

NARRABRI GAS PROJECT

WASTE MANAGEMENT PLAN

PHASE 1

0041-150-PLA-0005

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Document review history

In accordance with consent condition D4, this document has been reviewed as follows:

[illegible]

Acronyms and abbreviations

Acronym	Description
CIP	clean in place
CoC	Conditions of consent for the NGP SSD 6456
CSG	coal seam gas
DPE	The former NSW Department of Planning and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure
EIS	environmental impact statement
EMS	Environmental Management Strategy
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
EPL	environment protection licence under the POEO Act
IEA	Independent Environmental Audit
kg	kilogram
kg/ha	kilograms per hectare
L	litre
m	metre
mm	millimetre
MNES	Matters of National Environmental Significance
NOA	naturally occurring asbestos
PAL	petroleum assessment lease under the PO Act
PEL	petroleum exploration licence under the PO Act
PO Act	<i>Petroleum (Onshore) Act 1991 (NSW)</i>
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
POEO Regulation	Protection of the Environment Operations (General) Regulation 2022
PPL	petroleum production lease under the PO Act
PPLA	petroleum production lease application under the PO Act
RDM	residual drilling materials (rock-based)
RO	reverse osmosis
SMS	Santos Management System
SSD	State significant development

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1. Introduction

1.1 Narrabri Gas Project

1.1.1 Background

Resource exploration has been occurring in the north-western area of NSW since the 1960s; initially for oil, but more recently for coal and gas. Santos NSW Pty Ltd began exploring for natural gas from coal seams in north-western NSW in 2008 and is currently conducting coal seam gas (**CSG**) exploration and appraisal activities within Petroleum Exploration Licence (**PEL**) 238, Petroleum Assessment Lease (**PAL**) 2 and Petroleum Production Lease (**PPL**) 3, located in the Gunnedah Basin about 20 kilometres (**km**) south-west of the town of Narrabri. Activities in PAL 2 have focussed on the Bibblewindi and Bohena CSG pilots, whilst recent activities in PEL 238 have focussed on the Dewhurst and Tintfield CSG pilots.

The Narrabri Coal Seam Gas Utilisation Project (Wilga Park Power Station and associated infrastructure) operates under an existing Part 3A approval under the *Environmental Planning and Assessment Act 1979* (NSW) (**EP&A Act**). It was originally approved in 2008, with various modifications approved between 2011 and 2019. It encompasses a gas gathering system, a compressor and associated flare, a gas flow line from Bibblewindi to Wilga Park within a 10 metre (**m**) corridor with a riser at Leewood and an expansion of the existing Wilga Park Power Station from 12 to 40 megawatts.

1.1.2 Current Project

On 30 September 2020 Santos NSW (Eastern) Pty Ltd (**Santos**) obtained consent for State significant development (**SSD**) 6456 to develop the Narrabri Gas Project (**NGP**) (**the Project**). Approval EPBC 2014/7376 under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (**EPBC Act**) was granted on 24 November 2020.

The Project includes the progressive installation of up to 850 new gas wells on up to 425 new well pads over approximately 20 years and the construction and operation of gas processing and water treatment facilities. The Project area covers about 950 square kilometres (95,000 hectares) and the Project footprint will only directly impact about 1 % of that area.

Four phases of development are defined under the consent, including:

- Phase 1 - exploration and appraisal;
- Phase 2 - construction activities for production wells and related infrastructure;
- Phase 3 - gas production operations; and
- Phase 4 - gas well and infrastructure decommissioning, rehabilitation and closure.

Phase 1 of the Project is defined in the consent as the phase of the development comprising ongoing exploration and appraisal activities in the Project area, including:

- seismic surveys;
- core and chip holes;
- construction and operation of pilot wells (up to 25 wells on up to 25 well pads across the Project area); and
- pilot well ancillary infrastructure, including access tracks, gas and water gathering lines, water balance tanks, safety flaring infrastructure, utilities and services, and environmental monitoring equipment including groundwater monitoring bores.

Santos plans to continue exploration and appraisal of the resource in the near term until a final investment decision can be made. The exploration and appraisal activities will include continued operation of Santos' existing wells, infrastructure and facilities in PEL 238 and PAL 2, and construction and operation of new core holes, pilot wells and supporting infrastructure permitted under Phase 1.

Santos' existing exploration and appraisal activities in PEL 238 and PAL 2 include:

- Tintsville Pilot;
- Bibblewindi East Pilot;
- Bibblewindi West Pilot;
- Dewhurst North Pilot;
- Dewhurst South Pilot;
- Dewhurst northern and southern flow lines;
- Leewood Water Management Facility including ponds, water treatment plant and irrigation area;
- Bibblewindi Facility including gathering system, water balance tank, compressor and flare; and
- Bibblewindi to Leewood buried gas pipeline.

These exploration and appraisal activities will continue as part of the NGP. The initial, new-appraisal Phase 1 scope is a relatively minor extension to these existing exploration and appraisal activities.

The Phase 1 scope is planned to include the construction and operation of:

- 4 coreholes;
- 6 pilot wells;
- 2 deep reservoir monitoring bore (converted coreholes);
- new shallow water monitoring bores;
- associated linear infrastructure;
- seismic surveys (length and location to be determined); and
- continued operation of Santos' existing exploration and appraisal activities, including workover activities.

The full definitions of the approved activities for Phases 2, 3 and 4 of the Project are provided in the consent. Santos is not prevented from carrying out any or all of the phases concurrently, subject to the conditions of the consent.

1.2 Purpose and scope of this Plan - Phase 1

This Waste Management Plan (or the **Plan**) applies to activities undertaken during Phase 1 of the Project. It has been developed in accordance with the requirements of approval conditions of PEL 238; PAL 2; PPL 3; compliance conditions of Environment Protection Licence (**EPL**) 20350; SSD 6456 conditions of consent (**CoC**) and the applicable regulatory framework regarding waste management in NSW. The Plan describes how reasonable and feasible waste minimisation and management measures, as appropriate, will be implemented to prevent, mitigate or minimise material harm to the environment.

The Plan applies to the construction and operation of Phase 1 activities only. It will be revised, updated and approved prior to subsequent phases to reflect the additional gas production infrastructure and

associated activities and related waste generation, if any; updated operational procedures and any revised lease or licence conditions.

As required by CoC B71, Santos will implement each revision of this Waste Management Plan once approved by the Planning Secretary.

This revision of the Plan has been prepared to reflect a location change for well pad Dewhurst 34 (DWH 34). The original site identified for DWH 34 was on a private property and discussions had been held over several years with a registered titleholder that was residing on the property. A land access agreement was provided to the titleholders, all titleholders were not agreeable to the activity progressing and the agreement was not finalised. On this basis, the location for well pad DWH 34 has been moved from private property to State forest, as described in the Field Development Plan (**FDP**).

Some minor adjustments and corrections have also been made throughout the document.

1.3 Objectives

The objectives of this Plan are to provide the following:

- details of the relevant statutory requirements, including any relevant approval, licence or lease conditions;
- details of any relevant commitments or recommendations identified in the Environmental Impact Statement (EIS) for the Project;
- identify waste types and quantities on site;
- describe measures to minimise waste production;
- identify potential reuse or recycling opportunities and ensure appropriate handling and collection procedures are in place;
- investigate methods to minimise waste generated by the Project and implement reasonable and feasible measures to minimise waste;
- ensure the disposal of wastes conforms with applicable guidelines or licences;
- ensure storage areas for fuels, oils or other potential contaminants are appropriately stored; and
- describe reporting protocols.

1.4 Consultation

As detailed on page (i), this Waste Management Plan has been prepared by suitability qualified and experienced persons in accordance with CoC B70(a).

This Plan has been prepared in consultation with the NSW Environment Protection Authority (**EPA**), Narrabri Shire Council (**Council**), and the owner of waste facilities and/or land on which waste is proposed to be disposed. The primary objective of consultation was to seek feedback from relevant stakeholders during development of this Plan to ensure agreement with the proposed approach to waste management.

As requested by Council, Santos will continue its regular liaison with Council's Waste and Water Divisions to ensure that Council's water treatment and waste facilities can appropriately manage the volume and product type that may be generated by the Project for offsite disposal.

The consultation correspondence is presented in Appendix A.

No further consultation was required to be undertaken for this minor revision of this Plan, as the then NSW Department of Planning and Environment (**DPE**) considered the changes are relatively minor and agreed that further consultation with other agencies was not required. This is reflected in the DPE letter of approval for the revised FDP (Rev 0B), issued on 28 November 2023.

A copy of the DPE FDP approval letter is available on the Project website.

1.5 Structure of this Plan

The structure of this Plan is as follows:

Section 1	Provides an introduction to the Project and the context, scope, purpose and objectives of this Plan.
Section 2	Defines the roles and responsibilities of personnel involved with the Project, including staff, consultants, contractors and service providers
Section 3	Outlines the statutory provisions relevant to the management of wastes generated during the execution of the Phase 1 activities
Section 4	Describes and illustrates the waste management system
Section 5	Describes how Santos will consider the waste management hierarchy
Section 6	Describes the proposed waste management practices to be implemented
Section 7	Details waste management measures for each waste identified in the waste inventory
Section 8	Describes the waste monitoring program
Section 9	Describes the actions required for waste related incidents and non-compliances
Section 10	Describes waste related reporting, evaluation and review requirements
Section 11	References
Section 12	Glossary
Appendix A	Consultation records
Appendix B	Compliance conditions relevant to this Plan

1.6 Distribution

A copy of the latest approved Plan is available to all Santos personnel via the Santos intranet. In accordance with consent condition D13, the latest copy can also be found on the Project website.

In accordance with specific licence, approval or code of practice conditions, a latest copy of this Plan is available at the Santos Operations Centre located at 300 Yarrie Lake Road in Narrabri. This is where operational and field staff commence and finish each workday.

Note that any printed copies of this Plan are uncontrolled.

2. Roles and responsibilities

All Santos employees and contractors involved in the Project are responsible for the environmental performance of their activities and for complying with all legal requirements and obligations. All Project personnel will be required to comply with approval requirements of the activities they undertake and potential environmental impacts from all activities will be managed in accordance with the Project's relevant management plan(s).

In accordance with consent condition D1, the Environmental Management Strategy (**EMS**) sets out the roles, responsibilities, authorities and accountabilities of all key personnel involved in the environmental management of the Project, including the requirements and obligations in this Plan. All roles, responsibilities and accountabilities have been assigned in accordance with Santos Management System *SMS-MS_14 People Management Standard*.

3. Regulatory requirements

The Project is permissible with development consent under the *State Environmental Planning Policy (Resources and Energy) 2021*, and is identified as a 'State significant development' under section 4.38 of the EP&A Act and the *State Environmental Planning Policy (Planning Systems) 2021*.

The Project was subject to the State significant development assessment and approval provisions of Division 4.1 of Part 4 of the EP&A Act and has been granted approval as a State significant development under the EP&A Act and the EPBC Act.

