



Surat Basin Carbon Capture and Storage Project

APPENDIX 01D: RESPONSE TO EIS SUBMISSIONS

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
1	1	General	General		I have uncovered horrendous operational practises by Origin energy in the Wieambilla, Ducklo, Tara and surrounding areas. As a southerner of this great land, I am appalled along with thousands of other Australians as to the environmental disaster that your department has allowed to happen in that region. I implore you to watch this 20 min video I produced because it is gaining a lot of traction around the whole country. I have tagged multiple news outlets and Senators.		Noted	N/A
1	2	General	General		I have also just discovered on your website that the Surat Basin Carbon Capture and Storage Project does not need Commonwealth approval because... - Not a controlled action under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999; EPBC (2021/9122).		Adequately dealt within EIS, no change to EIS	See Chapter 4 Approvals, section 4.3.4; and Appendix 04A, EPBC Referral Decision
1	3	General	General		That is unconscionable, because to give approval on the premise that we don't have legislation to safeguard us is reprehensible sir and is only restricted in the jurisdiction of corporate contracts. In Common Law, you are held accountable to do no harm, cause no loss, commit no fraud and keep the peace. What you are contributing too, is approving contracts without the evidence that the projects will not cause harm to the environment and people, in addition, great loss to the environment and people. This is evidence of fraud and deceit and this does not contribute to keeping the peace or exemplify good governance by any measure.		Adequately dealt within EIS, no change to EIS	See Chapter 4 Approvals, section 4.3.4; and Appendix 04A, EPBC Referral Decision
1	4	General	General		Thus, breaking all true domestic laws and so claims for damages by all people affected can be now made. This is a first Notice Of Warning to retract and cease further approvals that are causing destruction of the land and all future projects involving land and water systems that do not provide abundant evidence that the business you are conducting will not affect the environment or people in anyway and will leave the environment in the exact same condition the environment was in or better.		Noted	N/A
1	5	General	General		In all your positions, you carry the responsibility to conduct safe and efficient measures to prevent harm and loss to the people in the community. The people are aware of these crimes and violations being made on the land where custodians of the land have the duty to hold anyone accountable who are not acting within the highest laws of doing no harm.		Noted	N/A
1	6	General	General		N.B substantial resources are being distributed to also stop Santos continuing their venture in the Pilliga.		Noted	N/A
1	7	General	General		[video attachment to email]		Noted	N/A
2	1	General	General		Please be advised the Department of Tourism, Innovation and Sport (DTIS) - Tourism Division has reviewed the Surat Basin Carbon Capture and Storage Project EIS and does not consider the project impacts on the State's interest in tourism. Thank you for providing DTIS with an opportunity to provide feedback on the Surat Basin Carbon Capture and Storage Project EIS, and please note that based on the above consideration, DTIS (Tourism) will not be making any submission in relation to the project.		Noted	N/A
3	1	General	General		Thank you for your email below, regarding public notification of the Environmental Impact Statement (EIS) for the Surat Basin Carbon Capture and Storage Project - Request for Assessment. Please be advised that the Queensland Ambulance Service (QAS) has no issues or input for this project and it's not necessary for the QAS to review the EIS. Should you require further information, the Commissioner has asked Mr Russell Cooke, Director, Darling Downs, QAS, to be available to assist you, on telephone 4698 5918 or email russell.cooke@ambulance.qld.gov.au.		Noted	N/A
4	1	General	General		Please find attached my submission.		Noted	N/A
4	1	General	General		1. The EIS acknowledges there is insufficient available seismic information as to faulting as the Moonie 3D seismic survey has not yet been completed. There appears not to have been an AEM survey completed. But, the groundwater modelling relies on there being no faulting therefore the argument by the proponent that any adverse impact of the project will be limited is unsupported. The project should be rejected as the seismic information, which is essential to modelling adverse impacts has not been gathered by the proponent and it is essential information for EIS modelling. It is far easier to show no impact when the relevant information which would assist to identify the impact has conveniently not been gathered in time.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1.3; and Chapter 8 Geology, sections 8.6.2.1, 8.7.6.1, 8.7.6.2, 8.7.6.3, 8.9.2, 8.9.3, and 8.10.
4	2a	General	General		2. The EIS uses some of the Office of Groundwater Impact (OGIA) groundwater model however the OGIA model has not been properly technically reviewed by an independent panel as if a technical panel existed under the Water Act the members would be listed in the Queensland Register of Appointees to Government Bodies - Water Act 2000 https://governmentbodies.premiers.qld.gov.au/LegislativeBodiesDisplay.aspx?Parameter=268 , which they are not.		Noted	N/A
4	2b	General	General		Of note is the OGIA groundwater model conflicts with CSIRO research published by Cui, Moore & Raiber, 2018 " <i>Probabilistic assessment of the impact of coal seam gas development on groundwater: Surat Basin, Australia</i> " which indicates there is some doubt as the validity of the OGIA model particular as the OGIA model not subject to a transparent, legitimate technical review process. The project should be rejected as the EIS has been based, at least in part, on the OGIA groundwater model which has not been technically reviewed.		Amended EIS	See Chapter 8 Geology, sections 8.4 and 8.6; and Appendix 08B.
