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## Springdale Graphite Project Produces High Quality Graphene

Comet Resources Ltd (**ASX: CRL**) (“**Comet**” or the “**Company**”) is pleased to announce that metallurgical test work on diamond core from the Springdale Graphite Project, Western Australia, has produced high quality graphene. This specialist test work was ordered following the Company’s discovery that the graphite rich core from the Springdale Project was electrically conductive, a very rare property in graphite deposits around the world. Having successfully produced graphene from diamond core, Comet will now include potential graphene production in assessing any future commercial development of the Springdale Graphite Project.

### Highlights of the Springdale Graphite Project Include:

- Located in Western Australia with access to existing roads, grid power and port facilities.
- Multiple zones of graphite mineralization have been identified from surface and extend over at least 4km of strike.
- Exploration drilling has confirmed excellent grade and widths including HD001 15.8 metres at 10% TGC and HD003 17.5 metres at 11 % TGC.
- Early stage metallurgy has recovered graphene (several layers thick) by exfoliation, a very rare property in graphite deposits worldwide.

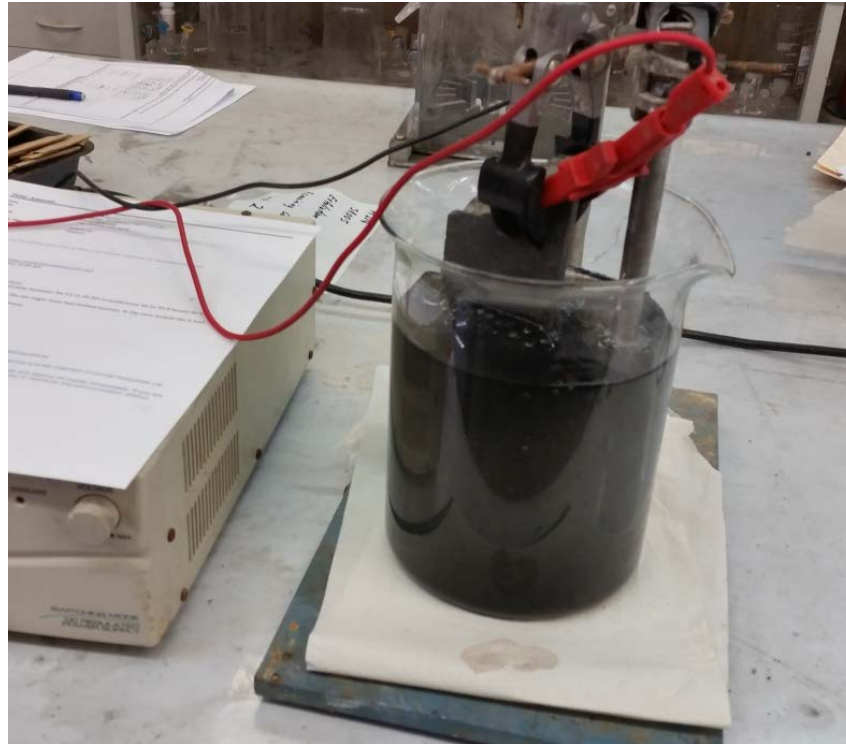
### Highlights of Graphene Properties Include:

- It is the thinnest and toughest 2D material. 200 times stronger than steel.
- Graphene is flexible and transparent, has the largest surface area of all materials, and is the most stretchable crystal.
- Graphene is currently the best electricity conductor known to man and is the perfect thermal conductor.
- Graphene is light and weighs just 0.77 milligrams per square meter and has the highest surface area of all materials.

Comet’s Managing Director Tony Cooper said ***“Confirmation of the presence of high quality Graphene at Springdale is a gamechanger for the future of this project, dramatically changing the potential economics. Comet’s graphite now has that “X factor” property with graphene being identified from exfoliated ore.”***

