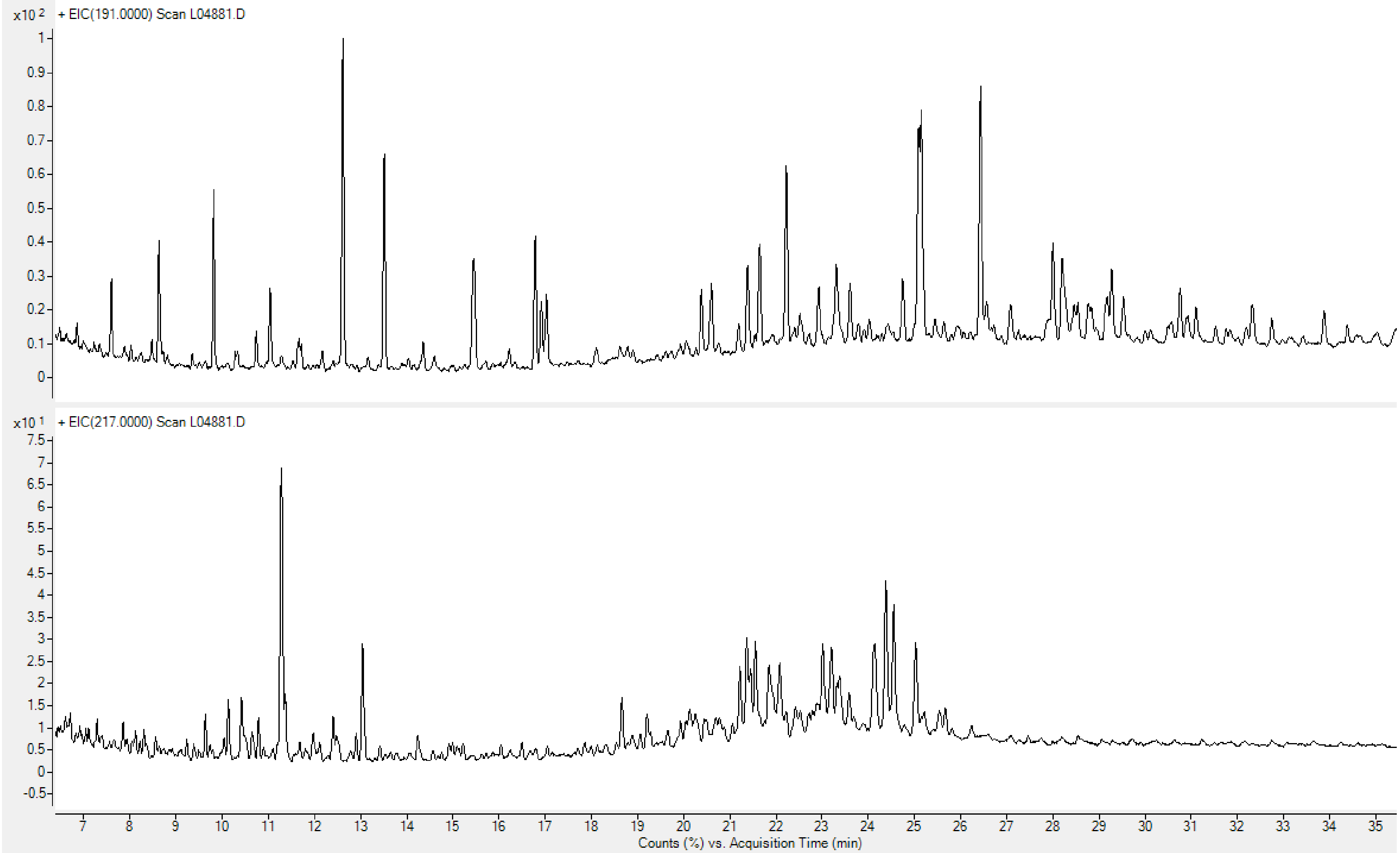
Lab. # L04879
8-30-77-7W6 (1714m-1716m)
(Montney Formation)



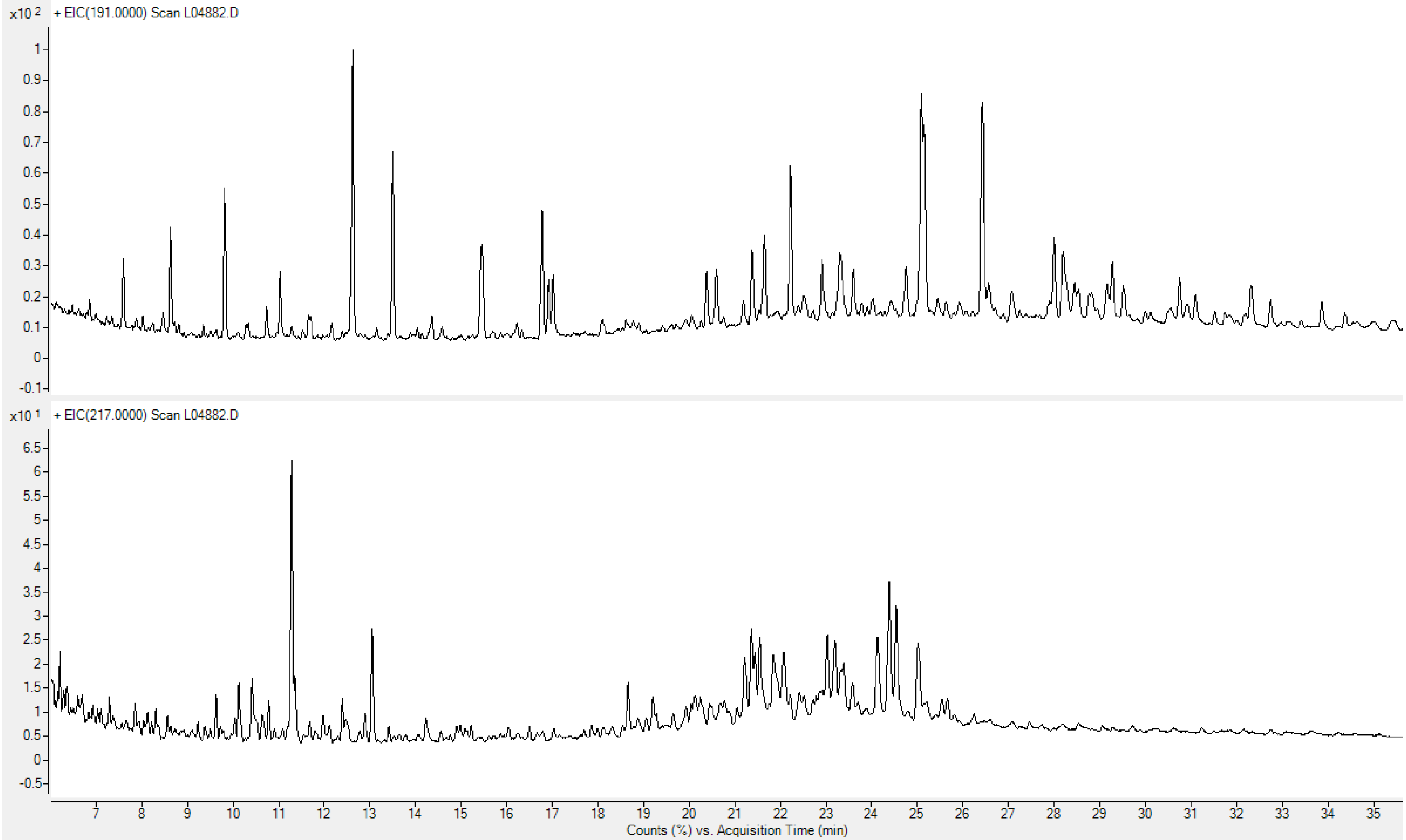
Lab. # L04880
2-21-78-6W6 (1417m-1421m)
(Halfway Formation)



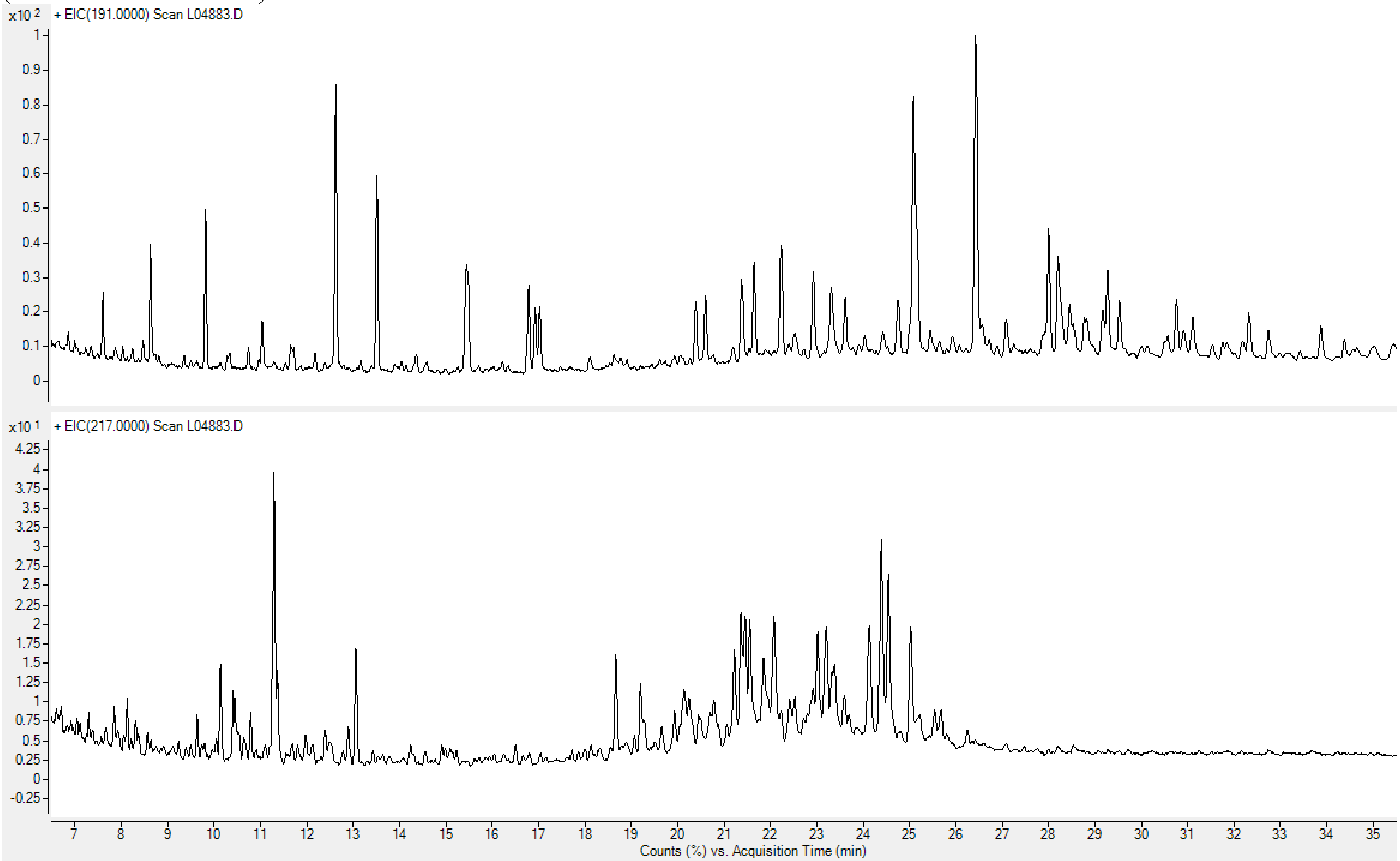
Lab. # L04881
7-17-77-7W6 (1689m-1730m)
(Charlie Lake Formation)



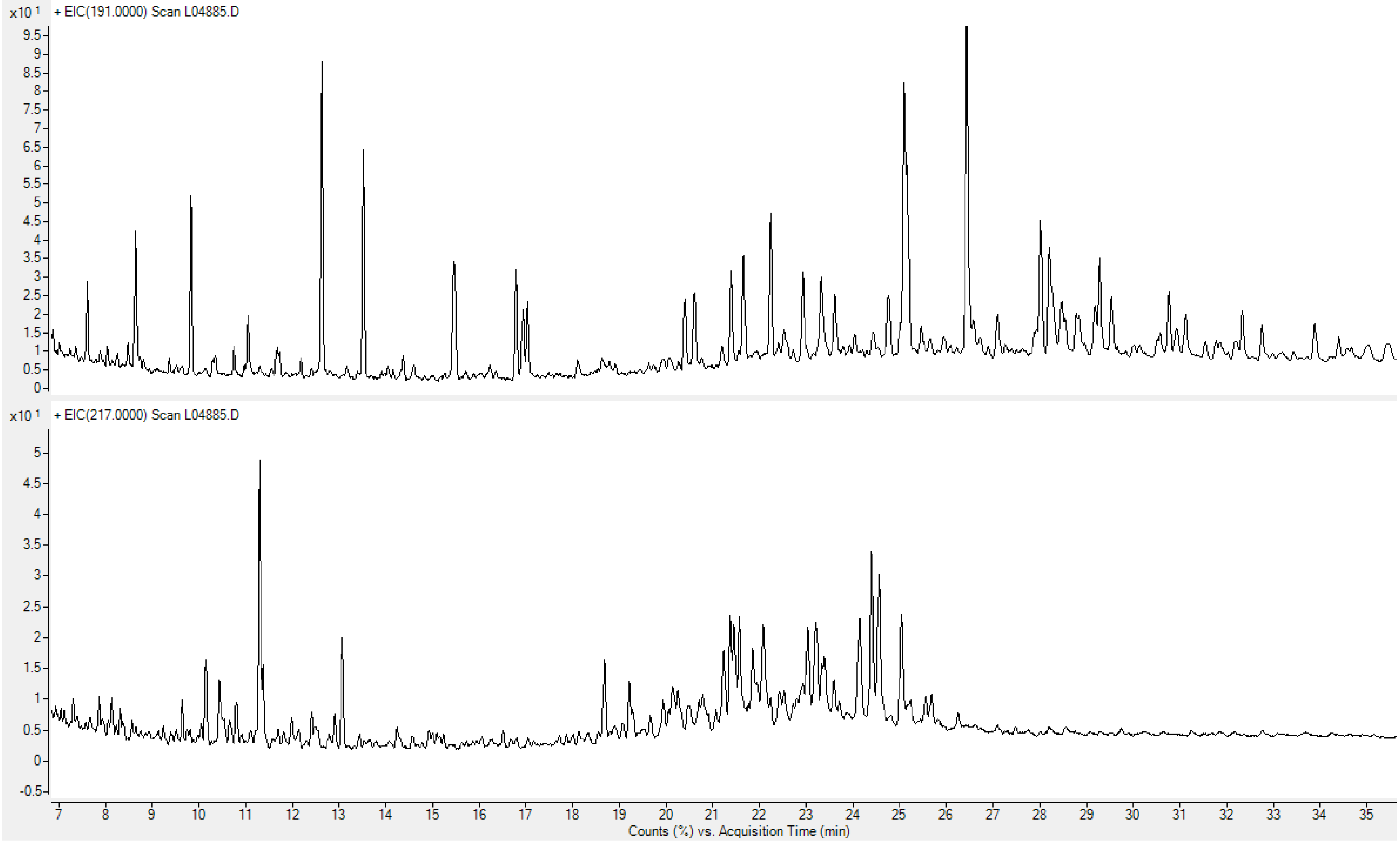
Lab. # L04882
9-28-77-7W6 (1516m-1520m)
(Charlie Lake Formation)



