Cooperative Research Centres Association, Inc.
ABN: 42 892 101 689

Cooperative Research Centres - Delivering Innovation for Australia

CRCA NATIONAL OFFICE
UNIT 4, ENGINEERING HOUSE, 11 NATIONAL CIRCUIT, BARTON, ACT 2600
PH NO: **02 6270- 6524** ***FAX NO:*** **02 6273-1218**
E-MAIL: admin@crca.asn.au **Web site: http://www.crca.asn.au**

29th April 2005

Mr Petro Georgiou, MP
Chair,
House of Representatives Science & Innovation Committee
Parliament House
CANBERRA ACT 2600

Dear Mr Georgiou,

Re: **Inquiry into pathways to technological innovation**

Please find enclosed a brief submission from the Cooperative Research Centres Association of which all of the 69 currently operating CRCs are members.

Additional hard copies of the booklet which are part of the submission can also be provided if this would be helpful

We understand that the Committee plans to hold public hearings and the CRC Association would be pleased to arrange for the Committee to hear in more detail from several CRCs.

Yours sincerely,

Dr Anne Campbell
Executive Manager
CRC Association

Cooperative Research Centres Association, Inc.
ABN: 42 892 101 689

Cooperative Research Centres - Delivering Innovation for Australia

CRCA NATIONAL OFFICE
UNIT 4, ENGINEERING HOUSE, 11 NATIONAL CIRCUIT, BARTON, ACT 2600
PH NO: **02 6270- 6524** ***FAX NO:*** **02 6273-1218**
E-MAIL: admin@crca.asn.au **Web site: http://www.crca.asn.au**

Submission: Inquiry into pathways to technological innovation

Introduction:
The aim of the inquiry is to determine how to improve the pathways from innovation to commercialization. In our experience, there is no one way pathway to successful commercialisation or adoption of technology. Indeed commercialisation itself can be defined quite broadly for example:

"Commercialisation is a diverse process: it may involve patents or simply the transfer of skill and knowledge. Technology may be commercialised through many routes – participants, new ventures, non-participants, intermediaries provider knowledge to dispersed farmers or mining companies, specialist suppliers marketing new instruments, software, etc to dispersed users, foreign companies." [1] Commercialisation is a heterogeneous process that often involves incremental changes in materials, products or processes. It often involves investment in new equipment, facilities or skills. Its economic impact may arise from the production or investment decision of only a few firms or of many small producers or users. The time scale from development to application to economic returns may span a few years or be measured in decades. Commercialisation may include, for example: changes in instruments and data interpretation that lead to the discovery of new resources or new treatments for diseases; processes that result in higher recovery of gold from ore or higher quality welding on ships and pipelines; improved product design and quality." [2]

Key Factors:
Successful commercialisation and utilisation of technology depends on timing, on emerging needs, on competitor activity, on market access and on "champions" and depending on the technology, secure patents. Good project management and team skills are also an important ingredient. In some industry sectors, however, it is better if the knowledge can be disseminated widely and taken up and used as quickly as possible – particularly in the Agriculture sector. Thus technology transfer is also a key component in adoption.

The CRC Program occupies a crucial niche in collaborative research in the Australian Science &Innovation scene through bringing together researchers with users of research in long term contractural relationships of 7-year terms. Thus there is input into planning the research by the research users right from the start as well as monitoring its progress. This means that what is done is better tailored to the users – and it is less likely for technology to be "looking" for a market or use (as can be the case when it is developed in isolation of the user). It also means that the uptake and use of the research is likely to be faster. In addition the CRC Program has been instrumental in training more workplace ready postgraduates who are important vehicles of technology-transfer as they move into the workplace often in one of the CRC's industry participants.

Examples:
In response to the Committee's interest in compiling a series of case studies of successful innovations, we enclose the booklet "Winning new ways for Australia – underpinning economic growth" which incorporates recent highlights of the CRC Program in 2004. These examples are based on the applications received for the CRC Association's annual Awards for Excellence in Innovation. Awards are given for the uptake and use of research as well as for education & training and public outreach activities in recognition of the importance of these latter skills in the uptake and use of research. The stories in the booklet illustrate the range of innovations from a number of CRCs in the CRC Program covering the industry sectors of manufacturing, ICT, mining & energy, agriculture & rural based manufacturing, the environment, medical science & technology. As can be seen from this booklet, the projects are in different stages of development in the pathway to utilisation and commercialisation. Also included in the booklet are examples of the projects of 8 CRC PhD students because, as noted earlier, CRC PhDs trained in the operating environment of a CRC are more work place ready not only technically but with added skills such project and time management; team work

experience. The booklet can also be accessed from the CRCA web site (www.crca.asn.au – Resources).

