

COMPLIANCE AUDIT PROGRAM

**Narrabri gas project –
beneficial use of gas**

Santos NSW (Eastern) Pty Ltd

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Contents

Introduction	3
Background.....	3
Audit objectives.....	4
Audit scope.....	4
Audit criteria.....	4
Audit team	5
Audit methods	6
Preliminary document review	6
Opening meeting	7
Site interviews and inspections	8
Data collection and verification	8
Site inspections	8
Closing meeting	8
Reporting	8
Audit findings.....	9
Approvals and consents.....	9
PAL2	9
PEL238	11
Wilga Park Power Station.....	12
Gas and power metering.....	13
Gas wells.....	13
Biblewindi compressor station	13
Wilga Park Power Station.....	13
Records and reporting	14
Royalty.....	14
Audit conclusions	16
Photographs.....	17

Introduction

Background

Santos NSW (Eastern) Pty Ltd (Santos) is the operator of Petroleum Assessment Lease 2 (PAL2) and Petroleum Exploration Licence 238 (PEL238) near Narrabri in Northern NSW. The registered titleholders for both PAL2 and PEL238 are Santos NSW Pty Ltd and EnergyAustralia Narrabri Gas Pty Ltd.

A coal seam gas (CSG) exploration and appraisal project (the Narrabri Gas Project) has been ongoing on PAL2 and PEL238 since about 2004. Activities in PAL2 have focussed on the Bibblewindi and Bohena CSG pilots, whilst recent activities in PEL238 have focussed on the Dewhurst and Tintsville CSG pilots.

As part of the appraisal activities, gas is generated from the wells in each pilot. This gas is either flared at one of several flare sites within the project area or is sent to the gas-fired Wilga Park Power station where it is beneficially used to generate power which is supplied to the NSW electricity grid.

In December 2015, an amendment to the Petroleum (Onshore) Act 1991 (PO Act) was made to insert a new section relating to the beneficial use of gas from exploration licences and assessment leases. The Petroleum (Onshore) Regulation 2016 includes provisions to regulate this beneficial use of gas.

Section 28B of the PO Act states:

28B Right to beneficial use of gas yielded through prospecting

(1) In addition to the other rights conferred by the title, an exploration licence or assessment lease confers on its holder:

(a) the right to carry out such operations as may be described by the regulations to enable the beneficial use of gas recovered from the land comprised in the licence or lease, but only if that gas would otherwise have been flared or released into the atmosphere as part of activities under the licence or lease, and

(b) the right to use that gas subject to, and in accordance with, the regulations.

(2) The regulations may make provision for or with respect to royalty payable under Part 7 in respect of gas used in accordance with this section.

Clause 16 of the PO Reg states:

16 Beneficial use of gas: section 28B (Former clause 13A of 2007 Reg)

(1) For the purposes of section 28B (1) (a) of the Act:

(a) all assessable prospecting operations authorised by an exploration licence or assessment lease, and by an activity approval, may be carried out to enable the beneficial use of gas, and

(b) all operations authorised by an exploration licence or assessment lease in relation to which a relevant development consent is in force authorising works that facilitate the beneficial use of gas may be carried out to enable the beneficial use of gas.

(2) In relation only to an assessable prospecting operation authorised by an activity approval, for the purposes of section 28B (1) (b) of the Act:

(a) the right to the beneficial use of gas conferred by section 28B of the Act is limited to a period of 1,000 days (whether or not consecutive), per well, in total, and

(b) gas cannot be used beneficially unless the activity approval for the assessable prospecting operation involved specifically extends to include the beneficial use of the gas.

(3) For the purposes of section 28B (2) of the Act, royalty is payable under and in accordance with Part 7 of the Act in respect of any petroleum recovered by the holder of the petroleum title and used beneficially, unless that recovery and use is authorised by a relevant development consent.

(4) In this clause:

relevant development consent means development consent or approval granted under Part 3A, 4 or 5.1 of the Environmental Planning and Assessment Act 1979 before 18 December 2015.