4	3	General	General		3. The EIS indicates the injection of material will change the quality of the water, with the reaction making the water unsuitable for various uses including drinking water and livestock water. The EIS appears not to have properly identified groundwater users reliant on the groundwater, who have made statements to media in January 2023 to identify themselves and their potential impacts. E.g., https://www.queenslandcountrylife.com.au/story/8067035/glencore-co2-project-sparks-water-security-fears-for-producers/ The EIS appears deficient as to such impacts therefore the project should be rejected.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6.2.1.4, 9.7.4, 9.7.5, 9.9, 9.10, 9.11, and 9.12.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
4	4	General	General		4. The EIS says the injected material will create a plume which will rise until it encounters 'low permeability'. This acknowledges there is permeability meaning that over a very long period of time migration can and therefore will occur. We have a responsibility to future generations not to destroy the environment and land use that they will need in order to survive, whether that be in 100 years, 1,000 years or 100,000 years. The project must be rejected under the precautionary principle due to likely impact on future generations.		Amended EIS	See Chapter 9 Groundwater, section 9.6.2.1.4, 9.6.2.2, 9.7.3, 9.7.4, 9.7.5, and 9.9.
4	5a	General	General		5. The EIS appears to omit proper geomechanical and geotechnical modelling as to impact of fault reactivation, fracturing and surface uplift which is known to occur in carbon capture storage projects. Of note is the proponent has conveniently failed to obtain essential seismic information prior to submitting the EIS, so any modelling on these matters would in any case be compromised due to the absence of the data on faulting including near surface faulting. The project should be rejected as the EIS fails to provide sufficient information to be able to indicate the likelihood of fault reactivation, fracturing and surface uplift. This image indicates the known results of carbon capture and storage: FIGURE		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1.3; and Chapter 8 Geology, sections 8.6.2.1, 8.7.6.1, 8.7.6.2, 8.7.6.3, 8.9.2, 8.9.3, 8.10.2, 8.10.3, 8.10.4.2, 8.10.4.3, and 8.10.4.3.2.
4	5b	General	General				Noted	N/A
4	6	General	General		6. The EIS acknowledges the project is in the Murray-Darling Basin. Being in the Murray-Darling Basin, interference with water flowing on the surface of the land is unlawful. Surface water not under entitlement or authorisation is owned by the Commonwealth Water Entitlement Holder (CWEH). The CWEH has been omitted from the EIS as an interested person or an affected person. Surface water entitlement holders and authority holders have been omitted from the EIS as interested/affected persons. The EIS does not appear to include any modelling and analysis of risks to changes which could occur to the surface flow of water due to uplift altering the surface topography. The project should be rejected as the EIS contains insufficient information as to if surface water owned by the CWEH, and surface water to which a person/entity is entitled to or authorised to take, will be interfered with.		Adequately dealt within EIS, no change to EIS	See Chapter 10 Surface Water, sections 10.4.2, 10.6, and 10.7.
