

QUEENSLAND FLOODS
COMMISSION OF INQUIRY

STATEMENT OF ANDREW STUART BRIER

WITH RESPECT TO THE MORANBAH CSG SITE

I, **ANDREW STUART BRIER** of c/- 400 George Street Brisbane in the State of Queensland, General Manager Strategic Implementation, Coal & CSG Operations, Regional Service Delivery, Operations and Environmental Regulator, Department of Environment and Resource Management (DERM), solemnly and sincerely affirm and declare:

Requirement from Queensland Floods Commission of Inquiry

1. I have seen a copy of a letter dated 13 September 2011, which is attachment **ASB-01**, from the Commissioner, Queensland Floods Commission of Inquiry to me requiring a written statement under oath or affirmation, and which details the topics my statement should cover.

Role

2. I am currently the General Manager Strategic Implementation, Coal and Coal Seam Gas Operations within the Regional Service Delivery Division in the Department of Environment and Resource Management. I have held this position since 21 February 2011 although I was involved in the management of flood related issues surrounding coal mines from the 10 January 2011 onwards.
3. Between 2010 and 2011 my roles were as follows:
 - 25/12/2009 to 05/08/2010 - Regional Manager GABSI & Major Projects
 - 06/08/2010 to 02/01/2011 - Regional Manager CSG Activities
 - 03/01/2011 to 20/02/2011 - Director LNG Enforcement Unit
 - 21/02/2011 onwards - General Manager Coal & CSG Operation

Item 1: Department of Environment and Resource Management's activities in respect of each mine's flood preparedness in advance of the 2010/2011 wet season, including whether any particular activities were undertaken as a response to the forecast of an above-average rainfall wet season.

4. Environmental authorities include requirements for companies to prepare Water Management Plans that outline the overall mine water management strategy for their site. The environmental authorities require an annual review of these plans to ensure learnings from past wet season performance are incorporated into forward plans and preparations for future wet seasons.
5. Environmental authorities for mine sites also include dam structural design, construction and operation requirements that are commensurate with flood risks given a mines location, including:

- a. certified hazard assessment required for all dams;
 - b. must be designed to prevent floodwaters from entering the dam, wall failure and overtopping up to and including a specified flood event based on AEP;
 - c. certified design plans, high risk dams reviewed by DERM technical experts;
 - d. having a marked "mandatory reporting level" above which DERM must be notified immediately, and actions put in place to prevent or minimise environmental harm;
 - e. ensuring that dams are inspected by a suitably qualified and experienced person;
 - f. undertaking reviews annually about the effectiveness of the dam during the preceding wet season and modifying the water management system accordingly;
 - g. monitoring of water quality within the dam prior to the wet season;
 - h. maintaining a register of dams and relevant information.
6. Arrow Energy (as CH4 Pty Ltd) holds a number of petroleum tenements in the Moranbah area for extraction and processing of coal seam gas (CSG). Arrow undertakes these activities under EA PEN100015907 (**ASB-MCSG01-01**).
 7. The site is located about 2.5 km from the Moranbah township and is divided by the Isaac River which flows through it.
 8. The EA in place at the time allowed for the release of reverse osmosis (RO) treated CSG water to Isaac River subject to limits on quality and the available flow in the river.
 9. Arrow did not have an operating RO plant or other required infrastructure to conduct releases, as allowed by its EA at this time.
 10. Prior to the 2010/2011 wet season a total of 10 operating dams were present on PL191 and PL196.
 11. Dams 1, 2 and 10 were the major dams providing approximately 90% of the total storage capacity for CSG water.
 12. Other much smaller dams were used for moving water between groups of remote wells and the major dams. Dam 3 was mainly used for brine storage.
 13. Dam 11, a major part of Arrow's future water management plans, was being constructed at the time and was not capable of having water stored in it or transferred to it during the 2010/2011 wet season.
 14. The construction of dam 11 was delayed by rains in October and November 2010, which prevented it from being completed as scheduled during 2010.
 15. DERM did not undertake a pre wet season compliance inspection of this site. As detailed below DERM was already dealing with Arrow Energy in regards to

water management concerns at the Moranbah site prior to the wet season.