The Project will be carried out in accordance with the:

- relevant existing development consents and activity approvals;
- the conditions of relevant tenements including PEL 238, PAL 2, PPL 3;
- the provisions of the *Petroleum (Onshore) Act 1991* (NSW) (**PO Act**) and relevant codes of practice and guidelines;
- EPL 20350 issued by the EPA and the provisions of the *Protection of the Environment Operations Act 1997* (**POEO Act**);
- the Protection of Environment Operations (Waste) Regulation 2014 (**Waste Regulation**);
- the National Environment Protection (Movement of Controlled Waste between States and Territories) Measure (the **Controlled Waste NEPM**) and
- the conditions of consent for the NGP SSD 6456.

3.1 Compliance conditions

Compliance conditions associated with the following licence(s), lease(s) and consent(s) are or will be relevant to this Plan:

- PEL 238, granted on 1 September 1980, most recently renewed on 12 April 2022 and varied on 5 September 2023;
- PAL 2, granted on 30 October 2007 and varied on 5 September 2023;
- PPL 3, granted on 15 December 2003 and varied on 5 September 2023;
- PPLs 13, 14, 15 and 16, once issued;
- EPL 20350, as varied; and
- SSD 6456.

3.1.1 PEL 238

There are no specific conditions or obligations in PEL 238 related to waste management.

3.1.2 PPL 3

The lease conditions of PPL 3 that are indirectly relevant to waste management include condition 1 (minimisation of harm to the environment) and condition 2 (petroleum operations plan).

3.1.3 PAL 2

Lease condition 2 of PAL 2 and PPL 3 state that activities must only be carried out in accordance with a Petroleum Operations Plan (**POP**) which has been approved by the Director-General of the Department of Primary Industries. Further, the POP must (i) identify how operations will be carried out on site in order to prevent and or minimise harm to the environment; and (ii) reflect conditions of approval under the EP&A Act, the POEO Act, and any other approvals relevant to PAL 2 and PPL 3.

This Plan supports the POP and satisfies condition 2 of PAL 2 and PPL 3 by providing information about how Santos will manage its wastes produced from the Project within PAL 2 and PPL 3. Specific commitments in relation to waste management in the POP include:

- CSG activities will be carried out in a competent manner. This includes:
 - the processing, handling, movement and storage of materials and substances used to carry out the activity; and
 - the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.
- waste identified for recycling will be stored separately from other waste; and
- waste will be classified in accordance with the EPA Waste Classification Guidelines as in force from time to time.

3.1.4 EPL 20350

'Petroleum exploration, assessment and production' is a scheduled activity listed in Schedule 1 of the POEO Act. Under section 48 of this Act, all scheduled activities are required to hold an environment protection licence. EPL 20350 is held for Santos' current CSG activities in PEL 238, PAL 2 and PPL 3.

There are several specific conditions that relate to waste management including L3, O1 and O5 which are provided in Table 3.1. Note that the EPL may be varied from time to time and therefore the most recent version of the EPL must be reviewed when assessing compliance.

Table 3.1 - EPL waste management requirements

Condition No.	Condition requirement
L3	<p>Waste</p> <ul style="list-style-type: none"> • L3.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence. • L3.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence. • L3.3 The licensee may transport and reuse drilling and completion fluids from well pads in accordance with the Waste Management Plan approved under development consent SSD 6456. • L3.4 The licensee may transport and apply drill cuttings from any of their well pads to land at the Premises in accordance with the Waste Management Plan and Rehabilitation Management Plan approved under development consent SSD 6456. • The licensee may accept waste generated by the Kahlua Pilot (EPL 20351) for storage and treatment at the Leewood facility

Condition No.	Condition requirement
O1	Activities must be carried out in a competent manner <ul style="list-style-type: none"> • O1.1 Licensed activities must be carried out in a competent manner. This includes: <ul style="list-style-type: none"> a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.
O5	Processes and management <ul style="list-style-type: none"> • O5.1 The licensee must ensure that waste identified for recycling is stored separately from other waste. • O5.2 Any liquid and/or non-liquid waste for processing, storage, resource recovery or disposal at the premises must be assessed and classified in accordance with the EPA Waste Classification Guidelines as in force from time to time. • O5.3 Waste must be classified in accordance with the EPA Waste Classification Guidelines as in force from time to time prior to dispatching from the premises. • O5.4 All above ground tanks containing material that is likely to cause environmental harm must be bunded or have an alternative spill containment system in place.

3.1.5 Development Consent SSD 6456

There are several SSD 6456 consent conditions that are directly relevant to waste management, provided in full below. Table B1 in Appendix B specifies where each of the requirements of the SSD 6456 consent conditions relevant to this Waste Management Plan are addressed in this Plan. The key conditions are listed below:

Consent condition B67 states that Santos must:

- (a) implement all reasonable and feasible measures to:
 - (i) maximise beneficial reuse of waste generated by the development;
 - (ii) minimise the residual waste generated by the development;
 - (iii) minimise the on-site storage of waste generated by the development;
- (b) classify all waste in accordance with the EPA's Waste Classification Guidelines (2014, as may be updated or replaced);
- (c) dispose of all waste at appropriately licensed waste facilities, or as otherwise approved in an EPL or RREO in the case of treated water or drilling-related waste;
- (d) manage sewage treatment and disposal in accordance with the requirements of Council;
- (e) keep accurate records of the amount of waste transported from the project area (on a monthly basis), and report on this in the Annual Review; and
- (f) monitor and report on the effectiveness of waste avoidance, minimisation and management measures in the Annual Review.

Consent condition B68 states that except as expressly permitted in an applicable EPL, specific resource recovery order or exemption under the Protection of the Environment Operations (Waste) Regulation 2014, Santos must not receive waste in the Project area for storage, treatment, processing, reprocessing or disposal.

Consent condition B70 states that prior to the commencement of Phase 1, Santos must prepare a Waste Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:

- (a) be prepared by a suitably qualified and experienced person/s;
- (b) be prepared in consultation with the EPA, Council, and the owner of any waste facilities or land on which waste is proposed to be disposed;
- (c) describe the measures to be implemented to ensure:
 - (i) compliance with the waste operating conditions in this consent;
 - (ii) compliance with the Protection of the Environment Operations (Waste) Regulation 2014; and
 - (iii) reasonable and feasible waste minimisation and management measures are being employed;
- (d) be consistent with the outcomes of the Produced Salt Beneficial Reuse and Disposal Study;
- (e) identify all waste streams generated by the development (including produced water, salt and drill mud/cuttings);
- (f) identify the fate of those waste streams (including identification of the specific receiving facilities which have agreed to accept those wastes);
- (g) describe the waste management system in detail, including a contingency strategy if beneficial reuse and/or disposal options become unavailable; and
- (h) include a monitoring program that:
 - (i) evaluates and reports on:
 - the effectiveness of the waste management system;
 - ongoing classification of waste; and
 - compliance against the waste operating conditions and the EPL; and
 - (ii) defines what constitutes a waste-related incident or non-compliance and includes a protocol for identifying and notifying the Department and relevant stakeholders of these events.

Consent condition B71 states that Santos must implement the Waste Management Plan once approved by the Planning Secretary.

3.2 Relevant codes, standards, policies and guidelines

3.2.1 Waste Classification Guidelines

The *Waste Classification Guidelines* (NSW EPA, 2014) (**Waste Classification Guidelines**) have been developed to help waste generators classify the wastes they produce. The guidelines are a step-by-step process for classifying waste into one of special waste, liquid waste, hazardous waste, restricted solid waste, general solid waste (putrescible), or general solid waste (non-putrescible).

Generators and waste facilities must ensure they classify their waste carefully in accordance with the procedures in the guidelines.

3.3 EIS commitments

In the EIS Chapter 31, Santos has committed to implement a number of measures pending Project approval and a final investment decision. The EIS commitments relevant to waste management have been reproduced in Table 3.2, in accordance with consent condition D3(c) which states that Santos must ensure that (where relevant) the management plans include any relevant commitments or recommendations identified in the EIS.

Table 3.2 - EIS commitment relevant to waste management

Number	EIS Commitment relevant to waste management
1.2	<p>A project wide environmental management strategy, comprising a number of sub-plans to be used throughout the planning and design, construction, operation and decommissioning and rehabilitation stages of the Project are described in Chapter 30 [of the EIS]. The sub-plans are¹:</p> <ul style="list-style-type: none"> • ... • Waste Management Plan • ...
19.1	A Waste Management Plan will be implemented.

EIS commitment 19.2 states that solid salt product will be disposed of at an appropriately licensed facility in accordance with regulatory requirements. No solid salt is proposed to be produced during Phase 1 of the Project and therefore is not considered in this Plan. The Phase 1 Salt Management Plan, included as section 7 of the Produced Water Management Plan, provides further details on the proposed approach to the management of salt for the Project, which includes consideration of findings from the Produced Salt Beneficial Reuse and Disposal Study required by CoC B69.

As described in section 10 of this Plan and section 8 of the EMS, this Plan will be subject to regular evaluation and review. This will include the EIS commitments to ensure they remain current, applicable, and generally improve the environmental performance of the Project.

¹ Only the plans relevant to waste management have been listed. The full list of sub-plans is provided in the EMS section 3.5.

4. Waste management system

As described in this Plan, the waste management system for the Project would follow the waste management hierarchy (section 5) and waste management practices (section 6). All wastes will be included in a waste management inventory (section 6.2) and classified according to the *Waste Classification Guidelines* (section 6.1). Measures to minimise waste in accordance with the waste management hierarchy (section 5) will be considered, and then waste management practices applied in consideration of its classification, volume and available waste facilities (sections 6 and 7). A monitoring program will be implemented (section 8) which will be used to review and evaluate the waste management practices (section 10). Figure 4.1 provides a flow diagram which represents the waste management system. A contingency strategy where beneficial reuse and/or disposal options become unavailable have been developed and is presented in section 9.2.

