

CRC CARE™

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment

# STRATEGIC PLAN 2007-2012

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Established and supported  
under the Australian Government's  
Cooperative Research Centres Program

## Message from the Chairman and Managing Director

Our Strategic Plan for 2007 – 2012 provides the vision and mission of CRC CARE and an overview of how we intend to bring this vision to reality.

We recognise that to be internationally competitive, Australian industry must be among the world leaders in how it deals with the challenge of contamination of soil, water and air. It is an issue that confronts all societies and all industries. The leader in the field will achieve not only a healthier society, better regulation and a more efficient productive sector, but a global reputation for addressing one of the great issues of sustainability.

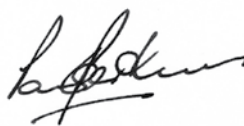
The CRC for Contamination Assessment and Remediation of the Environment (CRC CARE) is a co-operative research centre established and supported through the Australian Government's Co-operative Research Centre's Program. The Program's objective is to "enhance Australian industry through the development of sustained, user-driven, cooperative public-private research centres that achieve high levels of outcomes in adoption and commercialisation."

Commencing in September 2005, CRC CARE has over twenty partners including:

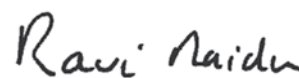
- Leading companies in the mining, petroleum and agricultural industries
- State and Commonwealth agencies and regulatory authorities
- SME's including venture capitalists, environment consultants and suppliers, and
- Australian Universities.

Together, the Australian Government and our partners will invest more than \$100 million over a seven year period in the development of cutting edge technologies and knowledge in assessing, preventing and remediating contamination of soil, water and air and also managing solid and liquid wastes.

The outcomes of our research will deliver significant economic and social benefits to Australia and countries around the globe.



Prof. Paul Perkins AM  
CHAIRMAN



Prof. Ravi Naidu  
MANAGING DIRECTOR

## Our Vision

To be recognised as a world leader in dealing with the challenge of contamination of the environment.

## Our Mission

To develop tools, know-how and products for industry and government that provide new and economic ways to prevent, assess and remediate contamination of soil, water and air.

## Our Values

- Concern for the health of the environment
- Continually strive for research excellence
- Collaboration is the key to success
- Consideration of the needs of all industry stakeholders in our activities
- Recognition of the importance of our people to the success of CRC CARE

## Our Goals

- **High Quality Research**  
To deliver research quality that positions CRC CARE as a national centre of excellence with international standing and reputation, ensuring our outcomes are recognised and utilised globally.
- **Solutions for Industry**  
To develop cost-effective and sustainable solutions and technologies within regulatory and policy frameworks for the identification and remediation of contamination problems of key importance to Australia and the Asia-Pacific region.
- **Develop the Business**  
To lead the development of a new export industry in environmental risk assessment and remediation through the delivery of the solutions and technologies and supporting the implementation with training programs that develop and improve the environmental management skills of the industry's labour force.
- **Deliver Public Benefits**  
To ensure the effective adoption of our solutions and technologies, leading to direct health, environmental and economic benefits to the Australian public through reduced exposure to toxic contaminants and improved amenity of our cities as a result of cost-effective remediation of urban land.
- **Capacity Building**  
To educate a generation of researchers, highly skilled at solving and preventing the problems of contamination and create employment opportunities in the industry for these specialists.

## CRC Care Research Program

CRC CARE's research program provides the core strategies required to achieve our goals.

Projects are developed that focus on both fundamental science and real-life field contamination problems prioritised by industries and regulatory bodies. The research is targeted to key problem areas of air, soil and surface and groundwater contamination, and waste (solid and liquid) management. Our research scope includes short-term and long-term bench, laboratory and field scale investigations and scale-ups together with policy and legal review.

The research is structured under six major programs:

1. Program 1 – Risk Assessment
2. Program 2 – Remediation Technologies
3. Program 3 – Prevention Technologies
4. Program 4 – Social, Legal, Policy and Economic Issues
5. Program 5 – Education and Training
6. Program 6 – National Demonstration Sites

## Program 1: Risk Assessment

### Overview

The principal objective of this program is to develop more reliable exposure and risk assessment methods to provide a sound basis for management decisions for contaminated environments. This includes targeting:

- More reliable information on speciation, bioavailability, toxicology and how these can be measured;
- A better understanding of exposure pathways and contaminant fate, and long-term exposure;
- Innovative assessment and monitoring tools; and
- Enhanced risk assessment and contaminant fate and transport models through a combination of advanced computer simulation and field analysis.

### The Risk Assessment Program includes four subprograms:

- Reliable and acceptable techniques and technologies to quantify the risk associated with contamination in soil, ground water, surface water and air
- Methods for speciation, bioavailability and toxicity assessment of contaminants
- Exposure Pathway and Biological Effect Assessment
- Risk Characterisation and Communication.

