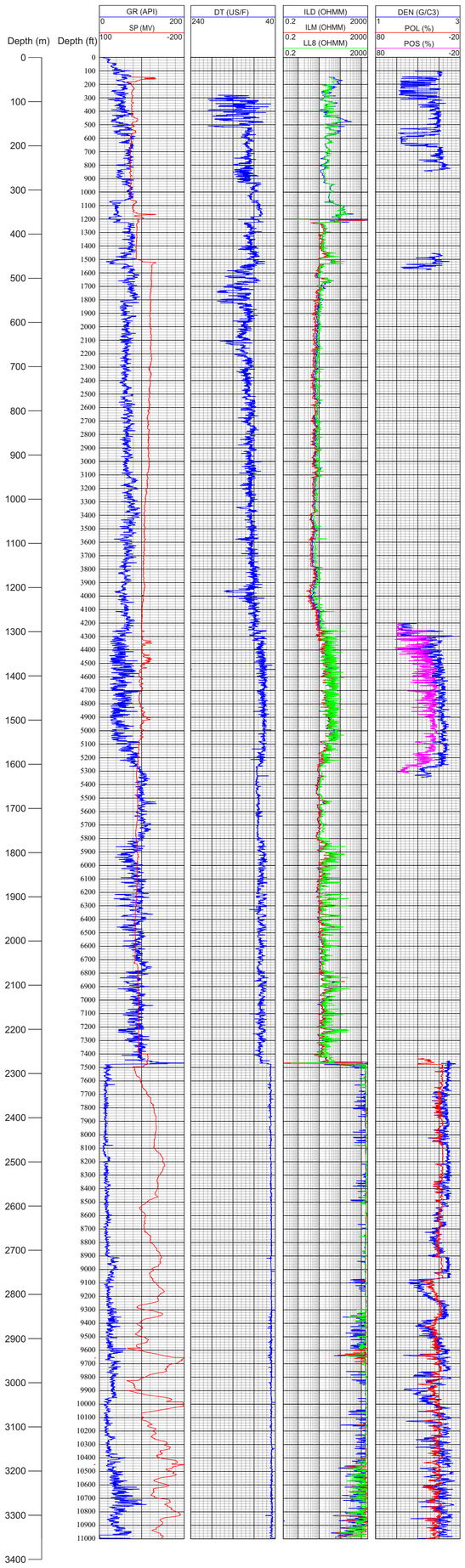
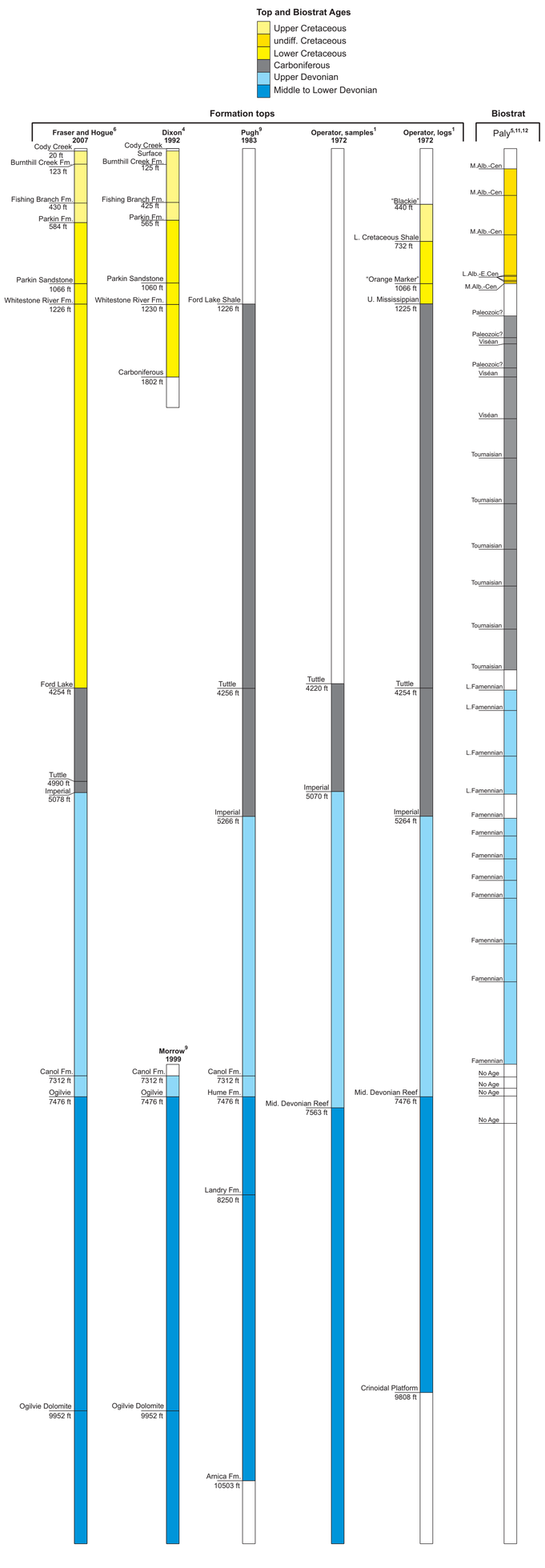
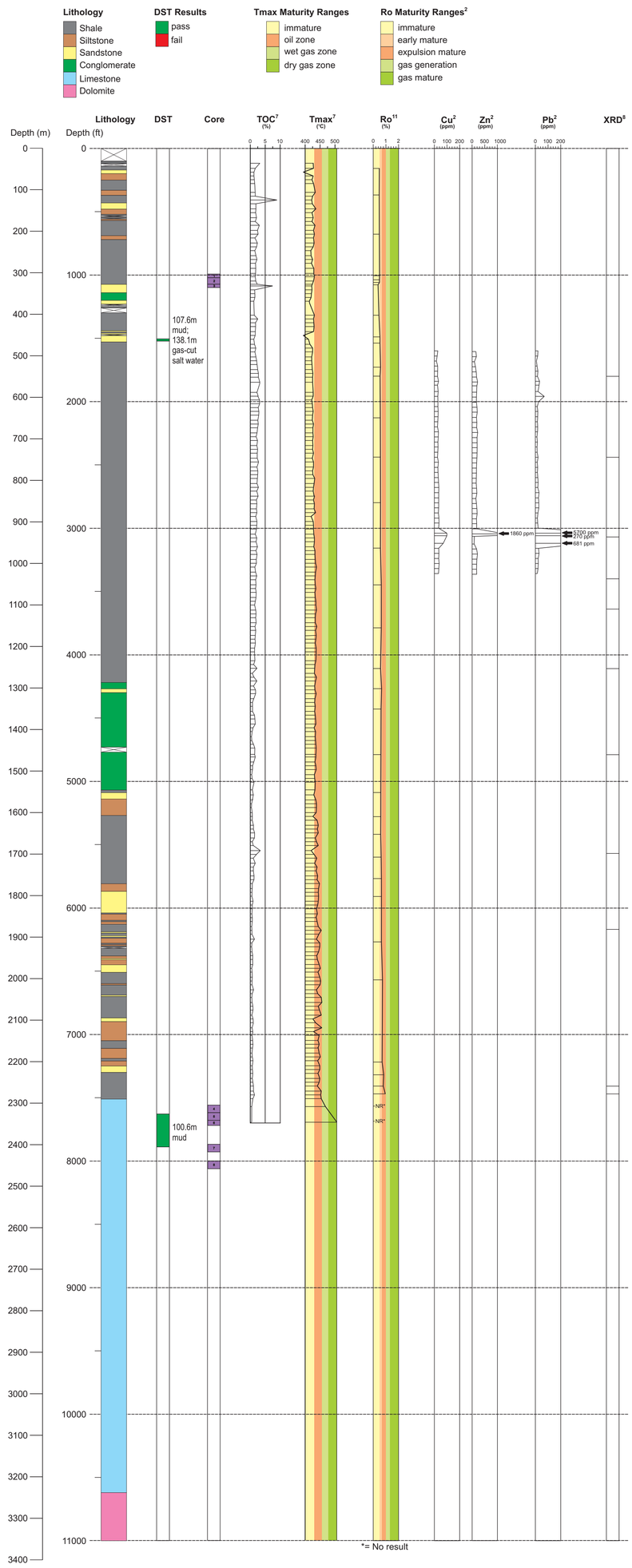
Well Name: N. Parkin YT D-61
UWI: 300D616630137000
Location: Eagle Plain, Yukon (NAD83; 66.336463°N; 137.219285°W)
MAP Area: NTS 116-I-6
Ground Elevation: 483.1m
KB Elevation: 489.2m







