NSW Resources
Resources Regulator

Compliance audit program

PEL238, PAL2, and PPL3 – Narrabri gas project

Santos NSW Pty Ltd

Santos NSW (Narrabri Gas) Pty Ltd

Santos NSW (Eastern) Pty Ltd

Santos NSW (Hillgrove) Pty Ltd

Santos QNT Pty Ltd

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1. Introduction

1.1. Background

Petroleum exploration licence 238 (1955) was granted to Consolidated Petroleum Australia NL and Australian Gas Light Company on 1 September 1980. The title was transferred to Eastern Star Gas Limited and Truenergy Gunnedah Gas Pty Ltd on 27 August 2012. The names of the companies were changed to Santos NSW Pty Ltd and Santos NSW (Narrabri Gas) Pty Ltd in 2012 and 2022 respectively. PEL238 is about 27 kilometres south-west of Narrabri in northern NSW.

Petroleum assessment lease 2 (1991) was granted to Eastern Star Gas Limited on 30 October 2007. The company name was changed to Santos NSW Pty Ltd in 2012. The title was transferred to Santos NSW Pty Ltd and Energy Australia Narrabri Gas Pty Ltd in March 2014. Energy Australia Narrabri Gas Pty Ltd changed its name to Santos NSW (Narrabri Gas) Pty Ltd in April 2022. PAL2 is about 30 kilometres south-west of Narrabri in northern NSW.

Petroleum production lease 3 (1991) was granted to Narrabri Power Limited on 15 December 2003. The title was transferred to Australian Coal Bed Methane Pty Ltd and Santos QNT Pty Ltd on 16 March 2011. PPL3 is about 21 kilometres west of Narrabri in northern NSW.

Santos NSW Pty Ltd is the conventional gas operator for PEL238. Santos NSW (Eastern) Pty Ltd is the operator for PAL2 and PPL3 and the coal seam gas operator for PEL238.

Santos NSW Pty Ltd and Santos NSW (Eastern) Pty Ltd will be collectively referred to as Santos for the purposes of this report.

The Narrabri gas project, covering parts of PEL238, and all PAL2 and PPL3, was approved as a state significant development by the Independent Planning Commission on 30 September 2020. Phase 1 of the approved project permitted the continuation of the exploration and appraisal operations in PEL238, PAL2 and PPL3.

As part of the compliance audit program, an audit of the exploration activities associated with the Gunnedah area exploration project within PEL238, PAL2 and PPL3 was undertaken on 4 and 5 December 2024 by the Resources Regulator within the Department of Primary Industries and Regional Development, and NSW Environment Protection Agency (EPA) as the lead regulator for petroleum.

1.2. Audit objectives

The objectives of the audit were to:

- undertake a compliance audit of the Santos petroleum exploration and production activities against the requirements of the *Petroleum (Onshore) Act 1991* and the conditions of the exploration licence, assessment lease, and production lease issued pursuant to that Act.
- assess the operational performance of the exploration and/or production activities and the ability of the titleholder to implement management systems and controls to provide for sustainable management of the operations.

1.3. Audit scope

The scope of the audit included:

- operation of the exploration and/or production activities associated with PEL238, PAL2 and PPL3 including:
  - management and monitoring of operating wells within PEL238 and PAL2
  - management and monitoring of shut-in/suspended wells within PEL238, PAL2 and PPL3
  - rehabilitation and partial rehabilitation of wells and infrastructure within PEL238, PAL2 and PPL3
  - operation of water management facilities and other infrastructure including:
    - Leewood water management facility
    - Bibblewindi facility, including water balance tank, gas plant and flare
    - Tintsfield Ponds
    - gas and water pipelines
  - management of appraisal pilot wells from which gas is being beneficially reused, particularly in relation to the metering of gas
  - management and operation of the Wilga Park Power Station, particularly in relation to metering of incoming gas supply and outgoing electricity production for beneficial reuse of gas
- a review of documents and records pertaining to the exploration operations for the period commencing 2 December 2022 and ending 5 December 2024.

1.4. Audit criteria

The audit criteria against which compliance was assessed included:

- *Petroleum (Onshore) Act 1991*
- Petroleum (Onshore) Regulation 2016
- Conditions attached to PEL238 (granted 1 September 1980, last renewed 12 April 2022)
- Conditions attached to PAL2 (granted 30 October 2007, renewal pending)
- Conditions attached to PPL3 (granted 15 December 2003, renewal pending)
- Commitments made in:
  - PEL238 - Coal Seam Gas Exploration and Appraisal: Produced Water Management Plan – Tintsfield Water Management Facility (Santos document no. 0041-150-PLA-0027, Revision 0, June 2023)
  - PEL238 and PAL2 – Narrabri Gas Project: Rehabilitation Management Plan – Phase 1 (Santos document no. 0041-150-PLA-0001, Revision 0, November 2022)

  - PEL238 and PAL2 – Narrabri Gas Project: Produced Water Management Plan – Phase 1 (Santos document no. 0041-150-PLA-0018, Revision 0, January 2024)
  - PAL2 – Petroleum Assessment Lease No. 2 – Petroleum Operations Plan, 1 October 2023 to 30 September 2024
  - PPL3 – Petroleum Production Licence 3: Petroleum Operations Plan (May 2022)
- Exploration code of practice: Environmental management (version 3, September 2017, version 4, June 2021, and/or version 5, March 2022)
- Exploration code of practice: Rehabilitation (version 3, September 2017, version 4, June 2021 and/or version 5, March 2022)
- Exploration code of practice: Community consultation (version 1.1, May 2016, version 2.0, October 2022, and/or version 2.1, May 2023)
- Exploration code of practice: Produced water management, storage and transfer (version 3, September 2017, version 4, June 2021, and/or version 5, March 2022)
- Code of practice for construction, operation and decommissioning of petroleum wells (February 2023)
- Exploration reporting: A guide for reporting on exploration and prospecting in New South Wales (version 3, October 2021 and version 4, January 2022)
- Exploration guideline: Annual activity reporting for prospecting titles (version 3.0, December 2020 and version 4, October 2022)

1.5. Publishing and disclosure of information

This audit report was published on the Regulator's website consistent with:

- Section 113M of the *Petroleum (Onshore) Act 1991*
- Resources Regulator's *Compliance Publication Policy*
- *Government Information (Public Access) Act 2009*.

2. Audit methods

The audit process involved interviewing site personnel, reviewing documentation and samples of records provided by the licence holder and/or operator to determine the level of compliance of the operations and assess the status of the operational performance. The audit process and methodology are described in more detail in the sections below.

2.1. Opening meeting

An opening meeting was held onsite on 4 December 2024. The audit team, which included representatives from the Resources Regulator and the EPA, 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, including the interview of personnel, review of documentation, examination of records and a site inspection to assess specific compliance requirements.

2.2. Site interviews and inspections

2.2.1. Data collection and verification

Where possible, documents and data provided during the audit process were reviewed electronically on the day. Where documents were unable to be reviewed on the day, they were provided following the audit.

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 records, including site photographs, where possible. Where suitable verification could not be provided, this has been identified in the audit findings as not determined.

