

MEETING MINUTES

Narrabri Gas Project (NGP)

Water Technical advisory Group (WTAG)

Meeting # 3

DATE / TIME
19 October 2021

LOCATION
Santos Operational Centre, Yarrie Lake Road
Narrabri

FACILITATOR
Garry West

MINUTE TAKER
Trish Dandridge

ATTENDEES

- ◆ Garry West (Independent Chair)
- ◆ Cate Barrett (DPIE Water) - **via Teams**
- ◆ Randall Cox (Independent Expert) – via Teams
- ◆ Mike Williams (Independent Expert) - via Teams
- ◆ Cr Cathy Redding (Council Representative)
- ◆ Conrad Bolton (Local Landholder representative) -via Teams
- ◆ Jack Warnock (Local groundwater user)
- ◆ Edward Trindall (Narrabri LALC)
- ◆ Annie Moody (Santos)
- ◆ David Gornall (Santos) – via Teams

Guest

- ◆ Todd Dunn (Santos)
- ◆ Servaes van der Meulen (Santos) – via Teams

Apologies

- ◆ Fabienne d’Hautefeuille (DPIE Water)

Discussions

NO.	DISCUSSIONS
1. Welcome	Chair thanked everyone for their attendance.
Acknowledgement of Country	The Chair read the acknowledgement of Country.
Confirmation to minutes / actions	Minutes of last meeting (WTAG Meeting 2) accepted. Actions update listed in actions table (no actions outstanding). Action 6, template feedback to be interactive with a tablet or ipad – this function is unable to be actioned and is closed.
Correspondence	The Chair tabled a copy of a correspondence from DPIE prepared in response to a third party letter in relation to the NGP Water Conditions of Consent.
Action: Letter to be circulated to WTAG members.	

<p>2. Presentations</p>	<p>Presentation 3: Santos delivered a presentation. Agenda items included:</p> <ul style="list-style-type: none"> • Santos update • WTAG feedback and responses • Introduction to new plans available for consultation <ul style="list-style-type: none"> ○ Site Water Balance ○ Surface Water Management Plan ○ Dust Suppression Protocol • WTAG schedule <ul style="list-style-type: none"> ○ Next meeting / batch of plans
<p>3. Key topics discussed and questions raised</p>	<p>**Minutes to be read in conjunction with Santos presentation**</p> <p>Feedback, responses and clarification on specific plans. Santos received 73 responses in the feedback. Summary of feedback areas included:</p> <ul style="list-style-type: none"> • Use of acronyms • Industry jargon • Lifting language direct from approvals which is hard to understand • Formatting and typos • Cross-reference to information in Water Management Plans not yet available to be reviewed by WTAG members <p>Water Management Plan</p> <ul style="list-style-type: none"> • Q. Can we include Water Sharing plan for Naomi alluvium as an appendix? • A. Given the water sharing plans can be updated from time to time it is better we refer to the document rather than include them as appendices as they may go out of date quickly. • Q. Can we consolidate the Trigger Action Response Plans (TARPs) into one document? • A. They are better off being located in the sub plan which they are mentioned rather than providing a stand-alone document which provides the TARPs all in one place. This is to ensure TARPs are presented in the right context and to meet a specific purpose. <p>Erosion & Sediment Control Plan (ESCP)</p> <ul style="list-style-type: none"> • There is no TARP in this plan but there is a commitment that a site-specific ESCP is in place for a particular activity. • Action: Wording in the ESCP to be reviewed to ensure it is not misleading in relation to TARP requirements. <p>Product Water Management Plan</p> <ul style="list-style-type: none"> • Comment regarding providing more information and storage capacity, brine management. • Most of the detail within the Site Water Balance Plan, Santos will ensure information is cross-referenced in the plans and does not repeat the same information between plans. • All TARPs are relevant to appraisal activities in Phase 1 and plans will be updated for Phase 2 through the WTAG. <p>Irrigation Management Plan</p> <ul style="list-style-type: none"> • Q. Is the irrigation area suitable and be able to accept the volume of water needed. • Q. How much water is being produced and how is it calculated for the irrigation area. • A. Some of this information is provided in the Site Water Balance data and what Santos believe the application rates are going to be. It is proposed it will be approximately 2 – 10ml of water per day which Santos are comfortable that area can take. There is monitoring and management of the area to ensure Santos are not irrigating more than the land can take.