Abstract:

This tabulation and graphical summary presents multiple key datasets reflecting the current state of knowledge for N. Parkin YT D-61 petroleum exploration well in eastern Eagle Plain, northern Yukon. The graphical summary contains four parts: images of the key downhole geophysical logs that are commonly used for lithological and sequence stratigraphic analysis; biostratigraphic and lithological summaries together with tops picks that illustrate the historical evolution of stratigraphic knowledge; analytical columns summarizing organic and inorganic geochemistry and thermal maturity data; and finally a list of references documenting the source data used in the compilation. The data tabulation consists of an Excel spreadsheet containing all of the public domain data summarized in the graphic.

Introduction:

Multiple well-based datasets were combined graphically at a consistent scale as a tool to facilitate the integration of biostratigraphic, geochemical, thermal and other public domain data from individual wells in the GEM Yukon Basins project area.

As a basis for comparison with other datasets, conventional downhole well-log data are shown in the graphical summary, as plotted from commercially available digitized curves, including gamma ray (GR), spontaneous potential (SP), deep resistivity (ILD), medium resistivity (ILM), shallow resistivity (LL8), sonic transit-time (DT), bulk density (DEN), and neutron porosity (POS and POL). Other information is compiled from the well history report, originally filed with the National Energy Board (NEB), and now available digitally from the Yukon Government Oil and Gas Resources Branch website (http://www.emr.gov.yk.ca/oilandgas/mapsdata.html). These data include (conventionally) cored intervals and drill stem test (DST) intervals with summarized results; a generalized lithology log compiled from the cuttings and core sample descriptions; as well as initial stratigraphic tops picks based on both the sampling and the logs. Subsequent tops picked by Pugh (1983) and Morrow (1999) for Paleozoic strata, Dixon (1992) for Cretaceous rocks and Fraser and Hogue (2007) for the complete succession are also summarized. These columns illustrate the historical evolution of the stratigraphic nomenclature as well as differences of interpretation reflected in the picks. Additional historical data include a suite of inorganic geochemistry analyses filed with the well history report, and two palynological determinations from cored intervals (Ford, 1988).

A considerable amount of new data collected through the current GEM Program is also summarized here. These include thirty new palynological determinations, and three preliminary micropaleontological determinations; comprehensive profiles of the section overlying the Paleozoic carbonate succession for organic geochemistry (Lane et al., 2010) and vitrinite reflectance (Reyes et al., in press); and finally an overview suite of X-Ray diffraction (XRD) analyses are also shown. The accompanying data are also tabulated in .xls files. These datasets are described in more detail below.

Organic Geochemistry (Rock-Eval):

Rock-Eval pyrolysis results shown here are summarized from Lane et al. (2010). Tmax values increase consistently downhole from marginally mature above 3200 ft (~1000 m) toward the upper range of the oil window at 7500 ft (~2285 m). Specifically, Tmax values are typically in the 420-435°C range above 3200 ft; and deeper Tmax values vary from 433°C at 3200 ft, to 454°C at 7500 ft. Total organic carbon (TOC) values are typically below ~3%. The depth range of 1700-3000 ft (~520-915 m) consistently returned TOC values of 2-3%; whereas TOC values consistently <1% were measured below 5800 ft (~1770 m). Other depths were characterized by TOC values of 1-2%.

Inorganic Geochemistry:

In 1990, Cominco Ltd. collected 45 cuttings samples over the interval 1600-3360 ft (488-1024 m) for analysis of copper (Cu), lead (Pb) and zinc (zinc) concentrations. This interval corresponds to the shale-dominated Early Carboniferous section. The analytical results were subsequently filed in the well history report deposited at the Geological Survey of Canada (Calgary) when they came into the public domain in May 1992. Typical concentrations for these elements are <40 ppm Cu, <30 ppm Pb and <230 ppm Zn. In one restricted zone at 3040-3120 ft (927-951 m) somewhat elevated concentrations were measured, with the 3040 ft (927 m) sample yielding the highest values at 99 ppm Cu, 5700 ppm Pb and 1860 ppm Zn.

Vitrinite Reflectance:

Thirty-four vitrinite reflectance values (%Ro) are summarized here from Reyes et al. (2012). These results are consistent with the Rock-Eval Tmax data. Reflectances increase more or less continuously from ~0.46% near the surface, to 0.95% at the level of the Canol Formation, indicative of continuously increasing thermal maturity through the oil window.

X-Ray Diffraction (XRD):

Eleven samples were run for quantitative mineralogy. The results summarized here form part of a more comprehensive Open File report on XRD analyses from Yukon wells, in preparation. The sampling zone, spanning 1800-7470 ft (550-2280 m) corresponds to the Late Devonian to Carboniferous interval (Imperial-Tuttle-Ford Lake succession). Results, recalculated as ternary output (quartz-clays-carbonate), are summarized as follows: 80-90% quartz, 8-13% clays and 0-6% carbonate.

Biostratigraphy:

Three reports contain palynological data for this well. The first, by J.H. Ford (1988) contains interpretations of two composite samples identified as cuttings, although their depths correspond to those of Cores #1 and #2. These cores were resampled and three cuttings samples were also collected from the overlying succession for this project (Sweet, 2009). Although these two reports differ in some details, both interpreted the presence of palynomorphs indicative of Albian to Cenomanian ages, together with recycled Carboniferous and Permo-Triassic spores.
An additional 24 cuttings samples and one core sample were collected between 1540 ft (469 m) and 7686 ft (2343 m) and processed for palynomorphs (Utting, 2010). Of this group, 21 samples yielded enough identifiable palynomorphs to assign ages, ranging from Famennian (Late Devonian), upward through Late Famennian, Tournaisian and Viséan, suggesting a continuous sedimentation record through this interval spanning the Imperial, Tuttle and Ford Lake successions. Further, these data constrain the position of the sub-Mesozoic unconformity to be shallower than 1540 ft (469m).