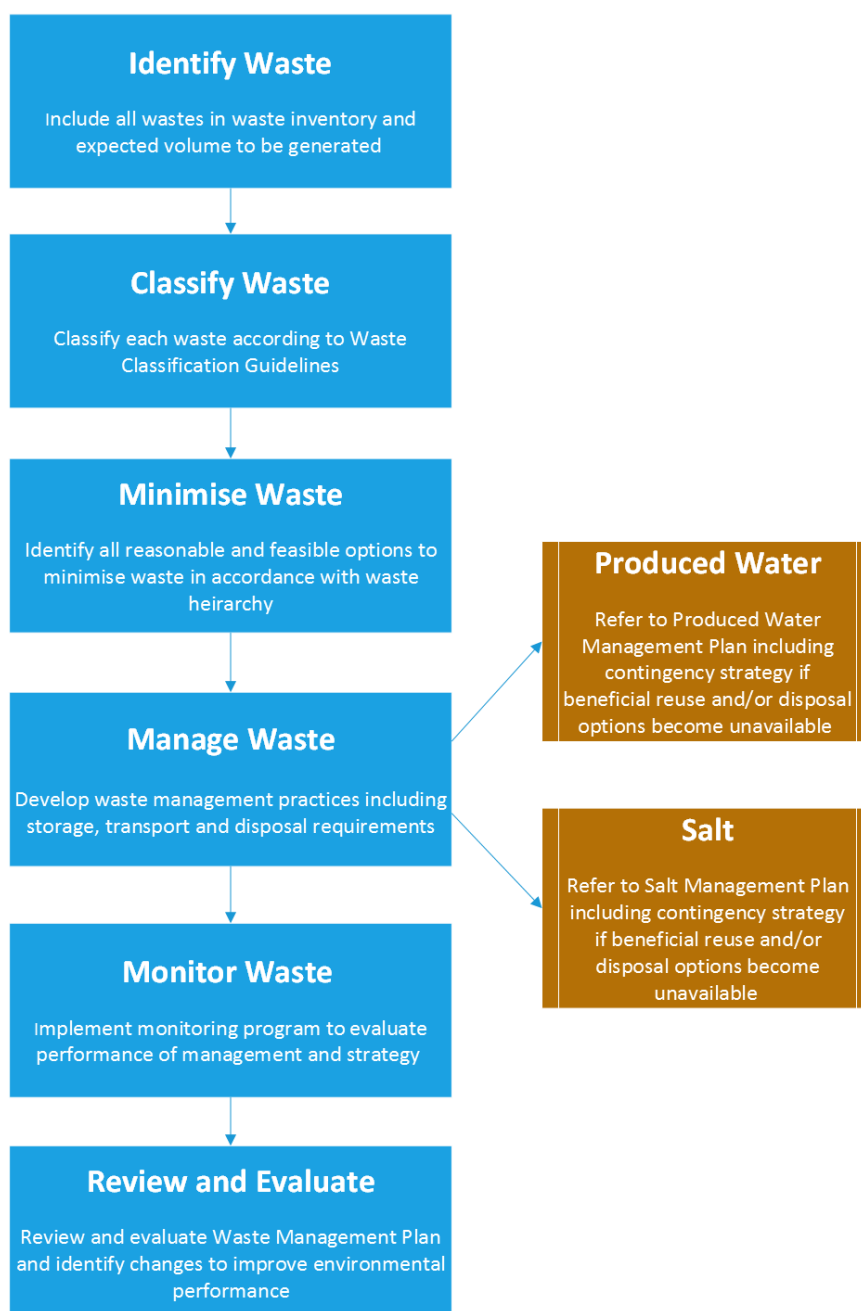


Figure 4.1 - Waste management system

5. Waste hierarchy

The Project waste management strategy revolves around the waste management hierarchy. The waste management hierarchy² consists of the following elements, as presented in Figure 5.1:

- **Avoid** choose a process so as to avoid the production of the waste
- **Reduce** review the process and raw materials to reduce
- **Reuse** reuse as much as possible in the process to minimise the waste
- **Recycle** use the waste stream as a raw material in a different process as an alternative source of energy/fuel
- **Treatment** appropriately treat waste and/or neutralise residuals.
- **Disposal** dispose of wastes responsibly using appropriate methods.



Figure 5.1 - Waste management hierarchy

5.1.1 Waste avoidance

Waste avoidance is primarily achieved during the planning and design of an activity. At the concept stage, alternative approaches to materials used, construction and operational techniques and maintenance of a process will be undertaken to achieve a less resource intensive and more efficient process. Waste avoidance will also be encouraged through the proficient use of contracts management and setting of provisions related to waste targets.

Where feasible, the generation of waste will be prevented or reduced by choosing lower waste inputs, increasing the efficiency in the use of raw materials, energy, water and land, redesigning processes or products and improving maintenance and operation of equipment.

² The waste hierarchy is a set of priorities for the efficient use of resources; this underpins the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.

The amount of material brought onto site for Phase 1 of the Project will be minimised through project planning, resulting in a cost saving and reduction in the volume of waste going to landfill. Excess materials and used chemical containers will, where reasonable and feasible, be returned to the supplier or other local users. Most of the infrastructure at Leewood and Bibblewindi will be pre-fabricated offsite, minimising the generation of waste on site.

In accordance with CoC B68, Santos will not receive waste in the Project area for storage, treatment, processing, reprocessing or disposal, unless it has been authorised in an applicable EPL, or through a specific resource recovery order and exemption under the Waste Regulation.

5.1.2 Waste reduction

Waste reduction is closely related to waste avoidance as described above. However, waste reduction will be achieved at any stage of the Project by reviewing existing processes and materials used, to achieve a more resource efficient process. Waste reduction also requires less energy than the waste management options listed further down the hierarchy by designing out waste before it is created.

5.1.3 Waste reuse

Some waste streams are able to be reused with no or minimal treatment. Predominant reuse opportunities for the Project will include the return and reuse of packaging materials (e.g. pallets, chemical containers), where reasonable and feasible, and the reuse of treated or amended produced water (of a suitable quality) for dust suppression and construction and operational purposes (including well completions). The reuse of brine or salt will also be investigated in consultation with the EPA.

Waste will be separated and collected at designated waste storage areas, taking into account health, safety and hygiene issues. Santos will reuse materials identified as construction wastes as follows:

- vegetation wastes from site clearing would be stockpiled, mulched and reused for site rehabilitation;
- solvents, metals or oil would be recovered and reused for a secondary purpose; and
- wood from concrete formwork would be recovered and reused.
- pallets would be reused or recycled
- paper and cardboard would be reused or recycled.

5.1.4 Waste recycling

Waste recycling includes the use of a waste stream as a raw material in a different process or as an alternative source of energy. Recycling is typically more energy intensive than reuse. The Project will produce a number of waste streams that are able to be recycled including plastics, paper, and cardboard. Some regulated wastes can also be recycled.

Wastes that are to be recycled will be sorted and stored on-site for collection by a licensed waste transporter. Depending on the waste type being recycled, the waste will be taken to the appropriate licensed facility for recycling.

Recyclable building wastes would be collected separately, including:

- scrap steel and off-cuts;

- wooden pallets (where they cannot be reused);
- plastics;
- paper and cardboard (where it cannot be reused); and
- oils.

Santos will work with its contractors during Phase 1 of the Project to develop a recycling program with the objective of maximising use of local recycling and reuse opportunities. The availability and capacity of local facilities will be a factor in maximising recycling and reuse opportunities.

5.1.5 Waste treatment

The main waste types generated from the Project which are able to be treated for reuse on-site or for safe transport and disposal are produced water, and fluids from drilling & completion (**D&C**) activities. Produced water will be treated to reduce salt content for reuse onsite or for other beneficial uses such as irrigation. The produced water can be further treated to produce solid salt, however the production of solid salt is not proposed for Phase 1 of the Project.

In accordance with the POEO Act, once D&C fluids have been used, these are technically defined as a waste (refer also to section 6.1). However, as per EPL 20350 condition L3.3, drilling fluids may be transported from one well pad to any other well pad for reuse. Spent drilling fluid unsuitable for reuse will be transported by a licenced contractor for disposal at an appropriately licenced facility.

Refer also to the Produced Water Management Plan (which includes the Salt Management Plan) for further details on the treatment and reuse of produced water.

5.1.6 Waste disposal

Wastes that cannot be reused, recycled or treated for beneficial reuse will be segregated and stored in designated waste storage areas at each facility or activity location for collection by a waste transporter. Regulated wastes will be similarly segregated and stored for collection by a waste transporter licensed to transport them. All waste, including salt product, that is not recycled or reused will be disposed of at a landfill that can lawfully accept the waste.

A number of waste disposal facilities are located within the immediate area surrounding the Project as well as the surrounding region. The nearest licensed waste facility is the Narrabri Landfill, about 25 km from Leewood. Tracking and transportation of waste is discussed in section 6.4.

Waste facilities used are dependent on the waste type being disposed of, the waste transporter, and the ability of the facility to receive the required volumes of waste. Waste disposal facilities proposed to be used for the Project during Phase 1 are listed in Table 7.1.

In accordance with the POEO Act and its regulations, it is Santos' responsibility to ensure that any transporter of waste is appropriately licensed to transport the waste, and the facility that is to receive the waste is legally able to receive the type of waste concerned.

6. Waste management practices

Waste management practices to be implemented will consider the waste management hierarchy (section 5), and will ensure that the Project activities that generate, receive (store) or dispose of waste have an understanding of:

- the types and quantities of waste generated, received and/or disposed; and
- any risks associated with the transporting handling and disposal of these wastes.

The objectives of the waste management practices will be to:

- maximise beneficial reuse of waste generated by the Project;
- minimise the residual waste generated by the Project; and
- minimise the on-site storage of waste generated by the Project.

Waste management practices are discussed in sections 6.1 to 6.5. Section 7 provides specific waste management measures for each waste identified in the waste inventory (section 6.2).

6.1 Waste classification

Waste is defined under the POEO Act as:

- any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- any discarded, rejected, unwanted, surplus or abandoned substance, or
- any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- any processed, recycled, reused or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- any substance prescribed by the regulations to be waste.

The POEO Act, Waste Regulation and Waste Classification Guidelines provide a classification system for waste. The classifications relevant to the waste generated by the Project are listed in Table 6.1. Many waste types are pre-classified under the POEO Act, others require testing to determine its classification. All waste will be classified prior to leaving the Project footprint³.

³ The Project footprint is defined as the area of surface expression being about 1,000 hectares occupied by the infrastructure components of the Narrabri Gas Project

Table 6.1 - Waste classifications and associated waste types

Classification	Description of waste types
Category 1 trackable waste	Waste type described in Schedule 1, Part 1 of the Waste Regulation that exhibits any of the characteristics specified in Schedule 1, Part 3.
Category 2 trackable waste	Waste type described in Schedule 1, Part 2 of the Waste Regulation that exhibits any of the characteristics specified in Schedule 1, Part 3.
Hazardous waste	<p>Defined under the Australian Dangerous Goods Code:</p> <ul style="list-style-type: none"> • Class 1 (explosives) • Class 2 (gases) • Division 4.1 (flammable solids) • Division 4.2 (substances liable to spontaneous combustion) • Division 4.3 (substance which when in contact with water emits flammable gases) • Class 5 (oxidizing substances and organic peroxides) • Division 6.1 (toxic substances) • Class 8 (corrosive substances)
Liquid waste	<p>Defined in the Waste Classification Guidelines as waste that:</p> <ul style="list-style-type: none"> (i) has an angle of repose of less than 5 degrees above horizontal, or (ii) becomes free-flowing at or below 60°C or when it is transported, or (iii) is generally not capable of being picked up by a spade or shovel
Restricted solid waste	Restricted solid waste includes wastes assessed and classified as such, in accordance with the procedures outlined in the Waste Classification Guidelines. No wastes have been pre-classified as 'restricted solid waste'.

