



## Heemskirk to break ground at Moberly Frac Sand Project

Heemskirk Consolidated Limited (ASX:HSK) is pleased to announce that the Board has approved the first stage of construction of its strategically located permitted and engineered Moberly frac sand processing and distribution asset located within the Western Canadian Sedimentary Basin (WCSB) at Golden, British Columbia (see figures 1 and 2).

This strategic asset will service the oil and gas drilling industry's frac sand requirements in British Columbia.

"Heemskirk is delighted to break ground at Moberly, in order to pour concrete footings before winter sets in," commented Heemskirk Managing Director, Mr Peter Bird. "This gives us the option of moving to the next stage of construction over the colder months."

"Our Moberly frac sand project has been in the planning stage for some time and we are pleased to be making a start on construction," Mr Bird said. "Demand for frac sand is growing strongly and is expected to accelerate as the oil and gas exploration companies expand the search for and development of gas resources immediately adjacent to Moberly. Gas demand is expected to rise from the LNG export facilities under construction on Canada's Pacific coast."

Initial plans are for a 300,000 tonne a year facility servicing the Canadian drilling market of approximately 3.0 million tonnes a year. The Moberly plant is located approximately 16km from the mine which has a 32.4 million tonne measured and indicated resource of 64% frac sand (see Appendix 1).

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The project is located strategically adjacent to Canadian Pacific Railways' main East West rail line, the Trans-Canada Highway, and on the western edge of the WCSB in British Columbia (see figure 1). Independent tests have verified that the project, as designed can produce American Petroleum Institute (API) specification 20/40, 30/50, 40/70 and 100 mesh Frac sands capable of meeting the requirements of exploration and development companies operating in Canada. Located approximately 700km from Grand Prairie, Alberta, an oil and gas hub, Moberly is well situated to provide a logistical advantage to its customers in the Western Canadian Sedimentary Basin (WCSB). Trucks can travel between Moberly and almost any wellsite in the WCSB in one day if the rail lines are busy or disrupted.

Heemskirk will use local construction and engineering group Maple Reinders to establish footings for the processing operations situated on the freehold owned and permitted plant site.

The capital cost estimate for this component of work is estimated to be \$2.14m which includes footings and earthworks. This work will be internally funded and remains within the overall budget.

Whilst this work is underway the subsequent construction elements will be subject to final detailed pricing and award.

Mr Bird said negotiations concerning a possible joint venture ownership of the project, announced in August, were continuing with the due diligence exclusivity period being extended to 15 October to allow the other party time to address deal structuring issues.

### **About the Project**

The Moberly Project is a redevelopment of an existing permitted open pit mine and facilities to produce high quality API Specification Frac Sand Product for the supply into the Western Canadian Oil and Gas industry.

General Project Parameters are as follows:

- The capital cost estimate is C\$26m<sub>2013</sub>
- Initial design production rate is 300,000 tonnes of saleable frac sand per annum at full production (year 2 onwards)



- Project is readily expandable to double the initial production capacity once all initial operational and product sales milestones have been met
- Estimated Project NPV<sub>7.5</sub> C\$66m, NPV<sub>10</sub> C\$48m
- Total net assets of project valued at \$8.0m as at 31 March 2014
- Estimated Internal Rate of Return of 30%
- The Payback Period from start of production is approximately 3 years
- Construction time estimate 9 - 12 months from a development decision

The Company has existing cash and liquids of A\$17.4m with a corporate cash debt obligation of A\$2.74m payable in March 2015 (see presentation released to ASX on 11 September 2014).



**Figure 1 Moberly Plant Site Location**



**Figure 2 Planned Layout - Moberly Plant Site**



## Appendix

This report of mineral Resources and ore Reserves at Moberly as of 30 June 2013 was originally published on 1 November 2013 under the 2004 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (the JORC Code). A report as of 30 June 2014 is in preparation and will be reported under the 2012 Edition of the JORC Code.

### 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<sup>1</sup>. 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

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<sup>1</sup> 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.





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.

## 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<sup>2</sup>, 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**

Resource Category	Dry tonnes	
	2012	2013
Measured <sup>*^</sup>	10.8 million tonnes @ 64% frac sand	10.8 million tonnes @ 64% frac sand
Indicated <sup>*^</sup>	21.6 million tonnes @ 64% frac sand	21.6 million tonnes @ 64% frac sand
<b>Total Measured + Indicated<sup>*^</sup></b>	<b>32.4 million tonnes @ 64% frac sand</b>	<b>32.4 million tonnes @ 64% frac sand</b>

\* 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.

