

# Annual Environmental Performance Report 2020

## NT Exploration Permit 161 Tanumbirini North Water Bore Monitoring Program


Date	Rev	Reason for Issue	Author	Checked	Approved
20/10/2020	1	Submitting	MB	SR	AM

<b>Document title</b>	Annual Environmental Performance Report 2020 NT Exploration Permit 161 Tanumbirini North Water Bore Monitoring Program
<b>EMPs Covered</b>	NT Exploration Permit 161 Tanumbirini North Water Bore Monitoring Program
<b>Permit</b>	EP 161
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<b>Date approved</b>	20 October 2020

## Signature and Certification

I/We hereby declare that the information provided in this annual environment performance report and accompanying documents is to the best of my/our knowledge, true and correct.

### Asset/Project Approval

Signature	
Name (print)	Angus McIntyre
Position	Manager – Onshore New Ventures
Date	20/10/2020

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## Abbreviations and Units

Acronym / Abbreviation	Description
AEPR	Annual Environmental Performance Report
ALARP	As low as reasonably practicable
Code	Code of Practice
DENR	Department of Environment and Natural Resources
DPIR	Department of Primary Industry and Resources
EMP	Environmental Management Plan
EP	Exploration Permit
NT	Northern Territory
NT EPA	Northern Territory Environmental Protection Authority
SMS	Santos Management System
SSCC	Sacred Site Clearance Certificate

## 1.0 Introduction

The Petroleum (Environment) Regulations 2016 (NT) include a requirement for the interest holder to provide a report to the Minister on an annual basis that outlines the environmental performance of the interest holder (the Annual Environment Performance Report). The report must include sufficient information to allow the Minister to assess whether the interest holder has met the environmental outcomes and environmental performance standards included in the approved Environment Management Plan (EMP). The report is to consider information required to be recorded, monitored or reported under the Petroleum (Environment) Regulations 2016 (NT) and any other law in force in the Northern Territory related to conduct of the regulated activity.

This Annual Environmental Performance Report (AEPR) applies to the Tanumbirini North Water Bore Monitoring Program that was approved on 26 November 2018. The period covered by this AEPR is from 26 November 2018 – 25 November 2019.

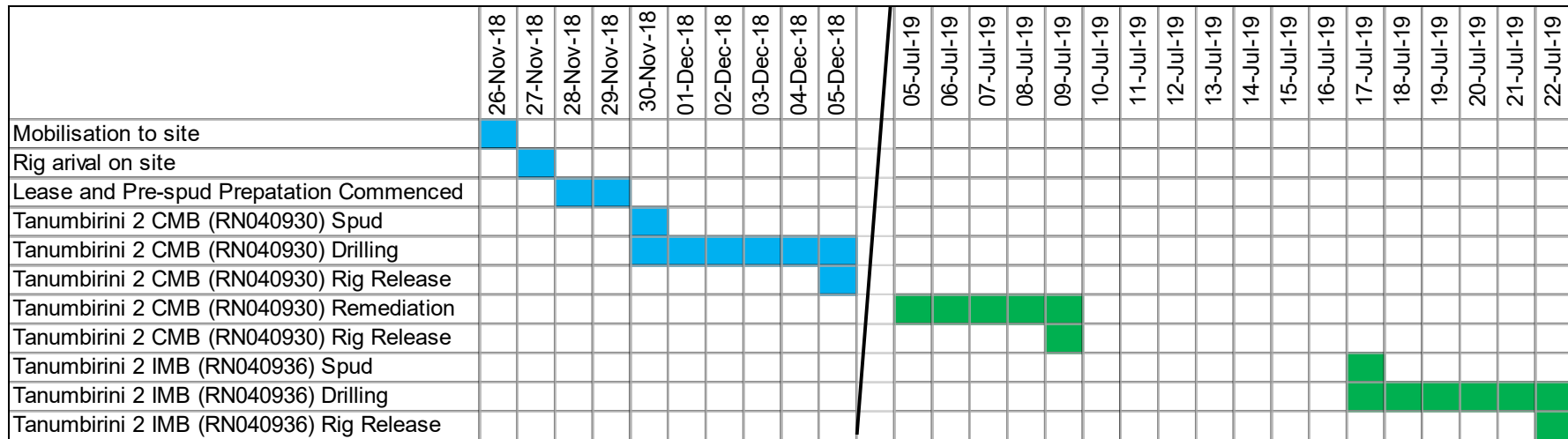


Figure 1 Timing of Regulated Activities Conducted During the Reporting Period

## 1.1 Background

Santos QNT Pty Ltd (Santos) is the operator of EP 161. Santos submitted the *Tanumbirini North water bore monitoring program, EP161* (EMP 2018) under the *Petroleum (Environment) Regulations (PER)* that came into force 6 July 2016. EMP 2018 was submitted to facilitate the installation of groundwater monitoring bores to meet the recommendations and commentary from the Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory. The monitoring bores are required to monitor key water quality indicators in the groundwater and collect baseline water quality data.

Activities approved under this EMP include scouting of water bore locations and access tracks for the nominated locations, preparation of water bore lease pads and installation of the water bores. Existing landholder tracks have been used to provide access. Importantly, no vegetation clearing or road upgrades were required.

EMP 2018 was approved on 26 November 2018. This AEPR has been prepared to report on activities that have occurred between the 26 November 2018 and 25 November 2019.



