# HEEMSKIRK
# *Announcement*

1 November 2013

## Reserves and Resources Update

### KEY POINTS

- **Annual Statutory Update of Resources and Reserves**
- **Overall Silica Resources at Moberly Project unchanged year on year**

In Canada there are two processing facilities - Lethbridge and Moberly. Lethbridge has been operating for over 60 years. Moberly has been operating for approximately 30 years. Products from these facilities are used predominantly in the oil and gas drilling services industry. Major developments are underway in this industry which will require significant consumables during the forthcoming decades.

Over the period the major focus of the Company has been advancing the engineering and finance stages of the Moberly Silica operation for a redevelopment producing frac sand.

Detailed engineering and design work is largely complete (90-95%). There are no permitting issues which would delay a development decision. The remaining issue is project financing. Discussions are underway with a number of parties.

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## 1. Moberly Silica Deposit (100% owned by Heemskirk)

The Moberly silica deposit occurs on the flank of Mount Moberly within a near vertical, massive quartzite unit which is at least 200 metres in thickness and has a strike extent of several kilometres. The deposit consists of approximately 1,000 metre strike length of variably altered, friable ('sandy') zones within the quartzite. The deposit has been quarried and processed since the early 1980s as a source for glass making silica sand, golf course sand and more recently for silica flour. Mining and pitting has occurred over an approximately 800m strike length, 150m vertical extent and 200m across the deposit.

During 2010 – 12 Heemskirk investigated, via an internal pre feasibility and then a feasibility study, the possibility of treating the quartzite to produce a 'frac sand' suitable for use in the oil & gas sector as a proppant[1]. The studies found the project to be economically viable and the project moved to engineering design of a new frac sand plant on the existing plant site and an expanded mine with at least a 35 year mine life.

In the past year Heemskirk have been negotiating finance arrangements to build the new plant and other works to allow the expanded mining operation. It is understood that these negotiations are on-going and the project remains financially robust.

Resources and Reserves of silica at Moberly are unchanged from last year. As last year, a minor amount of ore was trucked from the mine to stockpiles on site but was not treated.

Resources and Reserves of silica at Moberly in 2013 are estimated separately for the traditional markets of Moberly silica – firstly for glass making, sand golf course sand, silica flour and other silica products and separately for frac sand (with residues suitable for silica flour as a complimentary resource). These estimates are largely for the same area of the deposit, but utilising different processing routes and end markets. Therefore the resource estimates are not additive, but rather alternatives to one another. Due to the simplicity of the geometry of the resource blocks, traditional cross-sectional techniques were able to be used, based on volumes estimated from AutoCad applied to a digital terrain model (DTM) of the deposit.

[1] Frac sand consists of silica sand which, having certain characteristic roundness, sphericity, strength and certain other properties is suitable to act as a proppant in oil and gas wells. Proppants are injected into such wells in order to keep fractures open, allowing the continued free flow of the gas or oil from the reservoir. Frac sand is usually used by customers in certain size brackets, e.g. 20 mesh to 40 mesh, 40 mesh to 70 mesh and 70 mesh to 140 mesh, although the particular size used in any one well tends to be characteristic of the particular hydrocarbon field in question and/or the depth of the well. Although there are ISO and API standards for the various frac sand properties, there is no overall benchmark for 'frac sand', and customers may use sand not meeting a particular test under certain circumstances.

## *A. Silica for frac sand and silica flour markets*

These Resources and Reserves are for an alternative processing route and market to the glass sand and other products reported in Part 1B. Resources and Reserves presented in this Section A are therefore not additive to those presented in Section B but rather are alternatives.

*In-situ* silica destined for the frac sand market has an estimated 64% yield to 20 mesh to 140 mesh sized sand[2], with the balance (frac sand residues) suitable for silica flour. Therefore the frac sand is expressed as a tonnage and percent frac sand yield, with the frac sand residue resource expressed as *in-situ* tonnage.

**Table 1: In situ Identified Mineral Resources of silica suitable for 20 mesh to 140 mesh frac sand, at 30 June 2013**

| | Dry tonnes | |
|---|---|---|
| **Resource Category** | **2012** | **2013** |
| Measured*^ | 10.8 million tonnes @ 64% frac sand | 10.8 million tonnes @ 64% frac sand |
| Indicated*^ | 21.6 million tonnes @ 64% frac sand | 21.6 million tonnes @ 64% frac sand |
| **Total Measured + Indicated*^** | 32.4 million tonnes @ 64% frac sand | 32.4 million tonnes @ 64% frac sand |

* *Mineral Resources for frac sand include that proportion modified to produce Ore Reserves of frac sand.*
^ *Frac sand Resources are not additive to Resources for glass making etc*
*Columns may not add up due to rounding*

Residues from the production of frac sand (ie -140 mesh) are suitable for the production of silica flour for various uses, so the following Resources for frac sand residues are in addition to the Resources for frac sand.

