



## **INDEPENDENT TEST RESULTS VALIDATE LWP'S LOWER COST FLY-ASH BASED PROPPANTS**

ASX ANNOUNCEMENT

8 June 2016

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- **LWP's proppant technology is adaptable to both low cost shallow wells and higher cost deeper wells.**
  - **Independent test results for the low cost ceramic fly ash proppants demonstrate superior crush resistant k-values and specific gravity compared to mined frac sand.**
  - **LWP's R&D team are now testing other raw materials to combine with fly-ash to further increase LWP's growing flyash ceramic proppant product portfolio.**
  - **Financial modelling indicates manufacturing costs of LWP's low cost fly-ash based proppants could be 50% lower than the manufacturing cost of LWP's high end ceramic proppant.**

Energy technology company, LWP Technologies Limited ("**LWP**" or "**the Company**") is pleased to update shareholders on test results and R&D initiatives of its fly-ash based proppants which are used in hydraulic fracturing of unconventional oil & gas wells.

Oil & gas companies and service companies, particularly those in the United States, continue to assess technologies and products that show promise to make hydraulic fracturing more cost effective. The effect of the current low price oil & gas environment is that producers are increasingly focused on extracting oil & gas from shallow wells where they can use cheap mined frac sand proppants, in preference to the deeper wells, which require more expensive ceramic proppants.

LWP is fortunate in that its technology can be adjusted to serve both the low cost market segment requiring lower compressive strength, as well as the high compressive strength segment.

As reported to shareholders on 11 April 2016, LWP has been focused on lowering the manufacturing costs of its ceramic proppants, so that licensees might gain a competitive advantage by delivering a superior ceramic proppant than cheap mined frac sand in areas where transportation and logistics costs are high. LWP anticipates a comparative increase in well performance over mined frac sand due to (i) higher compressive strength with less fines (ii) lighter weight, and (iii) comparable sphericity and roundness. Further, with the significantly lower specific gravity, LWP expects well costs could be markedly reduced.

## Testing results of proppants made from Australian Flyash

LWP is pleased to report key test results undertaken by independent US expert testing lab GEL on the Company's proppants, using Australian fly-ash. These results continue to validate LWP's technology and the competitive cost advantages of its fly-ash based proppants. The complete report is attached for shareholders to review. The highlights include:

- K-values of 7K for 20/40 and an exceptional 9K for 30/50.
- Specific gravity of 1.52 which represents a reduction of circa 40% over mined frac sand.
- Bulk density of 1.4g/cm<sup>3</sup> is in the order of 8 to 10% lighter than mined frac sand
- Sphericity and roundness are superior compared to most mined frac sands.

### 4. Proppant Testing Results per ISO 13503-2/API RP19C:

Test	ISO 13503-2/API RP19C Specification (see Notes for more details)	GEL 1330 20/40	GEL 1331 30/50
Sphericity	0.6 or greater	0.8	0.8
Roundness	0.6 or greater	0.8	0.8
% Clusters	Less than 1% by count	0	0
Specific Gravity	Standard Method 2710F	1.52	1.52
Bulk density (g/cm <sup>3</sup> )	None (see Notes)	1.40	1.40
Crush testing	See Notes for a table of recommended maximum fines		
Mass % fines at 4,000 psi		3.0	1.8
Mass % fines at 5,000 psi		3.8	2.4
Mass % fines at 6,000 psi		5.9	3.3
Mass % fines at 7,000 psi		9.6	5.0
Mass % fines at 8,000 psi		13.1	7.3
Mass % fines at 9,000 psi			9.7
Mass % fines at 10,000 psi			13.0
K Value		7K	9K

## Results of other testing

In LWP's ongoing efforts to drive manufacturing costs even lower, LWP has been testing other materials combined with fly-ash to evaluate the effect on compressive strength and weight. The R&D team is very encouraged by the initial internal test results, which are set out below and demonstrate:

- K-values of 8K for 20/40 and an exceptional 10K for 30/50
- Bulk density of 1.32g/cm<sup>3</sup> for 20/40 and 1.29g/cm<sup>3</sup> for 30/50
- Both sphericity and roundness top the Krumbein chart at 0.9

Crush Testing EN ISO 13503-2:2006							
Sample	[%]Fines @6000psi	[%]Fines @7000psi	[%]Fines @8000psi	[%]Fines @9000psi	[%]Fines @10000psi	[%]Fines @11000psi	k Value
20 / 40	-	-	6,7	11,3	-	-	8 K
30 / 50	0,9	1,6	2,9	4,8	7,0	10,7	10 K

Test	20/40 mesh	30/50 mesh
Sphericity	0.9	0.9
Roundness	0.9	0.9
% Clusters	0	0
Apparent density [kg/dm <sup>3</sup> ]	2.59	2.59
Bulk density [kg/dm <sup>3</sup> ]	1.32	1.29
turbidity	n.a.	n.a.

