



Independent Expert Scientific Committee
on Coal Seam Gas and Large Coal Mining Development

2017–2018 **Annual Review of Activities**

An overview of the activities of the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development from July 2017 to June 2018



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Contact details

For information about this report or about the work of the IESC, please contact:

IESC Secretariat

Office of Water Science

Department of the Environment and Energy

GPO Box 787

CANBERRA ACT 2601

The report can be accessed at <http://www.iesc.environment.gov.au/>

Images

Front Cover: McIntyre River | Location: Condamine catchment area | © Department of the Environment and Energy

Back Cover: Paperbark forest at the Hunter Wetlands Centre (Shortland Wetland) | Location: Shortland, NSW
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2017–2018 **Annual Review of Activities**

An overview of the activities of the
Independent Expert Scientific Committee on
Coal Seam Gas and Large Coal Mining Development
from July 2017 to June 2018

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1. From the Chair

I am pleased to present the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) Annual Review of Activities 2017–2018. Throughout the year we continued to find new ways to apply advances in scientific understanding to ensure governments have access to the best science to underpin regulatory decision-making.

We provided advice on nine project proposals during the period. Since the establishment of the interim committee in 2011, the Committee has provided over 110 pieces of advice to regulators on the water-related impacts of coal seam gas and large coal mining developments.



We hosted the first IESC Research Symposium in Brisbane on 19 June 2018. The event was an opportunity to showcase scientific research from the Australian Government's \$19 million research program, which was guided by the IESC's advice on research priorities. The research funded by the program has advanced scientific understanding of the impacts of coal resource development in Australia on water flow, surface and groundwater connectivity, water quality changes, ecosystem impacts and cumulative impacts. The symposium attracted around 200 representatives from organisations including regulators, government agencies, industry peak bodies, coal resource companies, consultants and research institutions. Feedback from the day was overwhelmingly positive. We continue to look for opportunities to bring the important issues discussed at the symposium to the attention of our stakeholders.

In May 2018 we released an update of the IESC Information Guidelines to provide clearer guidance for project proponents on our information requirements. The Information Guidelines will be supported by a range of explanatory notes on significant topics, which we have been developing and consulting on since early 2018. We expect to release the full set of explanatory notes by the end of 2018.

We continued to increase our engagement with government agencies and with environment, community and industry groups through meetings, workshops and roundtable sessions. These consultations provided opportunities to enhance stakeholders' understanding of the IESC's role and methodology. Consultations also helped us to gain a better appreciation of how regulators, industry and community use our advice, guidelines and other scientific information.

On behalf of the Committee, I thank the Office of Water Science for its continued support, scientific expertise and dedication in assisting our work.

We are eager to continue to engage with interested parties and look forward to providing valued independent scientific advice to the Australian and state government regulators in the year ahead.

Dr Chris Pigram PhD, FTSE, GAICD
IESC Chair

2. Executive summary



Advice to regulators

The primary role of the Committee is to provide expert scientific advice on the water-related impacts of coal seam gas and large coal mining development proposals to the Australian and state government regulators. In 2017–18 the Committee provided advice on nine proposed coal resource development projects in New South Wales and Queensland.

IESC Research Symposium

In June 2018 we hosted the IESC Research Symposium at the Brisbane Convention Exhibition Centre. The symposium attracted around 200 attendees including representatives from regulators, government agencies, community organisations, industry peak bodies, coal resource companies, consultants and research organisations. It increased participants' awareness of advances in our understanding of the potential impacts of coal resource development on Australia's water resources.

Site visits

The Committee undertook a number of site visits to increase our understanding of site operations. The destinations included Centennial Coal's Mandalong underground coal mine, the University of New South Wales Water research laboratory centrifuge permeameter facility, and the University of Queensland Centre for Coal Seam Gas..

Engagement activities

The Committee continued to engage directly with regulators, industry, researchers and interest groups to explain our role and review our approach and how advice is adopted in regulatory decisions. Our engagement activities also included targeted consultation on the update to the Information Guidelines and explanatory notes.

Information Guidelines and explanatory notes

In May 2018 we released an update of the IESC Information Guidelines. These guidelines aim to assist proponents to provide adequate assessment documentation to enable the IESC to understand, consider and provide advice on the potential impacts of development proposals on water resources.

We are developing a range of explanatory notes to support the Information Guidelines by providing more specific and detailed guidance on priority matters.