For existing wells within the Bibblewindi East and Bibblewindi West pilots, which were beneficially using gas prior to the introduction and commencement of the beneficial use provisions in the Petroleum (Onshore) Act 1991 and the Petroleum (Onshore) Regulation 2007 (and the subsequent Petroleum (Onshore) Regulation 2016), the commencement date for the 1000-day limit is 18 December 2015, which was the commencement date for the beneficial use provisions of the Act and Regulation.

As part of the compliance audit program being undertaken by the Department of Planning & Environment – Resources Regulator (the Regulator), an audit of the exploration and appraisal activities associated with the beneficial use of gas by the Narrabri Gas Project was undertaken on Tuesday 21 August 2018.

Audit objectives

The objectives of the audit were to:

- Undertake a compliance audit of the Narrabri Gas Project, operated by Santos NSW (Eastern) Pty Ltd, against the requirements of the *Petroleum (Onshore) Act 1991* and Petroleum (Onshore) Regulation 2016 in relation to the beneficial use of gas from appraisal pilots in PAL2 and PEL238
- Assess the operational performance of the Narrabri Gas Project exploration and appraisal operations and the ability of the titleholder and/or operator to implement management systems and controls to provide for accurate reporting of gas produced and beneficially used from the appraisal pilots.

Audit scope

The scope of the audit included:

- Inspection of a selected sample of pilot wells from which gas is being beneficially reused as identified in Table 1, particularly in relation to the metering of gas
- Inspection of the Wilga Park Power Station, particularly in relation to metering of incoming gas supply
- A review of documents and records pertaining to the gas extraction activities associated with the Dewhurst, Tintfield, Bibblewindi East and Bibblewindi West appraisal pilots
- The assessment of compliance for the period commencing 18 December 2015 and ending 20 August 2018.

Audit criteria

The audit criteria against which compliance was assessed included:

- *Petroleum (Onshore) Act 1991*, particularly:
 - Section 28B Right to beneficial use of gas yielded through prospecting
 - Part 7 Royalties (Sections 84 to 94AA as relevant)

 - Part 8A Records and reports (Sections 97A to 97G as relevant)
- *Petroleum (Onshore) Regulation 2016*, particularly:
 - Clause 16 Beneficial use of gas: Section 28B
 - Part 4 Records and reports (Clauses 20 to 29 as relevant)
 - Part 8 Royalty (Clauses 42 to 48 as relevant)

Audit team

The audit team comprised of:

- Audit Team Lead - Jenny Ehmsen, Principal Compliance Auditor, who is an Exemplar Global registered Lead Environmental Auditor and Lead Occupational Health and Safety Management Systems Auditor (Certificate No. 15186)
- Audit Team Member - Matt Gagan, A/Manager Assessment Co-ordination, Division of Resources and Geosciences.

Audit methods

The audit process involved the interview of site personnel, a review of documentation and samples of records provided by the titleholder and/or operator and a site inspection of the operations to determine the level of compliance of the operations and assess the status of the project's operational performance. The audit process and methodology is described in more detail in the sections below.

Preliminary document review

Prior to the audit, documentation associated with the gas extraction from the pilot appraisal activities at the Narrabri Gas Project was reviewed by the audit team. This involved a review of the following documentation:

- Petroleum Assessment Lease No. 2 (PAL2) Petroleum Operations Plan, November 2017
- PAL2 Annual Environmental Management Report for period 1 January 2017 to 31 December 2017 (dated 27/2/2018)
- PAL2 Annual Environmental Management Report for period 1 January 2016 to 31 December 2016 (dated 28/2/2017)
- PAL2 Annual Environmental Management Report for period 1 January 2015 to 31 December 2015 (dated 29/2/2016)
- PAL2 Annual Report for period 31 October 2016 to 30 October 2017 (dated 30/11/2017)
- Project Approval 07_0023 Narrabri Coal Seam Gas Utilisation Project (consolidated approval issued by Department of Planning & Environment)
- Narrabri Coal Seam Gas Utilisation Project (MP 07_0023) Modification 3 Supporting Information (November 2013)
- Narrabri Coal Seam Gas Utilisation Project (MP 07_0023) Modification 4 Supporting Information (August 2016 – Withdrawn)
- Narrabri Coal Seam Gas Utilisation Project (MP 07_0023) Modification 5 Supporting Information (May 2017)
- Narrabri Coal Seam Gas Utilisation Project (MP 07_0023) Modification 6 Supporting Information (June 2018)
- PEL238: 2009 Narrabri Coal Seam Gas Program, Approval to conduct Tintfield Production Pilot (approval issued by I&I NSW dated 22/12/2009)
- Review of Environmental Factors: Tintfield CSG Pilot, Narrabri Coal Seam Gas Project, prepared by Eastern Star Gas, November 2009
- PEL238 Approval to undertake Dewhurst 26-29 Pilot Wells exploration program (approval issued by Office of Coal Seam Gas dated 16/8/2013)
- Review of Environmental Factors, Dewhurst 26-29 petroleum wells PEL238, Gunnedah Basin, prepared by RPS Australia East Pty Ltd for Santos NSW (Eastern) Pty Ltd, dated March 2013

