Narrabri Coal Seam Gas Utilisation Project

Approval 07-0023

Wilga Park Power Station and Pipeline

Santos

Proponent Contact Information and Declaration

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Declaration

Santos Limited declares the information contained within this document has been prepared and collated from all relevant information and is, to the best of our knowledge, neither false nor misleading.

Contents

1. Introduction

1.1 Background

This Annual Environmental Management Report (AEMR) has been prepared for submission to the NSW Department of Planning (DoP) by Santos Limited to satisfy commitment 11.7 (Final Statement of Commitments) made by the previous operator Eastern Star Gas (ESG) for the Narrabri Coal Seam Gas Utilisation Project (Project). ESG submitted the original Project Application (07-0023) in early 2007 with the approval being granted by DoP in December 2008 (Approval Doc. No. S07/00277). There was no specific obligation in the conditions of approval for the submission of an Annual Environmental Management Report.

Upgrades to the Wilga Park Power Station (WPPS) and the WPPS to Bibblewindi Facilities Area (BFA) pipeline took place in 2009 (Figure 1). The Gas Gathering System (GGS) was installed to transport coal seam gas (CSG) from the Bibblewindi and Bohena Pilots (approximately 47km southwest of the township of Narrabri) to the WPPS for electricity generation as part of the Narrabri Gas Utilisation Project.

In November 2011, Santos Limited acquired all of the shares in Eastern Star Gas Limited (ESG). Immediately following the acquisition, Santos conducted a review of all ESG commitments and assets. The review was conducted against applicable legislation, approval conditions and Santos' Operational and Environmental Health and Safety policies and standards. In February 2012, Santos made the decision to initiate a field shutdown of all NSW assets. This included the Wilga Park Power Station, which has not operated since that time.

The review also found that Commitment 11.7 had not been completed since Project commencement. Therefore this report encompasses all activities associated with the Project for the period of 2008 to 2013. The AEMR for the 2014 period will be provided within 2 months of the anniversary of the Project Approval (Feb 2015).

Since the field shutdown, a number of remedial activities (external to the facilities covered by this Project approval) have been and/or are currently underway. Following completion of remediation works, Santos intends to continue to develop the Narrabri Gas Utilisation Project when it is satisfied that all field assets meet Santos operational standards.