## Test Work Details.

**Figure 1: Exfoliation of HD002 Core.**

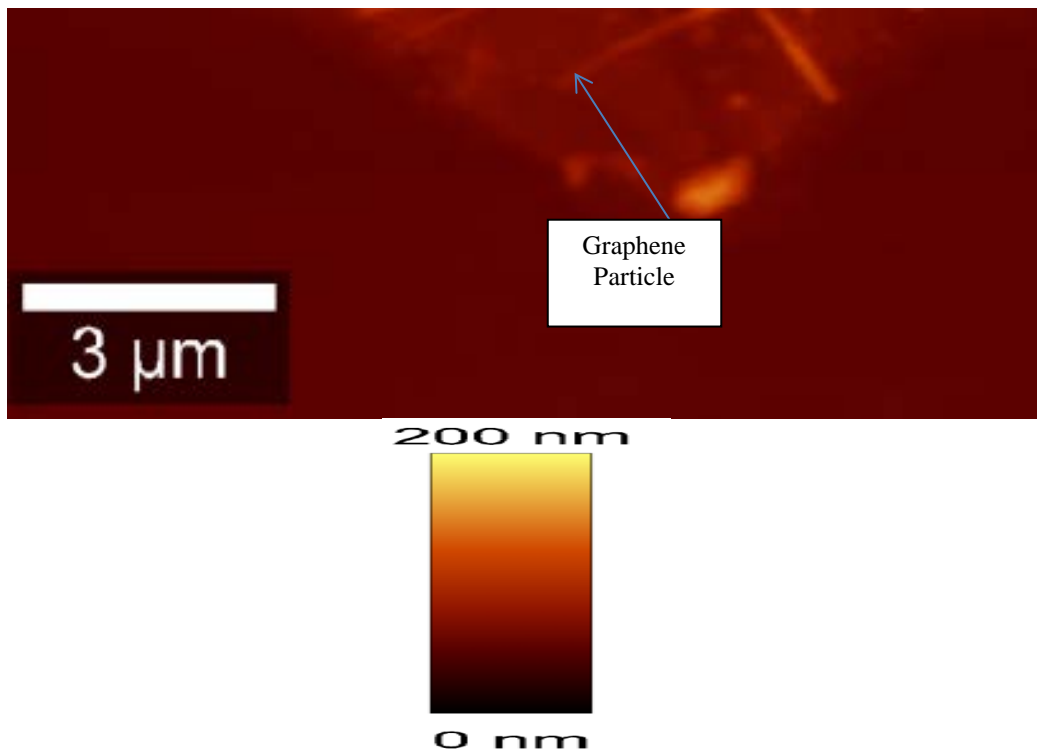


The initial phase of metallurgical test work at Springdale identified graphene (several layers thick) using Atomic-Force Microscopy and confocal Raman analysis. The program was managed by IMO Project Service Pty Ltd, Comet's metallurgical consultant, who selected a 10 cm core sample from HD002 (45.6m to 45.7m). The core was subjected to a technique called exfoliation which suspends the core in a conductive chemical solution and then running a charge through the core (anode) with the cathode being placed in the solution (Figure 1). Importantly, no core remained due to complete exfoliation.

This process utilised Springdale graphitic rock as it was extracted from the ground (in this case diamond core). The exfoliation method is used to peel graphene flakes from the graphite in the core. The few layered graphene particles are then separated from the product produced by exfoliation using a series of simple process steps.

