

May 14, 2013

MEETING MINUTES

Minutes: Santos Community Committee – Narrabri Shire
Tuesday, May 14 2013
Narrabri Crossing Theatre, Narrabri

Attendance: David Ross (Chair), Brendon Warnock, Terry Hinch, Victoria Hamilton, Tony Pickard, Ron Campey, Ian Duffy, Annie Moody, Annie Alexander

Guests: Kym Bailey (Santos), Glenn Toogood (Santos)

Apologies: Michael Guest, Katie Moor

	Discussion	Action/By Whom
1. Welcome and introductions	<p>The chair opened the meeting at: 5:40pm Welcome to the committee and Annie Moody, Santos, the Team Leader, Community and Land Access. Annie will replace Cate McMahon on the committee. Kym Bailey, Operations Manager, was also welcomed.</p> <p>The resignations of Judy Simmonds and Gerrit Nehkorn were noted. Both were thanked for the effort, time and input they provided to the committee.</p>	
2. Previous meeting's minutes	<p>The chair talked to the list of actions that remained open from previous CCC meetings. Many of the actions had been responded to previously (Appendix 3).</p> <p>Further information was provided on the action Santos to provide response to questions on Namoi Water Study – data presented by ESG.</p> <p>This action was in reference to a committee member's questioning of pH data provided by Eastern Star Gas to the authors of the Namoi Water Study and whether it was</p>	

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indicative of local conditions.

The chair had received a response from Schlumberger about this. The table referenced by the committee member was only part of the wider dataset used to reach conclusions in the final report and was not used in isolation. The data in Table 7.17 was taken from the attached letter report (Appendix 4), which was a public document on the internet. In addition there was public data from Santos (Table 7.18) and datasets provided to us by the Industry Partners under a confidentiality agreement. The confidential data were used to build the understanding of the catchment but were not permitted to be included in any public reports.

Schlumberger could not include every piece of data in the final report or it would have been a huge document. The reports produced throughout the study were designed to be taken as a series that build to give a final conclusion.

3. Ensuring the effectiveness of the meetings and media releases

The chair noted that, while the previous meeting focussed to a large extent on a water bore issue specific to one member, it was an important discussion that had to be had. The member pointed out that the issue is not just about his bore, but about possible aquifer contamination which could have come from the CSG operation next door. It just so happens that he has had trouble with his bores' water since the CSG Pilot wells were drilled next door.

The committee were then asked did they wish to do work in groups in the future or continue discussions within the larger group. All in favour in attendance accepted staying in the larger group for discussions.

A discussion was then held on how media releases are developed and sent to the media as there had been concerns raised by some members about the balance within the last media release. - The chair informed the committee that the independent secretary

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drafts the release and the chair then reviews it. Santos receives it at the same time other CCC members get a copy. Meanwhile, Katie forwards the release to local and regional newspapers, and radio and television stations. David is prepared to have two or three committee members assist in the forming and drafting of the release

Three members of the CCC to review future media release the day they are drafted

A committee member stated that the media release in the Courier did not show the correct information and that it was an insult to the committee members. Glenn addressed committee members to say that Santos also prepare media releases when items of community interest are generated to provide balance and give information to the community more broadly on the scientific evidence. The committee accepted this but observed that the concern was that a media release prepared on behalf of the CCC, which they did not all agree with, was used in preparing the Santos article.

A profile of Annie to be provided to members

Annie Moody introduces herself - brief background on past roles – has been engaged by Santos to undertake role of Team Leader Community and Land Access. Profile to be provided to Committee.

4. Management of surface water contamination –

Glenn Toogood
EHSMS overview

Kym Bailey-

Glenn handed over to Kym Bailey as Operations Manager to talk about Santos' Environmental Health and Safety Management System in relation to surface water contamination and spills – copies of documents provided to committee members.

Santos to provide committee with the EHSMS' updated literature

Equipment is designed to shut down if an incident occurs. For example, if a pipe breaks or valve malfunctions, the equipment is designed for zero spills and the well is monitored and will shut down.

If the system fails, emergency spill procedures will be activated according to the spill and its characteristics. A control system is alarmed and monitored remotely.

Santos has contract supervisors. That is, all contractors have a contractor representative

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allocated, which is usually the site supervisor. There is always someone overseeing the project who knows where contractors are located and what they are doing as all works requires a permit under the Permit to Work System. Thus, any contractor entering work/field for Santos needs a permit for work.

If there is a spill all operators and contractors are trained in what to do to contain the spill; they are aware at each particular point what the procedure would be.

