XPS BULLETIN

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➤ XPS will be attending Metsoc COM2017 in Vancouver, B.C., Aug. 27-30, 2017.

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XPS EXPERT PROCESS SOLUTIONS 10 years
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The XPS Centre – 20 Years Young!

THE 10TH ANNIVERSARY OF XPS ALSO COINCIDES WITH THE 20 YEAR ANNIVERSARY OF THE XPS CENTRE

In the last edition of the XPS Bulletin (Issue 17 – 10th Anniversary Edition) we highlighted the 10 Anniversary of XPS as an autonomous technology business within Glencore, responding to client needs in over 25 countries around the world. The 10th Anniversary of XPS also coincides with the 20 Year Anniversary of the XPS Centre (formerly the Falconbridge Technology Centre - FTC) in Falconbridge, Ontario.

FML Lab (Thornhill, circa 1978)

XPS Centre Milestones

1952 – Falconbridge Metallurgical Laboratories founded in Thornhill, Ontario

1957 – FML expanded to accommodate metallurgy groups

1968 – Computer mainframe installation

1970 – Two Story expansion to accommodate new product development along with electron microprobe technology

1984 – FML moves to Falconbridge, Ontario and becomes MTC

1994 – Engineering and construction starts on new $18M Falconbridge Technology Centre (FTC) now the XPS Centre

1997 – Official opening of FTC

2007 – XPS Expert Process Solutions is formed and FTC renamed to XPS Centre

Old Metallurgical Technology Centre – Falconbridge, Ontario

The history of the world class XPS Centre would not be complete without first reviewing the history of FTC. The story begins in the late 1940's when the Falconbridge President, Dr. H.J. Fraser conceived an idea of a central research laboratory for Falconbridge Nickel Mines. The original property and building located in Thornhill, Ontario was acquired and remodelled in 1952 and Falconbridge Metallurgical Laboratories (FML) was formed to satisfy an immediate need for quality control methodologies. The building was expanded several times to accommodate metallurgy groups, focused upon both sulphide and laterite ores and concentrates. Physical metallurgists played a major role in the late 1950's to provide a scientific base for competitive sales and promotion of Falconbridge products and development of new alloys.

After several expansions the group had grown to over 70 scientists, engineers, chemists, technicians and technologists. In 1984, the Thornhill facility was amalgamated with laboratory facilities in the town of Falconbridge to form the Metallurgical Technology Centre (MTC).

Fast forward to 1994, when the company began a $35M construction project which included an $18M, 2-story, 73,000 sq. ft. world class technology centre, now known as the XPS Centre. The XPS Centre was

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Lithium from the Canadian Shield

LITHIUM MINING IS A CANADIAN GROWTH INDUSTRY, WITH CANADIAN HARD ROCK DEPOSITS OFFERING SOME DISTINCT ADVANTAGES FOR HIGH-TECH LITHIUM MARKETS.

The battery industry has continued to push the envelope for product purity, especially with respect to control of magnesium and iron contamination. Historically the majority of commercial lithium has been obtained from brines and evaporitic deposits; however, brine sources are typically magnesium rich, and purification must be achieved hydrometallurgically.

Figure 1 – Pakeagama Lake (PAK) Spodumene

Figure 2 – Pakeagama Lake (PAK) Spodumene (UIZ) High Grade Zone

Mineral sources of lithium (spodumene $LiAlSi_2O_6$, or petalite $LiAlSi_4O_{10}$) have the advantage of containing no iron or magnesium, and are frequently hosted within rocks that also contain minimal iron and magnesium. As a result of this, hard rock lithium deposits which were historically considered to be economically disadvantageous relative to brine lithium resources have now emerged as attractive sources of exceptionally pure lithium materials. Mineral sources of lithium from the Canadian shield have come into their own.

XPS is proud to be working with Frontier Lithium (TSX.V: FL) in the development of the Pakeagama Lake (PAK) lithium project. Located 175 km north of Red Lake, the PAK project contains over 8 million tonnes of ore at ~1.8% Li_2O equivalent. The project anticipates the initial stage production of about 1,000 tpd of ore into a lithium concentrate containing over 7% Li_2O. Photos of the ore and ore zone arshown in Figures 1 and 2.

The upgrading task involves separation of spodumene from associated quartz and feldspars, as well as removal of trace diluents and contaminants. Crushed ore is upgraded by dense media separation (DMS) and is subjected to desliming and gravity separation (Ta recovery) followed by flotation for removal of micas and associated fluorine; separation of spodumene from gangue silicates (quartz and feldspar); reverse flotation for the removal of phosphates and tourmaline; and finally, wet high-intensity magnetic separation (WHIMS) for the reduction of iron to exacting specifications (<0.1% Fe_2O_3).

Development of the flowsheet has relied upon a combination of past industrial practice, mineralogical characterization by QEMSCAN, and laboratory testing of ore samples from the PAK deposit. Since the success of the project revolves around exacting control and reduction of potential contaminants, rigorous quality control methodologies are a key to project success.

The flotation products from the PAK project are suitable for sale into the glass industry, which will make up the initial market for concentrates; however, XPS will continue to work with Frontier Lithium in downstream development for the conversion of lithium concentrate into chemical products. Lithium concentrate will be converted through decrepitation, acid baking and leaching/precipitation to produce battery grade lithium carbonate and or hydroxide products. Frontier Lithium intends to spearhead the production of high quality battery grade lithium within Northern Ontario, establishing our region as a significant Canadian contributor to clean energy technology. XPS is extremely proud to be involved with Frontier Lithium in this groundbreaking and challenging project.

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