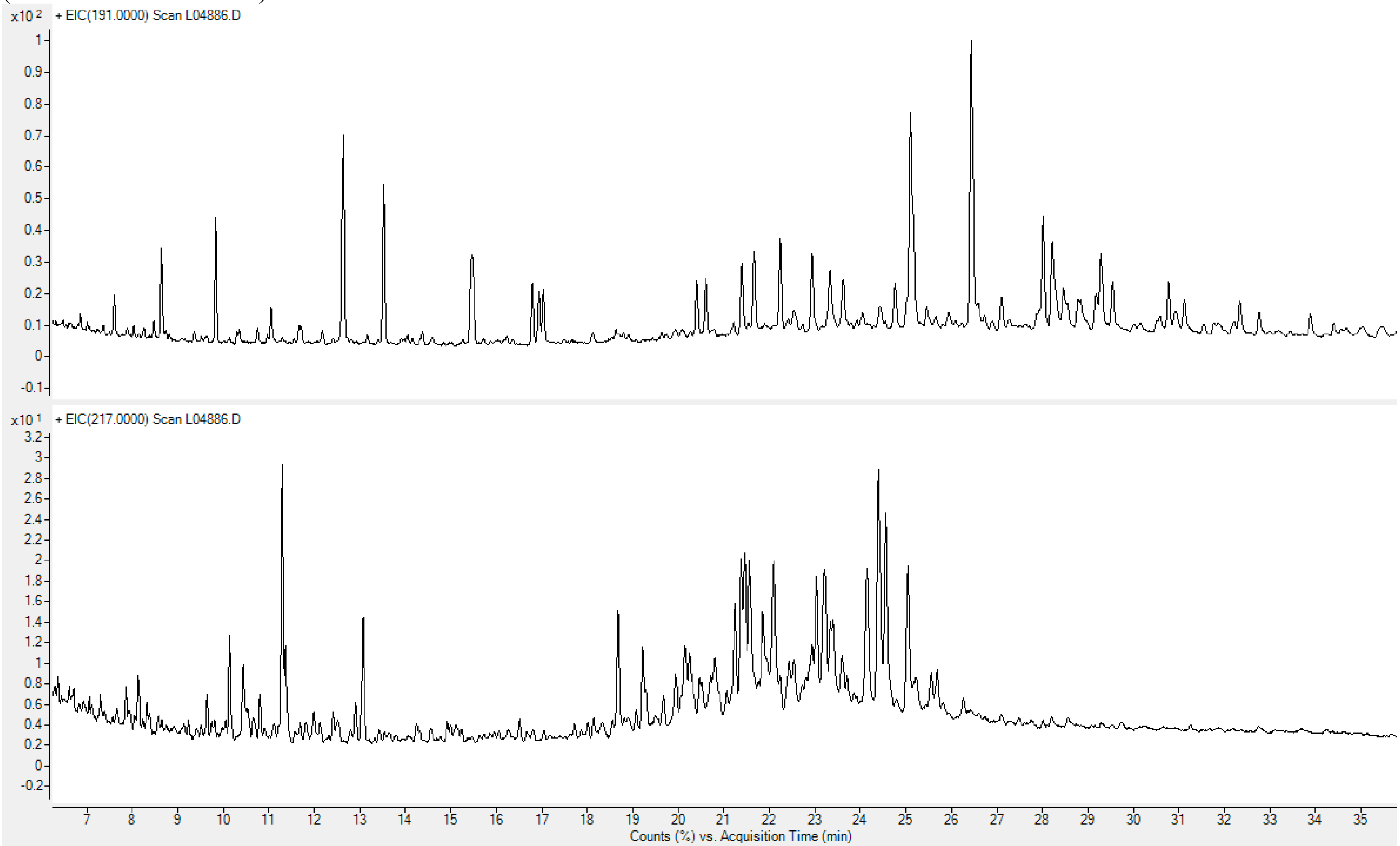
Lab. # L04883
6-4-78-7W6 (1495m-1499m)
(Charlie Lake Formation)



Lab. # L04885
16-33-77-7W6 (1499m-1614m)
(Charlie Lake Formation)



Lab. # L04886
3-3-78-7W6 (1473m-1477m)
(Charlie Lake Formation)



APPENDIX 5-1

In-place Resource Calculation of Montney Source Rock

- In-place Resource Calculation per square kilometer q (kg HC) =q (Type I) +q (Type II) +q (Type III)
- $q(i) = [HI_o(i) - HI_p(i)] \times [TOC_0(\%)/100] \times \rho \times h \times 10^6 \times$ ratio of kerogen type
- Ratio of Type I, Type II and Type III kerogen in Montney organic matters is 0.358, 0.45 and 0.192 respectively
- Original hydrogen index (HI_o) for Type I, Type II and Type III kerogen of Montney organic matters, is 600 mg HC/g TOC, 460 mg HC/g TOC and 260 mg HC/g TOC respectively
- Thickness of the different source rocks ($2 > TOC\% \geqslant 1$, $4 > TOC\% \geqslant 2$ and $TOC\% \geqslant 4$) and average TOC values are obtained from APPENDIX 3-4

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
1-2-88-1W6	0.8	1.3	420	600	460	260	1.02	1.035	1.04	2.358642	0	0	0	0
7-16-81-22W5	3	1.48	420	600	460	260	1.02	1.035	1.04	2.54356	0	0	0	0
7-23-84-24W5	0	0	420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-29-94-5W6	0	0	420	600	460	260	1.02	1.035	1.04		0	0	0	0
16-20-87-23W5	0	0	420	600	460	260	1.02	1.035	1.04		0	0	0	0
D-69-F/94-I-1	0	0	420	600	460	260	1.02	1.035	1.04		0	0	0	0
1-5-75-21W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-6-77-22W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-18-77-21W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-18-79-23W5	1	1.23	425	600	460	260	1.04	1.042	1.045	2.4645	0	0	0	0
1-19-79-22W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-20-75-19W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-27-80-24W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-28-65-17W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-36-69-19W5	0.6	1.3	425	600	460	260	1.04	1.042	1.045	2.6416	0	0	0	0
2-8-80-23W5	1.6	1.32	425	600	460	260	1.04	1.042	1.045	2.49625	0	0	0	0
2-25-78-21W5	0.2	1.27	425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-36-75-20W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
4-16-74-20W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
5-14-77-20W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
6-14-69-20W5	1.2	1.34	425	600	460	260	1.04	1.042	1.045	2.483667	0	0	0	0
7-9-68-18W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
7-20-68-17W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
8-9-73-21W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
8-20-71-18W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
9-2-89-4W6	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
9-9-85-24W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
10-13-67-19W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
11-7-83-22W5	0	0	425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-13-79-25W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-14-87-4W6		0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-26-62-18W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
2-11-72-24W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
2-22-87-5W6	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
3-2-97-11W6	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
3-6-79-24W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-11-82-2W6	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-18-69-21W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-30-66-20W5	0.6	1.22	430	590	445	250	1.045	1.052	1.05	2.693767	73768.4015	140020.16	39752.23795	253540.799
4-32-71-23W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
5-33-89-5W6	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
6-10-62-16W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
6-15-76-24W5	3.6	1.51	430	590	445	250	1.045	1.052	1.05	2.530211	514559.406	976687.698	277285.2272	1768532.33
7-6-67-20W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
7-33-68-21W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
9-13-96-10W6	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
10-23-65-20W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
13-3-63-16W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
14-17-74-23W5	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
14-34-80-1W6	0	0	430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-10-75-25W5	0	0	433	570	420	240	1.05	1.065	1.055		0	0	0	0
4-36-77-1W6	0	0	433	570	420	240	1.05	1.065	1.055		0	0	0	0

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
7-23-83-3W6	3.8	1.27	433	570	420	240	1.05	1.065	1.055	2.533016	1378538.52	2343405.47	495232.3537	4217176.34
1-24-63-20W5	0	0	435	550	400	225	1.065	1.08	1.062		0	0	0	0
3-34-58-16W5	0	0	435	550	400	225	1.065	1.08	1.062		0	0	0	0
4-20-66-22W5	0	0	435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-21-76-26W5	0	0	435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-24-85-5W6	4.6	1.24	435	550	400	225	1.065	1.08	1.062	2.413024	2623878.64	4013549.52	982279.0819	7619707.24
6-29-79-2W6	2.2	1.25	435	550	400	225	1.065	1.08	1.062	2.548867	1336233.73	2043936.08	500234.4309	3880404.24
6-35-77-2W6	9	1.29	435	550	400	225	1.065	1.08	1.062	2.549198	5642068.96	8630247.9	2112173.265	16384490.1
11-10-91-8W6	3.6	1.24	435	550	400	225	1.065	1.08	1.062	2.472762	2104307.27	3218800.32	787771.5756	6110879.17
14-20-78-1W6	1.8	1.2	435	550	400	225	1.065	1.08	1.062	2.485428	1023428.63	1565461.68	383132.2517	2972022.56
C-57-G/94-H-15	0	0	435	550	400	225	1.065	1.08	1.062		0	0	0	0
D-31-L/94-I-3	21	1.5	435	550	400	225	1.065	1.08	1.062	2.662121	15986041.3	24452643.2	5984558.006	46423242.5
1-26-74-1W6	0	0	436	530	385	217	1.07	1.09	1.068		0	0	0	0
5-4-78-2W6	6.4	1.36	436	530	385	217	1.07	1.09	1.068	2.57111	6000734.12	8232653.08	1973242.573	16206629.8
3-32-80-3W6	8.8	1.29	437	510	370	210	1.085	1.11	1.073	2.57389	10214512.4	13135311.2	3009770.076	26359593.7
4-24-68-25W5	3.6	1.32	437	510	370	210	1.085	1.11	1.073	2.656976	4413867.35	5675995.01	1300573.67	11390436
6-23-75-2W6	2	1.37	437	510	370	210	1.085	1.11	1.073	2.589898	2480781.37	3190150.85	730977.7757	6401910
6-32-71-26W5	13.4	1.26	437	510	370	210	1.085	1.11	1.073	2.608832	15398443	19801566	4537247.708	39737256.7
13-19-81-4W6	0.6	1.25	437	510	370	210	1.085	1.11	1.073	2.593733	680051.591	874509.615	200381.4624	1754942.67
15-16-80-4W6	27	1.28	437	510	370	210	1.085	1.11	1.073	2.553587	30851745.2	39673677.9	9090660.03	79616083.1
2-2-77-3W6	20	1.31	437.5	502	360	207	1.09	1.12	1.077	2.494939	24997514.3	32945170.7	7163974.429	65106659.4
2-21-92-10W6	0	0	437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
4-28-74-2W6	2.8	1.19	437.5	502	360	207	1.09	1.12	1.077	2.566365	3270084.73	4309768.49	937165.316	8517018.54
9-25-73-2W6	9.6	1.27	437.5	502	360	207	1.09	1.12	1.077	2.651252	12361226.9	16291329	3542572.77	32195128.7
9-36-89-9W6		0	437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
11-34-78-4W6	7	1.27	437.5	502	360	207	1.09	1.12	1.077	2.604565	8854672.19	11669907.8	2537638.116	23062218.1

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
14-6-85-6W6	0	0	437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
1-15-85-9W6	57.6	1.36	440	440	320	185	1.19	1.19	1.1	2.585392	138050405	151836164	32080630.19	321967199
1-20-79-5W6	61.4	1.5	440	440	320	185	1.19	1.19	1.1	2.618712	164398330	180815203	38203452.23	383416986
2-11-76-4W6	48.2	1.41	440	440	320	185	1.19	1.19	1.1	2.6245	121580153	133721188	28253216.25	283554558
2-13-65-24W5	0	0	440	440	320	185	1.19	1.19	1.1		0	0	0	0
3-3-75-4W6	16.6	1.37	440	440	320	185	1.19	1.19	1.1	2.63173	40796223	44870147.5	9480367.3	95146737.8
4-25-72-3W6	18.8	1.28	440	440	320	185	1.19	1.19	1.1	2.599637	42641300.7	46899475.3	9909132.829	99449908.8
6-13-80-6W6	27.2	1.37	440	440	320	185	1.19	1.19	1.1	2.636516	66968395.5	73655881.9	15562347.2	156186625
6-21-76-5W6	50.6	1.5	440	440	320	185	1.19	1.19	1.1	2.58964	133977263	147356277	31134099.42	312467640
6-28-73-3W6	4.6	1.27	440	440	320	185	1.19	1.19	1.1	2.555552	10176449.3	11192673	2364838.471	23733960.8
7-8-89-10W6	5.6	1.19	440	440	320	185	1.19	1.19	1.1	2.6	11810228.7	12989602.1	2744501.76	27544332.5
8-4-63-20W5	0	0	440	440	320	185	1.19	1.19	1.1		0	0	0	0
8-24-65-25W5	0	0	440	440	320	185	1.19	1.19	1.1		0	0	0	0
10-11-64-21W5	0	0	440	440	320	185	1.19	1.19	1.1		0	0	0	0
10-32-62-21W5	0	0	440	440	320	185	1.19	1.19	1.1		0	0	0	0
14-15-87-10W6	14.6	1.35	440	440	320	185	1.19	1.19	1.1	2.489059	33440423.6	36779795.5	7771001.22	77991220.4
15-7-82-7W6	61	1.45	440	440	320	185	1.19	1.19	1.1	2.637644	159024477	174904715	36954657.62	370883850
C-2-A/94-H-8	6	1.34	440	440	320	185	1.19	1.19	1.1	2.6	14248835.3	15671728.8	3311193.6	33231757.7
6-7-71-3W6	16.4	1.26	442	370	280	167	1.29	1.24	1.13	2.734235	60013763.6	56748840.7	11400211.56	128162816
3-33-82-10W6	112.6	1.53	442.5	350	270	162	1.305	1.25	1.135	2.637	530607639	485530011	97020412.56	1113158062
6-3-70-2W6	0	0	442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
6-10-84-10W6	59.4	1.33	442.5	350	270	162	1.305	1.25	1.135	2.625298	242242479	221662834	44293492.01	508198805
6-12-85-10W6	80.8	1.49	442.5	350	270	162	1.305	1.25	1.135	2.62513	369132289	337772756	67495008.31	774400053
9-26-80-8W6	28.3	1.37	442.5	350	270	162	1.305	1.25	1.135	2.650175	120009371	109814008	21943443.42	251766822
11-15-83-8W6	63	1.42	442.5	350	270	162	1.305	1.25	1.135	2.609605	272669952	249505350	49857087	572032389
11-16-87-11W6	104.2	1.45	442.5	350	270	162	1.305	1.25	1.135	2.6	458820291	419841338	83894257.57	962555886