- Development Consent SSD-6038, Dewhurst Gas Exploration Pilot Expansion (consolidated approval issued by Planning Assessment Commission)
- Dewhurst Gas Exploration Pilot Expansion – Environmental Impact Statement (EIS), prepared by RPS Australia East Pty Ltd for Santos NSW (Eastern) Pty Ltd, dated 30 October 2013
- Dewhurst Gas Exploration Pilot Expansion (SSD-6038) Modification 2 supporting information (June 2018)
- PAL2: Approval to conduct the Narrabri Coal Seam Gas Lateral Program, Lateral Production Pilot A, involving coal seam methane exploration wells Bibblewindi 18H, 12, 13, 14, 19H, 15, 16, 17 (approval issued by Department of Primary Industries 12/8/2008)
- Review of Environmental Factors, 2008 Narrabri Coal Seam Gas Lateral Program, Lateral Production Pilot A, prepared by Eastern Star Gas 25/7/2008)
- PAL2: Approval to conduct Narrabri Coal Seam Gas Project Bibblewindi Lateral Pilot – Shield Laterals Supplementary (approval issued by Department of Primary Industries 20/7/2009)
- Review of Environmental Factors – Narrabri Coal Seam Gas Project – Bibblewindi Lateral Pilot – Shield Laterals Supplementary, prepared by Eastern Star Gas, June 2009
- PAL2: Approval to conduct Narrabri Coal Seam Gas Project Bibblewindi West Lateral Production Pilot (approval issued by Department of Primary Industries, 30/4/2009)
- Review of Environmental Factors Narrabri Coal Seam Gas Project, Bibblewindi West Lateral Production Pilot, prepared by Eastern Star Gas, January 2009
- Development Consent SSD-5934, Bibblewindi Gas Exploration Pilot Expansion (approval issued by Planning Assessment Commission 18/7/2014)
- Bibblewindi Gas Exploration Pilot Expansion, Environmental Impact Statement, prepared by RPS Australia East Pty Ltd for Santos NSW (Eastern) Pty Ltd, dated September 2013

Opening meeting

The opening meeting was held onsite at Narrabri Operations Centre, 300 Yarrie Lake Road Narrabri, at 8.05am on Tuesday 21 August 2018.

The audit team was introduced, and the scope of their responsibilities was conveyed to the auditees. The objectives and scope of the audit were outlined. The methods to be used by the team to conduct the audit were explained.

It was stated that the audit team would be interviewing personnel, reviewing documentation, examining records and conducting a site inspection to assess specific compliance requirements.

Site interviews and inspections

Data collection and verification

Where possible, documents and data collected during the audit process were reviewed on site.

All information obtained during the audit process was verified by the audit team where possible. For example, statements made by site personnel were verified by viewing documentation and/or site inspections where possible. Where suitable verification could not be provided, this has been identified in the audit findings as not determined.