Information on the winners of the Awards for Excellence in Innovation 2004 – in addition to that provided in the booklet is given below. Some other examples not included in the booklet and categorized by industry are to be found at Appendix A: The example of Decipher (CRC for Sustainable Tourism, Enviroment Sector) lists some of the key issues that they had to address in bringing the product to market

Winners of the Awards in 2004 or the application and utilisation of research were:

CRCMining: Universal Dig and Dump System (UDD) (page 14)

The former CRC for Mining Technology & Equipment (now **CRCMining**) developed a breakthrough dragline technology which is now being commercialised by CRCMining in collaboration with industry partner BHP Billiton Mitsubishi Alliance (BMA). A dragline is arguably the most important piece of equipment in an open cut coalmine. Each dragline moves typically 13 million cubic metres of dirt a year, uncovering approximately $75 million worth of coal. These massive workhorses stand five storeys high, have a boom as long as a football field, weigh over 3,000 tonnes and cost $40 to $100 million each. The technology, UDD system, replaces the conventional rigging with a lighter, innovative configuration. The weight saving alone allows up to 10% more dirt to be moved safely by the dragline and the new control system means that the bucket can be picked up as soon as it is full thus reducing overall cycle time and giving another 15% potential productivity improvement. The system also allows the bucket to be dumped anywhere under the boom, improving the flexibility of the dragline operation.

CRCMining's industry partner, BMA, completed a full-scale trial of UDD at their Peak Downs mine starting operation in March 2002. BMA have 33 draglines operating in 8 Central Queensland coal mines which produce 45 million tonnes of coal annually and deliver more than $3.5 billion in export revenue for the Australian economy. With three of its draglines already using the new technology, two more in progress and more in the fleet set to follow, BMA is positioned to achieve substantial productivity improvements

CAST Metals Manufacturing: A Blanket for Magnesium (Page 16)

AM-cover is a simple, cost –effective replacement for the potent greenhouse gas sulphur hexafluoride, which is used globally as a protective cover gas to prevent molten magnesium from oxidising. AM-cover is set to replace sulphur hexafluoride with the more environmentally benign gas HFC-134a in magnesium smelters and casting operations worldwide. Use of AM-cover results in the reduction of greenhouse gas emissions by over 95% compared to sulphur hexafluoride based cover gas systems. The CRC's core partner, Australian Magnesium Corporation (AMC) had long recognised that the magnesium industry's reliance on sulphur hexafluoride as a cover gas to protect molten magnesium was a major impediment to expansion of the magnesium market due to the severe negative environmental impact of the gas.

CRC for Polymers: Fireproof Plastic - Ceramifying Polymers: (Page 19)

Plastics no longer need to collapse in the face of fire, instead they can turn into ceramic barriers that resist the passage of fire. This ceramifying polymer technology, developed by the **CRC for Polymers** with Olex (Australia's biggest power cable maker) has resulted in Olex's range of Pyrolex Ceramifiable ™ fire performance cables and a company created to exploit the wider ramifications of this breakthrough technology. During the next five years, this range of cables is expected to benefit Australia by creating 20 new jobs and by generating $75 million in sales revenue, arising predominately from the replacement of imported cables.

The winner for the Award in 2004 for education & training and public outreach activities was:

Australian Weed Management CRC: Warriors Fighting Weeds : (Page 31)

Weed Warriors is an innovative education and awareness program of the **CRC for Australian Weed Management** that bridges the gap between research and research users to empower and engage the community. It focuses initially on primary schools and uses biological control as the means to introduce teaching and learning about weeds into the curriculum. (Biological Control is the management of a weed using natural enemies from the weed's country of origin). Through the Weed Warriors Program, students are provided with the equipment and necessary know-how to breed insects such as the Gorse spider mite, Bridal creeper leafhopper and Paterson's curse weevil. At the end of the breeding phase, the students release their "bugs" at local weed infestations where joined by parents and other interested community members, they can demonstrate their contribution to the stewardship of local places.