3. The Committee

The Committee consists of eight members, appointed on a part-time basis by the Australian Government Minister with responsibility for the environment. Each member has extensive scientific qualifications and expertise in geology, hydrogeology, hydrology, ecology or ecotoxicology.



IESC Research Symposium, Brisbane

IESC members' individual expertise

(Photo: left to right)

Professor Joan Esterle—Geology
Dr Jenny Stauber—Ecotoxicology
Dr Ian Prosser—Hydrology
Dr Chris Pigram (Chair)—Geology
Dr Andrew Boulton—Ecology
Dr Wendy Timms—Hydrogeology
Professor Craig Simmons—Hydrogeology
Dr Glen Walker—Hydrology

Further information: <http://www.iesc.environment.gov.au/iesc>

4. Committee meetings

The Committee met nine times during 2017–18. The purpose of the meetings was to prepare scientific advice in response to requests from governments and to increase our collective scientific understanding of the water-related impacts of coal resource development.

The minutes from each meeting are available on the IESC website:

<http://www.iesc.environment.gov.au/committee/committee-meetings-and-workshops>

Meeting 45

26–27 July 2017

Canberra

The Committee provided advice on the Narrabri Coal Seam Gas Project and the Wambo Coal Mine South Bates Extension Modification Project.

Dr Dirk Mallants (CSIRO) presented the results of research to improve treatment of faults and aquitards in Australian regional groundwater flow models.

We received an update on the Bioregional Assessment Program.

Meeting 46

30–31 August 2017

Brisbane

The Committee provided advice on the Western Surat Coal Seam Gas Project.

We agreed to conduct an update of the Information Guidelines and to develop explanatory notes to better explain requirements in some areas.

Mr Sanjeev Pandey (Queensland Office of Groundwater Impact Assessment) and Ms Carolyn Collins, (Queensland GasFields Commission) gave presentations.

Members visited the University of Queensland Centre for Coal Seam Gas and were briefed on its current projects.

Meeting 47

11–12 October 2017

Canberra

The Committee provided advice on the Spring Gully North-West and North-East Coal Seam Gas Project.

We received an overview of the Society of Environmental Toxicology and Chemistry Conference held in September 2017.

Meeting 48

14–15 November 2017

Sydney

The Committee provided advice on the extension to the Alfredson Block Coal Seam Gas Project.

Professor Bruce Hebblewhite (University of New South Wales) gave a presentation on longwall mine design effects on subsidence and valley closure.

Members visited the University of New South Wales Water Research Laboratory to view a demonstration of its centrifuge facility.

Meeting 49

12–14 December 2017

Canberra

The Committee provided advice on the Central Queensland Coal Project, Ironbark No. 1 Project Coal Mine and extension of Moolarban Coal Mine Open Cut Optimisation Project.

Mr Hugh Middlemis (Hydrogeologic Pty Ltd) provided an update on the explanatory note on uncertainty analysis in groundwater modelling.

Meeting 50

8 March 2018

Sydney

The Committee met with representatives from peak bodies representing the agriculture, minerals and gas industries to provide context for the update to the IESC Information Guidelines and the new explanatory note on uncertainty analysis in groundwater modelling.

Tanya Doody (CSIRO) and Peter Hancock (Eco Logical) gave presentations on the explanatory note on groundwater-dependent ecosystems.

Members visited the Mandalong Underground Coal Mine to observe longwall mining operations.

Meeting 51

11 April 2018

Brisbane

Dr Pigram (Chair), Dr Prosser and Dr Walker hosted a workshop with environmental consultants on the Information Guidelines and the explanatory note on uncertainty analysis in groundwater modelling.

The Committee discussed the submissions received during the public consultation process and agreed to final changes before publication of the revised guidelines.

Meeting 52

23–24 May 2018

Canberra

The Committee provided advice on the Wallarah 2 Coal Project.

Mr Sanjeev Pandey (Queensland Office of Groundwater Impact Assessment (OGIA)) met with the members to discuss the OGIA groundwater model.

Meeting 53

20 June 2018

Brisbane

The Committee reviewed the feedback received from the IESC Research Symposium.

Dustin Hobbs (Hydrobiology) and Trang Huynh (Hydrobiology) gave presentations on the explanatory note on site-specific guidelines and monitoring of physical and chemical parameters.