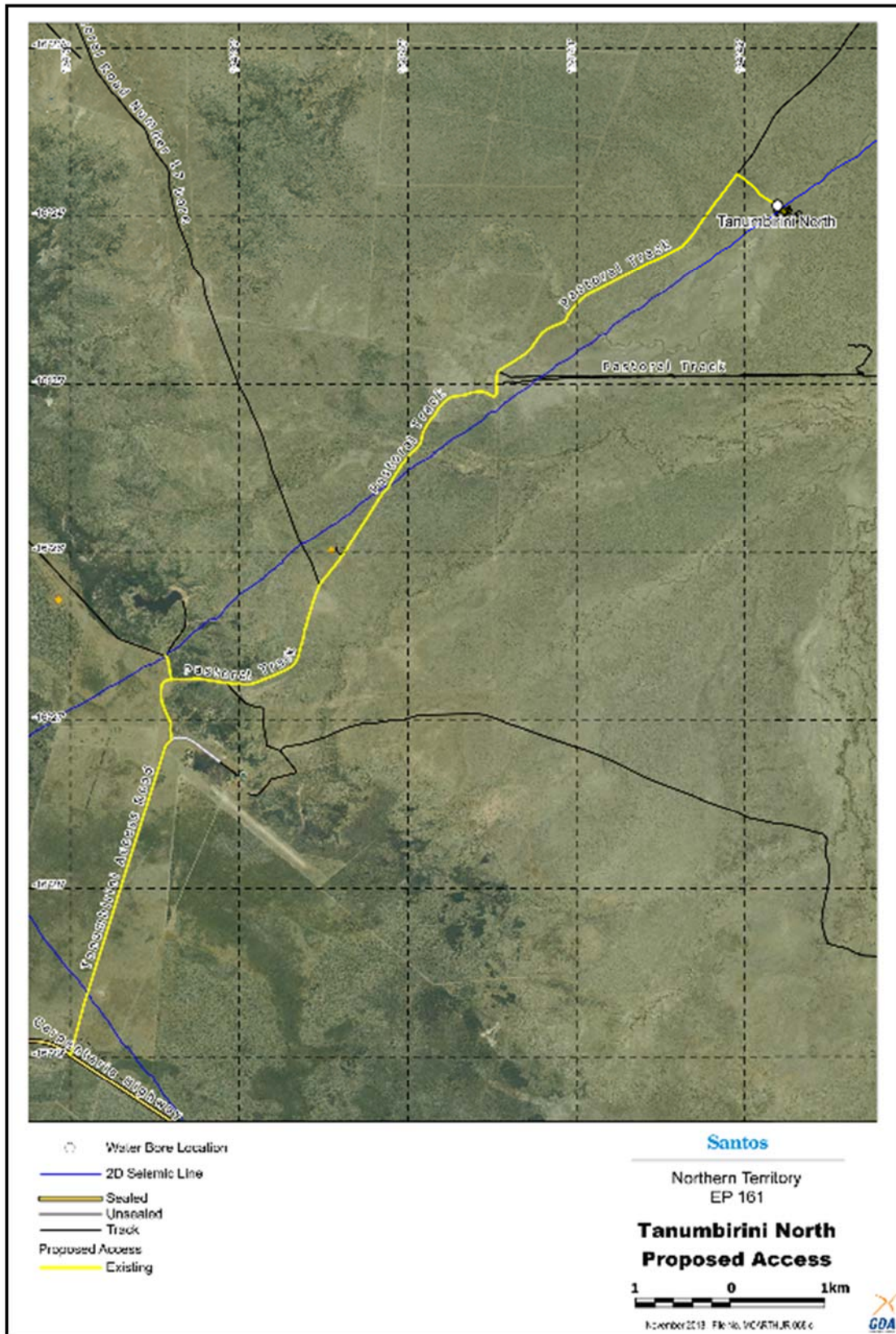


Figure 2 Location of Regulated Activities



Figure 3 Tanumbirini North lease pad

## 1.2 Contents of Performance Report

This AEPR describes the environmental performance of Santos by evaluation of the following:

1. Compliance with Ministerial approval conditions for each EMP.
2. Compliance with each environmental outcome and environmental performance standard within the EMP 2018.
3. Compliance with reporting requirements in accordance with the Code and Regulations.
4. All recordable and reportable incidents, including root cause analysis and related corrective actions to prevent re-occurrence.
5. Findings of all regulatory inspections and audits and related actions to address any findings.

## 1.3 Assessment of Compliance

Table 1 shows the compliance status indicators used in this AEPR.

**Table 1 Compliance Descriptors**

Indicator	Description
Compliant	Compliant with requirement for entire 12 month reporting period
Partially Compliant	Compliant with requirement for most of year, short periods of non-compliance
Not Compliant	Interest holder did not comply with the requirement during the reporting period
Not Applicable	Requirement not applicable during the reporting period

## 1.4 Evidence of Compliance

The following sources of evidence are used to demonstrate compliance:

1. Internal tracking of compliance by Santos through:
  - Internal annual audits of compliance, as follows:
    - i. Daily checklists
    - ii. Induction registers
    - iii. Stakeholder engagement register
2. Outcomes from regulatory inspections conducted by the Department of Environment and Natural Resources (DENR), Petroleum Operations.
3. Recordable and reportable incident reports submitted to DENR Petroleum Operations
4. Reports provided to DENR, the Department of Primary Industry and Resources (DPIR) and other government agencies.

## 2.0 Demonstration of Compliance

Table 2 demonstrates Santos' compliance with Ministerial EMP approval conditions.

