

# Waste and Resource Management Sub Plan

**Rev 03**  
**Reviewed June 2019**

# Dewhurst Gas Exploration Project Environmental Sub-Plan – Waste and Resource Management Sub Plan

## 1.1 Background

This Waste and Resource Management Plan (WRMP) is one of the Environmental Sub-Plans under the Project Environmental Management Plan (PEMP) for the Dewhurst Gas Exploration Pilot Wells Program and the Exploration Pilot Expansion Project (the Project).

This WRMP identifies:

- The types of waste generated during all phases of the Project;
- The waste management processes and procedures for each waste stream;
- The waste transport requirements;
- The monitoring requirements;
- The audit and inspection requirements; and
- The record keeping and reporting requirements.

All Santos NSW (Eastern) Pty Ltd (Santos) employees and their contractors working on the Project must comply with the PEMP and all sub-plans under the PEMP including this WRMP.

## 1.2 Key Statutory Requirements

### 1.2.1 General

- *Protection of the Environment Operations Act 1997* (NSW)
- *Contaminated Land Management Act 1997* (NSW)
- *Waste Avoidance and Resource Recovery Act 2001* (NSW)
- *Protection of Environment Operations (Waste) Regulation 2005* (NSW)
- National Environment Protection (Movement of Controlled Waste between States and Territories) Measure (Commonwealth)
- Australia Code for the Transport of Dangerous Goods by Road and Rail (Commonwealth)

### 1.2.2 Project Specific

- Approvals;
  - Department of Primary Industries (DPI) Project Approval for production pilots covering wells 13 to 18H – 21 July 2009 (DPI-PA)<sup>1</sup>.
  - Department of Trade and Investment (DT&I) Development Approval for pilot wells 26- 29 under Minister for Resources and Energy – 16/8/2013 (MRE-DA);
  - Department of Planning and Environment (DPE) Approval – 18 July 2014 (SSD-6038);
  - Environment Protection Licence 20350 (EPL 20350);
  - NSW Forests Occupation Permit (OP).

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<sup>1</sup> Note the operational conditions of consent and REF statement of commitments under this approval are addressed within the approved Project Environmental Management Plan (PEMP). This PEMP forms part of the SMS process for the Project

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- Renewal Petroleum Exploration Licence 238 (PEL 238);
- Review of Environmental Factors (REF (3/13));
- Review of Environmental Factors - Statement of Commitments (REF – SoC (3/13));

### 1.2.3 Santos Management System (MS)

This WRMP has been developed in accordance with relevant legislative and regulatory requirements and conditions in the Santos Management System (SMS), including:

- NSW Waste Management Plan – (0011-650-PLA-0002.2)
- SMS-MS1-ST13 Environmental Hazard Control Procedure

### 1.3 Objectives

The objectives of this WRMP are:

- provide a framework for understanding and addressing all aspects of waste management, including:
  - the types of waste streams including third party wastes generated by the Project;
  - the waste management strategy for destination of waste;
  - the risks associated with the management (including handling and disposal) of waste;
  - utilising the Waste Hierarchy as per How to Guide - Understanding Waste Concepts, which is, preferenced in descending order: waste avoidance, reduction, reuse, recycling and recovery and minimise waste treatment and disposal; and
  - the environmental monitoring and reporting requirements.
- minimise any risk to health and safety of Santos personnel, contractors and other stakeholders; and
- Ensure the Project is compliant with relevant legislative and other requirements as outlined in Section 1.2.

All operations and activities carried out by Santos' personnel and contractors will be conducted in a manner that minimises the environmental impact from the generation, transport, storage and disposal of wastes. Project personnel and contractors will be made aware and comply with this WRMP.

### 1.4 Performance Indicators

Performance indicators relating to this WRMP are outlined below:

- Implementation of the waste reduction hierarchy of avoid, reduce, reuse, recycle, recover, treat and dispose;
- Implementation of WRMP evidenced through fulfilment of all Project-specific monitoring and reporting requirements (refer to **Section 1.7**);
- No non-compliances related to waste identified during all phases of the Project;
- Signage and labelling of waste storage containers and areas observed – evidenced in audits and inspections;

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### 1.5 Predicted Impacts

**Table 1** and **Table 2** describe the predicted waste generated from works as described in the Review of Environmental Factors (REF) for Dewhurst 26-29 petroleum wells PEL 238, Gunnedah Basin, NSW (March 2013) and the Environmental Impact Statement (EIS) for Dewhurst Gas Exploration Pilot Expansion (October 2013), respectively. Dewhurst 26-29 wells have been completed and are now operational therefore Table 1 describes a higher volume of waste generation than is current, only general solid waste is produced during operations except during workover periods when some sewage waste, drill cuttings, drilling mud and mud contaminated cement slurry may be produced, depending on the precise nature of the workover operation.

