

BAKKEN OIL SHALE OPERATIONS BENCHMARKING



Improve Your Drilling & Completion Operations Efficiency & Reliability

- Detailed Time, Cost, or Operational Benchmarking Allows Participants to Reduce their Drilling & Completion Costs Through Focused Application of Successful Practices
 - **Best Practices** and **Emerging Technologies**



What Clients Say:

"We find the Ziff Energy reports to be comprehensive, well written, and most importantly, consistently objective ... The resulting analysis is of high quality and integrity ... Without the Ziff tools, we would find it very difficult to objectively measure."

Senior VP, Canadian Major

"The scope and format of the study assisted us in focusing on specific areas of improvement. The presentation of the results of the study was concise and informative and reflected considerable knowledge of operations ... As a result, we have been able to dramatically improve our operational efficiencies and lower our costs."

Vice President, Super-Major

"We got more than what we paid for, which is a pleasure to say. I would recommend this process to any company wanting to move from the 'also ran class' to 'best of class.'"

Operations Manager,
Independent Producer

"We are pleased with your work ... Ziff delivers the full package, a statistically rigorous analysis coupled with real suggestions that can be used to improve operating performance. It is refreshing to work with Ziff's staff, which consists of industry professionals who are knowledgeable and experienced."

Development Manager,
Large Independent Producer

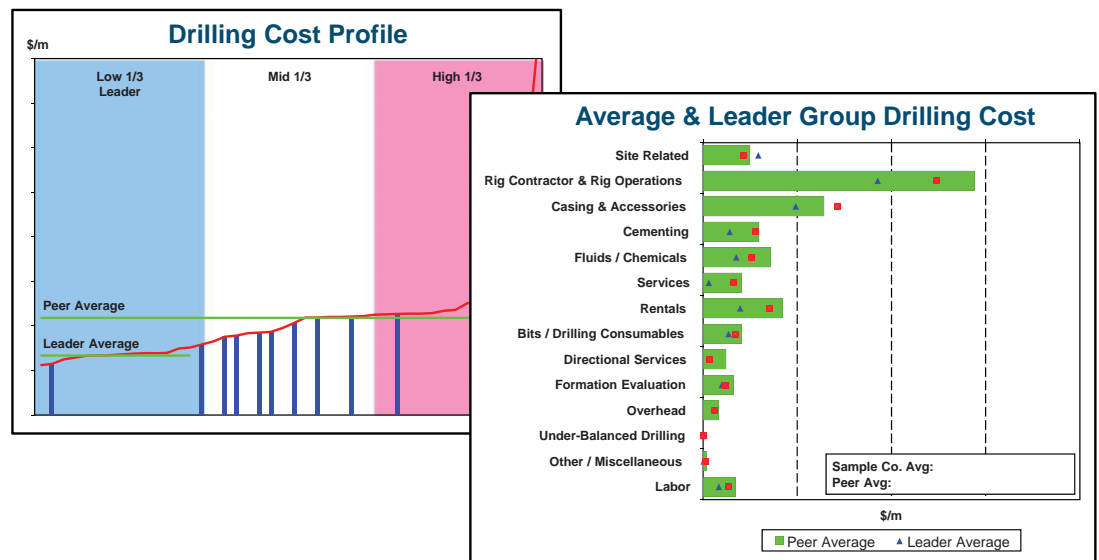
BAKKEN OIL SHALE OPERATIONS BENCHMARKING STUDY

The Bakken formation covers about 200,000 square miles (520,000 km²) of the subsurface in the central & deeper portion of the Williston Basin, covering parts of Montana, North Dakota, and Saskatchewan. Thanks to technological advances, the Bakken production today is about 200,000 Bbl/d.

Drilling represents the largest cost component in F&D, over \$7/BOE (\$1.15/McfE)
Minimizing drilling costs is critical to profitability for E&P companies.

This study will help you reduce your drilling costs by enhancing your drilling performance and efficiency and contribute to a lower Finding & Development cost. We will measure your drilling and completion costs relative to other operators in the study and provide your drilling and completions team with factual data that pinpoints high costs, compared to similar wells, and to assist in reducing the costs of future wells. As part of this work, Ziff Energy will also focus on best practices related to key challenging areas of Bakken Oil Shale: Expensive Drilling, and Completion Efficiency. A "Production Reliability" analysis will also be performed. The main objective of this deliverable is not only to define the gaps between current practices versus best practices, but to delineate *practical recommendations* to enhance operating efficiency.