**Table 2 Compliance with Ministerial EMP Approval Conditions**

No	Ministerial Condition	Compliance Status	Evidence
1	<p>The approval is subject to the following conditions:</p> <p>a. Water monitoring bores will be drilled and constructed by a water bore driller licensed under the Water Act and in accordance with the current version of the Minimum Construction Requirements for water bores in Australia.</p>	Partially Compliant	<p>Drilling licence number DL1007 was provided by Silver City Drilling (water bore drilling contractor). The water bore designs show that the bore was generally constructed in accordance with the current version of the Minimum Construction Requirements for water bores in Australia. The daily checklist also confirms this.</p> <p>The failure to isolate the Gum Ridge Formation and the Inacumba unit<sup>1</sup> during the drilling of the groundwater bore RN040931 was discussed with DENR during the reporting period. This connectivity is potentially inconsistent with the Minimum Construction Requirements for Water Bores in Australia (3rd edition).</p> <p>This was reported to DENR in the Recordable Incidents Summary Report for the period between 26 November 2018 and 24 February 2019.</p>
2	<p>b. The groundwater bore installation must be completed within 12 months from the date of this approval.</p>	Compliant	<p>Water bores were completed within 12 months from the date of this approval</p>

<sup>1</sup> Following publication of the Water Resources Division Technical Report 20/2020 entitled "Identification of the new Inacumba aquifer at Tanumbirini Station" the stratigraphic unit intersected by the Tanumbirini North water bores and previously called the Bukulara Sandstone is now termed the Inacumba unit.

Table 3 provides a systematic overview of Santos' compliance with the environmental outcomes and environmental performance standards within the approved EMP.

**Table 3 Compliance with Environmental Outcomes and Environmental Performance Standards Tanumbirini North Water Bore Program**

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
1	General Controls	All personnel are given environmental and cultural heritage inductions prior to commencing work. Inductions for all employees and contractors cover pastoral, conservation, legislation and infrastructure issues.	Compliant	Induction records show that environmental and cultural heritage inductions were conducted prior to commencement of operations. Daily EHS checklist also completed.
2		Activities to be planned to minimise new land disturbance by utilising previous disturbed areas or existing tracks (where possible), and through operational practices including weaving	Compliant	Site access via existing pastoral track (Figure 2). Tanumbirini North waterborne site was located in an area of previous disturbance so no significant vegetation clearing required (Figure 3). Daily checklist confirms all clearing is in accordance with Environmental Performance Standards.
3	Minimise disturbance to native fauna	Clearing of vegetation for track upgrades will be prohibited.	Compliant	Site access via existing pastoral track (Figure 2). Figure 3 shows the water bore lease pad has been located in an area of existing disturbance.
4		Flora rootstock will be left intact to promote regeneration.	Compliant	Tanumbirini North waterborne site was located in an area of previous disturbance so no significant vegetation clearing required (Figure 3). Daily checklist confirms all clearing is in accordance with Environmental Performance Standards.
5		Steep terrain will be avoided (where possible).	Compliant	Figure 2 shows the location of the access track and the water bore. These locations avoid steep terrain.
6		No Hollow timber/trees will be cleared	Compliant	Tanumbirini North waterborne site was located in an area of previous disturbance so no significant vegetation clearing required (Figure 3). Daily checklist confirms all clearing is in accordance with Environmental Performance Standards.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
7	Minimise disturbance to natural drainage patterns	Alteration of natural drainage contours or lines will be avoided.	Compliant	Figure 2 shows the only access tracks used by the project. Figure 3 shows the location of the water bores in an area of existing disturbance. No alteration of natural drainage contours or lines was required.
8		An all-terrain water bore drill rig will be used.	Compliant	The project utilised a truck mounted mobile drilling rig (Hydco 1000H Diamond / RC). This drill rig was chosen to ensure sites could be accessed while minimising disturbance to vegetation and impacts to soil.
9	Minimise disturbance of soil resources.	Alteration of natural drainage contours or lines will be avoided and/or bypass structures installed to minimise obstruction to flow	Compliant	Figure 2 shows the only access tracks used by the project. Figure 3 shows the location of the water bores in an area of existing disturbance. No alteration of natural drainage contours or lines was required.
10		Erosion and sediment control structures (e.g. berms, sediment fences) to be installed and maintained where necessary.	Not Applicable	Erosion and sediment control structures (e.g. berms, sediment fences) were not necessary. The Tanumbirini North waterbore is located in an area of existing disturbance with minimal slope and no evidence of erosion. The minimal works required for the installation of the waterbore were not considered likely to result in erosion.
11		Inversion of the soil profile will be minimised where possible	Not Applicable	Figure 3 shows the location of the water bores in an area of existing disturbance. Inversion of the soil profile was not required for the drilling of the water bores.
12	Avoid disturbance to sites of cultural,	Disturbance is restricted to areas for which NLC clearance has been provided.	Compliant	NLC clearance obtained for Tanumbirini North work area. GIS database maintained for project areas and cultural heritage sites. GIS shows that the