5. Advice on coal seam gas and large coal mining development proposals

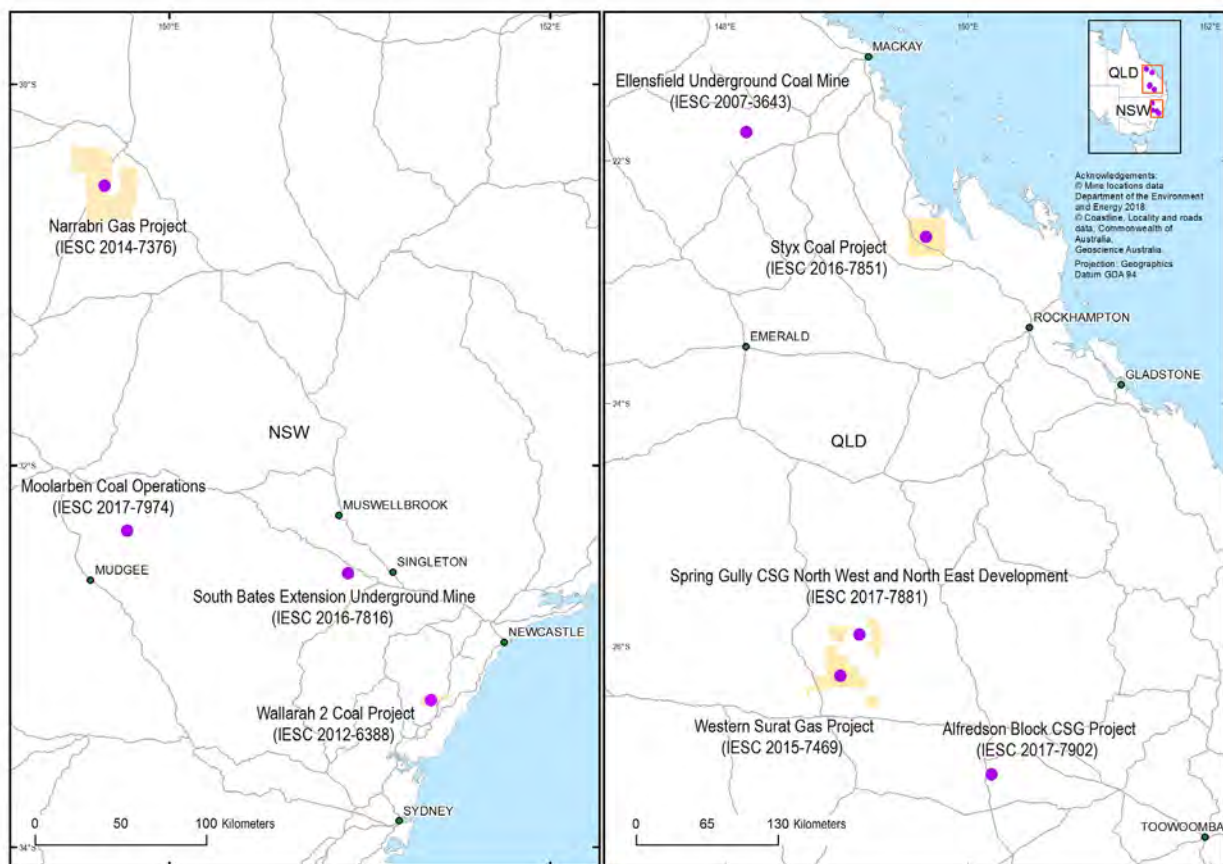
The Committee provided advice on four coal seam gas and five coal development proposals.

The Committee does not make decisions about whether to approve a development proposal. The Australian Government and relevant state government regulators have this responsibility.

Advice from the Committee helps increase transparency and strengthens the scientific basis of regulatory decisions by identifying potential water-related impacts of coal or coal seam gas developments.

Development proposals considered by the IESC in 2017–18

Referred by	Project name	State
Australian Government	Wallarrah 2 Coal Project – EPBC 2012/6388	NSW
Australian and New South Wales governments	Moolarben Coal Project—Optimisation Modifications—EPBC 2017/7974	NSW
Australian and Queensland governments	Central Queensland Coal Project—EPBC 2016/7851	QLD
Australian Government	Ironbark No. 1 Project—EPBC 2007/3643	QLD
Australian Government	Alfredson Block CSG Project—EPBC 2017/7902	QLD
Australian Government	Spring Gully North-West and North-East CSG Project (EPBC 2017/7881)—Expansion	QLD
Australian Government	Western Surat Gas Project—EPBC 2015/7469	QLD
Australian and New South Wales governments	Narrabri Gas Project—EPBC 2014/7376	NSW
Australian and New South Wales governments	Wambo Coal Mine South Bates Extension Modification Project—EPBC 2016/7816	NSW



Locations of proposed developments considered by the IESC in 2017–18

The Committee reviews information presented by the project proponent and responds to regulator questions. Its advice to regulators is informed and guided by the varied expertise of Committee members and draws on the best available scientific information, such as bioregional assessments.

