Atlas Stage 3 Gas Project

Application Number: 01527

Commencement Date: 10/11/2022

Status: Locked

1. About the project

1.1 Project details

1.1.1 Project title *

Atlas Stage 3 Gas Project

1.1.2 Project industry type *

Mining

1.1.3 Project industry sub-type

CSG

1.1.4 Estimated start date *

1/02/2023

1.1.4 Estimated end date *

31/01/2075

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

Senex Energy Pty Ltd (Senex), through its subsidiaries Senex Assets Pty Ltd and Senex Assets 2 Pty Ltd, is planning to develop the Atlas Stage 3 Gas Project. The Project is to develop, operate, decommission and rehabilitate up to 151 coal seam gas wells; gas and water gathering systems for the producing wells; access tracks; brine and produced water storages; borrow pits; and ancillary supporting facilities on Authority to Prospect (ATP) 2059, Petroleum Lease (PL) 445, the northern portion of PL209 and parts of PL1037 in the central part of the Surat Basin, Queensland (the proposed action/Project). *Att A Figures, Figure 1* shows the location of each Project tenement. The gas field will be progressively developed over a period of ~5–10 years. The proposed action will enable the development of ~200PJ of additional resource of natural gas to be produced for domestic and international markets.

The total Project Area is 12,304ha and the potential disturbance footprint matches that Project Area. However, Senex has committed to a maximum disturbance limit of 530ha within the Project Area and potential disturbance footprint. Actual ground disturbance locations are subject to design refinement, constraints assessment and land access negotiation and will be determined iteratively during progressive development of the gas field.

Coal seam gas wells

Wells will generally be spaced 500–750m apart. The wells will be designed, constructed, decommissioned and rehabilitated in accordance with applicable State Code of Practice. Well sites will generally be constructed in an area of ~80m x 70m. The layout and size of well sites will vary but typically 0.6ha is required. In some cases up to ~1ha is required to accommodate site constraints. Well construction will involve a drill rig and other equipment eg drill fluid pumps, processing and storage for water supply, fuel, and chemicals. Following drilling of the well, sites will be partially rehabilitated, leaving an area of ~60m x 60m for workover rig operations.

Hydraulic stimulation (fraccing) of wells is not required and is not part of the proposed action. Management of residual drilling material includes offsite and onsite options, managed in accordance with State approvals.

Once drilled, wells will be completed and a pump installed to dewater the production reservoir. The standard well facility will be fenced and generally consist of:

- 1. Wellhead gas and water metering package
- 2. Gas/water separation equipment
- 3. Initially, natural gas power generation for the electric motor (possibly powered by alternative sources including solar, hybrid and distributed power in the future)
- 4. Fuel and instrument gas scrubber to power the generator and supply gas to instruments
- 5. Sand/particulate filter separator for water and gas streams
- 6. Surface pressure piping constructed of steel and connection to the gathering system.

Once depleted of gas, wells will be progressively decommissioned and rehabilitated. The life expectancy of a well is between ~15-35 years.

The total disturbance footprint required during construction of all 151 wells will be ~100ha and after post-construction rehabilitation will occupy ~60ha. All of the areas to be utilised for wells have previously been cleared of original native vegetation. At completion of the Project all well pads will be rehabilitated to the condition of the adjoining land.

Gathering systems

Gas and water from the well facilities will be transported via a buried gathering system that enables gas at low pressure and water to flow through separate buried High Density Polyethylene pipes, up to 650mm diameter. The gathering has highpoint vents and low point drains to maintain hydraulic performance.

To install the gathering lines, 18m wide right-of-ways (ROW) with some vegetation removed, trench excavated, pipe laid, trench backfilled, and ROW reinstated and rehabilitated, except for a 6m wide track which will be maintained along the ROW for operations (a 24m wide ROW will be required during construction for ~15km of major trunk lines). Where practicable, the pipeline ROW will be aligned with existing tracks, fences or other linear infrastructure to minimise disturbance to vegetation and overall impact on land users. The proposed action includes Horizontal Directional Drill (HDD) crossings of Woleebee Creek in PL1037 and as required elsewhere.

The total disturbance area during construction of gathering lines (including temporary additional construction areas for drainage feature crossings, road crossings, inter-property tie-ins, HDD) will be ~264ha and after post-construction rehabilitation will occupy ~80ha.

Brine and produced water storages

Groundwater will be extracted from CSG production wells to depressurise the production coal seams. It is expected that the action may generate up to~6.5ML of produced water/day. The water management process for produced water for the proposed action is expected to involve:

- New pre-engineered above ground tanks and/or purpose-built earthen dams with impervious liners and leakage detection/collection systems, that may be established on PL209. However, to minimise impacts and improve operational efficiency, some of the water will be transferred to centrally located aggregation and brine storages that are already established for Senex Assets Pty Ltd's 'Project Atlas' (EPBC 2018/8329) and which are not part of the proposed action.
- 2. The existing Project Atlas water treatment facility (WFT) on PL1037 will treat water from the proposed action but is not part of the proposed action. Subject to water production rates and other field development characteristics, an additional WTF may also be constructed on PL209 and this potential new WTF is part of the proposed action.
- 3. After treatment the water will predominantly be used for irrigation, however other uses eg stock water, hydrogen fuel production or other beneficial uses may also be pursued. Treated water for irrigation will be transferred (via water transmission pipelines) to third party irrigation dam(s) (~50-200ML each) on PL1037 and/or PL209, which do not form part of the proposed action. The water will be treated to comply with the standard water quality parameters as specified in State codes. Minor quantities of produced water may be beneficially reused in the proposed action area for dust suppression and construction activities in accordance with *Att B Environmental Management Plan, Section 7.7, p22*.
- 4. Brine from the water treatment process will be stored in a new brine storage dam (up to 300ML) which will be developed on PL1037 and is part of the proposed action. Additional brine storage (up to 300ML) may also be required on PL209 if a WTF is established there. Further brine treatment options including concentration via solar evaporation may be used and result in a concentrated slurry or solid salt product. Where appropriate, salt or salt slurry will be trucked from site and disposed of at a Regulated Waste Facility.

In total, ~30ha of brine storage and ~30ha water storage will be established on previously cleared land as a result of the proposed action.

Ancillary supporting facilities

It is expected that several temporary accommodation facilities will be required for construction and drilling activities. These facilities would be assembled onsite using prefabricated modular units with basic amenities such as modular sewage treatment plants and water tanks. It is expected that in total these facilities would occupy ~20ha of previously cleared land.

It is expected that the following additional facilities and activities will be required to support construction and operations:

- 1. laydown, stockpile and site office areas (~45ha of previously cleared land)
- 2. borrow pits (~11ha of previously cleared land)
- 3. other ancillary facilities and infrastructure with a footprint of ~30ha of previously cleared land, including:
 - 1. power/communication lines (overhead or underground)
 - 2. plant and equipment service and maintenance facilities and workshops
 - 3. construction support, warehousing and administration buildings
 - 4. fuel and chemical storage
 - 5. washdown facilities
 - 6. ancillary infrastructure such as communications infrastructure, water supply, holding tanks and dams, and energy supply
 - 7. groundwater monitoring bores

- 8. environmental monitoring equipment and management controls
- 9. ecological, topographic, cadastral, geological, geophysical and geotechnical surveys.

Managing potential impacts

Senex has developed *Att C Constraints Protocol* to guide site selection so that impacts upon environmental values are avoided or minimised. All clearing and civils work will be undertaken in accordance with applicable Senex environmental management plans.

Operations will include visual inspection and maintenance of all well, gathering and water infrastructure. All wells will also be monitored remotely with field staff responding through well visits as changes to normal operations are detected. The well bore itself will generally be serviced by workover rig ~3 yearly, although some wells may require more frequent servicing.

Rehabilitation will be undertaken progressively through the life of the Project. Once operations have ceased, infrastructure will be decommissioned unless retention and transfer of ownership of assets is agreed with the landholder. Disturbed areas will be rehabilitated in accordance with *Att D Rehabilitation Plan, Section 5, pp21-22* and regulatory requirements. Where the landholder and regulatory authority agree in writing, infrastructure such as access tracks and dams may be retained onsite for landholder reuse.

Activities that do not form part of the action referred

Senex conducts, and is proposing to conduct, a number of authorised activities in the Project Area which do not form part of the proposed action. Details of these activities are provided in Section 3.1.2.

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

Yes

1.2.3 Is the proposed action the first stage of a staged development (or a larger project)?

No

1.2.4 Related referral(s)

EPBC Number	Project Title
2009/4974	Expansion of Coal Seam Gas Fields
2018/8329	Project Atlas CSG Project, between Wollumbilla and Wandoan, Qld

1.2.5 Provide information about the staged development (or relevant larger project).

The proposed action is not part of a staged development or larger project.

The proposed action is related to other actions in the region being:

- 1. 2009/4974 Expansion of Coal Seam Gas Fields (Australia Pacific LNG Pty Ltd)
- 2. 2018/8329 Project Atlas CSG Project, between Wallumbilla and Wandoan, Qld.

Existing Australia Pacific LNG Pty Limited EPBC approval (EPBC 2009/4974)

Petroleum Lease (PL) 445 and PL209 were purchased from Australia Pacific LNG Pty Limited (APLNG) in late 2021. The Environmental Authorities for these PLs were transferred to Senex in early 2022 as part of the purchase. Development of these PL areas by APLNG has received approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2011 as part of APLNG's approval over a larger area 'to develop, construct, operate and decommission the coal seam gas field component of the Australia Pacific LNG Project in the Walloons gas fields within the Surat Basin in south central Queensland'. However, the EPBC Act does not allow the partial transfer of a component of a larger project to a new proponent. As such, Senex has completed additional assessments and developed this referral. It is noted that the nature of the proposed action is consistent with that previously approved within PL445 and the northern portion of PL209 as part of APLNG's already approved project.

The proposed action includes activities within PL445 and the northern portion of PL209 which are within the same land area as that in which APLNG activities are already approved under EPBC 2009/4974.

Existing Senex project – Project Atlas CSG Project, between Wallumbilla and Wandoan (EPBC 2018/8329)

Senex Assets Pty Ltd's existing operating coal seam gas project 'Project Atlas' (EPBC 2018/8329) is carried out within PL1037. Project Atlas includes 113 CSG wells and associated well site facilities; gas and water gathering system for the producing wells; access tracks for operational purposes; produced water management facilities, including aggregation dams, water treatment facility and up to 300ML of brine storage (of which 100ML of brine storage is already constructed). Project Atlas was determined to be 'not a controlled action' on 18 January 2019, and the activities that make up Project Atlas do not form part of the proposed Atlas Stage 3 Gas Project action. Where practicable, and to the extent authorised by current and future approvals, the proposed action will integrate with infrastructure constructed as part of Project Atlas. Such integration, e.g. water treatment, will maximise operational efficiency and reduce the impacts of the proposed action.

The proposed action includes the new gathering, and an additional 300ML brine storage on PL1037 to allow the efficient processing of part of the produced water from the proposed action, as described in the response to 1.2.1 above. Project Atlas (on PL1037) is adjacent and generally to the west and south of the proposed action. The new gathering and the additional 300ML brine storage within PL1037 that is part of the proposed action will integrate with, adjoin, and be located in close proximity to, Project Atlas infrastructure.

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

Commonwealth Regulation and Policy

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Regulations 2000* focus on the protection of matters of national environmental significance (MNES). The Significant Impact Guidelines (SIG) provide overarching guidance of the determination of whether an action is likely to have a significant impact on MNES. *SIG1.1– MNES (C'wealth 2013)* have been applied to the assessed impacts of the proposed activity on Threatened Ecological Communities, Listed Flora and Fauna Species and Migratory Species within the Project Area. *SIG 1.3: CSG and large coal mining developments - impacts on water resources (C'wealth 202b)* has been applied to the assessment of water resource impacts identified and modelled for the Project and the Project cumulatively with surrounding CSG and large coal mining developments to determine its significance.

Relevant Queensland Legislation, Regulation, Policy and Codes

- 1. Petroleum and Gas (Production and Safety Act) 2004 (P&G Act) facilitates and regulates the carrying out of responsible petroleum activities and the development of a safe, efficient and viable petroleum and fuel gas industry. Tenements granted by the state of Queensland that are relevant to the proposed action are Authority to Prospect (ATP) 2059; Petroleum Lease (PL) 209; PL445 and PL1037. An application to convert ATP2059 from an ATP to a PL under the P&G Act will be lodged with the Queensland Government in the near future and the term ATP2059 in this referral includes any renewal, replacement, substitution, consolidation, subdivision, variation, or extension of the ATP2059 tenement (including by way of a Potential Commercial Area).
- 2. *Mineral and Energy Resources (Common Provisions) Act 2014* (MERCP Act) sets forth the requirements for accessing land for resource activities, including entry notice and other access requirements, the process for conduct and compensation agreements and make good impacts on water bores. The MERCP Act also consolidates provisions to manage overlapping coal and petroleum resource authorities.
- 3. Land Access Code (DNRM 2016) applies to activities authorised under the P&G Act on private land, including consultation, communication and conditions of conduct.
- 4. Queensland Code of Practice for constructing and abandonment of petroleum wells and associated bores in Queensland (Code of Practice Petroleum-Wells-Bores (DNRME, 2019)). The code of practice outlines mandatory requirements and good practice to achieve long term well integrity and appropriately reduce the risk of environmental harm. The up to 151 wells will be designed, constructed, decommissioned and rehabilitated in accordance with the Code of Practice Petroleum-Wells-Bores (DNRME 2019).
- 5. *Environmental Protection Act 1994* (EP Act) provides the regulatory framework for the environmental management of CSG activities. Approvals are issued in the form of an environmental authority (EA) for petroleum activities. The tenements held for this activity have existing environmental authorities EA0002524 for ATP2059, EA0001207 for PL1037 and P-EA-100112777 for PL209 and PL445. Occasions for notifications to landholders in relation to CSG activities are also prescribed in the EP Act.
- 6. Waste Reduction and Recycling Act 2011 (WRR Act) establishes the framework to modernise waste management and resource recovery practices in Queensland and to promote waste avoidance and reduction and encourage resource recovery and efficiency. The WRR Act provides the framework for End of Waste (EOW) Codes to be developed such that a waste can be deemed a resource. Produced water is contemplated under two EOW Codes Associated water (including coal seam gas water) and Associated water for irrigation (including coal seam gas water) detailed in items 7 and 8 below.
- 7. ENEW07546918 End of Waste Code Irrigation of Associated Water (including coal seam gas water) 2019. Produced water will be stored within existing aggregation dams on PL1037 prior to being treated within an existing water treatment plant. New aggregation dams may also be established on PL209 as part of the referred action. Treated water will be made available to landholders for irrigation purposes in accordance with EOW Code ENEW07546918.
- 8. **ENEW07547018 End of Waste Code Associated Water (including coal seam gas water) 2019**. Produced water may be provided to a third party for use such as (but not limited to) stock water, dust suppression, construction and industrial operations. These activities will be undertaken in accordance with EOW Code ENEW07547018.
- 9. Coal Seam Gas Water Management Policy 2012 (State of Queensland 2012) relates to the management and use of CSG water under the EP Act.
- 10. *Water Act 2000* provides for the sustainable management of water and the management of impacts on underground water, among other purposes. The Water Act provides for the management of the impacts on underground water caused by the exercise of underground water rights by resource tenure holders, which are regulated under the P&G Act. The Act also outlines the requirements for make good agreements, associated with the impacts to underground water. Under this regulatory framework, where there is an area of concentrated development, a cumulative management area (CMA) can be declared. The proposed action is located within the Surat CMA, which was declared in 2011.
- 11. The Environmental Offsets Act 2014 (and Regulation) and Queensland Environmental Offsets Policy 2022 Version 1.12 (QEOP) provide the framework for offsetting significant residual impacts to Matters of State Environmental Significance (MSES). The Environmental Offsets Act 2014 requires development proponents to provide offsets for significant residual impact to MSES, including endangered, of concern and watercourse regional ecosystems, connectivity areas and protected wildlife habitat. Potential impacts to each MSES have been assessed in accordance with the Queensland Environmental Offsets Policy Significant Residual Impact Guideline (DEHP 2014). A State Environmental Offset Strategy has been developed and will be implemented in accordance with the Environmental Offsets Act 2014 and the requirements of the existing EA conditions. The policy includes a

system for reporting to the Queensland Government on offset arrangements; their management; how offset values are met and maintained; and the offset reconciliation process. Senex will enter into an environmental offset agreement with the relevant Queensland Government Department. Senex will comply with any identified offset requirements under *Environmental Offsets Act 2014*.

- 12. *Aboriginal Cultural Heritage Act 2003* provides effective recognition, protection and conservation of Aboriginal cultural heritage. Senex will continue operate under the agreement with the Iman People #2 and the Wardingarri Aboriginal Corporation RNTBC.
- 13. *Biosecurity Act 2014* is the primary pest, disease and contaminant management legislation that provides comprehensive biosecurity measures to safeguard Queensland's economy, agriculture and tourism industries. Under the Biosecurity Act, the Project will be required to take all reasonable steps to prevent or minimise each biosecurity risk, minimise the likelihood of causing a biosecurity event and prevent or minimise the harmful effects a risk could have and not do anything that might make any harmful effects worse. The project will apply corporate procedures and plans to minimise biosecurity risks.

The proposed action may require additional approvals under State legislation including but not limited to:

- 1. Nature Conservation Act 1994 regulates an activity which may interfere with protected wildlife (native plants and animals) including requiring permits and species management plans. The project will apply for any permits and approvals that are necessary for the development as proposed and confirmed through survey.
- 2. Regional Planning Interests Act 2014 provides for the effective management of the coexistence between CSG activities and agricultural interests. Applications for dealings under the RPI Act will be undertaken as necessary.
- 3. *Fisheries Act 1994* provides for the use, conservation and enhancement of the community's fisheries resources and fish habitats. The project may require permits where works are considered to be constructing or raising waterway barrier works. The project will apply for permits that are necessary for the development when confirmed by survey.

Links used in this response are also provided in Att M Reference Links.

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

The Project Atlas tenement area is overlapped by the Iman People #2 Native Title determination area and Iman #4 registered claim area. The Registered Native Title Body Corporate (RNTBC) for the Iman People #2 is the Wardingarri Aboriginal Corporation RNTBC.

Within the Project Area, land subject to Native Title has either been:

- 1. Excluded from the tenement,
- 2. Subject to an ancillary agreement with the claimant, or
- 3. For Native Title land that was previously excluded from the tenement, the right to negotiate process was followed and where no claimant came forward at the time, the excluded land was added back into the tenement.

Senex holds an Ancillary Agreement with the Iman People #2 which allows access to undertake disturbance activities on the land subject to Native Title in this tenement area.