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
	sacred and heritage significance.			project is restricted to subject land as detailed in the AAPA Authority Certificate.
13		Disturbance is restricted to subject land as detailed in the AAPA Authority Certificate.	Compliant	AAPA certificate obtained for Tanumbirini North work area. GIS database maintained for project areas and cultural heritage sites. GIS shows that the project is restricted to subject land as detailed in the AAPA Authority Certificate.
14		Known sites of sacred or cultural significance are identified and avoided.	Compliant	Details of sacred and cultural significant sites included in GIS database and utilised when determining project footprint (and provided to project personnel as part of induction).
15		Any new sites identified during the activity will be reported to the Santos Cultural Heritage Team and avoided.	Not Applicable	No new heritage sites identified during the reporting period.
16		Maintain GIS database of project footprint and cultural heritage sites including details of any works conditions.	Compliant	GIS database that includes project areas and cultural heritage sites. This database is continually updated. Last update was 25 August 2020.
17	Minimise disturbance to livestock, pastoral infrastructure and landholders.	Relevant landowners and occupiers and relevant third-party tenement holders are notified prior to activity.	Compliant	Land Access and Compensation Agreement in place. Notice of Entry given on 19 November 2018, prior to commencing works. Ongoing consultation occurred with the landholder. Land Access Field Supervisor onsite during water bore activities.
18		All gates are left in the condition in which they were found (i.e. open / closed).	Compliant	Daily checklist confirms gates left in condition they were found. Landholder consultation logs show that there were no incidents or concerns regarding gates.
19		Damage to station tracks is avoided and reported if does occur.	Compliant	Daily checklist confirms damage to station tracks avoided / reported.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
20		Unauthorised offline driving is prohibited for all project personnel.	Compliant	Figure 2 shows the only access tracks used by the project. Complaints register shows no off road driving was recorded.
21		When necessary, all fences are restored to satisfaction of landowner / managers.	Not Applicable	Landholder consultation logs show that there were no fences that required restoration.
22		System is in place for logging landholder complaints to ensure that issues are addressed as appropriate.	Compliant	Landholder consultation logs include a system for logging landholder complaints.
23	Minimise reduction in air quality	Personnel are given environmental and cultural heritage inductions prior to commencing work.	Compliant	Induction records show that environmental and cultural heritage inductions were conducted prior to commencement of operations. Daily EHS checklist also completed.
24	Minimise smothering of undisturbed vegetation	Where possible, existing tracks, roads or seismic lines will be used for access.	Compliant	Site access via existing pastoral track (Figure 2). The access tracks in figure 2 were the only access tracks use by the project.
25	Minimise disturbance to fauna	Off track driving is prohibited – no bush bashing or short cuts are permitted.	Compliant	Figure 2 shows the only access tracks use by the project.
26	Minimise loss of amenity	Speeds on unsealed roads will be limited – max 80 km/hr on unsealed roads, 40 km/hr on water bore access tracks and seismic lines.	Compliant	Incident management system and daily checklist confirms speed limits were complied with.
27		Any remediation work should be undertaken upon completion of all activities.	Not Applicable	No remediation work required
28	Minimise disturbance to native fauna,	Personnel are given environmental and cultural heritage inductions prior to commencing work.	Compliant	Induction records show that environmental and cultural heritage inductions were conducted prior to commencement of operations. Daily EHS checklist also completed.



No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
29	landholders and livestock	Relevant landholders and occupiers are consulted with respect to water bore locations.	Compliant	Land Access and Compensation Agreement in place. This agreement included the location of the Tanumbirini North water bore. A Notice of Entry discussing the location and the scope of activities was completed before works were undertaken and ongoing consultation occurred with the landholder. Land Access Field Supervisor onsite during water bore activities.
30		Landholders are provided updates on progress throughout the project (both water monitoring bore drilling and groundwater monitoring events).	Compliant	Communications procedure with landholders was in place. Ongoing consultation was undertaken daily or as required.
31		Maintain communications during operations with relevant landholders.	Compliant	Stakeholder communication logs confirm communications with relevant landholders.
32		Water bore drilling will only occur during daylight hours.	Compliant	Project implemented as a daylight only operation (single crew). Daily reports confirm activity and timing.
33	Minimise disturbance to native fauna, landholders and livestock	Driving will only occur during daylight hours	Compliant	Project implemented as a daylight only operation (single crew). Daily checklist confirms driving only in daylight hours.
34		Personnel are given environmental and cultural heritage inductions prior to commencing work.	Compliant	Induction records show that environmental and cultural heritage inductions were conducted prior to commencement of operations. Daily EHS checklist also completed.
35		Off track driving is banned – no bush bashing or short cuts are permitted.	Compliant	Figure 2 shows the only access tracks use by the project. Daily checklist confirms there was no unauthorised off-road driving.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
36		Relevant landowners and occupiers are notified prior undertaking activities.	Compliant	Land Access and Compensation Agreement in place. Notice of Entry completed in 19 November 2018 before works undertaken.
37		All gates are left in the condition in which they were found (i.e. open / closed).	Compliant	Daily checklist confirms gates left in condition they were found. Landholder consultation logs show that there were no incidents or concerns regarding gates.
38		When necessary, all fences are restored to satisfaction of landowner / managers.	Not Applicable	No fences required restoration.
39		Speed will be limited along lines to 40km/hr and 80km/hr on other unsealed roads.	Compliant	Incident management system and daily checklist confirms speed limits were complied with.
40		All vehicle routes have speed limits set which must be adhered to.	Compliant	Daily checklist confirms speed limits set and complied with.
41	Minimise disturbance of soil resources	Disturbance is restricted to areas for which consent has been provided.	Compliant	All activities will comply with the land access agreements. Figure 2 illustrates the disturbance area.
42	Minimise disturbance to drainage patterns of surface waters and shallow groundwater resources,	No clearing of vegetation for access.	Compliant	All activities will comply with the land access agreements. Figure 2 and Figure 3 show that no clearing of vegetation was required for access. The existing tracks shown in Figure 2 were used for access.
43	Minimise disturbance to	Due to the instability and erosion potential when disturbed, the steeper slopes and escarpments of tableland land systems are avoided.	Compliant	Figure 2 and Figure 3 show that steep slopes and escarpments were avoided. The existing tracks shown in Figure 2 were used for access.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
44	native vegetation and native fauna,	Creek bank vegetation is left intact and detours sought if too dense to pass through.	Compliant	No removal of creek bank vegetation was required. The existing tracks shown in Figure 2 were used for access.
45	Minimise disturbance to culturally sensitive sites, Minimise disturbance to livestock, pastoral infrastructure and landholders	Unavoidable compaction in areas other than those susceptible to erosion, will be ripped on completion of work.	Not Applicable	The area surrounding the waterbore has not been reduced due to the area being utilised for civils works and other ancillary activities conducted in association with the Tanumbirini 1/2H petroleum explorations wells. Any restoration works required will be scheduled to follow completion of all ancillary activities at the site.
46		Any remediation work should be undertaken upon completion of all activities.	Not Applicable	The area surrounding the waterbore has not been reduced due to the area being utilised for civils works and other ancillary activities conducted in association with the Tanumbirini 1/2H petroleum explorations wells. Any restoration works required will be scheduled to follow completion of all ancillary activities at the site.
47		Unauthorised offline driving is prohibited for all project personnel.	Compliant	Daily checklist confirms no unauthorised offline driving. The existing tracks shown in Figure 2 were used for access.
48		Operations are shut down during wet weather or flooding and only restarted once potential for extensive damage has passed.	Not Applicable	For the project a significant rainfall event is defined as a rainfall forecast published by the BOM in which greater than 300mm of total rainfall is predicted over a 4-day period. During operations, there were no significant rainfall events predicted and no significant rainfall events occurred.  Daily report and checklist show that no operations were shut down due to wet weather or flooding.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
49		Following shut down due to flooding or inundation the risk assessment will be re-visited to ensure controls are still appropriate to manage risk to ALARP.	Not Applicable	For the project a significant rainfall event is defined as a rainfall forecast published by the BOM in which greater than 300mm of total rainfall is predicted over a 4-day period. During operations, there were no significant rainfall events predicted and no significant rainfall events occurred.  Daily report and checklist show that no operations were shut down due to wet weather or flooding.
50		Weed wash-down certification for vehicle and machinery from interstate.	Compliant	Weed hygiene certificates demonstrate compliance. Daily checklist confirms valid weed hygiene certification.
51	Minimise disturbance to native fauna	Ensure site environmental inductions for all site personnel and contractors include vehicle weed hygiene requirements and information on exotic invasive ants.	Compliant	Induction records show that environmental and cultural heritage inductions were conducted prior to commencement of operations. Daily checklist confirms compliance with weed hygiene requirements.
52	Minimise disturbance to native flora	All vehicle and equipment movements to stay on formed access tracks and seismic lines.	Compliant	Daily checklist confirms no unauthorised driving. The existing tracks shown in Figure 2 were used for access.
53	Minimise negative impacts to soil quality	Ensure vehicles, machinery and equipment entering the permit areas have been cleaned and are free of soil and vegetative matter, or have a valid weed hygiene certificate.	Compliant	Daily checklist confirms compliance with weed hygiene requirements.
54	Minimise disturbance to livestock	A baseline weed assessment will be completed prior the commencement of works covered in this EMP.	Compliant	A Baseline Weed Assessment was completed and sent to DENR Weed Management in November 2018.
55		The baseline assessment will assess and map all infestations of declared weeds	Compliant	Draft documents and data sent to DENR Weed Management in November 2018 and final version of the weed management plan was sent to via email on 19 November 2018. The Baseline Weed