Item 2: the water management sections of the environmental authority applicable at the mine during the 2010/2011 wet season, including:

- a) **Any concerns held by him or the Department of Environment and Resource Management (DERM) regarding its terms and the ability of the mine operator to comply with it**
 - b) **Any terms that the mine operator has indicated it is unable to comply with, or breached**
 - c) **Any terms that had to be amended from the Fitzroy model conditions because the model terms were unsuitable for this mine site**
 - d) **Any terms that he or DERM consider do not adequately promote environmental protection and dam safety**
- a) **Any concerns held by him or the Department of Environment and Resource Management (DERM) regarding its terms and the ability of the mine operator to comply with it**
16. Under its EA Arrow were required to notify DERM and take actions to prevent dams exceeding the DSA or if unable to prevent, to minimise any actual or potential environmental harm caused by the dam exceeding its DSA.
17. On 26 October 2010 Arrow wrote to DERM (**ASB-MCSG02-01**) advising it had exceeded the DSA in dam 1 due to recent rainfall. Arrow advised that it had taken actions to ensure that net evaporation was higher than net inputs by reducing the production of gas and water from wells. No discharge occurred or was threatened by dam 1 exceeding its DSA.
18. On 27 October 2010 DERM emailed Arrow (**ASB-MCSG02-02**) seeking information, including information about distances to sensitive receptors from the Dam.
19. On 29 October 2010 Arrow wrote to DERM (**ASB-MCSG02-03**) advising they were in the process of transferring water to other storages at the site and that they would be within DSA in a week. In regards to water management conditions Arrow had not breached its EA at this time.
20. On 20 November 2010 Arrow wrote to DERM (**ASB-MCSG02-04**) advising that following additional recent rainfall the DSA for several dams was now exceeded. Arrow advised that it would not have sufficient storage in the event of heavy or prolonged rainfall over the wet season. No issues relating to the structural integrity of any dams was raised. No discharge occurred or was threatened by the dams exceeding DSA's.
21. On 24 November 2010 DERM wrote to Arrow (**ASB-MCSG02-05**) warning them to take all reasonable and practicable measures to ensure compliance with its EA. DERM also sought additional information about water management

measures at the site to assist in quantifying potential risks should discharges or overtopping events occur at a later date.

b) Any terms that the mine operator has indicated it is unable to comply with, or breached.

22. On 3 December 2010 Arrow submitted a program notice (**ASB-MCSG02-06**) outlining water management concerns at the Moranbah site and stating that if forecast heavy rain occurred a discharge might be required from dams on site to prevent overtopping. No discharge had occurred, however Arrow advised DERM of the potential for discharges to occur. Arrow did not specify any concerns with the structural integrity of any dams on site.
23. Arrow stated that until dam 11 was completed they would not have sufficient water storage to manage water at the site, without a discharge. Arrow advised it would apply for a TEP for an authorised discharge over the wet season.
24. A meeting was scheduled for 14 December with Arrow, DERM and Queensland Health to discuss Arrows water management and the potential that Arrow would apply for a TEP to release CSG water to the Isaac River.
25. On 13 December 2010 Arrow advised DERM via phone that they had received significant rainfall, that some dams were approaching MRL and that they had formed a view that pond 2 was in danger of suffering structural failure, which would lead to the overland flow of CSG water.
26. Arrow further advised they would commence releasing CSG water via a pipe over the wall of pond 2, due to the concerns about the possible structural failure of pond 2.
27. Arrow was unable to provide any engineering advice in regards to the concerns held. DERM was not aware of any concerns detected during the annual inspection of Arrow's dams in October 2010.
28. Between 13 and 14 December 2010 Arrow released 2.6ML of CSG water in breach of the conditions of its EA (**ASB-MCSG02-07**). At the time of the releases Arrow were not able to provide a full suite of analysis to demonstrate the water quality being released.
29. On 20 December after further rain at the site Arrow commenced releasing CSG water to keep levels within pond 2 at levels its engineers advised was safe and to prevent other dams overtopping. This release continued until 6 January 2011 During this period Arrow released 34ML of CSG water in breach of the conditions of its EA (**ASB-MCSG02-09**).

c) Any terms that had to be amended from the Fitzroy model conditions because the model terms were unsuitable for this mine site.