In February 2018, Senex entered into a Cultural Heritage Management Agreement (CHMA) with both the Wardingarri Aboriginal Corporation RNTBC and the Iman #4. This CHMA has not been made publicly available due to cultural sensitivity reasons. The Iman People have since undertaken a number of Cultural Heritage clearances for Senex under this Agreement and will continue to for this proposed action.

Senex held its annual meeting in accordance with the CHMA terms and provided an update that Senex had acquired PLs 209 and 445 from APLNG and confirmed that these tenements would be covered by the existing CHMA for Project Atlas.

Senex's Sustainability Report describes broad community engagement objectives that include developing Stakeholder Management Plans on a project basis to help stakeholders understand the scope, purpose and potential impacts of the project in their region. For Atlas Stage 3 this Stakeholder Management Plan includes:

- Community information drop-in sessions
- Participation/support in community events
- · Updates and meetings with federal, state and local authorities, and in local media
- · Regulatory functions including submissions/applications, reporting and notices
- Landholder engagement.

Senex sponsors and assists with many community events and initiatives in the Wandoan region. Three community information drop-in sessions were held in May 2021 in Miles and Wandoan for the exchange of information with the community, local suppliers and potential future employees on Senex's field activities. Community information sessions are proposed for December 2022 focussed on providing the latest information on the Atlas Stage 3 development.

Senex has also presented on the Project at the Miles Women's Wellness Day (200 attendees) and the Wandoan Road Ahead Dinner (60 attendees), and published articles on it in local media outlets including the Murilla News delivered to all residents, Window on Wandoan, Country Caller and Chinchilla News as well as social media and web page posts. Through this consultation, key concerns raised generally related to desired improvements to the State Government funded Jackson-Wandoan Road given the location of Senex's proposed developments and housing. There was no negative feedback about Senex's proposed activities. This reflects Senex's operational track record and the local community's growing understanding and acceptance of gas developments over the past several years.

Senex hold monthly meetings with senior members of the Western Downs Regional Council and the Wandoan Community Commerce and Industry Association about project developments and upcoming events in the Project Area. Also, regular meetings are held with State and Commonwealth representatives to raise their awareness of the proposed development activities.

Senex is engaging with relevant landholders under its land access strategy via shed meetings, one-on-one sessions, notices of entry etc, ahead of entering into conduct and compensation agreements with them for the project's development. Senex engage with landholders in formal land access negotiations in accordance with their obligations under the *Mineral and Energy Resources (Common Provisions) Act* 2014 in order to secure agreement for access, the siting of wells and associated infrastructure. These processes are undertaken in acknowledgement of the rights and obligations of both parties.

When a publicly listed company, Senex reported annually on its operation and financial position. It also publishes separately a sustainability report 2021 Sustainability Report (Senex, 2021).

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

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Confirm that you have read and understand this Privacy Notice *

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details				
ABN/ACN	50008942827			
Organisation name	Senex Energy Pty Ltd			
Organisation address	ress PO Box 2233, Brisbane QLD 4001			
Referring party details				
Name	Steve Fox			
Job title	Atlas Approvals			
Phone	0410504268			
Email	steve.fox@senexenergy.com.au			

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

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No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details			
ABN/ACN	50008942827		
Organisation name	Senex Energy Pty Ltd		
Organisation address	PO Box 2233, Brisbane QLD 4001		
Person proposing to take the ac	ction details		
Name	Darren Stevenson		
Job title	Chief Operating Officer		
Phone	(07) 3335 9956		
Email	darren.stevenson@senexenergy.com.au		
Address	PO Box 2233, Brisbane QLD 4001		

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

No

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

Senex Energy Pty Ltd (Senex) is an environmentally responsible company committed to conducting its business in a manner which ensures high standards of environmental management and performance.

Senex is a registered suitable operator under the *Environmental Protection Act 1994* (Reference number 601241), as are Senex Assets Pty Ltd (Reference number RSO001534) and Senex Assets 2 Pty Ltd (Reference number 100143807).

Senex has a satisfactory record of responsible environmental management. There are no past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either Senex, Senex Assets Pty Ltd or Senex Assets 2 Pty Ltd. Otherwise, Senex notes the following:

- A penalty infringement notice was issued to Stuart Petroleum Cooper Basin Gas Pty Ltd (a subsidiary of Senex) (Stuart Petroleum) by the Queensland Department of Environment and Science in May 2022 for an alleged breach of the conditions of the *ENEW07547018 End of Waste Code Associated Water (including coal seam gas water) 2019* under the *Waste Reduction and Recycling Act 2011*. The alleged breach related to the salinity level of water being used in a produced water irrigation scheme at Senex's Western Surat Gas Project in the Surat Basin being marginally higher than the limit specified in Senex's resource management and monitoring plan. Senex had undertaken a scientific assessment of the matter and had satisfied itself, the landholder and the specialist consultant that the exceedance would not cause environmental harm, and in fact, that a failure to continue to irrigate could harm the soil structure. However, there was a delay in updating the resource management and monitoring plan. The incident did not cause environmental harm, Senex has since amended the resource management and monitoring plan, and salinity is now within the acceptable limits.
- An Environmental Protection Order (EPO) was issued to Stuart Petroleum by the Queensland Department of Environment and Science in November 2022. The EPO relates to an alleged miscalculation of impacts on a prescribed environmental matter under the environmental authority (EA) for the Western Surat Gas Project. The EPO includes an obligation for Senex to provide a report to the Department providing a calculation of the relevant impacts on or before 9 February 2023. In June 2022, Senex proactively committed to addressing the matter during the first 5-yearly review due in 2023 (as required under the EA) and has brought forward the preparation of this report for the Department which will be submitted by the required by date. Senex notes that no environmental harm is being alleged by the Department with respect to this matter.

Senex has previously referred the following projects under the Environment Protection and Biodiversity Conservation Act (EPBC Act):

- 1. EPBC 2018/8329 Project Atlas CSG Project, between Wallumbilla and Wandoan, Qld
- 2. EPBC 2015/7469 Stuart Petroleum Cooper Basin Gas Pty Ltd Western Surat Gas Project, NE of Roma, Queensland

The proposed action will be undertaken in accordance with the corporation's environmental policy and framework as outlined in the response to Question 1.3.2.18 and the attachments and hyperlinks contained therein.

Links used in this response are also provided in Att M Reference Links.

1.3.2.18 If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

Senex Energy Pty Ltd (Senex) is an environmentally responsible company committed to conducting its business in a manner which ensures high standards of environmental management and performance.

Senex will achieve this commitment through applying its core values to promote and maintain a culture of sustainability and continuously review and improve environmental performance across the business.

The proposed action will be undertaken in accordance with the corporation's environmental policy and framework. The Senex Environmental Management Policy (see **Att B Environmental Management Plan, Appendix 1, p41**) states that the Company's environmental goals will be achieved by actively focusing on:

- 1. Assessing the potential impacts of operations and activities on the local environment to limit disturbance
- 2. Operating in a safe and environmentally responsible manner
- 3. Empowering employees and contractors to achieve environmentally responsible operations and to improve environmental performance
- 4. Maintaining and continuously improving environmental standards, systems and controls across all activities and operational areas

Senex will ensure effective implementation of this policy through:

- 1. Ensuring that environmental goals and standards are understood and adopted at all levels across the Company
- 2. Instructing and educating employees and contractors where appropriate of their environmental responsibilities
- 3. Reporting environmental incidents, determining the cause and where appropriate implementing changes to prevent a recurrence
- 4. Measuring performance through regular monitoring, environmental audits and reporting
- 5. Ensuring compliance with relevant laws, regulations and where appropriate industry codes.

Senex and its controlled entities have completed a Sustainability Report for the financial year ending 30/06/2021 in accordance with global standards for sustainability reporting (GRI Standards: Core option). The **2021 Sustainability Report (Senex, 2021), Sustainability Data,** *p***88, includes summary information on environmental compliance for that period.**

Senex also operates the Western Surat Gas Project (2015/7469) in the Surat Basin approximately 80 km to the west of the Atlas Stage 3 Project. Reporting for the Western Surat Gas Project has been undertaken annually by Senex since 2019. The Annual *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) Compliance Reports for each year's activity period can be found on the webpage *Approvals - Senex Energy*.

Senex has also adopted a Climate Change Policy that can be found on the webpage Senex Climate Change Policy.

Links used in this response are also provided in Att M Reference Links.

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details			
ABN/ACN	50008942827		
Organisation name	Senex Energy Pty Ltd		
Organisation address	PO Box 2233, Brisbane QLD 4001		
Proposed designated proponent details			
Name	Darren Stevenson		
Job title	Chief Operating Officer		
Phone	(07) 3335 9956		
Email	darren.stevenson@senexenergy.com.au		
Address	PO Box 2233, Brisbane QLD 4001		

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN/ACN	50008942827
Organisation name	Senex Energy Pty Ltd
Organisation address	PO Box 2233, Brisbane QLD 4001
Representative's name	Steve Fox
Representative's job title	Atlas Approvals
Phone	0410504268
Email	steve.fox@senexenergy.com.au
Address	GPO Box 2233, Brisbane QLD 4001

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN

50008942827

21/12/2022, 08:36	Print Application · Custom Portal
Organisation name	Senex Energy Pty Ltd
Organisation address	PO Box 2233, Brisbane QLD 4001
Representative's name	Darren Stevenson
Representative's job title	Chief Operating Officer
Phone	(07) 3335 9956
Email	darren.stevenson@senexenergy.com.au
Address	PO Box 2233, Brisbane QLD 4001

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.5 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A?

No

1.4.7 Has the department issued you with a credit note? *

No

1.4.9 Would you like to add a purchase order number to your invoice? *

No

1.4 Payment details: Payment allocation

1.4.11 Who would you like to allocate as the entity responsible for payment? *

Person proposing to take the action

2. Location

2.1 Project footprint



2.2 Footprint details

2.2.1 What is the address of the proposed action? *

Intersection of Jackson-Wandoan Road and Gadsbys Road, Woleebee, Queensland 4419

2.2.2 Where is the primary jurisdiction of the proposed action? *

https://epbcbusinessportal.awe.gov.au/dashboard/print-application/?id=a77cdf53-8c60-ed11-a81b-002248157bba

Queensland

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

The total Project Area is 12,304ha and the potential disturbance footprint matches that Project Area. However, Senex has committed to a maximum disturbance limit of 530ha within the Project Area and potential disturbance footprint. Actual ground disturbance locations are subject to design refinement, constraints assessment and land access negotiation and will be determined iteratively during progressive development of the gas field.

The Project Area includes parts of 28 cadastral land parcels comprising Freehold and Lands Lease land along with road reserves and easements. The Project Area extends from 10 to 24 km southwest and south-southwest of Wandoan and is accessed via Jackson-Wandoan Road, Gurulmundi Road, Giligulgul Road and local roads. The intersection of Jackson-Wandoan Road and Gadsbys Road is approximately central to the southern part of the Project Area. Minor/unused stock routes exist on Jackson-Wandoan Road (SR:708WEST) and adjacent reserve, subject to a Lands Lease. The Project Area is entirely within the boundary of Western Downs Regional Council (WDRC), southern inland Queensland. *Att A Figures, Figure 2* shows the location of land parcels within and immediately surrounding the Project Area.

The land parcels partially or wholly within the Project Area are:

Lot 1 RP123884
Lot 2 RP123884
Lot 17 FT163
Lot 19 FT60
Lot 20 FT672
Lot 23 FT41
Lot 24 FT41
Lot 10 FT949
Lot 54 FT788
Lot 1 FT982
Lot 6 FT788
Lot 222 RP868424
Lot 48 SP127252
Lot 28 FT672
Lot 57 FT901
Lot 1 SP184589
Lot 2 SP184589
Lot 49 SP237297
Lot 26 FT88
Lot 29 FT169
Lot 50 FT167
Lot 45 FT167
Lot 46 FT103
Lot 51 FT429
Lot 52 SP237297
Lot 1 SP254444
Lot 5 SP186409
Lot 7 SP254407.

The Project Area is surrounded by six granted Petroleum Leases (PLs) and one PL application. There are two Mineral Development Licences (MDL) that overlap with parts of ATP259 and PL445 and PL209. and one granted Mining Lease (ML) which includes some minor overlap with PL445. *Att A, Figure 3* shows the relative location of the resource tenements.

3. Existing environment3.1 Physical description

3.1.1 Describe the current condition of the project area's environment.

The Project Area is in the Western Downs Regional Council (WDRC) area, 10km southwest of the nearest town, Wandoan, 63km northwest of Miles and 350km northwest of Brisbane. The majority of the Project Area has been subject to extensive disturbance with approximately 90.6% being cleared of remnant native vegetation (as can be seen in *Att A Figures, Figure 1* and *Figure 2*). The majority of the vegetation was cleared by the 1960's. The main land use within the Project Area is grazing of stock for beef production, with a feedlot located in the northeast of the Project Area. Some flood plain areas have been developed for centre-pivot irrigated cropping and other cropping areas (*Att A, Figure 4*). No Protected Areas or State Forests are located within the Project Area.

The *WDRC Planning Scheme, Zoning Maps* has the parcels associated with the Project Area zoned as "Rural". No changes to zoning are currently proposed/envisaged for this activity. The surrounding areas are also zoned Rural with two parcels to the southwest zoned for "Community Facilities" and one parcel to the northeast and another to the southeast zoned as "Recreation and Open Space". Wandoan is the nearest township and is located 10km northeast of the Project Area.

The vast majority of the Project Area is extensively cleared of native vegetation and converted to non-remnant pasture dominated by native and introduced grasses, notably Buffel Grass (*Cenchrus ciliaris*) and Sabi Grass (*Urochloa mossambicus*). Those habitats that are retained in the Project Area are mostly in moderate to low condition, with signs of degradation and fragmentation due to cattle grazing, erosion, and the presence of introduced flora species.

Although grass and bushfires do occur periodically and disturb areas of remnant vegetation, the Project Area has not suffered notable effects from major recent bushfire or other events. The Project Area has received record breaking rainfall throughout much of 2022 and low-lying areas have been subject to regular inundation and flooding during this period. This flooding has damaged some public roads, private access tracks, fencing and other agricultural infrastructure but the rainfall has generally been viewed as beneficial by local landholders.

The Project Area will mostly be accessed from the north and south along the Jackson-Wandoan Road which is the main road between Wandoan and Jackson, a small township on the Warrego Highway between Miles and Roma. During field development, and to a lesser extent operation and decommissioning and rehabilitation, equipment and materials that need to be transported from further afield will generally travel along the Warrego Highway to Miles, then along the Leichardt Highway to Wandoan and then along the Jackson-Wandoan Road to site. Other minor public roads that may be used for local access to the Project Area during field development, operation and decommissioning include Giligulgul Road, Gadsbys Road, Sundown Road and Weldons Road.

Links used in this response are also provided in Att M Reference Links.

3.1.2 Describe any existing or proposed uses for the project area.

The main land use within the Project Area is grazing of stock for beef production, with a feedlot located in the northeast of the Project area. Isolated residential areas (residences) occur throughout the area. Some flood plain areas have been developed for centre-pivot irrigated cropping and other cropping areas. There are currently no large scale industrial, commercial forestry, tourism or community uses in the Project Area. See the existing land uses in and around the Project Area in *Att A, Figure 4*.

Western Downs Regional Council (WDRC) considers agriculture, extensive agriculture, manufacturing and energy the four economic pillars for the region, which it considers the energy capital of Queensland supplying a diversity of gas, solar and coal electricity to the national electricity grid (*WDRC Planning Scheme, Part 3 – Strategic Plan, p3-2*). The *WDRC Planning Scheme, Zoning Maps (ZM-066)* has the parcels associated with the Project Area zoned as "Rural". The surrounding areas are also zoned Rural with two parcels to the southwest zoned for Community Facilities and one parcel to the northeast and another to the southeast zoned as "Recreation and Open Space". No changes to zoning are currently proposed/envisaged for this activity.

Existing Australia Pacific LNG Pty Limited EPBC approval (EPBC 2009/4974)

Petroleum Lease (PL) 445 and PL209 were purchased from Australia Pacific LNG Pty Limited (APLNG) in late 2021. The Environmental Authorities for these PLs were transferred to Senex in early 2022 as part of the purchase. Development of these PL areas by APLNG has received approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2011 as part of APLNG's approval over a larger area 'to develop, construct, operate and decommission the coal seam gas field component of the Australia Pacific LNG Project in the Walloons gas fields within the Surat Basin in south central Queensland'. However, the EPBC Act does not allow

the partial transfer of a component of a larger project to a new proponent. As such, Senex has completed additional assessments and developed this referral. It is noted that the nature of the proposed action is consistent with that previously approved within PL445 and the northern portion of PL209 as part of APLNG's already approved project.

Existing Senex project – Project Atlas CSG Project, between Wallumbilla and Wandoan (EPBC 2018/8329)

Senex Assets Pty Ltd's existing operating coal seam gas project 'Project Atlas' (EPBC 2018/8329) is carried out within PL1037. Project Atlas includes 113 CSG wells and associated well site facilities; gas and water gathering system for the producing wells; access tracks for operational purposes; produced water management facilities, including aggregation dams, water treatment facility and up to 300ML of brine storage (of which 100ML of brine storage is already constructed). Project Atlas was determined to be 'not a controlled action' on 18 January 2019, and the activities that make up Project Atlas do not form part of the proposed Atlas Stage 3 Gas Project action. Where practicable, and to the extent authorised by current and future approvals, the proposed action will integrate with infrastructure constructed as part of Project Atlas. Such integration, e.g. water treatment, will maximise operational efficiency and reduce the impacts of the proposed action. The proposed action includes the new gathering, and an additional 300ML brine storage on PL1037 to allow the efficient processing of part of the produced water from the proposed action, as described in the response to 1.2.1 above.

Compression and export facilities

Gas produced as part of the Atlas Stage 3 Project will be transported from the wells to compression facilities. These compression facilities, and associated power facilities and any export pipelines, will be owned by other entities including third parties, and will be subject to separate State licensing and approvals. These compression facilities, associated power facilities, and export pipelines are not part of the proposed action.

Ongoing appraisal program

The proposed action also excludes Senex's existing, ongoing appraisal program on ATP2059/PL209. The appraisal program is excluded as it is necessary to confirm the commercial viability of the Project (now confirmed) and then to help identify the optimal phasing for the gas field development. After the appraisal activities have ceased, the proposed action will utilise the infrastructure established for the appraisal program including operating wells, gathering system and associated facilities.

The appraisal program activities are approved under the relevant State Environmental Authorities. EPBC significant impact assessments have also been completed that confirm that the appraisal program activities are unlikely to have a significant impact on any MNES.