Classification	Description of waste types
Special waste	<p>Defined in the Waste Classification Guidelines as:</p> <ul style="list-style-type: none"> • clinical and related waste • asbestos waste • waste tyres
General solid waste (non-putrescible)	<p>This includes:</p> <ul style="list-style-type: none"> • glass, plastic, rubber, plasterboard, bricks, concrete or metal • paper or cardboard • household waste from municipal clean up (not containing food waste) • grit and screenings from potable water and water reticulation plants that has been dewatered so that it does not contain free liquids • drained oil filters (mechanically crushed), rags and oil absorbent materials • cured concrete waste from a batch plant as it would remain from its application on construction activities • building and demolition waste
General solid waste (putrescible)	<p>This includes:</p> <ul style="list-style-type: none"> • household waste that contains putrescible organics • waste from litter bins collected by or on behalf of local councils • food waste • grit or screenings from sewage treatment systems that have been dewatered so that the grit or screenings do not contain free liquids.

6.2 Phase 1 waste inventory

Waste inventories enable the accurate assessment of waste data. Waste inventories therefore directly assist in the implementation of the waste avoidance and waste reduction principles of the waste hierarchy by enabling the review of the waste streams generated by specific processes and consequently identify opportunities for improvement. Waste inventories are also important to enable the accurate reporting of waste types and volumes to regulatory bodies as required (e.g. sustainability reporting). Santos will use a waste inventory to record the details of waste products. Inventory information is to include the source, classification and volume of each waste.

Phase 1 will include ongoing exploration and appraisal works which will include the following activities and waste generation:

- operation of portable amenities - generating wastewater, sewage and effluent sludge;
- construction of gas and water gathering systems, and infrastructure at Leewood and Bibblewindi – generating general construction waste including timber pallets; concrete, metal straps, bands and off-cuts; cable reels; glass; paper; cardboard and plastic from packaging;
- setup and commissioning of plant and equipment - generating waste air and oil filters, rags, containers and drums, chemicals, batteries and tyres, and liquid wastes such as waste oil, oily water, paints, solvents, sealants, fuels and lubricants;
- concrete work at wells pads, Bibblewindi and Leewood - generating cement fluid and slurry;
- D&C of wells - generating waste casing materials, drilling fluids, drill cuttings;
- operation of exploration and appraisal wells - generating produced water that will be treated at the Leewood water treatment facility. The produced water would be managed in accordance with the Produced Water Management Plan, with the treated water being beneficially reused in agricultural irrigation, dust suppression, construction, D&C and firefighting activities;
- operation of water treatment facility at Leewood - treating the produced water from operation of the exploration and appraisal wells which would generate:
 - solids removed during the water treatment process;
 - brine from the reverse osmosis and brine concentrator;
 - used filter cartridges and reverse osmosis membranes from the water treatment facility.
- operation of other infrastructure at Leewood and Bibblewindi - generating waste fuels, oils and hydrocarbons; oily water, rags and absorbent material; wastewater;
- operation of plant and equipment - generating waste air and oil filters, rags, containers and drums, chemicals, batteries and tyres, and liquid wastes such as waste oil, oily water, paints, solvents, sealants, fuels and lubricants;
- fencing of well pads;
- maintenance of wells and wellhead infrastructure - generating plastic, scrap metal, cement fluid and slurry, drilling fluids used in wells during workover activities, and some green waste in accessing areas around wells; and
- maintenance of gas and water gathering systems - generating pipe off-cuts and entrained water.

Other waste that may be generated by a range of activities during construction include residual paints, sealants and solvents; insulation materials; electrical and electronic waste such as batteries; clinical waste generated by the workforce including and domestic waste generated by the workforce including food waste and recyclable material such as paper, cardboard, aluminium and other packaging.

For some of the materials listed above, including the waste casing materials, drilling fluids and drill cuttings (including where these materials are reused on site during rehabilitation efforts), a batch testing and classification process will be applied. In those circumstances that the same drilling fluids are being used while drilling in the same seam, the batch results would be used to classify the material for future locations. Validation testing would occur at each 5th well to confirm that the surrogate remains valid and that the classification remains correct.

Table 6.2 provides a waste inventory which identifies waste-generating activities and waste classifications that may be generated during Phase 1 of the Project. The quantity of each waste produced during Phase 1 of the Project will be recorded. This data will be used to develop forecasts for subsequent phases of the Project, which will be included in the waste inventory in future revisions of this Plan.

Hydrostatic testing water will also be generated during the commissioning of pipes for Phase 1, which will be tested and disposed of to either the Leewood water treatment facility or an off-site licenced facility.

Table 6.2 - Phase 1 waste inventory

Waste	Activity	Classification	Trackable waste	Monitoring frequency	Review frequency
Rock-based drill cuttings	Drilling of vertical wells	General solid waste (non- putrescible)	No	Monthly	Annual
Coal-based drill cuttings	Drilling of lateral wells	General solid waste (non- putrescible)	No	Monthly	Annual
Spent drilling and completions fluid	Drilling and completions of wells	Liquid waste (may be trackable, depending on the results of further testing)	Possibly tracked	Monthly	Annual
Cement slurry	Drilling of wells	General solid waste (non- putrescible)	No	Monthly	Annual
Produced water	Operation of exploration and appraisal, and production wells	Interim waste product – not for off-site disposal	Interim waste product – not for off- site transport	Monthly	Annual
Brine	Produced water treatment	Interim waste product waste product – not for off-site disposal	Interim waste product – not for off- site transport	Monthly	Annual
Filter membranes and clean in place (CIP) filters	Produced water treatment / reverse osmosis plant operation	Hazardous waste	Yes	Monthly	Annual
Algae and other pond solids	Reverse osmosis plant operation	General solid waste putrescible	No	Monthly	Annual
Recyclable containers, plastic, paper and cardboard including plastic drums	Installation of gas and water gathering systems Construction of power plant (if required), well pad facilities, gathering lines, water treatment plant, nodal compression facility, central processing facility, high voltage transmission lines, pipelines	General solid waste (non- putrescible)	No	Monthly	Annual
Concrete, and construction and demolition (C&D) waste	Construction of bulk earthworks, power plant, well pad facilities, gathering lines, water, treatment plant, nodal compression facility, central processing facility, high voltage transmission lines and pipelines	General solid waste (non- putrescible)	No	Monthly	Annual
Scrap metal, metal containers, wire and cable, electrical waste and electronic equipment, gas cylinders, white goods	Construction of power plant, well pad facilities, gathering lines, water treatment plant, nodal compression facility, central processing facility, high voltage transmission lines, pipelines	General solid waste (non- putrescible)	No	Monthly	Annual
Oils and hydrocarbons	Plant and equipment operation	Hazardous waste	Yes	Monthly	Annual
Engine oil filters (spent)	Plant and equipment operation	General solid waste (non- putrescible)	No	Monthly	Annual
Timber, crates, pallets	Delivery of construction materials used in construction of power plant, well pad facilities, gathering lines, water plant, nodal compression facility, central processing facility, high voltage transmission lines, pipelines	General solid waste (non- putrescible)	No	Monthly	Annual
Tyres	Plant and equipment operation	Special waste	Yes (if transported out of NSW)	Monthly	Annual
Batteries, residual paints, sealants, solvents, resins	Surface earthworks, construction of water treatment facility, worker accommodation, Plant and equipment operation	Hazardous waste, liquid waste	Yes	Monthly	Annual
Medical waste	Plant and equipment operation	Special waste	Yes	Monthly	Annual

6.3 Waste storage and handling

In addition to the Santos waste facilities located at the Santos' Project Operations Centre, wastes requiring transportation for recycling and/or disposal will be stored within designated waste storage areas located at each asset / activity location. Wastes will be segregated into general, recyclable and regulated waste types. Further segregation within each category will be undertaken as required dependent on its classification, for ease of identification and collection, and to avoid contamination.

General wastes will be stored within mixed general waste bins for removal. Putrescible wastes will be stored in covered containers, to minimise odours, exposure to Santos personnel and access to fauna.

General domestic recyclables will be stored within mixed recycling bins for removal. Other recyclable waste types, such as certain plastics, scrap metals and containers will be segregated separately for ease of collection and management at the recycling facility.

Regulated wastes require more specific storage and handling requirements due to their potential to cause environmental harm and/or health and safety issues. Regulated wastes will be stored in appropriate containers / tanks that are appropriately labelled and where applicable, in accordance with the recommendations of relevant Safety Data Sheets, AS1940:2017: *The storage and handling of flammable and combustible liquids*, and other relevant dangerous goods standard.

6.4 Waste transport and tracking

6.4.1 Waste transport

Both hazardous (regulated) and non-hazardous wastes will be transported to points within the Project area (e.g. transference of waste to a local collection point) as well as directly off-site for management or disposal. All waste material transported between well pads will occur within the same premise as EPL 20350, so no waste exemptions are required. General wastes and non-hazardous recyclable wastes may be removed offsite by a Santos representative, however, more preferably by a contracted waste collector.

Regulated wastes will be handled and transported by a licensed waste transporter and tracking of the waste as required by legislation will be undertaken, as detailed in section 6.4.2.

6.4.2 Waste tracking

Santos will track the quantities and movement of general, recyclable and regulated wastes. Quantities of general and recyclable wastes will be monitored monthly (section 8) and reported in the Annual Review (refer to section 10.1).

Tracking requirements for hazardous waste being transported within NSW and between NSW and other states and territories is regulated under Part 4 of the Waste Regulation. Santos and its licenced waste transporters and/or receiving facilities will track hazardous waste in accordance with the Waste Regulation, including the use of consignment authorisations and waste transport certificates. Quantities of hazardous waste and facilities used will be reported in the Annual Review.

6.5 On-site waste management

All on-site waste management facilities will be developed in accordance with internal waste management procedures and all legislative requirements in relation to waste management and disposal.

General waste generated during Phase 1 of the Project will either be collected and consolidated at a designated waste storage area at Leewood, Bibblewindi, or taken directly to a licensed waste facility. The waste storage area will consist of a compound for bins, containers, pallets and other waste equipment. Garbage and recyclables will be stored separately for appropriate reuse, recycling or disposal. Most waste is expected to be collected from the waste storage area by licensed contractors. Contractors may also collect directly from other sites in the operational area where this is required.

Waste requiring disposal would be transported to an appropriately licensed waste facility. All waste transport will be undertaken by licensed transporters and tracked as described in section 6.4.2.

6.5.1 Drilling waste

Management of drilling fluids will involve delivery and treatment of drilling fluids at the approved drilling fluids recycling facility at the Narrabri Operations Centre (licensed under EPL 20378) or taken directly to another licensed waste facility for processing, such as the Bibblewindi or Leewood fluid treatment facility (once licensed). These facilities will provide storage capacity for fluids, remove ultra-fine and colloidal solids, mix chemicals to the drilling fluids, and return fluids to field operations.