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
11-19-79-7W6	33.8	1.37	442.5	350	270	162	1.305	1.25	1.135	2.67986	144938225	132625038	26501628.31	304064891
13-1-86-11W6	76.6	1.59	442.5	350	270	162	1.305	1.25	1.135	2.590658	368527184	337219057	67384366.1	773130606
15-10-94-13W6	36.8	1.45	442.5	350	270	162	1.305	1.25	1.135	2.472015	154063756	140975311	28170211.05	323209278
C-13-H/94-A-16	66.2	1.51	442.5	350	270	162	1.305	1.25	1.135	2.623544	306306952	280284728	56007536.77	642599217
C-74-I/94-A-16	33	1.44	442.5	350	270	162	1.305	1.25	1.135	2.552108	141647542	129613914	25899934.33	297161391
6-8-81-9W6	102.8	1.63	443	335	260	160	1.33	1.26	1.14	2.621839	554328491	498195401	96159620.16	1148683512
3-13-66-1W6	21.8	1.43	445	280	225	140	1.4	1.3	1.17	2.64003	131996505	113142331	22185525.98	267324362
3-29-78-9W6	58	1.43	445	280	225	140	1.4	1.3	1.17	2.65283	352886051	302480359	59311893.34	714678303
4-2-70-5W6	25	1.35	445	280	225	140	1.4	1.3	1.17	2.66688	144357148	123737398	24263060.89	292357607
4-2-75-7W6	44.8	1.37	445	280	225	140	1.4	1.3	1.17	2.66793	262623783	225111012	44140916.71	531875711
5-21-69-3W6	9.6	1.31	445	280	225	140	1.4	1.3	1.17	2.65784	53608345.3	45951013	9010309.279	108569668
5-28-61-21W5	2.4	1.29	445	280	225	140	1.4	1.3	1.17	2.69368	13375437.4	11464910.9	2248098.264	27088446.6
6-12-61-20W5	1.8	1.51	445	280	225	140	1.4	1.3	1.17	2.673411	11654033	9989389.09	1958770.423	23602192.5
6-34-82-11W6	105.2	1.48	445	280	225	140	1.4	1.3	1.17	2.626423	655847945	562167649	110232703.2	1328248297
7-11-64-25W5	5.8	1.2	445	280	225	140	1.4	1.3	1.17	2.682992	29949509.7	25671568.5	5033812.246	60654890.5
7-30-83-12W6	130	1.51	445	280	225	140	1.4	1.3	1.17	2.602928	819489599	702434985	137737038.8	1659661623
11-9-73-6W6	12	1.29	445	280	225	140	1.4	1.3	1.17	2.6	64551352.3	55330938	10849572.86	130731863
15-30-56-16W5	0	0	445	280	225	140	1.4	1.3	1.17		0	0	0	0
16-16-82-12W6	138.8	1.47	445	280	225	140	1.4	1.3	1.17	2.627094	859693002	736895796	144494290.6	1741083089
B-60-L/94-H-10	34.2	1.33	445	280	225	140	1.4	1.3	1.17	2.540661	185347009	158872332	31152498.13	375371839
C-43-H/94-H-7	45.8	1.58	445	280	225	140	1.4	1.3	1.17	2.647863	307311730	263415803	51651915.72	622379449
C-75-J/94-A-9	58.4	1.54	445	280	225	140	1.4	1.3	1.17	2.645859	381646474	327132688	64145847.84	772925009
C-82-F/94-H-1	57.8	1.54	445	280	225	140	1.4	1.3	1.17	2.621576	374258758	320800222	62904145.62	757963126
D-54-F/94-A-16	55	1.54	445	280	225	140	1.4	1.3	1.17	2.65303	360401529	308922337	60575069.41	729898936
B-71-F/94-H-11	74.6	1.59	447	240	197	120	1.45	1.32	1.19	2.652533	587963387	491517457	100640544.9	1180121389
6-7-78-10W6	133.6	1.57	447.5	227	190	118	1.47	1.33	1.197	2.620457	1078927526	888200471	179377019.5	2146505016

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
9-28-67-4W6	15	1.28	447.5	227	190	118	1.47	1.33	1.197	2.6	97990454	80668224	16291395.99	194950074
11-17-80-11W6	147.4	1.57	447.5	227	190	118	1.47	1.33	1.197	2.659623	1208165284	994592266	200863433.7	2403620984
12-21-82-14W6	141.4	1.55	447.5	227	190	118	1.47	1.33	1.197	2.626681	1130049773	930285599	187876344.9	2248211716
A-44-J/94-H-13	41.6	1.44	447.5	227	190	118	1.47	1.33	1.197	2.6	305730217	251684859	50829155.5	608244231
A-62-K/94-H-2	89.2	1.53	447.5	227	190	118	1.47	1.33	1.197	2.620705	702075221	577966107	116723466.1	1396764794
B-66-C/94-H-6	75.4	1.53	447.5	227	190	118	1.47	1.33	1.197	2.666416	603809398	497071192	100386288.7	1201266878
C-98-H/94-H-2	86.4	1.58	447.5	227	190	118	1.47	1.33	1.197	2.608901	699097221	575514541	116228358.9	1390840121
D-93-J/94-J-1	29.8	1.41	447.5	227	190	118	1.47	1.33	1.197	2.6	214445984	176537366	35652701.92	426636053
5-7-59-20W5	0	0	450	190	160	100	1.51	1.35	1.222		0	0	0	0
6-3-68-4W6	46.2	1.42	450	190	160	100	1.51	1.35	1.222	2.68398	390259448	320905479	66100084.17	777265011
6-14-77-11W6	93.4	1.43	450	190	160	100	1.51	1.35	1.222	2.637849	780866335	642096653	132259015.7	1555222004
7-12-87-17W6	89.6	1.59	450	190	160	100	1.51	1.35	1.222	2.643994	834851948	686488350	141402813.8	1662743112
7-23-59-21W5	0	0	450	190	160	100	1.51	1.35	1.222		0	0	0	0
7-34-83-15W6	140.8	1.58	450	190	160	100	1.51	1.35	1.222	2.643503	1303417058	1071783598	220765897.3	2595966553
9-25-64-27W5	4	1.29	450	190	160	100	1.51	1.35	1.222	2.695275	30824540.7	25346635.6	5220897.911	61392074.2
11-34-86-16W6	128	1.59	450	190	160	100	1.51	1.35	1.222	2.650034	1195370146	982937970	202465482.1	2380773599
B-4-D/94-H-13	91.4	1.58	450	190	160	100	1.51	1.35	1.222	2.670094	854621098	702744275	144751208	1702116582
C-24-F/94-H-3	89.6	1.49	450	190	160	100	1.51	1.35	1.222	2.636012	779983641	641370825	132109509.7	1553463976
A-10-J/94-B-9	145	1.53	475	60	47	30	1.565	1.44	1.304	2.632629	1767015135	1563054779	336322402.8	3666392317
C-74-J/94-A-14	86.4	1.58	450	190	160	100	1.51	1.35	1.222	2.636095	797582552	655842190	135090320.3	1588515062
D-8-H/94-A-14	119.6	1.56	452	168	144	90	1.525	1.365	1.245	2.564838	1128631809	928854986	194462189.2	2251948984
2-16-57-21W5	0	0	455	140	122	78	1.54	1.38	1.265		0	0	0	0
2-30-54-18W5	0	0	455	140	122	78	1.54	1.38	1.265		0	0	0	0
6-22-57-20W5	0.6	1.46	455	140	122	78	1.54	1.38	1.265	2.7127	6026531.88	4987859.13	1050434.606	12064825.6
6-30-83-16W6	155.4	1.59	455	140	122	78	1.54	1.38	1.265	2.652159	1661916640	1375485313	289674855.7	3327076809
7-11-74-10W6	98	1.7	455	140	122	78	1.54	1.38	1.265	2.661126	1124351225	930569296	195976303	2250896824

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
10-18-79-14W6	158.6	1.64	455	140	122	78	1.54	1.38	1.265	2.606148	1719125797	1422834472	299646507.7	3441606777
15-28-77-13W6	137.8	1.67	455	140	122	78	1.54	1.38	1.265	2.626246	1532719174	1268555030	267155520.9	3068429726
A-26-A/94-G-9	55.4	1.47	455	140	122	78	1.54	1.38	1.265	2.597314	536430150	443976415	93500674.13	1073907239
C-12-A/94-J-7	16.8	1.29	455	140	122	78	1.54	1.38	1.265	2.6147	143708512	118940350	25048634.43	287697496
10-29-88-20W6	118	1.6	457.5	122	110	70	1.543	1.39	1.275	2.659918	1326010849	1099424945	233579778.6	2659015572
1-18-60-24W5	2	1.29	460	112	97	60	1.548	1.4	1.282	2.657289	18540965.4	15678543.4	3375031.167	37594540
4-11-64-2W6	17.2	1.28	460	112	97	60	1.548	1.4	1.282	2.6874	160009045	135306264	29126612.56	324441922
4-30-75-12W6	94	1.52	460	112	97	60	1.548	1.4	1.282	2.63305	1017429563	860355070	185203759.1	2062988392
5-14-62-27W5	1.2	1.19	460	112	97	60	1.548	1.4	1.282	2.63253	10166590.7	8597035.32	1850635.062	20614261.1
6-26-82-18W6	120	1.65	460	112	97	60	1.548	1.4	1.282	2.637741	1412443888	1194385640	257108626.4	2863938154
7-35-68-7W6	80.4	1.61	460	112	97	60	1.548	1.4	1.282	2.653403	928878649	785474969	169084744.2	1883438361
11-31-53-20W5	1.8	1.22	460	112	97	60	1.548	1.4	1.282	2.767374	16435162.6	13897842.1	2991709.694	33324714.4
12-13-63-2W6	2.2	1.47	460	112	97	60	1.548	1.4	1.282	2.6	22739827.6	19229170	4139354.419	46108352
12-34-62-1W6	9	1.29	460	112	97	60	1.548	1.4	1.282	2.684276	84281668	71269956.1	15341879.47	170893504
B-55-K/94-G-9	81.8	1.63	460	112	97	60	1.548	1.4	1.282	2.662814	960186568	811949457	174783757.1	1946919781
B-92-G/94-J-2	61.6	1.56	460	112	97	60	1.548	1.4	1.282	2.645627	687555410	581408094	125156424.7	1394119929
A-79-B/94-H-4	104.4	1.51	460	112	97	60	1.548	1.4	1.282	2.652865	1131009807	956400381	205878888.7	2293289077
4-26-85-20W6	118	1.6	462.5	100	88	55	1.552	1.41	1.288	2.628959	1378892904	1171548723	251626711.3	2802068338
5-30-65-6W6	23.4	1.36	462.5	100	88	55	1.552	1.41	1.288	2.63195	232689694	197700135	42462284.24	472852113
11-26-82-20W6	115.8	1.61	462.5	100	88	55	1.552	1.41	1.288	2.635195	1364871966	1159636115	249068106.2	2773576187
12-12-84-21W6	114.8	1.62	462.5	100	88	55	1.552	1.41	1.288	2.655127	1371787910	1165512108	250330159.4	2787630177
13-14-80-18W6	131.2	1.57	462.5	100	88	55	1.552	1.41	1.288	2.602502	1489255901	1265316432	271766258	3026338591
16-10-87-22W6	130.6	1.52	462.5	100	88	55	1.552	1.41	1.288	2.635246	1453291105	1234759664	265203236.8	2953254006
C-1-C/94-J-7	8.6	1.39	462.5	100	88	55	1.552	1.41	1.288	2.677733	88925271.4	75553574.8	16227492.02	180706338
2-26-58-25W5	1.8	1.44	465	90	80	48	1.56	1.42	1.291	2.7082	19993718.9	17045126.8	3688749.068	40727594.7
5-8-60-26W5	4	1.26	465	90	80	48	1.56	1.42	1.291	2.64899	38026701.6	32418678.7	7015751.328	77461131.6

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
5-9-63-5W6	2	1.22	465	90	80	48	1.56	1.42	1.291	2.66577	18526368.7	15794175.4	3418029.719	37738573.9
7-6-57-23W5	0	0	465	90	80	48	1.56	1.42	1.291		0	0	0	0
7-32-69-12W6	99.4	1.65	465	90	80	48	1.56	1.42	1.291	2.6	1214567002	1035447613	224082018.8	2474096634
7-33-61-4W6	8.4	1.34	465	90	80	48	1.56	1.42	1.291	2.676436	85806207.1	73151857.6	15830850.07	174788915
10-19-66-9W6	70.2	1.6	465	90	80	48	1.56	1.42	1.291	2.678797	856988061	730602956	158110350.8	1745701368
A-85-A/94-G-15	37.8	1.45	465	90	80	48	1.56	1.42	1.291	2.67942	418290815	356602991	77172729.18	852066536
C-18-D/94-G-9	82	1.76	465	90	80	48	1.56	1.42	1.291	2.648654	1088753626	928188681	200870030.4	2217812338
D-3-F/94-G-8	75.8	1.61	465	90	80	48	1.56	1.42	1.291	2.615728	909212625	775125654	167745542.4	1852083822
D-6-H/93-P-10	108.8	1.68	465	90	80	48	1.56	1.42	1.291	2.630228	1369333946	1167390160	252635807.4	2789359913
D-33-L/94-J-2	44.2	1.49	465	90	80	48	1.56	1.42	1.291	2.647704	496656021	423411216	91630748.77	1011697986
D-39-F/93-P-9	128.8	1.58	465	90	80	48	1.56	1.42	1.291	2.625968	1522089682	1297618102	280818537.1	3100526321
D-75-F/93-P-8	117.8	1.57	465	90	80	48	1.56	1.42	1.291	2.647648	1394707216	1189021484	257317058.9	2841045759
D-82-K/94-G-15	87	1.54	465	90	80	48	1.56	1.42	1.291	2.633805	1005081650	856856307	185432936.1	2047370893
2-11-55-26W5	1	1.5	470	72	60	36	1.565	1.43	1.296	2.731651	12121260.2	10546904.8	2283866.597	24952031.6
4-35-67-13W6	84	1.55	470	72	60	36	1.565	1.43	1.296	2.67197	1029138565	895470132	193908483.8	2118517181
5-7-54-23W5	0	0	470	72	60	36	1.565	1.43	1.296		0	0	0	0
A-45-F/93-P-7	84.8	1.67	475	60	47	30	1.565	1.44	1.304	2.614596	1120232367	990927876	213217891.5	2324378134
5-7-56-24W5	0	0	470	72	60	36	1.565	1.43	1.296		0	0	0	0
6-14-58-1W6	5.6	1.62	470	72	60	36	1.565	1.43	1.296	2.630925	70606193.7	61435592.5	13303495.2	145345281
10-25-70-14W6	69.2	1.7	470	72	60	36	1.565	1.43	1.296	2.633882	916605788	797553540	172705255.2	1886864583
12-36-53-23W5	0	0	470	72	60	36	1.565	1.43	1.296		0	0	0	0
14-3-57-26W5	0	0	470	72	60	36	1.565	1.43	1.296		0	0	0	0
16-31-80-21W6	74.8	1.63	470	72	60	36	1.565	1.43	1.296	2.617313	944009139	821397639	177868546.6	1943275325
D-83-L/94-A-12	104.2	1.62	470	72	60	36	1.565	1.43	1.296	2.670453	1333518185	1160315768	251259157.9	2745093110
5-5-83-24W6	82.4	1.62	475	60	47	30	1.565	1.44	1.304	2.628407	1061514793	938987865	202041962.6	2202544621
6-3-82-24W6	82	1.62	475	60	47	30	1.565	1.44	1.304	2.672803	1074204316	950212682	204457205.7	2228874204

In-place Resource Calculation of Montney Source Rock with 2>TOC%≥1 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
7-18-52-24W5	0	0	475	60	47	30	1.565	1.44	1.304		0	0	0	0
7-31-60-5W6	71.2	1.44	475	60	47	30	1.565	1.44	1.304	2.684644	832760800	736638143	158502385	1727901328
8-29-64-10W6	66.8	1.6	475	60	47	30	1.565	1.44	1.304	2.69719	872165906	771494856	166002501.9	1809663265
16-2-78-22W6	79	1.66	475	60	47	30	1.565	1.44	1.304	2.588371	1026958549	908420327	195464747.3	2130843624
16-36-83-25W6	107.4	1.58	475	60	47	30	1.565	1.44	1.304	2.64673	1358820703	1201976797	258629275.3	2819426775
A-10-J/94-B-9	150	1.6	475	60	47	30	1.565	1.44	1.304	2.632435	1911437090	1690806615	363810757.7	3966054463
A-31-B/94-B-15	148	1.68	475	60	47	30	1.565	1.44	1.304	2.654768	1997049243	1766536857	380105629.4	4143691729
A-45-F/93-P-7	83.6	1.67	475	60	47	30	1.565	1.44	1.304	2.615108	1104596259	977096589	210241814.4	2291934663
B-92-F/93-P-1	68.8	1.67	475	60	47	30	1.565	1.44	1.304	2.642928	918716300	812672101	174862607.1	1906251008
C-95-B/93-P-1	46.8	1.75	475	60	47	30	1.565	1.44	1.304	2.631079	651941982	576690607	124086483.2	1352719072
D-8-F/94-B-16	66.4	1.53	475	60	47	30	1.565	1.44	1.304	2.639671	811335410	717685811	154424412.9	1683445634
D-67-J/94-B-9	129.2	1.6	475	60	47	30	1.565	1.44	1.304	2.64442	1653880514	1462978890	314789079.9	3431648485
A-1-J/94-B-9	109.2	1.7	475	60	47	30	1.565	1.44	1.304	2.642373	1484078073	1312776149	282469965.1	3079324188
B-62-I/94-B-8	111.8	1.59	475	60	47	30	1.565	1.44	1.304	2.621572	1409911741	1247170577	268353618.1	2925435936