30. Site specific conditions were in place at Arrow's site. The Fitzroy model conditions were developed for use in coal mines in the Fitzroy Basin and are therefore not applicable to this site.
- d) Any terms that he or DERM consider do not adequately promote environmental protection and dam safety.**
31. To the best of my knowledge the Arrow EA does not contain terms that do not adequately promote environmental protection and dam safety.
32. At the time of the 2010/2011 wet season Arrow's water storage on site was not sufficient. Arrow has since completed dam 11, which provides an additional 400ML storage. If Dam 11 had of been constructed prior to the wet season it would have prevented Arrow from discharging.
33. In July 2011 Arrow submitted its Coal Seam Water Management Plan (**ASB-MCSG02-08**) which outlines its water management at the Moranbah site.
34. DERM has assessed this plan and requested further details from Arrow relating to a number of issues. The information is due to be submitted by 30 September 2011 **ASB-MCSG02-10**.

Item 3: any transitional environmental program (TEP) issued or refused or any emergency direction (ED) given or considered regarding either mine during the period 1 October 2010 to 30 July 2011 related to water management, and for each, the following:

- a) **Information received from the mine operator**
 - b) **Any relevant dam safety issues**
 - c) **Relevant correspondence with the mine operator and other stakeholders**
 - d) **Whether and, if so, how DERM consulted with stakeholders**
 - e) **What considerations DERM took into account in making the decision**
 - f) **Whether, and if so, how DERM balanced environmental considerations and economic consequences of mines being non-operational**
 - g) **Whether, and if so how, DERM took account of downstream effects, including cumulative effects**
 - h) **The terms of the TEP issued or ED given**
 - i) **What actions were taken by DERM to advise emergency management personnel, including local and regional disaster management groups and local residents downstream of the dam about the TEP and any discharges or effects**
 - j) **Reasons for the decision given to the mine operator**
 - k) **Any breaches of the TEP or ED by the mine operator and DERM's response**
- a) **Information received from the mine operator**

35. On 23 December 2010 Arrow submitted a TEP for assessment by DERM (**ASB-MCSG03-01**).
36. On 24 December 2010 Arrow submitted an engineering assessment of pond 2 in support of its TEP application (**ASB-MCSG03-02**).
37. On 31 December 2010 Arrow provided an amended TEP for assessment, in response to questions from DERM and QLD Health (**ASB-MCSG03-03**).
38. A further amended TEP with the required water quality information was submitted on 4 February 2011 and was approved on 4 February 2011 (**ASB-MCSG03-04**).
39. A notice approving the TEP was provided to Arrow with the approved TEP. (**ASB-MCSG03-05**).
40. On 4 April 2011 DERM extended the time for allowing a discharge under the TEP to 31 March to 13 May 2011. No other aspects of the TEP were amended and the TEP's final completion date for reporting did not change. (**ASB-MCSG03-06**).
41. On 6 June 2011 Arrow submitted a final report on the TEP (**ASB-MCSG03-09**).

b) Any relevant dam safety issues

42. As stated above, Arrow advised DERM on 13 December 2010 that it had formed a view that pond 2 was in danger of suffering structural failure, which would lead to the overland flow of CSG water. On 24 December 2010 Arrow submitted an engineering assessment of pond 2 in support of its TEP application (**ASB-MCSG03-02**).
43. The engineers report recommended that pond 2 be kept at a level 4m below its DSA.
44. Arrow's Coal Seam Gas Water Management Plan (**ASB-MCSG02-08**) submitted to DERM in July 2011 states that pond 2 is now active.

c) Relevant correspondence with the mine operator and other stakeholders

45. There was a significant level of correspondence with many mines in relation to TEPs assessed as a result of the 10/11 wet season within the dates specified. This correspondence is held in a number of regional offices and in the email accounts of a significant number of DERM staff. It is estimated that there are several thousand correspondence items across all mines within this period of time and, as such, DERM was unable to search all the potential sources of correspondence within the timeframe allowed for submission of this statement. I was not comfortable with attaching correspondence items to this statement at this time due to the potential for errors, omissions or inaccuracies due to the high number of documents that would need to be searched in a short period of time. If the Commission wishes copies of particular items of correspondence then I am more

than willing to provide these if requested. Additionally, if the Commission wishes copies of all correspondence these can be provided if time is allowed.

