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Dear Members of the Gloucester Community Consultative Committee,

The Independent Peer Review (IPR) Report prepared by Dr Richard Evans and recently released to the Gloucester Community Consultative Committee (GCCC) and community is welcomed by AGL as an important milestone in moving forward with this important CSG development at Gloucester.

AGL is pleased to provide a response to Dr Evans' IPR of the Phase 1 and Phase 2 reports investigating groundwater and surface water conditions within the Stage 1 Gas Field Development Area in Gloucester.

We have found Dr Evans' recommendations helpful in refining our future water study program, and concur with many of his insights. We sincerely thank Dr Evans for his contributions.

This is a very comprehensive review of the groundwater studies that have been completed to date for the project. Dr Evans' analysis has reassured AGL that this work is thorough and with some additional site investigations and data collation and analysis, we can proceed with confidence into the next phase of investigations (groundwater modelling).

The nature of scientific investigations such as these groundwater studies is that they are always incremental. Such studies build on the earlier results, interpretations and conclusions to further our knowledge and understanding. This peer review will help guide the further investigations required for this project.

There are 24 recommendations for further technical work in Dr Evans' IPR. Grouping these recommendations there are five that refer to further site investigations, five that relate to surface water hydrology, six that relate to further hydrogeological interpretation, and four that relate to the next phase of numerical modelling. Many of these studies were under way or were planned prior to the final IPR report being released. There are four recommendations that are not related to the regional groundwater investigations and these will be addressed by other AGL work programs at a later date.

Dr Evans' IPR report has provided AGL with an independent perspective (building on the advice received from Parsons Brinckerhoff). The high priority studies are mostly underway or planned for 2012/2013 (for example fault studies, installation of vibrating wire piezometers (VWP) into deeper coal seams, and more external investigation drilling).

Dr Evans has discussed the importance of the Waukivory Flow Testing program at Forbesdale and that this high priority work should proceed.

What follows in this AGL response is an assessment of each recommendation from Dr Evans as he has laid out in Section 7 (pgs 45-49) of his IPR.

Responses to High Priority field work recommendations:

Recommendation #1

AGL Response

AGL's response is in two parts to address the two parts of this IPR recommendation:

i. The Tiedman fault study is under way and all of the IPR suggestions are noted. The actual scope of this study is quite broad and captures these suggestions plus includes more activities. The Tiedman's fault study will look at leakage between undisturbed rock layers and leakage/flow in the adjacent fault zone. It is part of AGL's 2011/12 work program.

ii. AGL has evaluated the information that could be gathered from and the logistics to install the recommended monitoring bore very close to this proposed gas well at Waukivory. Such a deep monitoring bore could only be installed after the gas well is completed, and the logistics of drilling such a bore need to be closely examined before any decision to proceed.

The Waukivory pilot (from a water management perspective) will focus on the characteristics of the thrust fault zone and provide additional groundwater flow and permeability data. It is worthwhile noting that another monitoring bore into the interburden rocks at this location would not add to the knowledge about the potential water migration along faults. The value of an additional monitoring bore at this site is still being evaluated.

AGL notes the strong agreement that the Waukivory flow testing program should proceed as soon as possible so that further data can be collected to continue to build our understanding of the area.

Recommendation #2

AGL Response

AGL agrees with this recommendation and will schedule the stream gauge rating work accordingly. We anticipate this work will be completed during 2012/13.

Recommendation #3

AGL Response

AGL agrees with this recommendation and will investigate locations north of our Stage 1 area towards Gloucester. Provided a suitable site can be located on private or public lands, AGL anticipates this work will commence during 2012/13.

Recommendation #4

AGL Response

AGL agrees with the recommendation and will scope the requirements and schedule the field work to occur during 2012/13. We note that the proposed property surveys (Rec #11) may also assist in further defining the effect of these tributary water flows across the interburden rocks and coal seam subcrops and associated recharge areas.

Recommendation #5

AGL Response

As noted in the recommendation, AGL has already scheduled two deep VWPs to be installed in a new corehole. AGL is awaiting regulatory approval of this work plan (the REF was submitted to DTIRIS in November 2011). The deeper coal seams are to be targeted. We anticipate this work will be completed during 2012/13.

Recommendation #6

AGL Response

A nested gas monitoring bore is already in place in the Roseville Coal Seam sub-crop area. AGL accepts that additional gas monitoring sites further east would be useful to target and monitor gas emissions from deeper coal seams in this sub crop area.

This work however is not required for the sub-regional groundwater program and hence is not scheduled at this time. It will be undertaken at the appropriate time.

Recommendation #7

AGL Response

AGL's Part 3A approval includes the requirement to plug and abandon older exploration wells prior to construction. This practice is already in place for AGL's exploration wells. This work is not required for the sub-regional groundwater program and hence is not scheduled as part of AGL's groundwater investigation/monitoring programs. It will be undertaken at the appropriate time in compliance with the requirements of relevant statutory approvals.