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
1-2-88-1W6	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-16-81-22W5	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-23-84-24W5	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-29-94-5W6	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
16-20-87-23W5	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
D-69-F/94-I-1	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
1-5-75-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-6-77-22W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-18-77-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-18-79-23W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-19-79-22W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-20-75-19W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-27-80-24W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-28-65-17W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-36-69-19W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-8-80-23W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-25-78-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-36-75-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
4-16-74-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
5-14-77-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
6-14-69-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
7-9-68-18W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
7-20-68-17W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
8-9-73-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
8-20-71-18W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
9-2-89-4W6	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
9-9-85-24W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
10-13-67-19W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
11-7-83-22W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-13-79-25W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-14-87-4W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-26-62-18W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
2-11-72-24W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
2-22-87-5W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
3-2-97-11W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
3-6-79-24W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-11-82-2W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-18-69-21W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-30-66-20W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-32-71-23W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
5-33-89-5W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
6-10-62-16W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
6-15-76-24W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
7-6-67-20W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
7-33-68-21W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
9-13-96-10W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
10-23-65-20W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
13-3-63-16W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
14-17-74-23W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
14-34-80-1W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-10-75-25W5	0		433	570	420	240	1.05	1.065	1.055		0	0	0	0
4-36-77-1W6	0		433	570	420	240	1.05	1.065	1.055		0	0	0	0

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
7-23-83-3W6	0		433	570	420	240	1.05	1.065	1.055		0	0	0	0
1-24-63-20W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
3-34-58-16W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
4-20-66-22W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-21-76-26W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-24-85-5W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-29-79-2W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-35-77-2W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
11-10-91-8W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
14-20-78-1W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
C-57-G/94-H-15	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
D-31-L/94-I-3	1	2.32	435	550	400	225	1.065	1.08	1.062	2.66910318	1180472.805	1805680.331	441923.5416	3428076.677
1-26-74-1W6	0		436	530	385	217	1.07	1.09	1.068		0	0	0	0
5-4-78-2W6	0		436	530	385	217	1.07	1.09	1.068		0	0	0	0
3-32-80-3W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
4-24-68-25W5	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
6-23-75-2W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
6-32-71-26W5	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
13-19-81-4W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
15-16-80-4W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
2-2-77-3W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
2-21-92-10W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
4-28-74-2W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
9-25-73-2W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
9-36-89-9W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
11-34-78-4W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
14-6-85-6W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
1-15-85-9W6	2	2.85	440	440	320	185	1.19	1.19	1.1	2.58215016	10032434.21	11034276.46	2331371.736	23398082.41
1-20-79-5W6	2.2	2.67	440	440	320	185	1.19	1.19	1.1	2.620494882	10492216.14	11539972.37	2438217.451	24470405.96
2-11-76-4W6	1.2	2.23	440	440	320	185	1.19	1.19	1.1	2.556218833	4662663.887	5128279.066	1083525.949	10874468.9
2-13-65-24W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
3-3-75-4W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
4-25-72-3W6	1	2.65	440	440	320	185	1.19	1.19	1.1	2.54418004	4595615.502	5054535.206	1067945.014	10718095.72
6-13-80-6W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
6-21-76-5W6	3.2	2.45	440	440	320	185	1.19	1.19	1.1	2.59428125	13863825.72	15248272	3221723.736	32333821.45
6-28-73-3W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
7-8-89-10W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
8-4-63-20W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
8-24-65-25W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
10-11-64-21W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
10-32-62-21W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
14-15-87-10W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
15-7-82-7W6	1.8	2.7	440	440	320	185	1.19	1.19	1.1	2.650274978	8779649.456	9656388.193	2040245.284	20476282.93
C-2-A/94-H-8	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
6-7-71-3W6	0		442	370	280	167	1.29	1.24	1.13		0	0	0	0
3-33-82-10W6	17.4	2.41	442.5	350	270	162	1.305	1.25	1.135	2.65015	129798685.4	118771673.2	23733397.48	272303756
6-3-70-2W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
6-10-84-10W6	0.2	2.23	442.5	350	270	162	1.305	1.25	1.135	2.6684316	1390030.984	1271941.278	254164.0368	2916136.298
6-12-85-10W6	6.6	2.61	442.5	350	270	162	1.305	1.25	1.135	2.621763625	52748671.18	48267422.09	9644975.804	110661069.1
9-26-80-8W6	0.8	2.37	442.5	350	270	162	1.305	1.25	1.135	2.669175	5910836.256	5408682.761	1080783.106	12400302.12
11-15-83-8W6	2	2.25	442.5	350	270	162	1.305	1.25	1.135	2.59215001	13624048.84	12466621.45	2491126.666	28581796.96
11-16-87-11W6	3.4	2.31	442.5	350	270	162	1.305	1.25	1.135	2.6	23850516.69	21824302.5	4361013.297	50035832.49

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
11-19-79-7W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
13-1-86-11W6	27.8	2.54	442.5	350	270	162	1.305	1.25	1.135	2.623456683	216364476.1	197983290.6	39561757.48	453909524.1
15-10-94-13W6	2.6	2.38	442.5	350	270	162	1.305	1.25	1.135	2.531814492	18298510.24	16743965.26	3345841.414	38388316.92
C-13-H/94-A-16	9.6	2.56	442.5	350	270	162	1.305	1.25	1.135	2.654158325	76185368.24	69713060.9	13930323.11	159828752.3
C-74-I/94-A-16	1.4	2.26	442.5	350	270	162	1.305	1.25	1.135	2.581117229	9538448.77	8728112.436	1744083.889	20010645.1
6-8-81-9W6	55.2	2.73	443	335	260	160	1.33	1.26	1.14	2.651661818	504197167.4	453140536.5	87463316.25	1044801020
3-13-66-1W6	0.8	2.33	445	280	225	140	1.4	1.3	1.17	2.6	7772850.176	6662588.4	1306434.355	15741872.93
3-29-78-9W6	2.6	2.41	445	280	225	140	1.4	1.3	1.17	2.67936	26926660.88	23080498.7	4525742.043	54532901.62
4-2-70-5W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
4-2-75-7W6	2	2.63	445	280	225	140	1.4	1.3	1.17	2.66897	22515960.44	19299815.83	3784406.44	45600182.71
5-21-69-3W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
5-28-61-21W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
6-12-61-20W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
6-34-82-11W6	6.4	2.61	445	280	225	140	1.4	1.3	1.17	2.621596884	70234005	60201889.45	11804693.9	142240588.4
7-11-64-25W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
7-30-83-12W6	14.8	2.55	445	280	225	140	1.4	1.3	1.17	2.60191781	157491279.1	134995470.8	26470601.26	318957351.2
11-9-73-6W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
15-30-56-16W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
16-16-82-12W6	6.4	2.35	445	280	225	140	1.4	1.3	1.17	2.6334875	63524336.58	54450619.59	10676955.53	128651911.7
B-60-L/94-H-10	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
C-43-H/94-H-7	9	2.52	445	280	225	140	1.4	1.3	1.17	2.677574031	97396999.58	83484964.32	16370158.11	197252122
C-75-J/94-A-9	13.6	2.49	445	280	225	140	1.4	1.3	1.17	2.668264301	144919938.8	124219801.1	24357652.92	293497392.9
C-82-F/94-H-1	14.6	2.51	445	280	225	140	1.4	1.3	1.17	2.663624648	156552729.1	134190981.9	26312852.96	317056563.9
D-54-F/94-A-16	8.4	2.45	445	280	225	140	1.4	1.3	1.17	2.642197624	87211088.84	74753993.15	14658144.7	176623226.7
B-71-F/94-H-11	24.8	2.42	447	240	197	120	1.45	1.32	1.19	2.620292358	293880200	245673883.2	50302899.96	589856983.2
6-7-78-10W6	20.2	2.37	447.5	227	190	118	1.47	1.33	1.197	2.632206925	247359694.6	203632766.6	41124768.5	492117229.6

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
9-28-67-4W6	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
11-17-80-11W6	18	2.59	447.5	227	190	118	1.47	1.33	1.197	2.668719639	244221792.2	201049565.9	40603076.77	485874434.8
12-21-82-14W6	19.2	2.4	447.5	227	190	118	1.47	1.33	1.197	2.621573511	237128472.6	195210165.5	39423777.42	471762415.5
A-44-J/94-H-13	0.6	2.21	447.5	227	190	118	1.47	1.33	1.197	2.6	6767465.73	5571149.22	1125124.536	13463739.49
A-62-K/94-H-2	24.4	2.39	447.5	227	190	118	1.47	1.33	1.197	2.63463032	301589769.9	248276338.3	50140785.84	600006894.1
B-66-C/94-H-6	19.4	2.44	447.5	227	190	118	1.47	1.33	1.197	2.667388838	247848947.5	204035532	41206109.21	493090588.7
C-98-H/94-H-2	46.6	2.82	447.5	227	190	118	1.47	1.33	1.197	2.620712942	676026423.9	556522076.9	112392725.2	1344941226
D-93-J/94-J-1			447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
5-7-59-20W5	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
6-3-68-4W6	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
6-14-77-11W6	5.8	2.39	450	190	160	100	1.51	1.35	1.222	2.644096538	81235719.75	66799119.67	13759277.17	161794116.6
7-12-87-17W6	17.6	2.48	450	190	160	100	1.51	1.35	1.222	2.657998875	257136052.3	211439770.4	43552346.5	512128169.2
7-23-59-21W5	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
7-34-83-15W6	47.4	2.56	450	190	160	100	1.51	1.35	1.222	2.648454011	712286271.3	585704121.5	120643286.7	1418633679
9-25-64-27W5	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
11-34-86-16W6	30.2	2.54	450	190	160	100	1.51	1.35	1.222	2.644512238	449603901.6	369703683.5	76151534.3	895459119.4
B-4-D/94-H-13	33.4	2.58	450	190	160	100	1.51	1.35	1.222	2.687336531	513253665.1	422042090.6	86932195.08	1022227951
C-24-F/94-H-3	13.6	2.74	450	190	160	100	1.51	1.35	1.222	2.623969519	216716554.6	178203321.3	36706305.45	431626181.4
A-10-J/94-B-9	39.4	2.8	475	60	47	30	1.565	1.44	1.304	2.621974381	875132525.8	774119049.3	166567149.3	1815818724
C-74-J/94-A-14	28	2.64	450	190	160	100	1.51	1.35	1.222	2.642859937	432992063.9	356043976.4	73337908.96	862373949.3
D-8-H/94-A-14	34.8	2.53	452	168	144	90	1.525	1.365	1.245	2.559618221	531510165.8	437428631.5	91578696.95	1060517494
2-16-57-21W5	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
2-30-54-18W5	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
6-22-57-20W5	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
6-30-83-16W6	55	2.57	455	140	122	78	1.54	1.38	1.265	2.653948543	951370958.9	787402177.6	165825552.6	1904598689
7-11-74-10W6	55.2	2.68	455	140	122	78	1.54	1.38	1.265	2.660319689	998089023.8	826068384.2	173968589.6	1998125998

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
10-18-79-14W6	42	2.49	455	140	122	78	1.54	1.38	1.265	2.630157154	697576618.3	577349290.7	121588773.7	1396514683
15-28-77-13W6	68.4	2.63	455	140	122	78	1.54	1.38	1.265	2.633992985	1201677815	994568647.8	209454457.1	2405700920
A-26-A/94-G-9	23.8	2.54	455	140	122	78	1.54	1.38	1.265	2.627636355	402844570.6	333414310.3	70216483.81	806475364.7
C-12-A/94-J-7	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
10-29-88-20W6	56.4	2.61	457.5	122	110	70	1.543	1.39	1.275	2.658149822	1033179823	856632259.4	181996938	2071809020
1-18-60-24W5	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
4-11-64-2W6	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
4-30-75-12W6	25.8	2.64	460	112	97	60	1.548	1.4	1.282	2.62589	483697638.5	409022629.7	88047983.01	980768251.3
5-14-62-27W5	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
6-26-82-18W6	52	2.6	460	112	97	60	1.548	1.4	1.282	2.640545017	965481758	816427156.5	175747646.2	1957656561
7-35-68-7W6	12.6	2.53	460	112	97	60	1.548	1.4	1.282	2.649385173	228407296.2	193144943.2	41577217.11	463129456.5
11-31-53-20W5	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
12-13-63-2W6	0.4	2.38	460	112	97	60	1.548	1.4	1.282	2.6	6693975.236	5660534.88	1218511.258	13573021.37
12-34-62-1W6	0.6	2.3	460	112	97	60	1.548	1.4	1.282	2.6783667	9995923.602	8452716.393	1819568.345	20268208.34
B-55-K/94-G-9	31.4	2.62	460	112	97	60	1.548	1.4	1.282	2.652099955	590057904.5	498962609.2	107408852.6	1196429366
B-92-G/94-J-2	23	2.47	460	112	97	60	1.548	1.4	1.282	2.64804605	406840451.4	344030936	74057589.49	824928976.9
A-79-B/94-H-4	22.2	2.72	460	112	97	60	1.548	1.4	1.282	2.607087387	425746682	360018353.7	77499110.27	863264146
4-26-85-20W6	56.2	2.89	462.5	100	88	55	1.552	1.41	1.288	2.620871883	1182564120	1004741906	215799732.9	2403105759
5-30-65-6W6	0		462.5	100	88	55	1.552	1.41	1.288		0	0	0	0
11-26-82-20W6	81.6	2.8	462.5	100	88	55	1.552	1.41	1.288	2.617439734	1661382490	1411560339	303176708.6	3376119537
12-12-84-21W6	79.8	2.87	462.5	100	88	55	1.552	1.41	1.288	2.642304001	1681172659	1428374659	306788109.6	3416335428
13-14-80-18W6	51.2	2.72	462.5	100	88	55	1.552	1.41	1.288	2.584433853	999882653.4	849530259.1	182463179.7	2031876092
16-10-87-22W6	21	2.64	462.5	100	88	55	1.552	1.41	1.288	2.611198102	402168258.8	341694201.8	73389511.3	817251971.9
C-1-C/94-J-7	0		462.5	100	88	55	1.552	1.41	1.288		0	0	0	0
2-26-58-25W5	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
5-8-60-26W5	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
5-9-63-5W6	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
7-6-57-23W5	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
7-32-69-12W6	52.2	2.82	465	90	80	48	1.56	1.42	1.291		0	0	0	0
7-33-61-4W6	1	2.54	465	90	80	48	1.56	1.42	1.291	2.69584474	19503223.35	16626967.5	3598254.897	39728445.75
10-19-66-9W6	24	2.84	465	90	80	48	1.56	1.42	1.291	2.667494993	517858365	441486725.1	95542483.64	1054887574
A-85-A/94-G-15	2.4	2.38	465	90	80	48	1.56	1.42	1.291	2.677358342	43558458.46	37134634.63	8036335.001	88729428.09
C-18-D/94-G-9	89.4	3.03	465	90	80	48	1.56	1.42	1.291	2.65904254	2051555327	1749000314	378502510.6	4179058151
D-3-F/94-G-8	32	2.62	465	90	80	48	1.56	1.42	1.291	2.608985106	623018109.4	531137939.3	114943972.2	1269100021
D-6-H/93-P-10	100	2.9	465	90	80	48	1.56	1.42	1.291	2.622402461	2166083244	1846638120	399632383.8	4412353747
D-33-L/94-J-2	2.2	2.45	465	90	80	48	1.56	1.42	1.291	2.615672718	40155955.93	34233919.3	7408588.954	81798464.19
D-39-F/93-P-9	69.8	2.73	465	90	80	48	1.56	1.42	1.291	2.630106919	1427477510	1216958948	263363027.1	2907799484
D-75-F/93-P-8	45.6	2.78	465	90	80	48	1.56	1.42	1.291	2.626215579	948238998.9	808396578.2	174945728.7	1931581306
D-82-K/94-G-15	24.4	2.7	465	90	80	48	1.56	1.42	1.291	2.63844596	495084802.5	422071714.7	91340866.22	1008497383
2-11-55-26W5	0.6	2.3	470	72	60	36	1.565	1.43	1.296	2.752689033	11237443.73	9777881.769	2117339.442	23132664.94
4-35-67-13W6	28.8	2.62	470	72	60	36	1.565	1.43	1.296	2.66442	594740830.7	517493628	112060024.4	1224294483
5-7-54-23W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
A-45-F/93-P-7	77.2	2.91	475	60	47	30	1.565	1.44	1.304	2.597829565	1765680305	1561874023	336068339.7	3663622668
5-7-56-24W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
6-14-58-1W6	0.6	2.15	470	72	60	36	1.565	1.43	1.296	2.607266667	9949619.069	8657324.676	1874689.777	20481633.52
10-25-70-14W6	73.4	2.89	470	72	60	36	1.565	1.43	1.296	2.625189946	1647350174	1433386063	310390830.9	3391127068
12-36-53-23W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
14-3-57-26W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
16-31-80-21W6	79.8	2.91	470	72	60	36	1.565	1.43	1.296	2.591988675	1780574999	1549307141	335492818.8	3665374959
D-83-L/94-A-12	97.8	2.81	470	72	60	36	1.565	1.43	1.296	2.666573671	2167854112	1886284969	408463270.2	4462602351
5-5-83-24W6	65.4	3.03	475	60	47	30	1.565	1.44	1.304	2.613402413	1566815261	1385963274	298217634.3	3250996169
6-3-82-24W6	85	2.95	475	60	47	30	1.565	1.44	1.304	2.633482589	1997848360	1767243735	380257728.2	4145349823