46. QLD Health were liaised directly with and involved in meetings and provided advice on appropriate water quality for any release approved under the TEP. **(ASB-MCSG03-07 and ASB-MCSG03-08).**
47. The Mayors of the relevant local governments was spoken with personally at the time of discharges.

d) Whether and, if so, how DERM consulted with stakeholders

48. DERM liaised with QLD Health and sought its advice in regards to water quality of discharges that occurred and the final TEP approved. QLD Health Officers attended meetings with DERM and Arrow in regards to the releases at the site.
49. DERM verbally advised the Mayor's of both Isaac and Fitzroy Regional Council's of all discharges conducted by Arrow and of the final approved TEP.
50. DERM contacted landholders immediately downstream of the Arrow site and advised them of all discharges conducted by Arrow and of the final approved TEP.
51. DERM also consulted with the Fitzroy Water Quality Advisory Group (FWQAG) on three occasions during the dates specified. This consultation was in broad terms in context of all mine discharges that were occurring during the wet season and formed part of the agenda at meetings of the FWQAG held in Rockhampton on 16 December 2010, 4 February 2011 and 7 April 2011.
52. The FWQAG is made up of a number of stakeholders including the mining industry, community groups, conservation groups, local government and DERM. One of the key roles of the group is to provide advice to State Government agencies relating to water quality management in the Fitzroy River Basin.

e) What considerations DERM took into account in making the decision

53. Transitional environmental programs (TEPs) are specific programs that, when complied with, achieve compliance with the Environmental Protection Act 1994 (EP Act) for an activity by reducing environmental harm, detailing the transition of the activity to an environmental standard or detailing the transition of the activity to comply with a condition of a development approval, an environmental authority or code of environmental compliance. The requirements for TEPs and the process for assessing and approving them is set out in chapter 7, part 3 of the EP Act **(ASB-M03-e00a).**
54. Draft TEPs may be submitted voluntarily by a mine operator, or DERM may require an operator to submit a draft TEP if it is satisfied that an activity or proposed activity is or may cause unlawful environmental harm. In either case, the draft TEP is prepared by the operator. DERM's role is to assess the draft TEP

against the requirements of the EP Act and either approve the TEP, approve the TEP with conditions, or refuse to approve the TEP.

55. Section 338 of the EP Act (**ASB-M03-e00b**) provides the framework for considerations that the administering authority must make in deciding whether to approve or refuse a draft TEP or the conditions (if any) of the approval. In making its decision it:
- must comply with any relevant regulatory requirement and
 - subject to the above, must also consider the following:
 - the standard criteria
 - additional information given in relation to the draft TEP and
 - the views expressed at a conference held in relation to the draft TEP.
56. DERM has produced guidance material to support regional officers and delegated decision makers in assessing draft TEPs. A two part procedural guide; Part 1- Notice requiring a draft TEP (**ASB-M03-e01**) and Part 2-Considering and making a decision about a draft TEP (**ASB-M03-e02**) is attached. Supplementing the guidelines are two correlating assessment report templates Part 1 Assessment Report (**ASB-M03-e03**) to assist officers to record the information considered by DERM when deciding to issue a notice requiring a TEP and Part 2 – Assessment Report (**ASB-M03-e04**) to assist users to evaluate the content of a draft TEP and make a decision to either approve (with or without conditions) or refuse a draft TEP. Prior to the procedural guides and assessment reports coming into effect, a draft Administrative Practice Note (**ASB-E03-e04a**) and a Request for Statutory Approval template (**ASB-E03-e04b**) was utilised by regional officers to assist with the TEP assessment process.
57. In the case of the Arrow discharge and TEP, DERM considered a number of issues such as:
- The potential for uncontrolled discharges and associated environmental harm, should dams overtop and discharge undiluted CSG water, if Arrow were instructed to cease unapproved releases or if the TEP was not approved;
 - Discharges of up to 7.5ML/day CSG water with EC of up to 13000uS/cm into the Isaac River;
 - The base flood levels of the Isaac River before discharge would be allowed and the levels of dilution (more than 1:400) that would be achieved during any discharge;
 - The background water quality parameters in the Isaac River being mindful of the DRAFT environmental values and water quality objectives for the river;
 - Water users located downstream of the site;
 - The economic impacts to Arrow of shutting further wells to further reduce the production of water at the site; and
 - Advice from QLD Health on appropriate water quality information to be obtained.

