



ACCURATE, DEPENDABLE AND INDEPENDENT **TECHNICAL EXPERTS**

APPLIED RESEARCH & TESTING FACILITY

Oil sands - 80% sand, 10% bitumen and 10% water - one of the largest energy reserves in the world, but also among the most difficult and costly to process. SGS' Applied Research and Testing Facility fills a gap for the oil sands industry. The flexibility and independence of our ART facility allows you to do more rigorous, focused and confidential testing with the ultimate benefit being optimized & cost-effective processing technologies.

Our ART facility is designed for safety, environmental sustainability, and operational efficiency. When you need to be sure, trust SGS.

SGS IN THE OIL SANDS

SGS' oil sand initiative is located centrally within the Athabasca oil sand deposit, the largest reservoir of crude bitumen in the world. Nearby are the smaller yet considerable Peace River and Cold Lake bitumen deposits which, when taken together with the Athabasca resource, comprise approximately 1.7 trillion barrels of bitumen in-place.

SGS

OIL SANDS **PILOT TESTING** AND PROCESSING

SGS is dedicated to providing you with practical technical solutions that optimize your operations, reduce your risk, and maximize return. Our Applied Research and Training Facility houses a 2 tonne per hour pilot plant (nominal) that allows us to address many technical questions. SGS is well positioned to be a single source provider to the oil sands industry: our solutions address many operational challenges in the oil sands industry including extraction, froth treatment and tailings testing.

EXTRACTION PROCESS

The pilot plant equipment in the Facility is designed to be semi modular and so is skid-mounted. This configuration means we can test a variety of alternative flowsheets, and we can configure your plant quickly in a "plug and play" manner.

The pilot plant has been equipped with a range of equipment, including:

- Primary separation vessel (PSV)
- Hydrocyclone (primary and others)
- Mechanical flotation cells
- Flotation columns
- Contact columns
- Belt filter
- Thickeners

The SGS pilot plant equipment is available in a range of sizes and capacities sizes to permit a variety of different flowsheet configurations. Within a single pilot plant campaign, we can test several different flowsheet configurations (for example, a comparison of mechanical cells versus column cells).

FROTH TREATMENT

Froth treatment is a critical step in the overall bitumen production process. As such, the design of this represents an area of considerable technical risk. The SGS froth treatment plant has been designed to handle 400 kg/hr of froth. Our froth treatment plant operates on a continuous basis to service your needs.

The froth treatment plant has tankage for feed slurry, dilute bitumen, solvents, stripped tails and slops. This ensures that the various waste procedures are segregated. This makes it easier to manage product disposal. The froth treatment plant is located in a separate, well ventilated building, independent of the primary extraction pilot plant facility.

TAILINGS TESTING

Understanding the changes in the physical and chemical balance allow us to address any potential hazards. As part of a piloting exercise, tailings are produced and we characterize them for their chemical and physical characteristics. Such assessments can be performed on process waters or solids waste. Tailings are filtered and then chemically treated. Solids go for tailings testing while liquids are recycled back as process water.

SGS offers a large-scale geotechnical batch tests to study tailings characteristics including:

- Settling
- Compaction
- Rheology
- Porosity
- Clarity
- Chemical and bituminous aspects of tailings

PLANT OPTIMIZATION AND ADVANCED PROCESS CONTROL

- Pilot testing to identify optimum operating conditions and to benchmark the process performance of new ore-types against a known standard
- Pilot-scale comparison of flotation and primary separation equipment design
- Instrumentation selection and process control engineering
- Advanced process control systems (expert, neural networks, genetic algorithms, etc.)
- Image analysis of froths linked back to automated process control system
- Ore blending recommendations



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