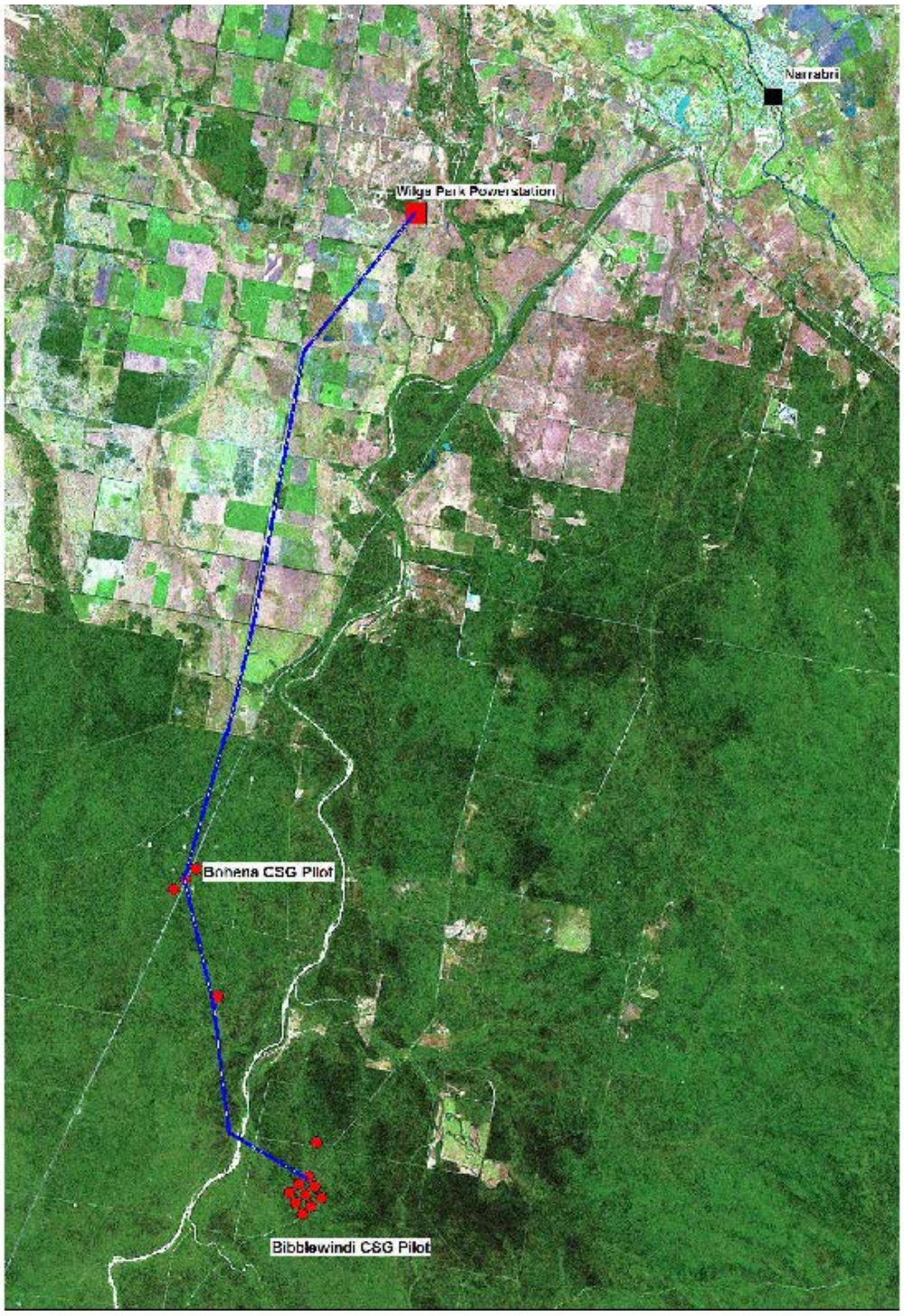

Figure 1 Location of the Wilga Park Power Station and Pipeline

2. Approvals

2.1 Project Application (DA 76/2003)

The original WPPS facility was constructed following the approval of Development Application 76/2003 by the Narrabri Shire Council in November 2002 (DA). The DA was for the construction of a GGS from the Coonarah Gas Field located within Petroleum Production Lease 3 (PPL 3) and an electricity generating facility to be constructed on the operator owned Wilga Park property.

2.2 Project Application (07-0023)

In early 2007, Eastern Star Gas Limited submitted a Part 3A Major Project Application 07-0023 to the NSW Department of Planning (NSW DoP) for;

- the construction and operation of gas gathering systems at the Bibblewindi and Bohena Coal Seam Gas Pilots;
- the construction and operation of gas compression facilities at the Bibblewindi and Bohena Coal Seam Gas Pilots;
- the construction of approximately 32km buried gas flow line between Bibblewindi and Bohena Pilot and Wilga Park Power Station; and
- the staged expansion and operations of the Wilga Park (base load) gas-fired power station from a capacity of 12 megawatts to 40 megawatts, fuelled by coal seam gas extracted from the Bibblewindi and Bohena Coal Seam Gas Pilots.

Approval was granted in December 2008 by the NSW Minister of Planning under section 75J of the *Environmental Planning and Assessment Act 1979*.

3 Environment Management

3.1 2008

3.1.1 Project Activities

The WPPS consisted of four operational 1 MW generators which were supplied with CSG delivered from the Coonarah Pilot (located in PPL 3), as approved by the DA (section 2.1). In December 2008, ESG received approval for the commencement of the Part 3A Major Project Application 07-0023 under approval File No. S07/00277. Construction activities began in early 2009.