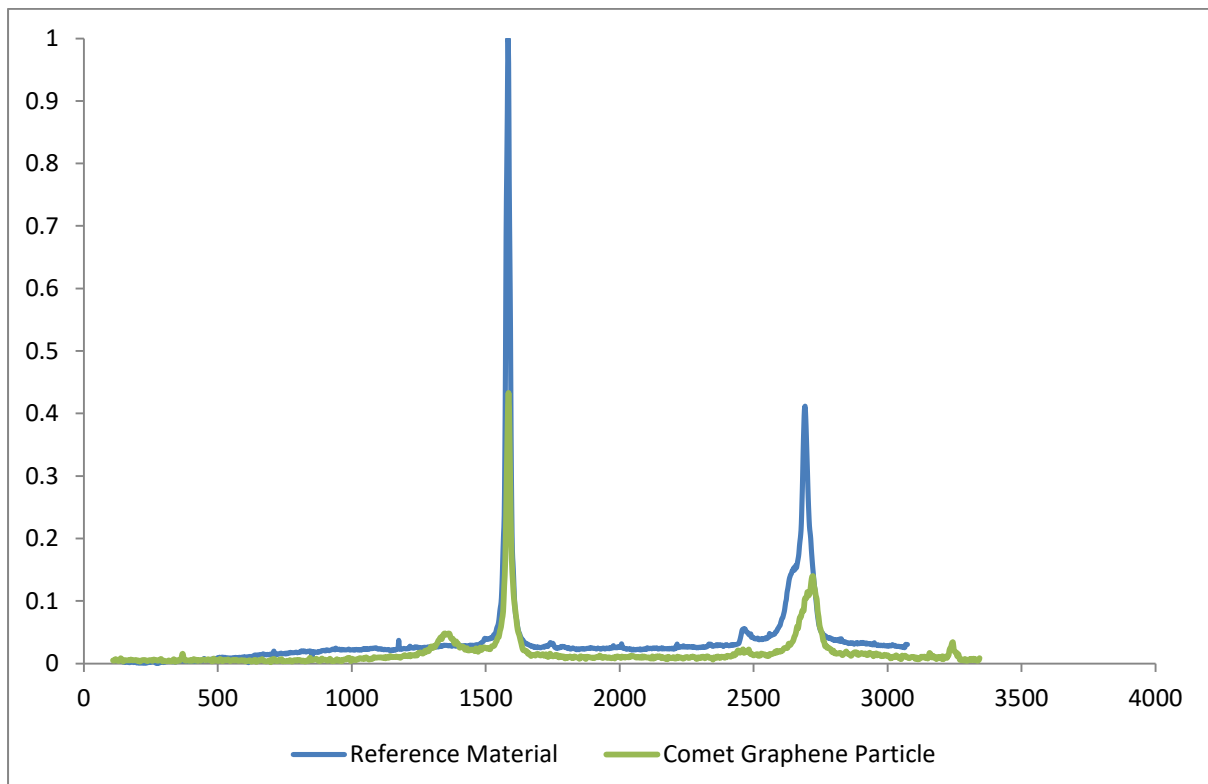
A sample of the separated graphene was sent to Curtin University, located in Perth Western Australia for analysis. A few drops of the suspended particles were transferred onto a glass coverslip. The sample was spin coated to achieve an even distribution on the glass surface. Atomic-Force Microscopy (AFM) and confocal Raman analysis were used to identify the presence of few layered graphene using a WITec Alpha 300SAR with  $2\omega$  NdYAG laser ( $\lambda = 532\text{nm}$ ) instrument. This method is used to identify the number of layers of Graphene within a particle and to confirm the particle being analysed conforms to the structure of few layered graphene. A picture of the identified graphene particle along with a particle thickness scale is shown in Figure 2.

**Figure 2: AFM Captured Few Layered Graphene Image and Thickness Chart.**



A Raman plot of the few layered graphene particle is shown in Figure 3. The Comet particle correlates with the reference sample indicating the high quality of Comets graphene particle.

**Figure 3: Comet Few Layered Graphene Raman Plot.**



It is very rare for a graphite deposit to be able to produce graphene using the exfoliation method. Graphene production is normally expensive to scale up, however the exfoliation method is believed to be a lower cost and scalable process.

Further work has been planned to test more core samples, work out qualitative processes and to also explore other process routes in forming and extracting graphene from Springdale graphite. Drilling more diamond core at Springdale is planned to commence soon.

## **What is Graphene**

Graphene is a natural material. Researchers discovered graphene in the 1940s; it was only in 2004 that a graphene sheet was isolated. In 2010 this achievement was awarded a Nobel Prize.

Graphite is stacked graphene sheets (a 1mm thick piece of graphite would be made from approximately 3 million sheets of graphene). Consider graphene as being a 2 dimensional (**2D**) material and graphite a 3 dimensional material, the challenge is to separate the sheet. Graphene is the most expensive material in the world and some commentators call 2004 the start of the graphene Era.

## **Why Graphene**

- It is the thinnest and toughest 2D material. 200 times stronger than steel.
- Graphene is flexible and transparent, has the largest surface area of all materials, and is the most stretchable crystal. The material is also extremely impermeable, even helium atoms cannot go through it.
- Graphene is currently the best electricity conductor known to man and is the perfect thermal conductor.
- Graphene is light - it weighs just 0.77 milligrams per square meter. Because it is a single 2D sheet, it has the highest surface area of all materials.

## **Graphene Production**

There are two approaches to produce graphene and graphene-related materials. The first one is top-down, which means you begin with graphite and produce graphene. The second one is bottom-up: start with carbon in some form and synthesize graphene sheets or flakes. These production methods to date have been expensive.

## **Graphene Uses**

Graphene's properties make it a wonder material that can be incorporated into a huge number of applications such as Coatings and paints, Composite materials, Conductive inks, Displays, Graphene thermal applications, Energy containers, Membranes, 3D Printings, Sensors, Electronics, Energy generation, Photonics / Optics, Medicine and biology, Lubricants, Spintronics to list a few. Over 13,000 graphene related patents have been filed and this number grows weekly.