In-place Resource Calculation of Montney Source Rock with 4>TOC%≥2 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
7-18-52-24W5	0		475	60	47	30	1.565	1.44	1.304		0	0	0	0
7-31-60-5W6	1	2.16	475	60	47	30	1.565	1.44	1.304	2.6829862	17533286.06	15509480.37	3337173.96	36379940.39
8-29-64-10W6	28	2.81	475	60	47	30	1.565	1.44	1.304	2.6930712	641066843.1	567070747	122016578.6	1330154169
16-2-78-22W6	68	2.96	475	60	47	30	1.565	1.44	1.304	2.583224811	1573091395	1391514976	299412193.7	3264018564
16-36-83-25W6	81.2	2.89	475	60	47	30	1.565	1.44	1.304	2.626283912	1864604266	1649379539	354896896.4	3868880702
A-10-J/94-B-9	46.6	2.77	475	60	47	30	1.565	1.44	1.304	2.629617809	1026950348	908413073.3	195463186.4	2130826608
A-31-B/94-B-15	127	2.88	475	60	47	30	1.565	1.44	1.304	2.653447162	2936282124	2597357382	558873231.8	6092512738
A-45-F/93-P-7	77.6	2.92	475	60	47	30	1.565	1.44	1.304	2.59884613	1781624876	1575978169	339103127.9	3696706173
B-92-F/93-P-1	56.6	2.96	475	60	47	30	1.565	1.44	1.304	2.628767036	1332451380	1178651193	253610306.3	2764712879
C-95-B/93-P-1	77.6	3	475	60	47	30	1.565	1.44	1.304	2.626432968	1849866661	1636343044	352091834.4	3838301539
D-8-F/94-B-16	21.4	2.75	475	60	47	30	1.565	1.44	1.304	2.60973228	464658143.6	411024284.7	88440070.64	964122498.9
D-67-J/94-B-9	43.2	2.88	475	60	47	30	1.565	1.44	1.304	2.625397396	988239965	874170893.8	188095298.7	2050506158
A-1-J/94-B-9	101.8	2.68	475	60	47	30	1.565	1.44	1.304	2.631093898	2171751088	1921073481	413357265.4	4506181834
B-62-I/94-B-8	38	2.69	475	60	47	30	1.565	1.44	1.304	2.62323289	811267080.8	717625368.6	154411407.4	1683303857

In-place Resource Calculation of Montney Source Rock with TOC % ≥4

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
1-2-88-1W6	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-16-81-22W5	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-23-84-24W5	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
7-29-94-5W6	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
16-20-87-23W5	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
D-69-F/94-I-1	0		420	600	460	260	1.02	1.035	1.04		0	0	0	0
1-5-75-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-6-77-22W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-18-77-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-18-79-23W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-19-79-22W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-20-75-19W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-27-80-24W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-28-65-17W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-36-69-19W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-8-80-23W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-25-78-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
2-36-75-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
4-16-74-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
5-14-77-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
6-14-69-20W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
7-9-68-18W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
7-20-68-17W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
8-9-73-21W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
8-20-71-18W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
9-2-89-4W6	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
9-9-85-24W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
10-13-67-19W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
11-7-83-22W5	0		425	600	460	260	1.04	1.042	1.045		0	0	0	0
1-13-79-25W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-14-87-4W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-26-62-18W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
2-11-72-24W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
2-22-87-5W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
3-2-97-11W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
3-6-79-24W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-11-82-2W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-18-69-21W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-30-66-20W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
4-32-71-23W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
5-33-89-5W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
6-10-62-16W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
6-15-76-24W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
7-6-67-20W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
7-33-68-21W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
9-13-96-10W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
10-23-65-20W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
13-3-63-16W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
14-17-74-23W5	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
14-34-80-1W6	0		430	590	445	250	1.045	1.052	1.05		0	0	0	0
1-10-75-25W5	0		433	570	420	240	1.05	1.065	1.055		0	0	0	0
4-36-77-1W6	0		433	570	420	240	1.05	1.065	1.055		0	0	0	0

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
7-23-83-3W6	0		433	570	420	240	1.05	1.065	1.055		0	0	0	0
1-24-63-20W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
3-34-58-16W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
4-20-66-22W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-21-76-26W5	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-24-85-5W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-29-79-2W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
6-35-77-2W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
11-10-91-8W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
14-20-78-1W6	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
C-57-G/94-H-15	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
D-31-L/94-I-3	0		435	550	400	225	1.065	1.08	1.062		0	0	0	0
1-26-74-1W6	0		436	530	385	217	1.07	1.09	1.068		0	0	0	0
5-4-78-2W6	0		436	530	385	217	1.07	1.09	1.068		0	0	0	0
3-32-80-3W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
4-24-68-25W5	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
6-23-75-2W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
6-32-71-26W5	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
13-19-81-4W6			437	510	370	210	1.085	1.11	1.073		0	0	0	0
15-16-80-4W6	0		437	510	370	210	1.085	1.11	1.073		0	0	0	0
2-2-77-3W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
2-21-92-10W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
4-28-74-2W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
9-25-73-2W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
9-36-89-9W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
11-34-78-4W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
14-6-85-6W6	0		437.5	502	360	207	1.09	1.12	1.077		0	0	0	0
1-15-85-9W6	0.6	5.59	440	440	320	185	1.19	1.19	1.1	2.5548374	5840853.24	6424122.802	1357317.66	13622293.71
1-20-79-5W6	0.4	8.84	440	440	320	185	1.19	1.19	1.1	2.55327905	6154042.75	6768587.522	1430097.72	14352728
2-11-76-4W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
2-13-65-24W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
3-3-75-4W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
4-25-72-3W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
6-13-80-6W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
6-21-76-5W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
6-28-73-3W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
7-8-89-10W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
8-4-63-20W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
8-24-65-25W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
10-11-64-21W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
10-32-62-21W5	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
14-15-87-10W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
15-7-82-7W6	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
C-2-A/94-H-8	0		440	440	320	185	1.19	1.19	1.1		0	0	0	0
6-7-71-3W6	0		442	370	280	167	1.29	1.24	1.13		0	0	0	0
3-33-82-10W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
6-3-70-2W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
6-10-84-10W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
6-12-85-10W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
9-26-80-8W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
11-15-83-8W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
11-16-87-11W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
11-19-79-7W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
13-1-86-11W6	0.6	5.45	442.5	350	270	162	1.305	1.25	1.135	2.6006268	9932517.374	9088703.048	1816138.45	20837358.87
15-10-94-13W6	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
C-13-H/94-A-16	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
C-74-I/94-A-16	0		442.5	350	270	162	1.305	1.25	1.135		0	0	0	0
6-8-81-9W6	3.4	5.26	443	335	260	160	1.33	1.26	1.14	2.66064706	60038864.63	53959135.61	10414969.7	124412969.9
3-13-66-1W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
3-29-78-9W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
4-2-70-5W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
4-2-75-7W6	0.8	8	445	280	225	140	1.4	1.3	1.17	2.65861	27289504.4	23391514.22	4586727.56	55267746.18
5-21-69-3W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
5-28-61-21W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
6-12-61-20W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
6-34-82-11W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
7-11-64-25W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
7-30-83-12W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
11-9-73-6W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
15-30-56-16W5	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
16-16-82-12W6	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
B-60-L/94-H-10	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
C-43-H/94-H-7			445	280	225	140	1.4	1.3	1.17		0	0	0	0
C-75-J/94-A-9	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
C-82-F/94-H-1	0		445	280	225	140	1.4	1.3	1.17		0	0	0	0
D-54-F/94-A-16	1.2	6.51	445	280	225	140	1.4	1.3	1.17	2.60768333	32672181.01	28005337.72	5491429.63	66168948.36
B-71-F/94-H-11	0		447	240	197	120	1.45	1.32	1.19		0	0	0	0
6-7-78-10W6	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
9-28-67-4W6	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
11-17-80-11W6	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
12-21-82-14W6	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
A-44-J/94-H-13	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
A-62-K/94-H-2	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
B-66-C/94-H-6	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
C-98-H/94-H-2	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
D-93-J/94-J-1	0		447.5	227	190	118	1.47	1.33	1.197		0	0	0	0
5-7-59-20W5	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
6-3-68-4W6	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
6-14-77-11W6	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
7-12-87-17W6	0.6	4.65	450	190	160	100	1.51	1.35	1.222	2.75376663	17028451.92	14002283.73	2884189.25	33914924.9
7-23-59-21W5	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
7-34-83-15W6	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
9-25-64-27W5	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
11-34-86-16W6	0.4	6.22	450	190	160	100	1.51	1.35	1.222	2.65955655	14665721.58	12059440.03	2484002.46	29209164.07
B-4-D/94-H-13	0		450	190	160	100	1.51	1.35	1.222		0	0	0	0
C-24-F/94-H-3	1	4.86	450	190	160	100	1.51	1.35	1.222	2.60405692	28049851.92	23065043.56	4750935.77	55865831.25
A-10-J/94-B-9	7.6	7.34	475	60	47	30	1.565	1.44	1.304	2.59651733	438219809.7	387637634.9	83407966.6	909265411.2
C-74-J/94-A-14	5.8	5.24	450	190	160	100	1.51	1.35	1.222	2.63372147	177407899.8	145880304.4	30048413.1	353336617.3
D-8-H/94-A-14	1.2	8.49	452	168	144	90	1.525	1.365	1.245	2.56575542	61651096.88	50738361.51	10622425.5	123011883.9
2-16-57-21W5	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
2-30-54-18W5	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
6-22-57-20W5	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
6-30-83-16W6	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
7-11-74-10W6	2.6	4.97	455	140	122	78	1.54	1.38	1.265	2.64349188	86630196.07	71699482.09	15099788.4	173429466.5

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
10-18-79-14W6	1.6	6.47	455	140	122	78	1.54	1.38	1.265	2.64047501	69321492.49	57373933.51	12082852.3	138778278.3
15-28-77-13W6	1.4	4.61	455	140	122	78	1.54	1.38	1.265	2.62315716	42935334.51	35535429.76	7483700.76	85954465.03
A-26-A/94-G-9	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
C-12-A/94-J-7	0		455	140	122	78	1.54	1.38	1.265		0	0	0	0
10-29-88-20W6	0		457.5	122	110	70	1.543	1.39	1.275		0	0	0	0
1-18-60-24W5	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
4-11-64-2W6	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
4-30-75-12W6	0.6	4.72	460	112	97	60	1.548	1.4	1.282	2.62564	20109544.52	17004959.56	3660561.25	40775065.34
5-14-62-27W5	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
6-26-82-18W6	0.6	5.76	460	112	97	60	1.548	1.4	1.282	2.64112997	24685237.59	20874240.42	4493479.41	50052957.42
7-35-68-7W6	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
11-31-53-20W5	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
12-13-63-2W6	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
12-34-62-1W6	0		460	112	97	60	1.548	1.4	1.282		0	0	0	0
B-55-K/94-G-9	3.8	6.1	460	112	97	60	1.548	1.4	1.282	2.5948406	162666424.6	137553387.6	29610338.1	329830150.3
B-92-G/94-J-2	1	5.01	460	112	97	60	1.548	1.4	1.282	2.63062826	35642734.22	30140078.68	6488083.89	72270896.79
A-79-B/94-H-4	7	7.47	460	112	97	60	1.548	1.4	1.282	2.58795715	365973406.4	309473094.7	66618518.9	742065019.9
4-26-85-20W6	15	8.38	462.5	100	88	55	1.552	1.41	1.288	2.58956667	904288738.4	768310804.9	165018763	1837618306
5-30-65-6W6	0		462.5	100	88	55	1.552	1.41	1.288		0	0	0	0
11-26-82-20W6	17.6	6.44	462.5	100	88	55	1.552	1.41	1.288	2.59692881	817717565.8	694757342.9	149220858	1661695766
12-12-84-21W6	20.6	8.91	462.5	100	88	55	1.552	1.41	1.288	2.60702213	1329334847	1129442713	242583129	2701360690
13-14-80-18W6	15	7.46	462.5	100	88	55	1.552	1.41	1.288	2.57681732	801047862.3	680594263.4	146178894	1627821019
16-10-87-22W6	11.4	7.21	462.5	100	88	55	1.552	1.41	1.288	2.5813421	589427547.3	500795303.6	107561446	1197784297
C-1-C/94-J-7	0		462.5	100	88	55	1.552	1.41	1.288		0	0	0	0
2-26-58-25W5	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
5-8-60-26W5	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
5-9-63-5W6	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
7-6-57-23W5	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
7-32-69-12W6	9.6	7.43	465	90	80	48	1.56	1.42	1.291	2.6	528215566.7	450316489	97453339.7	1075985395
7-33-61-4W6	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
10-19-66-9W6	6.6	5.69	465	90	80	48	1.56	1.42	1.291	2.66277272	284818439.5	242814577.6	52547690.5	580180707.6
A-85-A/94-G-15	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
C-18-D/94-G-9	22.4	5.14	465	90	80	48	1.56	1.42	1.291	2.66295983	873280078.2	744492293.5	161116153	1778888525
D-3-F/94-G-8	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
D-6-H/93-P-10	33.4	6.41	465	90	80	48	1.56	1.42	1.291	2.61038209	1591792223	1357041197	293678335	3242511755
D-33-L/94-J-2	0		465	90	80	48	1.56	1.42	1.291		0	0	0	0
D-39-F/93-P-9	19.8	6.75	465	90	80	48	1.56	1.42	1.291	2.60185845	990445152	844378339.9	182732570	2017556061
D-75-F/93-P-8	12.8	7.37	465	90	80	48	1.56	1.42	1.291	2.6202531	704041894	600212666.5	129892487	1434147048
D-82-K/94-G-15	1	8.76	465	90	80	48	1.56	1.42	1.291	2.5967044	64789469.08	55234582.39	11953358.7	131977410.2
2-11-55-26W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
4-35-67-13W6	3	6.27	470	72	60	36	1.565	1.43	1.296	2.65156	147543997.4	128380421.4	27799981.2	303724400
5-7-54-23W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
A-45-F/93-P-7	30.4	6.05	475	60	47	30	1.565	1.44	1.304	2.57755318	1434259455	1268707919	272987807	2975955181
5-7-56-24W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
6-14-58-1W6	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
10-25-70-14W6	31.2	7.12	470	72	60	36	1.565	1.43	1.296	2.59853462	1707632398	1485838602	321749102	3515220102
12-36-53-23W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
14-3-57-26W5	0		470	72	60	36	1.565	1.43	1.296		0	0	0	0
16-31-80-21W6	55	7.34	470	72	60	36	1.565	1.43	1.296	2.55100644	3046502901	2650811509	574016734	6271331144
D-83-L/94-A-12	18.4	6.41	470	72	60	36	1.565	1.43	1.296	2.62537935	916007878.3	797033288.7	172592598	1885633765
5-5-83-24W6	55.6	7.31	475	60	47	30	1.565	1.44	1.304	2.57873683	3170956755	2804944344	603539706	6579440805
6-3-82-24W6	50.4	7.8	475	60	47	30	1.565	1.44	1.304	2.59675896	3088502142	2732007178	587845820	6408355141