Responses to Moderate Priority field work recommendations:

Recommendation #8

AGL Response

AGL agrees that the sources of baseflow into the Avon River be further assessed, and we will work with our external consultants to develop a scope for this new study. We anticipate this work will be completed during 2012/13.

Recommendation #9

AGL Response

TMB04 and TMB05 are seepage monitoring locations monitoring soil water above the regional water table and do not contribute to our broader sub-regional groundwater investigations. AGL's regular dam inspections and current groundwater monitoring program will evaluate the future need to install water level data loggers, but it is outside of the scope of the main groundwater program. Work is not scheduled at this time. It will be undertaken if additional water level monitoring is required at these locations.

This work, which is covered by other AGL risk management processes, is outside of the scope of the sub-regional groundwater program and hence is not scheduled as part of its program at this time.

Recommendation #10

AGL Response

As stated in the recommendation, AGL will be decommissioning the Stratford holding dams shortly, rendering this recommendation unnecessary.

Recommendation #11

Response

Planning for this work has been in place for some time. Surveys and water level dips will be completed as part of the property survey work program scheduled for the Stage 1 GFDA during 2012/13.

Recommendation #12

Response

This work will occur as part of the property survey work program. However AGL first intends to identify possible permanent spring areas, possibly as nominated by the community. All identified springs will be assessed and their hydrological characteristics noted.

Responses to High Priority desk-based study / analysis recommendations:

Recommendations #13

AGL Response

Conceptual models will be kept updated as further information is obtained from current fault studies. Further field investigations will be considered based on the findings of these studies, although AGL will also consider a risk assessment approach. Relevant information learned from geophysical mapping will be incorporated, such as the seismic program results. We anticipate this work will commence during 2012/13 and possibly be ongoing into 2013/14.

Recommendation #14

AGL Response

AGL agrees that inclusion of major faults would improve the conceptual model. AGL will revise the conceptual model to include the faults once the studies are complete and, if fault study conclusions warrant, also include these features into the numerical model. This is part of AGL's planned work program for 2012/13.

Recommendation #15

AGL Response

AGL agrees that the numerical model boundaries need to be defined for the model. Work is already scheduled and is part of AGL's planned work program for 2012/13.

Recommendation #16

AGL Response

AGL believes it was premature to include a preliminary water balance into the Phase 2 program report on site characteristics. However, we agree that a preliminary water balance is crucial for the next phase being numerical modelling. Work is scheduled and is part of AGL's planned work program for 2012/13.

Recommendation #17

AGL Response

AGL agrees with this recommendation to improve the spatial coverage across the Stage 1 area and will compile the required data sets to incorporate results into the conceptual model and numerical model for the basin. AGL will incorporate data supplied by Gloucester Resources and Gloucester Coal under data sharing agreements, and the NSW Office of Water public database on water supply bores/wells. Work was always to be completed as part of the initial numerical modelling and is scheduled as part of AGL's planned work program for 2012/13.

Recommendation #18

AGL Response

AGL agrees with these recommendations and will undertake additional analysis of hydraulic conductivity data for the numerical modelling study. Work was always to be completed as part of the initial numerical modelling and is scheduled as part of AGL's planned work program for 2012/13.

Recommendation #19

AGL Response

AGL agrees with this recommendation and will incorporate any additional hydraulic conductivity data into the numerical model. Work was always to be completed as part of the initial numerical modelling and is scheduled as part of AGL's planned work program for 2012/13.

Recommendation #20

AGL Response

AGL agrees with the baseflow separation of the data from the Avon River Gauge. There are no additional gauges along the Avon River catchment downstream and the further downstream gauges involve tributaries with different geology, soils and baseflow characteristics so further assessment of other gauging stations is not planned. Analysis of the Avon River at Waukivory Gauge is planned for 2012/13.

Recommendation #21

AGL Response

AGL agrees with a baseline separation analysis on completion of gauging and determining a ratings table for one of the Tiedman's gauges. Work is planned for 2012/13.

Recommendation#22

AGL Response

AGL agrees with the recommendation and will update the conceptual model and consolidate it into one report. Work is planned for late 2012/13 or 2013/14.

Responses to Moderate Priority desk-based study / analysis recommendations:

Recommendation #23

AGL Response

Barometric effects are being filtered out of the monitoring bore traces, and the revised data and assessment will be included in the mid-2012 Groundwater Monitoring Report.

Recommendation #24

AGL Response

AGL will prepare a new conceptual report that will include the older information from SRK, 2010.

AGL acknowledges the value of the community-selected expert's input into our study. It is noted that "the review has not identified any issues which necessarily indicate the project represents a high or unacceptable risk from a hydrogeological perspective". However AGL agrees that the additional studies recommended by Dr Evans and committed to by AGL are important so that the proposed numerical modeling can be a robust and reliable assessment of long-term impacts. .

Yours sincerely,

John Ross

Manager Hydrogeology