Other resource activities

The Project Area is in the central part of Queensland's Surat Basin, an established gas-producing region (*Att A Figures, Figure 3*). The proposed action is surrounded by CSG developments, most of which are owned and operated by other parties. Field development in those Petroleum Leases (PL) to the north and west of the Project Area is extensive. An approval to develop pipeline and gasfield infrastructure and to extract coal seam gas within parts of the Project area (i.e. PL 445 and PL 209) was granted to APLNG as a component of the much broader Walloons gas fields (DSEWPaC 2009a, EPBC 2009/4974). The State approvals for PL 445 and PL 209 have subsequently been transferred to Senex.

The gas resource in the southern portion of PL209 is deeper than in the north and within geological strata with greatly reduced permeability, and uncertain stress regimes. The technical and commercial viability of extracting gas from this area is uncertain. Senex has not yet determined the most appropriate appraisal program, and consequently currently has no plans to develop this area.

In the northern part of the Project Area and further north, Wandoan Holdings Pty Limited hold Mining Leases (ML 50229, ML 50230 and ML50231) which were granted in 2017 for the development of an open-cut, thermal coal mine. This planned mining project has been on hold since 2013.

Other activities

Various pipelines and high-voltage powerlines pass through the Project Area to supply adjacent industrial and agricultural infrastructure.

Vena Energy have recently announced plans to develop a 125MW solar project which may overlap with the south-western portion of the Project Area within PL1037 and other solar developments exist and are planned in the region.

Links used in this response are also provided in Att M Reference Links.

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

The landscape is dominated by rural uses with meandering creek lines and riparian woodland corridors. The Project Area does not include any National Parks, Conservation Areas or State Forests. The Juandah and Cherwondah State Forests are the nearest protected areas.

The Project Area does not contain either Scenic Route or buffer or High Landscape Value Areas as described in the Western Downs Regional Council (WDRC) *WDRC Planning Scheme Scenic Amenity Overlay, OM-11, Sheet 12*. The majority of the Project Area has been subject to extensive disturbance with approximately 90.6% being cleared of remnant native vegetation. The main land use within the Project Area is grazing of stock for beef production, with a feedlot located in the northeast of the Project Area. There are no outstanding natural features or other important or unique values that apply to the Project Area.

Links used in this response are also provided in Att M Reference Links.

3.1.4 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

Biogeographically, the Project Area is entirely within the Brigalow Belt Bioregion. Landscapes are dominated by meandering watercourses traversing broad alluvial plains flanked by rolling rises on fine-grained sediments with a few scattered patches of colluvial sand deposits. Elevation in the Project Area varies from 250m above sea level on Woleebee Creek at the northern limit of the Project Area, up to 429m at the highest point in the far south-eastern corner. The majority of the Project Area consists of flats and gentle slopes below 300m above sea level. The Project Area is entirely drained by streams that flow north to the Dawson River, within the Fitzroy Basin.

Att A Figures, Figure 5 shows the maximum and minimum elevation within the Project Area as well as elevation contours.

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

The ecological studies conducted to support this referral assessed an area referred to in this referral as the Field Development Area (FDA). The FDA is approximately 98 km2 and is shown in *Att A Figures, Figure 6*. It is noted that the FDA did not extend to the part of Petroleum Lease (PL) 1037 which is west of Woleebee Creek because:

- this area has been the subject of previous ecological assessments, including those completed in 2018 for Senex's existing Project Atlas, and subsequent pre-disturbance surveys; and
- the only Atlas Stage 3 infrastructure proposed within this area is a new brine storage, which will be sited within previously cleared
 areas in the proximity of the existing Project Atlas water treatment facility. This new storage is a part of this proposed action as it is
 required to manage the additional water from the Project. It will be sited using Senex's Queensland Environmental Protocol for Field
 Development and Constraints Analysis (*Att C Constraints Protocol*) to ensure that there will be no significant impact to any Matters
 of National Environmental Significance.

The ecological assessment has used information gathered from the following sources:

- BOOBOOK Ecological Consulting Terrestrial Ecology Report (refer to Att E Ecology Assessment Report, Part2, Appendix C); and
- 2. Freshwater Ecology Aquatic Ecology Report (refer to Att E, Part2, Appendix D).

Overall, the assessment consisted of a desktop review to identify values that may be present, which then helped to guide the development and implementation of a field survey and sampling program to describe on-ground conditions and to assess the known, likely and potential occurrence of ecological values within the FDA.

BOOBOOK Ecological Consulting undertook terrestrial field ecology surveys via targeted vehicle based and foot traverses of the FDA, over the periods of 14 – 18th March 2022, 22 – 25th March 2022; 30 April – 5th May 2022, and 9 – 13th June 2022. Aquatic field ecological surveys were undertaken by Freshwater Ecology over an eight-day period (14 – 21st March 2022). The assessment methodology is further described in *Att E, Part1, Section 3, pp15-28*.

Two Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) listed Threatened Ecological Communities (TECs) were confirmed as known within the FDA:

- 1. Brigalow (Acacia harpophylla dominant and codominant) TEC (Brigalow TEC); and
- 2. Poplar Box grassy woodland on alluvial plains TEC (Poplar Box TEC).

Both these TECs are listed as Endangered under the EPBC Act. There are 17 patches of Brigalow TEC making up a total of 95.8ha in the FDA (representing 1% of the Project Area). There are 10 patches of Poplar Box TEC totalling 32.3ha (or 0.4% of the Project Area). The location of these TECs is illustrated in *Att E, Part1, Figure 4-2, p43*.

There are six EPBC Act listed threatened species (one flora and five fauna) that are known or likely to occur within the FDA:

- 1. Koala (Phascolarctos cinereus) (known to occur) Endangered
- 2. Greater Glider (central and southern) (Petauroides volans) (known to occur)- Endangered
- 3. Glossy Black-cockatoo (south-eastern subspecies) (Calyptorhynchus lathami lathami) (likely to occur) Vulnerable
- 4. White-throated Needletail (Hirundapus caudacutus) (likely to occur) Vulnerable (and Migratory)
- 5. Dulacca Woodland Snail (Adclarkia dulacca) (known to occur) Endangered
- 6. Ooline (Cadellia pentastylis) (known to occur) Vulnerable.

https://epbcbusinessportal.awe.gov.au/dashboard/print-application/?id=a77cdf53-8c60-ed11-a81b-002248157bba

Although not directly observed, evidence of Koala in the form of scratches on smooth barked trees has been recorded along several watercourse sections in the FDA. A total of 715.7ha of foraging and breeding habitat for Koala has been mapped as occurring in the FDA. The remainder of the FDA (9,098.3ha) is predominantly cleared land (with some scattered trees and shrubs) that is recognised as dispersal habitat for Koala (allowing Koala to move between areas of preferred habitat). The Koala scratch records and habitat areas are illustrated in *Att E, Part1, Figure 4-6, p53*.

Greater Glider was observed along waterways in the FDA, which was found to contain 528ha of potentially suitable habitat for this species. The observation locations and habitat areas are illustrated in *Att E, Part 1, Figure 4-7, p55*. The FDA also contains 659ha of potentially suitable habitat for Glossy Black-cockatoo, as illustrated in *Att E, Part 1, Figure 4-8, p57*. The FDA does not contain any suitable habitat for White-throated Needletail although this predominantly aerial species may fly over the area. The FDA contains 305.2ha of potentially suitable Dulacca Woodland Snail habitat which is illustrated in *Att E, Part 1, Figure 4-9 p59*.

Ooline has been recorded as abundant in the far south-eastern corner of the FDA and its habitat occupies 118.7 ha. This habitat includes Brigalow woodland and fringing regrowth and is illustrated in *Att E, Part1, Figure 4-3, p45*. It is noted that Ooline, which grows into a large tree, can sometimes be found within cleared areas as isolated trees or stands which have either been retained at the time of clearing or have subsequently regenerated.

Two listed migratory species are likely to occur in the FDA, being:

- 1. White-throated Needletail (Hirundapus caudacutus)
- 2. Fork-tailed Swift (Apus pacificus).

The FDA does not contain any suitable habitat for either of these predominantly aerial species although both may occasionally fly over the area.

Two listed threatened terrestrial flora species, Belson's Panic (*Homopholis belsonii*) and Slender Tylophora (*Vincetoxicum forsteri*), have been assessed as having the potential to occur within the FDA (refer to *Att E, Part2, Appendix B*). In essence, because part of these species' distributions overlap the FDA and potentially suitable habitat is present within the FDA, their presence cannot be ruled out.

A total of nine EPBC Act listed threatened terrestrial fauna species have been assessed as having the potential to occur within the FDA as determined by the 'likelihood of occurrence' assessment detailed in *Att E, Part2, Appendix B*. In essence, because part of these species' distributions overlap with the FDA, their presence cannot be ruled out. They are:

- 1. Australian Painted Snipe (Rostratula australis) Endangered (and Migratory)
- 2. Painted Honeyeater (Grantiella picta) Vulnerable
- 3. Squatter Pigeon (southern subspecies) (Geophaps scripta scripta) Vulnerable
- 4. Corben's Long-eared Bat (Nyctophilus corbeni) Vulnerable
- 5. Northern Quoll (Dasyurus hallucatus) Endangered
- 6. Yellow-bellied Glider (south-eastern subspecies) (Petaurus australis australis) Vulnerable
- 7. Collared Delma (Delma torquata) Vulnerable
- 8. Dunmall's Snake (Furina dunmalli) Vulnerable
- 9. Yakka Skink (Egernia rugosa)- Vulnerable.

The potentially suitable habitat for these species is presented in Att E, Part1, Figures 4-10, 4-11 and 4-12 (pp63-65).

Although there were no signs or observations within the FDA, six species listed as Migratory under the EPBC Act also have the potential to occur in the FDA. They are:

- 1. Common Sandpiper (Actitis hypoleucos)
- 2. Latham's Snipe (Gallinago hardwickii)
- 3. Oriental Cuckoo (*Cuculus optatus*)
- 4. Rufous Fantail (Rhipidura rufifrons)
- 5. Satin Flycatcher (*Myiagra cyanoleuca*)
- 6. Sharp-Tailed Sandpiper (Calidris acuminata)

The potential for these six species to utilise habitats within the FDA is described in Att E, Part1, Table 4-10, p67.

A broader and more detailed description of the flora and fauna within the FDA, including all species and vegetation communities listed as threatened under the Queensland legislation, is provided within in *Att E, Part1, Section 4, pp29-91*.

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

The Field Development Area (FDA) is entirely within the Brigalow Belt Bioregion. Landscapes in the northern portion of the FDA are dominated by meandering watercourses traversing broad, historically cleared, alluvial plains flanked by rolling rises on fine-grained sediments, with a few scattered patches of colluvial sand deposits. Landscapes in the southern portion of the FDA include similar landforms, but with alluvial sediments restricted to gullies along of streamlines and increasing topographic relief to the south, rising to a rocky scarp and plateau in the far southeast.

The vast majority of the FDA is extensively cleared of native vegetation and converted to non-remnant pasture dominated by native and introduced grasses, notably Buffel Grass (*Cenchrus ciliaris*) and Sabi Grass (*Urochloa mossambicus*). Riparian woodland dominated by Queensland Blue Gum (*Eucalyptus tereticornis*) with some fringing areas of Poplar Box (*Eucalyptus populneus*), Brigalow (*Acacia harpophylla*) and Belah (*Casuarina cristata*), follows the winding course of major watercourses through the Project Area. These narrow woodland corridors are disturbed by thinning, regrowth, grazing, tracks, weeds, gaps and edge effects causing death of some peripheral

trees. However, these corridors have high faunal habitat values, in particular for arboreal mammals and birds, due to features such as an abundance of large trees with hollows occurring on alluvial soils near water sources and ephemeral wetlands in floodplain depressions or cut-off oxbows from changes in stream path. The corridors along Wandoan Creek and Woleebee Creek form part of an extensive dendritic network of riparian woodland with connectivity north to the Dawson River at Taroom but isolated from other large woodland patches to the east, south and west. In the rolling downs beyond the watercourses, remaining fragments of woodland are small, scattered, isolated and disturbed.

Further south, the FDA includes similar but less continuous riparian woodland corridors along Hellhole Creek, Woleebee Creek and its tributaries. This area also includes many small, disturbed fragments of Brigalow and Belah woodland on the rolling downs. A more substantially wooded area occurs around the plateau in the far southeast with Brigalow and Belah forest, Mountain Coolibah (*Eucalyptus orgadophila*) woodland and open forest of Narrow-leaved Ironbark (*Eucalyptus crebra*).

Significant ongoing threats to biodiversity within the FDA include further loss of remnant and regrowth vegetation in an area that is already extensively cleared; potential loss of connectivity among areas of remnant and regrowth vegetation, especially though disruption of riverine corridors by tracks, powerlines and other linear infrastructure; loss of ecological integrity of vegetation patches through edge effects around fragments and along narrow corridors, death of larger trees without corresponding recruitment, disturbance of understorey vegetation, and invasion by weeds and pastoral grasses.

There are two *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) listed Threatened Ecological Communities (TECs) present in the FDA, and these make up 1.4% of the FDA (*Att E Ecology Assessment Report, Part1, Section 4.4.1, pp40-42* and *Figure 4-2, p43*). Both the Brigalow TEC and Poplar Box TEC are listed as Endangered under the EPBC Act.

The Brigalow TEC is characterised by *Acacia harpophylla* being either dominant in the tree layer, or co-dominant with other species – notably *Casuarina cristata*, other species of Acacia, or species of Eucalyptus. In the FDA this TEC is made up of 13ha of regrowth and 82.8ha of remnant vegetation. An additional 14 patches of Brigalow vegetation (totalling 56.2ha) did not meet the criteria for recognition as a TEC as:

- A. harpophylla was absent or subdominant; and/or
- the was patch less than 0.5ha in size (patches were measured by including any areas that extended beyond the FDA boundary); and/or
- exotic perennial plants comprised over 50% of total vegetation cover within the patch.

The Poplar Box TEC is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs, mostly occurring in gently undulating to flat landscapes and occasionally on gentle slopes on a wide range of soil types of alluvial and depositional origin. Within the FDA, ten patches of Poplar Box TEC occur, covering a total area of 32.3ha. Three of these patches were assessed as Category B (Good Quality) vegetation and seven patches were assessed as Category C (Moderate Quality) vegetation, all occurring on floodplains in the north, with some patches extending (and measured) beyond the FDA boundaries. An additional 15 patches of regrowth and remnant Poplar Box woodland on alluvial plains was assessed and did not meet the criteria for recognition as TEC (smaller than 5ha and/or the ground stratum was dominated by exotic weeds).

Stands of the EPBC Act threatened plant, Ooline, with trees up to 35m high occur in Brigalow woodland on the footslopes and midslopes in the far south-eastern corner of the FDA. This forest and woodland include fringing areas of regrowth and in some areas is disturbed by fire, light grazing, weeds, tracks and fencelines. Nonetheless, this area shows high ecological integrity and overall low levels of disturbance. This area is tenuously connected with much larger area of forest beyond the FDA, to the south and east, and it is on the periphery of the very extensive forested area around Barakula State Forest, some 45km east of the Project Area.

The FDA has been classified into six broad habitat types, defined based on vegetation community type, structure, and is based on groundtruthed mapping using the regional ecosystem (RE) verification method. These habitat types have then been considered as respective foraging, breeding, roosting, denning, dispersal, and movement functions for EPBC Act listed threatened and/or migratory species that are known, likely or have the potential to occur within the FDA. The mapped vegetation communities and broad habitat types are:

- 1. Acacia woodlands dominated by Brigalow (Acacia harpophylla)
- 2. Callitris and Eucalypt dominated woodlands
- 3. Eucalypt dominated woodlands mainly of Eucalyptus crebra, E. populnea and E. melanophloia
- 4. Riparian and wetland Eucalypt woodlands dominated by E. tereticornis
- 5. Eucalypt open forest dominated by E. populnea
- 6. Cleared exotic pasture.

There are 16 REs mapped within the FDA that account for a total of 678.3ha of native vegetation. Seven of these REs are classed under the Queensland *Vegetation Management Act 1999* as Endangered (209.6ha) or Of Concern (162ha). The dominant vegetation communities identified in desktop searches and verified by field surveys were RE 11.3.25 '*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines' and RE 11.9.5 '*Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks'. *Att A Figures, Figure 7* shows the REs mapped over the FDA and surrounds.

Ground-truthed REs detected within the FDA are described in Att E, Part1, Section 4.5.1, pp71-74.

Five introduced flora and evidence of three fauna species were recorded during field surveys. The three fauna species are listed as Restricted Invasive animals under the *Biosecurity Act 2014* including Dingo/Wild Dog (*Canis familiaris*), Rabbit (*Oryctolagus cuniculus*) and Pig (*Sus scrofa*). The five flora species, Common Pest Pear (*Opuntia stricta*), Tiger Pear (*Opuntia aurantiaca*), Harrisia Cactus (*Harrisia martini*), Mother-Of-Millions (*Kalanchoe delagoensis*) and Velvety Tree Pear (*Opuntia tomentosa*) are listed as Restricted Matter under the under the *Biosecurity Act 2014*.

Five exotic flora species listed as Weeds of National Significance are identified as potentially occurring in the FDA. These are Parthenium Weed (*Parthenium hysterophorus*), Fireweed (*Senecio madagascariensis*), Madeira Vine (*Anredera cordifolia*), Common Pest Pear and Velvety Tree Pear. The Weeds of National Significance listed Tiger Pear (*Opuntia aurantiaca*) was also detected during the field surveys at one location in the FDA. The locations where these weeds were recorded is presented in *Att E, Part1, Figure 4-5, p49*.

A broader and more detailed description of the vegetation within the FDA is provided in Att E, Part1, Section 4, p29-91.

Geologically, the Project Area forms part of the Surat Basin, with substrates following a conformal north to south series of late-Jurassic to early-Cretaceous sedimentary strata, overlain by Quaternary alluvial deposits on floodplains and by fine-grained Tertiary mudrock in the extreme southwest. A minor southwest trending fault is associated with the course of Woleebee Creek south of the junction with Conloi Creek. The northern half of the Project Area lies on fine-grained sediments of the Springbok Sandstone and Westbourne Formation. The transition between to medium to coarse-grained Gubberamunda Sandstone with fine to medium-grained bedrock of the Orallo formation forming the rolling hills occurs further south. Surface rock is generally absent from the north, excepting small patches of gravel that is not derived from the underlying substrate. By contrast, surface rocks and bedrock outcropping around hillcrests and slopes are increasingly common south of Giligulgul Road. Soils across the north vary from grey or brown sandy loams along streamlines, dark brown clay on floodplains and brown clay-loams on the surrounding undulating downs. Patches of duplex soils with a deep surface layer of pale-brown sand occur on Gubberamunda Sandstone in the central part of the Project Area. Soils are characterised as low to moderate erosion vulnerability, with moderately stable surface soils and moderately dispersive subsoils. *Att A, Figure 5* shows the soil types.