2.2.2. Site inspections

A site inspection was undertaken of the following exploration activities on PEL238, PAL2 and PPL3:

PEL238

- Dewhurst 27 – operational well
- Dewhurst 28 – operational well
- Dewhurst 2 – rehabilitation completed and in monitoring phase
- Tintsfield ponds

PAL2

- Bibblewindi 9 – suspended well
- Bibblewindi 22 – operational well
- Bibblewindi 23 – operational well
- Bibblewindi 24 – operational well

- Bibblewindi 25 – operational well
- Bohena 3 – well plugged but not decommissioned
- Bohena 6 – rehabilitation completed and in monitoring phase
- Bibblewindi facilities
- Leewood water management facility

PPL3

- Wilga Park 1 – suspended well
- Wilga Park power station

2.3. Closing meeting

A closing meeting was held on site on 5 December 2024. The objectives of this meeting were to discuss any outstanding matters, present preliminary findings and outline the process for finalising the audit report.

2.4. Compliance assessment definitions

The reporting of results from the compliance audit was determined based on the definitions presented below in Table 1.

Table 1 Compliance assessment definitions

Assessment	Criteria
Compliance	Sufficient and appropriate evidence is available to demonstrate the particular requirement has been complied with.
Non-compliance	Clear evidence has been collected to demonstrate the particular requirement has not been complied with. There are three subcategories of non-compliance reflecting the severity and level of risk associated with the non-compliance: NC1 – the absence of planning or implementation of a required operational element which has the potential to result in a significant risk. NC2 – an isolated lapse or absence of control in the implementation of an operational element which is unlikely to result in a significant risk. NC3 – an administrative or reporting non-compliance which does not have a direct environmental or safety significance. Note: The identification of a non-compliance in this audit may or may not constitute a breach of, or offence under, the *Mining Act 1992*. Non-compliances identified in this audit report may be further investigated by the Regulator and regulatory actions may be undertaken.
Observation of concern	Where an auditee may be compliant at the time of the audit but there are issues that exist that could result in the potential for future non-compliance if not addressed.

Assessment	Criteria
	Observation of concern was also used where an issue may not have particular compliance requirements, but which was not conducive to good management or best practice.
Suggestion for improvement	Where changes in processes or activities inspected or evaluated at the time of the audit could deliver improvement in relation to risk minimisation, sustainable outcomes and management practices.
Not determined	The necessary evidence has not been collected to enable an assessment of compliance to be made within the scope of the audit. Reasons why the audit team could not collect the required information include: • insufficient information on the file relating to the period covered by the audit or insufficient evidence collected to reach a conclusion • the wording on the criteria (approval condition) meant that no evidence could be gathered, or it was too difficult to gather the evidence. A 'not determined' assessment was also made where the condition was outside the scope of the audit.
Not applicable	The circumstances of the authorisation or licence holder have changed and are no longer relevant (e.g. no longer mining, mining equipment and plant has been removed). An invoking element in the criteria was not activated within the scope of the audit.

2.5. Reporting

Following completion of the 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 documentation review 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 as discussed in the audit findings.

3. Audit findings

3.1. Work program

Section 14 (1) of the *Petroleum (Onshore) Act 1991* required an application for a petroleum title to be accompanied by a proposed work program that:

- indicates the nature and extent of operations to be carried out
- sets out commitments relating to the conduct of those operations (such as the timing of the operations)
- provides for the carrying out of activities (such as community consultation and environmental management and rehabilitation) in connection with those operations.

Section 14 (2) identified the requirements for a work program for a petroleum production lease (PPL) was satisfied by providing a current development consent under the *Environmental Planning and Assessment Act 1979* for those petroleum production operations.

Clause 9 of the Petroleum (Onshore) Regulation 2016 required operations to be carried out as described in the approved work program and in compliance with any commitments in relation to the conduct of operations specified in the work program.

An approved work program was in place for PEL238 based on the work program submitted with the renewal in April 2022. This work program was varied by an endorsement schedule dated 3 May 2024. Evidence was available to confirm the work program was progressing. A review of the annual exploration reports for 2023 and 2024 for PEL238 showed the following works were progressed:

- ongoing care and maintenance of existing pilots and associated infrastructure including:
  - Dewhurst lateral pilot
  - Dewhurst North pilot
  - Dewhurst South pilot
  - Tintsfield lateral pilot
  - other individual wells in PEL238
- operation of the existing pilot production wells and appraisal of data
- appraisal and production evaluation to assist with reservoir knowledge
- field development planning
- drilling of 2 water monitoring bores as part of the groundwater monitoring plan.

State significant development consent SSD-6456 was used as the basis for the work program in PAL2 and PPL3. A review of the annual exploration reports for 2023 and 2024 for PAL2 and PPL3 showed the following works were progressed:

PAL2

- ongoing care and maintenance of existing pilots and associated infrastructure including:
  - Bibblewindi East multi-lateral pilot

  - Bibblewindi West tri-lateral pilot
  - other individual wells in PAL2
  - ongoing water management at Leewood water management facility
- operation of the existing pilot production wells and appraisal of data
- appraisal and production evaluation to assist with reservoir knowledge
- field development planning

PPL3

- plugging and decommissioning of Coonarah 4
- maintenance of well sites and gathering systems
- well integrity inspections, testing and assessments
- implementation of the leak detection and repair program
- inspection and cathodic protection of the gas gathering system.

Exploration data was noted to be maintained by the Santos geologists and petroleum engineers and submitted to NSW Resources with the annual activity reports as required.

3.2. Access arrangements

Section 69C of the *Petroleum (Onshore) Act 1991* stated, 'the holder of a prospecting title must not carry out prospecting operations on any particular area of land except in accordance with an access arrangement or arrangements applying to that area of land'. The access arrangement was required to be agreed in writing between the holder of the prospecting title and each landholder of that area of land.

Written land access agreements were in place for PEL238, PAL2 and PPL3. The Santos internal disturbance planning process included a check to ensure access agreements were in place before any activities took place.

A large part of the exploration operations was conducted within the Bibblewindi and Pilliga state forests. Santos obtained a permit from Forestry Corporation of NSW (Forestry) for the exploration operations. A copy of the permit dated March 2020 was sighted during the audit. Santos also had an agreement with Forestry for maintenance of nominated tracks.

Santos staff said regular meetings were held with Forestry to discuss the operations. Any obligations identified from consultation with Forestry were integrated into the Santos rehabilitation management plan or other relevant management plans prepared for the Narrabri gas project.

For exploration operations on private lands, Santos negotiated land access agreements which were included in property management plans for each property. The property management plans included details on the works proposed, access points for vehicles and indicative timeframes for completion of the works. Examples of property management plans were reviewed by the audit team, for example for the property management plan for the Dewhurst 35 water monitoring bores that were drilled on privately owned land.

In addition to the land access agreements, Santos implemented a notice of intention to visit process, which notified landholders about 2 weeks in advance of planned activities.

3.3. Native title and exempted areas

Section 70 of the *Petroleum (Onshore) Act 1991* required the consent of the Minister before a licence holder undertook any activities within an exempted area. Standard condition 1 of exploration licences relating to native title did not apply to PEL238 as noted on the instrument of renewal. There were no conditions relating to native title on either PAL2 or PPL3.

A large part of the exploration operations in PEL238 and PAL2 were conducted in the Bibblewindi and Pilliga State Forests. Santos was granted Ministerial consent under section 70 of the *Petroleum (Onshore) Act 1991* in September 2013 to conduct operations within the Bibblewindi and Pilliga State Forests. No further approvals under section 70 were required.