What is the time frame to report a spill? A Significant spill must be reported immediately. A spill of medium significance is reported in three to four days. It is initially reported to management, then onto regulators. What happens if a spill occurs on private property? The same requirements apply. Even if a contractor is responsible initially for a spill, Santos usually takes control of incidents as it is their reputation on the line.

If either contractor or employee made an error do you dismiss or counsel those responsible? Depends on circumstances of incident. Reference would be made to what is prescribed in the EHSMS.

Contractor management for Santos sets out the guidelines for any prospective contractor. They need environmental and safety plans before they are awarded the contract, and spot checks and auditing are on managers and supervisors scorecards.

Does Santos undertake drug and alcohol testing. Yes, the Health and Wellbeing Standard within the EHSMS sets out the requirements for drug and alcohol testings. But Santos does perform random drug and alcohol testing on staff and contractors.

A committee member then asked what happens to the water from the drilling on someone's property? It goes through a separator and drips into water containment bins. The contents of the bins are then disposed of in accordance with regulations. Pads are placed on the ground to ensure no damage is done to the ground.

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When we come to the core hole stage are the previous facilities going to be used? There will be a facility offsite for mixing mud.

With regards to exploration holes,- are Santos going to build a drill pond to accept the drilling waste? Waste will go into the bins similar to those used in the work over. Otherwise, drill ponds are a thing of the past. Instead, waste bins will be used. Once Santos goes into pilot mode, the water will be treated at Leewood, while the drilling waste and cut offs will be removed and taken to approved waste facilities.

Will there be fracking undertaken? Coal in Bohena trough is more accessible than many locations. The permeability of the coal means it doesn't need fracturing, which means direction drilling horizontally will be used.

5. General Business

Committee observed that there are many occasions where members are unable to come because of conflicting needs. It was recommended that four more members be sought for committee membership to ensure balance of the community representation. The chair accepted this, noting that his main requirement is for there to be a diverse representations of groups from the wider community rather than a few groups being represented by more than one member. The committee agreed with this. Discussion with Chair to liaise with Santos in relation to process – advertise in local paper for additional interested participants

Santos to advertise for vacant committee positions. Chair to select new members.

A committee member noted that Santos' past Chair made a misleading comment to the media regarding that all NSW gas is being "imported". This is not the case; the gas is transported from interstate rather than from another country. Santos noted that the word "imported" is standard industry language but acknowledged that the choice of words could be misleading. committed to advising Media and Public Affairs section of committee members' concern.

Santos to pass on to public relations department that misleading language used regarding NSW gas being imported needs to be rectified

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The update provided on 13th May was referred to by members.

Santos to look into Dewhurst 1 from previous Upcoming works - April report which mentioned access agreement- May report says Dewhurst 1 will be plugged and abandoned

A committee member than asked Santos what progress has there been made on resolving the problem another CCC member has with their bore. The member noted that the issue with the bore has gone on too long and Santos should do something. This goes to Santos' creditability.

Santos asked member have they undertaken the recommendations made by Santos to fix the bore? Member said that they would not undertake recommendations until he had been provided with the water analysis of wells on adjacent property. He had taken samples last year and had them tested, and wants Santos's analysis from that time as requested in letters since August 2012.

Santos to give a process to try and resolve committee members issue with his bore

The member reminded the CCC that Santos had failed to provide a map showing the locations of the SRB readings as presented to the CCC late last year. Santos noted that they had given a verbal answer; however; the Chair asked for a map showing locations as the member requested. Santos said they would be happy to comply with request to provide map with locations.

Santos to provide the committee with the maps with locations of where water sampling including SRB readings have been undertaken

He also reminded Santos that a preliminary report was all that was provided by Santos to him on the issue in March last year. No final report had ever been provided and this is not sufficient – he wants to see the whole report. -

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Next Meeting: 11th June

Issues: Review of Environmental Factors (REFs) preparation and process

Meeting Closed:

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Attachment 1. Actions

Action Raised	Date Raised	Progress Made
Santos to provide response to questions on Namoi Water Study – data presented by ESG.	9 th October	Completed
Santos to provide committee with a copy of Water Management Plan	11th December	Ongoing.
Action for Santos to provide committee with full soil analysis including analysis of bacteria of the Leewood site next year when it is available. As well as providing regular soil checks to ensure no contamination is occurring.	11th December	Ongoing
Specialist to answer questions on aquifer monitoring research that is being conducted.	11th December	Ongoing.
Santos to provide evaluation and commitment plan, Evaluation of water (full water analysis including bacteria but also escaped gases etc) fugitive omissions	11th December	Completed. Information sent to Committee on the 13 th May - material data sheet
Committee to read the presentation on land compensation and see if they are happy with the explanations.	11th December	Completed
Santos to provide full bacterial analysis of 3 dams at Bibblewindi.	11th December	Completed Information sent to Committee on the 13 th May advising tests will need to be accessed under the FOI from regulators for their test results. Santos will undertake tests when required by the regulator.
Full analysis of Bibblewindi ponds, committee have been provided with SRB, could they please have a full analysis. – Santos to look into it.	24 th April	Completed Documentation provided to the committee
Santos to find out if and what Biocides are used in the Pilliga area and what is the purpose of them.	24 th April	Completed Information sent to Committee on the 13 th May
Action Santos to find out if they flush out their wells before plugging them and what is the	24 th April	Completed

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process of plugging and abandoning the wells to ensure well integrity.		Information sent to Committee on the 13 th May
Santos to provide profile of Annie Moody	14 th May	Before next meeting (June 11 th)
Committee Members – two or three to review press/media releases - Tony Pickard accepted Annie Moody another, Victoria Hamilton	14 th May	Ongoing
Santos to provide the committee with the maps with locations of where water sampling including SRB readings have been undertaken	14 th May	Before next meeting
Santos to provide committee with the documents EHSMS- updated literature	14 th May	Before next meeting
Santos to advertise for vacant committee positions- chairman to select the members	14 th May	
Santos to look into Dewhurst 1 from previous Upcoming works - April report mentioned access agreement- May report says Dewhurst 1 will be plugged and abandoned	14 th May	Before next meeting
Santos to pass to public relations department community members feel that misleading information regarding NSW gas is being imported needs to be rectified	14 th May	
Santos to give a process to try and resolve committee members issue with his bore	14 th May	

Appendix 1: Presentation – Santos Environment, Health & Safety Management System

Appendix 2: Santos Updated

Appendix 3: Santos Response to Prior Actions and Material Safety Data Sheet

Appendix 4: Schlumberger Response to Action on Namoi Water Study



14 October 2009

Dr Ian Holland
Committee Secretary
Standing Committee on Environment, Communications and the Arts
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Dr Holland

Thank you for your 1 October 2009 letter regarding the inquiry into mining in the Murray-Darling Basin and affording Eastern Star Gas the opportunity to respond to a submission received by the Committee. The following comments may assist the Committee with its deliberations and endeavours.

- Gas production does not involve mining

While gas production is an extractive activity, it does not involve 'mining' in the ordinarily understood sense. Mining is generally accepted as involving excavation activities either on or under the surface of the earth. Gas production does not involve excavation of that kind. It involves the drilling of wells so that water can be pumped from target coal seams to allow gas desorption and production. In Eastern Star Gas' view, references to 'gas mining' and 'gas miners' are not helpful in furthering considered debate on issues relating to coal seam gas.

- Quality of Produced Water

The typical quality of water produced by Eastern Star Gas from present target coal seams is as set out in the following table. The water does NOT contain heavy metals or radioactive components.

Indicative Water Quality Information

Typical values	As produced	After processing
pH	7.5 to 8.0 (slightly alkaline)	5.5 to 6.0
TDS (mg/l)	8,000 to 10,000	80 to 150
Bicarbonate (mg/l)	5,000 to 8,000	~ 50
Chloride (mg/l)	~ 1,000	~ 5
Fluoride (mg/l)	< 1	0
Hydroxide, Nitrate (mg/l)	< 1	< 1
Potassium (mg/l)	~ 50	< 1
Sodium (mg/l)	3,000 to 4,000	~ 20
Calcium (mg/l)	~ 10	0
Barium(mg/l)	~ 1	0
Iron (mg/l)	< 1	< 1
Magnesium (mg/l)	~ 60	< 1
Strontium (mg/l)	~ 2	0



The principal solid contained within produced water is sodium bicarbonate, which is often referred to as baking soda. Eastern Star Gas uses reverse osmosis technology to process produced water with the brine being evaporated in a lined pond. It is possible the brine stream may itself be used for separate processing to recover the sodium bicarbonate.

- Coal Seam Gas Production and 'Fracking'

Eastern Star Gas' present preferred gas production technique involves the drilling of lateral, or 'in-seam', wells. Lateral wells do not require fracking. Where fracking has been historically carried out, modern high-pressure techniques were adopted to fracture coal seams about 1 kilometre deep. Explosives were not used and the fracking process was not detectable on the surface. Further, since the coal that was fraced is structurally weaker than the rock that lies above and below it, the resulting fractures remain predominantly within the coal.