f) Whether, and if so, how DERM balanced environmental considerations and economic consequences of mines being non-operational

58. The EP Act and subordinate legislation governs the responsibilities of DERM in the environmental regulation of mining activities in Queensland. The objective of the EP Act is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. This is referred to as ecologically sustainable development (ESD). Accordingly, DERM is required to balance environmental, economic, social and equity considerations when making decisions.
59. When making any decision under the EP Act, including whether to approve a draft TEP, DERM must consider the "Standard Criteria" (**ASB-M03-f01**) as specified in Schedule 4 of the EP Act. The standard criteria specifically require environmental and economic considerations to be balanced and considered. Part 2- Considering and making a decision about a draft TEP procedural guide (**ASB-M03-e02**) provides further guidance on some of the principles on evaluating ESD. In addition further direction is provided on other considerations of the standard criteria, relevantly the financial implications for an applicant in complying with a TEP (and any conditions that may have been imposed) and the character, resilience and values of the receiving environment.
60. Furthermore, part 2 and 3 of the Environmental Protection Regulation 2008 (EP Reg) (**ASB-M03-f02**) stipulate requirements for all environmental management decisions and additional regulatory considerations with respect to imposing conditions relating to a wide ambit of environmental and economic considerations including but not limited to monitoring, and releases to waters or land. Decisions must also consider any relevant Environmental Protection Policies (EPP) such as the Environmental Protection (Water) Policy 2009 which sets out to achieve the objective of the EP Act with respect to Queensland waters. It does this by identifying environmental values and management goals and providing a framework for making consistent, equitable and informed decisions about Queensland waters.
61. In its TEP application Arrow advised DERM that in an effort to manage water storage constraints, it had shut in a large number of wells, targeting the wells with high water to gas ratios to minimise the production of coal seam water associated with operations.
62. Arrow also advised that whilst shutting in some high water producing wells had reduced coal seam water production, shutting in further wells would yield limited benefits in terms of water reduction but would cause significant reduction in gas output.
63. While the economic impacts of requiring Arrow to shut in further wells was considered in granting a TEP, the actual conditioning of the TEP primarily related to managing risks to the environment by ensuring the discharge occurred in a controlled manner, with a minimum base flow and dilution in place.

g) Whether, and if so how, DERM took account of downstream effects, including cumulative effects

64. Within DERM internal advice was sought from the Aquatic Ecosystem Risk & Decision Support unit, who provided site specific advice in regards to appropriate release limits and dilution levels required to minimise impacts in the Isaac River to aquatic values.
65. When assessing the Arrow TEP DERM took into consideration the downstream impacts of the proposed releases to the Isaac River by ensuring the conditions of the TEP required adequate dilution to achieve downstream EC targets. These targets included drinking water quality guidelines and aquatic ecosystem guidelines to ensure the protection of waterholes in the Isaacs River.
66. DERM also took into account releases from other mines into the system along with background water quality parameters to ensure cumulative impacts were minimised and downstream water users were adequately protected. DERM also took these other releases into account to ensure other mines were afforded the opportunity to releases water where required under similar programs.
67. The Arrow TEP was approved with a condition that required them to cease releases if directed to do so by DERM.

h) The terms of the TEP issued or ED given

68. Refer to (a) in item 3 above for terms of TEPs issued.
69. No Emergency Direction was issued to Arrow.

i) What actions were taken by DERM to advise emergency management personnel, including local and regional disaster management groups and local residents downstream of the dam about the TEP and any discharges or effects