It was observed Santos maintained a geographic information system (GIS) that included information of Crown lands and other exempted areas where native title may apply. This was used for planning purposes and checks for exempted areas and native title were included in the internal disturbance planning process.

3.4. Community consultation

Condition 2 of PEL238 required the licence holder to carry out community consultation in relation to the planning and conduct of exploration activities. Community consultation was required to be carried out in accordance with the requirements of Exploration code of practice: Community consultation.

An assessment against the mandatory requirements of the code of practice was undertaken for PEL238 as documented in the following sections. There were no requirements for community consultation included in the conditions of PAL2 or PPL3. Generally, community consultation and engagement were very well managed.

3.4.1. Risk assessment

Mandatory requirement 1 of the code of practice required the licence holder to conduct a risk assessment to identify and consider the range of opportunities and potential threats associated with community consultation and engagement.

Santos undertook a community consultation risk assessment for the broader Narrabri gas project, which was documented as part of the community consultation strategy. The risk assessment was primarily focussed on the risks associated with each stakeholder group, rather than threats and opportunities for consultation and engagement overall. As suggestion for improvement one, it was recommended that Santos review the community consultation risk assessment against the objectives for consultation such that the risk assessment can focus on the risks and opportunities that need to be identified and managed to facilitate an inclusive and effective consultation program.

3.4.2. Community consultation strategy

Mandatory requirement 2 required the preparation of a community consultation strategy to manage the risks identified in the risk assessment. Mandatory requirement 3 set out the requirements for preparation of the community consultation strategy.

Santos prepared a consultation strategy for the broader Narrabri Gas project which included PEL1, PEL12, PEL238, PEL427, PAL2 and PPL3. The NSW Community Consultation Plan: 1 January 2024 to 31 December 2024 generally followed the guidance material in the code of practice and included:

- objectives for consultation
- a description and analysis of community stakeholders and impacts
- a description of how consultation would be undertaken
- a process for review and amendment of the strategy when required.

The strategy title included the 6 petroleum titles that make up the wider Narrabri gas project. Records confirmed that the strategy was generally implemented on all 6 titles. It was noted the strategy was heavily focused on PEL238, particularly in the background section. This was raised as observation of concern one. It was recommended Santos update the strategy to make it clear it applied to all 6 titles and included information specific to each title.

3.4.3. Implementation and reporting

Mandatory requirement 4 required the licence holder to implement, monitor and report annually on the community consultation strategy.

Santos used a variety of consultation tools as described in the consultation strategy. Monthly activity updates were prepared and distributed to key stakeholders, community organisations and interested subscribers. These were also available on the Santos Narrabri gas project website that included fact sheets and links to community consultation reports and other information.

A Santos shopfront was established in Narrabri. Interested members of the public and any other stakeholders could obtain information from the shopfront where Santos staff were available to answer queries and receive feedback.

Santos established a community consultative committee (CCC) for the Narrabri gas project in accordance with its development consent. Exploration activities in the wider Narrabri gas project area, including exploration activities in PEL238 were noted to be discussed at the CCC meetings.

Comprehensive annual community consultation reports were prepared and published on the Santos Narrabri gas project website for PEL238. Reports were also submitted to the Regulator with the annual activity reports, although this was not required after October 2022.

The reports included a discussion of the outcomes of consultation activities, and an evaluation of the effectiveness of the consultation activities. Both the outcomes and effectiveness of the consultation activities was related back to the objectives for consultation as described in the community consultation strategy.

Santos maintained detailed records of all consultation activities in its SRM database. This included:

- a comprehensive listing of stakeholders and their contact details

- copies of correspondence sent to stakeholders
- details of complaints and enquiries.

3.5. Exploration activity approvals

Sections 31A and 36A of the *Petroleum (Onshore) Act 1991* required the holder of an exploration licence or an assessment lease (respectively) to obtain an activity approval prior to carrying out assessable prospecting operations.

Evidence was available to confirm that assessable prospecting operation approvals were sought and granted for exploration activities. Assessable prospecting operation approvals granted included:

- assessable prospecting operations application dated 7 November 2022 for the Narrabri gas project phase one wells in PEL238 including Dewhurst 35 and Dewhurst 40 to 43, and associated approval dated 12 December 2022 (MAAG0015102).
- assessable prospecting operations application dated 7 November 2022 for the Narrabri gas project phase one wells in PAL2 including Dewhurst 34, Bibblewindi 30 and Bibblewindi 31, and associated approval dated 12 December 2022 (MAAG0015105).

The activities subject to the assessable prospecting operation approvals in both PEL238 and PAL2 were not commenced.

3.6. Environmental management

Condition 3 of PEL238 required the licence holder to prevent or minimise so far as is reasonably practicable, any harm to the environment arising from the activities carried out under the licence. Condition 2 of the assessable prospecting operation approvals for PEL238 and PAL2 required the licence holder to carry out the activity in compliance with Part B of the Exploration code of practice: Environmental management.

An assessment against the mandatory requirements of the code was not completed as part of the audit. The activities subject to the code on both PEL238 and PAL2 were not commenced.

Condition one of PAL 2 and PPL3 required the lease holder to implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation or rehabilitation of the exploration activities.

Santos prepared an environmental management strategy and a series of environmental management plans as part of its state significant development consent requirements for the Narrabri gas project. Each of the management plans included an assessment of risks for its specific issue (e.g. water management) and identified controls to mitigate those risks. An assessment of compliance against each of the state significant development consent management plans was beyond the scope of the audit.

No evidence was sighted during the audit site inspection to suggest any environmental harm had occurred or was occurring.

3.7. Cultural heritage

Condition 17 of PEL238 required the licence holder not to knowingly destroy, deface or damage any Aboriginal object or place, and to take every precaution against any such destruction, defacement or damage.

A comprehensive Aboriginal cultural heritage assessment was completed for the environmental impact statement for the Narrabri gas project. From that, Santos mapped all known cultural heritage items as a GIS layer, including exclusion zones around each item. This information was used by Santos in the internal disturbance planning process to identify and void impacts to cultural heritage.

As an example of cultural heritage management, it was noted a scarred tree was present at the site of the Tintsfield Ponds. Santos said the site was identified to the construction contractors and fenced off. Confirmation of fencing was sighted during the audit site inspection (Figure 1).

Figure 1: Fencing around scarred tree at Tintsfield Ponds

3.8. Produced water management

Condition 3 of the activity approval for assessable prospecting operations for the phase 1 exploration activities in PEL238 and PAL2 required the licence holder to comply with the mandatory requirements of the Exploration code of practice: Produced water management, storage and transfer.

The assessable prospecting operations approved for phase one were not commenced. The conditions of the approval were not triggered. However, Santos had existing produced water management facilities operating for several years to manage produced water generated from the appraisal operations in both PEL238 and PAL2.

Section 3.2 of the petroleum operations plan (POP) prepared by Santos for PAL2 identified the produced water management strategy for PAL2 was described in the Narrabri Gas Project Produced Water Management Plan Phase 1 that was prepared by Santos as a requirement of the state significant development consent. The development consent condition required Santos to design, install and maintain produced water infrastructure in accordance with the code of practice.