3.1.2 Environmental Performance/Compliance

No construction or operational activities were conducted under the Major Project Approval S07/00277 during 2008.

3.2 2009

3.2.1 Project Activities

Construction of the infrastructure associated with the Major Project Approval S07/00277 commenced in early 2009. At the time of construction, ESG was the operator of the Narrabri Coal Seam Gas Utilisation Project on behalf of the Narrabri Coal Seam Gas Joint Venture. For the Project, ESG engaged Adtech FRP Pty Ltd to construct the main pipeline with Austerberry/Ausdrill undertaking the Horizontal Direction Drilling (Newell Highway crossing) activities associated with the pipeline installation and Clarke Energy Australia for construction of the expansion of the Wilga Park Power Station.

The installation of the glass reinforced epoxy (GRE) pipeline, travelling 32km from the Bibblewindi Compressor Station to WPPS was completed and the right of way (ROW) rehabilitated during mid-2009. The pipeline was commissioned and used for the transportation of CSG following the commissioning of the first WPPS 3MW generator. In early 2009, construction began on the Bibblewindi Compressor Station. The compressor station was primarily constructed by the previous operator, ESG. Construction was completed in late 2009. It should be noted that to date, the Bibblewindi Compressor Station has not been commissioned for use. Santos is currently assessing what works are required if the compressor station is to be used for future operations.

During the 2009 period, lease clearance was completed and cement pads were installed for all four proposed generators. One of the four approved 3 megawatt (MW) gas driven reciprocating engine generators was installed. The unit was commissioned during 2009 and received first gas in late October 2009. The commissioning of WPPS triggered the approved Operations Environmental Management Plan (OEMP). The ESG OEMP was approved in July 2009.

3.2.2 Environmental Performance/Compliance

During the construction phase of the Project, environmental management was guided by the approved ESG Construction Environmental Management Plan (CEMP). In accordance with the project approval Condition 6.1, an independent environmental representative (ER) was engaged (Corey Beggs of CDB Environmental) to oversee the operator's performance against Project Approval, final Statement of Commitments (Aug 2008) and the ESG CEMP.

An initial audit during construction by the ER was conducted in February 2009. Condition 4.1 (c) under the project approval required the independent environmental auditing in accordance with AS/NZ ISO 19011:2003 – Guidelines for Quality and/or Environmental Management Systems Auditing. The audit report concluded that no items of major non-compliance were found. The comment was made that the project consisted of good management practices. Those that were observed during the audit included:

- Careful separation of topsoil and trench spoil being achieved;
- Reduced working of ROW and vegetation management is being implemented; and

- Good housekeeping evident at staging and laydown areas along the ROW.

Figure 2 Construction ROW showing topsoil stripping and separation.

Opportunities for improvement that were identified during the audit included:

- ESG site representative to attend toolbox meetings
- ESG HSEC Manager to review and score the induction records and sign off on the Site Authorisation Form
- Establish and maintain a register for the wash down bay at the Narrabri Site Office.

Following the completion of construction activities, a final audit for the construction phase of the project was conducted by CDB Environmental in November 2009. At the time of the audit all construction works had been completed, the pipeline had been installed and the right of way (ROW) rehabilitated.

The audit concluded that overall good environmental management practice was implemented for the construction of the Narrabri Coal Seam Gas Utilisation Project. No non-compliance items were found during the audit; however, the audit identified an area of improvement in that the ROW should be monitored over the summer rain period to allow the disturbed soil to settle before rectification works are undertaken. In the 2009 audit, areas noted as being areas of non-compliance and 'areas for improvement' during the

previous audit by the ER were noted as being sighted and documentation was stored at the Narrabri Site Office.

In July 2009, the ESG Operations Environmental Management Plan (OEMP) for the Project was approved. This plan was triggered following the commissioning of the first 3MW generator and transportation of first gas from Bibblewindi to the WPPS.

In late 2009, ESG engaged Planager Pty Ltd to conduct a hazard audit on the Project assets as a requirement of Condition 3.6 of the Project approval. The hazard audit was approved by DoP and required a subsequent hazard audit to be completed by no later than December 2012.