[1]]Review of Greater Commercialisation & Self Funding in the Cooperative Research Centres Programme (1998) page 39: Department of Industry, Science & Tourism; Steering Committee: Mr Don Mercer, Professor John Stocker
[2]]ibid pages 47-48

Appendix A:

Additional Examples of the Application & Utilisation of CRC Research

MANUFACTURING SECTOR

CRC for Advanced Composite Structures: (2005)
All new aircraft programs such as the Boeing 787, with the opportunity to incorporate radical new technologies are now rare. When Boeing launched the 787, Hawker de Havilland had its new advanced composite technologies ready to go, thanks to 13 years of research by CRC for Advanced Composite Structures. As a result Hawker de Havilland has gained 787 Tier One status, with a work package worth $5 billion over 30 years. The research outcome is a major new business program and a major expansion in status and capability for an established Australian business, Hawker de Havilland, with significant national benefit. For the first time ever, Hawker de Havilland has achieved Tier One supplier status on a commercial aircraft program with the assistance of new technologies developed by the CRC. This will ensure that Hawker de Havilland survives an extensive restructuring of the global aerospace industry and expands in size, importance and capability.

CRC for International Food Manufacture & Packaging Science (2002)
The CRC developed a superior biodegradable starch-based packaging technology, set to replace many plastics world wide; it had been developing the technology since 1995. Plantic Technologies Limited, an Australian company took a worldwide exclusive license to manufacture biodegradable products from the technology. In the application for the CRCA's Awards for Excellence in Innovation in 2002, it was noted that Plantic Technologies expected the product sales to exceed AU$200million by 2006 and that the technology was unique and was being protected by international patents or patent applications with further R&D underway to expand Plantic Technologies's IP position. The CRC brought together five participant organizations with the particular sets of skills and expertise not available in any one institution or industry partner in the biopolymer area. This collaboration funded and supported by the CRC program structure enabled the development of the plastic-replacement technology. An international survey by CRC participants had identified gaps in plastics-replacement R&D, market opportunities and likely product delivery systems.
Note: This CRC has now finished its seven year term

INFORMATION & COMMUNICATION TECHNOLOGY SECTOR

Capital Markets CRC: (2005)
Adapting leading edge research in data management, data mining and data visualisation from the capital markets arena, this CRC has produced the world's first real-time health fraud detection technology to tackle a problem reported to be costing Australia $1.8 billion dollars. Successful early trials have already identified fraud levels of 4%, a potential saving of at least $720 million per annum to the health industry. The CRC has established Dtech Pty Ltd, which is responsible for the ongoing development and marketing of this technology.

CRC for Satellite Systems: (2002)
Fed Sat was the first satellite designed and built in Australia for more than 3 decades. It was successfully launched in 2002 from Tanegashima Space Centre under a bilateral agreement with the Japan Aerospace Exploration Agency, through which the launch was bartered for scientific data from the satellite. FedSat is the first microsatellite to operate in the commercially-important Ka radio band. It was the first to demonstrate that "self-healing" satellite computers which are resistant to energetic solar particles. FedSat is still operating well, and is delivering data on the effects of solar radiation on the Earth's magnetic field, as part of an ongoing international research program involving Australia, Canada, Denmark, Japan and the USA. It is also collecting data for satellite navigation and orbit tracking, in a research program involving the CRCSS and NASA's Jet Propulsion Laboratory. FedSat also carries a communications package, known as ADAM, capable of collecting environmental data from instrumented platforms anywhere on Earth. ADAM, also built by the CRCSS, has been used on a Korean satellite and will be used by a satellite being built by Singapore. The CRCSS, in conjunction

with the Australian National University, is currently testing a device that could form the core of future motors for orbiting and interplanetary spacecraft.

Note: This CRC finishes its term on 31 December 2005.

MINING & ENERGY SECTOR:

CRC of Clean Power from Lignite (2005)

A high –technology Australian company, Laser Analysis Technologies Pty Ltd has been established to manufacture and sell a new instrument for analysing the elemental composition of materials quickly and cheaply. The product increases productivity in the mining and mineral processing industries as well as assisting environmental remediation. The new instrument, known as the Laser Plasma Spectrometer, is the product of research undertaken by the CRC. The new company is now a wholly owned subsidiary of the Melbourne based diversified instrument company XRF Scientific Ltd and is marketing its instruments worldwide. This significant outcome is the result of a coordinated research, development and commercialisation effort that has involved a range of activities including fundamental research, innovation, successive iterations of prototypes, field testing, industrial design, promotional marketing, business strategy development, technology licensing and the formation and spin-off of the new company.