Section 3.2 of the POP prepared by Santos for PPL3 referenced the produced water management plan for the Tintsfield pilot. It was noted no produced water was generated from PPL3 during the reporting period and no water was expected to be produced as production operations were suspended and were likely to remain suspended for the reporting period of the POP.

An assessment against the Exploration code of practice: Produced water management, storage and transfer was completed for the Narrabri gas project. The produced water management facilities included the Leewood water management facility within PAL2 (Figure 2) and the Tintsfield Ponds within PEL238 (Figure 3).

Figure 2: Lined pond at Leewood produced water management facility

Figure 3: Lined Pond 1 at Tintsfield produced water management facility

3.8.1. Produced water management plan

Mandatory requirement one required the licence holder prepare and implement a produced water management plan (PWMP) before commencing petroleum exploration, which required the management of produced water. Mandatory requirements 1.1, 1.3 and 1.4 required the PWMP to include:

- a description of the activities associated with produced water
- how identified risks would be managed and mitigated, including the characterisation, consideration of beneficial reuse, and the fate of the produced water
- a site-specific water balance that was to be maintained during the activities.

Mandatory requirement 1.5 required the PWMP to be submitted to the Regulator. There was no approval requirement for the PWMP.

Narrabri gas project produced water management plan

The Leewood produced water management facility in PAL2 was the main water management facility for the Narrabri gas project. Additional facilities were at Bibblewindi, including a 5 megalitre water balance tank that was used to manage the produced water flows between the gas field and the water treatment plant at Leewood.

Operation of the produced water management system for the Narrabri gas project was described in the Narrabri gas: project Produced water management plan prepared by Santos. The PWMP was reviewed by the audit team. The review confirmed:

- a brief overview of the Narrabri gas project phase 1 activities was documented in section 1.1.2
- characterisation of the produced water, including quantity and quality of water produced, was documented in section 4
- a site water balance was prepared and included as an appendix to the water management plan
- a risk assessment which documented the mitigation measures required to manage risks was included in section 8. For example:
  - pressure gauges were fitted to wellhead equipment and monitored remotely through a Supervisory Control and Data Acquisition (SCADA) system. Any change in pressure was investigated immediately and in the event of a leak, the well shut in
  - well integrity was monitored through a leak detection and repair program (LDAR) in accordance with the Santos Well Integrity Control Plan
- a monitoring program, including a leak detection and repair program was documented in section 9.

Tintsfield produced water management plan

The Tintsfield Ponds produced water management system was an existing facility with a produced water management plan before the code of practice for produced water management came into force. The previous conditions of PEL238 (condition 14) required the preparation of a produced water management plan prepared in consultation with the NSW Office of Water and the EPA. Previous produced water management plans for the Tintsfield Ponds were provided over several years.

The upgrade of the Tintsfield Ponds in 2023-2024 triggered the revision of the produced water management plan under mandatory requirement 4.1.

Santos prepared the Coal seam gas exploration and appraisal produced water management plan – Tintsfield water management facility, which was reviewed by the auditors. The review confirmed:

- characterisation of the produced water, including quantity and quality of water produced, was documented in section 2
- the produced water management activities were described in section 3, including:
  - a site water balance was documented in section 3.2 - this included the interaction with the Leewood Ponds water management facility as part of the broader Narrabri Gas Project
  - a description of how the Tintsfield Ponds produced water storage operated was provided in section 3.3
- a risk assessment which documented the mitigation measures required to manage risks was included in section 4. For example:
  - pressure gauges were fitted to wellhead equipment and monitored remotely through a Supervisory Control and Data Acquisition (SCADA) system. Any change in pressure was investigated immediately and in the event of a leak, the well shut in

  - well integrity was monitored through a leak detection and repair program (LDAR) in accordance with the Santos Well Integrity Control Plan
- a monitoring program, including a leak detection system was documented in section 5.

Santos provided the updated PWMP for the Tintsfield Ponds to the Regulator in July 2024.

3.8.2. Produced water storage

Mandatory requirements 2.1 to 2.4 set out the requirements for the storage of produced water. These included:

- evaporation ponds must not be used to manage produced water
- produced water storage facilities must:
  - not be operated beyond its intended design life
  - have a secondary containment if the facility has the capacity to store more than 5 cubic metres of water
  - have the capability to detect leaks of produced water through the primary containment
- if ponds were used to store produced water:
  - design and installation of the pond must comply with the requirements specified in a construction quality assurance program
  - the pond must contain an environmental freeboard capable of containing inflow from events up to an including a 1 in 100 year Annual Exceedance Probability (AEP) 72 hour rainfall event, without discharge
  - the pond must be located to be structurally stable in all events up to an including the probable maximum flood, must not be located in any area that will increase flood risk to surrounding lands, and must have a spillway or overflow level located above the 1 in 100 year annual recurrence interval
- if geomembrane liners were used in the construction of the pond:
  - liners and seams must be watertight and seamed over the full length in accordance with the manufacturer's standard procedures
  - quality control testing must be conducted over the full length of seams and joins prior to storing any produced water in the pond
  - liners must be installed on a stable soil sub-base, free of protrusions that have the potential to compromise the liner
  - controls must be implemented to limit as far as practical the entry of terrestrial fauna that have the potential to damage the liner from entering the pond.

Santos was not using evaporation ponds to manage produced water from the Narrabri gas project. The design life for both the Leewood water management facility and the upgraded Tintsfield Pond 1 was 25 years. Both facilities were well within their intended design life.

Tintsfield Pond 2 was decommissioned and was not used for the storage of produced water. Tintsfield Pond 1 was used for temporary storage of produced water before transport to the main Leewood produced water management facility that provides treatment and beneficial reuse of produced water.

At both Leewood and Tintsfield water management facilities, produced water was stored in lined ponds. The liners were made of high-density polyethylene (HDPE) and were placed on a 6 millimetre thick, fibre reinforced clay liner.

Each pond consisted of a double HDPE liner system with a containment sump on each layer. These sumps acted as a leak collection system that transferred any produced water collected below the liner directly back into the pond.

The design and construction of the Tintsfield Pond upgrade was reviewed during the audit as an example of the design and construction process.

The design of the upgrade for Tintsfield Pond 1 was documented in the design report prepared by Golders/WSP for the project dated May 2023. Section 3.3 of the Tintsfield PWMP provided a summary of the design parameters and operating levels for the ponds from the design report. This included a statement 'maximum operating water level (MOWL) - is the liquid level designed to contain a 72-hour 100-year annual exceedance probability (AEP) storm event without discharge to the environment, known as the environmental containment freeboard (ECF). It is a regulatory requirement to maintain the ECF. The design provides a total ECF of 0.62 m, consisting of 0.42 m to contain the 1:100 AEP plus 0.2 m wind and wave run-up allowance.'

Geomembranes liners were used in the Tintsfield Pond upgrade. Records for quality control testing of liner seams and joins were noted to be included in the construction report for the Tintsfield upgrade project prepared by Golders/WSP dated January 2024.

Table A2 in Appendix A of the Tintsfield PWMP identified the Tintsfield Ponds were fully fenced to limit as far as practicable the entry of terrestrial fauna and the potential for subsequent damage to the liner. The fencing was verified by the auditors during the audit site inspection.