5	1	General	General		Please see attached letter on behalf of Max Winders		Noted	N/A
5	1	General	General		Re: Submission on behalf of the Basin Sustainability Alliance concerning certain aspects of the EIS which relate to protection of the groundwaters of the Surat Basin in which this and subsequent carbon capture and storage projects are proposed My name is [REDACTED] and I make this submission on behalf of the committee of the Basin Sustainability Alliance (BSA) of which I am the current chair. The BSA was established in early 2010 to represent landholder, community groups and individuals with serious concerns about the unrestrained development of the coal seam gas industry and resources industries in the Surat Basin with objectives that include: - to work towards the sustainable management of rural land and water resources; - to protect and/or enhance the entitlements to existing quantities and qualities of water of rural interests throughout the Great Artesian Basin; and - to protect the Murray Darling Basin and rural lands and interests throughout the Great Artesian Basin from the adverse impact of salt, mineral and other contamination or other adverse impacts as a result of mining and		Noted	N/A
5	2	General	General		I believe that I am competent to prepare this submission as I am the director of the environmental engineering practice, Max Winders & Associates Pty Ltd, tas MWA Environmental, which has provided consulting services to landholders in groundwater impact assessments of the impacts of the coal seam gas industry upon the integrity of the aquifers of the Surat Basin.		Noted	N/A
5	3	General	General		I was also involved in the preparation of responses to various Underground Water Impact Reports (UWIRs) prepared by the Office of Groundwater Impact Assessment (OGIA) on behalf of Wambo Cattle Company Pty Ltd, a company of which I am the managing director and which monitors the standing water levels and water quality of five Huttons water bores at Braemar, near Kogan QLD 4406.		Noted	N/A
5	4	General	General		As such we have demonstrated significant inconsistencies between the results of such monitoring and the unsupported predictions of OGIA to date.		Noted	N/A
5	5	General	General		My understanding of the Glencore proposal, as explained in the Executive Summary of the EIS, is that it involves the injection of up to 110,000 tonnes per year of GHG stream (CO2) into an injection well for up to three years from April 2025 until September 2028, the monitoring of its transport through the Precipice aquifer during that period and subsequent monitoring of the expansion of the pollution plume through the Precipice from June 2028 to June 2030.		Noted	N/A
5	6	General	General		I note from the Proponent's Summary of Key Commitments and Proposed EA Condition Amendments, included as Section 10 of the EIS' Executive Summary, that the Proponent is committed to compliance with the existing conditions of the environmental authority but has requested deletion of part of EA condition 41 Groundwater concerning the conduct of "targeted monitoring measures for potential departures from the predicted GHG plume behaviour and implement mitigation measures" such that the following important condition should be deleted: <i>If the holder of this environmental authority becomes aware that environmental harm is caused or threatened to be caused as a result of injection activities, injection must cease immediately.</i>		Amended EIS	See Executive Summary, section 10; Chapter 9 Groundwater, section 9.13; and Chapter 22 Proposed Environmental Authority Condition Amendments, Table 22-1
5	7	General	General		It is amazing that the Proponent would wish to walk away from an "experiment" resulting in environmental harm to a significant part of the Precipice aquifer over three years. They are relying upon all of the assumptions they have made to date regarding the permeability of the sedimentary layers being correct and relevant in an area which is shown on Figures 9-1, 9-2 and 9-3 of the Executive Summary to be within the known proximity of the Moonie Fault line and the Goondiwindi Fault line - yet does not take into account the extent of fracturing and minor faulting which is likely to be associated with these major faults - as has been shown in other parts of the Surat Basin.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1.3; and Chapter 8 Geology, sections 8.6.2.1, 8.7.6.1, 8.7.6.2, 8.7.6.3, 8.9.2, 8.9.3, 8.10.2, 8.10.3, 8.10.4.2, 8.10.4.3, and 8.10.4.3.2.
5	8	General	General		It is of further concern that a brief review of the WSP Golder groundwater impact report attached to the EIS makes extensive references to the use of the regional groundwater impact modelling developed by the Office of Groundwater Impact Assessment (OGIA) for the assessment of the cumulative impacts of CSG extraction upon water bores in important regional aquifers such as the Precipice and the Hutton Sandstones.		Amended EIS	See Chapter 9 Groundwater, section 9.6.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
5	9	General	General		It is suggested that a review of the assumptions and limitations of WSP Golder's hydrodynamic modelling as listed on p.138 should be considered when assessing whether or not sufficient evidence has been provided within the EIS to allow the deletion of the cessation of the activity provision from EA Condition 41 and reinforces the need for more extensive monitoring to be provided.		Amended EIS	See Chapter 9 Groundwater, sections 9.1, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12 and 9.13.
5	10	General	General		Figures 7.2, 7.3 and 7.9 of the Executive Summary of the EIS indicate that the area in which the monitoring is proposed to take place is really quite small compared with the arrays of monitoring bores usually required to validate groundwater impact models.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater sections 9.8 and 9.10.
5	11	General	General		It is suggested that the conditions attached to any environmental approval should provide for a ring of monitoring wells to be constructed and monitored to provide a comprehensive set of results to be analysed professionally to show the actual rate of progression of the plume in all directions and to provide the basis for further monitoring beyond the end of the third year – as would be required if the environmental authority is to be extended in the future or at another site if this trial shows this process is successful in storing carbon.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9.8 and 9.10.
5	12	General	General		Reinforcing this suggestion regarding increasing the monitoring well network, it is the BSA's opinion that the recent 2021 UWIR produced by OGIA was deficient in that the modelling used to reach the report's conclusions has not been calibrated against near-field monitoring bores.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9.8 and 9.10.
5	13	General	General		The potential for this to have occurred and to be questioned may be identified through a critical reading of the most recent OGIA publication, <i>Modelling of cumulative groundwater impacts in the Surat CMA: approach and methods</i> - particularly the sections which deal with the most recent work using properly-validated local modelling to evaluate realistic values of the horizontal and vertical permeability from data obtained from monitoring bores at locations where the individual influences of the disruptor can be measured and the results not being clouded by externalities.		Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, and 9.7.