Spent drilling fluid unsuitable for reuse will be transported by a licensed contractor for disposal at an appropriately licensed facility. As detailed in section 6.2, a batch testing and classification process will be applied to the spent drilling fluids that are not suitable for reuse. This will include the development of a program of validation testing for future Project phases to confirm that a surrogate classification approach is appropriate. Depending on the results of testing this waste may be required to be tracked under the requirements of the POEO Act.

Residual drilling materials (**RDM**) from the near-vertical part of the well (which will be predominantly rock-based material) may be beneficially reused on any well pads using a mix, turn, bury strategy. RDM from one well pad may be transported to a future well pad to ensure sufficient area is available for the safe execution of all appraisal and exploration activities at the active well pad. As detailed in section 6.2, a batch testing and classification process will be applied to the RDM. This will include the development of a program of validation testing to confirm that a surrogate approach to classify the material is appropriate to meet the requirements, while the material at the future pilot well pad would be stored temporarily with dedicated controls in place. The application of RDM at well pads will be carried out with regard to the volume and characteristics of the drill cuttings, the characteristics of the receiving soil, and the volume and nutrient requirements of growth media. The RDM Management Protocol, presented as Appendix F of the Rehabilitation Management Plan, provides further details on the use of RDM for rehabilitation.

All transport of RDM between well pads will occur within the same EPL premises. Note that in the event RDM is not required for rehabilitation purposes, the material may be transported to a licensed facility for disposal.

Options for the beneficial reuse of coal-based cuttings will be investigated for subsequent phases of the Project, and if feasible and practicable, would be implemented under a Project-specific resource recovery order and exemption, once obtained. The off-site transport of coal-based cuttings for disposal at an appropriately licensed facility would be considered only as a last resort option.

6.5.2 Salt

Salt is generated through the treatment of produced water. The salt would be classified as general solid waste under the Waste Classification Guidelines.

There is no salt proposed to be produced for Phase 1 and Phase 2 of the Project, therefore this Plan does not consider the management of salt. Management of salt will be described in the Salt Management Plan and subsequent revisions of this Plan following completion of the Produced Salt Beneficial Reuse and Disposal Study required by condition B69. Part of this study includes the demonstration that operators of waste facilities can lawfully accept, and will permit, the volume and composition of salt waste produced by the development for disposal at their premises.

6.5.3 Sewage waste

Sewage treatment systems are a scheduled activity under the POEO Act if they *have an intended processing capacity of more than 2,500 persons equivalent capacity or 750 kilolitres per day and that involve the discharge or likely discharge of wastes or by-products to land or waters.*

The sewage treatment systems proposed to be used throughout the Project will not exceed the threshold to be defined as a scheduled activity and will not discharge to a watercourse. Therefore, a Section 68 approval for the sewage treatment systems will be obtained from Narrabri Shire Council under the *Local Government Act 1993*.

Portable ablution facilities for the storage of sewage will be used during Phase 1 of the Project at construction sites (e.g., during D&C). Packaged wastewater treatment plants, which are extensively utilised in both municipal and project-related settings, employ an aerobic process to treat sewage. The process generates effluent suitable for application to land and residual sludge that is held within storage tanks that are periodically collected by a licenced transporter and disposed at a licenced facility. A flow rate of 60 litres per person per day has been adopted for all site offices (including transient facilities), which assumes toilet and hand basin waste, including kitchen and shower facilities. This is in accordance with *AS/NZS1547:2012 - On-site Domestic Wastewater Management*.

6.5.4 Non-routine waste

In the event of a spill, waste generated during clean-up, including spoil, absorbent materials or cleaning products, soil or other items would be classified and stored appropriately prior to disposal at a facility licensed to accept the waste.

6.5.5 Naturally occurring asbestos

Most of NSW, has very little or no potential to host naturally occurring asbestos (**NOA**). Areas of identified potential cover about 0.83% of NSW which have been mapped on a high-, medium- and low potential basis. Ground disturbing activities, particularly in areas assessed as having high and medium potential (about 0.27% of NSW) should be managed to prevent exposure to NOA. (NSW Government, 2005). Santos has reviewed operational project areas against current risk maps published by the Department of Regional New South Wales. The planned exploration, appraisal and development activity are located within regions that are not of risk.

7. Itemised waste management and disposal

Waste management practices for wastes identified in the waste inventory produced during Phase 1 (section 6.2) are provided in Table 7.1. The objectives of the proposed management measures are to:

- maximise beneficial reuse of waste generated by the Project;
- minimise the residual waste generated by the Project; and
- minimise the on-site storage of waste generated by the Project.

Waste disposal will not be restricted to using waste disposal facilities identified in Table 7.1. Santos and its contractors may require the use of other facilities from time to time and any alternative disposal options will be assessed for suitability depending on the waste type and volume. Where facilities are required to be used that are not specified in this Plan, Santos and its contractors will ensure the facility is appropriately licenced to accept the waste(s).

Table 7.1 - Phase 1 waste management measures

Waste	Avoidance and reuse	Storage and collection	Disposal	Receiving facilities
Rock-based drill cuttings	Transport drill cuttings from any of the well pads to other well pads, and apply the drill cuttings to land using the mix, turn and bury method (refer also to the Rehabilitation Management Plan).	After temporary storage on a well pad, drill cuttings not utilised in beneficial reuse would be transported offsite and disposed of at an appropriately licensed facility.	Drill cuttings not utilised in beneficial reuse would be transported offsite and disposed of at an appropriately licensed facility.	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193) Cleanaway Operations P/L, 31 Gunnedah Rd, Tamworth NSW (EPL 10804) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065)
Coal-based drill cuttings	-	Temporary storage at site in appropriate containers.	Dispose of coal-based cuttings to an appropriately licensed facility or beneficially reused.	
Drilling fluid	About 90% reused and recycled in drill rig. Transport D&C fluids from one well pad to any other well pad for reuse, in accordance with EPL 20350 condition L3.3	Store drilling fluids on site in tanks and transfer to the treatment facility located at the Narrabri Operations Centre (or other appropriately licenced facility) for reuse in subsequent drilling.	Classify remaining drilling fluid waste and dispose of residual waste at a facility that can lawfully receive it.	
Cement slurry	-	Stored on site and collected by a licenced waste contractor for transport to an appropriate licenced landfill.	Dispose of at an appropriately licenced facility.	
Produced water	Beneficial reuse of treated water in agricultural irrigation, dust suppression, construction, D&C and firefighting activities	Produced water ponds at Leewood and Bibblewindi prior to treatment	Not for disposal.	N/A
Brine	Not for disposal. Treated through the brine concentrator to produce distillate for beneficial reuse and salt for licenced disposal	Brine storage ponds at Leewood and Bibblewindi prior to treatment	Refer to the Produced Salt Beneficial Reuse and Disposal Study.	N/A
Filter membranes and CIP filters	Treatment of the RO membranes and filters to convert to ultrafiltration membrane for offsite reuse	Stored in marked bins for collection by a licenced contractor	Potential reuse offsite (by third party) of RO membranes and filters	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193) Reuse options to be confirmed
Algae and other pond solids	-	Stored in marked bins for collection by a licenced contractor	Transport to a licenced landfill for disposal	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193)
Recyclable containers, plastic, paper and cardboard including plastic drums	Order in bulk wherever possible. Avoid using composite materials and items. Use returnable containers wherever possible.	<p>Keep recyclable plastic separate from non-recyclable. Place recyclable plastic in labelled containers and non-recyclable plastic in general waste bin.</p> <p>Ensure containers and drums are empty and cleaned appropriately and chemical labels are removed for reuse. Place on pallets in designated waste storage area for collection by contractor.</p> <p>Ensure paper is segregated and disposed in recycling bins.</p>	<p>Return recyclable materials directly to supplier where possible.</p> <p>Reuse and recycle paper, plastic, etc.</p>	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193) Visy Paper P/L, 6 Herbert St Smithfield NSW (EPL 20752) Challenge Community Services Narrabri NSW (address TBC) Australian Recycled Plastics, 268 Yarrie Lake Rd Narrabri NSW

Waste	Avoidance and reuse	Storage and collection	Disposal	Receiving facilities
Concrete, and construction and demolition (C&D) waste	Where practicable, avoid over-ordering and delivery of excess materials through a procurement process. Reuse waste on site in the form of concrete blocks and/or crush on site for use as road base or drainage medium.	Separate, stockpile and/or crush waste for reuse on site. Separate those materials that require offsite disposal.	Dispose waste that cannot be reused on site at an appropriately licensed facility.	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065)
Scrap metal, metal containers, wire and cable, electrical waste and electronic equipment, gas cylinders, white goods	Avoid over-ordering and delivery of excess materials through procurement process. Functional equipment considered for donation to community organisations. Recycle scrap metal and reuse white goods.	Separate waste for recycling and stockpile or store in appropriate container in a designated waste storage area. Organise collection by a licensed e-waste contractor.	Small quantities of some metals would be disposed of if mixed with or attached to other materials, such as timber or concrete, and cannot be easily separated. Dispose waste that cannot be reused on site at an appropriately licensed facility.	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193) Onesteel Recycling P/L, 14 Sparke St Hexham NSW (EPL 5345) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628)
Oils and hydrocarbons	Reuse in servicing of plant and vehicles off site.	Store oils and hydrocarbons in separate bulk or smaller containers as required. Store in a designated bunded area for collection by a licensed contractor.	Transport oils and hydrocarbons to recycling facility using an appropriately licensed contractor	<ul style="list-style-type: none"> Cleanaway Operations P/L, 31 Gunnedah Rd, Tamworth NSW (EPL 10804) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065) Renewable Oil Services, 36-38 Bradmill Ave, Rutherford NSW (EPL 13092)
Engine oil filters (spent)	Reuse in servicing of plant and vehicles off site.	Drain filters of excess oil prior to disposal. Place in designated bin in waste storage area for collection by contractor.	Transport oils and hydrocarbons to recycling facility using an appropriately licensed contractor.	<ul style="list-style-type: none"> Onesteel Recycling P/L, 14 Sparke St Hexham NSW (EPL 5345) Cleanaway Operations P/L, 31 Gunnedah Rd, Tamworth NSW (EPL 10804) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065) Renewable Oil Services, 36-38 Bradmill Ave, Rutherford NSW (EPL 13092)
Putrescible and general waste	In the canteen develop suitable low waste menus, serving methods and serving sizes	Separate food scraps and store in appropriate bin.	Transport waste to landfill.	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri (EPL 12193) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065)
Timber, crates, pallets	Avoid over-ordering and delivery of excess materials through a procurement process. Return pallets to supplier, where possible.	Stockpile timber, crates and pallets for reuse on site if suitable, or return to the supplier. Chip and mulch timber, crates and pallets if suitable (e.g. untreated).	Disposal to appropriately licenced facility as required	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri (EPL 12193) Reuseable pallets can be donated to local business.
Tyres	Change tyres at retailers in towns as much as possible	Place tyres on pallets at waste storage area for collection by a contractor for recycling	Return waste tyres directly to supplier where possible, or otherwise recycle	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri (EPL 12193) Tyrecycle, 81-85 Christie St, St Marys NSW (EPL 13217)