In-place Resource Calculation of Montney Source Rock with TOC % ≥4 (continued)

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total
7-18-52-24W5	0		475	60	47	30	1.565	1.44	1.304		0	0	0	0
7-31-60-5W6	0		475	60	47	30	1.565	1.44	1.304		0	0	0	0
8-29-64-10W6	5.4	5.65	475	60	47	30	1.565	1.44	1.304	2.69123396	248418989.2	219744857	47282487.7	515446333.8
16-2-78-22W6	52.6	6.82	475	60	47	30	1.565	1.44	1.304	2.55014879	2767749416	2448277813	526795790	5742823019
16-36-83-25W6	30.4	7.25	475	60	47	30	1.565	1.44	1.304	2.61216667	1741821321	1540768999	331527173	3614117493
A-10-J/94-B-9	12.4	6.67	475	60	47	30	1.565	1.44	1.304	2.59276325	648786059.8	573898961.6	123485805	1346170826
A-31-B/94-B-15	35.8	6.53	475	60	47	30	1.565	1.44	1.304	2.62947025	1859754415	1645089489	353973807	3858817711
A-45-F/93-P-7	30.4	6.05	475	60	47	30	1.565	1.44	1.304	2.57755329	1434259515	1268707972	272987818	2975955304
B-92-F/93-P-1	28.4	7.22	475	60	47	30	1.565	1.44	1.304	2.57207717	1595624367	1411447045	303700976	3310772388
C-95-B/93-P-1	52	7.16	475	60	47	30	1.565	1.44	1.304	2.60406504	2933319178	2594736439	558309284	6086364902
D-8-F/94-B-16	7.6	8	475	60	47	30	1.565	1.44	1.304	2.55069746	469195304.7	415037737.2	89303645	973536686.8
D-67-J/94-B-9	8.2	6.58	475	60	47	30	1.565	1.44	1.304	2.5975904	424034844.2	375089990.2	80708090.6	879832925
A-1-J/94-B-9	25.2	6.45	475	60	47	30	1.565	1.44	1.304	2.60925313	1283120952	1135014804	244221067	2662356823
B-62-I/94-B-8	4.8	5.21	475	60	47	30	1.565	1.44	1.304	2.6316422	199111769.1	176128996.3	37897665.5	413138430.9

In-place Resource (per square kilometer) Calculation of Montney Source Rock

UWI	Tmax (℃)	Resource (kg) with 2>TOC%≥1	Resource (kg) with 4>TOC%≥2	Resource (kg) with TOC%≥4	Total Resource (kg)	BOE	MBOE
1-2-88-1W6	420	0	0	0	0	0	0
7-16-81-22W5	420	0	0	0	0	0	0
7-23-84-24W5	420	0	0	0	0	0	0
7-29-94-5W6	420	0	0	0	0	0	0
16-20-87-23W5	420	0	0	0	0	0	0
D-69-F/94-I-1	420	0	0	0	0	0	0
1-5-75-21W5	425	0	0	0	0	0	0
1-6-77-22W5	425	0	0	0	0	0	0
1-18-77-21W5	425	0	0	0	0	0	0
1-18-79-23W5	425	0	0	0	0	0	0
1-19-79-22W5	425	0	0	0	0	0	0
1-20-75-19W5	425	0	0	0	0	0	0
1-27-80-24W5	425	0	0	0	0	0	0
1-28-65-17W5	425	0	0	0	0	0	0
1-36-69-19W5	425	0	0	0	0	0	0
2-8-80-23W5	425	0	0	0	0	0	0
2-25-78-21W5	425	0	0	0	0	0	0
2-36-75-20W5	425	0	0	0	0	0	0
4-16-74-20W5	425	0	0	0	0	0	0
5-14-77-20W5	425	0	0	0	0	0	0
6-14-69-20W5	425	0	0	0	0	0	0
7-9-68-18W5	425	0	0	0	0	0	0
7-20-68-17W5	425	0	0	0	0	0	0
8-9-73-21W5	425	0	0	0	0	0	0
8-20-71-18W5	425	0	0	0	0	0	0
9-2-89-4W6	425	0	0	0	0	0	0
9-9-85-24W5	425	0	0	0	0	0	0
10-13-67-19W5	425	0	0	0	0	0	0
11-7-83-22W5	425	0	0	0	0	0	0
1-13-79-25W5	430	0	0	0	0	0	0
1-14-87-4W6	430	0	0	0	0	0	0
1-26-62-18W5	430	0	0	0	0	0	0
2-11-72-24W5	430	0	0	0	0	0	0
2-22-87-5W6	430	0	0	0	0	0	0
3-2-97-11W6	430	0	0	0	0	0	0
3-6-79-24W5	430	0	0	0	0	0	0
4-11-82-2W6	430	0	0	0	0	0	0
4-18-69-21W5	430	0	0	0	0	0	0
4-30-66-20W5	430	253540.799	0	0	253540.799	1878.079993	2

In-place Resource (per square kilometer) Calculation of Montney Source Rock (continued)

UWI	Tmax (℃)	Resource (kg) with 2>TOC%≥1	Resource (kg) with 4>TOC%≥2	Resource (kg) with TOC%≥4	Total Resource (kg)	BOE	MBOE
4-32-71-23W5	430	0	0	0	0	0	0
5-33-89-5W6	430	0	0	0	0	0	0
6-10-62-16W5	430	0	0	0	0	0	0
6-15-76-24W5	430	1768532.33	0	0	1768532.331	13100.23949	13
7-6-67-20W5	430	0	0	0	0	0	0
7-33-68-21W5	430	0	0	0	0	0	0
9-13-96-10W6	430	0	0	0	0	0	0
10-23-65-20W5	430	0	0	0	0	0	0
13-3-63-16W5	430	0	0	0	0	0	0
14-17-74-23W5	430	0	0	0	0	0	0
14-34-80-1W6	430	0	0	0	0	0	0
1-10-75-25W5	433	0	0	0	0	0	0
4-36-77-1W6	433	0	0	0	0	0	0
7-23-83-3W6	433	4217176.34	0	0	4217176.339	31238.34325	31
1-24-63-20W5	435	0	0	0	0	0	0
3-34-58-16W5	435	0	0	0	0	0	0
4-20-66-22W5	435	0	0	0	0	0	0
6-21-76-26W5	435	0	0	0	0	0	0
6-24-85-5W6	435	7619707.24	0	0	7619707.242	56442.27587	56
6-29-79-2W6	435	3880404.24	0	0	3880404.242	28743.73513	29
6-35-77-2W6	435	16384490.1	0	0	16384490.13	121366.5936	121
11-10-91-8W6	435	6110879.17	0	0	6110879.169	45265.77162	45
14-20-78-1W6	435	2972022.56	0	0	2972022.562	22014.98194	22
C-57-G/94-H-15	435	0	0	0	0	0	0
D-31-L/94-I-3	435	46423242.5	3428076.7	0	49851319.13	369269.0306	369
1-26-74-1W6	436	0	0	0	0	0	0
5-4-78-2W6	436	16206629.8	0	0	16206629.77	120049.1094	120
3-32-80-3W6	437	26359593.7	0	0	26359593.68	195256.2495	195
4-24-68-25W5	437	11390436	0	0	11390436.02	84373.60018	84
6-23-75-2W6	437	6401910	0	0	6401910.001	47421.55557	47
6-32-71-26W5	437	39737256.7	0	0	39737256.65	294350.0493	294
13-19-81-4W6	437	1754942.67	0	0	1754942.669	12999.57532	13
15-16-80-4W6	437	79616083.1	0	0	79616083.15	589748.7641	590
2-2-77-3W6	437.5	65106659.4	0	0	65106659.42	482271.5512	482
2-21-92-10W6	437.5	0	0	0	0	0	0
4-28-74-2W6	437.5	8517018.54	0	0	8517018.542	63089.02624	63
9-25-73-2W6	437.5	32195128.7	0	0	32195128.71	238482.4349	238
9-36-89-9W6	437.5	0	0	0	0	0	0

In-place Resource (per square kilometer) Calculation of Montney Source Rock (continued)

UWI	Tmax (℃)	Resource (kg) with 2>TOC%≥1	Resource (kg) with 4>TOC%≥2	Resource (kg) with TOC%≥4	Total Resource (kg)	BOE	MBOE
11-34-78-4W6	437.5	23062218.1	0	0	23062218.08	170831.245	171
14-6-85-6W6	437.5	0	0	0	0	0	0
1-15-85-9W6	440	321967199	23398082	13622293.71	358987575.5	2659167.226	2659
1-20-79-5W6	440	383416986	24470406	14352728	422240119.6	3127704.589	3128
2-11-76-4W6	440	283554558	10874469	0	294429026.9	2180955.755	2181
2-13-65-24W5	440	0	0	0	0	0	0
3-3-75-4W6	440	95146737.8	0	0	95146737.8	704790.6504	705
4-25-72-3W6	440	99449908.8	10718096	0	110168004.5	816059.2926	816
6-13-80-6W6	440	156186625	0	0	156186624.6	1156937.96	1157
6-21-76-5W6	440	312467640	32333821	0	344801461.2	2554084.898	2554
6-28-73-3W6	440	23733960.8	0	0	23733960.81	175807.1171	176
7-8-89-10W6	440	27544332.5	0	0	27544332.52	204032.0928	204
8-4-63-20W5	440	0	0	0	0	0	0
8-24-65-25W5	440	0	0	0	0	0	0
10-11-64-21W5	440	0	0	0	0	0	0
10-32-62-21W5	440	0	0	0	0	0	0
14-15-87-10W6	440	77991220.4	0	0	77991220.4	577712.7437	578
15-7-82-7W6	440	370883850	20476283	0	391360132.4	2898963.944	2899
C-2-A/94-H-8	440	33231757.7	0	0	33231757.73	246161.1684	246
6-7-71-3W6	442	128162816	0	0	128162815.9	949354.1916	949
3-33-82-10W6	442.5	1113158062	272303756	0	1385461818	10262680.14	10263
6-3-70-2W6	442.5	0	0	0	0	0	0
6-10-84-10W6	442.5	508198805	2916136.3	0	511114941.4	3786036.603	3786
6-12-85-10W6	442.5	774400053	110661069	0	885061122.4	6556008.314	6556
9-26-80-8W6	442.5	251766822	12400302	0	264167124.3	1956793.514	1957
11-15-83-8W6	442.5	572032389	28581797	0	600614185.7	4448993.968	4449
11-16-87-11W6	442.5	962555886	50035832	0	1012591719	7500679.398	7501
11-19-79-7W6	442.5	304064891	0	0	304064891.4	2252332.529	2252
13-1-86-11W6	442.5	773130606	453909524	20837358.87	1247877489	9243536.958	9244
15-10-94-13W6	442.5	323209278	38388317	0	361597595.4	2678500.707	2679
C-13-H/94-A-16	442.5	642599217	159828752	0	802427968.8	5943910.88	5944
C-74-I/94-A-16	442.5	297161391	20010645	0	317172035.7	2349422.487	2349
6-8-81-9W6	443	1148683512	1044801020	124412969.9	2317897502	17169611.12	17170
3-13-66-1W6	445	267324362	15741873	0	283066235.3	2096786.928	2097
3-29-78-9W6	445	714678303	54532902	0	769211204.9	5697860.777	5698
4-2-70-5W6	445	292357607	0	0	292357606.7	2165611.902	2166
4-2-75-7W6	445	531875711	45600183	55267746.18	632743640.1	4686989.927	4687
5-21-69-3W6	445	108569668	0	0	108569667.6	804219.7603	804
5-28-61-21W5	445	27088446.6	0	0	27088446.56	200655.1597	201
6-12-61-20W5	445	23602192.5	0	0	23602192.47	174831.0553	175

In-place Resource (per square kilometer) Calculation of Montney Source Rock (continued)

UWI	Tmax (℃)	Resource (kg) with 2>TOC%≥1	Resource (kg) with 4>TOC%≥2	Resource (kg) with TOC%≥4	Total Resource (kg)	BOE	MBOE
6-34-82-11W6	445	1328248297	142240588	0	1470488885	10892510.26	10893
7-11-64-25W5	445	60654890.5	0	0	60654890.49	449295.4851	449
7-30-83-12W6	445	1659661623	318957351	0	1978618974	14656436.84	14656
11-9-73-6W6	445	130731863	0	0	130731863.2	968384.1717	968
15-30-56-16W5	445	0	0	0	0	0	0
16-16-82-12W6	445	1741083089	128651912	0	1869735000	13849888.89	13850
B-60-L/94-H-10	445	375371839	0	0	375371839.4	2780532.144	2781
C-43-H/94-H-7	445	622379449	197252122	0	819631570.8	6071344.969	6071
C-75-J/94-A-9	445	772925009	293497393	0	1066422402	7899425.199	7899
C-82-F/94-H-1	445	757963126	317056564	0	1075019689	7963108.811	7963
D-54-F/94-A-16	445	729898936	176623227	66168948.36	972691110.8	7205119.339	7205
B-71-F/94-H-11	447	1180121389	589856983	0	1769978372	13110950.91	13111
6-7-78-10W6	447.5	2146505016	492117230	0	2638622246	19545349.97	19545
9-28-67-4W6	447.5	194950074	0	0	194950074	1444074.622	1444
11-17-80-11W6	447.5	2403620984	485874435	0	2889495419	21403669.77	21404
12-21-82-14W6	447.5	2248211716	471762415	0	2719974132	20147956.53	20148
A-44-J/94-H-13	447.5	608244231	13463739	0	621707970.4	4605244.225	4605
A-62-K/94-H-2	447.5	1396764794	600006894	0	1996771688	14790901.39	14791
B-66-C/94-H-6	447.5	1201266878	493090589	0	1694357467	12550796.05	12551
C-98-H/94-H-2	447.5	1390840121	1344941226	0	2735781347	20265047.01	20265
D-93-J/94-J-1	447.5	426636053	0	0	426636052.6	3160267.056	3160
5-7-59-20W5	450	0	0	0	0	0	0
6-3-68-4W6	450	777265011	0	0	777265011.2	5757518.602	5758
6-14-77-11W6	450	1555222004	161794116.6	0	1717016120	12718637.93	12719
7-12-87-17W6	450	1662743112	512128169.2	33914924.9	2208786206	16361379.3	16361
7-23-59-21W5	450	0	0	0	0	0	0
7-34-83-15W6	450	2595966553	1418633679	0	4014600232	29737779.5	29738
9-25-64-27W5	450	61392074.2	0	0	61392074.22	454756.1053	455
11-34-86-16W6	450	2380773599	895459119.4	29209164.07	3305441882	24484754.68	24485
B-4-D/94-H-13	450	1702116582	1022227951	0	2724344532	20180329.87	20180
C-24-F/94-H-3	450	1553463976	431626181.4	55865831.25	2040955988	15118192.51	15118
A-10-J/94-B-9	475	3666392317	1815818724	909265411.2	6391476452	47344270.02	47344
C-74-J/94-A-14	450	1588515062	862373949.3	353336617.3	2804225628	20772041.69	20772
D-8-H/94-A-14	452	2251948984	1060517494	123011883.9	3435478363	25447987.87	25448
2-16-57-21W5	455	0	0	0	0	0	0
2-30-54-18W5	455	0	0	0	0	0	0
6-22-57-20W5	455	12064825.6	0	0	12064825.61	89369.07861	89
6-30-83-16W6	455	3327076809	1904598689	0	5231675498	38753151.84	38753
7-11-74-10W6	455	2250896824	1998125998	173429466.5	4422452288	32758905.84	32759