Pipelines were used to convey water to a centralised balance tank located at Tintsfield 7 well. Water was pumped from this balance tank to Tintsfield Pond 1 via a series of flow lines. The PWMP briefly described the produced water gathering and transfer system in section 3.1. Santos stated the design, construction and operation of the HDPE flowlines is undertaken in accordance with the Australian Pipelines and Gas Association's Code of Practice for Upstream Polyethylene Gathering Networks – CSG Industry (APGA, 2019) (as amended).

The flowline and pipeline monitoring was described in section 5.2 of the PWMP. Loss of containment of produced water from flowlines, pipelines and low points was included in the risk assessment documented in Table 4.1 of the PWMP. The control measures included 'Differential pressure flowmeters are used to determine if there are any losses of produced water along the pipeline network. In the event that a loss was detected, wellheads are able to be shut-in remotely.'

3.8.3. Trigger action response plan

Mandatory requirement 3 required the licence holder to include a trigger action response plan (TARP) in the produced water management plan. The TARP was required to set out specific procedures to be followed and actions to be taken for a series of defined events, including any detection of leakage through a primary containment, or the detection of leakage from a pipeline.

Santos prepared and documented a TARP in section 10 of the Narrabri Gas Project PWMP. Similar TARPs were included in section 6 of the Tintsfield PWMP. The TARPs included actions and notification requirements for a range of possible non-routine operating scenarios.

A TARP for pond water levels was documented in Table 6.1 of the Tintsfield PWMP and Table 10.1 of the Leewood PWMP. The pond water level TARPs identified actions and notifications required for various scenarios where the trigger levels related to the maximum operating water level and the full storage level were exceeded.

The TARPs addressed leakage through the primary containment as part of a primary leak collection system. It also included detection of leakage through the secondary leak collection system which included the depressurisation sump. Leakage rate monitoring parameters were documented in each PWMP.

Table 6.2 of the Tintsfield PWMP and Table 10.2 of the Leewood PWMP documented the TARP processes and actions for the leak detection system.

There was no specific TARP for the detection of pipeline leakage included in either PWMP, but both PWMPs referred to the Santos Pipeline Integrity Management System. It was noted the risk assessments included in the PWMPs stated 'Differential pressure flowmeters are used to determine if there are any losses of produced water along the pipeline network. In the event a loss is detected, wellheads are able to be shut-in remotely.'

Santos staff said there were no TARP triggers reached during the operation of either the Leewood or Tintsfield produced water management facilities. There was no loss of containment from the storages and water volumes were as expected or below. The audit team viewed the SCADA system screens for the Leewood and Tintsfield ponds and the associated water flowlines to confirm monitoring of the produced water management system.

3.8.4. Review of the plan

Mandatory requirement 4 required the licence holder to review and update the produced water management plan if any of the triggers were met. These triggers included:

- a direction by the Minister or the EPA
- if there were any changes to the way produced water was managed that required additional assessment under the *Environmental Planning & Assessment Act 1979*
- before making any significant changes to the design or operation of the produced water management system
- in the event a TARP is activated
- otherwise at intervals of no longer than one year.

If the PWMP was revised because of the review, an updated PWMP was required to be submitted to the Regulator.

There were no significant changes to the way produced water was stored or managed, and no TARP triggers were activated. Santos reviewed the Narrabri Gas project PWMP annually to confirm it was appropriate and effective for the management of produced water from the Narrabri gas project. The version provided for audit was dated January 2024.

The Tintsfield PWMP was revised in 2024 to update the plan to align with the as-built documentation after the completion of the Tintsfield Ponds upgrade project. An updated copy of the plan was provided to the Regulator in July 2024.

3.9. Rehabilitation

Condition 5 of PAL2 and PPL3 required the lease holder to rehabilitate disturbed lands to a sustainable/agreed end land use to the satisfaction of the Director-General. The requirements of the state significant development consent required Santos to prepare a rehabilitation management plan to the satisfaction of the Regulator. An assessment of compliance against the rehabilitation management plan prepared for the development consent was beyond the scope of the audit.

Condition 5 of PEL238 required the licence holder to carry out rehabilitation of all disturbance caused by activities carried out under the licence in accordance with the requirements of the Exploration code of practice: Rehabilitation. An assessment against the mandatory requirements of the code of practice was undertaken for the exploration activities in PEL238 as documented in the following sections.

3.9.1. Risk assessment

Mandatory requirement 1 required the licence holder to conduct a risk assessment to evaluate the range of potential threats and opportunities associated with rehabilitating disturbed areas to a condition that could support the intended final land use.

Santos undertook an assessment of the risks associated with rehabilitation of the phase 1 exploration and appraisal activities. This risk assessment was documented in Table 5.2 of the rehabilitation management plan prepared for the phase 1 activities on PEL238 and PAL2.

Risks assessed included:

- weed infestation and introduction of plant disease
- erosion due to site characteristics
- damage from livestock or fauna
- poor topsoil management
- lack of availability and quality of seed resources, including genetic integrity
- poor seed viability, seed dormancy.

Controls were outlined for each risk. Controls included:

- native seed banking for use in rehabilitation
- engineering design, construction design, maintenance to reduce the potential for erosion

- rehabilitation management plan includes weed management prior to topsoil stripping and reinstatement.

3.9.2. Rehabilitation objectives and completion criteria

Mandatory requirement 2 required the licence holder, not later than 14 days before the commencement of surface disturbing activities, to provide to the Secretary a copy of clear, specific, achievable and measurable rehabilitation objectives and completion criteria (ROCC). For higher risk prospecting operations, a rehabilitation management plan was required to be prepared and submitted with the rehabilitation objectives and completion criteria.

The definitions in Appendix 4 of the code of practice defined a higher risk prospecting activity to include the construction and use of petroleum wells, including associated water management, gas gathering and pipeline infrastructure.

The Narrabri gas project phase one exploration and appraisal activities in PEL238 and PAL2 were classified as a higher risk prospecting activity. A rehabilitation management plan was required to be prepared and submitted.

Santos prepared and submitted the Narrabri gas project: Rehabilitation management plan, Phase 1 in November 2022. It was noted the approved phase 1 exploration activities in PEL238 and PAL2 were not commenced. The plan included:

- a rehabilitation risk assessment (section 5)
- rehabilitation objectives and completion criteria (sections 7 and 9)
- a description of the rehabilitation program to be implemented for the project (sections 10 and 11)
- an outline of the rehabilitation monitoring program, including a rehabilitation TARP (sections 12 and 13).

3.9.3. Rehabilitation program

Mandatory requirement 3 required the licence holder to develop, implement and complete a rehabilitation program (which includes a monitoring program) to rehabilitate disturbed areas to a condition that could support the intended final land use. Mandatory requirement 5 required the licence holder to commence rehabilitation of a site as soon as reasonably practicable following the completion of activities on that site.

Section 10 of the rehabilitation management plan prepared for the phase 1 activities described the rehabilitation planning process and rehabilitation methods to be used for rehabilitation of the project. Final rehabilitation will not be completed until the decommissioning of the wells and infrastructure. Partial rehabilitation of the construction areas back to a minimal well pad area was planned at each well site.

For the older operational or suspended wells in PEL238, PAL2 and PPL3 inspected during the audit, it was confirmed Santos completed partial rehabilitation of well pads back to a minimum area for operational purposes. Annual rehabilitation monitoring was undertaken by an ecological consultant. Monitoring results were reviewed against the TARP outlined in the rehabilitation management plan. Santos said none of the TARP levels were triggered.

