



HEAVY OIL AND OIL SANDS TESTING



Capabilities

Industry Trends

The Maxxam Advantage

Analytical Testing Services

We create value for the Oil & Gas industry by delivering the most comprehensive range of analytical services that address the key business objectives of our customers – from productivity to regulatory compliance.

Customers leverage Maxxam's technical expertise to optimize their operational processes and to design customized solutions that serve the emerging needs of the industry. Maxxam's Petroleum Services group provides accurate and timely analytical testing services in support of oil sands mining and SAGD operations, crude oil upgrading and refining sectors.

Capabilities

As the scientific leaders in analytical services and solutions, Maxxam's capabilities for the heavy oil and oil sands sector include the following:

- Crude Assays / Distillations
- Blend Studies
- Processability / Batch Extraction
- Asphaltene Analysis
- Dean Stark Extractions
- Particle Size Distribution
- Composition Analysis
- Outsourcing Lab Operations
- Analytical Support for Pilot Plants
- On-site Sampling / Testing
- Thermal Water Analysis Programs
- Hydrocarbon Fingerprinting
- Crude Oil by Rail Sampling & Analysis
- Solvent Coinjection
- Tailings Characterization
- Core Processing
- Air Quality Monitoring

Industry Trends

Given delays in pipeline approvals, we are seeing dramatic growth in shipping crude oil by rail. This creates new sampling, analytical, distribution and valuation challenges for producers, midstreamers, transloading facilities and refineries. More sophisticated refinery control systems and tighter product specifications for refined products must be supported by advances in analytical technology. These advances will allow for faster results with lower detection limits to provide more detailed determinations of quality before the product arrives at the refinery.

Oil sands producers continue to focus on maximizing reservoir yield, while maintaining product quality. Companies are also accelerating the pace of improvement in environmental performance in the oil sands through collaborative action and innovation. Businesses committed to sustainable growth are taking actions to monitor and minimize their impact on air, land and water. Through COSIA (Canada's Oil Sands

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Innovation Alliance), oil sands producers have signed precedent-setting Joint Venture Agreements (JVA) and are sharing new technologies and launching new projects in four key Environmental Priority Areas (EPA): land, water, tailings and greenhouse gases.

A significant problem for thermal oil operations is the risk of increased corrosion, sediment and scale build-up within thermal water treatment facilities and steam generators. A comprehensive sampling and analysis program was initiated in 2012 to expand the body of knowledge available regarding the amount and character of dissolved inorganic and organic material in thermally produced water in SAGD facilities. There is growing demand for thermal water chemistry expertise and analysis at onsite laboratories as well as offsite when more comprehensive evaluation is deemed appropriate.

The Alberta Department of Energy now requires detailed bitumen assays for oil sands projects. The development of a bitumen resource knowledge base will be used for policy analysis, planning, and royalty compliance among other government priorities.

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EXPERTISE: As Canada's leader in heavy oil and oil sands testing, Maxxam provides our customers with the confidence that comes from working with a partner that has over 40 years of experience and technical expertise in this industry. Our ability to provide a comprehensive range of sampling services and laboratory testing along with maintaining the industry's highest standards in data quality give our customers the service they need to succeed in today's marketplace. In our experience, the technical competence of a laboratory depends on a number of factors including:

- The qualifications, training and experience of their staff,
- Having properly maintained and calibrated equipment in suitable testing facilities,
- Following strong quality assurance procedures including accurate recording and reporting procedures and,
- Using appropriate and valid test methods for the client's situation

QUALITY: Maxxam has a strong Quality Management System (QMS) which encompasses both quality assurance and quality control. Across Canada, more than 40 people are employed on Maxxam's Quality Assurance (QA) team as Regional Managers, Specialists and Coordinators. QA staff are responsible for carrying out the monitoring, documentation and training required by the company's QMS. To ensure independence, integrity and effectiveness of their functions, these employees report to the National Director of Quality, who reports directly to Maxxam's President.

Our laboratories are accredited to ISO/ IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories" which is the global standard for laboratory quality management programs. But accreditation is just a minimum requirement to ensure quality. Maxxam laboratories also participate in many national and international proficiency testing and double-blind-check sample programs to assess turnaround time (TAT), data accuracy and traceability.

INNOVATION: At Maxxam, **Success Through Science®** is more than a tagline. Our actions, as well as our investments in people and R&D demonstrate that Maxxam is not only committed to high quality analytical data for routine analyses, but we are also committed to advancements in science. Our commitment to innovation contributes to the success of our customers' projects and their businesses.

Maxxam is the Canadian market leader in analytical services and solutions to the energy, environmental, food and DNA industries and a member of the Bureau Veritas Group of companies – a world leader in testing, inspection and certification services. We support critical decisions made by our customers through the application of rigorous science and the knowledge and expertise of our over 2500 employees.

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