

# MEETING MINUTES

## Narrabri Gas Project (NGP)

### Water Technical Advisory Group (WTAG)

#### DATE / TIME

Thursday 15<sup>th</sup> September  
9:30am

#### LOCATION

Teams meeting / Shop Front Conference Room

#### FACILITATOR

Garry West

#### MINUTE TAKER

Lyn Firth

#### ATTENDEES

- ◆ Garry West (Independent Chair)
- ◆ Cate Barrett (DPE)
- ◆ Fabienne d’Hautefeuille (DPE)
- ◆ David Gornall (Santos)
- ◆ Todd Dunn (Santos)

- ◆ Edward Trindall (Narrabri LALC)
- ◆ Randall Cox (Independent Expert)
- ◆ Mike Williams (Independent Expert)
- ◆ Phil Jones (DPE) (Teams)
- ◆ Wayne Jones (DPE) (Teams)

#### GUESTS

- ◆ Keith Phillipson (AGE)
- ◆ Servaes van der Meulen (Onward) (Teams)

#### APOLOGIES

- ◆ Annie Moody (Santos)
- ◆ Conrad Bolton (Local groundwater user)
- ◆ Jack Warnock (Local groundwater user)

### Discussions

NO.	DISCUSSIONS
1. Welcome  Declaration of Interest  Recording of Minutes  Confirmation of Minutes/actions	Chair welcomed and thanked all members for their attendance and acknowledged Gomeri country on which the meeting was held as well as Elders past, present and future and all Aboriginal persons present.  The Chair asked if there were any new declarations of interest. Nil.  The chair asked member if there was any objection to the recording of the minutes for secretarial purposes with the minute’s audio being deleted once the minutes were final and approved. There was no objection.  Minutes of last meeting circulated and uploaded to the website. Actions update listed in actions table.
2. Correspondence	Nil
3. Presentations	See attached slide presentations.

<p><b>Santos Corporate Update</b>          Todd Dunn</p>	<ul style="list-style-type: none"> <li>• Half yearly results are a reflection of current commodity prices. There has been an increase in profits for the first half of the year, also in part because Oil Search merger.</li> <li>• Santos has announced a final investment decision to proceed with the Pika project (in Alaska).</li> <li>• The Hunter Gas Pipeline acquisition was announced in August. This is an approved underground pipeline from Wallumbilla to Hexham.</li> <li>• It is a phased project – 1<sup>st</sup> phase is Narrabri to Hexham to meet the domestic market demand.</li> <li>• Construction to commence in early 2024.</li> <li>• As part of the engineering design, Santos will assess the requirements to transport hydrogen with consideration for the existing pipeline network and future customer demand as sit evolves during the energy transition.</li> <li>• In order to transport hydrogen, a modification to the existing approval would be required.</li> <li>• One of the key factors in the immediate future is engagement and consultation with the landowners affected by the route.</li> <li>• There are seven community meeting organised for next week.</li> <li>• There is an interactive map on the website.</li> <li>• This project does not fall under the Narrabri Gas Project scope.</li> </ul> <p>Randall – Is it a new thing to have the design suitable for hydrogen?          Todd – No – our industry is moving in that direction. As a business, we have committed to net-zero by 2040 so we have to have a way forward to meet this goal. It does come at a cost, but it is about engineering design and being able to meet future requirements. A modification to the existing approval would be required in order for the pipeline to transport hydrogen.</p> <ul style="list-style-type: none"> <li>• Progress on the Narrabri Gas Project appraisal phase: Santos is focussed on the preparation and approval of the 26 plans and sub-plans progressing through the various stages of the consultation and approval process. No appraisal drilling can be done until this stage is completed. We are expecting that drilling can commence in Q4 2022.</li> <li>• We need 12 months of data from getting wells on line before the final investment decision can be made.</li> <li>• At a time when the ACCC is forecasting domestic gas shortfalls, the Narrabri project will inject new supply into southern domestic markets and put downward pressure on gas prices for NSW businesses, manufacturers and families.</li> </ul>
<p><b>Groundwater Model Development Prior to Phase 2</b>          Keith Phillipson</p>	<p>Dave Gornall introduced the next presentation emphasising the importance of having the groundwater modelling process in place before the commencement of drilling. Santos is wanting to commence Phase 2 as soon as possible. He acknowledged the important role that the WTAG group has in the process developing a model.</p> <p>See attached slide presentation.</p> <p>Condition B39 is the main driver of this work.</p> <p>Dave invited feedback into the proposed process of groundwater model improvement prior to commencement of Phase 2 of the NGP.</p> <p>Timelines were presented.</p> <p>Proposed workshops:          1<sup>st</sup> one at the end of the conceptualisation – for everyone here plus potentially CSIRO who are feeding into the knowledge base          2<sup>nd</sup> workshop at the end of stage 4 once there is data for the conceptualisation model</p>

Comment - Michael – This is a technical group but there are other players who will have concerns. How will that fit it? Their needs will need to be addressed if this model is to be used.

Fabienne – how are you going to incorporate the data gathering during Phase1 appraisal in this model for Phase 2?

