

SPARC GRAPHENE DEMONSTRATES 100% IMPROVEMENT IN ENVIRONMENTAL REMEDIATION IN PFAS REMOVAL

HIGHLIGHTS

- ▶ **The use of Sparc graphene improves absorption of PFAS contaminants by up to 100% compared to industry standard granulated activated carbon (GAC)**
- ▶ **Technology demonstrates a major improvement on ability to remediate hazardous sites**
- ▶ **Next stage of test work to focus on PFAS immobilisation and destruction from contaminated sites**

Sparc Technologies Limited (**ASX: SPN**) (**Sparc** or the **Company**) is pleased to announce the completion of the first round of testing on the ability of graphene-based materials to remediate water contaminated with poly-fluorinated alkyl substances (**PFAS**). The testing included several PFAS compounds including perfluorooctanesulfonic acid (**PFOS**) and perfluorooctanoic acid (**PFOA**).

Sparc Managing Director, Tom Spurling, commented:

"The results from this round of test work are very encouraging in that they confirm the use of our graphene enhanced adsorbent, developed with our strategic partner the University of Adelaide, performs at a significantly higher level than products that are currently commercially available.

This enables us to move forward to the next stage and test the product in an industrial environment, as well as to scope the product's economic viability. An exciting part of the next stage of our testing will involve an investigation as to whether our graphene membrane has the ability of effectively destroy PFAS as part of its application."

Current Treatments

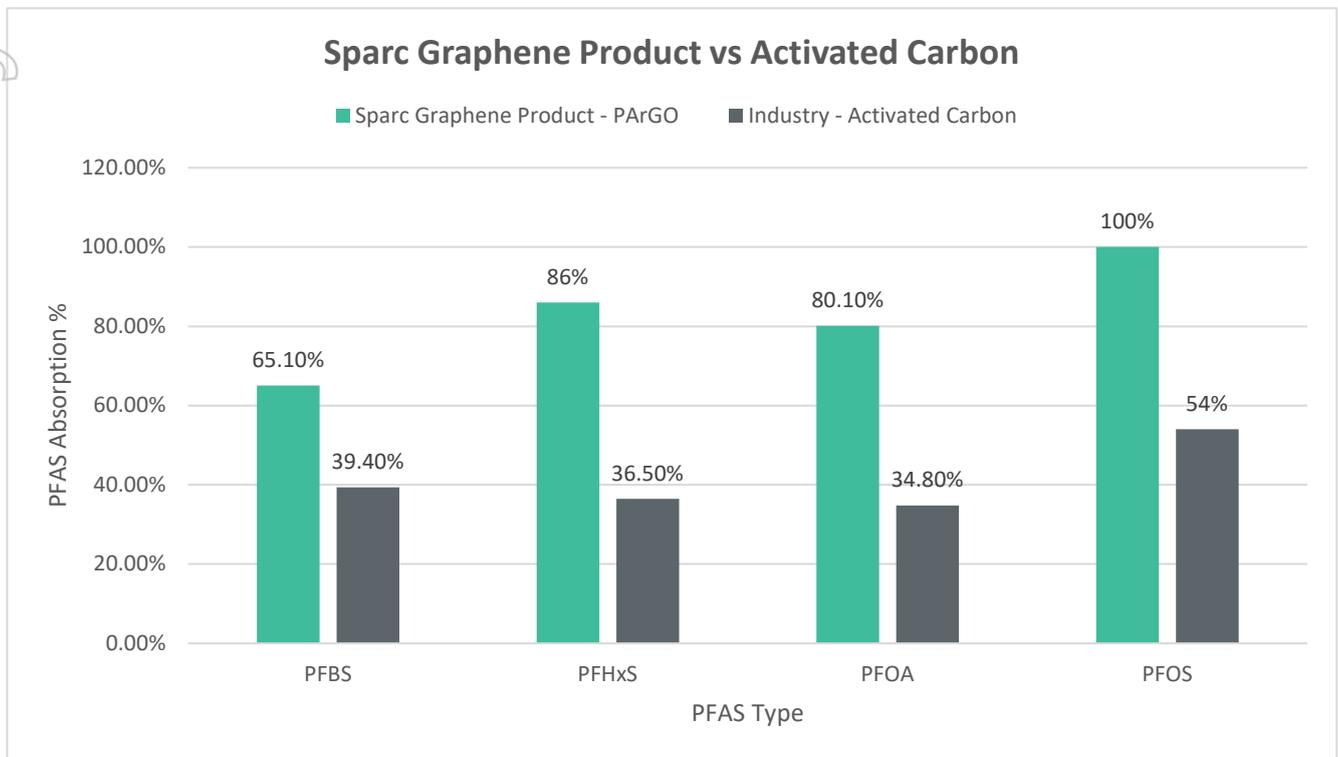
A number of technologies have the potential to remove PFAS. Activated carbon is the most commonly used technology to remove PFAS, which works to remove PFAS from drinking water and is used in water treatment systems at significant cost. Other technologies including ion exchange or existing membrane technologies also have potential application, with each having various limitations.