On the specific matter of Mr Pickard's failed water bore, the following background information is relevant:

- Fracking of the Bibblewindi pilot production wells took place during the second half of 2006.
- Mr Pickard's bore pump failed during 2008. Eastern Star Gas verbally offered to investigate the cause of the failure but was advised by Mr Pickard that it had already been independently assessed by a local irrigation specialist. We understand poor initial construction and the deterioration of the substandard PVC bore casing prevented the bore pump from being removed from the borehole. As a result, Mr Pickard had another water bore drilled which we understand is fully operable and yields appropriate volumes of water.
- Failure of the water bore was not attributable to fracking operations carried out in separate strata some 15km southwest and 900 metres deeper than the failed water bore.

- Well Design Protects Aquifers

Within the Narrabri region the Pilliga sandstone, which lies from just below the surface to a depth of up to several hundred metres, contains high quality aquifers that are routinely drawn upon, for agricultural and other purposes, by bores only around 80 metres deep. Below the Pilliga sandstone lies the Napperby shale, a laterally continuous, impermeable layer that prevents poorer quality water from deeper in the earth entering the Pilliga Formation, and also prevents leakage of water from the Pilliga sandstone to the deeper layers .

Eastern Star Gas' coal seam gas wells are designed and drilled to specifically protect the integrity of the Pilliga sandstone and the valuable aquifers that lie within it. The layout of the wells is depicted in the attached figure. It is noteworthy that:-

- While drilling through the Pilliga sandstone, Eastern Star Gas uses fresh water (from its water treatment plant) to which is added bentonite (clay) to ensure no leakage into or contamination of



the Pilliga sandstone and the aquifers that lie within it. Small quantities of caustic soda may also be added to the water if necessary to keep its pH at around 9 to 10.

- While drilling through the Purlawaugh formation, in addition to bentonite and possibly caustic soda the water has added to it KCl and NaCl (to prevent reactive clays in the formation from swelling) and cellulose (which forms a coating to prevent fluid from entering the formation). The cellulose used by ESG is known as 'Pac R', and is itself used as an additive in the food industry for thickening and taste enhancement.

From time to time, small amounts of xanthum gum (a thickening agent also used in the food industry) and lime may be used. All additives are used in concentrations that are neither toxic nor harmful to the environment.

- After drilling through the Pilliga sandstone and entering the Napperby shale (at a depth of around 300 to 400 metres), steel casing is inserted into the borehole, cemented into position back to surface and pressure tested. This casing ensures nothing can enter or leave the Pilliga sandstone during subsequent drilling operations.
- A second steel casing is subsequently installed and cemented into position from surface down to the target coal seam, further guaranteeing the integrity of the aquifers in the Pilliga sandstone.

- Compliance with Licence Conditions

Eastern Star Gas takes exception to suggestions that it is not complying with licence conditions. Allegations of this nature have been and continue to be made by one Narrabri resident but, without exception, have been proven to be without foundation.

- Community Interaction

Eastern Star Gas also takes exception to suggestions that it has a 'cavalier attitude to the local people'. On the contrary, Eastern Star Gas aspires to maintain close working relations with all stakeholders, and especially the Narrabri community. A single and simple public example of this is Eastern Star's sponsorship of the annual Nosh on the Namoi regional cultural event, at which the company's senior management have voluntarily manned a stand to raise money the proceeds of which have been donated to Riding for the Disabled. While there are other examples, it is not the company's philosophy to publicise them as a substitute for real engagement with the local community.

While some seismic and corehole drilling has, with prior approval of landowners, taken place on private land, Eastern Star Gas' coal seam gas production activities have to date been entirely within the Pilliga Forest. Planning is now underway, and agreements have been reached with affected parties, for establishment of a pilot production project on private land in the Dewhurst area. Well in advance of this development, the company has provided all landholders in the Dewhurst area with a fact sheet explaining what will take place and detailing what roads will be used to move equipment to and from site. Personal contact has subsequently been made with landholders, including Mr Pickard.



As most people will appreciate, natural gas is an environmentally friendly fuel that has an important role to play in NSW', and Australia's, development. Through a prudent approach to exploration and eventually development of the world-class coal seam gas resource of the Narrabri region, it is Eastern Star Gas' aim to ensure the state of NSW, the Narrabri region and company shareholders benefit through, among other things, job creation, royalty revenue and dividends.