Dave - Comes down to the field data collation activities. Production won't start until the middle of next year, but I guess it can still feed into our conceptual model update in Stage 4. If there is data that is useful, it will get pulled into stage 4 conceptual model update and model objectives review.

Comment - Cate: The timing seems ambitious. There are third party reviews required.

Fabienne: In Stage 1, DPE Water needs a face-to-face consultation meeting with Santos where they can focus on details. DPE Planning may want to be there too, but it is important that DPE Water can have this technical discussion with you. Can this be organised?

Dave: Santos will have to consult with the advisory group, and potentially other stakeholders such as DPE explicitly, and the report will be the basis of what we are proposing at that stage. Perhaps those meetings you are talking about could be held in parallel and if something comes out of the DPE water consultation, we can bring it back to the WTAG at that point.

*Discussion - about the importance of understanding what the model objectives are. Do the model objectives cover everything that needs to be done? This will affect what other work needs to be done to meet those objectives. It is important to have this discussion earlier rather than later and check that there are no gaps in the model objectives at the beginning of the process and that everybody agrees.*

**Modelling Objectives – slide**  
Stage 1

Dave – We can have an early workshop about model objectives. To agree what model class criteria we realistically expect to move from class 2 to class 3. It could come about sooner given that the conceptualisation work will require time to pull it all together in a comprehensive way.

Based on this feedback and discussion, we can split the modelling objectives workshop/report stage out from the model conceptualisation workshop/report stage. That would occur prior to undertaking a review of new research and providing an analysis of the structural geology.

Stage 2

*Discussion – about the use of NMR and its use in permeability profiling. The process means that there is a distribution of permeability values for each model cell based on the lithology of bore holes in or near the model cell rather than average data. This increases the confidence that the regulator has in the data and in the value of the model.*

Stage 3 – updating the geological model and getting more detail on the key formations

Q. So any hint of Xray or size assessment?

A. (Keith) We take the bore hole information and then use geological modelling to develop...

Q. (Cate) How do you decide what permeability values to use?

A. (Dave) What you end up with is an envelope right across the distribution for the purpose of determining impacts you assume something at the higher end, conservatively

<p>DPE Water's comments Presented by Fabienne d'Hautefeuille</p>	<p>we will take one of the more permeable realisations and will run that that through the model and even at upper end, what does that result look like.          In terms of determining potential impact, we will err on the side of caution and select the values at the end of the distribution range that will tend to overestimate impacts.          Todd: This will continue to evolve over the life of the project as we get more data consistent with the conditions of consent.</p> <p><i>Discussion – further discussions on permeability.</i></p> <p>Stage 4 – Reviewing and updating the conceptual model and model objectives and using all the information gathered through Stages 1, 2 and 3.</p> <p>Stage 5 – Undertake the groundwater modelling for Phases 2 and 3 in accordance with the model objectives, project Conditions of Consent and the Groundwater Management Plan.</p> <p>Timing deadlines – discussion followed concerning model objectives.</p> <p>Dave: Which model class 3 criteria can realistically be met prior to Phase 2? Some of the criteria are difficult to meet. Modelling guidelines and the class 3 criteria – which ones are we going to be move up to a class 3 prior to Phase 2. Everyone needs to have the same the expectation. There needs to be further consultations with DPE and DPE Water on model objectives.</p> <p>Michael: When considering the impacts, the model(s) need to consider what is happening with the overlying GAB and alluvium in terms of the change in volumetric exchange. The current approach will provide some of that information but will not address the above exchange satisfactorily, so how the knowledge gaps will be addressed needs to be considered. For water management purposes, the NSW government has a numerical model for the Lower Namoi alluvium that takes account of the dynamic change of water exchange with the GAB. Whereas they currently only have a statistical model for the GAB in this area. When setting the model objectives, the matter of who and how impacts on the units overlying the GAB need to be addressed.</p> <p>Dave: Yes agreed. This is a good example of why it is important to establish modelling objectives early on. To agree what the groundwater model is expected to do.</p> <p>Discussion followed.</p> <p>Refer to attached Slides</p> <p>Two aspects that DPE Water is commenting on:          1. The Groundwater Management Plan which supports the management of impact of Phase 1.          2. The data gathering and modelling plan which supports readiness and suitability for Phase 2 groundwater management plan.</p> <p>Phase 1 nominated groundwater production take response triggers – refer to slide.</p> <p>Fabienne: Stage 1 was designed for a larger appraisal program, and it has been reduced. By using the model prediction for 25 wells and only having 11, Santos is not testing whether the model will detect any impact. DPE didn't have this input in the presented documents.</p> <p>Dave: We have set triggers for the volume of produced water from the coals seams assuming 25 wells being pumped. We propose to pump 25 wells as the existing wells approved under SSD consents transition under the NGP consent.</p> <p>However, we do need to address what happens operationally if in a given year, we do not have 100% operation across the wells for unplanned reasons. We need to prescribe</p>
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in our annual review process at least on an annualised basis look back – how does it compare.