Sparc Graphene and PFAS

The results of Sparc's graphene laboratory testing showed that a graphene-based adsorbent material (Polyamine modified reduced Graphene Oxide or **PArGO**) was up to twice as effective at absorbing PFAS as the current industry standard adsorbent, granulated activated carbon (GAC), which was used as the control in the testing.

Given the significant outperformance of Sparc's laboratory results, the Company will now seek to conduct a follow up programme to determine the viability of Sparc's product in addressing the significant issues surrounding contaminated sites and water present around the world.

Figure 1 - Absorption rates of various forms of PFAS with Sparc graphene product versus Granulated Activated Carbon.



An industry standard granulated activated carbon (**GAC**) product was used as the control sorbent. This GAC is a well-known and high-performing grade of GAC, often used for PFAS removal and is certified for use in municipal and drinking water systems expressly for this purpose.

The results of Sparc's trials are very encouraging and will now be augmented by follow up testing that will focus on development of a viable graphene-based adsorbent including:

- ▶ Reusability
- ▶ Biofilm build up
- ▶ Speed of extraction and its relationship to the amount of graphene required
- ▶ Testing the sorbent in contaminated water collected from contaminated sites
- ▶ Testing the efficiency of sorbents in immobilising PFASs in contaminated soils
- ▶ Methods of removal of PFAS from the adsorbent and PFAS destruction

This data will be used to scope the economics of a graphene-based adsorbent, at which point Sparc will look to engage with an industry partner on a commercial basis.

About PFAS

PFAS is a group of man-made chemicals that have been available since the 1940s, which have been used historically in a variety of industries around the globe. PFAS has become a major worldwide environmental issue, whereby soil and water, including ground and drinking water, become contaminated through the use of fire retardants and other industrial applications. PFAS remains highly persistent in the environment long

after use and will accumulate in the human body for long periods of time. As exposure continues, PFAS can cause significant health effects in humans and animals, including reproductive and developmental issues, liver and kidney and immunological problems. Studies have also shown PFAS can contribute to decreased infant birth weight, effects on the immune system, cancer and tumours and thyroid hormone disruption.

The United States Environmental Protection Agency (**EPA**) and the Australian Government have conducted extensive studies on the environmental and health effects of PFAS and have found its impact to be widespread. For example, the US Department of Defence, in a report to the House Armed Services Committee, identified at least 126 military installations containing potentially harmful levels of PFAS, the remediation cost of which exceeds US\$2 billion.¹ Investigations at Australian Defence installations have found similar issues given historical firefighting use.

Similarly, US based The Environmental Working Group (**EWG**) has found more than 110 million Americans are exposed to toxic PFAS levels in drinking water that exceed the EWG limits, with almost every city sampled having contamination above EWG limit levels.²

Update on Quarterly Activities Report lodged with ASX on 29 January 2021 (Listing Rule 4.7C.3)

The Company advises that the figure provided in the activities report lodged on 29 January 2021 pursuant to Listing Rule 4.7C.3 of \$27,681 relates to the period from re-listing date to 31 December 2020. The total amount pertaining to payments to directors for reimbursement of arrears of directors' fees and travel expenses for the period 1 October 2020 to 31 December 2020 was \$46,748, as per section 6.1 of the applicable Appendix 4C.

-ENDS-

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About Sparc Technologies

Sparc Technologies Limited (ASX: SPN) is a South Australian based company that is focusing on the development of innovative technology solutions using the unique properties of graphene. Graphene, which can be extracted from graphite, is a 2-dimensional nano material made of carbon atoms arranged in a hexagonal pattern, giving it unique and powerful properties that, with the right technology, can be imparted on products to improve performance. Sparc Technologies has licenced graphene-based technologies from the University of Adelaide, a leading institution in the field of graphene research, and will focus on commercialising graphene-based technologies for large industrial markets for marine and protective coatings, environmental remediation and bio-medical applications.

¹ Copp, Tara. DoD: At least 126 bases report water contaminants linked to cancer, birth defects. Military Times, April 2018

² <https://www.ewg.org/research/national-pfas-testing/>