Summary of activities in western Liard Basin, British Columbia: Regional mapping and characterization of the Besa River Formation

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Summary

The Geoscience and Strategic Initiatives Branch participated to two cooperative geosciences programs in western Liard Basin during the summer of 2012: 1) Regional mapping within the Toad River map area (094N) and 2) Examination of the Besa River Formation in western and northern Liard Basin. The regional mapping program is in its second year (McMechan et al., 2012) and is part of the Geological Survey of Canada's (GSC) ongoing Geomapping for Energy and Minerals (GEM), Yukon Sedimentary Basins project. Examination of the Besa River Formation is in its third year and in 2012 was conducted as part of a multi-jurisdictional project between the governments of Yukon, Northwest Territories and British Columbia. This work was also supported by the GEM program through use of analytical laboratories at the Geological Survey of Canada.

Besa River stratigraphy exposed along the western margins of the Liard Basin contains equivalents to the Horn River Formation currently being developed for its shale gas potential in eastern Horn River Basin (Ferri et al., 2011, 2012). The recent announcement by Apache Canada Ltd. of initial, average one month production of 21.3 million cubic feet (mmcf) per day (6.03 x 105 m3) from a well within central Liard Basin underscores the potential for shale sequences in this area to hold significant potential. This well was drilled to a depth of 3800 m and laterally almost 900 m into the upper Besa River Formation. Apache Canada Ltd. estimates ultimate production of 17.9 billion cubic feet (5.06 x 108 m3) from this well and suggests a net resource of 48 trillion cubic feet on its 430 000 acre (174, 021 Ha) land holdings.

Regional mapping in Toad River map area (094N) is in its second and final year and will result in 3 - 100 000 scale maps of the NW, NE and SE quadrants of 094N together with 4 – 1:50 000 scale maps covering the SW quadrant. Surface samples were also collected for Rock-Eval, reflective light thermal maturity and apatite fission track analysis. Cuttings from several petroleum wells in the map area were also sampled for Rock-Eval analysis.

Composite sections of the Besa River Formation were measured in southern Caribou Range and along the Alaska Highway, south of Stone Mountain. Some 170 m of the Besa River Formation were

measured in 3 separate sections in southern Caribou Range. Lithologic, gamma ray spectrometrey and lithogeochemical data are similar to those observed in other sections of the formation in western Liard Basin (Ferri et al., 2011, 2012) suggesting similar depositional conditions. Changes in abundances of several trace elements, particularly, V, Mo, Ba and P, suggest variations in redox conditions during deposition of the formation. Radiolarian and conodont fragments from the upper part of the section in Caribou Range indicate a mid-Tournaisian age. Characteristics of the lower Besa River Formation observed along the Alaska Highway south of Stone Mountain are similar to the Evie Member of the Horn River Formation.

References

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