3.3 Heritage

3.3.1 Describe any Commonwealth heritage places overseas or other places recognised as having heritage values that apply to the project area.

There are no registered heritage places within the Project Area based on a review of the following registers and lists:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- Register of the National Estate (Non-statutory archive)
- State Heritage Register
- Queensland Heritage Register
- Western Downs Regional Council Cultural Heritage overlay local heritage places.

There is limited potential for historical archaeological deposits to exist across the Project Area given historic land use. In general, this early pastoral history can be archaeologically represented by:

- building remains (fireplaces, posts, post holes, etc)
- rubbish dumps (discarded bottles, crockery, metal and bone)
- yards and fencing (posts and/or post holes)
- water infrastructure (bores, windmills, tanks, dams, wool scours and irrigation channels, etc.).

3.3.2 Describe any Indigenous heritage values that apply to the project area.

The traditional owners of the land where the Project Area is located are the Iman People. The Project Area is overlapped by the Iman People #2 Native Title determination area and Iman #4 registered claim area. The Registered Native Title Body Corporate (RNTBC) for the Iman People #2 is the Wardingarri Aboriginal Corporation RNTBC. *Att A Figures, Figure 8* shows the cultural heritage areas in relation the Project Area.

Senex has entered into a Cultural Heritage Management Agreement (CHMA) with both the Wardingarri Aboriginal Corporation RNTBC and the Iman #4. This CHMA has not been made publicly available due to cultural sensitivity reasons. The Iman People have since undertaken a number of Cultural Heritage clearances for Senex under this CHMA.

Senex held its annual meeting in December 2021 in accordance with the CHMA. An update was provided that Senex had acquired PL209 and PL445 from APLNG and confirmed that these tenements would be covered by Senex's existing CHMA for Project Atlas.

A search of the DATSIP Public Map has shown some registered Cultural Heritage Sites within the Project Area. These sites are taken into consideration and avoided when planning disturbance activities in these areas. When undertaking cultural heritage surveys, Senex also records any unregistered sites that are found and these sites are recorded in a mapping database and avoided during project activities.

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

The Project Area is located within the Upper Dawson River sub-basin, which is part of the Fitzroy River Basin. Key watercourses within the vicinity of the Project Area include Woleebee Creek, which flows north from its headwaters flanking the southwestern boundary of Petroleum Lease (PL) 209, and north along the boundaries of PL445 and Authority to Prospect (ATP) 2059, to join Juandah Creek to the northeast; Wandoan Creek, a headwater tributary of Woleebee Creek, present within ATP2059 to the west of PL445; Conloi Creek, a tributary to Woleebee Creek, which flows west across the central portion of PL209; and Hellhole Creek, a tributary to Woleebee Creek which flows north-west into Woleebee Creek across the southern portion of PL209. The Project Area is located almost entirely within the sub-catchment of Woleebee Creek.

The regional and local hydrology is described in detail in *Att F EPBC Water Resource Impact Assessment, Part1, Section 6, pp44-64*. Watercourses within the Project Area are classified as Stream Orders 1 to 5 using the Strahler method, with the majority being Stream Order 1 (minor streams) (*Att F, Part 1, Section 6.2.1, p44-46*). Reaches of Stream Order 5 (major streams) are associated with Woleebee Creek within PL445 and PL209. The watercourses across the Project Area are characteristically ephemeral and typically only flow during significant runoff events. This is likely a result of the Project Area being located in the upper most reaches of the catchments with limited runoff area. Catchments within the Upper Dawson River sub-basin are influenced by anthropogenic activities including land use, riparian management, water infrastructure and point source releases.

The regional hydrostratigraphy is described in detail in *Att F, Part2, Section 7.2, pp65-70*. The Surat Basin forms part of the Great Artesian Basin (GAB), which comprises several aquifers and confining aquitards. Aquifers of the Surat Basin are a significant source for water used for stock, public water, and domestic supply. Office of Groundwater Impact Assessment (OGIA) presents the hydrostratigraphy of the Surat and Bowen Basin as shown in *Att F, Part2, Figure 7.2, p67*.

The main aquifers within the GAB, from the deepest to the shallowest, are the Precipice Sandstone, Hutton Sandstone, Springbok Sandstone, Gubberamunda Sandstone and Mooga Sandstone. These aquifers are typically laterally continuous on a regional scale, have significant water in storage largely under confined conditions, and are extensively developed for water supply. The major aquitards in the Surat Basin are the Evergreen Formation, Durabilla Formation and Westbourne Formation.

The Project Area is situated where the Springbok Sandstone, Westbourne Formation, and Gubberamunda Sandstone outcrop. The Walloon Coal Measures (WCM) outcrop is mapped ~14 km north and northeast of the Project Area. Within these outcrop areas, particularly within the aquifer units, diffuse aquifer recharge is likely to occur, a process by which rainfall infiltrates directly through outcropping aquifers (*Att F, Part 2, Section 7.6, p82*). Recharge rates are estimated to range between 1.1 and 26.5mm/yr depending on exposed hydrostratigraphic unit at the surface (*UWIR for the Surat CMA (OGIA 2019)*).

The local hydrogeology is described in detail in the *Att F, Part2, Section 7.3, pp71-78*. North-south and west-east oriented cross sections are presented in *Att F, Part2, Figure 7.4, p72*, with the section locations provided in *Att F, Part2, Figure 7.1, p66*. These sections show the hydrostratigraphic units dipping from the outcrop towards the south. Generally, all units are laterally extensive and continuous across the Project Area.

Quaternary-age alluvium has been mapped within the Project Area and is associated with Wandoan, Woleebee and Conloi creeks, as shown in *Att F, Part2, Figure 7.1, p66*. The alluvium is mapped as laterally thin across the Project Area, with increased lateral extent towards the north as Wandoan and Ogle Creeks flow into Woleebee Creek.

Potential surface expression Groundwater Dependent Ecosystems (GDEs) and subsurface GDEs are mapped as potentially being present in the vicinity of the Project (*Att F, Part2, Figure 7.34, p104* and *Figure 7.36, p106*). These generally correspond with the location of the mapped alluvium associated with Woleebee Creek within the Project Area and Horse Creek and Juandah Creek further afield. There are no spring vents or complexes within 25km of the Project Area.

Detailed discussion of the potential aquatic GDEs is presented in *Att F, Part2, Section 7.10.1, pp102-106*. OGIA has identified three potential watercourse springs present within, or directly adjacent to, the Project Area associated with Woleebee Creek. These are shown on *Att F, Part2, Figure 7.34, p104* and are considered to source groundwater from the alluvium (W279), alluvium/Gubberamunda Sandstone (W280) and alluvium /Orallo Formation (W281).

Woleebee Creek was identified by OGIA as being a potentially gaining stream (*Identification of Gaining Streams in the Surat CMA; Hydrogeological Investigation Report (OGIA 2017)*). Field verification undertaken along Woleebee and Wandoan Creeks in 2018 (*Att F, Part4, Appendix IX, pp9-21*) identified that these creeks are likely to be losing streams and as such there is unlikely to be significant baseflow provided to these creeks. The field verification concluded that, based on the difference between the alluvial groundwater and surface water major ion chemistry signatures, and groundwater chemistry signatures from the Surat Basin units, groundwater within the alluvium is not considered to be sourced by the underlying Surat Basin units. It is likely that during wet periods, groundwater levels in the alluvium will rise up into the sandy base of the creek. Ongoing baseflow contributions from the alluvium and Surat Basin units to the watercourses are considered highly unlikely.

The watercourses within the Project Area, including Wandoan and Woleebee Creeks, are characteristically ephemeral and typically flow only during significant rainfall events. Pooled water may remain after significant rainfall events, which provides a habitat for a limited number of aquatic species. Shallow pools were identified in the watercourses but were generally turbid with water quality results indicating that these pools are fresh and surface water sourced. The identified aquatic ecosystems are generally of low to fair habitat and had presence (but low diversity) of non-conservation significant native aquatic fauna and flora.

Detailed discussion of the potential terrestrial GDEs is presented in the *Att F, Part2, Section 7.10.2, pp107-115*. Terrestrial GDEs have been identified and are generally associated with Wandoan and Woleebee Creek systems (*Att F, Part2, Figure 7.36, p106*). The ecology survey identified flora and fauna that do not depend on the permanent presence of water (*Att F, Part4, Appendix VIII, pp13-17*). The ephemeral nature of these creek systems, which follow the episodic cycle of wetting and drying, with dry periods followed by wet periods in which the creek system flows, correlate with the highly resilient nature of the vegetation communities present.

Regional Ecosystem (RE) 11.3.25 (Forest Red Gum *Eucalyptus tereticornis* or River Red Gum *Eucalyptus camaldulensis* woodland fringing drainage lines) is the most widely abundant vegetation community identified that has the potential to be a GDE, however interconnected patches of other REs are also present. Historic land clearing is known to have occurred throughout the Project Area that has impacted the condition of terrestrial GDEs, particularly along creek lines and water courses. Grazing pressure is also likely to influence the ecological condition of RE patches and their value for maintaining biodiversity levels.

In the preparation for the assessment of impact on water resources the following field programs, modelling and risk assessments were undertaken:

- Ecological Survey and GDE Mapping that is reported in Terrestrial and aquatic ecology field surveys by ERM Att F, Part4, Appendix VIII
- Bore Baseline Assessment for Atlas Stage 3 (2022) Att F, Part1, Section 4.1.2.2, p33
- Field Verification Mapping 2018 Att F, Part4, Appendix IX
- Subterranean Fauna Sampling by Freshwater Ecology 2022, Att F, Part4, Appendix VII
- Aquatic Ecology Survey by Freshwater Ecology 2022 Att E, Ecology Assessment Report, Part2, Appendix D
- Groundwater Modelling (OGIA) using Atlas Stage 3 development information Att F, Part2, Section 8, pp125-138
- Chemical Risk Assessment, Att F, Part3, Appendix I.

Links used in this response are also provided in Att M Reference Links.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision		Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	Yes	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	Yes	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth heritage places overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

https://epbcbusinessportal.awe.gov.au/dashboard/print-application/?id=a77cdf53-8c60-ed11-a81b-002248157bba

4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No World Heritage properties occur within the Project Area. The closest is the Great Barrier Reef on the coast, approximately 295km from the Project Area. The proposed action will not have a significant impact on the Great Barrier Reef after implementing the management and mitigation measures outlined and considering the location of the project in the Upper Dawson River sub-basin of the Fitzroy River catchment and, therefore, is not a controlled action.

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No National Heritage Places occur within the Project Area The closest is the Great Barrier Reef, approximately 295km from the Project Area. The proposed action will not have a significant impact on the Great Barrier Reef after implementing the management and mitigation measures outlined and considering the location of the project in the Upper Dawson River sub-basin of the Fitzroy River catchment and, therefore, is not a controlled action.

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The distance from the Project Area to Great Sandy Strait (including Great Sandy Strait, Tin Can Bay and Tin Can Inlet), being the closest identified wetland is 320km. The wetland is in another surface water catchment from the Project Area and the proposed action will not impact it, nor any other Ramsar Wetlands. Therefore, the proposed action is not a controlled action.

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species
No	No	Acacia curranii
No	No	Adclarkia cameroni
Yes	Yes	Adclarkia dulacca
No	No	Arthraxon hispidus
Yes	Yes	Cadellia pentastylis
No	No	Calidris ferruginea
Yes	Yes	Calyptorhynchus lathami
No	No	Calytrix gurulmundensis
No	No	Chalinolobus dwyeri
No	No	Dasyurus hallucatus
No	No	Delma torquata
No	No	Dichanthium setosum
No	No	Egernia rugosa
No	No	Elseya albagula
No	No	Erythrotriorchis radiatus
No	No	Falco hypoleucos
No	No	Furina dunmalli
No	No	Geophaps scripta scripta
No	No	Grantiella picta
No	No	Hemiaspis damelii
No	Yes	Hirundapus caudacutus

Direct impact	Indirect impact	Species
No	No	Homopholis belsonii
No	No	Lepidium monoplocoides
No	No	Macroderma gigas
No	No	Nyctophilus corbeni
Yes	Yes	Petauroides volans
No	No	Petaurus australis australis
Yes	Yes	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)
No	No	Rheodytes leukops
No	No	Rostratula australis
No	No	Thesium australe
No	No	Vincetoxicum forsteri
No	No	Xerothamnella herbacea

Ecological communities

Direct impact	Indirect impact	Ecological community
No	Yes	Brigalow (Acacia harpophylla dominant and co-dominant)
No	No	Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions
No	Yes	Poplar Box Grassy Woodland on Alluvial Plains
No	No	Weeping Myall Woodlands

4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.4.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

As approximately 90.6% of the Field Development Area (FDA) has been historically cleared of its original native forest, the proposed action is able to avoid almost all direct impacts to *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed ecological communities and species. However, as detailed in *Att E Ecology Assessment Report, Part1, Section 5, pp97-100* the proposed action may require unavoidable direct impacts in the form of clearing very limited areas of naturally vegetated habitat for five EPBC Act threatened fauna species which are known or likely to occur in the FDA. This clearing may be unavoidable where other environmental, landholder, infrastructure and constructability constraints mean it is not practicable for the Project's linear infrastructure to totally avoid these habitat areas.

As is standard practice for CSG developments, and in accordance with responsible landholder engagement, the precise locations for the proposed action's infrastructure will be determined iteratively during the progressive development of the gas field. However, with the exclusion of locations where site ecology surveys verify that habitat is in fact not present, Senex commits to the following maximum disturbance limits across the FDA and life of the Project:

- Zero direct impact upon the Brigalow (*Acacia harpophylla*) Threatened Ecological Community (TEC) which occupies 1% of the FDA as mapped in *Att E, Part1, Figure 4-2, p43* (there is potential for indirect impacts which are discussed below)
- Zero direct impact upon the Poplar Box (*Eucalyptus populnea*) Grassy Woodland TEC which occupies 0.4% of the FDA as mapped in *Att E, Part1, Figure 4-2, p43* (there is potential for indirect impacts which are discussed below)
- Zero disturbance of the mapped Ooline (*Cadellia pentastylis*) habitat which occupies 118.7ha (1.2%) of the FDA as shown in *Att E, Part1, Figure 4-3, p45.* However, removal of some individual Ooline plants may be necessary see below
- Zero disturbance of White-throated Needletail (*Hirundapus caudacutus*) habitat (none present in the FDA) as this species is a predominantly aerial species that has not previously been recorded in the area (the nearest record is a 1971 sighting (entered in 2002) from the extensively timbered Cherwondah State Forest 7 km to the east)
- Dulacca Woodland Snail (*Adclarkia dulacca*) potential habitat totalling 305.2 ha within the FDA will be avoided through careful design of the proposed action such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-9, p59*) will not exceed

- 1ha (equating to approximately 0.3% of the potential habitat present in the FDA)
- Glossy Black-cockatoo (*Calyptorhynchus lathami lathami*) habitat totalling 659ha within the FDA will be avoided through careful design of the proposed action such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-8, p57*) will not exceed 1ha (equating to approximately 0.2%)
- Greater Glider (*Petauroides volans / Petauroides armillatus*) habitat totalling 528ha within the FDA will be avoided through careful design of the proposed action such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-7, p55*) will not exceed 1ha (equating to approximately 0.2%)
- Koala (*Phascolarctos cinereus*) foraging and breeding habitat totalling 715.7ha within the FDA will be avoided through careful design of the proposed action such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-6, p53*) will not exceed 1ha (equating to approximately 0.1%)
- Koala dispersal habitat totalling 9098.3ha of previously cleared land within the FDA will be minimised such that any direct disturbance to this dispersal habitat (as shown in *Att E, Part1, Figure 4-6, p53*) will not exceed 530ha (equating to approximately 5.8% of the previously cleared land within the FDA).

Disturbance within the areas currently mapped as potentially suitable habitat for MNES may be undertaken and not accounted against these maximum disturbance limits where detailed site ecology surveys (undertaken in accordance with *Att C Constraints Protocol*) provide finer scale habitat mapping which confirms that there is in fact no habitat actually present within the proposed disturbance location.

It is noted that impacts within Koala dispersal habitat will be minimised using *Att C Constraints Protocol* but will, at times, require the unavoidable disturbance of open areas and removal of individual juvenile and non-juvenile trees and seedlings which are located within a predominantly cleared landscape. It is noted that impacts to dispersal habitat will be largely temporary in terms of the Right of Way will be constructed and then rehabilitated. Application of *Att C Constraints Protocol* means that individual juvenile and non-juvenile trees and seedlings will be avoided unless unavoidable due to other constraints (e.g. environmental features and values, cultural heritage values, geological features, landholder / livestock / agricultural requirements and existing or planned landholder, utility or community infrastructure).

Whilst all 118.7ha of mapped Ooline habitat will be avoided, in some cases this vulnerable species, which grows into a tree up to 35 m in height, is retained (or has regenerated) in otherwise cleared paddocks in the southern third of the FDA. *Att E, Part1, s4.4.2.1, p44* and *Figure 4-3, p45* describe and show the area of potential Ooline occurrence within these cleared areas. *Att C Constraints Protocol* specifically requires that pre-disturbance surveys are completed to ensure that, if any individual Ooline plants are found to be present, they will be avoided wherever possible. It is recognised that in the absence of adequate management and mitigation measures there is also potential for the proposed action to have an indirect impact upon Ooline through:

- · Introduction and/or spread of weed species
- · Degradation of Ooline habitat as a result of dust, erosion or accidental release of hazardous materials
- Habitat fragmentation.

It is recognised that in the absence of adequate management and mitigation measures there is also potential for the proposed action to have an indirect impact upon each of the Brigalow TEC and Poplar Box Grassy Woodland TEC through:

- · Introduction and/or spread of weed species
- · Degradation as a result of dust, erosion or accidental release of hazardous materials.

It is recognised that in the absence of adequate management and mitigation measures there is also potential for the proposed action to have an indirect impact upon Dulacca Woodland Snail, Glossy Black-cockatoo, Greater Glider and Koala through:

- Introduction and/or spread of weed species
- · Disturbance or displacement from foraging or roosting habitat, or breeding places
- · Degradation of threatened species habitats as a result of dust, erosion or accidental release of hazardous materials
- · Habitat fragmentation
- Inhibiting their ability to adapt and survive predicted climate change effects (for example through impeding migration pathways or inhibiting access to refuge areas)
- · Fauna injury during construction activities and movement of machinery/vehicles.

