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#### Application of MWD (Measurement-While-Drilling) Gamma Ray Logging to Horizontal Bakken Wells

Since the first horizontal Bakken well was drilled in 1987, the play has made a major contribution towards renewing interest and revitalizing activity in the Williston Basin. Approximately 45 horizontal Bakken wells have been drilled in the North Dakota and Montana portion of the basin. The play has introduced new drilling technology to the Williston Basin.

The Directional-MWD tool has already proven to be an essential component in drilling horizontal wells. A further advancement in the technology of drilling successful horizontal wells has been the recent use of the Directional-Gamma MWD tool.

This paper describes the geological and engineering benefits from the application of MWD formation gamma ray logging to the Bakken Formation. Real-time correlation of MWD gamma ray logs with offsetting wells enables the well site geologist to accurately establish the target depth. With the identified gamma markers and the directional data, adjustments can be made to the tangent and build sections to allow a high inclination entrance into the target formation at the desired true vertical depth. Accurate logging of bed boundaries and target formation characteristics enables the operator to selectively drill within the Bakken Formation. Trouble zones can be identified; production performance evaluated and attributed to vertical variations in the Bakken Shale.