- **Drilling cost data** is segregated into 14 main standard classifications; the total costs are shown as 56 Sub-Categories of Drilling Costs
- **Completion cost data** is grouped into 12 main standard classifications; 35 cost sub-classifications to provide clients with further insight
- **Drilling time data** is segregated into 5 standard classifications, Completion time data has 3 categories. These categories are divided into a total of 28 sub-categories that can provide further insight into drilling activities.



This study is for you if your company needs:

- a focused approach to evaluate your drilling performance
- consistent, reliable and detailed information to assess the strengths and opportunities for improving your current drilling program
- an understanding of the performance gaps and improvement opportunities in the well construction process
- knowledge of best practices for internal learning.

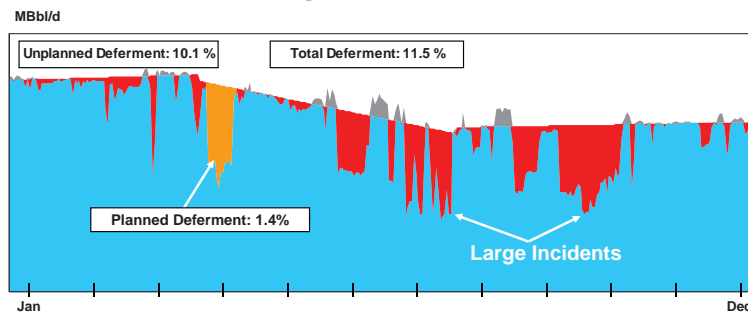
Our Methodology:

- **analyzes industry performance** by area/geology, depth range, type of wells
- includes multiple **Performance Metrics**, including cost per foot, feet per day, completion time, and others
- analyzes **Cost Drivers** such as well depth, well profile (vertical, horizontal, multilateral), geology, surface location, hydrogen sulfide, and completion design
- identifies and quantifies **performance gaps** and **improvement opportunities**.

Uptime & Reliability

Our Reliability metrics are based upon an analysis of daily production data to identify downtime incidents (unplanned and planned), and lost production. Because Ziff Energy applies the methodology consistently to all assets, our approach removes the subjectivity and uniqueness of each operator's definition of their own internal reliability metrics. Ziff Energy's Reliability metrics, including Mean Time Between Incidents (MTBI) and Mean Time to Repair (MTTR), are used to benchmark overall production performance and are based upon the production losses.

Sample Metrics - Planned vs. Unplanned Downtime & Production Deferment



Our Deliverables to you . . .

Comprehensive Report

- In-depth drilling and completion cost analysis
- Organized by multiple peer asset categories or groupings of similar fields based on technical and operational characteristics
- A proven study designed with considerable input from clients
- Ziff Energy's analysis highlights performance gaps and quantifies improvement opportunities.

Customized Field-Level Production Analysis

- 'Uptime Reliability' Performance relative to peer fields & Operators
- Operating Cost Analysis for each field, identifying potential cost savings by cost category for each field
- Operating Best Practices and review of emerging technologies.

Submit Data Electronically - Much Easier!

- Our improved cost data gathering approach is now based on your own data structure, so data retrieval is far easier, and fast! Ask us about Electronic Data Gathering from your accounting and well data systems.

Private Debriefing

- To help focus your team on immediate solutions.
- identification of tendencies within your organization towards high or low cost bias for each cost category
- provides strong insights into your company's drilling and completion performance
- provides specific analysis of main improvement opportunities.

Experienced Team

- Operations Professionals with 20+ years experience have the knowledge and background to provide specific and actionable solutions related to Bakken Oil Shale operations

"We encourage other operators to participate in Ziff Energy's multi-client benchmarking projects.

Some of the benefits are:

- *standardized cost data & peer field comparison*
- *points to areas where we may have gaps in performance*
- *the results encourage us to take a look at our operating metrics and understand the drivers and where to focus our time and efforts*
- *(uptime) reliability metrics*
- *automated data gathering takes effort away from staff, who are stretched these days."*

VP, Large Independent Producer

"Immensely impressive . . . much more detailed than other benchmarking studies."

President, Major

"We have been benchmarking with Ziff Energy for almost a decade now, so we are believers in the data. Our costs were still climbing... We thought we had good disciplines. We thought we were doing well, but the data told us otherwise... We asked them [Ziff Energy], to help out... to share some of the best practices they had seen in the industry..."