5	14	General	General		Further support for the need for a comprehensive network of monitoring bores to be placed close to a potential source of change in groundwater formation pressures, such as adjacent to a deep coal mine, can be obtained by reference to the detailed monitoring conditions which the Coordinator General has placed upon expansion of the New Acland coal mine in the associated water licence recently granted for the dewatering of the coal mine to access the deeper coal seams and impact upon water bores in the surrounding rural lands. A copy of this 50 year associated water licence may be obtained from the DRDMW website		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9.8 and 9.10.
5	15	General	General		You might also be aware that members of the BSA committee are extremely concerned that a poorly-managed trial of CCS technology by Glencore at Moonie might lead to a premature application by Glencore to carry out a much larger operation at Wandoan – a proposal which our members have earlier strongly resisted and have indicated their intention to continue to resist.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.3.
5	16	General	General		If you would like further information concerning the above, I would be pleased to attend a meeting to discuss the matters I have raised – noting that I have not physically visited the site nor attended any of the public meetings. However, I have been involved in rural industries in the Surat Basin for more than 30 years and have checked the location of the proposal on Google Earth Pro to advise myself of the local terrain and rural land uses.		Noted	N/A
6	1	General	General		Please find attached my submission in reply to Glencore's CTSCo Carbon Capture Plan.		Noted	N/A
6	1	General	General		Its been brought to my attention that Glencore CTSCo propose to inject 110 Million Litres per year of Liquified CO2 into the Great Artesian Basin Aquifer. The Sandstone that they wish to inject is the Precipice Sandstone. This is a high quantity Aquifer which is locally relevant for invaluable water for towns and agricultural enterprises, and other regionally important facilities across southern Queensland.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.8.
6	2	General	General		The CTSCo EIS controversially and incorrectly states that this aquifer does not hold any significance locally as a water source. And also, that the Aquifer is Saline. At 1850 PPM this is a perfectly good water source for Humans and Stock.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.8.
6	3	General	General		My concerns are that future pumping of groundwater for water supply purposes could result in; - Degassing and Short-circuiting of CO2 back into the atmosphere through locally pumped bores. - Leakages of CO2 to overlying Aquifers and atmosphere through locally drilled petroleum exploration wells which are poorly capped. - Acidification of the water aquifer quality, leading to the dissolution and mobilisation of heavy metals (such as lead and arsenic) from the host rock through the aquifer, rendering the precipice aquifer unsuitable for human and stock consumption - Corrosion and Damage to steel bore casing and cement leading to pathways for CO2 to the atmosphere.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.8, 9.9, 9.10 and 9.11.
6	4	General	General		Glencore are being untruthful and deceptive in claiming that the precipice aquifer 'does not hold significance as a water source nor does it hold environmental Value'. The Department of Environment along with the Queensland government must not make the same mistake that the 'Hopeland Linc Energy Project' was for Qld. The prosperity and quality of life of all Queenslanders now and for future generations rely upon the amazing natural asset of the GAB. It must not be environmentally damaged.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.8, 9.9, 9.10 and 9.11.
7	1	General	General		Please find attached Resources comments on the publicly notified EIS for the Surat Basin Carbon Capture and Storage Project. If you have any questions about the response please give myself or Adam a call.		Noted	N/A
7	1	4	Approvals	4.4 Queensland State Legislation and Policies P6-13	State Land under the Land Act 1994 & SPP Development & Construction State Interest Advice to the Proponent if road closures or realignments are required to facilitate the Project.	If a road closure or realignment is needed to facilitate the Project, the Proponent should contact Louise Schefe, Senior Land Officer at email: LASSLSMajorProjects2@resources.qld.gov.au to arrange a pre-lodgement meeting to ensure the necessary application requirements under the Land Act 1994 are met. For more information, please direct the Proponent to the Queensland Government website:	Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
7	2	General	General		Agricultural Soils - SPP Agriculture State Interest (2)(c) The Terms of Reference (ToR) specifies that the land and soil resources of the proposed project area should be described and mapped at a scale relevant to the site and in accordance with relevant guidelines (section 7.2 and 9.2 of the ToR). This information cannot be found in the EIS.	The items specified in the ToR must be completed, that is: - Describe, map and illustrate land and soil resources (types and profiles) of the proposed project area at a scale relevant to the site and in accordance with relevant guidelines. - Areas that will be disturbed e.g. flowline corridor, transportation facility, sewage treatment unit will require more detailed investigation. The soil survey should be undertaken by suitably qualified persons such as a Certified Professional Soil Scientist (CPSS).	Adequately dealt within EIS, no change to EIS	See Chapter 7 Land, sections 7.3.8, 7.4.2.2, 7.4.2.3, 7.4.2.3.1, 7.4.2.4.3.1, 7.4.3.3, 7.5.2.2, 7.5.2.3.1, 7.6.2.3.1, 7.6.3.3, 7.7.2.3.1, 7.7.3.3, and 7.8; and Chapter 9 Geology, sections 8.3.2.2, 8.5.2, and 8.7.5.