The Committee considers all potential impacts on water resources in its advice. This includes the proposed project's effects on groundwater, surface water, water quality and quantity, ecosystems and ecological processes.

Advice is published on the Committee website within 10 business days of providing it to the requesting regulator.

A full list of development proposals for which the Committee has provided advice to regulators is on our website: www.iesc.environment.gov.au/advice/proposals.html

6. Engagement

The Committee continued to engage with key stakeholders to increase their understanding of how our work contributes to a stronger scientific framework for regulating coal seam gas and large coal mining developments and address community concerns about any potential impacts on Australia's water resources.

Chair meetings

The Chair met with a diverse range of stakeholders including regulators, government agencies, peak industry bodies, and conservation and community groups to gain an understanding of how they use the IESC's advice, to ensure that it remains relevant and practical. More than 35 meetings were held across New South Wales, Queensland, Victoria and South Australia with 19 government agencies, 11 peak bodies and eight environment non-government organisations.

Regulator workshops

The Committee hosted regulator workshops in New South Wales and Queensland to review how its advice is used by regulators and adopted in the regulatory decision-making process.

The workshops allowed us to better understand how our advice is used and how to improve its format and presentation. Based on feedback from regulators, we revised our advice template to improve the format and presentation. We added a summary section at the beginning of our advice to increase accessibility for non-scientific audiences.

Industry roundtable discussions

The Committee hosted two roundtable discussions on updates to the IESC Information Guidelines and the new explanatory notes. The discussion with industry and industry consultants provided valuable context on how proponents apply the Information Guidelines.



Panel discussion, IESC Research Symposium, Brisbane, Queensland

Understanding the Committee's methods enable industry to more effectively address the Committee's requirements in their environmental impact statements. Consultants welcomed the discussions and gave feedback that they had increased their understanding of the IESC's role and methodology.

Research symposium

The Committee hosted around 200 delegates at the IESC Research Symposium held in Brisbane in June 2018. There was overwhelmingly positive feedback from attendees about the quality and relevance of the scientific presentations from guest researchers and the overall delivery of the event. It was encouraging to hear that a high percentage of participants would continue to use the scientific findings in their future work.

'I enjoyed hearing about the findings of key research projects on water resources and how these may assist the Queensland regulator.'

Greg Tkai, Queensland Department of Environment and Science

Workshops and conferences

Australian Petroleum Production and Exploration Association National Conference

Dr Glen Walker released the IESC's revised Information Guidelines at the Australian Petroleum Production and Exploration Association (APPEA) conference in May 2018. Dr Walker presented the guidelines to delegates, including oil and gas industry delegates, leading policymakers and senior government officials.

CSIRO workshop on environmental tracers in coal and unconventional gas development proposals

Dr Glen Walker and Professor Craig Simmons gave opening addresses on behalf of IESC to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Workshop on Environmental Tracers in Coal and Unconventional Gas Development Proposals in May 2018. Dr Walker presented 'The IESC and the review process for development proposals' and Professor Simmons presented 'Hydrological challenges in unconventional gas development'. The one-day workshop brought together experts from academia, research agencies, industry and regulatory bodies.

Faults and aquitards in Australian regional groundwater models workshop

on behalf of the Committee, Dr Glen Walker attended the Faults and Aquitards in Australian Regional Groundwater Models Workshop run by the Department of the Environment and Energy in May 2018. The workshop focused on presenting and discussing the results of research to improve the treatment of faults and aquitards in groundwater modelling. The research was conducted by a \$2.6 million partnership between the Department of the Environment and Energy, CSIRO, Flinders University and the University of Queensland, which completed its work in 2017 and published a suite of reports presenting its findings in early 2018.

7. Information Guidelines

The IESC Information Guidelines provide guidance on the information needed in environmental impact assessments to enable us to provide robust scientific advice to regulators.

The Information Guidelines are designed to assist proponents develop their environmental impact assessments. They are not mandatory and proponents are encouraged to refer to issues of relevance to the particular project.