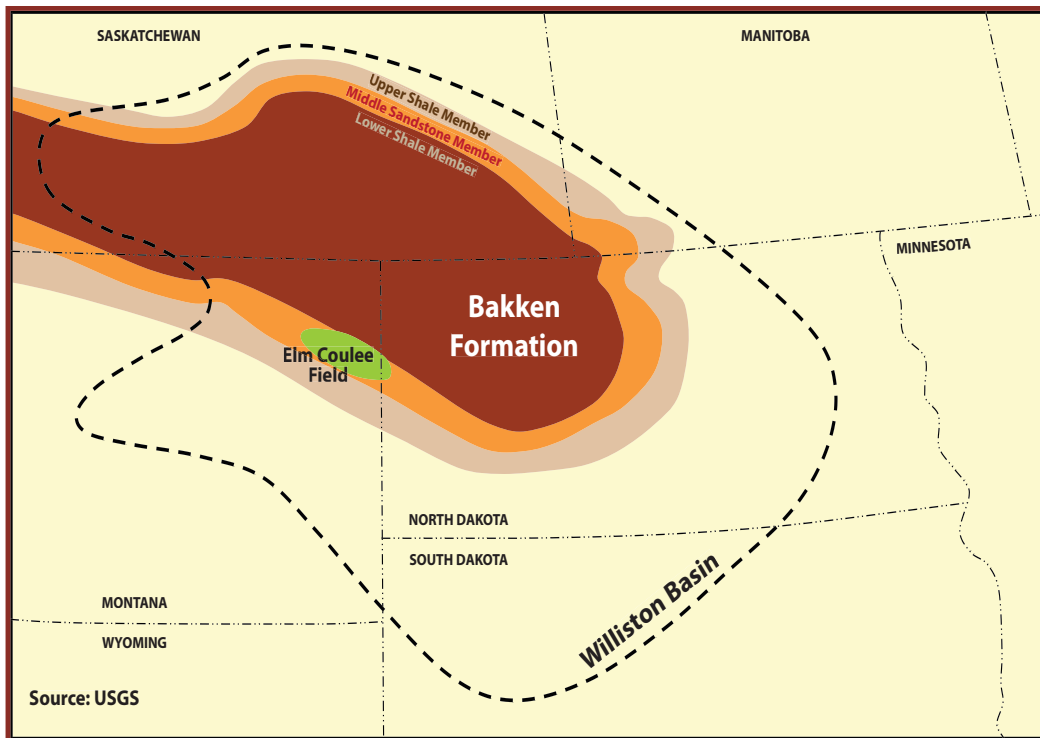
- *in 2009 & 2010, we managed to flatten our operating costs – the overall operating expenditure was a little bit lower than our growth*
- *in 2009, we saved \$23 million*
- *in 2010, we saved \$40 million."*

Technical Director,
International Independent

"The value for changes we implemented was estimated at \$5 million, a very good return!"

Senior Engineer,
International Major

Bakken Formation - the New Bonanza



You are invited to participate in this effective analysis and gain the benefits

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Why Ziff Energy?

Ziff Energy has completed 180+ multi-client studies, assisting 100+ E&P companies in 40+ countries to lower operating costs and increase production by comparing their field operating cost performance against similar gas or oil fields. To date, over 4,000 oil and gas fields, representing over \$30 billion in operating costs, have been analyzed in our field operations studies.

For 4 years, we have used Electronic Data Gathering to transfer data from your accounting system to Ziff Energy. Clients no longer complete cost spreadsheets. We cross reference your cost accounting codes to our standardized detailed set. The download of your cost data is loaded into the benchmarking categories using the code mapping. Transparency is enhanced, client effort dramatically reduced, and you can drill down into your own cost data to better understand your performance gaps.

Ziff Energy's Center for Benchmarking Excellence

In 2007, Ziff Energy established a unique World Upstream "Center for Benchmarking Excellence", to ensure that Ziff Energy studies for upstream operations are the best conceived and executed. The core group, mainly based in Calgary, comprises a full time cadre of Analysts, currently professional engineers and economists who each have 5-15 years of experience and a Masters or B.Sc. in Engineering or Economics. The group works with Project Managers, Directors, VP's, and Ziff Energy's team of International Associates, based in various countries, who each have 15-30+ years of E&P operations experience. They are supported by two full time IT team members and a leading desktop publishing team.

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