Site inspections

A site inspection was undertaken comprising the following elements of the Narrabri Gas project operations:

- Dewhurst 27 - wellhead infrastructure, including gas metering
- Dewhurst 28 - flare and gas metering
- Bibblewindi 16 - wellhead infrastructure, including gas metering
- Bibblewindi 28H - wellhead infrastructure, including gas metering
- Bibblewindi 24 - wellhead infrastructure, including gas metering
- Tintsfeld 5 - wellhead infrastructure, including gas metering
- Bibblewindi compressor station and flare – gas metering and control room
- Wilga Park Power Station – gas inflow metering, control room and metering of outgoing energy production

Closing meeting

The closing meeting was held onsite at Narrabri Operations Centre, 300 Yarrie Lake Road Narrabri, commencing at 3.00pm on Tuesday 21 August 2018. The objectives of this meeting were to discuss any outstanding matters, present preliminary findings and outline the process for finalising the audit report.

Reporting

Following completion of the site audit, the audit checklists were completed, and audit notes were reviewed to compile a list of outstanding matters to be noted in the audit report. This report was prepared to provide an overview of the operational performance of the site in relation to the exploration activities and identify any non-compliances or observations of concern noted by the auditors during the site inspections and interviews.

The draft audit findings were forwarded to Santos for comment. Consideration was given to the representations made during the finalisation of the audit report.

Audit findings

Approvals and consents

The Bibblewindi East and West pilots are within PAL2, while the Dewhurst and Tintsville pilots are within PEL238. Details for each petroleum title are provided in Table 1.

Table 1 Title details

Title	Grant date	Last renewal	Expiry date	Comment
PAL2	30/1/2007	Application made 26/10/2012	30/10/2013	Renewal pending
PEL238	1/9/1980	Application made 1/7/2016	2/8/2016	Renewal pending

It is noted that both PAL2 and PEL238 are past their last expiry date, but renewal applications have been made for both titles. Under the provisions of Section 20 of the *Petroleum (Onshore) Act 1991*, if an application for renewal of a title has not been withdrawn or determined before the date on which the title would, but for this section, expire, the title continues in force until the date on which the application is withdrawn or determined. Therefore, both PAL2 and PEL238 continue in force until such time as a determination is made on the renewal applications.

A review of development consents and activity approvals for the wells and the power station shows that all wells in the four active pilots have approval to send gas to the Wilga Park Power Station as described in the following sections.

PAL2

Based on information contained in the most recent Petroleum Operations Plan (POP) for PAL2 (dated November 2017) and the 2017 Annual Environmental Management Report (AEMR) (submitted January 2018), there are 17 wells in PAL2 that are currently active for gas production. The wells and their original activity approval dates are tabulated in Table 2.

It is noted that each activity approval permits the collection and use of gas, either directly as a condition of approval, or through description in the REF.

Table 2 Well details for appraisal pilots in PAL2

Well	Approval date	Use of gas permitted
Bibblewindi East		
Bibblewindi 12	12-Aug-08	Yes
Bibblewindi 13	12-Aug-08	Yes
Bibblewindi 14	12-Aug-08	Yes
Bibblewindi 15	12-Aug-08	Yes
Bibblewindi 16	12-Aug-08	Yes
Bibblewindi 17	12-Aug-08	Yes
Bibblewindi 18H	12-Aug-08	Yes
Bibblewindi 19H	12-Aug-08	Yes
Bibblewindi 21H	20-Jul-09	Yes
Bibblewindi 27	20-Jul-09	Yes
Bibblewindi 28H	20-Jul-09	Yes
Bibblewindi 29	20-Jul-09	Yes
Bibblewindi West		
Bibblewindi 22	30-Apr-09	Yes
Bibblewindi 23	30-Apr-09	Yes
Bibblewindi 24	30-Apr-09	Yes
Bibblewindi 25	30-Apr-09	Yes
Bibblewindi 26H	30-Apr-09	Yes

In 2013, Santos proposed to drill two additional holes in the Bibblewindi East pilot. An Environmental Impact Statement (EIS) was prepared and a development application lodged with DPE because “*The development of the proposed activity is for the purpose of drilling and operating more than five wells within a three kilometre radius within PAL 2 and is therefore deemed to be SSD under the SRD SEPP.*” (from the EIS). The description of the development in the EIS stated:

The proposed activity includes:

- *construction: site preparation activities at existing well leases, establishment of necessary equipment, temporary structures and facilities on the lease areas to enable drilling; drilling one vertical pilot well (Bibblewindi 31) and one lateral pilot well (Bibblewindi 32) and connection to the Bibblewindi Multi-Lateral Pilot.*
- *operation: operating the existing Bibblewindi Multi-Lateral Pilot with the new Bibblewindi 31 and 32 wells, management of the water and gas produced during operation for up to 3 years and general maintenance activities.*
- *post operation and rehabilitation: decommissioning and rehabilitation of pilot wells and ancillary infrastructure or suspension of wells for potential future use.*

The SSD application (SSD 13_5934) included the establishment of two new wells Bibblewindi 31 and 32, and operation of the Bibblewindi Multi-Lateral Pilot (including the two new wells) for a period of three years. The two new wells have not been constructed but the pilot is operational with the existing wells (as listed above). The SSD application was approved on 18/7/2014 and under Condition 5(a) of that approval, gas from the development was allowed to be delivered for consumptive use at the Wilga Park Power Station for a period of three years from the date of approval of MP 07_0023 Mod 3, in the case of existing wells within the development. Mod 3 to MP 07_0023 (Wilga Park Power Station) was also approved 18/7/2014 and allowed the gas from the Bibblewindi Multi-lateral pilot to be used at Wilga Park for a period of three years from that date.

The SSD consent does not have any effect on the operation of the 1000-day limit, as the existing wells within the Bibblewindi East and Bibblewindi West pilots are authorised under the relevant activity approvals.

PEL238

PEL238 includes three active appraisal pilots – Dewhurst North, Dewhurst South and Tintsville.

Dewhurst North comprises wells Dewhurst 22 to Dewhurst 25. It was originally approved 16/8/2013 but did not include beneficial use of gas. Excess gas is collected and conveyed to a flare at the site of Dewhurst 22. At this stage, it is not proposed to connect the Dewhurst North Pilot to Wilga Park. Further approvals will be required if this is to be proposed.

Dewhurst South comprises wells Dewhurst 26 to Dewhurst 29. It was originally approved 16/8/2013 but did not include beneficial use of gas. Excess gas was to be collected and conveyed to a flare at the site of Dewhurst 28, and this is what currently occurs.

In October 2013, Santos made application to DPE (as State Significant Development) to expand operations at the Dewhurst South pilot (Wells 26 to 29) to include two additional wells (Dewhurst 30 and 31). This application also included expansion of the Dewhurst 13 to 18H pilot by adding additional lateral wells. This

application was approved on 18/7/2014 but did not include the beneficial use of gas with excess gas continuing to be flared at Dewhurst 28. It was noted that the two new wells (Dewhurst 30 and 31) had not been drilled at the time of the audit.

In May 2017, Santos lodged Modification No. 1 (Mod 1) which requested to extend the period that the existing wells in the development may be operated for a further three years. Mod 1 was approved 14/7/2017.

In June 2018, Santos lodged Modification No. 2 (Mod 2) which sought to allow gas recovered from prospecting activities at the Dewhurst South 26-31 pilot wells to be beneficially used in the Wilga Park Power Station for the generation of electricity. Mod 2 was approved on 23/7/2018. It is expected that works to connect the Dewhurst South pilot to the Wilga Park Power Station will be completed late 2018 or early 2019. An activity approval modification for these works was approved by the Regulator on 14/9/2018.

The activity approval for the Tintsville pilot (dated 22/12/2009) permits the beneficial use of gas at Wilga Park through description of this system in the REF. The Tintsville pilot is not yet connected to the Wilga Park Power Station and all gas produced is currently flared at the Tintsville flare. It is expected that works to connect the Tintsville pilot to the Wilga Park Power Station will be completed late 2018 or early 2019.

For both the Dewhurst and Tintsville wells, the 1000-day limit will commence from the date that gas is first beneficially used from these wells.

Wilga Park Power Station

Wilga Park Power Station was originally constructed and operated under a development consent issued by Narrabri Shire Council on 14/11/2002. This consent (and subsequent modifications) allowed the power station to operate up to a capacity of 12MW using gas extracted from the Coonarah gas field in PPL3.