70. DERM advised the Mayor's of both Isaac and Fitzroy Regional Council's of all discharges conducted by Arrow and of the final approved TEP.
71. DERM contacted landholders immediately downstream of the Arrow site and advised them of all discharges conducted by Arrow and of the final approved TEP.
72. Given the relatively minor nature of the volume of CSG water released by Arrow (less than 100L/second at the maximum of 7.5ML/day), and the fact that the release was unlikely to cause any significant issues to downstream landholders or the environment, it was not considered necessary to formally notify local and regional disaster management groups or landholders other than those immediately adjacent to the discharge.

j) Reasons for the decision given to the mine operator

73. No reasons were given to Arrow in regards to the final decision to approve the TEP.
74. Arrow was communicated with throughout the TEP negotiations and was advised as to the appropriate level of information requirements required before DERM would approve any TEP to discharge. Arrow were initially unable to provide DERM with appropriate water quality information, due to a range of reasons including wet weather access, laboratory delays and the closure of its Brisbane Office due to the Brisbane River flooding in January 2011.

k) Any breaches of the TEP or ED by the mine operator and DERM's response

75. Arrow did not breach any conditions of its TEP in regards to the water quality discharged, the base flows in the Isaac River required during discharge or the level of dilution required.
76. Arrow did however fail to comply with conditions relating to the submission of water quality monitoring, however this appeared to be as a result of the laboratory used at that time and not a deliberate act on behalf of the company.
77. At no stage was Arrow directed to cease the release under the TEP.

Item 4: the effects on the environment, drinking water quality and public health downstream of each of the mine sites (as far as the Great Barrier Reef Marine Park) as a result of discharges of water under a TEP or ED.

78. The potential effects of releases of water from mine sites are assessed prior to the grant of environmental authorities or transitional environmental programs. In applying to receive approval to discharge to a surface water, applicants must prepare information to support the application which identifies the environmental values, water quality objectives and management intent (that is, the goals to be achieved in terms of meeting water quality objectives and protecting environmental values) of the surface water. This framework is provided in the EPP Water (**ASB-MCSG04-01**). Applications must be able to demonstrate that the management intent for the receiving water will be met despite the discharge occurring.
79. All applications for environmental authorities and TEPs submitted for the approval of discharge to surface waters must be assessed by DERM against the requirements of the EP Act which includes the EPP Water, including an impact assessment to ensure that environmental values of any surface water will be protected. In conducting these regulatory assessments, DERM has developed a number of decision support tools including the guideline "Protecting Environmental Values from CSG Water Discharged to Surface Waters" (2010, **ASB-MCSG04-02**) Conditions for Coal Mines in the Fitzroy Basin – Approach to Discharge Licensing (June 2010) and the Operational Policy "Waste water discharge to Queensland Waters" (2007, **ASB-MCSG04-03**) and associated

procedural information (**ASB-MCSG04-04** and **ASB-MCSG04-05**). DERM has also prepared an “Interim Decision Support Matrix Release of water produced in association with Coal Seam Gas activities to surface waterways” (2010, **ASB-MCSG04-06**) which informs assessments and resultant authority conditions