7	3	General	General		The location and characteristics of unstable soil types must be considered to minimise erosion risk. To adequately inform erosion and sediment control strategies and soil stripping/stockpiling plans, a suitably scaled soil and land resource survey is required.	Resources recommends the Proponent provides an Erosion and Sediment Control Plan (ESCP) for the site in accordance with relevant guidelines, taking care to note areas of sodic/dispersive soils and how they will be managed. The ESCP should be guided by the following: - IECA (2008). <i>Best Practice Erosion and Sediment Control</i> . International Erosion Control Association (Australasia), Picton NSW. - Carey BW, Stone B, Norman PL, Shilton P (2015). <i>Soil conservation guidelines for Queensland</i> . Department of Science Information Technology and Innovation, Brisbane. The ESCP should be undertaken by suitably qualified persons.	Adequately dealt within EIS, no change to EIS	See Chapter 8 Geology, sections 8.3.2.2, 8.5.2, 8.7.5; and Chapter 19 Rehabilitation, sections 19.5.4.1, 19.5.4.2.2, 19.5.5, and 19.8.
7	4	8	Geology	8.3.2.2 Surface Geology – Soils and Undifferentiated Quaternary Deposits P43-47	The EIS does not refer to the best available soils and land resource information that is available for the operational lands. The EIS refers to the Atlas of Australian Soils mapping which is mapped at 1:2 000 000 scale. However, 1:250 000 mapping is available for this area and is described in two land management manuals.	The EIS should refer to the best available soils and land resource information: - Thwaites RN and Macnisch SE (eds) (1991). <i>Land Management Manual Waggamba Shire</i> . Queensland Department of Primary Industries, Brisbane. https://tinyurl.com/29pccsft - Maher JM (ed) (1996). <i>Understanding and managing soils in the Murilla, Tara and Chinchilla Shires</i> . Queensland Department of Primary Industries, Brisbane. https://tinyurl.com/2xjwfx3t	Amended EIS	See Chapter 8, section 8.7.4, 8.9.1, 8.10.1, 8.14; and Chapter 19 Rehabilitation, sections 19.5.4.1, 19.5.4.2.2, 19.5.5, and 19.8.
7	5	8	Geology	8.3.2.2 Surface Geology – Soils and Undifferentiated Quaternary Deposits P43-47	The EIS describes three dominant soil orders (using the Australian Soil Classification) in the area. The two land management manuals that cover the site contain much more detailed information about dominant soil types found in the area. For example, the northern part of the flowline is mapped as a 4a/4b unit, with dominant soils being Kupunn and Tara. Kupunn and Tara soils are cracking clays with gilgai and typically have sodic to strongly sodic, medium to very highly saline, and acidic subsoils—these soil characteristics (i.e., cracking clays, gilgai, sodic, saline, acid) will require specific erosion and sediment control measures. Part of the flowline (e.g., closer to the Moonie Highway) are mapped as a 6 unit, which contains texture contrast soils. It is necessary to delineate the different soil types along the 9.5 km flowline as this will influence the depth of topsoil, and what management is required to control erosion during and post construction.	Refer to best available soils and land resource information, as described in item 4 above. Compare and correlate the soil types described in the two land management manuals with the soils described on site.	Amended EIS	See Chapter 8, section 8.7.4.
7	6	8	Geology	8.5.2 Soils P69	The EIS states that the operational lands are mostly covered by gilgai soils (vertisols). However, as stated in items 4 and 5 above, existing soils mapping shows that part of the flowline is mapped as texture contrast soils which have different erosion control and management requirements to vertisols.	Provide a soils map delineating the different soil types along the 9.5 km flowline, and the soils at the Transportation Facility.	Amended EIS	See Chapter 8, section 8.7.4.
7	7	19	Rehabilitation	19.5.4.1 Step 1: Post-construction Rehabilitation P10	Further information about topsoil management and back-filling is required. Some pipeline installations compact the subsoil at several intervals before replacing with topsoil to help prevent subsidence along the pipeline alignment (e.g., bedding sand, pipe, bedding sand, subsoil, compact and test, subsoil, compact and test, subsoil, topsoil).	Provide more details here in particular topsoil management and backfilling requirements. update this section when section 19.5.5 of the EIS is updated.	Amended EIS	See Chapter 8, section 8.7.4; and Chapter 19 Rehabilitation, sections 19.5.5, and 19.8.