In-place Resource (per square kilometer) Calculation of Montney Source Rock (continued)

UWI	Tmax (℃)	Resource (kg) with 2>TOC%≥1	Resource (kg) with 4>TOC%≥2	Resource (kg) with TOC%≥4	Total Resource (kg)	BOE	MBOE
10-18-79-14W6	455	3441606777	1396514683	138778278.3	4976899739	36865923.99	36866
15-28-77-13W6	455	3068429726	2405700920	85954465.03	5560085110	41185815.63	41186
A-26-A/94-G-9	455	1073907239	806475364.7	0	1880382604	13928760.03	13929
C-12-A/94-J-7	455	287697496	0	0	287697496.2	2131092.565	2131
10-29-88-20W6	457.5	2659015572	2071809020	0	4730824592	35043145.13	35043
1-18-60-24W5	460	37594540	0	0	37594539.96	278478.0738	278
4-11-64-2W6	460	324441922	0	0	324441922.4	2403273.499	2403
4-30-75-12W6	460	2062988392	980768251.3	40775065.34	3084531709	22848383.03	22848
5-14-62-27W5	460	20614261.1	0	0	20614261.13	152698.2306	153
6-26-82-18W6	460	2863938154	1957656561	50052957.42	4871647672	36086279.05	36086
7-35-68-7W6	460	1883438361	463129456.5	0	2346567818	17381983.84	17382
11-31-53-20W5	460	33324714.4	0	0	33324714.37	246849.7361	247
12-13-63-2W6	460	46108352	13573021.37	0	59681373.39	442084.2473	442
12-34-62-1W6	460	170893504	20268208.34	0	191161711.9	1416012.681	1416
B-55-K/94-G-9	460	1946919781	1196429366	329830150.3	3473179298	25727254.06	25727
B-92-G/94-J-2	460	1394119929	824928976.9	72270896.79	2291319803	16972739.28	16973
A-79-B/94-H-4	460	2293289077	863264146	742065019.9	3898618243	28878653.65	28879
4-26-85-20W6	462.5	2802068338	2403105759	1837618306	7042792404	52168832.62	52169
5-30-65-6W6	462.5	472852113	0	0	472852113.5	3502608.248	3503
11-26-82-20W6	462.5	2773576187	3376119537	1661695766	7811391491	57862159.19	57862
12-12-84-21W6	462.5	2787630177	3416335428	2701360690	8905326295	65965379.96	65965
13-14-80-18W6	462.5	3026338591	2031876092	1627821019	6686035703	49526190.39	49526
16-10-87-22W6	462.5	2953254006	817251971.9	1197784297	4968290275	36802150.18	36802
C-1-C/94-J-7	462.5	180706338	0	0	180706338.2	1338565.468	1339
2-26-58-25W5	465	40727594.7	0	0	40727594.74	301685.887	302
5-8-60-26W5	465	77461131.6	0	0	77461131.59	573786.1599	574
5-9-63-5W6	465	37738573.9	0	0	37738573.87	279544.9917	280
7-6-57-23W5	465	0	0	0	0	0	0
7-32-69-12W6	465	2474096634	0	1075985395	3550082029	26296903.92	26297
7-33-61-4W6	465	174788915	39728445.75	0	214517360.5	1589017.485	1589
10-19-66-9W6	465	1745701368	1054887574	580180707.6	3380769649	25042738.14	25043
A-85-A/94-G-15	465	852066536	88729428.09	0	940795963.8	6968858.991	6969
C-18-D/94-G-9	465	2217812338	4179058151	1778888525	8175759014	60561177.88	60561
D-3-F/94-G-8	465	1852083822	1269100021	0	3121183842	23119880.31	23120
D-6-H/93-P-10	465	2789359913	4412353747	3242511755	10444225415	77364632.71	77365
D-33-L/94-J-2	465	1011697986	81798464.19	0	1093496450	8099973.703	8100
D-39-F/93-P-9	465	3100526321	2907799484	2017556061	8025881867	59450976.79	59451
D-75-F/93-P-8	465	2841045759	1931581306	1434147048	6206774112	45976104.54	45976
D-82-K/94-G-15	465	2047370893	1008497383	131977410.2	3187845687	23613671.75	23614

In-place Resource (per square kilometer) Calculation of Montney Source Rock (continued)

UWI	Tmax (℃)	Resource (kg) with 2>TOC%≥1	Resource (kg) with 4>TOC%≥2	Resource (kg) with TOC%≥4	Total Resource (kg)	BOE	MBOE
2-11-55-26W5	470	24952031.6	23132664.94	0	48084696.59	356182.9377	356
4-35-67-13W6	470	2118517181	1224294483	303724400	3646536064	27011378.25	27011
5-7-54-23W5	470	0	0	0	0	0	0
A-45-F/93-P-7	475	2324378134	3663622668	2975955181	8963955983	66399673.95	66400
5-7-56-24W5	470	0	0	0	0	0	0
6-14-58-1W6	470	145345281	20481633.52	0	165826915	1228347.518	1228
10-25-70-14W6	470	1886864583	3391127068	3515220102	8793211753	65134901.87	65135
12-36-53-23W5	470	0	0	0	0	0	0
14-3-57-26W5	470	0	0	0	0	0	0
16-31-80-21W6	470	1943275325	3665374959	6271331144	11879981428	87999862.43	88000
D-83-L/94-A-12	470	2745093110	4462602351	1885633765	9093329226	67357994.27	67358
5-5-83-24W6	475	2202544621	3250996169	6579440805	12032981594	89133196.99	89133
6-3-82-24W6	475	2228874204	4145349823	6408355141	12782579168	94685771.61	94686
7-18-52-24W5	475	0	0	0	0	0	0
7-31-60-5W6	475	1727901328	36379940.39	0	1764281268	13068750.14	13069
8-29-64-10W6	475	1809663265	1330154169	515446333.8	3655263767	27076027.91	27076
16-2-78-22W6	475	2130843624	3264018564	5742823019	11137685206	82501371.9	82501
16-36-83-25W6	475	2819426775	3868880702	3614117493	10302424970	76314259.04	76314
A-10-J/94-B-9	475	3966054463	2130826608	1346170826	7443051897	55133717.76	55134
A-31-B/94-B-15	475	4143691729	6092512738	3858817711	14095022178	104407571.7	104408
A-45-F/93-P-7	475	2291934663	3696706173	2975955304	8964596141	66404415.86	66404
B-92-F/93-P-1	475	1906251008	2764712879	3310772388	7981736275	59123972.4	59124
C-95-B/93-P-1	475	1352719072	3838301539	6086364902	11277385513	83536188.99	83536
D-8-F/94-B-16	475	1683445634	964122498.9	973536686.8	3621104820	26822998.67	26823
D-67-J/94-B-9	475	3431648485	2050506158	879832925	6361987567	47125833.83	47126
A-1-J/94-B-9	475	3079324188	4506181834	2662356823	10247862845	75910095.15	75910
B-62-I/94-B-8	475	2925435936	1683303857	413138430.9	5021878224	37199097.95	37199

APPENDIX 5-2

In-Place Resource Calculation of Doig Source Rock

- In-place resource per square kilometer q (kg HC) =q (Type I) +q (Type II) +q (Type III)
- q (i)= $[HI_o(i) - HI_p(i)] \times [TOC_0(\%)/100] \times \rho \times h \times 10^6 \times$ratio of kerogen type
- Ratio of Type I, Type II and Type III kerogen in Doig organic matters is 0.418, 0.41 and 0.172 respectively
- Original hydrogen index (HI_o) for Type I, Type II and Type III kerogen of Doig organic matters, is 600 mg HC/g TOC, 470 mg HC/g TOC and 300 mg HC/g TOC respectively

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total	MBOE
1-15-85-9W6	18.4	1.5	440	435	320	230	1.1	1.04	1.03	2.56738	53759119.49	45321856.44	8787451.628	107868427.6	799
2-7-85-23W6	45.2	3.4	465	72	62	50	1.4	1.338	1.216	2.617	1242680016	900163103.3	210292171.2	2353135291	17431
4-2-70-5W6	19.6	1.5	447	210	180	150	1.297	1.168	1.083	2.656	165103494.7	108442644.2	21818433.37	295364572.3	2188
6-3-77-11W6	42.8	3.5	449	170	145	120	1.32	1.2	1.105	2.624	932597641.1	628527244.8	134474170.5	1695599056	12560
6-7-78-10W6	30.6	4	445	275	225	175	1.26	1.13	1.062	2.5735	539182487.8	357547688.7	71923128.01	968653304.5	7175
7-34-83-15W6	46	1.8	450	150	130	110	1.33	1.215	1.118	2.623	543336729	367847390.1	79351013.63	990535132.8	7337
7-35-68-7W6	14	1.5	450	150	130	110	1.33	1.215	1.118	2.664	139956783.1	94752912.24	20439834.11	255149529.5	1890
8-8-80-17W6	26.5	3	465	72	62	50	1.4	1.338	1.216	2.6441	649506115.8	470484302.6	109912487.1	1229902906	9110
10-10-71-8W6	22.3	2.6	450	150	130	110	1.33	1.215	1.118	2.667	386849164.5	261902882.6	56496959.78	705249006.8	5224
11-17-80-11W6	35.8	2.4	447.5	200	170	140	1.304	1.173	1.09	2.6297	492622608.1	325989489.8	67775917	886388015	6566
13-1-86-11W6	24.4	1.8	440	435	320	230	1.1	1.04	1.03	2.547	84868042.96	71548367.9	13872508.13	170288919	1261
1-1-73-4W6	2	1.5	442	370	280	210	1.153	1.063	1.038	2.666	8865736.612	6622959.846	1285137.835	16773834.29	124
1-14-75-11W6	40.6	3	452	125	110	90	1.348	1.244	1.15	2.598	846927468.5	581022797.2	131441351.8	1559391618	11551
1-30-84-22W6	31.6	3.25	462.5	78	68	55	1.397	1.332	1.213	2.638	825825760	594784126.3	138484308.6	1559094195	11549
2-2-78-11W6	33	3.5	446	240	200	160	1.28	1.15	1.072	2.64	587319828.5	388178406	78711316.99	1054209551	7809
4-1-76-8W6	27.7	3.75	444	300	240	190	1.226	1.11	1.053	2.618	418088946.4	284652728.2	54178899.88	756920574.5	5607
4-2-75-7W6	26	3.5	444	300	240	190	1.226	1.11	1.053	2.647	370325263.3	252133182.2	47989346.61	670447792.1	4966
4-3-75-6W6	29.6	3	443	330	260	200	1.187	1.085	1.044	2.6898	319980652.7	223134048.2	42890578.17	586005279	4341
4-11-64-2W6	6.5	0.5	440	435	320	230	1.1	1.04	1.03	2.6745	6594454.474	5559483.15	1077927.806	13231865.43	98
4-15-85-23W6	41.2	3.25	465	72	62	50	1.4	1.338	1.216	2.621	1084390834	785502788.7	183505729.5	2053399352	15210
4-35-67-13W6	19.4	2.75	475	53	45	35	1.415	1.351	1.227	2.6884	464032456.9	337641986.1	80213449.67	881887892.7	6533
5-9-63-5W6	11.9	0.5	443	330	260	200	1.187	1.085	1.044	2.666	21250437.5	14818696.4	2848433.314	38917567.22	288
5-21-69-3W6	10	1	443	330	260	200	1.187	1.085	1.044	2.6449	35432355.24	24708259.07	4749394.032	64890008.34	481
5-24-73-8W6	26.5	4.5	445	275	225	175	1.26	1.13	1.062	2.611	532961021.1	353422052	71093228.38	957476301.5	7092
5-30-65-6W6	17.5	0.5	447.5	200	170	140	1.304	1.173	1.09	2.6478	50513457.46	33426919.42	6949733.616	90890110.49	673
5-32-72-13W6	42	1.8	462.5	78	68	55	1.397	1.332	1.213	2.5646	590996112.7	425652872	99105273.77	1115754259	8265
5-32-86-23W6	32	2.8	462.5	78	68	55	1.397	1.332	1.213	2.5996	709998986.6	511362259.9	119061094.4	1340422341	9929
6-6-86-14W6	49.8	1.8	447.5	200	170	140	1.304	1.173	1.09	2.6169	511449595.6	338448114.2	70366168.27	920263878.1	6817

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total	MBOE
6-7-71-3W6	12.5	1	442	370	280	210	1.153	1.063	1.038	2.6676	36962739.1	27612227.57	5357954.628	69932921.29	518
6-8-81-9W6	39	1.8	446	240	200	160	1.28	1.15	1.072	2.6483	358090702.3	236673565.7	47990531.59	642754799.6	4761
6-10-84-10W6	15.4	1.5	441	400	300	220	1.125	1.05	1.033	2.5729	55897667.6	43496765.58	8447994.886	107842428.1	799
6-12-81-11W6	36	2	447	210	180	150	1.297	1.168	1.083	2.6374	401503525.6	263714005.8	53058706.82	718276238.2	5321
6-12-85-10W6	21.5	1.5	441	400	300	220	1.125	1.05	1.033	2.5552	77502090.6	60308245.62	11713141.05	149523477.3	1108
6-13-80-6W6	21	1.8	442	370	280	210	1.153	1.063	1.038	2.604	109110414.3	81508612.8	15816161.45	206435188.6	1529
6-14-77-11W6	37	3.75	447.5	200	170	140	1.304	1.173	1.09	2.5977	785843111.6	520026062.1	108117728.7	1413986902	10474
6-18-67-2W6	3	0.9	442	370	280	210	1.153	1.063	1.038	2.6864	8040218.811	6006274.343	1165474.438	15211967.59	113
6-21-76-5W6	16.4	2.6	442	370	280	210	1.153	1.063	1.038	2.5664	121303956.9	90617539.3	17583683.28	229505179.5	1700
7-8-89-10W6	13.9	1.8	440	435	320	230	1.1	1.04	1.03	2.5	47454808.5	40006980	7756950.6	95218739.1	705
7-12-87-17W6	36	2.5	451	140	120	100	1.34	1.23	1.135	2.6105	605348009.6	414689672.3	91731925.8	1111769608	8235
7-30-83-12W6	41	1.8	446	240	200	160	1.28	1.15	1.072	2.5623	364229477.3	240730877.9	48813236.77	653773592	4843
7-31-60-5W6	28	1.5	443	330	260	200	1.187	1.085	1.044	2.686	151128392.7	105387278.2	20257425.22	276773096.2	2050
7-32-69-12W6	33	2.6	465	72	62	50	1.4	1.338	1.216	2.65	702540558.7	508900989.2	118887225.6	1330328773	9854
7-32-79-10W6	38	2.5	448	185	160	130	1.312	1.181	1.095	2.6633	575840104.2	379786167.2	81009356.4	1036635628	7679
7-33-61-4W6	23.8	0.5	442	370	280	210	1.153	1.063	1.038	2.6598	35085637.19	26209978.53	5085858.265	66381473.99	492
8-19-66-12W6	41	2.6	475	53	45	35	1.415	1.351	1.227	2.652	914641225.5	665516550.4	158106457.5	1738264233	12876
8-20-84-7W6	10	1.8	440	435	320	230	1.1	1.04	1.03	2.5243	34471992.26	29061761.04	5634782.849	69168536.15	512
8-29-64-10W6	21.4	1.8	460	85	75	60	1.39	1.32	1.206	2.6916	310238083.7	221641806.7	51615934.49	583495824.9	4322
8-30-77-20W6	32.8	4.5	475	53	45	35	1.415	1.351	1.227	2.6008	1241976453	903694106	214690188.6	2360360747	17484
8-31-81-9W6	22.5	1.8	445	275	225	175	1.26	1.13	1.062	2.6038	180506495.2	119699140.1	24078288.99	324283924.2	2402
9-7-66-2W6	10.7	0.9	440	435	320	230	1.1	1.04	1.03	2.6641	19463893.55	16409119.01	3181562.955	39054575.52	289
9-23-79-9W6	37.2	2.2	445	275	225	175	1.26	1.13	1.062	2.6535	371719120.2	246497828.2	49584699.93	667801648.3	4947
9-26-80-8W6	20.5	1.9	442	370	280	210	1.153	1.063	1.038	2.5995	112235619.7	83843230.99	16269177.36	212348028.1	1573
9-27-89-12W6	11.8	2.6	446	240	200	160	1.28	1.15	1.072	2.5738	152096389.2	100525354.4	20383624.94	273005368.6	2022
9-34-86-25W6	35.2	2.5	465	72	62	50	1.4	1.338	1.216	2.6225	713076967.7	516533273	120670246.4	1350280487	10002
10-1-68-9W6	13.8	2	455	105	90	75	1.365	1.288	1.181	2.675	208519656.3	148154956.3	33743780.01	390418392.7	2892
10-9-81-12W6	31.6	2	447.5	200	170	140	1.304	1.173	1.09	2.6298	362371191.4	239796545.8	49855689.49	652023426.6	4830