Although unlikely, it is conservatively considered that in the absence of adequate management and mitigation measures there is some limited potential for the proposed action to have an indirect impact upon White-throated Needletail through noise or visual disturbance or injury during construction activities including vegetation clearing and movement of machinery/vehicles.

A detailed description of the mechanisms by which indirect impacts could occur and risks they pose to MNES, in the absence of adequate management and mitigation measures, is provided in *Att E, Part1, Section 5, pp92-96*.

As detailed in *Att G Significant Impact Assessment Report, Section 6, pp58-84* a significant impact assessment has been completed against the Significant Impact Guidelines 1.1(SIG 1.1) – Matters of National Environmental Significance (MNES) (*SIG1.1– MNES (C'wealth 2013)*) which found that, with the implementation of the proposed management and mitigation measures, the action is unlikely to result in any significant direct or indirect impacts to any threatened ecological communities or species.

It is also recognised that the proposed action will enable to development of ~200PJ of additional resource of natural gas to be produced for domestic and international markets, which represents a very minor contribution to global greenhouse gas emissions and to climate change.

Links used in this response are also provided in Att M Reference Links.

4.1.4.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

4.1.4.6 Describe why you do not consider this to be a Significant Impact. *

Approximately 90.6% of the Field Development Area (FDA) has been cleared of its original native forest and the landscape is well suited to accommodate the proposed action which will avoid almost all direct impacts to ecological values including all known and likely *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed ecological communities and species. As detailed in *Att G Significant Impact Assessment Report, Section 6, pp58-84* a significant impact assessment has been completed against the Significant Impact Guidelines 1.1(SIG 1.1) – Matters of National Environmental Significance (MNES) (*SIG1.1–MNES (C'wealth 2013)*). The assessment found that, with the implementation of the proposed management and mitigation measures, the action is unlikely to result in any significant direct or indirect impacts to any threatened ecological communities or species.

The ecological assessment principally relied upon information gathered from:

- BOOBOOK Ecological Consulting Terrestrial Ecology Report (refer to Att E Ecology Assessment Report, Part2, Appendix C); and
- Freshwater Ecology Aquatic Ecology Report (refer to Att E, Part2, Appendix D).

In adherence with the requirements of the EPBC Act a desktop review of available information was undertaken to identify species that may be impacted by the proposed action. BOOBOOK Ecological Consulting then undertook terrestrial field ecological surveys in 4 events from March – June 2022. Aquatic field ecological surveys were undertaken by Freshwater Ecology over an 8 day period (14 – 21 March 2022). The assessment methodologies applied are further described in *Att E, Part1, Section 3, pp15-28*. Detailed field surveys were completed mainly in the wet/post-wet season, due much higher than average rainfall throughout 2022. Although at times access to areas was restricted by wet ground conditions, surveys were undertaken within representative examples of all vegetation and habitat types present. Sampling sites were also well distributed across the FDA (*Att E, Part1, Figure 3-1, p18*). The spread of sites was suitable for supporting the consideration and assessment of the potential for direct and indirect impacts.

The absence of a species from a database list or observational studies was not interpreted as meaning absence from the FDA and the 'likelihood of occurrence' assessment adopted a precautionary approach to identifying species that have potential to occur (considering habitat features), in order to assess the potential for impacts accordingly.

The conditions during the survey periods were considered suitable for detection and identification of the relevant threatened flora and fauna species. Targeted fauna searches were limited due to the increased rainfall and to address this, the predictive mapping of threatened flora and fauna occurrence applied conservative estimates of occurrence that assumed species presence within areas of potentially suitable habitat (*Att E, Part2, Appendix C, p12*).

As the site is largely cleared, the principal extant ecological values today are associated with the retained corridors of vegetation along several watercourses which traverse the FDA (including Woleebee Creek, Wandoan Creek, Conloi Creek and Hellhole Creek). These creeks are all ephemeral and do not hold permanent water but the vegetated corridors and periodically inundated watercourses are used by native terrestrial and aquatic fauna to survive in, and traverse, the landscape. The retained vegetated rocky scarp and plateau in the far southeast corner of the FDA provides suitable habitat for the vulnerable Ooline which was recorded there as well as potential habitat for several threatened fauna species. Other smaller mostly isolated patches of retained vegetation within the otherwise cleared landscape also have higher ecological value as potential fauna refuges (e.g. possibly for Dulucca Woodland Snail) and 'stepping-stones' for common and threatened fauna (e.g. Koala and Glossy Black-cockatoo). These vegetated areas represent the high environmental value areas within the FDA and are illustrated in *Att A Figures, Figure 9*.

The proposed action will avoid direct impacts to all TEC and Ooline habitat areas shown as 'No Go' Areas in *Att A, Figure 9* and preferentially minimise impacts within all areas of naturally vegetated MNES Fauna Habitat (as shown in *Att A, Figure 9*). The rocky scarp and plateau in the south-eastern corner of the FDA and all vegetated riparian corridors and individual isolated remnants will be retained and protected. It is only where other environmental, landholder, infrastructure and constructability constraints apply that the proposed action's linear infrastructure may not be able to totally avoid traversing a small proportion of a small number of these remnant areas. However, even this impact will be very limited with a maximum direct disturbance limit of 1 ha (equating to 0.14%) of all high environmental value areas shown in *Att A, Figure 9* across the entire FDA and life of the Project. This clearing has been carefully assessed against the *SIG1.1–MNES (C'wealth 2013)*, as detailed in *Att G, Section 6, pp58-84* which found that the clearing is unlikely to result in a significant impact to any threatened ecological community (TEC) or species.

Project construction will also require progressive disturbance of up to 530ha of previously cleared land which includes scattered trees and regrowth in some areas. It is recognised that all parts of the FDA may potentially be used by the endangered Koala to move through the landscape and the proposed disturbance of these areas may in some cases temporarily (during construction) impede this use of these areas. Once installed, however, the infrastructure will not notably impede Koala movement (gas and water gathering lines are buried and access tracks are unformed and lightly used at limited speeds). The significant impact assessment therefore found that this disturbance is unlikely to result in a significant impact to Koala (or any TEC or species).

The proposed action also has the potential to have indirect impacts through introduction and/or spread of weed species; disturbance or displacement to fauna from foraging or roosting habitat, or breeding places; degradation of habitats or threatened ecological communities as a result of dust, erosion or accidental release of hazardous materials; habitat fragmentation; inhibiting the ability of ecological communities or species to adapt and survive predicted climate change effects; and fauna injury during construction activities and movement of machinery/vehicles. However with the implementation of standard CSG environmental management and mitigation measures, the risk of indirect impacts will be effectively managed and a significant impact to any threatened community or species is unlikely.

With the implementation of these measures and the maximum disturbance limits identified on 4.1.4.2 and restated below, the proposed action is unlikely to have a significant impact upon any EPBC Act listed TEC or species as it involves:

- Zero direct disturbance of the:
 - Brigalow TEC which occupies 1% of the FDA as mapped in *Att A, Figure 9*, and therefore no significant impact will occur to this TEC
 - Poplar Box TEC which occupies 0.4% of the FDA as mapped in Att A, Figure 9, and therefore no significant impact will occur to this TEC
 - Mapped Ooline habitat which occupies 118.7ha (1.2%) of the FDA as shown in *Att A, Figure 9*. (In some cases Ooline trees and stands are retained (or have regenerated) in otherwise cleared paddocks in the southern third of the FDA. *Att C Constraints Protocol* specifically requires that pre-disturbance surveys are completed to ensure that, if present, any individual Ooline plants in these areas are avoided wherever possible)
 - White-throated Needletail habitat (none present in the FDA), as this species is a predominantly aerial species (the nearest record of which is a 1971 sighting (entered in 2002) from the extensively timbered Cherwondah State Forest 7km to the east) and, therefore, no significant impact will occur to this species.
- Dulacca Woodland Snail potential habitat totalling 305.2ha within the FDA will be avoided through careful design such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-9, p58*) will not exceed 1ha (equating to ~0.3%) and, therefore, no significant impact to this species is likely. Further mitigation measures, including the implementation of the *Att C Constraints Protocol*, specifically requires targeted searches for this snail in suitable areas.
- Glossy Black-cockatoo habitat totalling 659ha within the FDA will be avoided through careful design such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-8, p57*) will not exceed 1ha (~0.2%) and, therefore, no significant impact to this species is likely.
- Greater Glider habitat totalling 528ha within the FDA will be avoided through careful design such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-7, p55*) will not exceed 1 ha (~0.2%) and, therefore, no significant impact to this species is likely.
- Koala foraging and breeding habitat totalling 715.7ha within the FDA will be avoided through careful design such that any clearing of habitat for the species (as shown in *Att E, Part1, Figure 4-6, p53*) will not exceed 1 ha (~0.1%) and disturbance within Koala dispersal habitat will be minimised such that any direct disturbance will not exceed 530ha (~5.8%). The nature, scale and temporary duration of this disturbance will not significantly affect the ability of Koala to utilise, traverse and move across the landscape and, therefore, no significant impact to this species is likely.

The full assessment against SIG1.1– MNES (C'wealth 2013) criteria is provided in Att G, Section 6, pp58-84 and found that the proposed action is unlikely to have a significant impact on any threatened ecological communities or species.

4.1.4.7 Do you think your proposed action is a controlled action? *

No

4.1.4.9 Please elaborate why you do not think your proposed action is a controlled action. *

As detailed in *Att G Significant Impact Assessment Report, Section 6, pp58-84*, a significant impact assessment has been completed for the proposed action against the Significant Impact Guidelines 1.1(SIG 1.1) – Matters of National Environmental Significance (MNES) (*SIG1.1– MNES (C'wealth 2013)*). The impact assessment found that, with the implementation of the proposed controls and mitigation measures, the proposed action is unlikely to result in any significant direct or indirect impacts to any threatened ecological communities or species.

Individual well sites are relatively small in area and dispersed (500-750m spacing). Therefore, well site placement and spacing has flexibility and allows for the avoidance of clearing vegetated corridors so all direct and indirect impacts are of a relatively minor nature and affect a relatively limited area. Crossings of vegetated watercourses will be minimised and use of horizontal directional drilling for crossing Woleebee Creek within PL1037 (and elsewhere as required) will further minimise habitat disturbance and reduce marginal clearing that would be required for a more indirect route. Approximately 90.6% of the Field Development Area (FDA) has been cleared and most was cleared by the 1960's. Therefore, direct impacts to Threatened Ecological Communities (TEC) and habitat of threatened flora are avoided.

However, it is recognised that there may be limited circumstances where other environmental, landholder, infrastructure and constructability constraints mean it is not practicable for the Project's linear infrastructure to totally avoid limited parts of these habitat areas. In total across the entire FDA and life of the Project a maximum of 1 ha of the High Environmental Value Areas (as shown in *Att A Figures, Figure 9*) will be cleared. This unavoidable clearing represents 0.1-0.3% of the potentially suitable habitat for each individual species in the FDA and does not affect the extant ecological functions and processes or the capacity of the landscape to meet the requirements of any threatened species. This unavoidable clearing will not be consolidated in a single location but as scattered (widely dispersed) relatively small transects and edge trimming to larger (unavoidable) habitat patches. The measures specified in *Att C Constraints Protocol* and *Att B Environmental Management Plan* ensures ecological impacts associated with the unavoidable clearing are minimised.

The two likely migratory species are predominantly aerial species that will not be significantly impacted by the proposed action.

The progressive disturbance of up to a total maximum of 530ha of Koala dispersal habitat (within existing cleared areas) during the construction of the Project will not significantly inhibit the ability of Koala to disperse across the landscape. Well construction areas not required for operations, are available for rehabilitation within 12 months. The rehabilitation of these disturbances will progressively reduce

the total disturbance by approximately 306ha over the life of the Project. All areas (except infrastructure items required to be retained for the landholder, such as access roads) will be rehabilitated once the wells are decommissioned.

The life of the Project is approximately 52 years. As wells are decommissioned (the life of individual wells is expected to be between 20-35 years) the entire disturbance footprint will be rehabilitated to the existing adjoining land use (excluding landholder retained infrastructure). As such the impacts to ecology MNES are of a temporary duration.

Indirect impacts including introduction and/or spread of weed species; disturbance or displacement to fauna species from foraging or roosting habitat, or breeding places; degradation of threatened species habitats or threatened ecological communities as a result of dust, erosion or accidental release of hazardous materials; habitat fragmentation; inhibiting the ability of ecological communities or species to adapt and survive predicted climate change effects (for example through impeding migration pathways or inhibiting access to refuge areas); and fauna injury during construction activities and movement of machinery/vehicles will be able to be managed through Senex's mature environmental management systems and processes as detailed in the following referral question.

The Australian Government's recovery plans for threatened ecological communities, threatened fauna, threatened flora (other than conservation dependent species) set out the management and research actions required to help stop the decline of, and support the recovery of listed TECs and species. The *National Recovery Plan for the Koala Phascolarctos cinereus (C'wealth 2022)* is relevant to the proposed action. This Recovery Plan was considered as part of the significant impact assessment and identification of threat management and mitigation measures for the proposed action. The proposed action was found to be unlikely to cause significant impacts to Koala and is not inconsistent with this recovery plan. A number of Conservation Advices have also been developed for the known, likely and potentially present species and these Advices have also been considered as detailed in the *Att G, Section 6, pp58-84*. Again, the proposed action was found to be unlikely to cause significant impacts to any listed threatened communities or species or listed migratory species and is not inconsistent with these Conservation Advices.

These findings and the ability of the proposed action to be developed with minimal impact upon the site's ecological communities, species and systems confirm that the proposed action will not be inconsistent with Australia's obligation under the Biodiversity Convention and the Convention on Conservation of Nature in the South Pacific (Apia Convention).

The Australian Government's threat abatement plans establish a national framework to guide and coordinate Australia's response to key threatening processes registered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The plans identify management, research and other actions required to support the long-term survival of native ecological communities and species affected by key threatening processes. The proposed action has been reviewed against the 13 currently approved threat abatement plans and is not inconsistent with any of the management or other actions identified.

The proposed action does not involve international or any other trade in wildlife and Senex supports the complete suite of domestic measures Australia has adopted for improved conservation and tighter restrictions on trade of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listed species.

Based on the described nature, scale and duration of the impacts and the determination that none of the direct or indirect impacts are likely to be significant for any EPBC Act threatened ecological communities or species, the proposed action is not a controlled action.

Links used in this response are also provided in Att M Reference Links.

4.1.4.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Senex will implement *Att C Constraints Protocol*. This Protocol guides infrastructure siting when selecting preferred locations, aligning with planning principles to avoid, minimise, mitigate and then manage potential environmental impacts. Unlike other industries, CSG development, affords the flexibility to move the location of individual wells to avoid values as they are identified. Each well can be relocated 50m+ in any direction and groups of wells can be adjusted providing even more flexibility to avoid all significant impacts. Gathering lines can also be oriented to be within disturbed corridors and fence lines and to minimise creek crossings and disturbance of remnant and habitat patches.

The action avoids Threatened Ecological Communities (TEC) and aims to avoid other mature vegetation (which represents habitat for the known and likely threatened species), important Dulacca Woodland Snail populations (if found) and Ooline. Prior to undertaking disturbances, ecological surveys are undertaken by a suitably qualified person to confirm on-ground biodiversity values.

With the exclusion of locations where site ecology surveys verify that habitat is in fact not present, Senex commits to the following maximum disturbance limits across the FDA and life of the Project:

- Zero disturbance of the Brigalow TEC which occupies 1% of the FDA as mapped in *Att E Ecology Assessment Report, Part1, Figure 4-2, p43*
- Zero disturbance of the Poplar Box TEC which occupies 0.4% of the FDA as mapped in Att E, Part1, Figure 4-2, p43
- Zero disturbance of the mapped Ooline habitat which occupies 1.2% of the FDA as shown in *Att E, Part1, Figure 4-3, p45*. However, removal of some individual Ooline plants may be necessary.
- Zero disturbance of White-throated Needletail habitat (none present in the FDA), a predominantly aerial species not previously been recorded in the area (nearest record is 1971 sighting (entered 2002) from the Cherwondah State Forest 7km to the east)
- Dulacca Woodland Snail potential habitat totalling 305.2ha within the FDA will be avoided such that any clearing of habitat (as shown in_*Att E, Part1, Figure 4-9, p59*) will not exceed 1ha (0.3% of that present)
- Glossy Black-cockatoo habitat totalling 659ha within the FDA will be avoided such that any clearing of habitat (as shown in of Att E, Part1, Figure 4-8, p57) will not exceed 1ha (0.2%)

- Greater Glider habitat totalling 528ha within the FDA will be avoided such that any clearing of habitat (as shown in of *Att E, Part1, Figure 4-7, p55*) will not exceed 1ha (0.2%)
- Koala foraging and breeding habitat totalling 715.7ha within the FDA will be avoided such that any clearing of habitat (as shown *Att E, Part1, Figure 4-6, p53*) will not exceed 1ha (0.1%)
- Koala dispersal habitat totalling 9098.3ha of previously cleared land within the FDA will be minimised such that direct disturbance to this dispersal habitat (as shown in *Att E, Part1, Figure 4-6, p53*) will not exceed 530ha (5.8%).

Disturbance within these areas of potentially suitable habitat may be undertaken and not accounted against these maximum disturbance limits where detailed ecology surveys (undertaken in accordance with *Att C Constraints Protocol*) provide finer scale habitat mapping which confirms that there is in fact no habitat present within the proposed disturbance location.

Senex has also developed the following plans and procedures that will be complied with throughout the action:

- Att H Significant Species Management Plan
- Att B Environmental Management Plan
- Att D Rehabilitation Plan
- Att K CSG Water Management Plan ATP2059
- Att L CSG Water Management Plan PL445_PL209
- Att J Water Monitoring and Management Plan
- Att I Weed Hygiene Procedure
- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, pp97-100.

The specific mitigation measures, relevant to each of the potential impacts, are further described below:

Clearing of native vegetation and habitat, leading to disturbance or displacement to fauna species from foraging or roosting habitat, or breeding places.

- Att C Constraints Protocol for constraints planning and field development will be implemented
- Vegetation will not be cleared unless authorised under a Senex Access to Work (ATW) permit. The ATW permit will be approved prior to any disturbance occurring
- · All infrastructure will be located preferentially in pre-disturbed areas of land
- Where the gathering infrastructure crosses Woleebee Creek within PL1037, the pipeline will be constructed using horizontal directional drilling (HDD) method to avoid the requirement to clear vegetation and habitats in these areas
- Additional species-specific targeted field-based surveys will be undertaken by suitably experienced ecologists where required within
 areas identified as potentially suitable habitat
- Targeted surveys will be undertaken for Ooline, which is known to be present (sometimes as retained individual trees and stands in otherwise cleared areas) and other, potentially present threatened flora species particularly Belson's Panic (*Homopholis belsonii*) and Slender Tylophora (*Vincetoxicum forsteri*) so that, if they are found to occur, disturbance can be avoided wherever practicable
- · Habitat assessment will be undertaken for threatened fauna where infrastructure is proposed and habitat may be present
- Right of Way (RoW) width will be minimised where practicable
- To prevent unnecessary land and vegetation disturbance, vehicles and equipment will remain within approved work zones
- · 'No-go' areas will be GPS located and clearly marked e.g. with signage, bunting, flagging tape
- · Reinstatement of areas which are not required for ongoing operational purposes.