**Table 1. Predicted waste generated from works as described in the REF**

Source	Classification	Estimated Quantity
Sewage waste	Liquid waste	2m <sup>3</sup> per month
General waste including food waste from personnel and non-recyclables	General solid waste (putrescible)	20m <sup>3</sup>
Drill cuttings	General solid waste (non-putrescible)	680m <sup>3</sup>
Drilling mud		400m <sup>3</sup>
Mud contaminated cement slurry		115m <sup>3</sup>

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**Table 2. Predicted waste generated from works as described in the EIS**

Source	Classification	Estimated Quantity
<b>Construction Activities</b>		
Drill fluid	Liquid waste	825m <sup>3</sup>
Drilling fluid-contaminated cement slurry		160m <sup>3</sup>
Produced water		450m <sup>3</sup>
Fuels, engine coolant and hydrocarbon residuals		< 200L
Human waste including pump out waste and sewage		< 60m <sup>3</sup>
General waste including food waste from personnel and non-recyclables	General solid waste (putrescible)	<40m <sup>3</sup>
Drill cuttings	General solid waste (non-putrescible)	350m <sup>3</sup>
Drained oil filters, empty oil containers and oil absorbent materials that do not contain free liquids, plastics (e.g. packaging pipe caps), concrete wastes, cured resins, paints, glues, etc.		< 80m <sup>3</sup>
Contaminated soil ^	Dependent on waste material	Undetermined
Recyclables including glass, PET bottles, aluminium, scrap metal (e.g. pipe cuttings), rope spacers, paper and cardboard.	Recyclable	<40m <sup>3</sup>
<b>Operational Activities</b>		
Produced water	Liquid waste	Max. 845m <sup>3</sup> per day
Waste generated from maintenance works	Various	Undetermined

^ Contaminated soil was not identified in the EIS, however, it is considered a potential waste that may be generated during construction/operation.

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### 1.4 Mitigation Measures

<i>Plan Ref</i>	<i>Actions</i>	<i>Timing</i>	<i>Reference</i>
<b>Waste Management</b>			
WRMP-1	<p>Prior to commencement of construction, Santos will implement a Waste Management Plan that will be based on the waste reduction hierarchy of avoid, reduce, reuse, recycle, recover, treat and dispose.</p> <p>This plan will target the requirements to:</p> <ul style="list-style-type: none"> <li>• minimise and monitor the waste generated by the development;</li> <li>• ensure all above ground tanks containing material that is likely to cause environmental harm will be managed in accordance with the Project Hazard and Risk Management Sub Plan;</li> <li>• ensure it has in place appropriate containment, mitigation, contingency, remediation and rehabilitation methods and actions in order to prevent an accidental spill of waste material or in the event of an accidental spill;</li> <li>• ensure that the waste generated by the development is appropriately stored, handled and disposed of;</li> <li>• manage on-site sewage treatment and disposal in accordance with the requirements of Narrabri Shire Council.</li> <li>• report on waste management and minimisation in the Annual Review.</li> </ul>	Prior to construction	<p>SSD-6038 Schedule 3, Condition 22</p> <p>SSD-6038 Appendix 4, Condition 73</p> <p>REF (3/13) Section 2.8.1.2</p>
WRMP-2	<p>Santos will ensure that:</p> <p>a) The sites of prospecting operations are maintained in a clean and tidy condition at all times;</p> <p>b) All waste, including contaminated residues, must be collected, segregated, according to their classifications under the Waste Classification Guidelines (EPA, 2014), and securely deposited in properly constructed containers and disposed of lawfully; A written record will be kept in accordance with the NSW Waste Management Plan</p> <p>c) Drilling by-products contaminated by chemicals, oils or fuels must be collected and remediated or disposed lawfully; and</p> <p>d) All drill cuttings and drilling fluids not being reused in drilling operations are disposed lawfully.</p> <p>The management of waste, including its transport will comply with the <i>Protection of the Environment Operations Act 1997</i> (POEO Act) and Protection of the Environment Operations (Waste) Regulation 2005 (POEO (Waste) Regulation).</p>	At all times	<p>PEL 238 Condition 36</p> <p>SSD-6038 Appendix 4, Condition 72 &amp; 74 REF – SoC (3/13) OPCondition 43</p>
WRMP-3	<p>Appropriate waste/recycling receptacles will be provided and will include covered rubbish bins for disposal of domestic wastes. These will remain during drilling activities.</p>	At all times	<p>EPL 20350 O5.1 REF – SoC (3/13) Condition 41</p>
WRMP-4	<p>Solid wastes requiring on-site storage will be placed within suitable storage containers in a designated waste transfer point within the lease area prior to transportation to appropriate facilities.</p>	As required	<p>REF (3/13) Section 2.8.1.2</p>