Waste	Avoidance and reuse	Storage and collection	Disposal	Receiving facilities
Batteries, residual paints, sealants, solvents, resins	Use rechargeable batteries wherever possible, recycle used batteries. Avoid over-ordering and delivery of excess materials through a procurement process	Store wet and dry batteries separately in containers at designated waste storage area for collection by contractor for recycling. Store chemicals in banded purpose-designed enclosure, for collection by a licensed operator	Transport waste using an appropriately licensed contractor. Recycle batteries. Recover chemicals. Dispose of other materials appropriately	<ul style="list-style-type: none"> Narrabri Shire Council Landfill, Yarrie Lake Rd, Narrabri NSW (EPL 12193) Cleanaway Operations P/L, 31 Gunnedah Rd, Tamworth NSW (EPL 10804) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065)
Sewerage and septic waste	-	Collection in septic tanks and temporary construction ablution blocks prior to pump out and transport for disposal	Transport waste using an appropriately licensed contractor	<ul style="list-style-type: none"> Narrabri Shire Council Sewage Treatment Works, Newell Hwy, Narrabri NSW (EPL 200) Gunnedah Shire Council Sewage Treatment Works, 72-78 Kamilaroi Hwy, Gunnedah NSW (EPL 831)
Chemical wastes	Minimise chemical use and promote the use of non-hazardous alternatives	Store in a designated banded area for collection by a licensed contractor	Transport waste using an appropriately licensed contractor	<ul style="list-style-type: none"> Cleanaway Operations P/L, 31 Gunnedah Rd, Tamworth NSW (EPL 10804) Cleanaway Co P/L, 40 Christie Street, St. Marys NSW (EPL 12628) Environmental Treatment Solutions, 26 Hinkler Ave, Rutherford NSW (EPL 20065)

8. Waste monitoring program

A waste monitoring program will be implemented across the Project in order to evaluate and report on:

- the effectiveness of the waste management system;
- ongoing classification of waste;
- compliance against the waste operating conditions and the EPL; and
- identify waste-related incidents or non-compliances.

Waste generated at the Project will be monitored on a monthly basis through:

- waste disposal receipts provided by the waste contractors; and
- Santos' waste register and waste inventories.

Visual inspections of Santos waste facilities will also be undertaken monthly to monitor the adherence to waste storage and handling requirements.

Waste data will be collected and recorded according to type in Santos' waste register. The waste register will be used to assess the effectiveness of waste avoidance, minimisation and management measures and to monitor the requirements listed above. A monthly summary report will be prepared to evaluate the performance of the waste management system.

9. Incidents, non-compliances and complaints

9.1 Incidents and non-compliances

Incident reporting and non-compliance notification will be in accordance with CoC D6 and D7 respectively, as described in section 6 of the EMS. In the event of a waste-related environmental incident or non-compliance, generally considered as a deviation from the approved Plan or the obligations under CoC B70, Santos will initiate an investigation. The incident will be reported immediately after Santos becomes aware of an incident causing or threatening to cause material environmental harm⁴. Any notification will be provided to the Department and any other relevant agencies immediately via the Major Projects Portal and will describe the location and nature of the incident that occurred.

Within 7 days of becoming aware of a non-compliance, Santos will notify the Department of non-compliance via the Major Projects Portal. This report will include the set out of the non-compliance, the reason for the non-compliance (if known) and the actions that have been or will be taken to address the non-compliance.

Where waste-related incidents or non-compliances are identified, Santos will:

- take all reasonable and feasible steps to ensure that the incident or non-compliance ceases and does not reoccur;
- consider all reasonable and feasible options for remediation (where relevant) and submit a report to the relevant department(s) describing options and any preferred remediation measures or other courses of action; and
- implement remediation measures as directed by the relevant department(s).

9.2 Unpredicted impact protocol

It is considered unlikely that the activities during Phase 1 will result in any unpredicted or unforeseen impacts in relation to waste management. However, in accordance with CoC D3(f), the following strategy outlined in Table 9.1 below will be adopted in the event where the designated beneficial reuse or disposal of waste is unavailable. It is to be noted that, as detailed in the approved Produced Salt Beneficial Reuse and Disposal Study and stated in section 6.5.2, that no solid salt will be produced during Phase 1 and 2 of the Project. This Plan, the Salt Management Plan and Produced Salt Beneficial Reuse and Disposal Study will be updated prior to Phase 2.

Table 9.1 - Unpredicted impact protocol

Step	Strategy
1	Implement immediate corrective actions to minimise the unpredicted impact
2	Review the unpredicted impact and consider the following: <ul style="list-style-type: none"> • current activities in the vicinity that may have triggered this event; and • relevant monitoring data.
3	Notify the relevant agencies and departments
4	If appropriate, commission an investigation by an appropriate specialist

⁴ Refer to the Glossary in section 12 for the full definition of 'incident', as per the Development Consent for SSD 6456.

Step	Strategy
5	Based on the results of the investigation, develop the appropriate amendment and amelioration methods for the beneficial reuse or disposal of the specific type of waste(s)
6	Implement the information from the investigation to update this Waste Management Plan which will include any or all of the following: <ul style="list-style-type: none"> • a review and where required, revision of the designated beneficial reuse and disposal options identified in Table 7.1 • a review and where required, revision of the waste monitoring method and frequency; • a review the actions that may have been taken prior to event; and • implement any relevant training based on the findings of the investigation to avoid any recurrence of the unpredicted impact.

9.3 Complaint management

Santos has a documented *Complaint Management Procedure* that is communicated to all relevant staff members. Complaints can be directed to Santos via phone or email 24 hours a day, 7 days a week. Contact details are publicly available on the Project website and are presented in Appendix D of the EMS.

All complaints are logged on a complaint form which includes the following details:

- date and time of the complaint;
- complainant details;
- details of the issue or complaint;
- actions taken to remediate the issue, if any;
- follow up actions required, if any;
- details of further liaison with complainant, if any; and
- closure date and time of the issue.

As per CoC D13, Santos maintains a complaint register which is updated as required and available on the Project website.

10. Reporting, evaluation and review

10.1 Annual Review

Santos will review the performance of its waste management system for the previous calendar year and report results within the Annual Review to the satisfaction of the Planning Secretary as described in section 6 of the EMS and in accordance with condition D8. The Annual Review will be submitted to the Department via the Major Projects Portal by the end of March each year and will at minimum provide the following information in regard to waste management as per condition B67(e) and (f):

- the amount of waste transported from the Project area;
- the effectiveness of waste avoidance, minimisation and management measures; and
- any waste related incidents or non-compliances.

Further, the annual review under consent condition D8 requires a number of items to be reviewed or assessed. In summary these are:

- monitoring results and complaints;
- trends in monitoring data;
- non-compliances and incidents;
- compliance with performance measures;
- discrepancies between predicted and actual impacts; and
- measures to be implemented to improve environmental performance.

The Annual Review may also make recommendations for any additions, changes or improvements of the waste management system.

10.2 Independent environmental audits

Within one year of commencement of Phase 1 and every three years thereafter, Santos will commission an Independent Environmental Audit (**IEA**) of the development, to be conducted in accordance with CoC D9. The audit team will be led by a suitably qualified auditor and include experts in groundwater, well integrity, hazards, and any other fields specified by the Planning Secretary.

The IEA process is further described in section 8.3 of the EMS.

10.3 Waste Management Plan review and evaluation

As required by CoC D4, Santos will review the suitability of the Waste Management Plan, within two months of:

- (a) the submission of an incident report;
- (b) the submission of an Annual Review;
- (c) the submission of an Independent Environmental Audit;
- (d) the submission of a Field Development Plan;
- (e) the submission of a Groundwater Model Update; or
- (f) the approval of any modification of the conditions of this consent.

In view of the various conditions requiring annual reviews, suitability assessments and performance evaluations, this Plan will be reviewed and, if necessary, updated in at least the following circumstances:

- in accordance with any direction from the NSW EPA or the Minister administering the PO Act;
- due to any significant change to the management processes as described herein. If there is ambiguity in relation to whether there is a significant change, Santos will consult with the Planning Secretary to determine whether the Plan must be reviewed; and
- otherwise at intervals of no longer than one year.

The review history table in the front of this Plan provides the details of each review, conducted in accordance with condition D4.

As required by CoC D5, if the review under condition D4 determines that the Waste Management Plan require revision - to either improve the environmental performance of the development, cater for a modification or comply with a direction - then Santos will submit the revised Plan to the Planning Secretary for approval within 6 weeks of the review.

Further details on the reporting, evaluation and review of the Plan are provided in section 8 of the EMS.

10.4 Improvement measures

Consent condition D3(g) requires that this Plan includes a program to investigate and implement ways to improve the environmental performance of the Project over time; and CoC D3(i) states that the Plan is to include a protocol for the periodic review. The protocol for review is set out by consent conditions D8, D4 and D5, which have been addressed in sections 10.1 and 10.3 above.

Measures to improve the environmental performance of the Project that will be implemented following review and evaluation include the following:

- audit of waste management system, reviewing waste management measures;
- identification of potential system improvements such as upgrade of waste infrastructure and handling procedures;
- implementation of modifications to the waste management system; and
- additional monitoring.

In accordance with CoC D13 and as described in section 6 of the EMS, all relevant monitoring data and associated reports will be made available on the Project website, for the duration of the Project. This information will be kept up to date.

11. References

GHD (2017). *Narrabri Gas Project Environmental Impact Statement*. Prepared for Santos Ltd.

Heads of Asbestos Coordination Authorities (2015). *Mapping of Naturally Occurring Asbestos in NSW – Known and Potential for Occurrence*. Prepared by the NSW Trade & Investment, Division of Resources & Energy

NSW EPA (2014). *Waste Classification Guidelines. Part 1: Classifying Waste*.

Standards Australia (2012). *Australian Standard/New Zealand Standard International Standards Organisation 1547:2012 - On-site Domestic Wastewater Management*.

Standards Australia (2017). *Australian Standard/New Zealand Standard International Standards Organisation 1940:2017 - The storage and handling of flammable and combustible liquids*.