3.3 2010

3.3.1 Project Activities

The installation of the remaining three 3 MW generators and associated housing was completed in 2010.

3.3.2 Environmental Performance/Compliance

In mid-2010, neighbouring residents, Mr and Mrs Hatch (Bildebri) contacted the previous operator regarding concerns over the potential of noise impacts on their residence. The Bildebri residence is located within 1km of WPPS. ESG made contact with the landholders on a number of occasions to resolve any concerns that were raised. As no official complaint was submitted and the threshold monitoring levels of the approval had not been triggered, the operator was not required to respond to the landholders' concerns. However ESG voluntarily responded to the issues raised by Mr and Mrs Hatch by engaging noise consultants to investigate the potential for noise levels to be reduced in the current operating generators and to implement these mitigations on the three currently uncommissioned units.

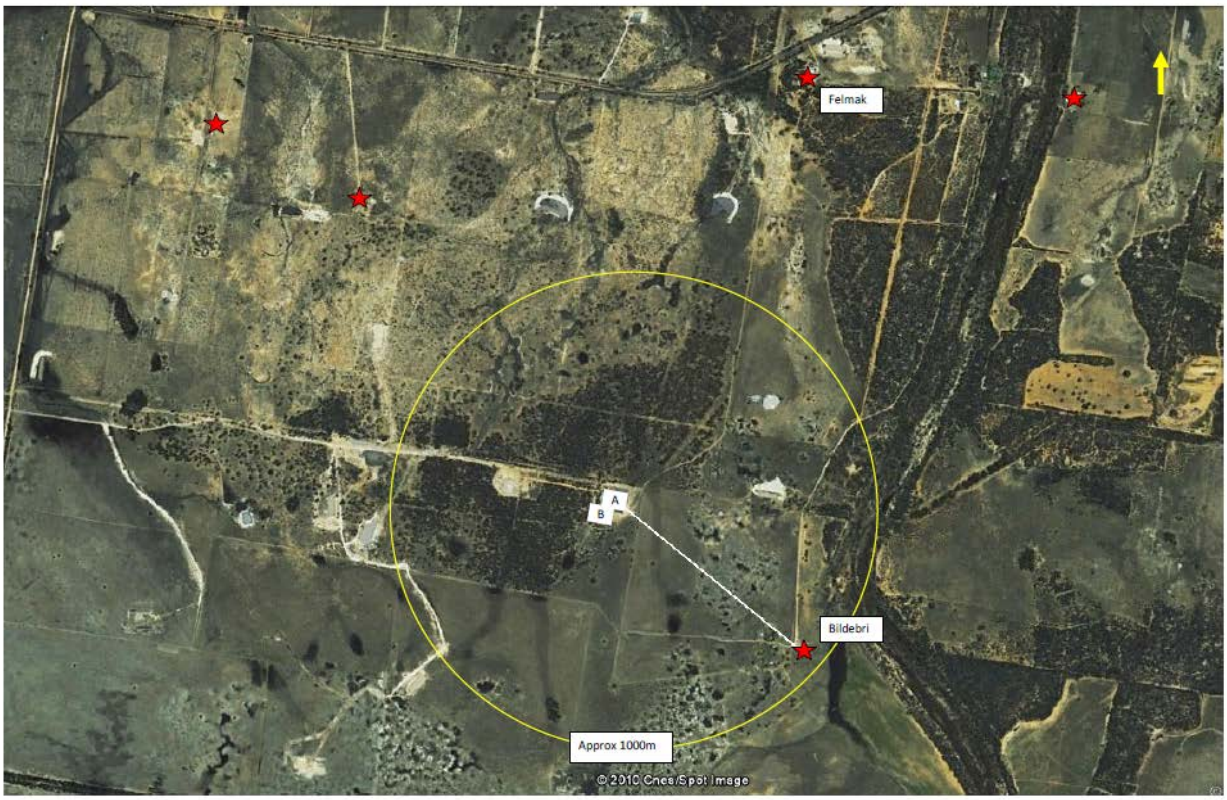

Figure 3: Location of the Bildebri residence in relation to the WPPS (A – original power station; B – WPPS expansion)

In September 2010, Noise Measurement Services Pty Ltd was engaged to conducted noise modelling on the commissioned 3 MW unit. Elevated results indicated that there was a potential point source issue with the cooling tower fans. Attenuation measures were recommended by the consultant and adopted by ESG in 2011 following installation of VSD operated ventilation fans.