<sup>2</sup> October 2011 Moberly Frac Sand Feasibility Study, including yield estimates by MineSense Technologies Limited



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

Resource Category	Dry tonnes (millions)	
	2012	2013
Measured <sup>*^</sup>	3.9	3.9
Indicated <sup>*^</sup>	7.8	7.8
<b>Total Measured + Indicated<sup>*^</sup></b>	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 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**

Reserve Category	Dry tonnes	
	2012	2013
Proved <sup>^</sup>	8.9 million tonnes @ 64% frac sand	8.9 million tonnes @ 64% frac sand
Probable <sup>^</sup>	4.6 million tonnes @ 64% frac sand	4.6 million tonnes @ 64% frac sand
<b>Total Proved + Probable<sup>^</sup></b>	13.5 million tonnes @ 64% frac sand	13.5 million tonnes @ 64% frac sand

<sup>^</sup> 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<sup>3</sup> 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**

Resource Category	Dry tonnes (millions) of silica product	
	2012	2013
Measured*	21.6	21.6
Indicated*	21.6	21.6
<b>Total Measured + Indicated*</b>	<b>43.2</b>	<b>43.2</b>

\* Mineral Resources include that proportion modified to produce Ore Reserves.

Columns may not add up due to rounding

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**

Reserve Category	Dry tonnes (millions) of silica product	
	2012	2013
Proved	12.8	12.8
Probable	0.7	0.7
<b>Total Proved + Probable</b>	<b>13.5</b>	<b>13.5</b>

Columns may not add up due to rounding

The information in Section 1 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

<sup>3</sup> Some mining and stockpiling occurred after this period however this was not material





*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.*

## **Moberly**

### **General Background Information**

Expenditure on the Project to date relates to completion of detailed engineering drawings and specifications to 90-95% of requirements, site preparation, project management and quotation preparation. From an engineering viewpoint the project is ready to proceed to the next stage.

### **Background**

The Project is located adjacent to the Trans-Canada Highway and Canadian Pacific Rail Mainline near Golden, British Columbia, Canada. It is also within 12 hours trucking to targeted market areas which extend from southern Saskatchewan (Bakken Basin) to northeast British Columbia (Horn River Basin).

Frac sand is manufactured from naturally occurring, high quality, very low impurity quartz sand via a crushing, grinding, washing and sizing process. Frac sand is used in the oil & gas sectors to facilitate well productivity – chiefly the unconventional tight gas and shale gas industry.

Resources of silica at the Moberly silica mine were reported as at 30 June 2013 and will be restated for the year ending 2014. Contained within a Measured and Indicated Resource of 43 million tonnes of silica suitable for glass manufacturing, cement additives and traditional and related uses, is an estimated Measured and Indicated Resource of 32.4 million tonnes of which approximately 64% is frac sand. The host silica unit extends well beyond the current resource boundary, especially along strike to the south-east.

Of note, the 2013 Reserve and Resource reports Silica Frac Reserves as 13.5 million tonnes (as reported on 1 November 2013). The reserves provide high confidence to develop the Project.



Due to oil & gas demand exceeding supply from conventional reservoirs, attention has shifted in recent years to the exploitation of less permeable basins. This has been facilitated by the rapid improvement in horizontal drilling and frac technology. As a result, the demand for frac sand continues to grow.

### **Production**

The plant design as proposed will allow for all year round processing of feedstock and the production of frac sand for the Western Canadian Sedimentary Basin (WCSB) energy projects.

Production of 20/40, 30/50, 40/70 and 100 mesh<sup>4</sup> products may be delivered to customer facilities from the plant by rail or truck. The plant has a flexible design to adapt to changes in product requirements and utilises energy efficient technology wherever possible.