The Committee reviews a proponent's environmental impact assessment documentation against the Information Guidelines. We do this to determine whether the assessment provides enough evidence to allow independent verification of the processes of cause and effect between the project and water resources, and the predicted magnitude of the impacts on water resources.

We continue to see an increase in the use of the guidelines in assessment documentation, which has improved the quality, transparency and robustness of environmental assessments.

The Information Guidelines are available on the Committee's website:

<http://www.iesc.environment.gov.au/publications/information-guidelines-independent-expert-scientific-committee-advice-coal-seam-gas>

Update to the Information Guidelines

In mid-2017 the Committee agreed to update its Information Guidelines. The update was initiated to ensure that recent advances in theory and leading practice are considered and incorporated.

The updated version provides additional and clearer guidance on specific technical aspects. It highlights the importance of undertaking a risk assessment early in an environmental assessment process, which allows investigations of potential impacts and selection of management options commensurate with the project's risk profile.



Dr Glen Walker presenting the IESC Information Guidelines at the 2018 APPEA conference, Adelaide, South Australia

To support the uptake and understanding of the new guidelines, the Committee hosted roundtable discussions with industry and environmental consultants in Sydney and Brisbane. The updated Information Guidelines were released on the Committee's website in May 2018 and presented at the 2018 APPEA conference by Dr Glen Walker.

Development of explanatory notes

To support and complement the Information Guidelines, the Committee began developing a range of explanatory notes. These notes provide further guidance for proponents on preparing environmental impact assessments. The explanatory notes we are preparing relate to uncertainty analysis in groundwater modelling, assessing impacts on groundwater-dependent ecosystems, and developing and implementing site-specific guideline values for physical and chemical water quality parameters.

The explanatory notes on uncertainty analysis and groundwater-dependent ecosystems were released for public consultation in early 2018. The Committee welcomed feedback on their content, usability and applicability.

Uncertainty analysis in groundwater modelling

This note places uncertainty analysis for groundwater modelling within a risk management framework and provides information on the value of, and need for, undertaking uncertainty analysis. It notes some potential methods for quantifying uncertainty and establishes some guiding principles to follow when carrying out an uncertainty analysis.

Assessing groundwater-dependent ecosystems

This note describes the information required and tools available to assess the potential risks to groundwater-dependent ecosystems from coal and coal seam gas resource development.

Site-specific guidelines and monitoring of physical and chemical parameters

This note summarises how to implement the Australian and New Zealand Guidelines for Fresh and Marine Water Quality in designing appropriate monitoring programs for physical and chemical parameters. It includes guidance on how to use monitoring data to develop site-specific guideline values for water and sediment quality.