80. The approach used by DERM throughout the 2010-2011 wet season aimed to be consistent with state/national water quality guidelines e.g. The Queensland Water Quality Guidelines (2006), ANZECC/ARMCANZ Guidelines for Fresh and Marine Water Quality 2000, the Australian Drinking Water Quality Guidelines and the October 2010 released Draft for Consultation – Establishing Environmental Values, Water Quality Guidelines and Water Quality Objectives for Fitzroy Basin Waters. .
81. Controls and limitations are placed on authorities as conditions such as limits upon the volumes discharged, timing of discharge and required dilution and mixing zones for discharges. Conditions also include comprehensive contaminant monitoring programs for discharge quality which is supplemented by detailed receiving environment monitoring programs.
82. Releases of water from a dam at a mine site can be authorised by the conditions of an environmental authority or via specific permission under a transitional environmental program. Regardless of the statutory instrument, for releases of water from a dam at a mine site to be authorised, the assessment procedure described above would apply.
83. The EP Act and the subordinate Environmental Protection (Water) Policy 2009 (EPP Water) provides for drinking water values for Queensland waters. Accordingly, the protection of these values must be demonstrated prior to any authority being granted authorising a contaminant release to surface waters. Conditions of the environmental authority or TEP will provide quality limits and environmental monitoring to ensure that discharge quality is sufficient to protect drinking water values.
84. During the 10/11 wet season, DERM staff liaised with Queensland Health on a regular basis to ensure that any authorised or un-authorised discharges from mine sites were managed to ensure the protection of drinking water quality.
85. TEPs issued during or as a result of the 10/11 wet season also considered the effects of any mine site release on drinking water and were conditioned to ensure that the discharge was managed in such a way as to ensure the protection of drinking water supplies.
86. Arrow conducted monitoring of unapproved discharges prior to TEP approval (referred to in Item 2 part b above) in accordance with either the monitoring requirements of its EA or the monitoring requirements of the draft TEP which it later submitted to DERM.
87. The TEP required that monitoring occur at the discharge point, upstream of the discharge and 500m downstream of the discharge.

88. Arrow were required to monitor daily during release for Electrical conductivity (uS/cm), pH, Turbidity (NTU) and BTEX.
89. Arrow were required to monitor at the commencement of a release and then weekly thereafter for a suite of metal, TPH and Flouride.
90. There is no evidence to suggest that the discharges from Arrow had any environmental impacts upon the Isaac River.

Item 5: details of how the new Fitzroy Model Conditions negotiated during 2011, or any other discussions with DERM, will resolve any issue raised above 1, 2, 3, or 4

91. Arrow have completed dam 11, providing an additional 400ML of storage on the site. Given these changes to water storage, Arrow would not need to discharge if the same wet season events occurred in the future. As mentioned previously, the Fitzroy Model Water Conditions for Coal Mines do not apply to this site.

Item 6: an explanation as to whether the new Fitzroy Model Conditions negotiated during 2011 are advantageous or disadvantageous to the mine operator in the management of water at the mine, the downstream environment and safety issues.

92. The conditions on Arrow's EA are site specific and do not use the new Fitzroy Model conditions.

Item 7: any briefing (written or oral) given to any Minister or Director-General regarding a TEP or ED related to water management or non-compliance with an environmental authority at the mine and the reason for that briefing

93. Incident alerts in regards to the water management situation at the Arrow site were prepared during December 2010 (**ASB-MCSG07-01 and ASB-MCSG07-02**).
94. To the best of my knowledge, there were no further specific written briefings provided to any Minister or Director General in relation to this CSG site. A number of general briefings were provided in relation to mines/CSG activities and the 10/11 wet season and these are attached as items **ASB-D07-03 to ASB-D07-06**. A weekly report on TEPs was provided via email to key departmental and ministerial staff during the time period requested and a copy of the latest report provided prior to 20 July 2011 is attached as item **ASB-D07-07 (A and B)**. It is possible that there were other written briefing material provided during this period but this is the best information DERM staff were able to gather within the timeframe permitted for submission of this statement
95. There were a significant number of oral briefings provided to the Minister for Climate Change and Sustainability and the Director General of DERM in relation

to TEPs during the wet season period of which there are no written records. In general, these were primarily in relation to the mining/CSG industry as a whole and the number of TEPs issued or currently being assessed. Individual mines and CSG sites were discussed at several of these briefings but I am unable to provide an accurate transcript or meeting notes from these briefings.

Item 8: DERM's opinion as to whether the mine operator should be managing water at the Mine other than by storing it in dams or ponds, including by using desalination plants, purification procedures or any other means

96. Arrow's Coal Seam Gas water management plan details its strategy for water management at this site which includes the construction of further dams, the construction and operation of an RO water treatment plant to allow the discharge RO treated CSG water at 2ML/day under its current EA, the beneficial use of CSG water by both industry (coal washing) and agriculture.
97. Arrow is required by both the conditions of its EA and the EP Act to review its water management.
98. Arrow is required under conditions of its EA to develop and implement a water release reduction strategy and to report to DERM annually on progress.
99. In addition to this EA condition Arrow are also required by s316A of the Environmental Protection Act to submit with its annual return an evaluation of the effectiveness of the management of coal seam gas water under the criteria mentioned in section 310D(5)(e) for carrying out each relevant CSG activity.