Chairman Siegfried Konig said: "LWP's R&D team continues to assess a range of processes and materials to deliver proppants that are much lower in cost and we are delighted with the independent test results of our low cost ceramic proppant. Based on these initial results, the financial modelling indicates that manufacturing costs will be approximately 50% of the cost of producing our higher strength ceramic proppants.

We are encouraged by the growing interest in our technology as oil & gas companies and contractors continue to assess ways to make hydraulic fracturing more cost effective. While recent improvements in oil & gas prices are encouraging, LWP is well aware of the changing market dynamics in the energy sector."

ENDS

### For further information please contact:

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## About LWP Technologies

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LWP Technologies Limited (LWP) is an Australian oil and gas technology company focused on commercialising next generation, fly-ash based, proppants for use in hydraulic fracturing of oil and gas wells globally. LWP is seeking to commercialise its proppants as a cost effective, superior alternative to bauxite and clay based ceramic proppants, typically used in hydraulic fracturing operations currently. The Company commenced proppant production from its pilot scale proppant manufacturing plant in Queensland, Australia, in Q3, 2015. LWP is seeking joint venture partners and/or licensees to commercialise its proppant product, and deliver significant returns to shareholders.

## **About Proppants**

Proppants are a sand-like commodity used to 'prop' open fractures in shale rocks which allows oil and gas to flow. Proppants are often the single largest cost item in the fracking process and represent a multi-billion dollar global market annually. Traditional ceramic proppants are made from clay and/or bauxite.

LWP Technologies ceramic proppants are majority manufactured from fly-ash, a by-product of coal fired power plants. The Company is of the view that its unique proppant product has the potential to lead the industry due to:

- the widespread abundant availability of fly-ash, often near to oil and gas shale resources;
- the ultra-light weight of LWP fly-ash proppants; and
- the ability of LWP proppants to withstand the very high pressures and heat of deep wells.

LWP proppants have been certified by Independent Experts to meet or exceed both the American Petroleum Institute standards and the ISO standards.

# Global Energy Laboratories **TESTING SERVICES REPORT**

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Butte, MT 59701 USA  
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## 1. General Information:

Sample report date:	June 3, 2016
Delivery method:	FedEx
Client point(s) of contact:	Siegfried Konig Dr. Ralph Enderle
Company name:	LWP Technologies
Sample legend:	- GEL 1330 is sample labeled "LWP MM1513-2040" - GEL 1331 is sample labeled "LWP MM1513-3050"

## 2. Sample Processing Information:

Processing performed:	Created crush prep material using lab sieves
Wet sieve analysis results:	Not performed

### 3. Sieve Analysis Results:

Size Designation	GEL 1330 Percent of total	GEL 1331 Percent of total
6/12	0	0
8/16	0	0
12/20	0	0
16/30	16	3
20/40	95	84
30/50	83	97
40/70	4	16
70/140 (100 mesh)	0	0