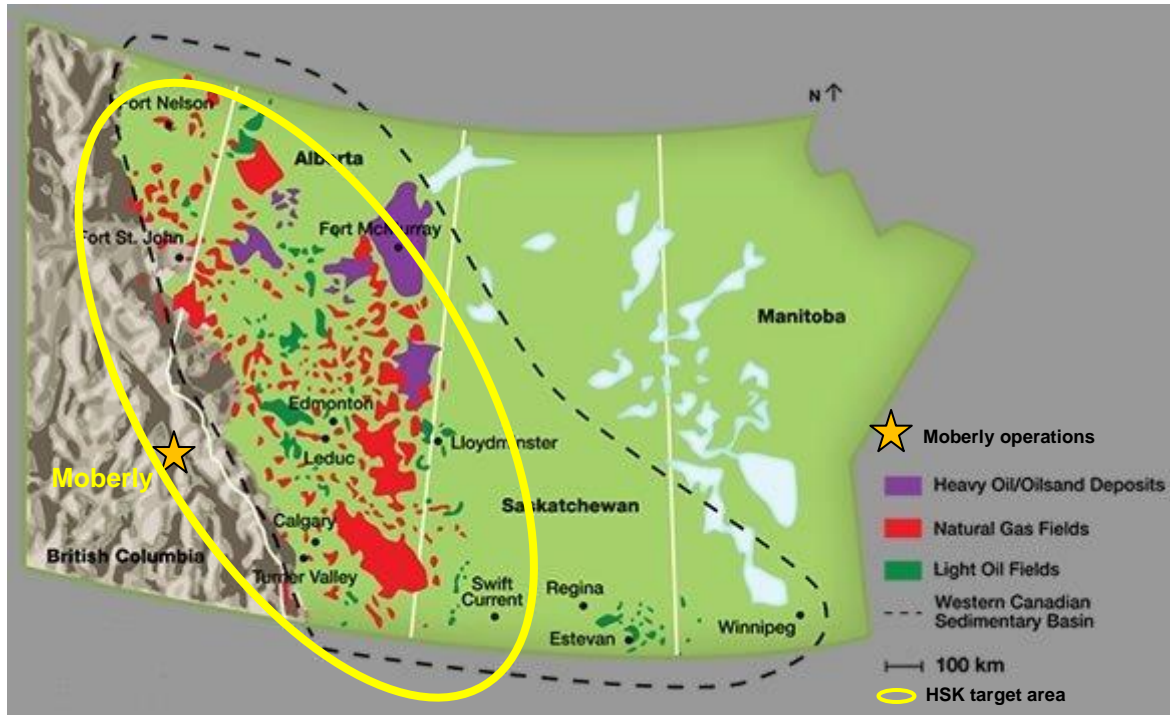
The samples produced from the design flowsheet exceed the technical requirements for frac sand crush and conductivity performance for all the potential customers with whom the Company has held preliminary discussions. The frac sand produced would be suitable for the use in oil & gas wells within any basin at pressures up to 6000 psi and well depths greater than 2,500m. The Project sample product meets or exceeds the performance characteristics of material from other current domestic producers.

### **Markets**

The WCSB extends from the Southern portion of Alberta to Northern British Columbia over an area exceeding 1.4 million square kilometers. From a logistics and infrastructure standpoint, the Moberly facility is exceptionally well located at the approximate midpoint of this region.

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<sup>4</sup> A description of sand size referring to the number of openings per inch of sieve mesh



**Figure 3: Moberly location in the WCSB - North American Areas of Use**

Both road and rail transport infrastructure is immediately adjacent to the process facility (see figure 2, items 11 and 12).

Overall demand in the region remains positive with estimated frac sand consumption now at 2.5 million tonnes per annum (tpa). Longer term projections as unconventional basins begin to move to production from exploration are significantly greater. Given the high demand in the region and initial estimated production rates from the Moberly facility (300,000 tpa).

### **Ancillary works completed**

- All critical path predevelopment permits have been granted, including a permit for mining volumes up to 400,000 tonnes per annum
- Haul road improvement design work is complete.
- Two water bores at the plant site have been tested and, based on hydrologists' estimates, will be able to supply sufficient make up water during winter for the plant.
- Ore sufficient for commissioning has been hauled to the plant site.



- Multiple technical (product performance) approvals from the target customer base have been received.

### **Summary**

The commercial assessment is based on development of a project to service the WCSB particularly in British Columbia and Alberta. The Company's access to rail capability also would facilitate easy access to the US market if required. Sale prices for frac sand are based on current pricing levels in Western Canada. These prices range from CAD 180-220 per tonne. This includes the transport cost based on the likely transload destinations for supply of the Project's products. The capital expenditure estimate is based on the redevelopment of the current Moberly site and some minor haul road refinements.

The work completed since November 2011 has been undertaken by the Company's operations management team, along with a group of well credentialed consultants from the frac sand, engineering, project management, environmental consulting, hydrology and process equipment industries.

The work includes assumptions based on current pricing, cost estimates, interest rates and oil & gas industry trends. These may change over time.