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Impact Craters within the Western Sedimentary Basin of North America

***Richard A. F. Grieve**, NRCan, Ottawa, ON K1A OE8, Canada, phone: 613 995 5372, rgrieve@nrcan.gc.ca and Joanna V. Morgan, Imperial College London, London, United Kingdom.*

Seven impact structures are now known from the Western Sedimentary Basin of North America. The most recent discoveries are: Elbow, Maple Creek and Viewfield, all in Saskatchewan. There are also a number of seismically imaged structures that have the morphology of impact structures but for which definitive proof of an impact origin in the form of shock metamorphic effects is not yet available. The production of hydrocarbons from known impact structures in the Western Sedimentary Basin, ranges from none to about 1000 BOPD (at Red Wing Creek, North Dakota). Other hydrocarbon producing impact structures also occur in Canada, Mexico and the United States, outside the Western Sedimentary Basin. Most production at impact structures occurs from structural traps in the rim and central uplift and from brecciated target rocks, including crystalline rocks. The most productive impact-related hydrocarbon reservoir rocks are breccias in the Gulf of Mexico believed to be genetically linked to the K/T impact that formed the Chicxulub structure on the Yucatan Peninsula, Mexico. Many impact structures remain to be discovered throughout the world. For example, the current estimate of the terrestrial cratering rate indicates that as many as 12 plus/minus 6 impact structures with diameters of 10 km or greater remain to be discovered in the Williston Basin. If half of them have reserves similar to the 9 km diameter Red Wing Creek structure, the cumulative potential impact-related reserves are on the order of 1 BBO and 600 BCFG in the Williston Basin alone.