Figure 4 Noise Attenuated Intake on 3 megawatt units.

3.4 2011

3.4.1 Project Activities

In February 2011, the second 3MW generator unit was commissioned and began receiving CSG from the same Bohena and Bibblewindi Pilots as the first commissioned unit. The commissioning did not trigger any approval monitoring requirements.

In August 2011, ESG purchased 100ha of compensatory habitat package to offset the value of habitat lost as a result of the Project. The purchase satisfies the Project Approval condition 2.34. The land is located near the township of Warialda in NSW.

The acquisition of ESG by Santos occurred in November 2011. In December 2011, Santos initiated a review into existing operations and infrastructure to ensure alignment with Santos' EHSMS, Australian and International Standards, national, state and local legislation, approval conditions and landholder agreements. This study covered all of Santos' acquired NSW assets, which included the Project (Approval S07/00277).

3.4.2 Environmental Performance/Compliance

As discussed earlier, ESG purchased a 100ha parcel as compensatory habitat package located near Warialda, NSW. Santos is currently actively seeking an in-principle agreement with National Parks and Wildlife Services (NPWS) NSW with terms for the perpetual management of the area. That work is ongoing.

Following consultation with the landholders of the neighbouring property to WPPS (Bildebri), 200 trees were planted for visual amenity between the residence and the power station. As per condition 2.37 (c) (Visual Amenity) only locally occurring indigenous species were planted. ESG consulted with the Narrabri branch of the then Namoi CMA to determine the appropriate species for planting. These species are consistent with the following vegetation types:

- Wilga Park - RVC 32 (Pilliga Box, Poplar Box, White Cypress pine); and
- RVC 79 (Brigalow - Belah woodland).

3.5 2012

3.5.1 Operational Activities

As a result of Santos' review into the previous operator's practices, the field was shut down in early February 2012.

In early 2012, the Santos EHS Toolbox was introduced into NSW activities, superseding the previous operators EHS record system. The EHS Toolbox contains a suite of Environment and Safety applications for the reporting and recording various safety and environment events including proactive reporting (hazard identification). These applications include the Incident Management System (IMS) and Audit and Inspection Manager (AIM).

The High Voltage (HV) facilities within the Essential Energy yard were upgraded at WPPS. This was a joint project between Santos and Essential Energy. John Holland was the onsite project supervisory contractor. An additional HV switchboard was installed in the WPPS HV room. Also a TX2 (transformer) was installed, a TX7 was installed, and a Low Voltage (LV) switchboard was extended

The access track into WPPS was upgraded during this year as the roads did not meet Santos specifications as well as to accommodate increased traffic due to the upgrading of the power station. Special Civilised Services were engaged to conduct this work under the newly implemented (for NSW operations) EHSMS10 Contractor Engagement and Management. The upgrade included the installation of 3 culverts, a number of improved mitre drains and the use of armouring.

3.5.2 Environmental Performance/Compliance

The internal audit was finalised in early 2012 with a large number of recommendations. A snapshot of the improvement opportunities of this internal audit included:

- Development of an obligations directory (EHSMS02);
- Central monitoring of compliance (EHSMS02);
- Inductions for the field to include environmental aspects (EHS);
- Central bund register put in place (EHS02);
- Up to date noise monitoring at perimeter of Power Station (EHS12);
- Development of a procedure for draining stormwater from USTs and bunds (EHS02);
- Bund inspections included in the daily inspection checklist at WPPS (EHS02);
- Chemicals and produced water being stored in bund areas (EHS02);
- Waste management plan development (EHS04);
- Development of weed management plan (EHS09);
- Development of hazard register - SHRR

- Scheduling of Self-audits (EHSMS09);
- Scheduled inspection of the GRE ROW (EHSMS09); and
- Enhanced chemical management (HSHS08) Chemical Management and Dangerous Goods.