- Q. Can water be provided to a third-party irrigator?
- A. Phase 1, Santos is comfortable that the amount of water being produced is not going to stretch the irrigation area. Future third party provision of treated and amended water will be subject to an EPA resource recovery order and exemption.
- Action: Santos to provide more clarity in relation to soil types within the plan to avoid confusion.
- Action: Santos to clarify groundwater at the site to be site specific.
- Action: Santos to clarify groundwater monitoring details.
- Q. What does BOD refer to?
- A. Biological Oxygen Demand – measure of oxygen which is needed by aerobic biological organisms to break down organic material present in the water sample. It is normally a key measure for organic waste, e.g. treated sewage, released to the environment. High BOD would be found in a fluid that has a lot of organic material in it, would have a high oxygen demand because the bugs will be busy chewing up the waste and therefore 'demand' all the oxygen to live and grow. As CSG water (effectively aquifer water) does not have a naturally high organic content, it does not have an intrinsically high BOD. Furthermore, we settle-out and filter CSG water to remove solid and therefore any potential organic material prior to treatment by reverse osmosis.
- Q. What EM survey methods are used?
- A. Electromagnet survey methods – a way of investigating the shallow profile of the soil to confirm what the soil types are like and soil thicknesses. At this stage we do not have enough detail to determine what survey types will be used but it is something Santos are looking at.
- Q. Are the surveys going to be surface surveys or down the hole surveys as well?
- A. It is Santos's understanding that they will be surface surveys.
- Action: Santos to clarify if there will be any down the hole surveys completed.
- Q. How does Santos plan to deal with the run off from the irrigation area?
- A. The maximum application rates are calculated to ensure there is no runoff and is continually monitored for any run off. Soil moisture data is also used to understand the condition of the soil to see if the soil is saturated and therefore manage the likelihood of inducing runoff. There are a range of monitoring methods and triggers outlined in the Irrigation Management Plan that ensure there is no over-irrigation which does not create run off.
- Q. There may be run off from rainfall events which may cause issue with sediment, nutrients etc leaving that area. How is that managed?
- A. When Santos has operated the irrigation previously, there is a checklist that has to occur prior to turning the irrigation on. One of the items specifically looks at the weather forecasts and if there was a significant rainfall event forecast the instruction is not to irrigate. There will be similar controls in place with this project. It is strict requirement that Santos ensures it does not allow surface run off of irrigation water from their sites.

Pollution Incident Response Management Plan (PIRMP)

- Feedback relating to lack of detail of what infrastructure Santos has in Phase 1.
- Action: Santos to improve detail around scope of the PIRMP in relation to what is in phase 1, eg road construction, wells, gathering lines etc.
- Feedback for rainfall runoff and potential loss when irrigating, ie. lose water from the site in relation to the PIRMP. If Santos is working within the bounds of the IMP, then Santos would have considered the water quality they are irrigating with. It would not be considered pollution.
- Q. The water Santos is applying within this project is very well controlled but when rainfall occurs that creates runoff, it will carry sediment and nutrients that are considered to be an issue for EPA or others who may observe this.
- A. As Santos is not turning the soil, in effect the soil and crop is very stable, which reduces impact of runoff during heavy rain events.
- Q. Are you going to put stock on the crop?
- A. Santos will probably harvest the crop and use it as feed rather than put cattle on it. There is nothing in the water that would be harmful to animals.
- Q. Can sections of the gathering pipelines be isolated?
- A. Yes, this is a part of the engineering design so Santos can perform

maintenance.