AJ Parker CRC for Hydrometallurgy (Parker Centre) (2004)

An R&D project costing $10 million has generated an estimated $295 million (net present value) in current benefits and is expected to yield a further $250 million in efficiencies flowing from wider use of current technologies, according to an independent industry-based study compiled by Strategic Technology Evaluation and Management (STEM). It also saves billions of litres of water.

A fundamental advance in understanding of processes for separating fine particles from water is being captured by the minerals industry through a unique partnership between government, scientists and 27 companies,

The research is revolutionizing one of the mineral industry's most unpredictable and erratic operations - the use of gravity thickeners, huge tanks used to concentrate mineral slurries for extraction or disposal in the alumina, gold, base metals ands mineral sands industries.

The collaborative framework which turned fundamental science into a major payoff for Australian industry and the environment has also played a crucial role. Not only has it enabled government, science and industry to leverage their investment in the technology many times, achieving outcomes that have not been achievable anywhere else in the world but at the same time it is also ensuring far more effective and widespread uptake of new technology by industry. The CRC recognised at the outset that effective technology transfer needs to be continuous, from the earliest planning stages throughout the project - not just left to the end with the hand-over of a technical report. The success of this project lies in constant engagement with the companies and their technical experts, and the demonstrated solution of specific on-site challenges.

AGRICULTURE & RURAL BASED MANUFACTURING:

CRC for Cattle & Beef Quality: (2003)

Beef quality traits like tenderness underpin Australia's position as world's No 1 beef trader. Four technologies developed by the CRC for Cattle & Beef Quality will guarantee success into the future. All 4 products resulted from careful basic scientific research in collaboration with the cattle industry, coupled with well-conceived delivery strategies to ensure early adoption by end users. Use of all 4 technologies leads to cumulative improvement in tenderness – the most important consumer relevant beef quality trait . As a result of the $32 M *CRC Experiment* (involving 7 cattle breeds, 9 cross bred genotypes and 12,000 carcases finished on pasture and feedlots in southern and northern Australia) the industry now has the best ever understanding of genetic and non-genetic factors affecting beef tenderness in Australian beef cattle. Cattle breeders can now identify sires with high genetic merit for tenderness by measuring Flight Time or marbling on –farm. Also the *CRC Experiment* showed that

grain feeding guarantees consistent tenderness and so Australia's largest beef retailers use grain-feeding to guarantee consistent tenderness. The latest development from the *CRC Experiment* has been a patented gene marker test (GeneSTAR Tenderness ®) which has been commercialised through Genetic Solutions Pty Ltd, a spin off company formed to deliver genetic technologies for the livestock industries.

Australian Cotton CRC: (2005)
The CRC has developed an insect attractant Magnet®, based on five plant volatiles, which is now being commercialised by a regionally based Australian SME, Ag Biotech Pty Ltd under a licensing agreement with the CRC. Magnet ® uses semiochemicals (signalling chemicals which modify insect behaviour). Extensive field trials by the CRC and cotton industry participants have shown that it has the potential to substantially reduce insecticide use in cotton. It will have applications for other industries in Australia and overseas. Key aspects of Magnet ® have been patented and patent applications are currently in the national phase in Australia, the USA, Europe, Brazil and India. It has benefits for an established industry (with its reduced price for insect control which represents 35% of a growers' variable costs in an established industry which is Australia's 5th largest agricultural industry with exports of around $1.5 billion); it also benefits business development in that it will open domestic and international markets for innovative Australian SMEs and it has benefts in the national interest in that it will reduce the use of broad spectrum insecticides and their attendant risks and help ensure the sustainability of an important regional industry.