7	8	19	Rehabilitation	19.5.5 Topsoil Management and Revegetation P11-12	Further information about topsoil management is required. Refer to: - IECA (2008). <i>Best Practice Erosion and Sediment Control</i> . International Erosion Control Association (Australasia), Picton NSW. (Especially chapter 6 and Appendix C for detail about topsoil management and stockpiling) For example: - The EIS states the depth of topsoil to be removed is 20 mm. IECA guidelines typically states 50 mm. A better understanding of the soil types at the Transportation Facility and along the flowline is needed — 50 mm would usually be acceptable for vertisols, while 20 mm is more suited to texture contrast soils. Describe whether there will be different topsoil removal depths along the alignment, or one depth regardless of soil type. - More detail is required about the subsoils. If subsoil is sodic, gypsum (or other ameliorants) should be applied prior to topsoil replacement (see Appendix C of the IECA guidelines for more information). If the subsoil is acidic, there is a need to consider implications for construction e.g., is the pipe made from acid-resistant materials. - The length of time the stockpiles will remain for should be stated. IECA guidelines state that stripped topsoil should be used as soon as possible, and preferably not stockpiled for more than 12 months. Describe whether the topsoil for the transportation facility will need to be stockpiled long term (while facility is being used for three years, then decommissioned).	Provide further detail in the EIS on topsoil management, e.g., confirm depth of topsoil to be removed, provide a map showing soil types along the flowline and at the transportation facility, describe how sodic/dispersive soils will be managed (if present in the subsoil and topsoil), describe how acid soils will be managed (if present in the subsoil), specify how long the topsoil stockpiles will remain before being used.	Amended EIS	See Chapter 8, section 8.7.4; and Chapter 19 Rehabilitation, sections 19.5.5, and 19.8.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
7	9	3	Community and Stakeholder Engagement	3.4.1 Identification of Interested and Affected Persons Table 3-2 Summary of Interested and Affected Persons p7	Mining and the Mineral Resources Act 1989 & Petroleum and Gas (Production & Safety) Act 2004 & State Planning Policy Mining and extractive resources State interest Consultation with overlapping tenure holders.	Resources provides the following updated details for overlapping tenures Authority to Prospect (ATP) - ATP 2044 & ATP 2045: ATP2044 Holder: ENERGYCAPTURE PTY LIMITED (ACN: 628 778 861) Contact: Neil YOUNG Unit 3B Level 3, 60 Hindmarsh Square Adelaide SA 5000 Phone: 0417850245 Email: neil.young@elixirenergy.com.au ATP2045 Holders: SANTOS QNT PTY. LTD. (ACN: 083077196) (50%) STARZAP PTY LTD (ACN: 079932246) (50%) Contact: Santos LIMITED Team Leader Tenures Compliance Level 22, Santos Place 32 Turbot Street Brisbane QLD 4000 Phone: 3838 5544	Amended EIS	See Chapter 2 Proposed Project Description, section 2.5; and Chapter 3 Community and Stakeholder Engagement, section 3.4.1.
7	10	9	Groundwater	9.7.2.8 Groundwater Monitoring Trigger Investigation Values P84	Technical Advice The groundwater investigation trigger value for pH is 3.5 – this appears low. Adding CO ₂ water to the aquifer will cause acidification, the EIS states pH is expected to fall from 8.35 to 4.4 but not below 4. It is unclear what will happen to groundwater salinity (total dissolved solids [TDS]) when CO ₂ water is added. The TDS investigation trigger value appears high when compared to the stated water quality objectives (WQO) and the existing value.	Confirm groundwater monitoring investigation trigger values are appropriate.	Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.9.4, 9.10, 9.10.1.4, and 9.10.1.5; and Appendices 9C and 9D.
8	1	General	General		Please see attached letter relating to our businesses concern to the draft EIS for the Surat Basin Carbon Capture and Storage project Could you please provide advise that you have received the attached letterd.		Noted	N/A
8	1	General	General		I refer to the draft Environmental Impact Statement (EIS) for the carbon capture and storage project in the Surat Basin proposed by Carbon Transport and Storage Corporation Pty Ltd (CTSCo). I wish to make a submission against the proposed development and the false and misleading content of the EIS. The grounds for my submission are in relation to the potential impacts of groundwater, used for agricultural and domestic purposes.		Noted	N/A
8	2	General	General		I am the Managing Director of Arubial Pty Ltd, owner of the Lillyvale Feedlot, located on [REDACTED] [REDACTED] The feedlot has an operating capacity of 26,000 standard cattle units (SCU) with water supplied from surface and groundwater allocations including a 300 ML entitlement from the Precipice Sandstone. The Precipice bore linked to this allocation was constructed in 2020 and has a total depth of 2.13 km. This water has been tested and we are in the process of designing cooling tanks to ensure this water is suitable for use in the feedlot. The water quality from this aquifer is suitable for stock drinking water without further treatment.		Noted	N/A
8	3	General	General		The injection, into the Precipice Sandstone, of large volumes of liquified CO ₂ would be one of the greatest environmental disasters in Queensland history and puts the future of agriculture in Southern Queensland at risk. Whilst I understand that the trial project, which is the subject of the Environmental Impact Statement (EIS), is unlikely to impact on the water quality and supply from our Precipice Sandstone bore, I believe that the long-term injection of greater volume of CO ₂ will impact on our water supply. It is clear from comments within the EIS and public statements from CTSCo that they intend to scale up the proposal following the trial.		Amended EIS	See Executive Summary, section 1, 4.1, 9.5; Chapter 2 Proposed Project Description, section 2.3.1, 2.3.4; and Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.6, 9.7.3, 9.7.4, 9.7.5, 9.9.1, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, and 9.10.1.8.