Degradation of threatened species habitats or threatened ecological communities as a result of dust, erosion or accidental release of hazardous materials

- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, pp97-100
- Staff and contractors will be made aware through general site induction and training of the potential to generate dust emissions and mitigation and management measures that should be implemented
- Drilling of wells is of short duration, averaging ~3 days per well
- · Vehicles, plant and machinery will comply with site-specific speed limits
- Dust suppression used where required
- Erosion and sediment control in accordance with *Att B Environmental Management Plan, Section 7.14, pp32-34* and the Contractor's erosion and sediment control procedures (where relevant)
- · Where required, watercourse crossing points will be adequately stabilised to prevent erosion
- · RoW construction period in waterways will be minimised
- Construction activities will generally avoid watercourse but where access tracks will cross waterways, construction will comply with the relevant codes of practice as specified in *Att B, Section 5.7, p17*

Habitat fragmentation

- Att C Constraints Protocol for constraints planning and field development will be implemented to minimise habitat fragmentation, etc
- Well siting and the distance between well placement is flexible and will be located preferentially to avoid, then to minimize isolation, fragmentation, edge effects and dissection of tracts of native vegetation
- · Pipeline infrastructure will maximize co-location and be installed perpendicular to waterway crossings or via HDD
- Buried gathering lines are rehabilitated post-construction, with only 6m wide track remaining
- RoW widths in native vegetation and waterway crossings will be minimised.

Inhibiting the ability of ecological communities and species to adapt and survive predicted climate change affects

- All infrastructure will be located preferentially in pre-disturbed areas of land
- Att C Constraints Protocol for constraints planning and field development will be implemented to minimise habitat fragmentation
 etc
- Where the gathering infrastructure crosses Woleebee Creek within PL1037, the pipeline will be constructed using horizontal directional drilling method to avoid impeding this extant wildlife corridor.
- · RoW widths in native vegetation and waterway crossings will be minimised.

Fauna injury during construction activities and movement of machinery/vehicles

- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, p97-100
- Well construction involves small crew numbers that minimise traffic to and from the site by staying at the construction site while drilling
- Excavations and trenches will be inspected for trapped fauna on a daily basis during construction
- · Measures to prevent fauna entrapment and facilitate escape will be implemented within open trenches
- Where required, a qualified fauna spotter-catcher will conduct a search just prior to clearing for the presence of fauna. Where detected, the most appropriate method to avoid or minimise impacts on that fauna will be implemented.

Introduction and/or spread of weed species

- <u>Att I Weed Hygiene Procedure</u> will be implemented including the stipulated weed washdown and certification requirements for all vehicles and machinery
- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, p97-100
- · Activities will be planned so that movement of vehicles, plant, machinery and equipment between properties is minimised
- Access to landholders' properties is managed through established processes including the Senex ATW permit. Site specific weed
 management requirements will be defined prior to access to any property or work site
- Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements
- Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds. Landowner approval may also be required for imported soils and gravel.

More information on mitigation measures is outlined in the Att E, Part1, Section 6, pp97-100.

4.1.4.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

No offsets are proposed as no significant impacts are likely.

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species
No	No	Actitis hypoleucos
No	Yes	Apus pacificus
No	No	Calidris acuminata
No	No	Calidris ferruginea

Direct impact	Indirect impact	Species
No	No	Calidris melanotos
No	No	Cuculus optatus
No	No	Gallinago hardwickii
No	Yes	Hirundapus caudacutus
No	No	Motacilla flava
No	No	Myiagra cyanoleuca
No	No	Rhipidura rufifrons

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.5.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

As detailed in *Att G Significant Impact Assessment Report, Section 6, pp58-84*, a significant impact assessment has been completed for the proposed action against the Significant Impact Guidelines 1.1 (SIG 1.1) – Matters of National Environmental Significance (MNES) *SIG1.1– MNES (C'wealth 2013)*. The impact assessment found that, with the implementation of the proposed controls and mitigation measures, the proposed action is unlikely to result in any significant direct or indirect impacts to any migratory species.

Only two *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed migratory species, the White-throated Needletail (*Hirundapus caudacutus*) and Fork-tailed Swift (*Apus pacificus*) are considered likely to occur within the Field Development Area (FDA).

The White-throated Needletail (listed as both vulnerable and migratory) is a largely aerial species when on migration through Australia, only occasionally stopping to roost in Eucalypt forests. Therefore, it is considered that the proposed action will not result in a significant impact upon this species. Additionally, the White-throated Needletail was not observed during field surveys and the nearest record is a sighting from 1971 (entered in 2002) from the extensively timbered Cherwondah State Forest 7 km to the east.

The Fork-tailed Swift is almost exclusively aerial and occur mostly over inland plans and sometimes above foothills and coastal areas. Therefore, it is considered that the proposed action will not result in a significant impact upon this species. Additionally, the Fork-tailed Swift was not observed during field surveys, and the nearest record is from State Forest south-east of the FDA in 1965 (entered in 2002) from the extensively timbered Cherwondah State Forest 7 km to the east.

Although there will be no direct impacts to White-throated Needletail or Fork-tailed Swift habitat and indirect impacts are unlikely, the assessment completed for this referral has conservatively assumed that, in the absence of appropriate management and mitigation measures, there is some limited potential for indirect impacts upon these migratory species through disturbance or injury during construction activities and movement of machinery/vehicles. Therefore, migratory species are considered further in the following questions.

4.1.5.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

4.1.5.6 Describe why you do not consider this to be a Significant Impact. *

The White-throated Needletail has been identified as likely to occur within the Field Development Area (FDA). The White-throated Needletail was not observed within the FDA during the field investigations despite targeted bird surveys during summer months coinciding with the migratory season and the nearest record is a 1971 sighting (entered in 2002) from the extensively timbered Cherwondah State Forest 7 km to the east.

This species was conservatively concluded to be an important population in the FDA. However, as the White-throated Needletail is a largely aerial species, and as there is a lack of habitat in the FDA, no significant impact will occur to this species.

Although the Fork-tailed Swift was not observed during field surveys, it has been identified as likely. Potential foraging habitat was assessed to occur over dry open habitats, where it would likely fly aerially over. Additionally, the Fork-tailed Swift was not observed during field surveys, and the nearest record is a 1965 record (entered in 2002) from the extensively timbered Cherwondah State Forest 7 km to the east. Therefore, no significant impact will occur to this species.

Therefore, no habitat is identified in the FDA and no significant impact is likely for either of these migratory species. These were the only two migratory species considered likely to occur in the FDA. The full assessment against Significant Impact Guidelines 1.1 (SIG 1.1) – Matters of National Environmental Significance (MNES) *SIG1.1– MNES (C'wealth 2013)* criteria is included in *Att G Significant Impact Assessment, Section 6, pp58-84* and confirmed that the proposed action is unlikely to have a significant impact on migratory species.

4.1.5.7 Do you think your proposed action is a controlled action? *

No

4.1.5.9 Please elaborate why you do not think your proposed action is a controlled action. *

As detailed in *Att G Significant Impact Assessment, Section 6, pp58-84*, a significant impact assessment has been completed for the proposed action against the Significant Impact Guidelines 1.1 (SIG 1.1) – Matters of National Environmental Significance (MNES) *SIG1.1– MNES (C'wealth 2013)*. The impact assessment found that, with the implementation of the proposed controls and mitigation measures, the proposed action is unlikely to result in any significant direct or indirect impacts to any migratory species.

In particular, it is unlikely that the proposed disturbance will lead to a long-term decrease in the size, reduce the area of occupancy, or fragment an important population. For these reasons, the proposed action is unlikely to lead to a significant impact to the White-throated Needletail or Fork-tailed Swift (and other migratory species are not considered likely to occur). Mitigation measures will also be implemented to ensure migratory species are protected from potential direct and indirect impacts.

As such, the proposed action will not be inconsistent with Australia's obligation under the Biodiversity Convention and the Convention on Conservation of Nature in the South Pacific (Apia Convention).

The proposed action does not involve international or any other trade in wildlife and Senex supports the complete suite of domestic measures Australia has adopted for improved conservation and tighter restrictions on trade of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) listed species.

Based on the nature of the existing landscape in the Field Development Area (90.6% is previously cleared land), the fact the proposed action will disturb very little natural vegetation and the fact that potential indirect impacts are limited and manageable through standard CSG environmental practice, the impact assessment has found that the proposed action is unlikely to result in a significant impact for any *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) migratory species. Therefore, the proposed action is not a controlled action.

4.1.5.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Senex will implement Senex's Queensland Environmental Protocol for Field Development and Constraints Analysis (*Att C Constraints Protocol*) as is implemented for all Senex development in Queensland. This Protocol aims (among other things) to guide infrastructure siting that considers biodiversity values and environmental constraints when selecting preferential locations, aligning with planning principles to avoid, minimise, mitigate and then manage potential environmental impacts.

Senex has also developed the following plans and procedures that will be complied with throughout the construction, operation and decommissioning and rehabilitation stages of the proposed action:

- Att H Significant Species Management Plan
- Att B Environmental Management Plan
- Att D Rehabilitation Plan
- Att K CSG Water Management Plan ATP2059
- Att L CSG Water Management Plan PL445_PL209
- Att J Water Monitoring and Management Plan
- Att I Weed Hygiene Procedure
- Implementation of Senex corporate procedures for field operations as per Att E, Ecology Assessment Report, Part1, Section 6, p97-100.

The specific mitigation measures, relevant to each of the potential impacts, are further described below:

Clearing of native vegetation and habitat for threatened and migratory species and threatened ecological communities, leading to disturbance or displacement to fauna species from foraging or roosting habitat, or breeding places.

- Att C Constraints Protocol for constraints planning and field development will be implemented
- Vegetation will not be cleared unless authorised under a Senex Access to Work (ATW) permit. The ATW permit will be approved prior to any vegetation clearance or disturbance occurring
- · All infrastructure will be located preferentially in pre-disturbed areas of land
- Where the gathering infrastructure crosses Woleebee Creek within PL1037, the pipeline will be constructed using horizontal directional drilling method to avoid the requirement to clear vegetation and habitats in these areas
- · Habitat assessment will be undertaken for threatened fauna where infrastructure is proposed and habitat may be present
- Right of Way (RoW) width will be minimised where practicable
- To prevent unnecessary land and vegetation disturbance, vehicles and equipment will be retained within the approved work zone

https://epbcbusinessportal.awe.gov.au/dashboard/print-application/?id=a77cdf53-8c60-ed11-a81b-002248157bba

- 'No-go' areas will be GPS located and clearly marked e.g. with signage, bunting, flagging tape
- Reinstatement of areas which are not required for ongoing operational purposes.

Degradation of threatened species habitats or threatened ecological communities as a result of dust, erosion or accidental release of hazardous materials (indirect impacts)

- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, p97-100
- Staff and contractors will be made aware through general site induction and training of the potential to generate dust emissions and mitigation and management measures that should be implemented
- Drilling of wells is of short duration, averaging ~3 days per well
- Vehicles, plant and machinery will comply with site-specific speed limits to minimise dust generation
- · Dust suppression may be used where deemed to be appropriate
- Erosion and sediment control to be managed in accordance with Att B Environmental Management Plan, Section 7.14, pp 32-34 and the Contractor's erosion and sediment control procedures
- · Where required, watercourse crossing points will be adequately stabilised to prevent erosion
- · RoW construction period in waterways will be minimised
- Construction activities will generally avoid watercourse but where access tracks will cross waterways, construction will comply with the relevant codes of practice as specified in *Att B, Section 5.7, p17*
- Regular monitoring and, where necessary maintenance of rehabilitated areas in accordance with Senex corporate procedures for field operations as per *Att E, Part1, Section 6, p97-100* and the requirements of the *Environmental Protection Act 1994* (Qld) and the Environmental Authority conditions.

Habitat fragmentation

- Att C Constraints Protocol for constraints planning and field development will be implemented, which includes desktop mapping, planning, ecological surveys and redesign to minimise habitat fragmentation and other direct and indirect impacts
- Infrastructure will be located preferentially to avoid, then to minimize isolation, fragmentation, edge effects and dissection of tracts of native vegetation
- · Pipeline infrastructure will maximize co-location and be installed perpendicular to waterway crossings or via HDD
- · Buried gathering lines are rehabilitated post-construction, with only 6m wide track remaining
- RoW widths in native vegetation and waterway crossings will be minimised.

Inhibiting the ability of ecological communities and species to adapt and survive predicted climate change affects

- All infrastructure will be located preferentially in pre-disturbed areas of land
- Att C Constraints Protocol for constraints planning and field development will be implemented to minimise habitat fragmentation etc
- Where the gathering infrastructure crosses Woleebee Creek within PL1037, the pipeline will be constructed using horizontal directional drilling method to avoid impeding this extant wildlife corridor
- RoW widths in native vegetation and waterway crossings will be minimised.

Fauna injury during construction activities and movement of machinery/vehicles

- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, p97-100
- Well construction involves small crew numbers that minimise traffic to and from the site by staying at the construction site while drilling
- · Excavations and trenches will be inspected for trapped fauna on a daily basis during construction
- · Measures to prevent fauna entrapment and facilitate escape will be implemented within open trenches
- Where identified as required, a qualified fauna spotter-catcher will conduct a search immediately prior to clearing of vegetation for the presence of fauna species. Where fauna are detected, the spotter catcher will assess and implement the most appropriate method to avoid or minimise impacts on that fauna as a result of clearing.

Introduction and/or spread of weed species

- Att I Weed Hygiene Procedure will be implemented including the stipulated weed washdown and certification requirements and procedures for all vehicles and machinery
- Implementation of Senex corporate procedures for field operations as per Att E, Part1, Section 6, p97-100
- Activities will be planned so that movement of vehicles, plant, machinery and equipment avoid moving between properties as
 required
- Access to landholders' properties is managed through established processes including the Senex ATW permit. Site specific weed
 management requirements will be defined prior to access to any property or work site
- Weed management and control methods will depend upon the location, weed species identified, the degree of the infestation, relevant landholder agreement or conduct and compensation agreements provisions, and local, state and national regulatory requirements
- Imported material able to transport weed seed will be assessed to ensure they are free of contamination, disease and invasive weeds. Landowner approval may also be required for imported soils and gravel.

More information on mitigation and management measures are outlined in the Att E, Section 6, p97-100.

4.1.5.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

No offsets are proposed as no significant impacts are likely.

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

Nuclear actions are not proposed as part of the action.

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No Commonwealth Marine Areas occur within the Project Area. The closest is the Great Barrier Reef, approximately 290 km from the Project Area. The proposed action will not have a significant impact on the Great Barrier Reef after implementing the management and mitigation measures outlined and considering the location of the project in the Upper Dawson River sub-basin of the Fitzroy River catchment and is, therefore, not a controlled action.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project Area does not traverse the Great Barrier Reef Marine Park; the project is situated approximately 290 km from the coastline. The proposed action is not likely to have a significant impact on the Great Barrier Reef Marine Park after implementing the management and mitigation measures outlined, and considering the location of the project in the Upper Dawson River sub-basin of the Fitzroy River Catchment and is, therefore, not a controlled action.

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

Yes

4.1.9.2 Briefly describe why your action has a direct and/or indirect impact on this protected matter. *

Potential Impacts to Surface Waters

Ramsar Wetlands

Given there are no Ramsar Wetlands within 25km of the Project Area, the proposed action will have no direct or indirect impact on these protected matters.

Discharge

Surface water diversions are not proposed (*Att F EPBC Water Resource Impact Assessment, Part2, Section 9.1.2, p140*) and no discharge of produced water to surface water is currently planned. Associated water infrastructure will be constructed and monitored in accordance with relevant standards and siting will be planned in accordance with *Att C Constraints Protocol* to avoid impacting watercourses and minimise surface water discharge from disturbed areas. No impact is expected.

Production Activities

The potential for the Project to cause reduced baseflows to watercourses, which could in turn result in degradation of water quality and reduced water availability to potential users downstream has been considered. Watercourses in the Project Area are not baseflow fed but are likely to 'lose' water to the alluvial system during times of prolonged rainfall and creek flow. Therefore, no significant impact to surface water quality or quantity is considered likely. There are also no licensed surface water users identified within the vicinity or immediately downstream of the Project Area.

Non-production Activities

In the absence of appropriate mitigation measures, such as identified in *Att F, Part2, Section 10, pp161-170*, and stipulated in *Att K CSG Water Management Plan ATP2059*, *Att L CSG Water Management Plan PL445_PL209* and *Att J Water Monitoring and Management Plan*, the potential non-production related impacts associated with the general construction and day to day operations of coal seam gas (CSG) surface facilities comprise:

- Localised transport of suspended sediment to waters during construction or site works, resulting in the potential to alter flow regimes and quality
- Localised release of hydrotest water, effluent, or trench water to land. This is not intended for release to the surface water system so has limited potential for any impact to surface water quality
- Alteration of a watercourse character or changes to riparian buffers due to construction works
- · Unplanned releases from water storage facilities with the potential to impact surface water quality
- · Unplanned release of fuels and chemicals that could impact surface water quality.

Potential Impacts to Groundwater

Potential impacts likely to result from production activities include a reduction in groundwater head causing a decline in groundwater level / pressure at water bores and reducing water availability. Thus further consideration has been given to the potential for this to result in impacts to groundwater Environmental Values.

Predictive model scenario simulated by the Office of Groundwater Impact Assessment (OGIA) (*Att F, Part2, Section 8, pp125-138*) for the Project, assessed potential impacts to groundwater bores for two scenarios – Project only impact and cumulative impact (including existing approved CSG and coal mining developments).

Potential long-term impacts to groundwater bores have been assessed against the Queensland *Water Act 2000* (Water Act) bore trigger threshold of 2m for an unconsolidated aquifer (e.g. alluvium) and 5m for a consolidated aquifer (e.g. Surat Basin units) using the outputs and drawdown predictions from the Surat Cumulative Management Area Underground Water Impact Assessment Report (UWIR) numerical model.