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
				Assessment documentation was approved by DENR.
56		Baseline data will be collected in consultation with the Department of Environment and Natural Resources (DENR) and data will be provided to DENR in a format to be specified by them.	Compliant	Baseline data was collected in consultation with DENR Weed Management. Spatial data was collected using DENRs preferred spatial data structures. Data sent to DENR Weed Management in November 2018. Baseline Weed Assessment documentation was approved by DENR.
57		Areas of priority weeds identified will be marked.	Not Applicable	No priority weeds were identified during the baseline assessment.
58		If infestations of priority weed species are identified during water monitoring bore drilling program, they will be avoided, where possible, via a detour around the infestation.	Compliant	Figure 2 shows the use of existing tracks used for access. No weed infestations were encountered on the access track or the waterbore lease pad.
59		If infestations are unavoidable, infestations will be crossed at the narrowest point and wash downs will be conducted once exiting the infestation.	Compliant	Figure 2 shows the use of existing tracks for access. No weed infestations were encountered on the access track or the well pad.
60		Any onsite wash down sites will be marked for further monitoring.	Not Applicable	There were no onsite wash down sites required for this EMP.
61		Undertake post-activity weed assessment and monitoring.	Compliant	Reports from the post wet seed monitoring survey show the weed monitoring program in place. The post-wet annual weed monitoring report sent to DENR's weed management officer on 23 July 2020.
62	Minimise disturbance to native fauna	Include fire season education as part of the induction.	Compliant	Daily checklist shows that toolbox meeting conducted and included a discussion on fire risk level for the day and fire risk management.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
63	Minimise disturbance to native flora	Use of qualified water bore driller contractors with Northern Territory dry season experience.	Compliant	Drilling licence number DL1007 was provided by Silver City Drilling (water bore drilling contractor).
64	Minimise negative impacts to landholders	All vehicles will be equipped with portable fire extinguishers.	Compliant	Daily checklist confirms vehicles were equipped with portable fire extinguishers.
65	Minimise disturbance to livestock	Machinery and vehicles should be parked in areas of low fire risk and be free of any combustible material, for example in the case of dry grass build up.	Compliant	The Tanumbirini North waterbore is located on the Tanumbirini 1 lease pad. This in an area of existing disturbance and is devoid of tress. The waterbore area and the access track are considered areas of low fire risk.
66		All vehicles will be equipped with fully operational VHF and / or UHF radio transceivers.	Compliant	Daily checklist confirms vehicles were equipped with fully operational VHF and / or UHF radio transceivers.
67		Smoking will only be permitted in areas clear of vegetation, and there will be no disposal of butts.	Compliant	Incident management systems shows there were no incidents of smoking in unpermitted areas.
68		All personnel will receive information prior to the commencement of the activity relating to: <ul style="list-style-type: none"> <li>Provisions of the Emergency Response Plan including procedures during a fire emergency</li> <li>The operation of firefighting equipment and communications</li> <li>Restricted smoking requirements</li> </ul>	Compliant	Silver City Drilling Emergency Response Plan provided to Santos included procedures for Fire and Explosion response and Bush Fire procedure. Rig induction documents location of firefighting equipment and restricted smoking area. Daily checklist shows that toolbox meeting conducted and included a discussion on fire risk level for the day and fire risk management.
69		Toolbox meetings will be conducted to: <ul style="list-style-type: none"> <li>Alert the workforce of the fire risk level for the day</li> <li>Discuss any fire risk management breaches and remedial actions</li> </ul>	Compliant	Daily checklist shows that toolbox meeting conducted and included a discussion on fire risk level for the day and fire risk management.