8	4	General	General		As an existing user of groundwater from the Precipice Sandstone, only 8 km from the EPQ10 permit area, I believe we should have been involved in stakeholder engagement prior to the draft EIS. This would have ensured that CTSCo understood potential impacts on groundwater modelling. They also would have understood that the use of Precipice Sandstone groundwater in agriculture is already occurring and the depth and quality of the Precipice Sandstone aquifer are not barriers to the construction of water supply bores. This contradicts their statement in the 2 February 2023 Queensland Country Life news article. Similar comments are consistently made throughout the EIS and are false and misleading.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.5.3, and 3.5.4; Appendix 3C; and Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.6.2, 9.7.5, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, and 9.10.1.8.
8	5	General	General		Regardless of the potential for impacts to our water supply from the proposed project, the approval of this project would set a precedent that slightly saline groundwater at a depth of over 2 km has no value to agriculture and further injection projects can target the Precipice Sandstone. The future of our family business is dependent water that meets this description. We strongly object to this project and hope the Department of Environmental and Science can see that they are being misled by CTSCo.		Amended EIS	See Executive Summary, section 9.5; and Chapter 9 Groundwater, sections 9.3.2, 9.7.5, and 9.10.1.8.
9	1	General	General		Thank you for providing this material. We have nil input.		Noted	N/A
10	1	General	General		I am objecting on the potential impacts to water quality on overlaying aquifers due to failures with the project (bore casing and cement failing allowing the CO ₂ to migrate upwards) I am seeking more concrete evidence and a guarantee that they will not ruin my bore by undertaking this project. They need to more clearly demonstrate why/how the injection plume is not going to impact on our bores. I am concerned with all the deep gas activity in the area (4000m) punching through this layer (2200m) where they are hoping to store the CO ₂ that they will allow migration to overlying aquifers.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2, 2.8.1.3, and 2.11; Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.1, 9.7.1, 9.7.3.1, 9.7.4.2.1, 9.7.5, 9.8, 9.9.1, 9.10, and 9.11.
10	2	General	General		This project may adversely impact on future generations ability to run their farming operations – they are taking a very short sighted view – once an aquifer is contaminated you cant really “clean it up”		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11.7, and 2.12; and Chapter 9 Groundwater section 9.10.
10	3	General	General		I am also really worried about the additional trucks on the road carting from Millmerran to Moonie 9 B Doubles per day for 3 years. Our roads are already in a bad state of repair.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, sections 9.7, and 9.11; Chapter 2 Proposed Project Description, sections 2.9.1, and 2.10.1; Chapter 11 Transport, section 11.7; and Chapter 15 Hazards and Safety, sections 15.3, 15.5.2.2, 15.5.2.1, 15.6.1, and 15.7.1.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
10	4	General	General		If this project is deemed successful after the initial 3 year period it will be expanded and we will be the area to get many more CO2 injection wells and trucks etc and I am really not ok with that – being the dumping ground for the emissions of Glencore.		Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 2, section 2.3.1, and 2.3.4; and Chapter 4 Approvals, section 4.4.9.
10	1	General	General		I am objecting on the potential impacts to water quality on overlaying aquifers due to failures with the project (bore casing and cement failing allowing the CO2 to migrate upwards)		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2, 2.8.1.3, and 2.11; Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.1, 9.7.1, 9.7.3.1, 9.7.4.2.1, 9.7.5, 9.8, 9.9.1, 9.10 and 9.11
10	2	General	General		I am seeking more concrete evidence and a guarantee that they will not ruin my bore by undertaking this project. They need to more clearly demonstrate why/how the injection plume is not going to impact on our bores.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2, 2.8.1.3, and 2.11; Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.1, 9.7.1, 9.7.3.1, 9.7.4.2.1, 9.7.5, 9.8, 9.9.1, 9.10 and 9.11
10	3	General	General		I am concerned with all the deep gas activity in the area (4000ml punching through this layer (2200m) where they are hoping to store the CO2 that they will allow migration to overlying aquifers.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2, 2.8.1.3, and 2.11; Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.1, 9.7.1, 9.7.3.1, 9.7.4.2.1, 9.7.5, 9.8, 9.9.1, 9.10 and 9.11
10	4	General	General		This project may adversely impact on future generations ability to run their farming operations -they are taking a very short sighted view - once an aquifer is contaminated you cant really "clean it up"		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11.7, and 2.12; and Chapter 9 Groundwater section 9.10.