For the Project only scenario:

- There are 23 bores in the Walloon Coal Measures which have a predicted drawdown >5m. These bores screen the Upper Juandah Coal Measures (21 bores) and the Taroom Coal Measures. Of the 23 bores, 12 are water supply bores, 10 bores are noted as 'not water supply', and one as 'potential water supply'
- All 23 bores are already cumulatively impacted without the Project, are already being managed by approved make good
 arrangements and not triggered due to this Project.

For the cumulative scenario:

- 248 bores are triggered (>5 m drawdown) of which 243 were already impacted without Atlas Stage 3 and are already being managed by approved make good arrangements. Only 5 bores were triggered due to the addition of the Project. (2 bores screen the Upper Springbok Sandstone and 3 screen the Upper Juandah Coal Measures)
- All 5 triggered bores above are located off-tenure, and of the 5 only 1 is an existing usable water bore (others are noted as abandoned and destroyed, monitoring bores or blocked and unusable).

Any impact to groundwater bores as a result of CSG activities are assessed and managed under the underground water management framework established by Chapter 3 of the Water Act to ensure bore owners are not disadvantaged by such actions. Under the Act, a resource tenure holder is subject to make good obligations ensuring that a bore is properly monitored and, where necessary, that any impairment caused by a resource operation are 'made good'.

A single usable water bore will be affected and this bore will be managed under the existing make good framework which is administered by OGIA, within the Surat Cumulative Management Area (CMA). It is acknowledged that the CMA provides for adaptive management approach to reflect changes in neighbouring proponent's development plans.

Potential Impacts to GDEs and Springs

In relation to **watercourse springs**, these are identified by OGIA in the Project Area along Woleebee Creek (*Att F, Part2, Section 7.10.1, pp102-106*). OGIA identify these watercourse springs as sourcing groundwater from the alluvium, Gubberamunda and Orallo Formations (*Att F, Part2, Table 7.4, p103*). These formations are not predicted to experience drawdown of >0.2 m and therefore the flow regime is unlikely to change because of associated water abstraction. Potential impacts to associated watercourse springs are therefore unlikely.

In relation to **other aquatic and terrestrial GDEs**, there is potential for connection with outcropping geological formations in the Project Area, either directly, or through connections to overlying alluvial deposits. The locations of potential GDEs and springs from the Queensland GDE mapping (*Att F, Part 2, Section 7.10, pp102-117*) and GDEs field-verified by ERM ecologists within the Project Area were plotted against the area where these outcropping units are predicted to experience a potential drawdown of >0.2 m.

The results of the modelling for the Project only scenario indicate that only the Upper Springbok Sandstone outcrop areas are predicted to experience a drawdown >0.2m (spring trigger threshold). Potential terrestrial GDEs are mapped on alluvium along Wandoan and Woleebee Creeks (*Att F, Part2, Figure 7.36, p106*). Some GDE areas are located on the Springbok Sandstone outcrop within the 0.2m Project only drawdown trigger extent.

However, the Springbok is unlikely to be supporting these GDEs. The likely source of water for these potential terrestrial GDEs is the alluvium. Wandoan and Woleebee Creeks are characteristically ephemeral and typically flow only during and immediately following significant rainfall events. The groundwater system in the alluvium is likely replenished by surface water during prolonged wet periods when the ephemeral creek systems are flowing. Baseflow contributions from the alluvium and Surat Basin units to these watercourses are considered unlikely, based on site observations and water quality analyses during site verification in 2018 along these creek systems in PL 1037 (*Att F, Part4, Appendix IX, Section 4, p9-21*). The water quality of the alluvium is fresh but turbid, and distinct from groundwater in the underlying Westbourne Formation or Springbok Sandstone, which is generally more saline. A hydrogeological conceptual model illustrating the evident relationship between the terrestrial GDEs and groundwater has been prepared in *Att F, Part2, Figure 7.40, p124* and it is concluded that the contributing drawdown impacts from the Project to potential terrestrial GDEs are not significant.

The predicted drawdown from the development of the Project (only), at the locations of aquatic GDEs, is predicted to be less than the 0.2 m trigger. The aquatic ecosystems are characterized by a low diversity of non-conservation significant aquatic fauna and flora and are lacking suitable habitat for EPBC Act listed aquatic species. Impacts to EPBC Act listed aquatic species are considered unlikely.

Further detail on the impact to GDEs within the Project Area is presented in the Att F, Part2, Section 9.4, pp146-155.

Other Potential Impacts (Changes to water quality)

https://epbcbusinessportal.awe.gov.au/dashboard/print-application/?id=a77cdf53-8c60-ed11-a81b-002248157bba

Other potential impacts to groundwater that would, in the absence of appropriate mitigation measures, be associated with the Project include:

- Potential to introduce a connection between hydrostratigraphic units, which were previously isolated units, through drilling and construction of CSG production wells, resulting in the potential for alteration of groundwater flow regimes and quality
- Use of drilling fluids which have the potential to impact groundwater quality
- CSG produced water storage facilities have the potential to impact groundwater levels and quality, through seepage or unplanned releases
- Localised incidental CSG activities have the potential to impact shallow groundwater systems, such as fuel spills or improper storage of chemicals
- Beneficial use activities, such as third-party irrigation and stock watering, have the potential to impact shallow groundwater systems should over-irrigating occur, or the relevant beneficial use quality guidelines are not adhered to.

These potential impacts are mitigated, monitored, and managed by adopting appropriate standards and management practices as identified in *Att F, Part2, Section 10, pp161-170*, and stipulated in *Att K CSG Water Management Plan ATP2059,_Att L CSG Water Management Plan PL445_PL209* and *Att J Water Monitoring and Management Plan.*

4.1.9.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

No

4.1.9.6 Describe why you do not consider this to be a Significant Impact. *

Att F EPBC Water Resource Impact Assessment, Part2, Section 11, pp171-177 provides a summary of the potential impacts of the proposed action against the Significant Impact Guidelines 1.3 (SIG 1.3): Coal seam gas and large coal mining developments- impacts on water resources (SIG 1.3: CSG and large coal mining developments - impacts on water resources (C'wealth 2022b)) criteria. As summarised below, Att F, Part2 concluded that the Project will not have a significant impact on water resources.

Changes to hydrological characteristics

Potential Impact to Surface water

Discharge

The Project does not include any abstraction or discharges associated with surface water and watercourses. There are no direct impacts to volume or quality. Surface water is not generally used as a sustainable water source due to the ephemeral nature of the watercourses. Coal Seam Gas (CSG) water (associated water) production for the Project is limited to the coal seams of the Walloons Coal Measures (WCM). Associated water will be transported, treated, and contained within Senex's current water management infrastructure, with additional infrastructure constructed as required. Associated water will be treated/stored in site-specific infrastructure, which will be constructed and monitored in accordance with relevant standards/guidelines. Infrastructure siting will be planned in accordance with *Att C Constraints Protocol*.

The *Att C Constraints Protocol* will be implemented to avoid impacting watercourses. The gas field layout will minimise watercourse crossings, and infrastructure will be located away from watercourses, to minimise surface water discharge from disturbed areas.

Production activities

The Project is located in an area where the Upper Springbok Sandstone, Westbourne Formation and Gubberamunda Sandstone outcrop. These outcrop areas are considered to be the location where diffuse rainfall recharge occurs to GAB formations. There is no drawdown predicted in the outcrop areas of the Gubberamunda Sandstone. There is minor Project only drawdown of <0.2 m on a small area of the Westbourne Formation, and minor drawdown of <1.8 m in the Upper Springbok Sandstone outcrop. Recharge to groundwater from surface water is unlikely to decrease as a result of the Project, as it does not include any abstractions from the creek systems.

Surface water volumes are not anticipated to be impacted as groundwater drawdown in potentially baseflow contributing formations is limited to negligible. No impacts on streamflow quality or quantity are expected due to the depressurisation of the coal seams, therefore impacts to watercourses are not considered significant. The flow regime of Woleebee Creek and its tributaries is not expected to change due to drawdown of groundwater in the underlying geological units. Potential impacts to groundwater/surface water interactions are not anticipated and will not affect waterway/floodplain connectivity.

Given the distance to the coast, changes to coastal processes will not occur as a result of the Project.

Potential Impact to Groundwater Bores

Groundwater within the vicinity of the Project is utilised by a number of third-party users, with stock and domestic use being the dominant purpose. The presence of the Project only (with no surrounding developments) results in the prediction of 23 groundwater bores exceeding the consolidated groundwater trigger of 5m. These bores source groundwater from the WCM and are already predicted to be triggered by adjacent developments (without the Project).

Under the cumulative scenario, the Project is predicted to cause an additional five bores to exceed the consolidated groundwater trigger of 5m; however, only one of these bores is of usable condition. This bore is located off tenure. The Water Act protects water bore owners whose bore is predicted to be impacted and outlines tenure holder obligations under the groundwater management framework. Tenure

holder obligations include undertaking bore assessments, entering into make good agreements, and if a bore is or is likely to become impaired, provide make good measures.

A single usable water bore will be affected and this bore will be managed under the existing make good framework administered by Office of Groundwater Impact Assessment (OGIA), within the Surat Cumulative Management Area (CMA). The CMA provides for an adaptive management approach to reflect changes in neighbouring proponent's development plans.

Potential impacts to GDEs and Springs

Woleebee Creek and its tributaries are ephemeral and not considered to be gaining streams dependent on groundwater contribution. The groundwater modelling outputs provided by OGIA do not predict drawdown in the alluvial system or Surat Basin units which have been identified as a potential source to watercourse springs in Petroleum Lease (PL) 209 (Gubberamunda Sandstone and Orallo Formation). Therefore, surface water baseflow volumes and species dependent on water resources are not predicted to be impacted. No changes to habitat or lifecycle of a native species dependent on a water resource are expected.

These ephemeral creeks are characterized by a low diversity of non-conservation significant aquatic fauna and flora and are lacking suitable habitat for *threatened* aquatic species. Impacts to threatened aquatic species are unlikely.

Water quality analysis and field verification observations indicate that watercourses in the Project Area are not baseflow fed but are likely to 'lose' water to the alluvial system during times of prolonged rainfall and creek flow. Groundwater quality data sourced from the Groundwater Database (GWDB) within the vicinity of the Project indicate there is a distinction between the water chemistry for shallower formations (alluvium, Gubberamunda Sandstone) showing a calcium / magnesium-bicarbonate water type and the other deeper formations (e.g. WCM, Springbok Sandstone), which show a sodium-chloride signature. The surface water system and alluvium are disconnected from these deeper formations where drawdown is predicted. Based on the results of the numerical groundwater modelling outputs provided by OGIA, drawdown is not predicted to occur in formations which are the identified sources of groundwater for the potential watercourse springs along Woleebee Creek.

Native species habitats dependent on water resources in the Project Area include aquatic ecosystems within the creek system, and potential aquatic and terrestrial groundwater dependent ecosystems (GDEs) which may have some degree of dependence on groundwater. An assessment of these potential GDEs indicate that these ecosystems are sourcing from the alluvial system which:

- is disconnected from deeper Surat Basin units, such as the Westbourne Formation and Springbok Sandstone that outcrop under the Project Area, and
- is likely replenished by surface water during prolonged wet periods when the ephemeral creek systems are flowing.

It is concluded that the contributing drawdown impacts from the Project to potential terrestrial GDEs are not significant.

Other Potential Impacts (Changes to water quality)

Changes to groundwater or surface water quality as a result of CSG production are not anticipated. Associated water from the Project will be treated / stored in site-specific infrastructure, which will be constructed and monitored in accordance with *Att F, Part1, Section 2.2, pp16-20*.

To ensure isolation between hydrostratigraphic units, CSG production wells will be designed to prevent any interconnection between target hydrocarbon bearing formations and aquifers. Fuel and chemicals used will be stored and handled in accordance with the relevant Standards and regulatory requirements.

A chemical risk assessment for use of drilling chemicals has been undertaken (*Att F, Part3, Appendix I*). It was determined that the risk to the matters of national environmental significance (MNES) receptors from drilling fluids were limited to above ground chemical spills, the loss of chemicals to aquifers below ground, and the eventual disposal of the drilling fluids. The risk to MNES receptors was determined prior to, and following, mitigation and management measures. The risk assessment determined that the likelihood for a drilling fluid to adversely affect a MNES is highly unlikely.

It is unlikely that the Project would result in a risk to human or animal health, or to the condition of the environment due to change in water quality. Project activities are unlikely to introduce organic chemicals, heavy metals, salt, or other potentially harmful substances to the environment.

Brine storages will be designed and constructed in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (DES 2016a)* and operated in accordance with the relevant Environmental Authority conditions. Additional groundwater monitoring bores will be installed if required. Any salt or salt slurry will be trucked from the site and disposed at a Regulated Waste Facility as per the *CSG Water Management Policy (State of Queensland 2012)*.

Beneficial use of produced or treated water will be in accordance with the requirements of the ENEW07547018 EOW Code Associated Water (including coal seam gas water), 2019 and the ENEW07546918 EOW Code - Irrigation of Associated Water (including coal seam gas water), 2019 including applicable water quality criteria which ensures the quality and quantity of treated or blended CSG water is appropriate for the receiving environment.

No changes to groundwater and surface water quality or changes to the water resource that may cause the establishment or spread of an invasive species are expected. As detailed in *Att F, Part2*, it is concluded that the proposed action will not have a significant impact on water resources.

Links used in this response are also provided in Att M Reference Links.

4.1.9.7 Do you think your proposed action is a controlled action? *

No

4.1.9.9 Please elaborate why you do not think your proposed action is a controlled action. *

It has been assessed that the proposed action is unlikely to affect the flow regime of the watercourses within the Project Area. Impacts to the recharge rates to groundwater are not expected. Impact to inter-aquifer connectivity is considered insignificant. Potential impacts to groundwater/ surface water interactions as a result of the Project are not anticipated and will not affect watercourse / floodplain connectivity.

Changes to groundwater or surface water quality as a result of coal seam gas (CSG) water (associated water) production are not anticipated, so no significant impact to local water quality is anticipated. It is not likely that the Project would result in a risk to human or animal health, or to the condition of the environment as a result of a change in water quality.

The presence of the Project only (with no surrounding developments) results in the prediction of 23 groundwater bores exceeding the consolidated groundwater trigger of 5m. These bores are sourcing the Walloon Coal Measures and are already predicted to be triggered by adjacent developments (without the Project). There are five additional bores triggered as part of the cumulative scenario due to the addition of the Project. Only one of these five bores is an existing, usable bore and the predicted maximum Project only contribution to drawdown is 26% of the total cumulative drawdown. Resource tenure holders are required to enter into make good agreements with the owners of the groundwater bores as necessary, where impacts are predicted.

Surface water volumes are not anticipated to be impacted as groundwater drawdown in potentially baseflow contributing formations is limited to negligible. The ephemeral creeks present in the Project area are not considered to be baseflow fed and 'lose' to the groundwater system during periods of creek flow.

A chemical risk assessment has been undertaken for the use of all planned drilling chemicals. Activities associated with the Project are unlikely to introduce organic chemicals, heavy metals, salt or other potentially harmful substances to the environment.

Surface water baseflow volumes and species dependent on water resources are not predicted to be impacted.

No changes to habitat or lifecycle of a native species dependent on a water resource are expected.

No changes to groundwater and surface water quality are likely as a result of the Project. Therefore, no changes to the water resource that may cause the establishment of an invasive species (or the spread of an existing invasive species) are expected.

It is concluded that the Project will not have a significant impact on water resources and therefore is not a controlled action.

4.1.9.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

The monitoring, mitigation and management of activities to address the potential impacts identified for the Project are outlined as follows:

Coal Seam Gas (CSG) Production Wells and General Project Activities

CSG production wells will be designed and constructed to:

- 1. Prevent any interconnection between target hydrocarbon bearing formations and aquifers
- 2. Ensure that gas is contained within the well and associated pipework and equipment without leakage
- 3. Ensure zonal isolation between different aquifers is achieved
- 4. Not introduce substances that may cause environmental harm.

With relation to drilling fluids, the mandatory requirements that will be followed include:

- 1. Drilling fluids will be selected and managed to ensure all manufactured products used during well procedures on CSG wells are in accordance with the manufacturer's recommendations and relevant Safety Data Sheets (SDS)
- 2. The name, type and quantity of each chemical used on each well throughout the life of the well will be recorded

Good industry practice for CSG drilling that will be followed includes:

- 1. Drilling fluid will be a carefully monitored and controlled mixture which is designed to:
 - 1. Achieve best drilling results and ensure efficient removal of formation cuttings
 - 2. Control formation pressures
 - 3. Minimise damage to formations.
- 2. Ensuring that the drilling fluid selected is appropriate for the well design to manage any locally experienced drilling problems and the geological conditions likely to be encountered
- 3. The preferential use of biodegradable substances in the drilling fluid
- 4. The source of water for all well procedures (drilling, completion, workover and abandonment) will be recorded for future well monitoring purposes
- 5. Products will be chosen, stored, and used at concentrations that minimise the risk of causing environmental harm
- 6. Relevant personnel, including contractors, will be made aware of the environmental impact and emergency spill procedures for the products and substances in use on-site
- 7. Use of established, effective drilling practices to achieve a stable, uniform and, as far as possible, in-gauge hole.

CSG Water Production

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The volume of CSG water produced will be monitored and recorded and provided to the relevant authority as required.

Groundwater Monitoring

Senex has developed the Atlas Stage 3 Water Monitoring and Management Plan (*Att J Water Management and Monitoring Plan*), outlining Senex's proposed monitoring, management and mitigation measures to specifically address impacts to groundwater from the Project.

Groundwater Bore Baseline Assessments

Senex will comply with any updates to the bores required for baseline assessment as part of the Water Management Strategy that may be required in any future updates of the Underground Water Impact Report (UWIR) or if directed by the chief executive of the Queensland Department of Environment and Science (DES). Any future baseline assessments will be conducted in accordance with the DES **Baseline Assessment Guideline (DES 2022a)**.

Surface Water Monitoring

There are no planned discharges to surface water from the proposed Project infrastructure (e.g. water storage facilities). Should this change, relevant assessments and further approvals would be sought as required.

Bore Impact Management Measures

Senex will comply with any future updates of the UWIR with respect to potentially impacted water bores for which Senex is the responsible tenure holder, and subsequently undertake the necessary requirements under its make good obligations. Any required bore assessments will be undertaken in accordance with the DES **Bore Assessment Guideline (DES 2022b)**.

CSG Water Management

CSG water management will be undertaken in accordance with *Att K CSG Water Management Plan ATP2059* and *Att L CSG Water Management Plan PL445_PL209*, which have been developed to meet the requirements of the *CSG Water Management Policy (State of Queensland 2012)*.

Untreated CSG water quality will be monitored based on licensing requirements for the intended use (e.g. stock watering, irrigation).

Water quality data from treated CSG water will be monitored regularly and used to confirm that it is suitable for designated beneficial use and that the water treatment facility is effectively treating the CSG water.