### Key Performance Indicators

1. The development of advanced techniques and prototypes for tools (including probes and sensors) for the prediction, detection and monitoring of contaminants in air, soil and water. It is expected that the technologies and tools will be at an early stage of commercialisation by 2012.
2. The delivery of economic and social benefits by 2012 from the outputs associated with projects focused on the development of human and ecological health risk assessment systems.

## Program 2: Remediation Technologies

### Overview

The principal objective of this program is to develop cost-effective management and remediation technologies for contaminated soil and groundwater environments. This includes:

- Better understanding of the combinations of separation and treatment technologies which will optimise overall treatment requirement, and to minimise the volume of soil requiring landfill disposal;
- The application of bioremediation and other remediation/management to reduce bioavailability and toxicity of contaminants;
- The evaluation and demonstration of low-maintenance remediation options such as permeable reactive barriers to meet regulatory requirements where off-site discharge of contamination is threatened;
- The remediation of source zones which may provide ongoing sources of contaminant risk or exposure; and
- The development and evaluation of better containment options and better protocols for natural attenuation assessment for contaminants that may need to be left in place or need disposal.

### The Remediation Technologies Program includes five subprograms:

- Remediation technologies for heavy metal(loid) contaminated soils
- Remediation technologies for mixed contaminants
- Remediation of persistent organic pollutants
- Remediation technologies for contaminated groundwater
- Reactive filtration media for remediation.

### Key Performance Indicator

1. The development of cost effective and sustainable solutions and technologies for the use by the commercial remediation sector.

## Program 3: Prevention Technologies

### Overview

The objective of this program is to enhance productive use of industrial and municipal waste. The program targets safe re-use of wastes and treated soils involving those contaminants and groups of wastes and potential contaminants that pose major problems in Australia. It draws on fundamental understandings developed in Programs 1 and 2. It includes:

- Laboratory and pilot scale testing of manufactured soil as an alternate source of nutrients;
- Coupled immobilisation and bioremediation of contaminants present in wastes; and
- Development and uptake of cleaner technologies to limit contaminant release.

### The Prevention Technologies Program includes three subprograms:

- Manufactured soils
- Soil recycling
- Biodegradation of agricultural wastes.

### Key Performance Indicators

1. The development of technologies to the proof of concept stage for the manufacture of micronutrient fertilizers and synthetic soils from waste materials.
2. The development of a re-vegetation plan for the mining industry utilising plants with high tolerance of metalloids.

## Program 4: Social, Legal, Policy and Economic Issues

### Overview

The goal of Program 4 is to secure the adoption of evidence-based solutions to site contamination problems by regulatory agencies, with a high level of public acceptance and confidence in these solutions.

### The Social, Legal, Policy and Economic Issues Program includes two subprograms:

- Community perceptions and acceptance
- Legal and policy frameworks for addressing site contamination in Australia and the Asia-Pacific region.

### Key Performance Indicators

1. The adoption by regulatory agencies and industry of:
  - a. Protocols for the management of community perceptions of risk associated with contaminated sites.
  - b. Recommendations for new and improved regulatory frameworks to address site contamination.
  - c. A reference database providing a comparative analysis of contaminated sites law and policy in Australia, Europe, North America and the Asia Pacific.

## Program 5: Education and Training

### Overview

The aims of the Education Program are:

- To provide a best-practice educational program enabling industry to use the most advanced techniques for assessment, remediation and prevention of future contamination;
- To train industry professionals in advanced assessment and remediation technologies to improve Australia's skills base;
- Through a targeted post-graduate education program provide the industry with a stream of highly educated and innovative workforce for the research and industry sectors;
- To significantly increase the export value of Australian environmental assessment and remediation education services by 2015;
- To enhance the awareness and scientific skills of staff in industry; and
- To increase the awareness of opportunities and procedures for commercial adoption and utilisation in industry.

### Key Performance Indicators

1. The training of 1,000 industry professionals by 2012.
2. The completion of 50 PhD and 25 Honours students and see these successful people employed in the industry.

## Program 6: National Contaminated Sites Demonstration

### Overview

The National Contaminated Sites Demonstration Program provides an opportunity to demonstrate to industry integrated multidisciplinary solutions to complex land, groundwater and air contamination problems and issues across Australia. It also provides an opportunity to scientists and consultants to test and validate novel site assessment and remediation technologies.

The Demonstration Program addresses the following issues that currently constrain assessment and remediation of potentially contaminated sites:

- Monitored natural attenuation as a risk based strategy for managing contaminated sites;
- Source Characterisation and remediation of chlorinated hydrocarbon contaminated sites;
- Health investigation levels for petroleum hydrocarbon contaminated sites;
- Impracticability End Points for LNAPL Remediation; and
- Aqueous film forming foam - long-term impacts at fire drill training areas.

### Key Performance Indicators

1. The establishment and proof of concept in the field of
  - a. A permeable reactive barrier for the remediation of contaminated groundwater.
  - b. Strategies for the management of acid-sulphate soils.
  - c. Successful assessment of the petroleum hydrocarbon contamination at the Port Stanvac (South Australia) site.
  - d. Successful demonstration of an Aqueous Film Forming Foam monitoring tool in the field.