Three additional samples, collected in the interval 1320-1730 ft (402.3-527.3 m) and processed for micropaleontology produced consistent faunal assemblages comprising non-age diagnostic tubular agglutinated foraminifera, shell fragments and rare to abundant ostracods. The ostracods resemble Carboniferous forms and will be forwarded to an ostracod specialist for more specific analysis (C. Schröder-Adams, pers. comm., 2012). If the ostracods are indeed Paleozoic, then the sub-Mesozoic unconformity would be bracketed between 1075 ft (327.6 m) and 1320 ft (402.3 m).

Acknowledgements:

The authors would like to thank the numerous colleagues who provided helpful suggestions on the content and design of early drafts of the summary graphic. Kezhen Hu provided additional helpful suggestions in her critical review of the Open File. Dr. Claudia Schröder-Adams kindly provided the micropaleontological assessment of three cuttings samples. This is a contribution to the Geo-Mapping for Energy and Minerals (GEM) Program.

References:

[1]Chevron Ltd., 1972. Well history report, Chevron SOBC WM N. Parkin YT D-61. Department of Indian Affairs and Northern Development, 01 June, 1972.

[2]Cole, G.A., Abu-Ali, M.A., Aoudeh, S.M., Carrigan, W.J., Chen, H.H., Colling, E.L., Gwathney, W.J., Al-Hajji, A.A., Halpern, H.I., Jones, P.J., Al-Sharidi, S.H., and Tobey, M.H., 1994. Organic Geochemistry of the Paleozoic Petroleum System of Saudi Arabia; Energy & Fuels, v. 8, p. 1425-1442.

[3]Cominco Ltd., 1990. Geochemistry report. Insert appended to Chevron SOBC WM N. Parkin YT D-61 well history report file. Released from Confidential, April 10, 1992, 1p.

[4]Dixon, J., 1992. Stratigraphy of Mesozoic strata, Eagle Plain area, Northern Yukon; Geological Survey of Canada, Bulletin 408.

[5]Ford, J.H., 1988. Palynology of Cretaceous strata in 13 wells from Eagle Plains, Northern Yukon; Birch YT B-34, Chance #1, Chance G-08, Eagle Plains #1, Ellen C-24, Molar P-34, Parkin D-61, N. Parkin C-33, Pine CK. O-78, Porcupine K-56, E. Porcupine I-13, Whitefish I-05, Whitestone N-26. Geological Survey of Canada Paleontological Report, MISC-1-JHF-1988, 33p.

[6]Fraser, T. and Hogue, B., 2007. List of Wells and Formation Tops, Yukon Territory, version 1.0; Yukon Geological Survey, Open File 2007-5.

[7]Lane, L.S., Snowdon, L.R., and Obermajer, M., 2010. Rock-Eval/TOC and Oil Show Analyzer data for selected Yukon Territory borehole samples; Geological Survey of Canada, Open File Report 6652, 1 CD-ROM.

[8]Morrow, D.W., 1999. Lower Paleozoic stratigraphy of Northern Yukon Territory and Northwestern District of Mackenzie; Geological Survey of Canada, Bulletin 538.

[9]Pugh, D.C., 1983. Pre-Mesozoic geology in the subsurface of Peel River map area, Yukon Territory and District of Mackenzie; Geological Survey of Canada, Memoir 401, Appendix II.

[10]Reyes, J., Saad, S., and Lane, L.S., 2012. Vitrinite thermal maturation profiles for eight Yukon petroleum exploration wells; Geological Survey of Canada, Open File 7056, 1 CD-ROM.

[11]Sweet, A.R., 2009. Applied research report on 6 samples from Chevron SOBC WM N. Parkin Y.T. D-61 (NTS 116I/06, 66° 20' 11.4" N. 137° 13' 9.48" W); Geological Survey of Canada, Paleontological Report ARS-2009-08, 7 p.

[12]Utting, J., 2010. Palynological investigation of 24 cuttings samples from north Parkin D-61, submitted by L.S. Lane, GSC Calgary (UTM Zone 08W); Geological Survey of Canada, Paleontological Report JU-2010-01, 6p.

Recommended citation:

Lane, L.S., Hayman, A., Utting, J. and Sweet, A.R., 2012. Summary of current geochemical, geophysical and biostratigraphic data for Chevron SOBC WM N. Parkin YT D-61 (UWI 300D616630137000), Eagle Plain, Yukon; Geological Survey of Canada, Open File 7050, 1 CD- ROM. doi:10.4095/290117