The audit also uncovered that Condition 2.27 of the Project approval to come under non-compliance by the previous operator. The condition states that:

> ***Condition 2.27:*** *Waste generated outside the site is not to be received at the site for storage, treatment, processing, reprocessing, or disposal….*

Santos identified a section of Lot 1 DP 1064422 (Wilga Park property) which was referred to by the previous operator as the 'boneyard' was being used for the storage of various used materials from outside of the site, such as piping, fencing materials etc. This did not align with Santos' EHS04. Appropriate clean-up action was conducted in mid-2012 to achieve compliance with this condition. This condition is now adhered to by Santos.

The introduction and implementation of the Santos' EHS Toolbox AIM allowed for the centralised storage of proactive inspections and internal audits. During 2012 Santos personnel were trained in its use and seven inspections and reviews were carried out at WPPS and documented within AIM. This system also allows for the proactive ad-hoc identification of potential hazards and reporting of incidents. During 2012, 28 proactive environment reports (hazard identification), two non-conformances and five process safety exceptions were recorded within the system. There were no matters that triggered notification under section 120 of the Protection of Environment Operations Act 1997. As this was the first year of the system's implementation, no reporting targets were included in the Santos NSW Operations EHS scorecard. EHS performance with regards to this project were mainly concentrated around implementation of the EHSMS audit recommendations.