IESC members, Barton, Canberra

8. Bioregional assessments

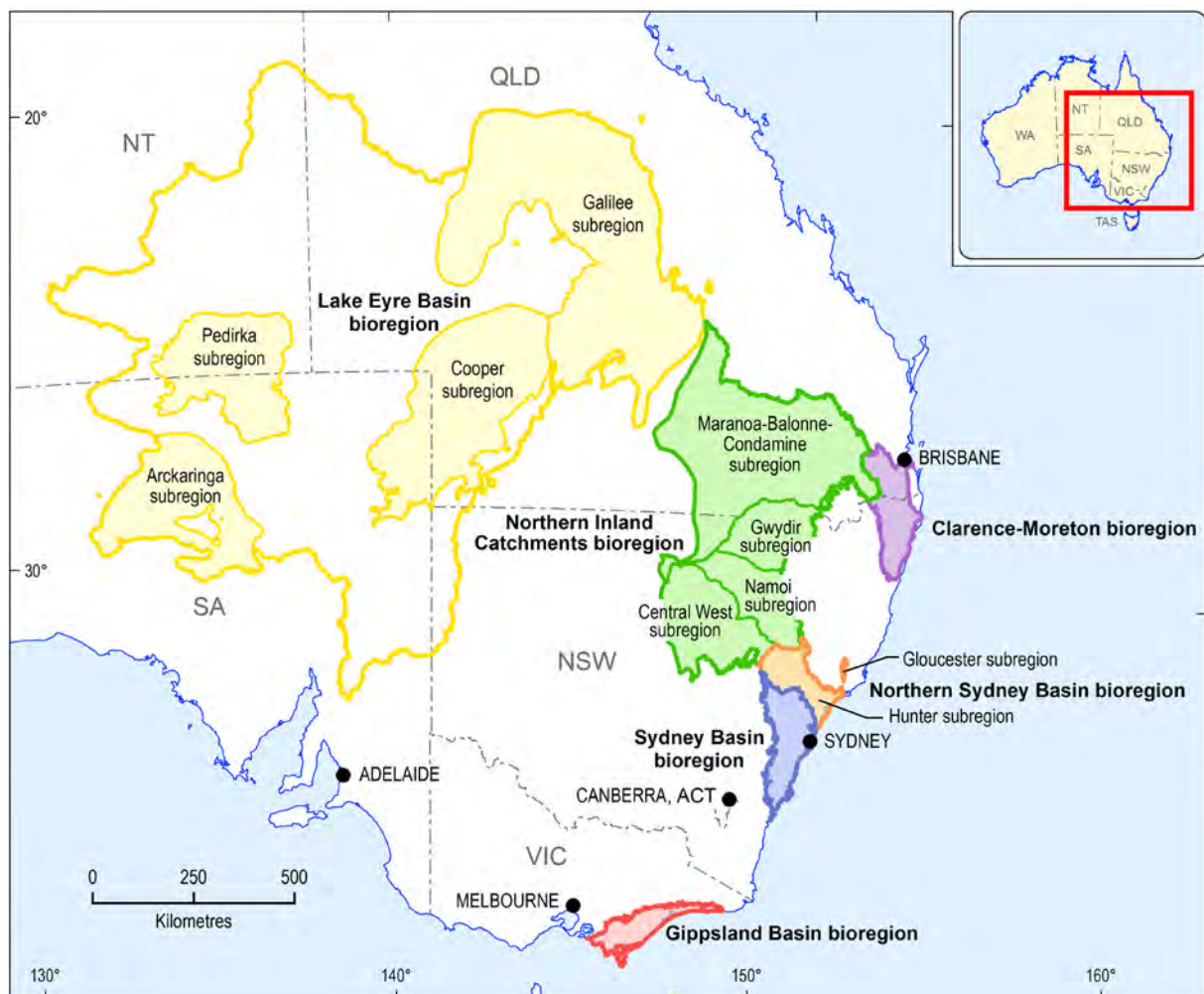
Bioregional assessments provide the IESC with scientific information and independent expert knowledge on potential cumulative impacts of coal seam gas and coal mining development on water-dependent assets. The assessments are a collaboration between the Australian Government Department of the Environment and Energy, the Bureau of Meteorology, CSIRO and Geoscience Australia.

In 2017–18, bioregional assessments and related tools and information were released for the Maranoa–Balonne–Condamine, Clarence–Moreton, Cooper, Hunter and Gloucester regions.

The Bioregional Assessment Explorer mapping tool displays results of the bioregional assessments for these regions. Results for the Galilee and Namoi subregions will be added as the assessments are completed.

Maranoa–Balonne–Condamine subregion

The bioregional assessment found that the impacts of two proposed coal mines on water resources will be limited to small areas near the mines. Most water-dependent assets in the region will be unaffected. Some possible impacts may require more detailed local investigation.



Source: *Bioregional Assessment Program, Commonwealth of Australia (2014)*

Hunter subregion

Twenty-two potential new coal mines or expansions of existing coal mines were assessed. Regional scale hydrological modelling indicates that an area of 2441 square kilometres could experience groundwater drawdown due to potential new mines or mine expansions. About 1228 kilometres of streams and 102 square kilometres of groundwater-dependent ecosystems could be affected by changes in groundwater or surface water. Changes in hydrology could affect the management of the regulated Hunter River and the reliability of water supply in some unregulated streams. More detailed local information is needed to determine the level of risk.

Clarence–Moreton bioregion

The bioregional assessment found that potential changes in water resources due to the now-withdrawn West Casino Coal Seam Gas Project would probably have been minimal at the surface. There is very limited potential for the commercial production of coal seam gas in the Queensland part of the Clarence–Moreton, and no new coal mining development was identified in the bioregion.

Cooper subregion

Conceptual modelling and a fact sheet were released. There is no potential for coal mining. One advanced coal seam gas proposal was identified: the proposed Southern Cooper Basin Gas Project. If it goes into production, the project may increase surface water flows into Strzelecki Creek. Springwater levels in the Lake Blanche Springs are unlikely to be affected.

Gloucester subregion

Additional coal resource development is predicted to cause minor hydrological change. No impacts on ecological assets are predicted in the south, given the limited additional coal resource development. In the north, potential impacts on ecological assets are expected to be minor and localised because predicted hydrological changes are small.