Water and Brine Storage Pond Monitoring

Storage structures will be designed and constructed in accordance with the *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures* (DES 2016a) and relevant Environmental Authority (EA) conditions.

Water storage facilities will be monitored to ensure the operating water levels are maintained within the specifications of the dam design.

Should additional water storage ponds be constructed, a seepage monitoring plan will be developed and implemented in accordance with Environmental Authority requirements.

Beneficial Use Activities

Water provided by the Project to third parties will be compliant with the requirements of the End of Waste codes relevant to the end use of the water.

Infrastructure location Planning

The Att C Constraints Protocol will be adhered to for the siting of infrastructure.

Construction and operation of infrastructure will be in accordance with *Att B Environmental Management Plan, Section 7, pp19-34* and the procedures therein.

Links used in this response are also provided in Att M Reference Links.

4.1.9.11 Please describe any proposed offsets and attach any supporting documentation relevant to these

measures. *

No offsets are proposed.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

There is no Commonwealth land within or adjacent to the Project Area that will be impacted by the proposed action.

4.1.11 Commonwealth heritage places overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project Area is located within Queensland and the proposed action will not impact an overseas Commonwealth Heritage place and is therefore not a controlled action.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

None

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Threatened Species and Ecological Communities (S18)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth heritage places overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

No

4.3.8 Describe why alternatives for your proposed action were not possible. *

Petroleum Lease (PL) 1037 was granted by the Queensland Government in March 2018. Authority to Prospect (ATP) 2059 was awarded to Senex by the Queensland Government in 2021 based on the strength of its proposed development plans and will be subject to a PL application in the near future. PL209 and PL445 were acquired in January 2022 and the project is restricted to extracting gas from the stated tenure. Senex has investigated alternatives within the Project Area (e.g. number of wells, well layout, infrastructure location) to maximise commercial outcomes of the proposed action as well as avoid and minimise environmental disturbance, which has resulted in disturbance of threatened species, ecological communities and their habitat largely being avoided.

Taking no action has not been considered as this is not consistent with a petroleum tenement or community energy demands. Australia has an identified shortfall in domestic gas supply on the east coast, and the proposed action assists in meeting the identified shortfall, thereby supporting Queensland's and Australia's standard of living and economic viability.

Approximately 90.6% of the Field Development Area has been cleared of its original native vegetation (most was cleared by the 1960's) and the proposed action is able to be developed whilst protecting the extant environmental values and coexisting with current and envisaged land uses. The proposed action is consistent with the Western Downs Regional Council's identification of the region as the energy capital of Queensland supplying a diversity of gas, solar and coal electricity to the national electricity grid (*WDRC, Planning Scheme, Part 3 – Strategic Plan, p3-2*).

The proposed impacts will be consistent or less than those which have already been authorised in PL445 and PL209 under the APLNG approval (EPBC 20099/4974). The Project Area is highly suited to the proposed action, given the current modified condition of the landscape and limited extent of natural vegetation within the Project Area. No appropriate alternative is identified given the economic and

social benefits that will be achieved through developing the natural gas resource in a manner that avoids significant impact upon any MNES or other significant environmental values.

Links used in this response are also provided in Att M Reference Links.

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas Stage 3 Gas Project
#2.	Att B Environmental Management Plan	Document	Project Atlas Environmental Management Plan [SENEX-ATLAS-EN-PLN-015]
#3.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#4.	Att D Rehabilitation Plan	Document	Project Atlas Rehabilitation Plan [SENEX-ATLS-EN- PLN-004]

1.2.6 Commonwealth or state legislation, planning frameworks or policy documents that are relevant to the proposed action

#1.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#2.	Coal Seam Gas Water Management Policy 2012 (State of Queensland, 2012)	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0034/8 po-csg-water-management-poli
#3.	Code of Practice Petroleum-Wells-Bores (DNRME 2019)	Link (Webpage)	https://www.resources.qld.gov.au/data/assets/pdf_file/0006/14€ of-practice-petroleum-well
#4.	ENEW07546918 EOW Code – Irrigation of Associated Water (including coal seam gas water), 2019	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0027/8 eowc-irrigation-associated-w
#5.	ENEW07547018 EOW Code Associated Water (including coal seam gas water), 2019	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0028/8{ eowc-associated-water.pdf
#6.	Land Access Code (DNRM 2016)	Link (Webpage)	https://www.resources.qld.gov.au/data/assets/pdf_file/0004/442 access-code-2016.pdf
#7.	Queensland Environmental Offsets Policy Significant Residual Impact Guideline (DEHP 2014)	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0017/9(residual-impact-gui
#8.	SIG 1.3: CSG and large coal mining developments	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/significa impact-guidelines-1-3.pdf

https://epbcbusinessportal.awe.gov.au/dashboard/print-application/?id=a77cdf53-8c60-ed11-a81b-002248157bba

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resources (C'wealth					
202	2b)				
#9.	SIG1.1- MNES (C'wealth	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf		
	2013)		guidonnoo_1.pai		

1.2.7 Public consultation regarding the project area

#1.	2021 Sustainability Report	Link (Webpage)	https://www.senexenergy.com.au/2021-sustainability-
	(Senex, 2021)		report/

1.3.2.17 (Person proposing to take the action) Proposer's history of responsible environmental management

#1.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#2.	ENEW07547018 EOW	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0028
	Code Associated Water	eowc-associated-water.pdf	eowc-associated-water.pdf
	(including coal seam gas		
	water), 2019		

1.3.2.18 (Person proposing to take the action) If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

#1.	Att B Environmental Management Plan	Document	Project Atlas Environmental Management Plan [SENEX-ATLAS-EN-PLN-015]
#2.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#3.	2021 Sustainability Report (Senex, 2021)	Link (Webpage)	https://www.senexenergy.com.au/2021-sustainability- report/
#4.	Approvals - Senex Energy	Link (Webpage)	https://www.senexenergy.com.au/sustainability/environment/prog in-the-surat-basin/
#5.	Senex Climate Change Policy	Link (Webpage)	https://www.senexenergy.com.au/sustainability/environment/clima change-and-environmental-managemen

2.2.5 Tenure of the action area relevant to the project area

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas
	,,		Stage 3 Gas Project

3.1.1 Current condition of the project area's environment

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas Stage 3 Gas Project
#2.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#3.	WDRC Planning Scheme,	Link (Webpage)	https://Western Downs Planning Scheme Western
	Zoning Maps		Downs Regional Council (wdrc.qid.gov.au)

3.1.2 Existing or proposed uses for the project area

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas Stage 3 Gas Project
#2.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#3.			

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	WDF Part	RC Planning Scheme 3- Strategic Plan	Link (Webpage)	https://www.wdrc.qld.gov.au/files/assets/public/business- amp-development/development/western-downs-p
	#4.	WDRC Planning Scheme Zoning Maps	e, Link (Webpage)	https://Western Downs Planning Scheme Western Downs Regional Council (wdrc.qld.gov.au)

3.1.3 Natural features, important or unique values that applies to the project area

#1.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#2.	WDRC Planning Scheme Scenic Amenity Overlay	Link (Webpage)	https://Western Downs Planning Scheme Western Downs Regional Council (wdrc.qld.gov.au)

3.1.4 Gradient relevant to the project area

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas
	J.		Stage 3 Gas Project

3.2.1 Flora and fauna within the affected area

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas Stage 3 Gas Project
#2.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#3.	Att E Ecology Assessment Report, Part1	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report, Main Report
#4.	Att E Ecology Assessment Report, Part2	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report containing all Appendices

3.2.2 Vegetation within the project area

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas Stage 3 Gas Project
#2.	Att E Ecology Assessment Report, Part1	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report, Main Report

3.3.2 Indigenous heritage values that apply to the project area

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas
	5		Stage 3 Gas Project

3.4.1 Hydrology characteristics that apply to the project area

#1.	Att E Ecology Assessment Report, Part2	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report containing all Appendices
#2.	Att F EPBC Water Resource Impact Assessment, Part1	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 1 Main Report - Section 1 to 6
#3.	Att F EPBC Water Resource Impact Assessment, Part2	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 2 Main Report - Section 7 Onwards
#4.			

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Att F EPBC Water Resource Impact Assessment, Part3	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 3 Appendices I-III	
#5. Att F EPBC Water Resource Impact Assessment, Part4	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 4 Appendices IV-IX	
#6. Att M Reference Links	Document	Hyperlinks to referenced sources within referral	
 #7. Identification of Gaining Streams in the Surat CMA; Hydrogeological Investigation Report (OGIA 2017) 	Link (Webpage)	https://www.rdmw.qld.gov.au/data/assets/pdf_file/0008/124174 streams-surat-cumulative-rep	
#8. UWIR for the Surat CMA (OGIA, 2019)	Link (Webpage)	https://www.rdmw.qld.gov.au/data/assets/pdf_file/0019/146124 full-report.pdf	

4.1.4.2 (Threatened Species and Ecological Communities) Why your action has a direct and/or indirect impact on the identified protected matters

#1.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#2.	Att E Ecology Assessment Report, Part1	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report, Main Report
#3.	Att G Significant Impact Assessment	Document	Atlas Stage 3 Gas Project EPBC Act Ecology Significant Impact Assessment Report
#4.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#5.	SIG1.1– MNES (C'wealth 2013)	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf

4.1.4.6 (Threatened Species and Ecological Communities) Why you do not consider the direct and/or indirect impact to be a Significant Impact

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas Stage 3 Gas Project
#2.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#3.	Att E Ecology Assessment Report, Part1	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report, Main Report
#4.	Att E Ecology Assessment Report, Part2	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report containing all Appendices
#5.	Att G Significant Impact Assessment	Document	Atlas Stage 3 Gas Project EPBC Act Ecology Significant Impact Assessment Report
#6.	SIG1.1– MNES (C'wealth 2013)	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf

4.1.4.9 (Threatened Species and Ecological Communities) Why you do not think your proposed action is a controlled action

#1.	Att A Figures	Document	Figures and maps of features and details of Atlas
			Stage 3 Gas Project

#2.	Att B Environmental Management Plan	Document	Project Atlas Environmental Management Plan [SENEX-ATLAS-EN-PLN-015]
#3.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#4.	Att G Significant Impact Assessment	Document	Atlas Stage 3 Gas Project EPBC Act Ecology Significant Impact Assessment Report
#5.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#6.	National Recovery Plan for the Koala Phascolarctos cinereus (C'wealth 2022)	Link (Webpage)	https://www.agriculture.gov.au/sites/default/files/documents/recov
<i>#</i> 7.	SIG1.1– MNES (C'wealth 2013)	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf

4.1.4.10 (Threatened Species and Ecological Communities) Avoidance or mitigation measures proposed for this action

#1.	Att B Environmental Management Plan	Document	Project Atlas Environmental Management Plan [SENEX-ATLAS-EN-PLN-015]
#2.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#3.	Att D Rehabilitation Plan	Document	Project Atlas Rehabilitation Plan [SENEX-ATLS-EN- PLN-004]
#4.	Att E Ecology Assessment Report, Part1	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report, Main Report
#5.	Att H Significant Species Management Plan	Document	Atlas Stage 3 Gas Project Significant Species Management Plan
#6.	Att I Weed Hygiene Procedure	Document	Queensland Weed Hygiene Procedure [SENEX-QLD- EN-PRC-023]
#7.	Att J Water Monitoring and Management Plan	Document	Atlas Stage 3 Water Monitoring and Management Plan [SENEX-ATLS-EN-PLN-017]
#8.	Att K CSG Water Management Plan ATP2059	Document	ATP 2059 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-013]
#9.	Att L CSG Water Management Plan PL445_PL209	Document	PL 445 and PL 209 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-014]

4.1.5.2 (Migratory Species) Why your action has a direct and/or indirect impact on the identified protected matters

#1.	Att G Significant Impact Assessment	Document	Atlas Stage 3 Gas Project EPBC Act Ecology Significant Impact Assessment Report
#2.	SIG1.1– MNES (C'wealth 2013)	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf

4.1.5.6 (Migratory Species) Why you do not consider the direct and/or indirect impact to be a Significant Impact

#1.	Att G Significant Impact Assessment	Document	Atlas Stage 3 Gas Project EPBC Act Ecology Significant Impact Assessment Report
#2.	SIG1.1– MNES (C'wealth 2013)	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf

4.1.5.9 (Migratory Species) Why you do not think your proposed action is a controlled action

#1.	Att G Significant Impact Assessment	Document	Atlas Stage 3 Gas Project EPBC Act Ecology Significant Impact Assessment Report
#2.	SIG1.1– MNES (C'wealth 2013)	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/nes- guidelines_1.pdf

4.1.5.10 (Migratory Species) Avoidance or mitigation measures proposed for this action

#1.	Att B Environmental Management Plan	Document	Project Atlas Environmental Management Plan [SENEX-ATLAS-EN-PLN-015]
#2.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#3.	Att D Rehabilitation Plan	Document	Project Atlas Rehabilitation Plan [SENEX-ATLS-EN- PLN-004]
#4.	Att E Ecology Assessment Report, Part1	Document	Atlas Stage 3 Gas Project Terrestrial and Aquatic Ecology Assessment Report, Main Report
#5.	Att H Significant Species Management Plan	Document	Atlas Stage 3 Gas Project Significant Species Management Plan
#6.	Att I Weed Hygiene Procedure	Document	Queensland Weed Hygiene Procedure [SENEX-QLD- EN-PRC-023]
#7.	Att J Water Monitoring and Management Plan	Document	Atlas Stage 3 Water Monitoring and Management Plan [SENEX-ATLS-EN-PLN-017]
#8.	Att K CSG Water Management Plan ATP2059	Document	ATP 2059 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-013]
#9.	Att L CSG Water Management Plan PL445_PL209	Document	PL 445 and PL 209 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-014]

4.1.9.2 (Water resource in relation to large coal mining development or coal seam gas) Why your action has a direct and/or indirect impact

#1.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#2.	Att F EPBC Water Resource Impact Assessment, Part2	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 2 Main Report - Section 7 Onwards
#3.	Att F EPBC Water Resource Impact	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 4 Appendices IV-IX

Assessment, Part4				
#4.	Att J Water Monitoring and Management Plan	Document	Atlas Stage 3 Water Monitoring and Management Plan [SENEX-ATLS-EN-PLN-017]	
#5.	Att K CSG Water Management Plan ATP2059	Document	ATP 2059 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-013]	
#6.	Att L CSG Water Management Plan PL445_PL209	Document	PL 445 and PL 209 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-014]	

4.1.9.6 (Water resource in relation to large coal mining development or coal seam gas) Why you do not consider the direct and/or indirect impact to be a Significant Impact

#1.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#2.	Att F EPBC Water Resource Impact Assessment, Part1	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 1 Main Report - Section 1 to 6
#3.	Att F EPBC Water Resource Impact Assessment, Part2	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 2 Main Report - Section 7 Onwards
#4.	Att F EPBC Water Resource Impact Assessment, Part3	Document	Atlas Stage 3 EPBC Water Resource Assessment Report, Part 3 Appendices I-III
#5.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#6.	Coal Seam Gas Water Management Policy 2012 (State of Queensland, 2012)	Link (Webpage)	https://Coal Seam Gas Water Management Policy 2012 (des.qld.gov.au)
#7.	ENEW07546918 EOW Code – Irrigation of Associated Water (including coal seam gas water), 2019	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0027/8 eowc-irrigation-associated-w
#8.	ENEW07547018 EOW Code Associated Water (including coal seam gas water), 2019	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0028/8 eowc-associated-water.pdf
#9.	Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (DES 2016a)	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0023/9 mn-assessing-consequence-hy
#10.	SIG 1.3: CSG and large coal mining developments	Link (Webpage)	https://www.dcceew.gov.au/sites/default/files/documents/significa impact-guidelines-1-3.pdf

- impacts on water resources (C'wealth 2022b)

4.1.9.10 (Water resource in relation to large coal mining development or coal seam gas) Avoidance or mitigation measures proposed for this action

#1.	Att B Environmental Management Plan	Document	Project Atlas Environmental Management Plan [SENEX-ATLAS-EN-PLN-015]
#2.	Att C Constraints Protocol	Document	Queensland Environmental Protocol for Field Development and Constraints Analysis [SENEX- CORP-EN-PRC-019]
#3.	Att J Water Monitoring and Management Plan	Document	Atlas Stage 3 Water Monitoring and Management Plan [SENEX-ATLS-EN-PLN-017]
#4.	Att K CSG Water Management Plan ATP2059	Document	ATP 2059 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-013]
#5.	Att L CSG Water Management Plan PL445_PL209	Document	PL 445 and PL 209 Coal Seam Gas Water Management Plan [SENEX-ATLS-EN-PLN-014]
#6.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#7.	Baseline Assessment Guideline (DES 2022a)	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0033/86 gl-baseline-assessments.pdf
#8.	Bore Assessment Guideline (DES 2022b)	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0027/86 gl-bore-assessment.pdf
#9.	Coal Seam Gas Water Management Policy 2012 (State of Queensland, 2012)	Link (Webpage)	https://Coal Seam Gas Water Management Policy 2012 (des.qld.gov.au)
#10.	Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (DES 2016a)	Link (Webpage)	https://environment.des.qld.gov.au/data/assets/pdf_file/0023/90 mn-assessing-consequence-hy

4.3.8 Why alternatives for your proposed action were not possible

#1.	Att M Reference Links	Document	Hyperlinks to referenced sources within referral
#2.	WDRC Planning Scheme Part 3- Strategic Plan	Link (Webpage)	https://www.wdrc.qld.gov.au/files/assets/public/business- amp-development/development/western-downs-p

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN/ACN	50008942827
Organisation name	Senex Energy Pty Ltd
Organisation address	PO Box 2233, Brisbane QLD 4001
Representative's name	Steve Fox
Representative's job title	Atlas Approvals
Phone	0410504268
Email	steve.fox@senexenergy.com.au
Address	GPO Box 2233, Brisbane QLD 4001

Check this box to indicate you have read the referral form. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

By checking this box, I, **Steve Fox of Senex Energy Pty Ltd**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	50008942827
Organisation name	Senex Energy Pty Ltd
Organisation address	PO Box 2233, Brisbane QLD 4001
Representative's name	Darren Stevenson
Representative's job title	Chief Operating Officer
Phone	(07) 3335 9956
Email	darren.stevenson@senexenergy.com.au
Address	PO Box 2233, Brisbane QLD 4001

Check this box to indicate you have read the referral form. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

I, Darren Stevenson of Senex Energy Pty Ltd, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

Check this box to indicate you have read the referral form. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

I, Darren Stevenson of Senex Energy Pty Ltd, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

I would like to receive notifications and track the referral progress through the EPBC portal. *