Figure 4, Figure 5, Figure 6 and Figure 7 show examples of partial rehabilitation completed. Rehabilitation was observed to be progressing on each site inspected. Some areas were impacted by bushfire in 2023.

Figure 4: Partial rehabilitation at Bibblewindi 22

Figure 5: Partial rehabilitation at Bibblewindi 24

Figure 6: Sediment fencing and mulch piles for partial rehabilitation at Dewhurst 28

Figure 7: Partial rehabilitation around Dewhurst 27 - rehabilitation was affected by 2023 bushfire

In 2011 and 2012, Santos was issued notices under section 77 of the *Petroleum (Onshore) Act 1*991 for various Bohena sites and for a section of land adjacent to the site of the Bibblewindi facilities. The notices required remediation and rehabilitation of the areas after incidents involving discharge of saline water occurred. Santos prepared the Bibblewindi and Bohena revegetation strategy which was used as the guide for the ongoing rehabilitation activities. The rehabilitation of these areas was progressing, and monitoring by an external consultant in 2023 confirmed it was on track to achieve the completion criteria. A bushfire in late 2023 affected the rehabilitation areas. Further monitoring was required to assess the impacts to rehabilitation progress.

Figure 8 and Figure 9 show the fire affected areas under rehabilitation that were inspected during the audit.

Figure 8: Bibblewindi rehabilitation area

Figure 9: Bohena rehabilitation area

3.10. Security deposit

Condition 4 of PEL238, condition 17 of PAL2 and condition 18 of PPL 3 required the licence holder to provide a security deposit to secure funding for the fulfilment of obligations under the licence.

The security amount required for PEL238 was $8,695,348, which department records confirmed was held. This amount included rehabilitation associated with the phase 1 exploration and appraisal activities approved in 2022 which were not commenced.

The security amount required for PAL2 was $49,024,000, which department records confirmed was held. This amount included rehabilitation associated with the phase 1 exploration and appraisal activities approved in 2022 which were not commenced.

The security amount required for PPL3 was $2,274,000. The security deposit was increased from $1,444,000 following a review of the rehabilitation cost estimate provided with a revised petroleum operations plan for PPL3. The additional security amount was pending payment.

3.11. Overlapping coal titles

Condition 8 of PEL238 and condition 19 of PPL3 required the licence holder to make reasonable attempts to enter into a co-operation agreement with the holder(s) of any overlapping coal titles. The condition was not imposed on PAL2. Condition 11 of PAL2 and PPL3, and condition 14 of PEL238, required the licence holder to undertake operations with regard to identifying, managing and minimising the impact of activities on the potential mineability of coal seams.

A search of the department's Minview system identified several overlapping coal titles held by Narrabri Coal Pty Ltd including:

- EL9455 (1992)
- EL9456 (1992)
- EL6243 (1992)
- ML1609 (1992)
- ML1839 (1992)

Authorisation AUTH216, held by the Secretary of Regional NSW, also overlapped PEL238. There were no overlapping titles in PAL2 or PPL3.

Santos staff said contact was made with the overlapping coal company and a meeting was held between Santos and Whitehaven Coal Pty Ltd in August 2023 to discuss an agreement. No formal co-operation agreement was in place.

3.12. Construction, operation and decommissioning of wells

The licence conditions for PEL238 were amended by an instrument of variation dated 29 August 2023 which replaced conditions 9 to 13 and 15 to 16 with one condition requiring the lease holder to design, construct, operate, maintain and decommission all petroleum wells in accordance with the Code of practice for construction, operation and decommissioning of petroleum wells published by Department of Regional NSW in February 2023.

The licence conditions for PAL 2 and PPL 3 were amended by an instrument of variation dated 29 August 2023 which replaced conditions 6, 9 to 10 and 12 with one condition requiring the lease holder to design, construct, operate, maintain and decommission all petroleum wells in accordance with the Code of practice for construction, operation and decommissioning of petroleum wells published by Department of Regional NSW in February 2023.

There were 28 operational wells producing gas across PEL238 and PAL2. There were no operational wells in PPL3. All gas produced from the 28 wells was piped to the Wilga Park Power Station for beneficial use. There were no drilling or workover activities in progress.

Given the stage of activities within the Narrabri gas project, the assessment against the Code of practice: Construction, operation and decommissioning of petroleum wells (2023) focussed on the sections related to well integrity management during the operational phase.

Well integrity ensured well fluids and gases were contained within the well infrastructure. Under the provisions of the code, licence or lease holders were required to have a management system in place to describe how well integrity was to be maintained for the well life cycle. It was noted there was also a requirement under the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 to have a well integrity control plan.

3.12.1. Well integrity management

Section 2.9 of the code of practice set out the mandatory requirements for well integrity management which included:

- being able to demonstrate well integrity through the establishment of a well integrity management system
- documenting and maintaining integrity records including the current operational status and completion status of all wells
- completing risk assessments if a well integrity issue was discovered, including the implementation of control measures for the well to continue operating.

Santos developed a well integrity management procedure which it applied to its New South Wales assets.

Verification of well integrity and barriers was documented in section 5.2 of the Santos well integrity procedure. A review of completed work orders confirmed the procedure was implemented. Santos completed a risk assessment to classify the wells into 'concern levels', with the concern level dictating the monitoring requirements and frequency for the wells.

The Santos well integrity management procedure was reviewed during the audit. The review confirmed:

- a regular wellhead maintenance program was documented in section 5.2
- procedures for inspections for identification of leaks was included in sections 1.1, 2.2 & 5.2.3
- a program for routine operational visits to wells was documented in section 5.2.2
- procedures for monitoring and management of annuli pressures were included in appendix D
- barrier maintenance and verification were described in section 5.2.3
- a program for assessment during the well life cycles of the wellhead, tubing and casing, for any wear due to erosion or corrosion, and its impact on well integrity was documented in section 5.2 and appendix E
- risk assessment and response levels for impaired barriers were described in appendix F
- well integrity records to be maintained were documented in section 6.2, and Table 11
- flowcharts describing what do to in the event a well integrity issue was discovered were included in the well integrity management procedure
- the requirement to notify the EPA as soon as reasonably practical but no later than 5 days, where a well integrity issue was identified, was included in Table 1 of section 1.1 of the procedure.

Records were documented and maintained to verify implementation of the procedure. For example, work orders were generated at scheduled intervals as determined by the well integrity management procedure. These work orders were completed by the maintenance crews and outcomes recorded in the Santos OEC task history dashboard. Santos maintained a register of all wells which detailed the concern level and operational and completion status of each well.

The well integrity management procedure provided for review by the audit team was revised in November 2022. The Code of practice: Construction, operation and decommissioning of petroleum wells was issued in 2023. As demonstrated above, the 2022 Santos procedure satisfied the requirements of the 2023 code, but it was noted it contained references to the previous well integrity code. As suggestion for improvement 2, Santos should review its well integrity management procedure to confirm it aligns with the 2023 code. This review should include updating the procedure to reference the 2023 code of practice.