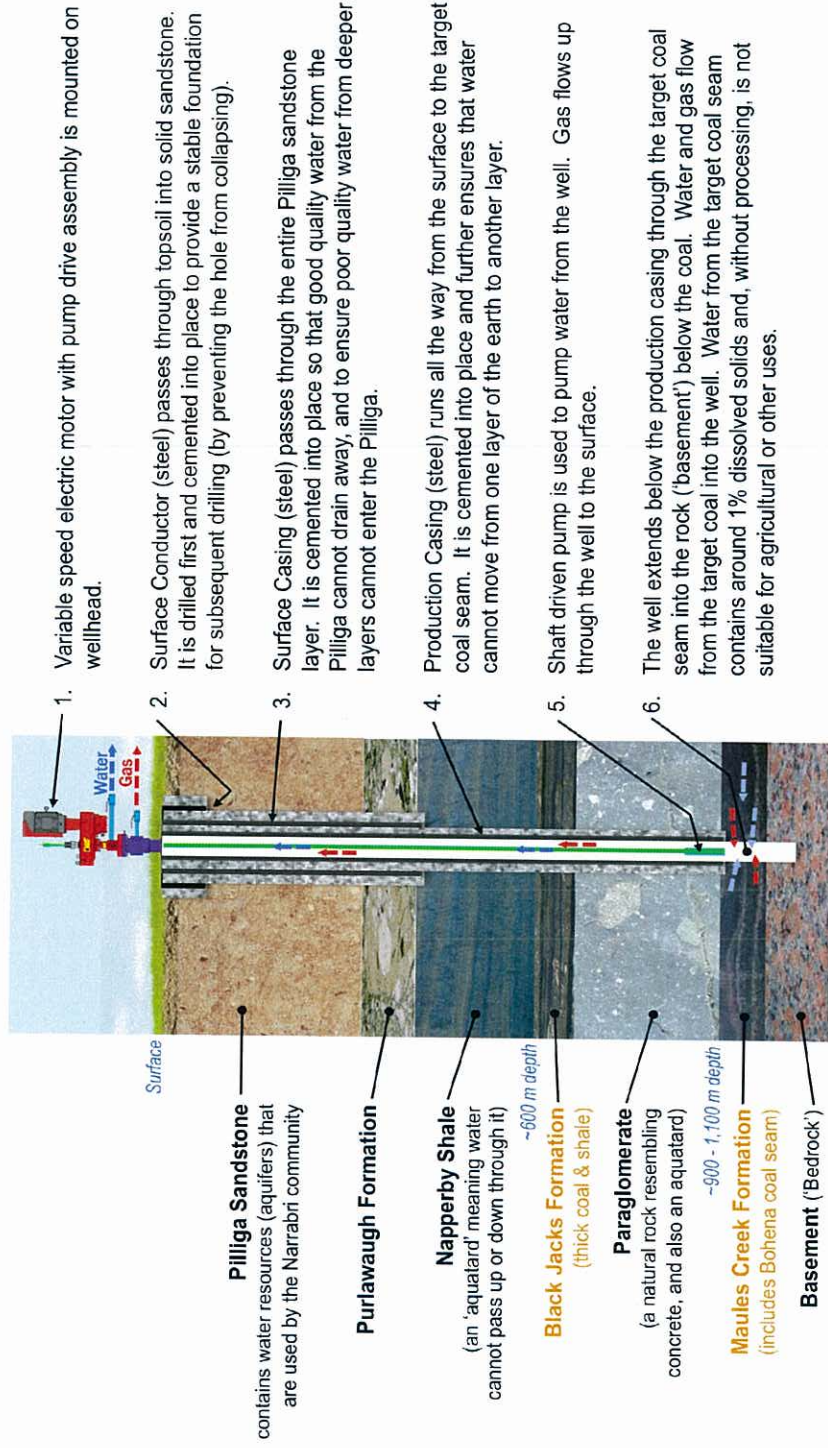
Should you wish to discuss any of the matters referred to above or have any further questions, please feel free to contact me.

Yours sincerely

DC

David Casey
Managing Director
Eastern Star Gas

Anatomy of a Narrabri CSG Well



Product Name **IDCIDE-20****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier Name RHEOCHEM LTD
Address 11 Alacrity Place, Henderson, WA, AUSTRALIA, 6166
Telephone +61 8 9410 8200
Fax +61 8 9410 8299
Emergency 1800 127 406 (Australia); 011 64 3 3530199 (International)
Web Site <http://www.rheochem.com.au/>
Synonym(s) IDCIDE 20
Use(s) BIOCIDES • DRILLING FLUID ADDITIVE • WATER TREATMENT
SDS Date 01 Nov 2010

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R36/38 Irritating to eyes and skin.
R43 May cause sensitisation by skin contact.