12. Glossary

Term	Definition ⁵
Amended treated water	Produced water that has undergone treatment and amendment, as generally described in the EIS, to enable it to be used for beneficial reuse purposes including irrigation, stock watering, drilling, construction and dust suppression
Approved disturbance area	The disturbance areas shown in the EIS as modified by any approved Field Development Plan
Beneficial use	Beneficial use refers to the use of waters, including produced water from an oil or gas well, for a secondary purpose that has a positive value. Potential beneficial use options for produced water include domestic and livestock supply, industrial supply, irrigation supply, dust suppression and recreation.
Brine	Saline water with a total dissolved solid concentration of greater than 40,000 milligrams per litre. May be a wastewater produced by the desalination of coal seam water (e.g. by reverse osmosis)
Bund (or bunding)	Wall of a secondary containment system, usually in the form of an embankment, used to prevent sediment and liquids from entering the environment
Completion fluid	A low solid mud or salt solution (brine) used for well testing and upon a well's completion. It is intended to minimise formation damage and to control formation pressure
Council	Narrabri Shire Council
Department	NSW Department of Planning, Housing and Infrastructure (DPHI)
Drill cuttings	Drill cuttings are the waste rock and spoil extracted from wells during drilling
Drill (or drilling) fluid	Water-based fluids used in the drilling process to cool and lubricate the drill bit, and also to carry drill cuttings to the surface
Ecosystem	An interconnected biological community of organisms that interact with each other and their physical environment.
EIS	The Environmental Impact Statement titled Narrabri Gas Project Environmental Impact Statement, dated 31 January 2017, submitted with the development application, including the Applicant's response to submissions and supplementary response to submissions, and the additional information provided by the Applicant to the Department in support of the application
Exploration well	A petroleum well that is drilled to: a) Explore for the presence of petroleum or natural underground reservoirs suitable for storing petroleum, or b) obtain stratigraphic information for the purpose of exploring for petroleum. For clarity, an exploration well is not a production well
Feasible	Means what is possible and practical in the circumstances
Gas well	Pilot wells and production wells
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance
Linear infrastructure	Project related infrastructure of a linear nature including gas and water gathering lines, gas and water pipelines, access tracks, power lines, communication lines and other service lines
Major facilities	Leewood facility and Bibblewindi facility
Material harm	Is harm that:

⁵ The majority of the definitions are as provided in the Development Consent for SSD 6456 and EPL 20350.

Term	Definition ⁵
	<ul style="list-style-type: none"> involves actual or potential harm to the health or safety of human beings or to the environment that is not negligible, or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) <p>This definition excludes “harm” that is authorised under either SSD 6456 or any other statutory approval</p>
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the Project
Mitigation	Activities associated with reducing the impacts of the development
Petroleum Assessment Lease 2 (PAL 2)	<p>A PAL is required to hold the exclusive right to prospect for petroleum and to assess any petroleum deposit over a specified area of land in NSW. A lease allows the holder to maintain a title over a potential area, without having to commit to further exploration. The holder can, however, continue prospecting operations and to recover petroleum in the course of assessing the viability of commercial mining.</p> <p>PAL 2 is held by Santos NSW Pty Ltd.</p>
Petroleum Exploration Licence 238 (PEL 238)	<p>Before exploring for minerals or petroleum in NSW, an explorer must first obtain a Petroleum Exploration Licence (PEL) under the <i>Petroleum (Onshore) Act 1991</i>. An exploration licence gives the licence holder exclusive rights to explore for petroleum or specific minerals within a designated area but it does not permit mining, nor does it guarantee a mining or production lease will be granted.</p> <p>PEL 238 is held by Santos NSW Pty Ltd.</p>
Petroleum Production Lease 3 (PPL 3)	<p>A petroleum production lease gives the holder the exclusive right to extract petroleum within the production lease area during the term of the lease.</p> <p>PPL 3 is held by the following titleholders:</p> <ul style="list-style-type: none"> Santos QNT Pty Ltd; Santos NSW (Hillgrove) Pty Ltd; and Santos NSW (Eastern) Pty Ltd.
Petroleum production lease application (PPLA)	<p>A petroleum production lease gives the holder the exclusive right to extract petroleum within the production lease area during the term of the lease. Development consent under the <i>Environmental Planning and Assessment Act 1979</i> must be in place before a petroleum production lease can be granted.</p> <p>Santos, on behalf of its then joint venture partner lodged four petroleum production lease applications under the PO Act in May 2014 for the Project area, being PPLAs 13, 14, 15 and 16.</p> <p>The ownership of the application is now held by Santos NSW Pty Ltd.</p>
Pilot well	A well for gas and water extraction, for the purpose of exploration, appraisal and assessment of the gas field potential
Planning Secretary	Planning Secretary under the EP&A Act, or nominee
Pollution incident	Has the same meaning as in the POEO Act
Produced water	Any form of groundwater that is actively extracted from a borehole, well or excavation, excluding incidental groundwater mixed with drilling fluids
Production well	A well for gas and water extraction, for the purpose of commercial gas production and/or use

Term	Definition ⁵
Project area	The area of approximately 95,000 hectares that encompasses the Project
Project footprint	The area of surface expression being about 1,000 hectares occupied by the infrastructure components of the Narrabri Gas Project
Project-related infrastructure	All infrastructure and other structures associated with the development. This includes linear infrastructure and non-linear infrastructure, surface infrastructure and subsurface infrastructure, major facilities, wells and well pads and other gas field infrastructure
Reasonable	Means applying judgement in arriving at a decision, considering mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Treated water	Produced water that has undergone treatment to enable it to be used for beneficial reuse purposes including irrigation, stock watering, drilling ⁶ , construction and dust suppression, and/or for managed release to Bohena Creek ⁷
Unacceptable risk	The level of risk at which mitigation actions are deemed to be warranted.
Watercourse	A river, creek or other stream, including a stream in the form of an anabranch or tributary, in which water flows permanently or intermittently, regardless of the frequency of flow events: In a natural channel, whether artificially modified or not, or in an artificial channel that has changed the course of the stream. It also includes weirs, lakes and dams
Well	Pilot wells and production wells
Well pad	An area of up to 1 hectare in size upon which the gas wells are to be located, with the area decreasing to no more than 0.25 hectares following rehabilitation ⁸ , or other area as may be approved in the Field Development Plan

⁶ Note that when 'drilling' is stated in consent conditions, where relevant this has been interpreted to mean 'drilling and completions'.

⁷ Note that there will be no discharge to Bohena Creek for Phase 1.

⁸ Workover activities will be contained within the operational area of the well pad area of around 0.2 ha, with an additional laydown area that could be approximately 0.2 ha in size.

Appendix A - Consultation records

This information is provided by Narrabri Shire Council



Our Reference: DLA:MH:1950357
Your Reference: SSD-6456-PA-22
Contact Name: Donna Ausling

Senior Environmental Advisor – Onshore Oil and Gas
Santos Ltd
32 Turbot Street
BRISBANE QLD 4000

Email: [REDACTED]

Thursday, 27 January 2022

Re: Narrabri Gas - Post Approval (SSD-6456-PA-22) – Produce Salt Beneficial Reuse and Disposal Study; Waste Management Plan; Rehabilitation Management Plan-Council Feedback

Dear Ms [REDACTED]

Thank you for the opportunity to provide comment on the abovementioned Plans. Council's consolidated feedback in this regard is provided herewith:

Produced Salt Beneficial Reuse and Disposal Study

It is noted that the submitted report identifies a number of businesses that will support to waste management activities that are currently located outside of the Region. These businesses are therefore encouraged, wherever reasonably practicable, to establish site operations within the Narrabri Local Government Area (LGA).

Transportation of waste materials (to be reused) does not appear to have been identified in previous Transport Management Plans for Santos. Consequently, any model to utilise the nominated by-product materials may be subject to a separate approvals process.

The Report mentions several negotiations with local Councils to dispose of waste. The particulars of these consultations have not been included in Appendix A, with details currently 'blank'. Since project inception there have been a number of changes to staff within the waste area across the Region, including within the Narrabri Shire Council. On this basis, Santos is encouraged to conduct routine and regular consultations with relevant Council personnel to ensure that lines of communication are maintained and available technical expertise can appropriately inform project decision-making processes.


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Council is also currently investigating opportunities to increase the capacity of the Narrabri Landfill. As a consequence, ongoing communication with Council's Waste Division is recommended.

Council has been consistent in endeavouring to diversify the economy of the Narrabri Shire. It is considered that the gas industry would add the existing agriculture, mining and education industries to broaden and strengthen the economic base of the Shire. Council is in the process of developing an industrial estate titled the 'Northern NSW Inland Port' (N2IP) and is currently working with the NSW government as it investigates Narrabri Shire as a Special Activation Precinct (SAP).

With the commencement of a gas industry, N2IP and the SAP would welcome the attraction and arrival of a range of ancillary businesses that either use gas as a feedstock, or for the provision of cheaper base energy. Similarly, ancillary businesses able to use by-product generated from the extraction of gas is an industry category that both Council is committed to attracting to the Narrabri Shire. Council is of the opinion that ancillary industries such as algae farming, a zirconium processing facility and sodium bicarbonate would prosper in Shire, particularly given proximity to the source of the by-product. Therefore, strong consideration should be given to the establishment of any business that requires gas for energy, feedstock or any specialist by-product reuse ancillary organisation.

Waste Management Plan (Phase 1)

As detailed above, given the dynamic nature of waste management and associated environmental requirements, ongoing and routine liaison is needed with Council's Waste and Water Divisions. This approach will ensure that Council's Water Treatment and Waste Facilities can appropriately manage the volume and product type that will be disposed offsite. It is acknowledged that such premises have been identified throughout the Report as the receiving facility.

Rehabilitation Plan (Phase 1)

It is noted that the objectives of this Plan are:

- To ensure rehabilitation works address relevant regulatory requirements;
- To present the final end land-uses and preliminary completion criteria;
- To describe rehabilitation works proposed during Phase 1;

Page 2

This information is provided by Narrabri Shire Council

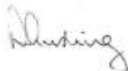
- To provide guidance on how topsoil and subsoil is managed to conserve the seed bank, nutrients and to promote the natural establishment of vegetation that will be self-sustaining in the long-term; and
- To establish a rehabilitation monitoring program to track progress of rehabilitation.

In relation to section 4.7 of the Plan, your attention is drawn to the NSW Department of Primary Industries (DPI) State Significant Agricultural Land (SSAL) Mapping Project. Further information in relation to this initiative is available from <https://www.dpi.nsw.gov.au/agriculture/lup> in the event that the development footprint intersects SSAL land.

Sections 6 - 7 of the draft Plan (pp.27 - 29) currently contains a series of referencing errors which require attention.

Thank you for the opportunity to provide feedback. Should you require any additional information or clarification in relation to this matter you are invited to contact Council's Strategic Planning Team or the undersigned on (02) 6799 6866, or by emailing council@narrabri.nsw.gov.au.

Yours faithfully



Donna Ausling
A/Director Planning, Strategy & People


Management Plan Consultation Feedback Form
DOCUMENT TITLE: Waste Management Plan (Condition B70)

STAKEHOLDER: NSW Environment Protection Authority (EPA)

**CONSULTATION
RELEASE DATE:** 1 December 2021

COMMENTS DUE DATE: Mid Jan 2022

General Feedback	
Key Issues	Nil
Suggestions for improvement	The plan can be strengthened by replacing loose language and indeterminate terms, such as, 'should, where reasonable, may', as these words point at best practice but are not definitive or binding.
	Ensure that material transport between well pads occurs within the same EPL premises so no waste exemptions are required.