3.12.2. Well suspension

Section 2.11.2 of the code of practice set out the mandatory requirements for well suspension that included:

- 2 tested well barriers must be used for well suspension
- suspended wells must be classified and addressed in the well integrity management system
- appropriate suspension fluids must be used

- the suspended well site must:
  - display appropriate safety signs
  - be secured with a locked fence around the well
  - be maintained clear of vegetation around the well
  - have wellhead valves securely chained and locked or have their handles removed.
- A program must be in place for regular inspections to check for gas leaks and well integrity monitoring and maintenance matters.
- A record of all inspections must be kept.

Examples of suspended wells on PAL2 and PPL3 were inspected during the audit. Bibblewindi 9 and Wilga Park 1 were suspended for several years. As shown in Figure 10 and Figure 12, the well sites displayed safety signage, and the area around each well was maintained clear of vegetation. The well sites were fenced, and the wellhead valves were securely locked or had handles removed (Figure 11 and Figure 13).

Figure 10: Signage at suspended well Bibblewindi 9

Figure 11: Fencing at Bibblewindi 9

Figure 12: Signage at suspended well Wilga Park 1

Figure 13: Handles locked or removed at Wilga Park 1

3.13. Beneficial use of gas

Section 28B of the *Petroleum (Onshore) Act 1991* and clause 16 of the Petroleum (Onshore) Regulation 1991 allowed the licence holder to beneficially use gas recovered from the exploration operations, if that gas would otherwise have been flared or released into the atmosphere as part of the exploration activities.

Under the provisions of clause 16(3) of the Petroleum (Onshore) Regulation 1991, royalty was payable for any gas recovered by the lease or licence holder and beneficially used. Gas produced from the appraisal pilots in PEL238 and PAL 2 was beneficially used to power the Wilga Park Power Station. The power station used gas fired engines (Figure 14) to generate electricity which was sold to Essential Energy for distribution through the state energy grid.

Figure 14: A gas fired engine generator at the Wilga Park Power Station

The Wilga Park Power Station was inspected during the audit. It was observed Santos had metering equipment installed to measure the volume of gas received by the power station (Figure 15) and the amount of power generated (Figure 16).

Figure 15: Metering of gas inflows to the Wilga Park Power Station

Figure 16: Metering of energy produced from the Wilga Park Power Station

The SCADA system recorded information on gas flows and energy production. Santos was maintaining records to confirm energy production (for example, Australian Energy Market Operator statement dated November 2024). Data on electricity produced was used to calculate royalty payable.

Records from NSW Resources confirmed Santos was submitting royalty returns and calculating the monthly royalty payable. It was noted royalty was payable only in those months where the value of electricity produced exceeded the net wellhead value.

3.14. Reporting

3.14.1. Annual reporting

Section 97C of the *Petroleum (Onshore) Act 1991* and clause 21 of the Petroleum (Onshore) Regulation 2016 required the lease holder to submit an annual report within one calendar month following grant anniversary date. Condition 6 of PEL238 required the licence holder to submit an activity report annually within one calendar month following grant anniversary date. Annual activity reports were required to be prepared in accordance with the Exploration guideline: Annual activity reporting for prospecting titles. Condition 3 of PAL2 and PPL3 required the lease holder to lodge annual environmental management reports which reported against compliance with the POP and progress in achieving the rehabilitation completion criteria.

During the audit scope period, Santos prepared and submitted annual reports comprising:

- annual geological reports
  - PEL238 annual report for reporting period 1 September 2022 to 31 August 2023 – submitted 29 September 2023
  - PEL238 annual report for reporting period 1 September 2023 to 31 August 2024 – submitted 30 September 2024
  - PAL2 annual report for reporting period 31 October 2022 to 30 October 2023 – submitted 30 November 2023
  - PAL2 annual report for reporting period 31 October 2023 to 30 October 2024 – submitted 30 November 2024
  - PPL3 annual report for reporting period 15 December 2021 to 14 December 2022 – submitted 14 December 2022
  - PPL3 annual report for reporting period 15 December 2022 to 14 December 2023 – submitted 21 December 2023
- environmental and rehabilitation compliance reports
  - PEL238 environmental and rehabilitation report for reporting period 11 February 2022 to 10 February 2023 – submitted 14 March 2023
  - PEL238 environmental and rehabilitation report for reporting period 11 February 2023 to 10 February 2024 – submitted 11 March 2024
  - PAL2 environmental and rehabilitation compliance report for reporting period 31 October 2022 to 30 October 2023 – submitted 30 November 2023

- PAL2 environmental and rehabilitation compliance report for reporting period 31 October 2023 to 30 October 2024 – submitted 30 November 2024
- PPL3 Environmental management report for reporting period 15 December 2021 to 14 December 2022 – submitted 16 December 2022
- PPL3 Environmental management report for reporting period 15 December 2022 to 14 December 2023 – submitted 15 December 2023

Community consultation reports were not required to be submitted to the Regulator after October 2022. Although not required, Santos submitted annual community consultation reports with its annual activity report for PEL238 for 2023. The report was also published on the Santos Narrabri gas project website.

The annual geological reports generally followed the NSW Resources guideline 'Onshore petroleum reporting and data submission - A guide to geoscientific reporting and data submission of onshore petroleum exploration and production in New South Wales'.

Santos used the Regulator template for the preparation of the environmental and rehabilitation compliance reports for PEL238 and PAL2.

3.14.2. Drilling and seismic activity reporting

Section 97C of the *Petroleum (Onshore) Act 1991* and clause 22 of the Petroleum (Onshore) Regulation 2016 required the licence holder to prepare and submit a report in relation to each seismic program, and the drilling of each borehole.

There was no drilling or seismic survey in PEL238, PAL2 or PPL3 during the audit scope period and no requirement for drilling or seismic survey reports to be submitted.

3.14.3. Partial relinquishment reporting

Section 97C of the *Petroleum (Onshore) Act 1991* and clause 23 of the Petroleum (Onshore) Regulation 2016 required the licence holder to prepare and submit a partial relinquishment report where the licence holder's title was partially cancelled. Reports were required to be submitted within one calendar month of notification of the part cancellation.

PEL238 was renewed on 12 April 2022. Relinquishment of part of the title was a requirement of renewal. Santos relinquished 25% of the title. The partial relinquishment triggered the requirement for a partial relinquishment report for PEL238 in accordance with clause 23 of the Regulation.

Santos prepared the Partial relinquishment report – Petroleum exploration licence (PEL) 238. The report was submitted on 9 May 2022 which was within one calendar month of the renewal.

3.15. Commercial production, well drilling and assessment

Condition 13 of PPL3 required the lease holder to notify the Director-General when commercial production commenced. Production commenced in 2003, beyond the scope of the audit. Production operations were suspended in 2013.

Condition 14 of PAL2 and condition 15 of the PPL3 required a daily report to the Director-General while a drilling activity was taking place. A weekly progress report was also required. No drilling

activities were undertaken on PAL2 or PPL3 during the audit scope period. The conditions were not triggered, and reports were not required.

Condition 15 of PAL2 and condition 16 of PPL3 required the submission of a monthly report outlining the gas flow rates and gas composition for each well connected to the gathering system, and the total gas flow to the treatment facility. Monthly production reports were submitted to NSW Resources up until November 2021. Between November 2021 and November 2024, no monthly reports were submitted. Santos self-reported this as a non-compliance to the Regulator in July 2024. The matter was referred to EPA as lead regulator for petroleum and the EPA issued a formal warning letter for the non-compliance to Santos in October 2024. The outstanding reports were submitted.