## Springdale Background

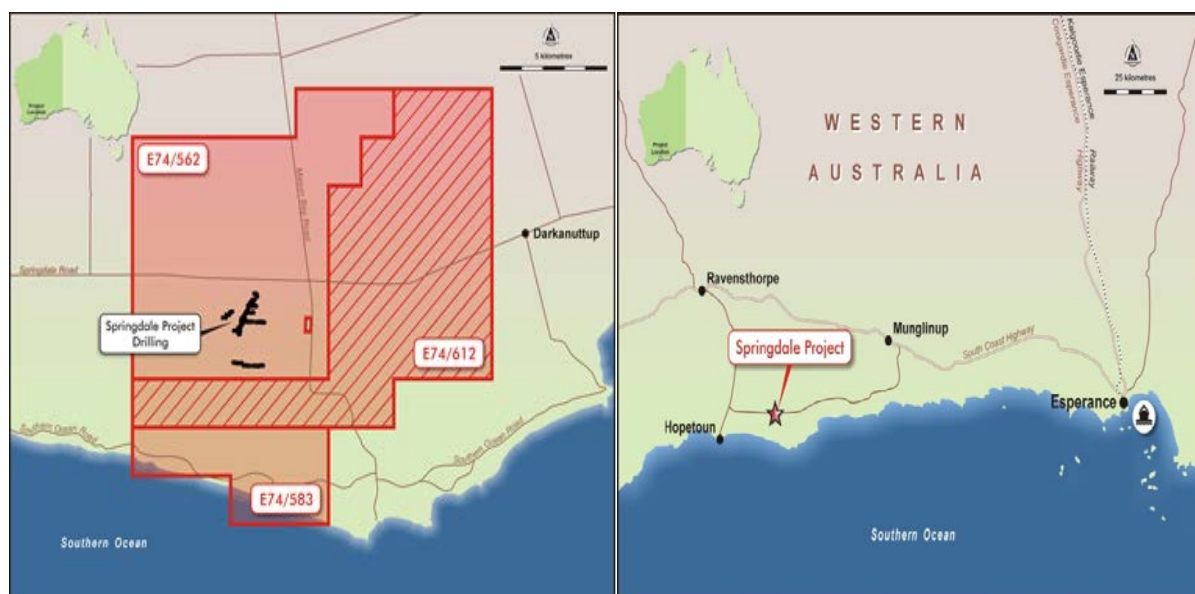
Comet's Springdale project is located approximately 30 km east of Hopetoun, Western Australia. The tenements lie within the deformed southern margin of the Yilgarn Craton and constitute part of the Albany-Frazer Orogen, which hosts the historic Halberts Graphite mine near Munglinup (50km away). The Munglinup area has produced the bulk of Western Australia's recorded graphite production. The tenement is over freehold land with sealed road access within 20km and is located approximately 150km from the port of Esperance.

Comet has three tenement's E74/562, E74/583 and ELA74/612 at the Springdale Graphite project. The total land holding at Springdale is approximately 220 square kilometres.

Comet completed a successful first pass aircore drilling program in February 2016. This program confirmed that graphite was present in a prospective zone/horizon. Following a second round program in September 2016, Comet has now drilled 113 aircore holes for 2,901 metres and 4 diamond holes for 282 metres at it 100% owned Springdale Graphite Project.

Comet is continuing to conduct metallurgical tests on diamond core from Springdale Graphite Project and plans to conduct further drilling during Q2 2017.

**Figure 4: Plan Showing Location, Tenements and Area Drilled.**



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*Comet listed on the Australian Stock Exchange in 1994. The Company discovered and studied the Ravensthorpe Nickel Project. In 2001 Comet successfully sold its final equity to BHP Billiton and returned to Comet shareholders \$32 million. Comet has a number of exciting projects that it is currently exploring and advancing. Comet has cash assets of approximately \$1.1 million and has approximately 133 million shares on issue.*

*The information in the report to which this statement is attached relates to Exploration Results, Mineral Resources or Ore Reserves compiled by Mr. A Cooper, who is a Consultant and director to Comet is also a Member of The Australian Institute of Mining and Metallurgy, with over 30 years' experience in the mining industry. Mr. Cooper 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 2012 edition of the "Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Mr. Cooper consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.*