CRC for Value Added Wheat (2005)
Triticarte ™ is a new low-cost method of mapping genes to speed up breeding improvements to wheat. These improvements will enable manufacturers to produce better noodles, biscuits, pasta or bread. It will help the wheat industry to be more profitable and assist in its efforts to move Australia's $8 billion a year wheat industry from a bulk commodity towards higher margin uses. The CRC has for nine years been doing research to produce commercial outcomes that will benefit the Australian wheat industry. An important long –standing project has been developing molecular markers to locate and map genes for wheat breeders. In 2001, the CRC started work with Diversity Arrays Technology Pty Ltd and then a year later planned a new joint venture company between the two called Triticarte Pty Ltd which is now offering the technology that was initially developed as a service to wheat breeders. Having breeders adopt Triticarte has been a major technology transfer task led by the CRC. Wheat breeders are modifying their traditional approach to get the benefits of the new technology more efficiently. The technology is receiving substantial industry support and is being actively taken up and used. Long term partners of the CRC supporting the venture include Arnott's Biscuits, Allied Mills and the Grains Research & Development Corporation. This collaborative program has provided a national benefit in an established industry by developing a new business.

CRC for Aquaculture: (2000)
The **CRC for Aquaculture with Wattyl Australia** developed PearlSafe® a biodegradable coating to protect pearl oyster shells from red sponge attack – so far protecting $10 M worth of stock. The CRC also developed NetSafe®, a non-toxic coating to stiffen netting cages to prevent damage from seals and to date this new product has protected salmon stock worth as much as $5M.

Note: This CRC has finished; it is now CRC for Sustainable Aquaculture of FinFish

ENVIRONMENT:

CRC for Catchment Hydrology: (2003)
The CRC has over three years developed an urban stormwater decision-support system called **music (Model for Urban Stormwater Improvement Conceptualisation;** this has revolutionised access to expertise and technology in the stormwater industry. It provides the planning framework and computer tools to support regional planning and the design of wetlands, vegetated swales and other systems that remove pollutants from stormwater. Melbourne Water Corporation analysis has shown

that the improved reliability of **music**-based designs can result in substantial reductions (up to 50%) in the cost of proposed works and still meet the identified water quality targets. On a regional scale, there have been documented cost savings of tens of millions of dollars. The success of the program is reflected in the rapid adoption of **music** by industry. Within six months of its launch in July 2002, over 300 licences to use **music** had been issued throughout Australia and overseas.

Note: This CRC will finish in mid 2005 and become part of a new CRC – eWater- as a result of the 2004 Selection Round

Decipher: (-2005)
Decipher is Australia's leading portal for tourism industry statistics and business intelligence. Tourism operators of all sizes from SMEs to major corporations can now visit www.decipher.biz to access the latest information, both free and fee-based, to assist them in making better business and investment decisions.

Decipher delivers data from over 200 different sources including Australian Bureau of Statistics, Tourism Research Australia, and State and Regional tourism organisations.

Decipher is the result of a working alliance involving the Sustainable Tourism Cooperative Research Centre, Amadeus (the world's largest travel IT company), international consultants Ernst & Young and Ausindustry.

Research and development of the Decipher was carried out at Sustainable Tourism CRC partner Universities - University of Queensland and Southern Cross University. Amadeus contributed IT architecture, while Ernst & Young extensively researched the industry's business needs. AusIndustry provided funding for commercial proto-type development and industry delivery of the completed application.

Decipher was launched by Hon Fran Bailey at Parliament House Canberra on 10 February 2005 and is being rolled out across the industry in association with all State Tourism Organisations and key industry associations.

This CRC has provided some useful guidance on the key issues that had to be addressed underpinning the importance of the strong links with the "end-users"/business viz:

- Detailed business analysis (which showed up the difficulties of funding IT operations post dotcom)
- Formation of Decipher technologies P/L both as a 'spin-off' and as a means of retaining the name
- Patents in US and Australia (a very expensive item)
- Trademark registration
- IP licence agreements
- Development strategy to work with major stakeholders to push the project forward
- Appointment of an experienced professional in the field (with a range of skills – technical, accounting, tour operator) to take the project forward
- Analysing and refining the business case (as so often business is more concerned with the product than the buyer)
- Keeping the team skills and expertise together so that it is not necessary to re-invent to accommodate change
- Working with AusIndustry (and others) to find financial capacities to take the project to market
- Development of new products that will keep the system 'fresh' and ahead in a very competitive world