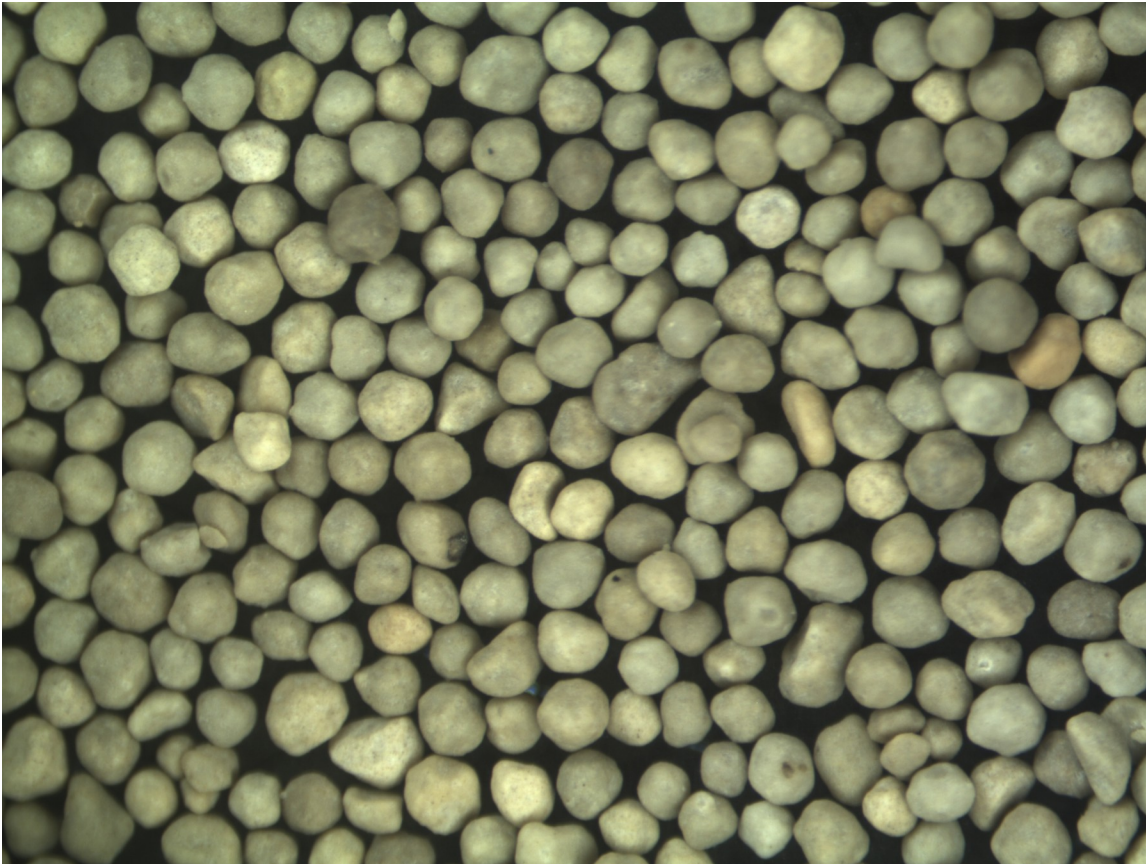
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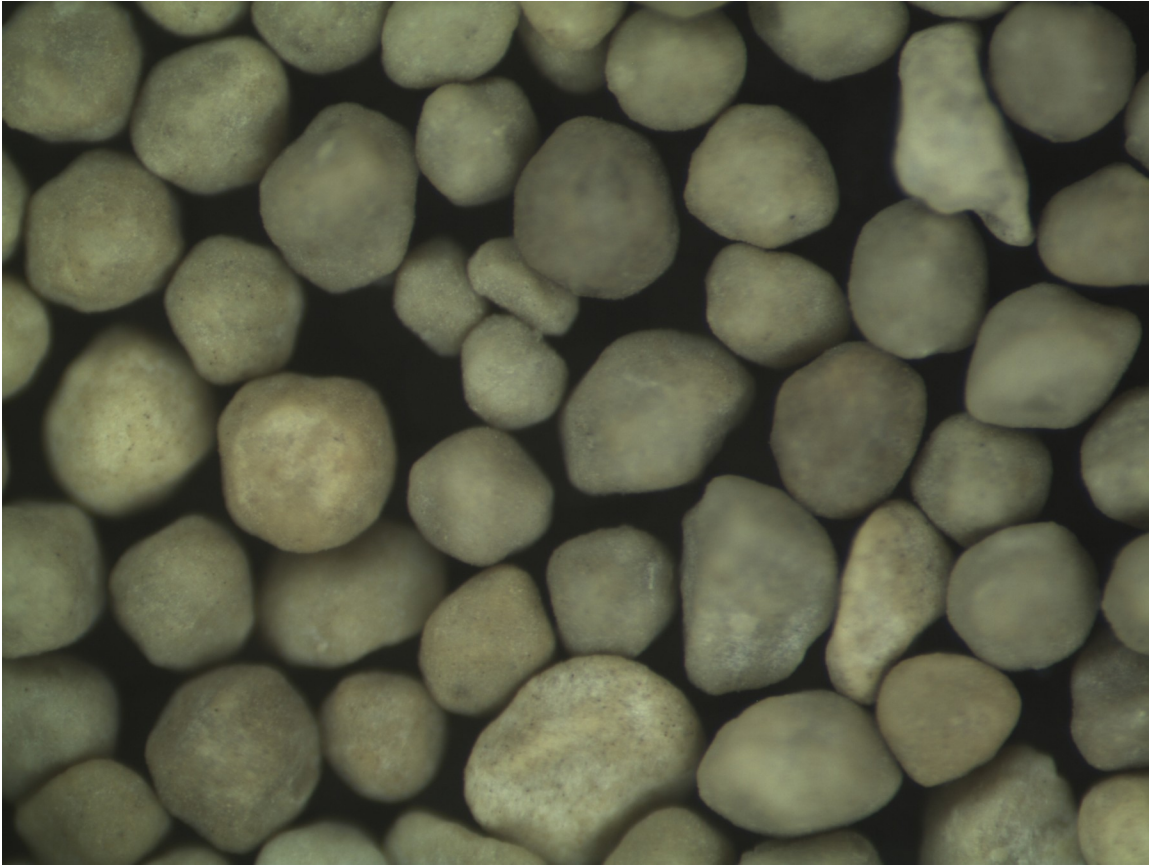