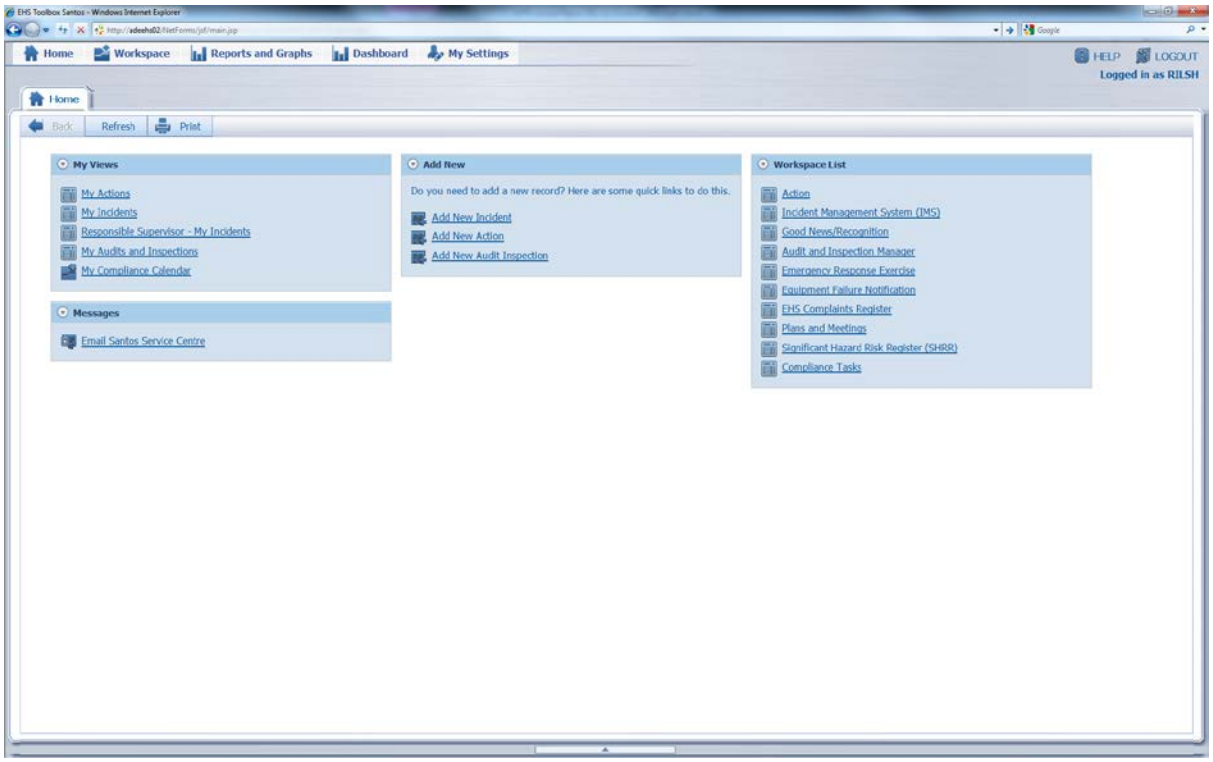

Figure 5 Santos' EHS Toolbox system which includes the IMS and AIM components for both proactive and reactive reporting

When Santos acquired ESG, Santos introduced a number of EHS software systems which enable centralised storage of data and documents to maintain EHS and compliance performance. ComTrack is the system used by Santos under EHSMS02 Legal Obligations and other requirements. It allows for the storage and tracking of licence and approval conditions as well as their status (i.e. non-compliant, on track and/or completed). All compliance obligations have been loaded into ComTrack, and responsible personnel assigned to monitor compliance.

Planager Pty Ltd conducted a hazard report in 2012. This hazard report was conducted as a follow up to an audit which was completed in 2010 by the same consultant. At the time the 2012 audit was conducted, the WPPS was not in operation due to the field shut in. This redirected the focus of the hazard audit onto the EHS systems that were in place. This report was supplied to DoP in January 2013. The 2012 audit also reviewed Santos' EHSMS which was not included in the 2010 audit. The main outcome of the approval of the 2012 audit required a follow up audit to be conducted 12 months after the power station recommences operation.

An Operations Waste Management Plan (WMP) was developed and approved for use in September 2012. The WMP was developed in alignment with state and federal legislation as well as Santos EHS04 Waste.

3.6 2013

3.6.1 Operational Activities

During late 2013, construction along the ROW from the Santos property 'Leewood' to BFA involved the installation of a new pipeline to carry CSG water to storage ponds on the Leewood property. This installation was designed and implemented to have no impact on the existing GRE pipeline; however pressure testing and monitoring of the existing pipe was conducted. The ROW access track was reinstated and rehabilitation works carried out following the burial of the new flowline. It should be noted that these activities were undertaken under a separate approval and therefore are not subject to review under the Project approval and OEMP. This information has been included simply on the basis that the new pipeline is within the same ROW as the GGS covered by this approval, and that the OCSG required rehabilitation to be to the same standard as required under the Project approval.

3.6.2 Environmental Performance/Compliance

Following on from the internal corporate audit undertaken in 2011/2012, a follow up review of the audit was undertaken in early 2013. This was able to conclude that the closing out of the recommendations and actions was on track to be completed as scheduled. It was also able to report that the utilisation of available internal systems such as the EHS Toolbox and ComTrack had improved significantly as across the entire NSW business in that there was:

- Good level of reporting in IMS for the past 12 months with nearly 300 reports entered;
- Good level of reporting in AIM with over 150 records in the last 12 months;
- No outstanding IMS entries greater than 6 months old; and
- No outstanding AIM entries greater than 6 months old.

For the Project area in 2013, a number of internal audit and inspections, proactive and incident reporting was conducted for the Project approval areas. One workplace inspection on the compressor station, eight inspections and reviews were conducted on the ROW, 14 inspection and reviews and one audit were conducted at the WPPS. 23 proactive environment reports were entered into the IMS, no reportable incidents and one internal non-conformance.