Further information is available at: <http://www.bioregionalassessments.gov.au>

9. Research

Applying the latest science to our advice is a major priority for the Committee. For this reason, we advise the Australian Government on priorities for research on the impacts of coal resource developments.

Between 2013 and 2017, the Australian Government invested \$19 million in a research program guided by the IESC's research priorities determined in 2013. The research has improved understanding in important areas and strengthened the scientific basis of regulatory decision-making. This research has also informed the Committee's advice to regulators.

After the research program was completed in 2017, the Committee reviewed and updated its research priorities. We identified three priority themes for further scientific understanding.

Hydrology: address gaps in knowledge on surface and groundwater connectivity, groundwater modelling, and impacts on water bodies. These are crucial elements to better understand long-term impacts on water resources.

Ecology: improve scientific understanding of the ecological impacts of changes to water quantity, quality, and flow; and explore better ways to monitor and mitigate the effects of coal seam gas and coal mining on aquatic ecosystems, key species and ecological communities.

Chemicals: improve understanding of chemicals used in coal seam gas extraction and their movement in surface and groundwater systems, wastewater management and geogenic chemicals.

While the specific Australian Government funded research program has finished, the Committee has shared the updated research priorities more widely as a resource that may help organisations develop future research plans and priorities. We continue to look for opportunities for collaborative partnerships to achieve these goals.

Published research

In 2017–18, the Australian Government published the final research produced under the program. The IESC welcomes the release of this research and will use it in the future when developing advice on project proposals.

National assessment of chemicals associated with coal seam gas extraction in Australia

This research examined human health and environmental risks from chemicals used in drilling and hydraulic fracturing for coal seam gas (CSG) in Australia between 2010 and 2012. It aimed to increase the knowledge base about chemicals used in the industry and provide information to the Australian Government, the IESC, industry, and the public about the use and potential risks of these chemicals.

The research was led by the Department of the Environment and Energy in collaboration with the National Industrial Chemicals Notification and Assessment Scheme (NICNAS), CSIRO and, in an advisory role, Geoscience Australia.

Research on faults and aquitards in Australian regional groundwater models

This research produced a suite of reports presenting work flows, techniques and worked examples to improve the consideration of faults and aquitards in Australian regional groundwater models, particularly those models used to assess the potential impacts of coal mines and coal seam gas extraction projects.

The reports demonstrate better procedures for integrating existing modelling and data collection techniques, including some used mainly in the petroleum industry. They also describe some new methods for measurement and modelling developed as part of this research.

Further information, including copies of the research, is available at:

<http://www.environment.gov.au/water/coal-and-coal-seam-gas/science-research>

10. IESC Research Symposium

On 19 June 2018 we hosted the IESC Research Symposium at the Brisbane Convention and Exhibition Centre. The symposium highlighted how research has advanced scientific understanding of the impacts of coal seam gas extraction and large coal mining developments on water flow, surface and groundwater connectivity, water quality changes, ecosystem impacts and cumulative impacts. The focus of the day was the \$19 million of research projects commissioned by the Australian Government between 2013 and 2017. These projects were guided by the Committee, as one of our functions is to advise the Australian Government on research into the impacts of coal resource development on Australia's water resources.

The research has improved understanding in key areas and strengthened the science to support regulatory decision-making. It has been used by the Committee to inform our advice to regulators.

The Chair provided a broad overview of the day's proceedings, the role and function of the Committee and reflections on what the Committee has learned since 2012 about the state of knowledge with respect to coal seam gas extraction and coal mining.

The symposium was structured around the priority research areas identified by the Committee in 2013:

Hydrology: address gaps in knowledge on regional hydrology, hydrological connectivity across aquitards and faults and through bores, and modelling of these in assessment of developments.

Ecology: improve ecological conceptual modelling and explore better ways to monitor and reduce the effects of coal seam gas and coal mining on aquatic ecosystems, key species and ecological communities, especially in swamps and intermittent streams.

Chemicals: improve understanding of the potential risks of chemicals used in coal seam gas extraction in surface and groundwater systems.

Cumulative impacts: address gaps in knowledge on approaches to evaluating the cumulative effects of coal seam gas and coal resource developments, and the uncertainty of model predictions.