In December 2008, Major Project MP07_0023 was approved which permitted:

- construction and operation of gas gathering systems at the Bibblewindi and Bohena CSG pilots
- construction and operation of gas compression facilities at Bibblewindi and Bohena pilots
- construction of a 32km buried gas flow line between the Bibblewindi and Bohena pilot and the Wilga Park Power Station
- the staged expansion and operation of the Wilga Park power station from a capacity of 12MW to 40MW, fuelled by gas extracted from the Bibblewindi and Bohena pilots.

This approval has been modified on several occasions, the most recent of which was Modification 6 (Mod 6) which sought to allow the receipt of gas for beneficial use at the power station from the Tintsville and Dewhurst South 26-31 pilot wells located within PEL238.

The approval for Mod 6 dated 23/7/2018 inserts a new condition 1.4A into the Project Approval which states:

1.4A Gas may only be received for beneficial use at the Wilga Park Power Station from the following wells:

- *Wells located within Petroleum Assessment Lease 2*
- *Tintsville pilot wells 2, 3, 4, 5, 6, and 7*
- *Dewhurst pilot wells 26, 27, 28, 29, 30 and 31*

Based on a review of the approvals and associated documentation for the Wilga Park power station, it is concluded that relevant approvals are in place to facilitate the beneficial use of gas.

Gas and power metering

Gas wells

Gas flow meters have been installed at each gas well to measure the volume of gas being generated. Generally, the meters are either a Foxboro I/A Series Intelligent Electronic Multivariable Transmitter (MVT) with orifice plate or a Foxboro I/A Series Intelligent Vortex Flowmeter (Vortex flowmeter) (Photo 1), both of which are robust and require no routine maintenance or recalibration according to a review of the manufacturers documentation. Santos field staff reported that the meters have been very reliable with none needing replacement or repair in the last five years. The meters are of a design where they either read or fail, so it is possible to tell when a meter is not functioning. The gas flow metering equipment at each well has the capability to record and store data on site for about 60 days so in the event of telemetry or power failure, data is not lost and can be retrieved manually from the wellhead.

The Dewhurst South pilot currently sends all produced gas to the flare at Dewhurst 28. An ultrasonic meter (Endress + Hauser Pro-sonic Flow B) (Photo 2) has been installed on the flare line to measure the amount of gas being flared from the four wells in the pilot. Further metering will be installed when the Dewhurst pilot is connected to the Bibblewindi compressor station.

Bibblewindi compressor station

There are two gas meters at the Bibblewindi compressor station (Photo 3). The first measures the total volume of gas flowing in to the station, and the second measures the volume of gas flowing out of the station in the pipeline to the Wilga Park Power Station. The difference between these two volumes is what is sent to the Bibblewindi flare. Both gas meters at the station are MVT meters with orifice plates. Data from the meter screen in the station control room showed that on Monday 20/8/2018, 2.63 mcf/d was sent from Bibblewindi to the power station and 0.78mcf/d was sent to the flare. All this gas came from the Bibblewindi East and West pilots.

Wilga Park Power Station

At Wilga Park Power Station, incoming gas from the Bibblewindi compressor station is measured through an ultrasonic meter. The control room at the power station tracks the volume of incoming gas and the amount of power produced by the operating units. At the time of the audit, three of the four 3MW units were in operation, along with the three 1MW units, giving a total power production of approximately 12MW from a gas inflow of 2711.12 Nm.

Essential Energy inspects and maintains the power metering for all energy produced from the Wilga Park Power Station.

Records and reporting

Data on the gas flows from each well are maintained in the PORT (Production and Operations Reporting) system. The data in this system was reviewed by the audit team and compared to the data coming direct from the telemetry system. For example, gas flow data observed on the meters at the Bibblewindi compressor station showed that 2.63 mcf/d was sent to the power station on 20/8/2018 with 0.78 mcf/d sent to the flare. Data in the PORT system reflected the same figures.

Although Santos is recording and tracking the volume of gas produced from each well, there is a common flow line from a central collection point in each of the Bibblewindi East and West pilots which is then combined at the inflow to the Bibblewindi compressor station. It is not possible to track (nor is it considered necessary) what proportion of gas from each individual well is sent to the flare or beneficially used at Wilga Park, once it has been combined at the Bibblewindi station.