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
70	No unplanned interactions or disturbance to landholders	Relevant landowners and occupiers are notified prior to activity	Compliant	Land Access and Compensation Agreement in place. Notice of Entry given on 19 November 2018, prior to commencing works.
71		Damage and degradation of station tracks is avoided.	Compliant	Incident management systems. Daily checklist confirms that damage and degradation of station tracks was avoided.
72		Inductions for all employees and contractors cover pastoral, conservation, legislation and infrastructure issues.	Compliant	Daily checklist confirms that all project staff undertaken an environmental and cultural induction.
73		All litter is to be managed and disposed of correctly.	Compliant	Incident management systems. Daily checklist confirms compliance with requirement.
74		Speeds on private unsealed roads will be limited to a maximum of 80 km/hr	Compliant	Incident management system and daily checklist confirms speed limits were complied with.
75		All gates are left in the condition in which they were found (i.e. open / closed).	Compliant	Daily checklist confirms gates left in condition they were found. Landholder consultation logs show that there were no incidents or concerns regarding gates.
76		When necessary, all fences are restored to satisfaction of landowner / managers.	Not Applicable	Landholder consultation logs show that there were no fences that required restoration.
77	Minimise disturbance to surface water, groundwater,	Licensed waste contractor will be used where appropriate.	Not Applicable	No listed wastes were generated by this waterbore drilling program.
78		Water bore drilling will be conducted by a licenced contractor	Compliant	Drilling licence number DL1007 was provided by Silver City Drilling (water bore drilling contractor).

No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
79	soil quality and native fauna	Spill kits available to treat spills in situ	Compliant	Daily checklist confirms the presence of spill kits.
80		Water bore drilling will be conducted in accordance with the Minimum Construction Requirements for Water Bores in Australia (3rd edition)	Partially Compliant	<p>Drilling licence number DL1007 was provided by Silver City Drilling (water bore drilling contractor). The water bore designs show that the bore was generally constructed in accordance with the current version of the Minimum Construction Requirements for water bores in Australia. The daily checklist also confirms this.</p> <p>The failure to isolate the Gum Ridge Formation and the Inacumba unit<sup>2</sup> during the drilling of the groundwater bore RN040931 was discussed with DENR during the reporting period. This connectivity is potentially inconsistent with the Minimum Construction Requirements for Water Bores in Australia (3rd edition).</p> <p>This was reported to DENR in the Recordable Incidents Summary Report for the period between 26 November 2018 and 24 February 2019.</p>
81		All fuel stored and used should be under the control of qualified or trained personnel.	Compliant	Daily checklist confirms all hazardous materials were stored and managed in accordance with Environmental Performance Standards.
82		Waste will be segregated on site and all putrescible waste material will be held in fauna proof containers.	Compliant	Minimal wastes produced and no listed wastes were produced under this EMP.

<sup>2</sup> Following publication of the Water Resources Division Technical Report 20/2020 entitled "Identification of the new Inacumba aquifer at Tanumbirini Station" the stratigraphic unit intersected by the Tanumbirini North water bores and previously called the Bukulara Sandstone is now termed the Inacumba unit.



No	Environmental Outcome	Environmental Performance Standards	Compliance Status	Evidence
				Daily checklist confirms all litter disposed of appropriately and all waste was held in fauna proof containers.
83		Any spills contained and retrieved.	Not Applicable	Incident Management System and daily checklist confirms that there were no spills.
84		Any spills will be remediated to the satisfaction of the landholder, fenced, soil removed to appropriate facility and signed off by land holder in accordance with the access.	Not Applicable	Incident Management System and daily checklist confirms that there were no spills.
85		Fuel and other lubricants will be appropriately stored and managed, in accordance with AS1940 The Storage and Handling of Flammable and Combustible Liquids.	Compliant	Daily checklist confirms all hazardous materials were stored and managed in accordance with Environmental Performance Standards.

Table 4 demonstrates Santos' compliance with reporting requirements in the Code of Practice: Onshore Petroleum Activities in the Northern Territory (Code of Practice) and the Petroleum (Environment) Regulations 2016 (NT).