SAFETY PHRASES

S23 Do not breathe gas/fumes/vapour/spray (where applicable).
S24/25 Avoid contact with skin and eyes.
S36 Wear suitable protective clothing.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated **DG Class** None Allocated **Subsidiary Risk(s)** None Allocated
Packing Group None Allocated **Hazchem Code** None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE	C8-H24-O8-P2.O4-S	55566-30-8	18-25%
WATER	H2O	7732-18-5	remainder

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically.

Product Name IDCIDE-20

First Aid Facilities Eye wash facilities should be available.

5. FIRE FIGHTING MEASURES

Flammability	Non flammable. May evolve toxic gases if strongly heated. May evolve carbon oxides, sulphur oxides and phosphates when heated to decomposition.
Fire and Explosion	Treat as per requirements for Surrounding Fires: Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Prevent contamination of drains or waterways.
Hazchem Code	None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage	Contact emergency services where appropriate. Use personal protective equipment. Clear area of all unprotected personnel. Ventilate area where possible. Contain spillage, then cover / absorb spill with non-combustible absorbant material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.
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7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from oxidising agents, acids and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds	No exposure standard(s) allocated.
Biological Limits	No biological limit allocated.
Engineering Controls	Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.
PPE	Wear splash-proof goggles and rubber or PVC gloves. When using large quantities or where heavy contamination is likely, wear: coveralls. Where an inhalation risk exists, wear: a Type A (Organic vapour) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS TO PALE YELLOW LIQUID	Solubility (water)	SOLUBLE
Odour	SLIGHT ODOUR	Specific Gravity	1.08
pH	3.0 - 3.5	% Volatiles	> 60 % (Water)
Vapour Pressure	18 mm Hg @ 20°C	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	> 100°C	Upper Explosion Limit	NOT RELEVANT
Melting Point	< 0°C	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	AS FOR WATER		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents and acids (eg. nitric acid).
Hazardous Decomposition Products	May evolve carbon oxides, sulphur oxides and phosphates when heated to decomposition.

Product Name **IDCIDE-20**

Hazardous Reactions Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Low to moderate toxicity - irritant. This product has the potential to cause adverse health effects with over exposure. Upon dilution, the potential for adverse health effects may be reduced.

Eye Severe irritant. Contact may result in irritation, lacrimation, pain, redness and blurring or dimness of vision. Prolonged contact may result in corneal burns and possible permanent damage.

Inhalation Low irritant. Over exposure to vapours may result in irritation of the nose and throat, with coughing. High level exposure may result in dizziness, nausea and headache. Due to the low vapour pressure, an inhalation hazard is not anticipated with normal use.

Skin Irritant. Contact may result in irritation, redness, rash and dermatitis. Prolonged or repeated contact may result in burns. May be absorbed through skin with harmful effects. May cause sensitisation by skin contact.

Ingestion Low to moderate toxicity. Ingestion may result in gastrointestinal irritation, nausea, vomiting, abdominal pain and diarrhoea.

Toxicity Data TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM SULPHATE (55566-30-8)
LD50 (Ingestion): 248 mg/kg (rat)
TDLo (Ingestion): 650 mg/kg/13 weeks - intermittent (rat)

12. ECOLOGICAL INFORMATION

Environment Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.

13. DISPOSAL CONSIDERATIONS

Waste Disposal For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved landfill site. For larger amounts, contact the manufacturer for additional information. Prevent contamination of drains or waterways as aquatic life may be threatened and environmental damage may result.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated			
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s) None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information EXPOSURE CONTROL: If utilised in a closed system the potential for over exposure is reduced. If not used in a closed system, local exhaust ventilation is recommended to control exposure. Provide eye wash and safety shower in close proximity to points of potential exposure. Where the potential for an inhalation risk exists, an approved respirator may be required. Do not eat, store, consume food, tobacco or drink in areas where product is used.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

ABBREVIATIONS:

ACGIH - American Conference of Industrial Hygienists.

ADG - Australian Dangerous Goods.

BEI - Biological Exposure Indice(s).

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EC No - European Community Number.

Product Name**IDCIDE-20**

HSNO - Hazardous Substances and New Organisms.

IARC - International Agency for Research on Cancer.

mg/m³ - Milligrams per Cubic Metre.

NOS - Not Otherwise Specified.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

RTECS - Registry of Toxic Effects of Chemical Substances.

STEL - Short Term Exposure Limit.

SWA - Safe Work Australia.

TWA - Time Weighted Average.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status

This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared By

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SDS Date 01 Nov 2010

End of Report

SANTOS UPDATE- May

Proposed upcoming work program – Narrabri area

Much of this work will take place over the next few months, but exact time frames for some of the schedule is dependent on factors like approval times and rig availability.