Item 9: an explanation of that which is involved in managing water at the Mine other than by storing it in dams or ponds, including by using desalination plants, purification Procedures or any other means

100. At the time of the 2010/2011 wet season Arrow primarily relied upon evaporation of CSG water in dams as the main means of disposing of its CSG water. Whilst its EA allowed for a discharge of RO treated CSG water of 2ML/day, Arrow did not have an RO plant at the site and was not able to discharge.
101. Arrow has plans in place to provide a nearby coal mine with up to 500ML/year of CSG water for coal washing.
102. Arrow has commenced the construction of an RO plant to treat and release up to 2ML/day of RO treated CSG water under its EA.
103. As stated in item 8 above, Arrow is required under both its EA and the EP Act to review its management of CSG water on an annual basis.

Item 12: a description of any concerns regarding the potential for pond overtopping at the site between 1 October 2010 and 30 July 2011

104. This is dealt with at item 3 part b above. Arrow advised DERM on 13 December 2010 that it had formed a view that pond 2 was in danger of suffering structural failure, which would lead to the overland flow of CSG water. On Arrow submitted an engineering assessment of pond 2 in support of its TEP application which recommended that pond 2 be kept at a level 4m below its DSA.
105. Older dams at the Arrow site did not have spillways in place and any overtopping of these dams may have put the structures at risk.
106. Arrow did not have sufficient water storage on site for the 2010/2011 wet season as it had not finalised the construction of dam 11, which provided an additional 400ML of storage.
107. Dam 11 is now constructed and fully operational.

Item 13: an explanation of how the risks to the environment, drinking water quality and public health posed by the discharge of water from coal seam gas operations are different to those risks posed by the discharge of water from coal, gold or copper mining

108. The process of extracting coal seam gas requires dewatering of the coal seam and as a result, large quantity of CSG water is generated, with the typical contaminant of concern being salts. The rate of generation of water and its quality depends on the location of the wells.
109. Salt was the limiting contaminant for Arrow's discharge, with CSG water on site being discharged at an electrical conductivity below 13 000 uS/cm.
110. The main difference between Arrows discharge and that of coal mines in the catchment, was that coal mines in general discharged large volumes (several hundred to several thousand megalitres) of mine affected water with an electrical conductivity generally ranging between 1200 to 4000 uS/cm.
111. In contrast Arrow discharged relatively small volumes (less than 60ML from December 2010 to March 2011) of CSG water at conductivities approaching 13000 uS/cm
112. A discharge from a copper or gold mine would typically be limited by the presence of heavy metals and not salt.

Item 14: an explanation of how the process of DERM assessing and deciding whether to grant a TEP is different for coal seam gas projects as compared to mines

113. Whilst the exact same assessment process would be followed for a coal seam gas release compared to one proposed for a coal, gold or copper mine, different site

specific and process specific considerations would be considered.

Item 15: an explanation of how consideration taken into account by DERM in assessing and deciding whether to grant TEP or ED is different for coal seam gas projects as compared to mines

114. As stated in item 14 above the exact same assessment process would be followed for a coal seam gas release compared to one proposed for a coal, gold or copper mine, however different site specific and process specific considerations would be considered.

115. These considerations would include the differences in the key limiting contaminants (electrical conductivity for coal and CSG discharge; heavy metals for gold or copper) and the impacts of those contaminants in the receiving environment.

I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the *Oaths Act 1867*.

Signed . [REDACTED]
Andrew Stuart Brier

Taken and declared before me, at Toowoomba this 3rd day of October 2011

[REDACTED]
Solicitor/Barrister/Justice of the
Peace/Commissioner for Declarations



[REDACTED]
JP (Qual)