**Table 4 Compliance with Mandatory Reporting Requirements**

No	Reference	Requirement	Compliance Status	Evidence
1	Code cl A.3.5	Geospatial information depicting areas cleared is to be provided to the Minister.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
2	Code cl A.3.6 (b)	Weed management plan developed as part of the EMP must provide for ongoing weed monitoring.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
3	Code cl A.3.7(a)vi	The fire management plan developed as part of the EMP must provide for annual fire mapping to monitor changes to fire frequency in the relevant areas.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
4	Code cl A.3.9(c) Code cl A.3.9(e)	The rehabilitation plan developed as part of the EMP requires progressive rehabilitation of significantly disturbed land which is required to commence no longer than 12 months following the cessation of activities on the land. It also requires regular maintenance and annual monitoring of rehabilitated areas.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
5	Code cl B.4.13.2(c)	As a minimum, the following must be recorded and reported for each stage (where a stage in this context means all fluids pumped at a particular depth interval): a) total volume of hydraulic fracturing fluid pumped, b) quality of water used (tested for analytes in section C.8 of this Code. Analyses do not need to be repeated if the same water source is used for multiple stages) and c) typical and maximum concentrations of chemicals or other substances used.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations

No	Reference	Requirement	Compliance Status	Evidence
6	Code cl B.4.13.2(k)iv	Where venting is the only technically feasible option for managing produced gas, the technical considerations preventing the use of the recovered gas must be recorded and included in the operator's annual report.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
7	Code cl B.4.14.2(c)	All new barriers or new well operating envelopes must be verified and clearly documented and reported by submission of an updated well barrier integrity validation (WBIV) report to DPIR.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
8	Code cl B.4.15.2(j)	Complete and accurate records of the entire decommissioning procedure must be kept, with these records submitted as part of the legislative reporting requirements for the decommissioning of petroleum wells.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
9	Code cl B.4.17.2(d)	Any guidelines published by the Northern Territory Government from time to time relating to reporting and data submission, and groundwater monitoring data standards must be followed.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
10	Code cl C.3(e)	The components of the wastewater management framework, include: Monitor, manage and report in accordance with the Wastewater Management Plan and Spill Management Plan.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
11	Code cl C.6.1(d)	Wastewater tracking documentation must be reported to the Minister at least annually in accordance with the framework (Spill Management Plan and Wastewater Management Plan) outlined in the EMP	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
12	Code cl C.7.1(d)ii	Wastewater Management Plan must include a program for monitoring and reporting against the effectiveness of the measures for the mitigation of	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations

No	Reference	Requirement	Compliance Status	Evidence
		interaction with wildlife, stock and human receptors with wastewater.		
13	Code cl D.4.3.2(f)	A written report detailing the levels of methane measured, the duration of the unusual readings and the results of the investigation (including remedial actions) must be submitted within one month of the significantly higher-level methane event being detected.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
14	Code cl D.5.9.2(c)	Emissions from exploration, well construction (including during flowback) and workovers must be measured and reports submitted.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
15	Code cl D.5.9.3(a)	Where natural gas is vented or flared at a gas processing or other downstream facility, emissions must be estimated and reported.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
16	Code cl D.6.1	All mandated government reporting is complied with; and all detectable leaks and emissions are reported on an annual basis.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
17	Code cl D.6.2(a)	Reports of baseline assessments must be submitted at the conclusion of each field campaign.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
18	Code cl D.6.2(b)	Emissions reporting must be in accordance with Section D.5.6. Emissions associated with venting and flaring as described in Section D.5.9 must be provided separately to the Northern Territory Government in accordance with this Code.	Not Applicable	Not applicable, approved prior to Code being incorporated into Regulations
19	Reg 14	A current EMP remains in force until the interest holder notifies the Minister the activity is no longer being carried out and all of the environmental outcomes and obligations under the plan have been	Compliant	The current EMP remains in force.

No	Reference	Requirement	Compliance Status	Evidence
		met, and the Minister advises the interest holder the notice is accepted and the plan ceases to be in force.		
20	EMP s 9.4 Ongoing Consultation Schedule 1, item 9(2)	Interest holders are required to conduct future engagement with stakeholders, in accordance with the description in the EMP.	Compliant	Stakeholder engagement logs indicate that engagement with stakeholders has been undertaken.
21	EMP Section 8.6 Incident Reporting Reg 33	DENR is notified of reportable incidents within 2 hours of the interest holder becoming aware of the incident, or within 2 hours of the incident occurring.  A written report must be provided within 24 hours if the initial report was made orally.	Not Applicable	There were no reportable incidents during this period.
22	EMP Section 8.6 Incident Reporting Reg 34	Reports on reportable incidents are to be provided to DENR as soon as practicable and within 72 hours of the event occurring.  A final report must be provided to DENR within 30 days after remediation/clean-up of the affected area.	Not Applicable	There were no reportable incidents during this period.
23	EMP Section 8.6 Incident Reporting Reg 35	A written report of all recordable incidents must be provided to DENR not later than 15 days after the 90 day reporting period (unless otherwise agreed).	Partially Compliant	Reports on all recordable incidents were provided: <ul style="list-style-type: none"> <li>• 1<sup>st</sup> report provided 28/06/2019, 109 days late (one recordable incident – see Section 3.2.2)</li> <li>• 2<sup>nd</sup> report provided 28/06/2019, 18 days late (no recordable incidents)</li> <li>• 3<sup>rd</sup> report provided 10/09/2019, 2 days late (no recordable incidents)</li> <li>• 4<sup>th</sup> report provided 27/11/2019, met timeframes (no recordable incidents)</li> </ul>
24	Reg 37A	A report about flowback fluid from hydraulic fracturing must be provided to the Minister within 6 months of the flowback occurring.	Not Applicable	The regulated activity did not include hydraulic fracturing.