Decommissioning of wells:

- Plug and Abandon (P&A) of Dewhurst 1, 3, 5 and 7;
- Cut off wells at Bibblewindi 1 and 2

Workovers, or modifications and upgrades, to existing wells:

- Workover now commenced on Wilga Park wells 1, 2 and 5.

Drilling of exploration core holes:

- Bibblewindi 30 in the Pilliga State Forest
- Dewhurst 8A on private land. This core hole will also be converted to a monitoring bore

Other work:

- Expansion of facilities at the Narrabri Operations Centre, Development Approval application has been submitted to Narrabri Shire Council.
- Survey work has been completed on the Leewood to Bibblewindi and the Dewhurst to Bibblewindi flowlines.
- Rig Camp site at McFarlane's moved to Wilga Park 2.
- Development of project execution plans for Leewood phase 1 is underway
- Santos will be installing four shallow water monitoring bores along Bohena Creek to monitor the water level and quality of the shallow ground water in the channel deposits of the ephemeral Bohena Creek.
- Santos will be conducting groundwater monitoring within the aquifer systems in the local project area. The proposed Santos water monitoring strategy includes 15 aquifer monitoring bores (AMBs) throughout the Narrabri Gas Development Project. The first two AMBs will be drilled at Bibblewindi 27 and 28H. These two AMBs will be installed on existing leases.

Pilliga rehabilitation

In the past six months:

- Rehabilitation work on Bohena sites in the forest is now complete with irrigation and soil monitoring taking place
- The Bibblewindi storage pond 2, near the site of the former water treatment plant, has been emptied and clean-up of the site is underway in preparation filling with fresh water for construction
- To view images of our rehabilitation work visit:

<http://www.santos.com/exploration-acreage/nsw-csg/pilliga-rehabilitation.aspx>

Over the next few months rehabilitation will be ongoing:

- Decommissioning and rehabilitation of selected wells
- Continued work at the sites that have been partially rehabilitated to date
- Assisted vegetation and irrigation will continue

Site visits:

We will be holding the second of our community site visits to the Pilliga on May 20. To register your interest in attending, please contact Annie Alexander at our Narrabri office on 02 6729035 by May 15.

Community:

- Santos has donated and installed 3 x 380,000 Litre tanks at Narrabri Airport for ongoing Fire Fighting Water Storage. Further to this we are presently constructing a 380,000 Litre tank in the town of Pilliga and also one at Gwabegar to be utilised for the same purpose. Airport complete and commissioned Pilliga started 15/04/13
- Santos major sponsor of the Dorothea Mackellar poetry awards. Dorothea Mackellar School Poet Visit to the Pilliga Primary school on the 16 May.
- Santos North West Tour (Cycling) launch held in Narrabri on May 1
- Santos loaning generators for Sony Music arranged Daft Punk album launch at Wee Waa Show 17/5
- Sponsorship of Narrabri Men's Shed for \$7,000
- Sponsorship to the Collins Park Lighting Committee \$20,000 for seating around the oval
- Narrabri Show on the 27 April - Santos had an information stand in main pavilion

Information Request Response

Reference:	130509_NCCC
Subject:	Outstanding Information Request Items Narrabri CCC 24 April 2013
Request date:	7 May 2013
Requested by:	David Ross Chair Narrabri CCC
Background Request:	<ol style="list-style-type: none"> 1. What biocides are used in the area (in wells) and what is their purpose 2. Are the wells flushed out before plugging them? What is the process of plugging and abandoning wells to ensure well integrity? 3. Santos to consider whether they would provide committee with full analysis of Bibblewindi ponds 4. Provide evaluation and commitment plan that evaluates water (full water analysis including bacteria but also escaped gases etc) 5. That last action came about from the following discussion in the December meeting: "Committee member asks about the monitoring of the ground water and the impact of the drilling and would like to see this information in a clear plan, to explain exactly what Santos is doing. Committee would also like to know what sort plan/commitments are based on the results from the monitoring. (If Santos was to see a pressure change in the aquifer or effects what are the actions that Santos is committed to?) "
Response:	<p>Item 1 - Biocides:</p> <ul style="list-style-type: none"> • Biocides are added to drilling fluids when high-background bacteria are detected (or suspected) in the makeup water; in particular if the makeup water has high vegetation content (for example from river water). • The treatment is normally in the range of 0.5 litres per 1,000 litres (however it should be noted that liquid Biocides are approximately 75% water so the concentration is very low, estimated to be 0.125 litres per 1,000 litres or in the hundreds of parts per million). • ENSW propose to use water from either the Narrabri Council Bore or other licenced bores with suitable water quality (where

available) to make up drilling fluids. This will not require pre-treatment with any biocide.