**Table 2: In situ Identified Mineral Resources of silica as frac sand residues, at 30 June 2013**

| | Dry tonnes (millions) | |
|---|---|---|
| **Resource Category** | **2012** | **2013** |
| Measured*^ | 3.9 | 3.9 |
| Indicated*^ | 7.8 | 7.8 |
| **Total Measured + Indicated*^** | 11.7 | 11.7 |

* *No proportion of these Resources are contained in the Ore Reserves below*
^ *Frac sand residue Resources are not additive to Resources for glass making etc*
*Columns may not add up due to rounding*

During the past year, an amendment to the Mining and Reclamation Permit relating to the Moberly mine and processing plant was approved by the regulators to accommodate the mining and processing of 400,000 tpa of ore and to allow the upgrading of the mine haul road to accommodate the hauling of this quantity. A condition to submit a report on the treatment of dust from the site

[2] October 2011 Moberly Frac Sand Feasibility Study, including yield estimates by MineSense Technologies Limited

has yet to be fulfilled, however discussion with the regulator has found that this can be done, as expected by the company, once the final design of the processing plant is done and the specifications of the dust filters and other suppression mechanisms is finally decided.

From the estimated Resources for frac sand were estimated the following Ore Reserves of frac sand (20 mesh to 140 mesh):

**Table 3: Ore Reserves of silica suitable for 20 mesh to 140 mesh frac sand, at 30 June 2013**

| | Dry tonnes | |
|---|---|---|
| **Reserve Category** | **2012** | **2013** |
| Proved^ | 8.9 million tonnes @ 64% frac sand | 8.9 million tonnes @ 64% frac sand |
| Probable^ | 4.6 million tonnes @ 64% frac sand | 4.6 million tonnes @ 64% frac sand |
| **Total Proved + Probable^** | 13.5 million tonnes @ 64% frac sand | 13.5 million tonnes @ 64% frac sand |

^ *Frac sand Reserves are not additive to Reserves for glass making etc*
*Columns may not add up due to rounding*

## *B. Silica for glass sand, golf course sand and silica flour markets*

These Resources and Reserves are for an alternative processing route and market to the frac sand reported in Part 1A. Resources and Reserves presented in this Section B are therefore not additive to those presented in Section A but rather are alternatives.

In-situ silica for glass making, golf course sand and silica flour and other silica products produces 100% saleable product and so is expressed as in-situ tonnes.

There was no mining in the reporting period[3] and no activities that would extend the resource, so there is no change in the Resources of silica for glass making etc as at 30 June 2013 versus 30 June 2012.

**Table 4: Identified Mineral Resources for silica for glass making and golf course sand, silica flour markets at 30 June 2013**

| | Dry tonnes (millions) of silica product | |
|---|---|---|
| **Resource Category** | **2012** | **2013** |
| Measured* | 21.6 | 21.6 |
| Indicated* | 21.6 | 21.6 |
| **Total Measured + Indicated*** | **43.2** | **43.2** |

* *Mineral Resources include that proportion modified to produce Ore Reserves.*
*Columns may not add up due to rounding*

[3] Some mining and stockpiling occurred after this period however this was not material

From the above in-situ Resources were estimated in 2012 the Ore Reserves given in Table 5.

These are contained within an engineered pit of 35 years duration at a mining rate of 400,000 tpa.

**Table 5: Ore Reserves for silica suitable for glass making, golf course sand and silica flour markets at 30 June 2013**

| | Dry tonnes (millions) of silica product | |
|---|---|---|
| **Reserve Category** | **2012** | **2013** |
| Proved | 12.8 | 12.8 |
| Probable | 0.7 | 0.7 |
| **Total Proved + Probable** | 13.5 | 13.5 |

*Columns may not add up due to rounding*

## 2. Princeton Zeolite Deposit (Exclusive mining rights held by Heemskirk)

**Table 6: In situ Identified Mineral Resources at 30 June 2013**

| | Dry tonnes (millions) zeolitised rock | |
|---|---|---|
| **Resource Category** | **2012** | **2013** |
| Measured | 0.44 | 0.44 |
| Indicated | 0.11 | 0.11 |
| **Total Measured + Indicated** | **0.55** | **0.55** |

## 3. Cache Creek Zeolite Deposit (100% owned by Heemskirk)

**Table 7: In situ Identified Mineral Resources at 30 June 2013**

| | Dry tonnes (millions) zeolitised rock | |
|---|---|---|
| **Resource Category** | **2012** | **2013** |
| Measured | 0.65 | 0.65 |
| Indicated | 0.24 | 0.24 |
| **Total Measured + Indicated** | **0.89** | **0.89** |

*The information in Sections 1, 2 and 3 that relates to Mineral Resources or Ore Reserves is based upon information compiled by Malcolm Ward, who is a Member of the Australasian Institute of Mining and Metallurgy. Malcolm Ward is employed by and is Principal of Mining Advisory Pty Limited. Malcolm Ward and Mining Advisory Pty Ltd are retained under contract by Heemskirk to provide geological services, including the estimation of Resources and Reserves.*

*Malcolm Ward has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Malcolm Ward consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*