The model is going to have to be revised prior to Phase 2 and we will be using water production data to help calibrate and improve the model whether or not a performance trigger is exceeded. The purpose of the performance trigger is the safety net and early warning of the potential for much greater impact than predicted. The non-exceedance of performance criteria is not necessarily useful for improving the model prior to Phase 2. Whether or not a performance criterion has been exceeded, we are going to use all monitoring data to improve the model prior to Phase 2 as far as practical.

Discussion followed.

Fabienne: Most of the production is in the first few years. We have a requirement of baseline data acquisition which is valid for all projects. The Aquifer Interference Policy is not a licencing tool. It is enacted under the Water Management Act 2000, that is there to manage impact to aquifers. It applies to all projects.

There is a requirement in the IEP to have 2 years of baseline before the start of activities. Your consent asks for 3. Mining projects have to have that requirement before they lodge an EIS not after. We expect Santos to meet that requirement. All monitoring points you point to in Phase 1 need to meet that requirement.

Dave: When it comes to the performance criteria about the changes in water pressures, we need to clarify, we don't propose to need baseline before applying the triggers to a monitoring point. We say that whatever level we are measuring at the commencement of Stage 1, if there is any drawdown more than ½ metre, that will be a trigger that we need to report and respond to. This is a conservative assumption in the absence of baseline data.

Some discussion followed.

Fabienne: One of the issues that we have around the trigger level number 2, one of the bores is 20 km away. It is meaningless. This bore will never change.

David: We will be installing new monitoring points in those formations prior to the commencement of Phase 1. If the pressure in that bore drops by more than ½ metre, than we will have exceeded the trigger.

Discussion following.

DPE Water slide on their projected timeline for baseline data, groundwater modelling and phase 2 commencement.

Garry: It is clear DPE need the baseline data item clarified before Phase 1 can commence.

Michael: There is soft information available that is relevant. Eastern Star bores were turned off for 3 or 4 years. When Santos turned them back on again, they didn't need to pump them to reestablish gas flow, they just worked which means that the material was very tight and that over period, the groundwater didn't recharge the partial void..

Discussion about resolution and the consequences for the project.

Dave: The performance triggers provide assurance that measurable drawdown is limited to the shallow GOB. Santos are not saying that if we don't exceed the trigger we are not using any of the data to inform the model. All of the data can be used to inform the model – it may just prove a negative. All monitoring data will be captured prior to the Phase 2 model final model calibration.

Discussion followed about monitoring points and triggers.

<p>Field Development Plan Presented by Servaes van der Meulen</p> <p><b>General Business</b></p>	<p>Fabienne: DPE does not consider suitable consultation has been undertaken.</p> <p>Dave: To resolve this, is it just a matter of providing greater clarity within the modelling plan to the reflect the proposed workflow we have been discussing today about consultation about reviewing modelling criteria and model objectives prior to Phase 2.</p> <p>Fabienne: Absolutely. However, we need to know what do you mean by a review? Checking in new data?</p> <p>Dave: I propose that we make sure the update to the model and those modelling outcomes are reported to our stakeholders and agreed to being reasonable before completing Groundwater Management Plan for Phase 2. The modelling has to be bedded down before the management plan is put in front of stakeholders.</p> <p>There was discussion held about the suitability of conducting a model audit which provides a level of assurance but can be ineffectual given that the auditor have not been “part of the journey”. This was compared with peer reviews where the reviewer is involved at set points along the whole modelling journey.</p> <p>Discussion about the proposed timelines</p> <p>Discussion about the baseline data</p> <p>Randall: If there is monitoring in place before pumping starts which show any reaction in that formation, Also Mike earlier referred to soft data from the Eastern Star bores which give an understanding of baseline conditions in the GOB.</p> <p>Michael: The soft data would account for the three years if this monitoring is in place. Fabienne’s point is real that three years data is acceptable but how do you define those three years that you need to be pragmatic about.</p> <p>‘From the chair – There are three points requiring clarification:</p> <ul style="list-style-type: none"><li>• Discussions what the model objectives are – between DPE and DPE Water and Santos and Keith</li><li>• Clarify the baseline date that DPE Water is requiring for the Phase 1 approvals</li><li>• Discussions to resolve what is required for Phase 2 monitoring</li></ul> <p><b>WTAG discussion process – see slide</b></p> <p>Garry: Noted the comments and issues raised by DPE Water representatives and will review meeting procedure to seek more interactive discussion by meeting participants.</p> <p>Discussion followed.</p> <p>See slide presentation</p> <p>It is hoped that the Field Development Plan will be available during the week starting Monday 19<sup>th</sup> September 2022.</p> <p>The chair will distribute the FDP including the feedback form and will also attach a copy of the Condition of Consent (B1 and B2) and also a copy of the Field Development Protocol.</p> <p>Santos have asked for a meeting to be held ASAP with DPE Water to discuss Baseline issues. This will be organised by Dave.</p>
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	Next meeting for WTAG is likely to be the beginning of November.  Meeting closed: 12:08pm
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NO.	ACTIONS	ACTION BY	DUE DATE
1	Further discussions concerning baseline issues between Santos and DPE Water.	Dave Gornall	16.9.22 or ASAP

**Next Meeting: TBA**