MEDICAL SCIENCE & TECHNOLOGY

CRC for Tissue Growth and Repair (2002)
TGR Biosciences was established as a means to continue the commercialization of the IP for the Centre Partners at the end of the second term of the CRC. Indeed this CRC established other spin off companies -globally focused - to overcome the technology transfer gap that has traditionally limited Australia's ability to impact on the pharmaceutical industry. These included: GroPep Ltd (listed on

the ASX), PrimeGro Ltd. In the pharmaceutical industry the phases in the route to commercialisation can be identified:

- Discovery phase (University, Hospitals; Research Institutions)
- Commercial proof of concept
- Early stage commercial development with some direct marketing
- Strategic alliance for final product development & marketing

The technology gap lies between discovery and final product development & marketing and encompasses the phases of the commercial proof of concept and early stage commercial development. The CRC provided the essential bridge between the research organisation participants and the biopharmaceutical industry by taking new discoveries through to the end of the commercial proof-of-concept and then establishing spin-off companies for further commercialisation

It is worth noting that although this CRC had two terms (13 years), this built on basic research conducted over nearly as many years before the CRC was established.

CRC for Eye Research & Technology: (2002) (Now Vision CRC 2005)
Successful products from collaboration: A highly successful collaboration between the CRC and multinational CIBAVision has resulted in market-leading products. The first of these is a breakthrough highly oxygen permeable soft contact lens designed to be worn continuously for a month. Launched internationally in 1999, the 'Focus Night and Day™' lens has rapidly taken a major role in the vision correction market and was the fastest contact lens product to reach $1 million in sales. The lens is expected to earn Australia a multi-million dollar income from the 3% royalty stream, which is used by the CRC to fund future research, to create new jobs and postgraduate student positions. The collaborative project also created over 40 novel polymers. These may have substantial other uses including drug delivery and wound healing, and a spin-off company to exploit the non-ophthalmic applications of the polymers has been established by CIBA Vision/Novartis, the CRC and the Institute for EyeResearch.

The long-term multidisciplinary CRC/CIBA collaboration has now resulted in another highly oxygen permeable lens - O2OPTIX. This first product to be developed under the Vision CRC collaboration is in stores in the second year of the new Centre as a testament to successful collaboration. While the Focus Night and Day™ lenses had achieved the oxygen permeability needed for healthy long-term wear, unfortunately the cost of this high end product put increased oxygen out of reach of most daily lens wearers. CIBA Vision and the Vision CRC identified a need for affordable daily wear lenses that would allow many more people to enjoy the benefits of more oxygen and healthier eyes. O2OPTIX is breakthrough in providing high levels of oxygen in an affordable daily wear lens, and is particularly appropriate for those patients who wear their lenses for long hours. The lens was launched in the US in September 2004 and in Australia in February 2005 with excellent sales to date.

Expanding the market through education: The eyecare market is directly influenced by the knowledge and skills of eyecare practitioners. CRCERT and the Vision CRC have taken a unique approach to expanding the market through education. The Presbyopia Education Program (PEP), for example, is a collaborative project between the CRC and Essilor International to deliver education about presbyopia (the age-related inability of the eye to focus on near objects) and its treatment to Asia Pacific eyecare practitioners and educators. Many eyecare practitioners in the region know little about the condition or its effective treatment with the latest vision correction devices. CRC education programs are changing this, and they are a vital component of the development of the market in Asia. One of the most important innovations of PEP is that it targets both practitioners and educators. While improving the skills of practitioners has an immediate effect on the eyecare they provide, improving the knowledge and materials of educators has an ongoing effect on all the future practitioners they teach.

CRC for Cochlear Implant & Hearing Aid Innovation: (2002)
SoundShield™ is a world first acoustic shock protection device for users of telephone headsets. It blocks high-pitched sounds within a few hundredth of a second of their start while preserving the sound spectrum of the message. It has particular application to those in call centres. In Australia there are more than 180,000 call centre workers and the overseas call centre market is significant. SoundShield™ was the result of a three-year collaboration between the CRC (through the National Acoustic Laboratories) and Telstra. Telstra identified the problem and the CRC developed the signal processing software and licensed it to Telstra, who constructed and trialled a number of prototype devices; tests were carried out in a call centre that had previously experienced a high incidence of shrieks. Telstra later negotiated with Polaris, an Australian SME for wider Australian and worldwide manufacture and distribution. It has created employment opportunities in manufacturing and marketing of the SoundShield™ and enhanced potential for a new export market for this novel product through Polaris.