Section	Type	Specific Feedback <i>Detail specific issues with certain sections in the document</i>

Waste Management Plan - NSC comments received on Revision A (draft)

Item	Section #	Section heading	Existing text	Comment	Draft response
1	1.4	Consultation	No specific text reference	Given the dynamic nature of waste management and associated environmental requirements, ongoing and routine liaison is needed with Council's Waste and Water Divisions. This approach will ensure that Council's Water Treatment and Waste Facilities can appropriately manage the volume and product type that will be disposed offsite. It is acknowledged that such premises have been identified throughout the Report as the receiving facility.	The text has been amended as follows: <i>... As requested by Council, Santos will continue its regular liaison with Council's Waste and Water Divisions to ensure that Council's water treatment and waste facilities can appropriately manage the volume and product type that may be generated by the Project for offsite disposal.</i>

Waste Management Plan - EPA comments received on Revision A (draft)

Item	Section #	Section heading	Existing text	Comment	Final response
1	N/A	N/A	No specific text reference	The plan can be strengthened by replacing loose language and indeterminate terms, such as, 'should, where reasonable, may', as these words point at best practice but are not definitive or binding.	The whole document has been reviewed, and where applicable, the terms 'should', 'would', 'where reasonable' and 'may' have been strengthened. Note that the terms 'should', 'would', 'where reasonable' and 'may' are used extensively in the consent conditions. Since the relevant conditions have been reproduced in full in this document, in these instances the above terms have not been removed or amended.
2	6.5.1	Drilling waste	Note that in the event RDM is not required for rehabilitation purposes, the material may be transported to a licenced facility for disposal.	Ensure that material transport between well pads occurs within the same EPL premises so no waste exemptions are required.	The text has been amended as follows: <i>All transport of RDM between well pads will occur within the same EPL premises.</i> Note that in the event RDM is not required for rehabilitation purposes, the material may be transported to a licenced facility for disposal.

Appendix B - Compliance conditions relevant to this Plan

Table B1 - SSD 6456 consent conditions directly relevant to this Plan

SSD 6456 consent conditions directly relevant to this Plan	Section reference
Consent condition A1 In meeting the conditions of this consent, the Applicant must implement all reasonable and feasible measures to prevent and, if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction, operation or rehabilitation of the development.	Section 1.2
Consent condition A5 The Applicant may only undertake the development in the following stages:	Section 1.1.2 Section 1.2
a) Phase 1, comprising ongoing exploration and appraisal activities;	
b) Phase 2, comprising construction activities for production wells and related infrastructure;	
c) Phase 3, comprising gas production operations; and	
d) Phase 4, comprising gas well and infrastructure decommissioning, rehabilitation and mine closure.	
Consent condition A23 With the approval of the Planning Secretary, the Applicant may:	
a) prepare and submit any strategy, plan or program required by this consent on a staged basis (if a clear description is provided as to the specific stage and scope of the development to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program	Section 1.2
b) combine any strategy, plan or program required by this consent (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined);	No combination proposed as part of this Plan
c) update any strategy, plan or program required by this consent (to ensure the strategies, plans and programs required under this consent are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the development); and	Section 1.2 Section 10.2
d) combine any strategy, plan or program required by this consent with any similar strategy, plan or program required by a consent	No combination proposed as part of this Plan
Consent condition B15 The Applicant must ensure that no offensive odours, as defined under the POEO Act, are emitted from the development.	Section 6.3
Consent condition B36 The Applicant must ensure that all surface discharges from the development comply with:	Section 6.1 Section 7
a) discharge limits (both volume and quality) set for the development in any EPL or RREO; and	
b) relevant provisions of the POEO Act	
Consent condition B37 The Applicant must ensure that the development complies with the water management performance measures in Table 7	

SSD 6456 consent conditions directly relevant to this Plan	Section reference
<ul style="list-style-type: none"> Maximise beneficial reuse of produced salt, as far as reasonable and feasible 	Section 6.5.2
<ul style="list-style-type: none"> Classify produced salt in accordance with the EPA's Waste Classification Guidelines 	Section 6.5.2
<ul style="list-style-type: none"> Store produced salt on-site within weather-proof structure, prior to off-site transport for reuse or disposal 	No salt proposed to be produced for Phase 1
<ul style="list-style-type: none"> Dispose salt waste not able to be beneficially reused to appropriately licenced waste facility 	
Consent condition B67 The Applicant must:	
a) implement all reasonable and feasible measures to:	Section 4
(i) maximise beneficial reuse of waste generated by the development;	Section 5
(ii) minimise the residual waste generated by the development	Section 7
(iii) minimise the on-site storage of waste generated by the development;	
b) classify all waste in accordance with the EPA's Waste Classification Guidelines (2014, as may be updated or replaced);	Section 6.1
c) dispose of all waste at appropriately licensed waste facilities, or as otherwise approved in an EPL or RREO in the case of treated water or drilling-related waste;	Section 5.1.6, Section 7
d) manage sewage treatment and disposal in accordance with the requirements of Council;	Section 6.5.3
e) keep accurate records of the amount of waste transported from the project area (on a monthly basis), and report on this in the Annual Review; and	Section 6.4.2, 8
f) monitor and report on the effectiveness of waste avoidance, minimisation and management measures in the Annual Review.	Section 8, 10
Consent condition B68 Except as expressly permitted in an applicable EPL, specific resource recovery order or exemption under the <i>Protection of the Environment Operations (Waste) Regulation 2014</i> , the Applicant must not receive waste in the project area for storage, treatment, processing, reprocessing or disposal.	Section 5.1.6
Consent condition B70 Prior to the commencement of Phase 1, the Applicant must prepare a Waste Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This Plan
a) be prepared by a suitably qualified and experienced person/s;	Section 1.4
b) be prepared in consultation with the EPA, Council, and the owner of any waste facilities or land on which waste is proposed to be disposed;	Section 1.4
c) describe the measures to be implemented to ensure:	
(i) compliance with the waste operating conditions in this consent;	Section 6
(ii) compliance with the Protection of the Environment Operations (Waste) Regulation 2014; and	Section 3
(iii) reasonable and feasible waste minimisation and management measures are being employed;	Section 5, 6, 7

SSD 6456 consent conditions directly relevant to this Plan	Section reference
d) be consistent with the outcomes of the Produced Salt Beneficial Reuse and Disposal Study;	Section 4, 6.5.2
e) identify all waste streams generated by the development (including produced water, salt and drill mud/cuttings);	Section 6.2
f) identify the fate of those waste streams (including identification of the specific receiving facilities which have agreed to accept those wastes);	Section 5.1.6, 7
g) describe the waste management system in detail, including a contingency strategy if beneficial reuse and/or disposal options become unavailable; and	Section 4
h) include a monitoring program that:	Section 8
(i) evaluates and reports on:	
▪ the effectiveness of the waste management system;	
▪ ongoing classification of waste; and	
▪ compliance against the waste operating conditions and the EPL; and	Section 9
(ii) defines what constitutes a waste-related incident or non-compliance and includes a protocol for identifying and notifying the Department and relevant stakeholders of these events.	
Consent condition B71 The Applicant must implement the Waste Management Plan once approved by the Planning Secretary.	Section 1.2
Consent condition D3 The Applicant must ensure that (where relevant) the management plans required under this consent include:	
a) summary of relevant background or baseline data;	Section 7
b) details of:	
(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 3
(ii) any relevant limits or performance measures and criteria; and	Section 4
(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 10.2
c) any relevant commitments or recommendations identified in the documents that together comprise the NGP EIS;	Section 3.3
d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 6
e) a program to monitor and report on the:	
(i) impacts and environmental performance of the Project; and	Section 8
(ii) effectiveness of the management measures set out pursuant to paragraph (d);	Section 10
f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 9

SSD 6456 consent conditions directly relevant to this Plan	Section reference
g) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 10.4
h) a protocol for managing and reporting any:	
(i) incident, non-compliance or exceedance of any impact assessment criterion and performance criterion	Section 9.1
(ii) complaint; or	Section 9.3
(iii) failure to comply with other statutory requirements; and	Section 9.1
i) a protocol for periodic review of the plan.	Section 10.3
Consent condition D4 Within 2 months of: (a) the submission of an incident report; (b) the submission of an Annual Review; (c) the submission of an Independent Environmental Audit; (d) the submission of a Field Development Plan; (e) the submission of a Groundwater Model Update; or (f) the approval of any modification of the conditions of this consent, the Applicant must review the suitability of existing strategies, plans and programs required under this consent.:	Section 10.3
Consent condition D5 If the review determines that the strategies, plans and programs required under this consent require revision – to either improve the environmental performance of the development, cater for a modification or comply with a direction - then the Applicant must submit the revised document to the Secretary for approval within 6 weeks of the review. Note: <i>This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.</i>	Section 10.3
Consent condition D6 The Applicant must notify the Department and any other relevant agencies via the Major Projects Portal immediately after it becomes aware of the incident. This notice must describe the location and nature of the incident.	Section 9.1
Consent condition D7 Within 7 days of becoming aware of a non-compliance with the conditions of this consent, the Applicant must notify the Department of the non-compliance via the Major Projects Portal. This notice must set out the non-compliance, the reasons for the non-compliance (if known) and what actions have been taken, or will be taken, to address the non-compliance. Note: <i>A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance</i>	Section 9.1
Consent condition D8 By the end of March each year, unless the Planning Secretary agrees otherwise, the Applicant must submit an Annual Review of the environmental performance of the development to the Department via the Major Projects Portal.	Section 10.1

SSD 6456 consent conditions directly relevant to this Plan	Section reference
<p>Consent condition D9</p> <p>Within one year of commencement of Phase 1 and every 3 years thereafter, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development.</p>	Section 10.2
<p>Consent condition D13</p> <p>From the commencement of Phase 1, until the completion of all rehabilitation required under this consent, the Applicant must:</p>	
<p>a) make copies of the following information publicly available on its website:</p> <ul style="list-style-type: none"> ▪ the document/s listed in condition A2(c); ▪ current statutory approvals for the development; ▪ approved strategies, plans and programs; ▪ detailed plans for the Phases of the development; ▪ minutes of CCC and Advisory Group meetings; ▪ regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent; ▪ a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; ▪ a summary of the current phase/s and progress of the development; ▪ contact details to enquire about the development or to make a complaint; ▪ a complaint register, updated monthly; ▪ a record of all incidents and non-compliances; ▪ the Annual Reviews of the development; ▪ audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant's response to the recommendations in any audit report; and ▪ any other matter required by the Planning Secretary; and 	<p>Section 1.6</p> <p>Section 9.3</p> <p>Section 10.4</p>
<p>b) keep such information up to date.</p>	<p>Section 1.6</p> <p>Section 10.4</p>