- Biocides are also used in the drilling fluid when additives that contain cellulose (such as PAC's – Poly Anionic Cellulose, starch) as these are bacteria sensitive. Again the treatment is in the 0.5 – 1.0 litres per 1,000 litres.
- Biocides are also sacrificial in that they continually deplete. Typically Biocides used in drilling fluids have a half-life of 48 hours.
- Daily treatments of drilling fluids are usually made while drilling or if the drilling fluid is to be stored. Treatment would be 0.5 litres per 1,000 litres per day.
- Attached is a copy of the Material Safety Data Sheet of IDCIDE-20, the biocide that ENSW will use in the upcoming activities in the NGDP area.

Item 2 – Plug and Abandon Procedure

A significant amount of information was provided to the Committee in relation to plug and abandonment procedures at the March CCC meeting and members should be referred to the minutes of that meeting for detail already provided.

Abandonment includes filling the entire wellbore from bottom to surface with cement in cement “plug” stages.

- The abandonment of the well using cement uses a small diameter steel tubing to convey the cement to the bottom of the hole and the cement flows up the outside of the tubing.
- A 200m cement plug is pumped and fills the hole from the bottom and displaces the drilling fluid in the hole back to surface. It is collected in the mud tanks.
- After the cement is pumped, the tubing is pulled out of the hole above the top of the plug to wait for the cement to set.
- Individual cement plugs are limited to 200m in length.
- All open hole cement plugs are left set and tagged to confirm placement before the next one is pumped (as per the Code of Practice – Coal Seam Gas – Well Integrity Sept 2012).
- Once a cement plug top is inside casing, it is left to set, tagged to confirm placement and pressure tested to confirm isolation.
- Cement plugs are then pumped one by one to surface.

Item 3 – Bibblewindi Ponds

- The assessment and analysis results of water contained within the Bibblewindi Ponds has been provided to both the NSW Division of Resources and Energy (DRE) and the Office of Environment and Heritage (OEH).
- The regulator has also undertaken independent tests and this information could be sourced from the regulator through Freedom of Information provisions, however Santos is unable to provide the regulator test results to the CCC as this information does not belong to Santos.

Item 4 – Evaluation and Commitment Plan

	<ul style="list-style-type: none"> • In accordance with the licence requirements within PEL238 pursuant to the Petroleum Onshore Act (1991) and the Protection of the Environment Operations Act (1997), Santos are committed to undertake various environmental assessments and review as part of its operations. Details of these commitments are available from the DRE website. Refer http://www.resources.nsw.gov.au/ • The request for Santos to undertake additional analytical assessment of the pond water within Bibblewindi is not warranted. The current analytical schedule for pond sampling concentrates on Contaminants of Potential Concern (COPC). Santos continually works with both independent experts and regulators to ensure the analytical schedules are reflective of all known COPC. • The analytical schedule provided by one of the Committee members has no scientific basis when compared against the COPC. • The concept of undertaking further biological testing was discussed at length at the April 2013 Narrabri CCC meeting with Dr Richard Cresswell who is Practice Leader for Coal Seam Gas related Groundwater at Sinclair Knight Merz (SKM) and is the senior hydrogeologist in SKM's Sydney office. • DR Cresswell is also a member of the federal Environment Minister's Expert Panel for Large Coal Seam Gas Projects and leads significant groundwater impact assessments for the coal industry in NSW. • He is a recognised as an independent consultant in this field and attended the meeting to inform the discussion on this basis. <p>Item 5 – Monitoring of ground water and impact of drilling</p> <ul style="list-style-type: none"> • Documents submitted to the Department of Resources and Energy for approval of activities provides full details on the analysis and sampling requirements. A monitoring and modelling plan for PEL238 was lodged with DRE in December 2012. Both the NSW OEH and Office of Water (NOW) were consulted with in the preparation of this plan. The plan is available from the DRE website. Refer http://www.resources.nsw.gov.au/ • Proposed drilling activities are designed in accordance with the NSW Code of Practice for Coal Seam Gas Well Integrity (DTIRIS 2012b). This code ensures appropriate controls are in place to minimise potential groundwater impacts. • The Committee may source these documents as required, once they are lodged for assessment and approval. Santos will not provide the information in a different format nor as a supplementary activity to the preparation of documents required for assessment and approval.
Briefing Officer:	Annie Moody Team Leader, Community and Land
Approving Officer:	Sam Crafter

	Manager, Community and Government Relations
Approval Date:	13/05/2013