3.16. Core and sample storage

Section 97G of the *Petroleum (Onshore) Act 1991* and Clause 29 of the Petroleum (Onshore) Regulation 2016 required the holder of an authority to, so far as is reasonably practicable, collect, retain and preserve:

- all drill cores remaining after sampling
- characteristic samples of the rock or strata encountered in any drill holes.

All core and samples collected were required to be labelled, stored and managed in a manner that preserved the integrity of the core or samples.

No new drilling was undertaken on PEL238, PAL2 or PPL3 during the audit scope period. Drilling was last undertaken in 2014. Core and samples were collected during previous drilling operations and several samples were sent to the department's Londonderry Core Library.

Santos said core and samples were stored at the Santos Narrabri Operations Centre that was not inspected during the audit.

3.17. Record keeping

Sections 97D and 97E of the *Petroleum (Onshore) Act 1991* related to the creation and maintenance of records required under the Act, the regulations, or a condition of title. Records must be kept in a legible form for production to any inspector and must be maintained for a period of four years after the expiry or cancellation of the title. Specific requirements for the types of records to be maintained for exploration activities were detailed in the mandatory requirements of the exploration codes of practice as follows:

- mandatory requirement 5 of the community consultation code of practice
- mandatory requirement 13.1 of the environmental management code of practice
- mandatory requirement 5 of the produced water code of practice
- mandatory requirement 6 of the rehabilitation code of practice.

Records reviewed during the audit demonstrated that Santos was generally maintaining records as required by the licence conditions and the exploration codes of practice. Examples of records reviewed included:

- land access agreements
- notice of intention to visit process and records
- Santos GIS system including environmental layers
- internal disturbance planning process records
- annual activity reports
- partial relinquishment reports
- correspondence with overlapping coal mine operators
- exploration activity approvals, including REFs
- environmental management plan, including environmental risk assessment
- rehabilitation management plan, including rehabilitation risk assessment
- groundwater modelling and monitoring plan
- produced water management plan
- photographic record of baseline condition, disturbance area and rehabilitation
- Santos SCADA and SAP systems
- Well integrity management procedure
- well integrity management system work orders
- well records and well barrier schematics
- well integrity risk assessments
- leak detection program records
- pest hygiene inspection records
- site inspection records
- community consultation strategy
- community consultation records in the SRM database
- community consultation reports.

4. Compliance management

4.1. Identifying and managing compliance obligations

Identifying compliance obligations is a critical step in the development of an effective compliance management system. Compliance obligations for an exploration project can include:

- regulatory requirements (for example, the *Petroleum (Onshore) Act 1991*)
- conditions imposed on the grant, renewal, or transfer of exploration licences
- exploration activity approvals
- exploration codes of practice
- specific commitments made by the organisation (for example, commitments made in the approved exploration activity applications).

Once identified, compliance obligations should be reviewed periodically to identify any changes in those obligations (for example, changes in legislation).

Santos identified its compliance requirements and developed comprehensive and robust systems to manage those obligations. Examples of compliance management systems and processes included:

- the Landfolio software system - used to action and track compliance requirements. For example:
  - reporting dates were entered into the system and reminders generated as dates approached
  - assessable prospecting operation approval requirements were tracked for each exploration activity
  - work program requirements were entered in the system and were tracked and actioned as required
- the internal disturbance planning process – required for any surface disturbing activity. This process used a gateway process to ensure compliance requirements were identified and actioned throughout the planning and implementation of exploration activities
- the well integrity management system which included surveillance, verification and maintenance activities scheduled in the SAP system – SAP automatically generated work orders for scheduled preventative maintenance tasks. Any follow-up action required was actioned through a corrective maintenance request generated in SAP.

Records were generally available to confirm compliance with documents and records able to be linked through the Landfolio system.

4.2. Contractor management

Contractors are often used to undertake specialist tasks, for example, exploration drilling. While the responsibility for compliance or the implementation of environmental controls is often passed to the contractor, the licence holder will retain accountability for compliance with its licence conditions and other compliance obligations.

It is important that the licence holder exercises management control of its contractors by specifying contract requirements, providing oversight of contracted works, and evaluating the performance of the contractor during the contracted works.

Santos used contractors for the civil construction works for the Tintsfield Ponds upgrade. The civil construction works were reviewed during the audit as an example of the Santos contractor management process.

Santos prepared a detailed scope of works as part of a contractor construction pack. The scope of works set out the works required and included relevant compliance, environmental and safety requirements. All contractor personnel working on-site were required to complete both a Santos corporate induction and a site-specific Tintsfield project induction. Induction records were reviewed during the audit to confirm implementation of the process.

The planned construction disturbance zones were mapped by Santos, who provided a spatial layer to the contractor to confirm the disturbance footprint. A Santos construction manager was always onsite during the construction works to oversee the contracted works.

4.3. Inspections, monitoring and evaluation

An effective inspection, monitoring and evaluation process is required to:

- monitor the implementation of the risk controls
- evaluate the effectiveness of those controls based on an assessment of inspection and monitoring data
- implement an adaptive management approach if monitoring shows that controls may be ineffective.

Santos developed a series of programs for inspection and monitoring to confirm the implementation and effectiveness of the management strategies to address compliance requirements, and controls to address risks. These programs included:

- environmental inspections
- rehabilitation inspections
- routine well inspections
- leak detection and repair program
- telemetry for monitoring wells and pipelines.

Evaluation of the outcomes of the inspection and monitoring programs was undertaken.

5. Audit conclusions

From the evidence reviewed during the audit, it was concluded the exploration and appraisal operations undertaken by Santos on PEL238, PAL2 and PPL3 were well managed. Evidence was available to demonstrate comprehensive and robust systems and processes were developed to identify and manage compliance requirements. Records were maintained as required to demonstrate compliance.

Santos was compliant with the requirements of the exploration licence, assessment lease and production lease for the elements reviewed during the audit. The self-reported non-compliance was corrected, and Santos was compliant at the time of the audit.

The exploration activity approvals were not commenced, and the requirements of the Exploration code of practice: Environmental management were not triggered. An assessment against the codes of practice for community consultation, produced water, and rehabilitation identified no non-compliances for the elements reviewed during the audit.

One observation of concern was identified as summarised in Table 2. Two suggestions for improvement were identified as summarised in Table 3.

Table 2: Summary of observations of concern

Observation of concern No.	Description of Issue	Recommendation
1	The community consultation strategy title included the 6 petroleum titles that make up the wider Narrabri gas project. Records confirmed that the strategy was generally implemented on all 6 titles. However, it was noted the strategy was heavily focused on PEL238, particularly in the background section.	It was recommended Santos update the strategy to make it clear it applied to all 6 titles and included information specific to each title.

Table 3: Summary of suggestions for improvement

Suggestion for Improvement No.	Description of Issue
1	It was recommended that Santos review the community consultation risk assessment against the objectives for consultation such that the risk assessment can focus on the risks and opportunities that need to be identified and managed to facilitate an inclusive and effective consultation program.
2	Santos should review its well integrity management procedure to confirm it aligns with the 2023 code of practice. This review should include updating the procedure to reference the 2023 code.