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total	MBOE
10-18-81-13W6	23.4	2	450	150	130	110	1.33	1.215	1.118	2.641	309210825.9	209340523.5	45158354.21	563709703.7	4176
10-19-66-9W6	27.9	1.6	460	85	75	60	1.39	1.32	1.206	2.687	358913805.3	256416953.4	59714369.18	675045127.9	5000
10-21-87-15W6	37.4	2.6	447.5	200	170	140	1.304	1.173	1.09	2.6227	556041787.7	367956678.6	76501243.4	1000499710	7411
10-23-79-13W6	26.4	2.5	452	125	110	90	1.348	1.244	1.15	2.6159	462088177.2	317009159.9	71715107.77	850812444.9	6302
10-25-70-14W6	53	2.5	465	72	62	50	1.4	1.338	1.216	2.6388	1080340342	782568723.9	182820286.1	2045729352	15154
10-29-88-20W6	42.8	2.75	455	105	90	75	1.365	1.288	1.181	2.6215	871445952.2	619169622.9	141022103.2	1631637678	12086
10-36-83-14W6	45.2	1.8	447.5	200	170	140	1.304	1.173	1.09	2.5982	460890103.6	304990731.7	63410101.13	829290936.4	6143
11-9-73-6W6	18.4	3	445	275	225	175	1.26	1.13	1.062	2.63	248499211	164787100	33148036.08	446434347	3307
11-15-83-8W6	24	1.8	440	435	320	230	1.1	1.04	1.03	2.5594	83883167.91	70718064.77	13711520.71	168312753.4	1247
11-16-87-11W6	14.4	1.8	441	400	300	220	1.125	1.05	1.033	2.55	62163288	48372357.6	9394938.317	119930583.9	888
11-18-83-9W6	20.4	1.8	442	370	280	210	1.153	1.063	1.038	2.6215	106705292.3	79711917.57	15467525.63	201884735.5	1495
11-19-79-7W6	21.8	2	442	370	280	210	1.153	1.063	1.038	2.5903	125190098.1	93520598.4	18147001.06	236857697.6	1755
11-22-81-14W6	29	2	451	140	120	100	1.34	1.23	1.135	2.593	387497961.5	265452929.7	58719833.36	711670724.5	5272
11-34-86-16W6	47.4	2.5	449	170	145	120	1.32	1.2	1.105	2.6187	736245692.9	496195204.1	106161569	1338602466	9916
12-21-82-14W6	31.2	1.9	450	150	130	110	1.33	1.215	1.118	2.602	385883246.5	261248941.1	56355893.35	703488081	5211
12-25-79-16W6	18	2.8	462.5	78	68	55	1.397	1.332	1.213	2.6429	406026573.7	292432341.7	68087376.34	766546291.8	5678
13-11-87-14W6	35	2	447.5	200	170	140	1.304	1.173	1.09	2.6157	399208552.5	264173406.2	54923840.83	718305799.6	5321
13-12-81-23W6	43.3	4.6	475	53	45	35	1.415	1.351	1.227	2.541	1637459024	1191457427	283053987	3111970439	23052
13-14-75-10W6	40.6	3.75	450	150	130	110	1.33	1.215	1.118	2.6202	998003766	675664023.9	145752359.8	1819420150	13477
13-21-78-20W6	31	4.5	470	61	52	42	1.41	1.347	1.222	2.605	1154425988	838898986	197061277.6	2190386252	16225
13-31-79-13W6	27.4	2.6	455	105	90	75	1.365	1.288	1.181	2.635	530174288.7	376693257.4	85795674.52	992663220.7	7353
13-32-88-13W6	20	2.7	447.5	200	170	140	1.304	1.173	1.09	2.5606	301473654.5	199498036	41477295.28	542448985.7	4018
13-33-78-17W6	19	3	465	72	62	50	1.4	1.338	1.216	2.5764	453760184.9	328691353.2	76787437.82	859238976	6365
13-34-80-14W6	28.2	2.2	455	105	90	75	1.365	1.288	1.181	2.6337	461479299.8	327884894.4	74679079.39	864043273.5	6400
13-36-82-22W6	26	3	470	61	52	42	1.41	1.347	1.222	2.605	645485498.7	469061798.6	110184800.4	1224732098	9072
14-15-87-10W6	16.8	1.7	440	435	320	230	1.1	1.04	1.03	2.454	53172327.7	44827159.1	8691534.795	106691021.6	790
14-19-66-4W6	4.7	0.5	445	275	225	175	1.26	1.13	1.062	2.7	10860799.95	7202114.325	1448753.85	19511668.12	145
15-7-82-7W6	25.8	1.8	440	435	320	230	1.1	1.04	1.03	2.5716	90604243.65	76384296.52	14810146	181798686.2	1347

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total	MBOE
15-10-94-13W6	16.8	2	440	435	320	230	1.1	1.04	1.03	2.4698	62958442.38	53077385.09	10291170.54	126326998	936
15-26-79-17W6	12.5	3	465	72	62	50	1.4	1.338	1.216	2.5763	298514850.5	216235918.1	50516090.4	565266858.9	4187
15-28-77-13W6	40	2.75	455	105	90	75	1.365	1.288	1.181	2.6175	813192767.9	577780249.2	131595257.5	1522568275	11278
15-34-77-7W6	45	2.4	442	370	280	210	1.153	1.063	1.038	2.6263	314413738.3	234876091.5	45576020.21	594865850	4406
15-34-80-18W6	21.5	2.5	462.5	78	68	55	1.397	1.332	1.213	2.6218	429557413.4	309379948.2	72033308.07	810970669.7	6007
15-35-76-7W6	35	3	442	370	280	210	1.153	1.063	1.038	2.6563	309171780.1	230960198.2	44816169.21	584948147.5	4333
16-7-63-4W6	13.8	0.5	443	330	260	200	1.187	1.085	1.044	2.6574	24563869.77	17129272.21	3292569.622	44985711.61	333
16-11-59-4W6	18	1.5	441	400	300	220	1.125	1.05	1.033	2.701	68587843.5	53371624.95	10365902.12	132325370.6	980
16-16-82-12W6	39.3	1.9	447.5	200	170	140	1.304	1.173	1.09	2.5803	420078271.4	277983793.5	57795134.83	755857199.8	5599
16-18-86-9W6	22.2	1.7	440	435	320	230	1.1	1.04	1.03	2.5077	71800982.48	60532126.48	11736569.84	144069678.8	1067
16-36-83-25W6	43.8	4	475	53	45	35	1.415	1.351	1.227	2.615	1482264963	1078534224	256226874.3	2817026061	20867
6-10-79-19W6	25.7	3	470	61	52	42	1.41	1.347	1.222	2.611	639507157.4	464717453.9	109164293.6	1213388905	8988
A-10-A/93-P-10	52.6	2.75	475	53	45	35	1.415	1.351	1.227	2.5876	1210976258	881137564.2	209331441.5	2301445263	17048
A-10-J/94-B-9	37	3.5	475	53	45	35	1.415	1.351	1.227	2.6306	1102159966	801960023.7	190521270	2094641260	15516
A-10-J/94-B-9	29	3.5	475	53	45	35	1.415	1.351	1.227	2.6306	863855108.8	628563261.8	149327481.9	1641745852	12161
A-26-A/94-G-9	64.2	2.1	455	105	90	75	1.365	1.288	1.181	2.5946	987958878.9	701953029.8	159876856	1849788765	13702
A-31-B/94-B-15	47.2	3.5	475	53	45	35	1.415	1.351	1.227	2.633	1407281408	1023974256	243265087.8	2674520751	19811
A-43-E/94-A-15	47.6	2.5	449	170	145	120	1.32	1.2	1.105	2.618	739154579.9	498155658	106581010.5	1343891248	9955
A-45-F/93-P-7	54	3.5	475	53	45	35	1.415	1.351	1.227	2.604	1592292436	1158593052	275246412.8	3026131901	22416
A-62-K/94-H-2	27	3	442	370	280	210	1.153	1.063	1.038	2.5556	229462290	171414920.1	33261835.26	434139045.3	3216
A-70-A/93-P-10	37	3.25	470	61	52	42	1.41	1.347	1.222	2.6247	1002648979	728605575.9	171152842	1902407397	14092
A-71-J/93-P-8	34.8	2	462.5	78	68	55	1.397	1.332	1.213	2.655	563270434.2	405684018.7	94455901.46	1063410354	7877
A-78-C/94-G-1	28	3.5	475	53	45	35	1.415	1.351	1.227	2.6178	830008590	603935661.6	143476714.3	1577420966	11685
A-78-L/94-H-7	23.8	2.1	442	370	280	210	1.153	1.063	1.038	2.6139	144816699.6	108182233.3	20991986.11	273990919	2030
A-85-A/94-G-15	39.6	2	455	105	90	75	1.365	1.288	1.181	2.6306	588429082.9	418083775	95222780.79	1101735639	8161
B-4-D/94-H-13	32.8	2	447.5	200	170	140	1.304	1.173	1.09	2.642	377877050.8	250057437.4	51989013.91	679923502.1	5036
B-65-J/94-B-16	34	3.5	470	61	52	42	1.41	1.347	1.222	2.6344	995893364.4	723696401.8	169999654.2	1889589420	13997
B-66-C/94-H-6	35.4	3	447.5	200	170	140	1.304	1.173	1.09	2.6281	608527581.6	402688777.6	83722334.66	1094938694	8111

UWI	thickness (m)	TOC (%)	Tmax (℃)	HIp (I)	HIp (II)	HIp (III)	TOC_0/TOC (Type I)	TOC_0/TOC (Type II)	TOC_0/TOC (Type III)	Density (g/cm^3)	q(kg) Type I	q(kg) Type II	q(kg) Type III	q(kg) Total	MBOE
B-69-E/93-P-9	31.8	3.7	465	72	62	50	1.4	1.338	1.216	2.6475	962505129.8	697212148.9	162879656	1822596935	13501
B-76-I/94-A-15	15.6	2.2	446	240	200	160	1.28	1.15	1.072	2.5903	171232460.4	113172994.2	22948199.28	307353653.8	2277
B-95-C/93-P-9	36	3	462.5	78	68	55	1.397	1.332	1.213	2.6494	872196778.7	628181904.8	146260353.8	1646639037	12197
B-95-E/94-H-6	31	2.5	447.5	200	170	140	1.304	1.173	1.09	2.63	444397201.6	294076671.8	61140977.6	799614851	5923
C-21-L/94-A-13	36	3.5	462.5	78	68	55	1.397	1.332	1.213	2.6273	1009074896	726765571.4	169213708.3	1905054176	14112
C-56-A/93-P-9	25.8	2	462	80	70	57	1.395	1.33	1.211	2.642	413367518.7	297356888.6	69001952.3	779726359.6	5776
C-68-I/94-B-16	27.7	3.5	465	72	62	50	1.4	1.338	1.216	2.628	787247725	570260522.3	133221771.6	1490730019	11042
C-74-I/94-A-16	11	2	440	435	320	230	1.1	1.04	1.03	2.5325	42269299.05	35635314	6909328.58	84813941.63	628
C-75-J/94-A-9	34.4	2.6	447	210	180	150	1.297	1.168	1.083	2.5742	486804900.4	319741327.6	64331286.88	870877514.9	6451
C-82-F/94-H-1	21.6	2.1	442	370	280	210	1.153	1.063	1.038	2.61	131234184.9	98035704.8	19023125.06	248293014.8	1839
C-95-B/93-P-1	48	2.6	470	61	52	42	1.41	1.347	1.222	2.62	1038723689	754820368.5	177310818.8	1970854877	14599
C-97-B/94-H-12	34.2	2.1	447.5	200	170	140	1.304	1.173	1.09	2.63	411827187.3	272523697.6	56659935.63	741010820.6	5489
C-98-H/94-H-2	26.8	2.2	443	330	260	200	1.187	1.085	1.044	2.6077	205970900	143630936.3	27608578.56	377210414.9	2794
D-3-F/94-G-8	65	2.6	462.5	78	68	55	1.397	1.332	1.213	2.596	1337317672	963175722.5	224257370.1	2524750765	18702
D-6-H/93-P-10	34.1	3.5	465	72	62	50	1.4	1.338	1.216	2.64	973564187.9	705223025.3	164751121.9	1843538335	13656
D-8-F/94-B-16	30.6	3.5	475	53	45	35	1.415	1.351	1.227	2.6152	906179903.2	659359874	156643818.7	1722183596	12757
D-22-G/94-B-8	48.5	3.5	475	53	45	35	1.415	1.351	1.227	2.6086	1432640819	1042426417	247648759.3	2722715995	20168
D-38-J/94-B-16	36.1	3.5	475	53	45	35	1.415	1.351	1.227	2.6019	1063618531	773916281.1	183858931.1	2021393743	14973
D-39-F/93-P-9	23.4	3.5	465	72	62	50	1.4	1.338	1.216	2.6642	674200337.7	488372115.3	114091359.8	1276663813	9457
D-67-J/94-B-9	31	3.5	475	53	45	35	1.415	1.351	1.227	2.6361	925362012.9	673317271.9	159959671.2	1758638956	13027
D-75-F/93-P-8	43.6	2.6	465	72	62	50	1.4	1.338	1.216	2.655	929956432.2	673634770.8	157371611.9	1760962815	13044
D-82-I/94-A-15	13.1	2.3	446	240	200	160	1.28	1.15	1.072	2.6	150890268.7	99728190.9	20221983.31	270840442.9	2006
D-88-J/94-A-16	13	2.3	442	370	280	210	1.153	1.063	1.038	2.5595	84832008.06	63371946.14	12296871.42	160500825.6	1189
D-94-L/93-P-7	54	4	475	53	45	35	1.415	1.351	1.227	2.608	1822558119	1326140303	315050535.2	3463748957	25657
A-5-B/94-A-13	36.8	2.6	462.5	78	68	55	1.397	1.332	1.213	2.625	765585439.8	551397266.8	128382493.5	1445365200	10706
A-79-B/94-H-4	26	3.5	457.5	94	81	67	1.38	1.31	1.197	2.6144	694415349.8	497070719	114127931.4	1305614000	9671