For the purposes of the 1000-day limit, Santos is using the whole of each pilot as the operating unit, rather than the individual wells within each pilot. If the whole pilot is offline, then that would be no beneficial use for that day for that pilot. However, if only one or two wells within the pilot are offline (as is often the case with appraisal pilots) but the pilot as a whole is still online, then that would be counted as a day of beneficial use for each well within the pilot, provided a proportion of gas has been sent from Bibblewindi to the power station. Using this method, the 1000-day limit will be reached when a pilot (as a whole) has reached the 1000-day beneficial use mark, even though not all the wells in the pilot may have been online all that time. This is a very conservative approach.

Santos is using the ComTrack compliance management software to manage its compliance obligations. A review of the ComTrack system showed that the 1000-day limit for beneficial use of gas has been included in ComTrack for the Bibblewindi East and West pilots. At the time of the audit, the 1000-day limit had not been reached for any of the wells. ComTrack provides a 30-day notification prior to the limit being reached so that gas flows to the power station can be monitored and stopped once the 1000-day limit is reached.

The conditions attached to PAL2 include Condition 15 which requires Santos to submit monthly gas flow reports that detail the gas flow rates for each well connected to the gas gathering system, and the total gas flow in to the treatment facility. Santos has been submitting these reports as required since 2014 but these reports only cover the Bibblewindi East and Bibblewindi West pilots in PAL2.

Similar reporting conditions are not included in PEL238, therefore there is currently no requirement for Santos to report gas flows from the Dewhurst or Tintfield pilots.

Royalty

As part of the audit, Santos had in attendance the officer who manages the royalty reporting functions. These functions are conducted from Santos's office in Brisbane.

As mentioned under Records and Reporting, the data on gas flow volumes is managed by the PORT system. This system monitors each well and can provide reports by well or field on a daily or monthly basis. Gas volumes are measured in cubic feet, but for reporting purposes they are converted to terajoules (TJs). For royalty purposes, volumes of gas are recorded by lease/licence, rather than by field.

Under the provisions of Clause 16(3) of the PO Reg, royalty is payable for the Bibblewindi wells which are currently beneficially using gas, and as such royalty returns are required to be provided. Santos has provided monthly royalty returns since 2014. As the allowable deductions are greater than the revenue received for the beneficial use of gas, no actual royalty has been paid by Santos.

In relation to PEL238, once the Tintsville and Dewhurst pilots are connected by pipeline to the Wilga Park Power Station, royalty returns will be required for these wells under Clause 16(3) of the PO Reg, once the beneficial use of gas has commenced.

The audit team examined the royalty records and procedures used by Santos. The procedures that Santos has in place have direct links to gas volume data from PORT and ComTrack systems. Allowable deductions to determine the net well head value are consistent to that reported in an audit conducted in 2015. Depreciation schedule of assets were linked into the reporting process and calculated correctly over the life of the asset, mostly 10 years, but some over 25 years.

Overall, Santos maintain a strong, easy to follow and well-maintained royalty reporting system.

Audit conclusions

From the evidence reviewed during the audit, and observations made on site during the audit site inspections, it was concluded that Santos has good systems and processes in place for recording gas production from each well, including volumes sent to the flares, and volumes sent to the Wilga Park Power Station. Records of daily production from each well are maintained, however for the purposes of calculating the 1000-day limit for beneficial use, Santos is using the whole pilot as the operating unit. Using this method, the 1000-day limit will be reached when at least one well in each pilot has reached the 1000-day mark, even though not all the wells in the pilot may have been online all that time. This is a conservative approach.

Gas flow meters have been installed on each well in the pilot. Generally, the flow meters are quite robust and do not require routine maintenance or recalibration. Gas flow metering is also installed at the Bibblewindi compressor station and at the inflow to the Wilga Park Power Station. Power metering has been installed at the power station to measure the amount of power produced by the power station.

Santos maintains a strong, easy to follow and well-maintained royalty reporting system and royalty returns have been provided as required for the Bibblewindi wells.

No issues were identified during the audit.

Photographs

Photo 1: Vortex flowmeter installed at Dewhurst 27.



Photo 2: Ultrasonic gas flow meter installed on the flare line at Dewhurst 28.



Photo 3: Gas metering and flare at Bibblewindi compressor station.