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<b>Plan Ref</b>	<b>Actions</b>	<b>Timing</b>	<b>Reference</b>
WRMP-5	Santos will ensure that all waste materials generated at the wells (whether or not contaminated with oil) are disposed of in accordance with DECC Waste Classification Guidelines	At all times	SOPEPSR #601.2 EPL 20350 O5.2
WRMP-6	Any liquid and/or non-liquid waste for processing, resource recovery or disposal at the premises will be assessed and classified in accordance with the DECC Waste Classification Guidelines, prior to despatch from the site.	As required	MRE-DA Condition 11 EPL 20350 O5.2
WRMP-7	Regulated waste will be collected by licensed contractors for off-site disposal. General and recyclable waste will be transported to appropriate facilities.	As required	SSD-6038 Appendix 4, Condition 75 REF (3/13) Section 2.8.1.2
WRMP-8	<p><b>Drilling Waste Management</b></p> <p>Drilling fluids and drill cuttings will be reused or recycled where practical. Where reuse / recycling is not practical drill fluids &amp; drill cuttings will be disposed of appropriately.</p> <p>Recycling will involve:</p> <ol style="list-style-type: none"> <li>1. The drill cuttings will be tested to determine the appropriate reuse management or disposal method.</li> <li>2. Drilling fluids will be reused on-site where possible or transported back to the treatment and processing facility in Narrabri if operational so it can be reused in future drilling operations (or disposed of in a licenced facility).</li> <li>3. Following completion of cementing, excess fluids and cement slurries will be segregated in suitable storage containers and removed and disposed in accordance with its waste classification.</li> </ol>	During Construction During Drilling	SSD-6038 Appendix 4, Condition 71 & 76 REF (3/13) Section 2.7.3.4 & 2.8.1.2
WRMP-9	Drilling fluids will be transported to and from the site by a suitable contractor.	During Drilling	REF – SoC (3/13) Condition 21
WRMP-10	Liquid waste- Portable toilets will be provided on site and will be regularly serviced by a licensed contractor. Sewage waste will be removed from site by a licensed contractor for treatment and disposal, as required.	During Construction During Drilling	SSD-6038 Appendix 4, Condition 77 REF – SoC (3/13) Condition 48
WRMP-11	Produced water will be managed in accordance with the Produced Water Management Plan	At all times	REF (3/13) REF – SoC
WRMP-12	All staff and contractors will be made aware of waste management procedures during the site-specific induction and through toolbox talks.	At all times	SSD-6038 Appendix 4, Condition 79 REF – SoC (3/13)

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<b><i>Plan Ref</i></b>	<b><i>Actions</i></b>	<b><i>Timing</i></b>	<b><i>Reference</i></b>
WRMP-13	Disposal of chemical, fuel and oil containers will be managed according to the SDS or manufacturers' directions to avoid potential impacts to the environment or human health.	At all times	Condition 49 SSD-6038 Appendix 4, Condition 80



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### 1.5 Monitoring Requirements

<b>Aspect</b>	<b>Description</b>	<b>Frequency</b>
General – Inspections	<ul style="list-style-type: none"> <li>• Field Superintendent to assess potential waste issues during construction and drilling</li> <li>• Well Operator to undertake ‘Well Runs’ during operation to assess any potential waste issues.</li> <li>• Environmental Advisor inspection of activities to determine if all reasonable and feasible waste mitigation measures are in place</li> </ul>	<ul style="list-style-type: none"> <li>• Daily during construction and drilling</li> <li>• As planned during operation</li> <li>• 6 monthly during operation</li> </ul>

### 1.6 Reporting Requirements

<b>Description</b>	<b>Timing</b>	<b>Reference</b>
<p>Recording waste streams by completing a <b>Waste Management Facility Inventory Form</b>, containing details of all waste generated from the Project. The information in the form must include:</p> <ul style="list-style-type: none"> <li>• Classification;</li> <li>• Source;</li> <li>• Quantities;</li> <li>• Transport;</li> <li>• Storage and handling conditions; and</li> <li>• Final destination (e.g. reuse, recycle, recovery, treatment or final disposal).</li> </ul>	As required – for all waste	EHS04 Waste
<p>Tracking of Regulated Waste is recorded by completing a <b>Waste Transport Certificate</b> or a <b>Waste Tracking Form</b> or similar document (as required in NSW). These forms are completed by the relevant waste management transporter and depot operator. These are to be uploaded onto the <b>Waste Transfer Certificate Register</b>.</p>	As required – for all Regulated Waste	EHS04 Waste
<p>The quantity, type, classification and final destination of all waste will be recovered by completing a <b>Waste Tracking Form</b>.</p>	As required – for all waste	EHS04 Waste
<p>All other reporting requirements for soil and water reporting will be managed through Santos’ Compliance tracking system (ComTrack)</p>	As required	