Professor Craig Simmons, IESC Research Symposium, Brisbane, Queensland



Presenters and Panel Members, IESC Research Symposium, Brisbane, Queensland

(Back Row L-R) Dr Renee Rossini, Dr Mark Kennard, Mr Sanjeev Pandey, Dr Simon Apte, Dr Ed Cram, Mr Hugh Middlemis, Dr Dirk Mallants, Dr Kate Holland, Professor Jim Underschultz, Fiona Chandler

(Middle Row) Dr Sneha Satya

(Front Row) Dr Ian Prosser, Dr Jenny Stauber, Dr Chris Pigram, Dr Wendy Timms, Dr Glen Walker, Professor Craig Simmons, Professor Joan Esterle, Dr Andrew Boulton

Each session included an overview of how knowledge had improved on the subject since 2013; technical presentations from lead researchers; and panel discussions.

The symposium was strongly supported by stakeholders. There were around 200 attendees, including representatives from Australian Government and state regulators, industry, consultants and research organisations.

A summary of the research presented on the day has been published on the Committee's website.

*'Great explanation of the IESC's role and authority in Queensland.
Excellent quality and variety of technical talks. Efficient use of technology to
manage the day's agenda and keep on time.'*

Rachael Ilett, Senex Energy

The Committee would like to thank all those who attended the symposium, particularly the following presenters and participants:

- Dr Dirk Mallants (CSIRO)
- Professor Jim Underschultz (University of Queensland)
- Mr Hugh Middlemis (Hydrogeologic Pty Ltd)
- Dr Sneha Satya (National Industrial Chemicals Notification and Assessment Scheme)
- Dr Ed Cram (Department of the Environment and Energy)
- Dr Simon Apte (CSIRO)
- Dr Mark Kennard (Griffith University)
- Dr Renee Rossini (University of Queensland)
- Dr Kate Holland (CSIRO)
- Mr Sanjeev Pandey (Office of Groundwater Impact Assessment)
- Dr John Higgins (Department of the Environment and Energy)

'Excellent presentations that are relevant in today's need to regulate and prevent loss of biodiversity and water management'

Anna Dennis, Arden Environmental

'It was a very useful event; very well organised and useful topics selected for presenting to the general public'

Jorge Martinez, CSIRO



Dr Chris Pigram, IESC Research Symposium, Brisbane, Queensland

11. Site visits

The Committee participated in a number of site visits to projects and research facilities. These visits gave members the opportunity to gain a firsthand understanding of the latest science and on-the-ground site workings.

The Committee would like to thank staff at these sites for taking time out of their busy days to show members around the various facilities and to answer their questions.

University of Queensland Centre for Coal Seam Gas

In August 2017, Committee members visited the University of Queensland Centre for Coal Seam Gas. The centre conducts research and supports education in disciplines including economics, business, petroleum engineering, geosciences, water, ecology and social sciences. It also provides independent advice to industry and government on policy and business matters, scientific and technical issues, and strategic planning.

Researchers briefed Committee members on current projects including the 3D Water Atlas, a publicly available view of groundwater variability over time and space.

The visit included a lab tour in the School of Chemical Engineering to see its new high-pressure well simulator facility for plugging oil and gas wells, and a demonstration of the large-scale experimental well bore for investigating and measuring gas and water flows and how they interact.



*IESC visit the University of Queensland's Centre for Coal Seam Gas,
University of Queensland, St Lucia, Queensland*

University of New South Wales Water Research Laboratory

The Committee visited the University of New South Wales Water Research Laboratory in November 2017 to view a demonstration of its centrifuge permeameter facility. The centrifuge is one of only two of its type in the world for hydraulic characterisation of aquitards including clayey sediments and rock drill core.

The centrifuge can characterise and model fluid flow processes in geology over spatial and time scales that are not otherwise possible, simulating flows over thousands of years within a reasonable experimental time frame of weeks or months. The facility is available for research collaborations and provides services to industry.

IESC members inspect the centrifuge, University of New South Wales, Manly Vale, New South Wales



Mandalong Underground Coal Mine

In March 2018 the Committee visited the Mandalong mine in the Newcastle coalfields near Morisset to observe site operations. The mine produces up to 6.5 million tonnes of coal a year and supplies the Hunter region power stations.

Members had the opportunity to go underground, where they observed a continuous miner (a mining machine that produces a constant flow of ore from the working face of the mine) both cutting coal and installing roof and rib bolting in action and heard how issues such as subsidence (localised lowering of the land surface) were being managed on site.



IESC at Mandalong Underground Coal Mine, Morisset, New South Wales



Australian Government

This initiative is funded by the Australian Government

www.iesc.environment.gov.au