## Material Pictures

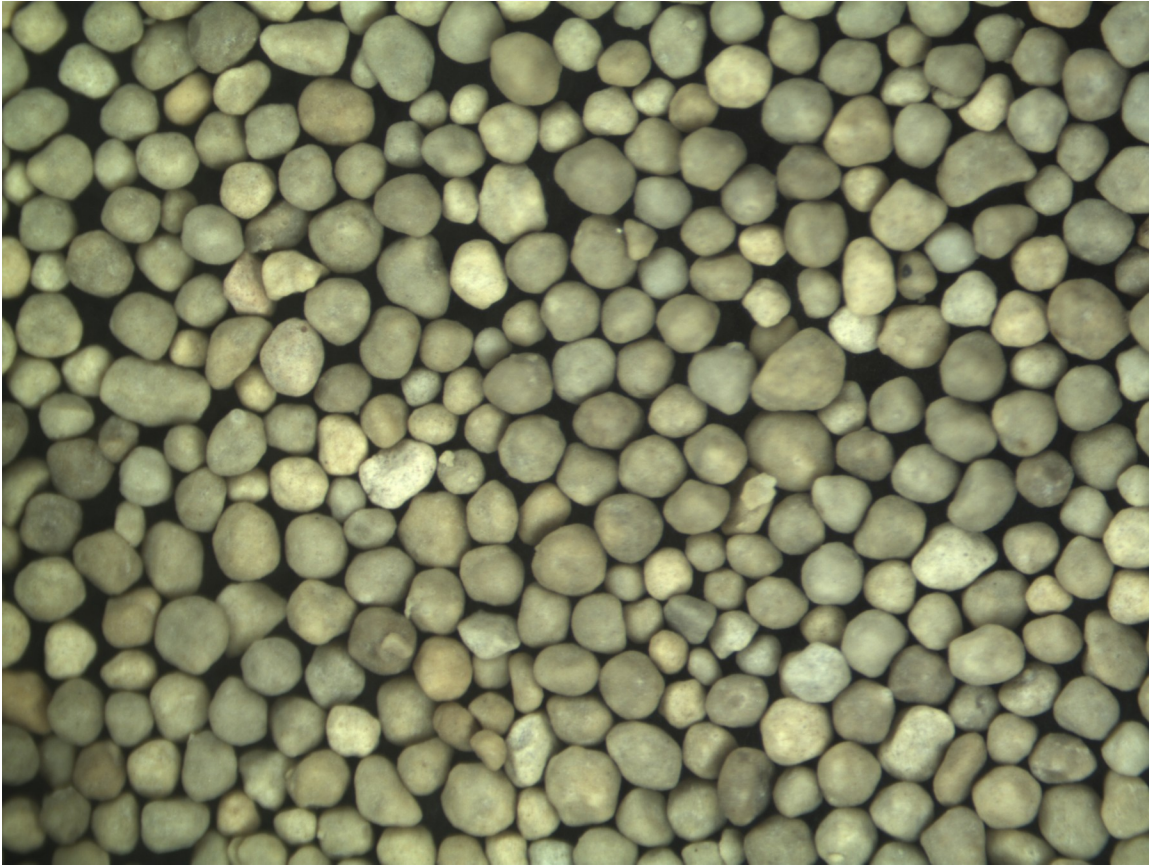
*Illustration 1: GEL 1330 20/40*



*Illustration 2: GEL 1330 20/40*

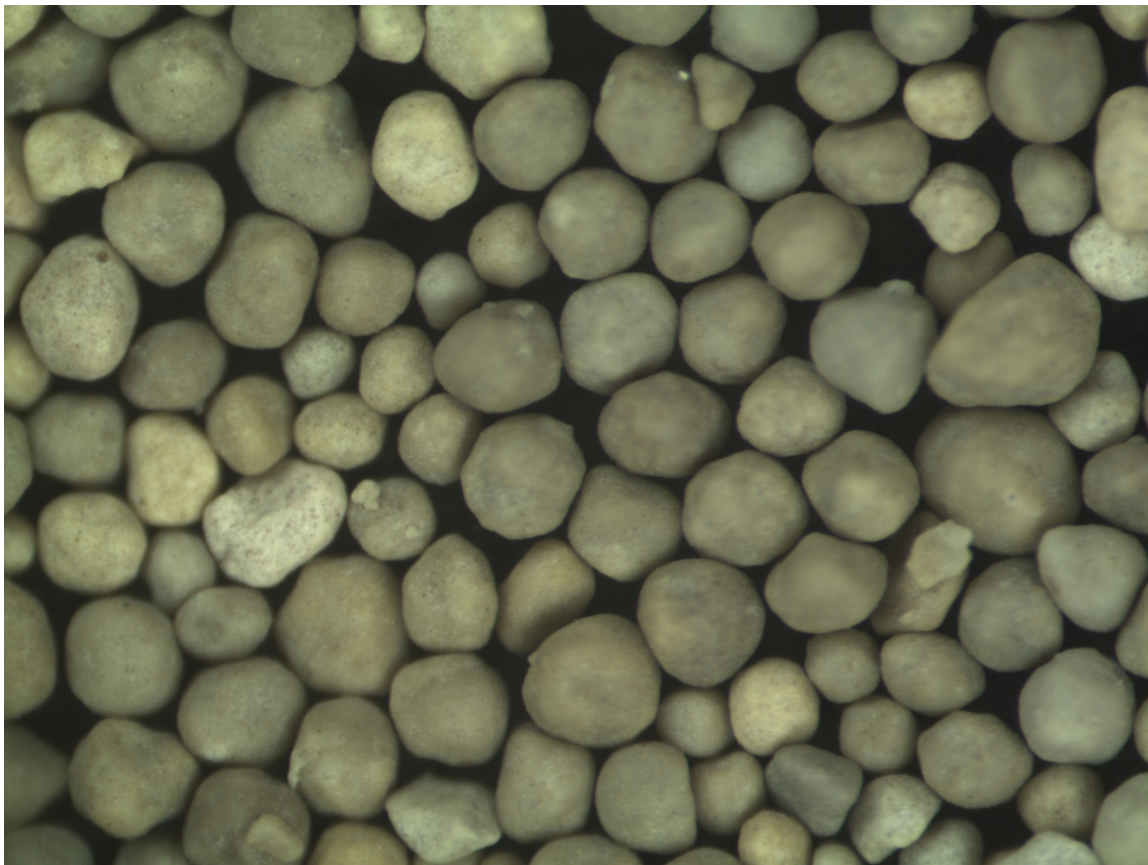


*Illustration 3: GEL 1331 30/50*





*Illustration 4: GEL 1331 30/50*



## Notes:

Wet sieve analysis is performed by washing the material over a 200 mesh sieve, in order to remove all the silt and any vegetation. Then, the material is dried at 250F and weighed after the drying. The percent lost during the wet sieve can then be calculated.

ISO 13503-2/API RP19C, Section 7,  
“Proppant Sphericity and Roundness”

Sphericity is a measure of how close a proppant particle approaches the shape of a sphere. Roundness is a measure of the relative sharpness of the corners of curvature. API RP-56 recommends a sphericity of 0.6 or greater and a roundness of 0.6 or greater for frac sand. The proppant should not be considered suitable if it contains 1% or more by count of clusters of multiple sand grains.

ISO 13503-2/API RP19C, Section 10 “Bulk Density”

The bulk density, apparent density and absolute density are important properties of proppants. Bulk density describes the mass of proppant that fills a unit volume and includes both proppant and porosity. It is also used to determine the mass of proppant that is necessary to fill fractures or storage tanks. Bulk density also is used during the calculation to determine the sample mass used during crush testing.

ISO 13503-2/API RP19C, Section 11,  
“Proppant Crush-Resistance Test”

From API Recommended Practice 56: Stress to be applied for initial crush testing, and suggested maximum fines for frac sand

Mesh Size	Stress on sand (in psi)	Suggested Max Fines (% by weight)
6/12	2,000	20
8/16	2,000	18
12/20	3,000	16
16/30	3,000	14
20/40	4,000	14
30/50	4,000	10
40/70	5,000	8
70/140 (100 mesh)	5,000	6

The highest stress level at which a proppant generates no more than 10% crushed material, rounded down to the nearest 1,000 psi is the “K-value.”

### Disclaimer:

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