No	Reference	Requirement	Compliance Status	Evidence
25	Reg 37B	A report about produced water from hydraulic fracturing must be provided to the Minister within 6 months of the produced water being extracted.	Not Applicable	The regulated activity did not include hydraulic fracturing.
26	Schedule 1, item 12	Interest holder must notify the Minister, occupier of the land and owner of the land on which the activity is to be carried out <b>before</b> commencement of activity.	Compliant	<ul style="list-style-type: none"> <li>• EMP approved 26 November 2018</li> <li>• Works did not commence until the security bond was in place and the EMP approved. Santos and DPIR were in frequent communication during this period. Works commenced 28 November 2018.</li> <li>• Final amendments to the EMP and the provision of the security bond were completed in consultation with DPIR. The department understood that works would commence upon approval.</li> <li>• LAA in place with landholder to allow water bore construction and drilling.</li> <li>• Occupier of land – NOE for water bore drilling activities 19 November 2018, via email.</li> </ul>
31	EMP Section 8.7.4	<p>Final Rehabilitation Report</p> <p>Timing: Following a minimum of one wet season post-restoration.</p> <p>Content: Final rehabilitation assessment and endorsement in accordance with the Environmental Closeout Procedures for Petroleum Activities (DPIR 2016).</p>	Not Applicable	Final rehabilitation inspections and reporting will be conducted at the completion of activities.

## 3.0 Summary of Compliance

### 3.1 Overview of Compliance

Table 5 provides a summary of the results of the compliance assessment against the 114 total compliance items.

Table 5: Compliance Summary

Compliance Indicator	Number	Percentage
Compliant	72	63.2
Partially Compliant	3	2.6
Not Compliant	0	0.0
Not Applicable	39	34.2

### 3.2 Overview of Items Found Not Compliant or Partially Compliant

The following sections describe:

- the specific compliance requirements not met for the reporting period
- an analysis of the possible potential environmental harm or impact to environmental values resulting from non-compliance or partial compliance, using multiple lines of evidence
- a summary of the corrective actions already implemented, and further actions still required, as applicable, to ensure compliance is fully achieved in the future.

#### 3.2.1 Ministerial Approval Conditions

##### 3.2.1.1 Description

The drilling of the groundwater bore RN040931, specifically the failure to isolate the Gum Ridge Formation and the Inacumba unit<sup>3</sup> in that bore. This connectivity is potentially inconsistent with the Minimum Construction Requirements for Water Bores in Australia (3rd edition).

##### 3.2.1.2 Analysis of Potential Environmental Harm or Impact

There was no discernible flow or permeability in the lower unit. No cross-flow or contamination of either aquifer is evident. Analysis of groundwater sampled from the bore demonstrates water quality that is consistent with groundwater sampled from other bores that target only the Gum Ridge Formation.

<sup>3</sup> Following publication of the Water Resources Division Technical Report 20/2020 entitled "Identification of the new Inacumba aquifer at Tanumbirini Station" the stratigraphic unit intersected by the Tanumbirini North water bores and previously called the Bukulara Sandstone is now termed the Inacumba unit.

### 3.2.1.3 Corrective Actions

The waterbore was remediated. Specifically, the following were one to ensure isolation:

- Cut weld rings between 12" and 8" production casing, and pull up the first 18m of casing.
- Cut and suspend 8" casing from 12" casing.
- Plug up the base of the hole using cement-bentonite grout (to <104m depth).
- Airlift bore until clean and take water sample for analysis.
- Future bores to be drilled to isolate the Gum Ridge Formation and the Inacumba unit<sup>4</sup>.

## **3.2.2 Environmental Performance Standards**

### 3.2.2.1 Description

The drilling of the groundwater bore RN040931, specifically the failure to isolate the Gum Ridge Formation and the Inacumba unit<sup>4</sup> in that bore. This connectivity is potentially inconsistent with the Minimum Construction Requirements for Water Bores in Australia (3rd edition).

### 3.2.2.2 Analysis of Potential Environmental Harm or Impact

There was no discernible flow or permeability in the lower unit. No cross-flow or contamination of either aquifer is evident. Analysis of groundwater sampled from the bore demonstrates water quality that is consistent with groundwater sampled from other bores that target only the Gum Ridge Formation.

### 3.2.2.3 Corrective Actions

The waterbore was remediated. Specifically, the following were one to ensure isolation:

- Cut weld rings between 12" and 8" production casing, and pull up the first 18m of casing.
- Cut and suspend 8" casing from 12" casing.
- Plug up the base of the hole using cement-bentonite grout (to <104m depth).
- Airlift bore until clean and take water sample for analysis.
- Future bores to be drilled to isolate the Gum Ridge Formation and the Inacumba unit<sup>4</sup>.

## **3.2.3 Regulatory Reporting**

### 3.2.3.1 Description

Recordable Incidents Summary Reports were not lodged within 15 days of the reporting period.

### 3.2.3.2 Analysis of Potential Environmental Harm or Impact

There was no potential for environmental harm or impact.

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<sup>4</sup> Following publication of the Water Resources Division Technical Report 20/2020 entitled "Identification of the new Inacumba aquifer at Tanumbirini Station" the stratigraphic unit intersected by the Tanumbirini North water bores and previously called the Bukulara Sandstone is now termed the Inacumba unit.



### 3.2.3.3 Corrective Actions

Santos will submit recordable incident reports for this EMP at 90 day intervals as required. The requirements to submit these recordable incident reports for this EMP has been added to Santos' compliance tracking system.

## **3.3 Application of Lessons Learned Across Santos' Onshore Interests**

Daily EMP checklist was very useful to check compliance with the EMP during activities on site and to provide evidence of compliance for this AEPR. Santos will continue with this approach.

The project's central document storage could be better set up at the beginning of the project to allow us to easily locate documents that provide evidence of compliance. This has improved as the project as a whole has become more mature.

Santos will submit recordable incident reports for this EMP at 90 day intervals as required. The requirements to submit these recordable incident reports for this EMP has been added to Santos' compliance tracking system.