- Q. How are the spillways designed?
- A. Spillways are an engineering structure and in a significant flood event, we are not going to lose integrity of the embankment wall.
- Q. Is vegetation on the embankments a risk?
- A. Vegetation is not a risk to the dam integrity as the ponds are lined and have leakage detection and there is no consequence to pond integrity if the embankment dries out. Santos is not using the dam walls as a means of containing the water – and so doesn't depend on the saturation of the embankment to contain water (unlike landholder's earth embankment dams). For our ponds, vegetation improves the integrity of the embankment as it makes them more stable and less susceptible to erosion due to rainfall etc.
- Q. Is there sufficient storage in wet weather?
- A. There is sufficient storage in Phase 1. In Phase 2 the EIS contemplates construction of additional storage ponds, if needed, to ensure Santos has enough capacity to operate. Furthermore, wells could be shut-in to avoid filling up ponds. It is an operational matter to ensure we understand wet weather forecasts, CSG water production and water re-use rates with enough accuracy and understanding of natural variation to ensure we maintain storage capacity. It is something we track closely and continuously. Santos Engineers review long term water forecasts, capacity of the ponds and irrigation rates to ensure suitable operation, so that wells do not need to be shut in but also so we avoid construction of expensive infrastructure, such as large storage ponds, if they are not needed.
- Comment: Burren Bore study to look at how much evaporation rate occurs.
- A. Santos looks at forecasts and variability in the weather and the unpredictability of the weather, looking at 5 to 10 year forecasts to be able to manage the variants. A weather station at Leewood assists with this.
- Q. Are sediments that are likely to occur in the ponds likely to be an issue and how do you manage to remove it?
- A. Santos are not expecting vast quantities of sediment to be occurring in the base of the pond.
- Q. Is there a DA in place in case things do not go to plan where you can construct another pond?
- A. The EIS approval allows for additional ponds south of the existing pond. This is already in place but will need additional approval, planning and engagement if we were to build it.

Site Water Balance

- Q. Are you planning to use the 10 megalitres from the recharge area?
- A. Santos has a license for 10 megalitres and will be effectively retiring this. Conditions require us to hold a water licence for all the water Santos needs throughout the life of the project including indirect impacts. If we need additional ground water for other uses Santos would enter into a purchase or a contractor to buy water off a third party.
- When you are pulling water from any aquifer you are depressurising that formation and creating a pressure sink; that means that water will want to travel from one area of pressure to a lower area of pressure. Most of the water that comes out of the coal comes from the coal itself. As we create pressure sink there is the potential for water to leak from overlying and underlying aquitards or low permeability layers and Santos are required to account for this water which may leak through those low permeability layers from managed water sources. At peak from the Pilliga Sandstones, at a time in the future (i.e. 200 years), this is the peak the ground water model is predicting. The model is currently predicting 9 megaliters per year across the 95,000-hectare project area for phase 1.
- Q. Is the plan site-specific?
- A. Yes, it is site-specific and the framework is an existing framework Santos has used.

Dust Suppression

- Q. What volume of water would you expect to use for dust suppression in phase 1 annually?

- A. 36 megaliters as in table (slide 25) primarily during construction.
- Q. How do you rehabilitate the sites?
- A. Santos rehabilitates sites by bringing the top soil and seed bank back over the site to facilitate regrowth and with polymer for soil stability when needed.
- Q. Do you use dam water for bush fires?
- A. Santos primarily use bore water for bush fires and can supplement with amended treated water.

Surface Water Management Plan (SWMP)

- Q. Is the release of water a beneficial use as indicated in the plan?
- A. The managed release of treated water is not considered a beneficial use and the SWMP is considered the most appropriate place to capture it, noting that Santos does not intend to operate the managed release during Phase 1.

Feedback action:

- Feedback on these plans is required by Monday 22 November 2021.
- The Groundwater Management Plan is expected to be sent out by 22 November 2021.

Actions

NO.	ACTIONS	ACTION BY	DUE DATE
1	Santos to send Chair draft response to correspondence dated 30 September 2021 to be tabled for discussion.	Santos and Chair	Next WTAG
3	Wording in the ESCP to be reviewed to ensure it is not misleading in relation to TARP requirements.	Santos	Next WTAG
4	Santos to improve detail around scope of the PIRMP in relation to what is in phase 1, eg road construction, wells, gathering lines etc.	Santos	5 November 2021
5	Santos to provide more clarity in relation to soil types to avoid confusion	Chair	5 November 2021
6	Santos to clarify ground water at the site to be site specific	Santos	22 November 2021
7	Santos to clarify groundwater monitoring details in the Irrigation Management Plan including groundwater monitoring points	Santos	22 November 2021
8	Santos to clarify if there will be any down the hole surveys completed	Santos	TBA
9	Feedback on these plans is required by Monday 22 November 2021	WTAG	22 November 2021
10	The Groundwater Management Plan is expected to be circulated prior to the next meeting	Santos	22 November 2021

Next Meeting

14 December 2021