In response to the internal corporate audit undertaken in 2011/2012, a bund register was created to satisfy the requirements of Santos' EHS02 Underground Storage Tanks (USTs) and Bunds. This standard requires each bund to be assessed for suitability for use, measurements to be noted, status to be assessed (i.e. damaged, in use, not in use etc.) and for this information to be stored in one central location. The EHS02 bund register for NSW is currently stored on the Santos intranet file sharing program known as 'SharePoint'. The

document has been published within the program so that it is accessible by all internal Santos staff.

Figure 6 Bunding at WPPS oil storage area

In mid-2013, internal emergency response desktop training was conducted with a specific focus on the potential for an environmental event. All operations personnel were taken through the training. The training allowed for the review of the Operations Emergency Response Plan (ERP) to be undertaken with some shortfalls being identified within the training exercise.

A recommendation from 2012 internal corporate audit was to develop a Weeds Management Plan (WMPL) even though it was noted that good knowledge of local weed species was evident during the audit. An Operations Pest Plant Management Plan (PPMP) was introduced in June 2013. The management plan documents the required procedure for bringing materials and machinery on to site. It has been observed that a similar process was practiced by the previous operator; however it was noted as being poorly documented. The plan also includes scheduled monitoring and highlights particular plant and weed species which are high risk specific to Santos' activities within NSW and that are identified by local authorities as being high risk due to the general populations' activities.

Santos introduced a preventative maintenance (PM) program called Oracle (myPlant). This program supersedes the previous operator's system. The program involved the cataloguing of infrastructure and equipment which are either assessed or reviewed for their required/recommended servicing periods. This information is collected in the myPlant program and a work order is automatically generated and assigned to the applicable

personnel. The program is still undergoing implementation to ensure that all PM requirements have been identified.

In late 2013, Santos received communication from a local landholder who was concerned that subsidence had occurred on the GRE ROW on their property. This was assessed during the scheduled GRE ROW quarterly inspection (AIM56496) and corrective actions were taken.

3.7 Additional Comments (2008-2013)

1. Environmental noise measurements were conducted at the WPPS in April 2007 (prior to the approval and construction of the WPPS expansion) by Spectrum Acousitcs Pty Ltd. During monitoring, three of the then ten generator sets were operating. Monitoring was conducted at sensitive surrounding receptors which resulted in the WPPS being inaudible from these locations.
2. CDB Environmental has conducted the role of the Independent Environmental Representative(ER) until September 2013, when the company relocated out of Australia. A new independent ER will be nominated to the regulator in a process separate to the AEMR, and will be concluded prior to the re-commencement of operations of the Wilga Park Power Station.
3. Vehicle access tracks are being maintained along the GRE ROW with the remainder of the ROW under re-vegetation. Current activities (late 2013) separate to the Project approval required the ROW to be cleared of all vegetation i.e. for the water flowline from Bibblewindi to Leewood. The ROW has since been reinstated as per the requirements of the Project approval.
4. Conditions which are triggered once the Power Station output reaches 12 megawatts are outlined in the Santos Compliance Tracking tool – ComTrack. Planning and scheduling for these actions is underway even though the triggering of this threshold is not anticipated in the near future.
5. A review of the OEMP is currently underway within Santos to include up to date information. The review is intended to reflect Santos ownership and responsible personnel. Once completed, it will be submitted to the DoP before being implemented and the changes communicated to Santos personnel.
6. NO_x monitoring has been undertaken for both performance and environmental purposes since the commissioning of the first generator unit. Sampling of the emissions is undertaken when gas changes fields and for general engine tuning and operation. Air Emission monitoring is formally triggered when WPPS reaches the trigger of a potential capacity of 12MW (Condition 2.4 Approval).
7. Operational noise monitoring requirements are not required until WPPS reaches a capacity of more than 12MW (2.5 Vibration, 2.8 Noise)
8. The latest two 3MW units to be installed have not been commissioned, and will not be commissioned until the power station is operational again. The availability and supply of a sufficient quantity of CSG will also determine when these units will be commissioned. Similar monitoring to that outlined above will be undertaken on these units during their commissioning phase.
9. The WPPS is not currently operational, but is expected to re-start in 2014.

End of Report