10	5	General	General		I am also really worried about the additional trucks on the road carting from Millmerran to Moonie 9 B Doubles per day for 3 years. Our roads are already in a bad state of repair.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, sections 9.7, and 9.11; Chapter 2 Proposed Project Description, sections 2.9.1, and 2.10.1; Chapter 11 Transport, section 11.7; and Chapter 15 Hazards and Safety, sections 15.3, 15.5.2.2, 15.5.3.1, 15.6.1 and 15.7.1
10	6	General	General		If this project is deemed successful after the initial 3 year period it will be expanded and we will be the area to get many more CO2 injection wells and trucks etc and I am really not ok with that - being the dumping ground for the emissions of Glencore.		Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 2 Proposed Project Description, section 2.3.1, and 2.3.4; and Chapter 4 Approvals section 4.4.9.
11	1	General	General		Please find attached response from Upper Dawson Branch Wildlife Preservation Society of Qld to the EIS for the Surat Basin Carbon Capture and Storage Project.		Noted	N/A
11	1	General	General		The Upper Dawson Branch of Wildlife Qld is opposed to the experimental injection of 330,000 tonnes of captured CO2 into the Precipice Aquifer of the Surat Basin at EPQ10. 1. Groundwater integrity. Our members hold that injecting into the aquifers of the Great Artesian Basin poses a risk to that most precious resource for human life - groundwater. Past experience has shown that - treating the ocean as a waste dump produces plastic gyres, and - treating the GAB as an infinite resource was unsustainable. We are also learning that the atmosphere is not infinitely capable of taking our invisible emissions. - space is rapidly filling with space junk - the Antarctic is becoming chemically polluted We conclude that it is not appropriate to add to our mistakes by injecting industrial-waste CO2 into another resource-rich, and out-of-sight 'space'.		Noted	N/A
11	2	General	General		2. Water supply security. Nothing in the EIS convinces us that dependence on the Precipice aquifer for farm and domestic purposes will be secured for the future if this trial is 'successful' and is followed by industrial-scale injection. The impacts of pressure changes in the aquifer at this pilot scale cannot predict the impact on groundwater throughout the aquifer during and after full-scale injection. The CTSCo EIS Executive Summary 9.5.1 "Predicted Plume behaviour" states that the highest pressure will be reached at the end of the 3 year injection pilot, and will reduce after that as the gas is absorbed into the water of the aquifer. This cannot tell us what pressures will be reached or at what level those pressures will affect water supplies in existing bores in the Precipice aquifer if more CO2 is pumped into it more often. This experiment cannot achieve its objective of demonstrating the safety of using the aquifer for industrial- scale storage while co-existing with		Amended EIS	See Executive Summary, section 9.5; Chapter 4 Approvals, section 4.4.9; and Chapter 9 Groundwater, sections 9.9.2.4 and 9.9.9.
11	3	General	General		3. Irrelevance of other Australian projects The Surat Basin has significant differences from Western Australia's, Chevron's Gorgon Carbon Dioxide Injection Project which is injecting 2km down under Barrow Island. This does not pose the same dangers to terrestrial (including human) life either - from undetected inadvertent gas leakage during and after the injection process or - from the lengthy transport on Queensland rural roads from sources of capture to the Surat Basin. Victoria's Otway International Test Centre in Nirranda South is still in the testing phase. In either case, the impacts of these projects on reducing the increase in GHG emissions will be negligible in light of the sequestration needed to keep emissions from spiralling into climate catastrophe.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	Chapter 2 Proposed Project Description, sections 2.9.1, 2.10.1, and 2.11; Chapter 9 Groundwater, section 9.4.3; Appendix 9A; Chapter 11 Transport, section 11.7; and Chapter 15 Hazards and Safety, sections 15.3, 15.5.2.2, 15.5.3.1, 15.6.1, and 15.7.1.
11	4	General	General		4. Unrealistic time-frame - Given the present goal of reaching 30% emissions reduction in Qld by 2030, it is impossible that this pilot project will deliver in time for industry to be able to safely scale up to transporting and injecting sufficient tonnage in the Surat Basin to contribute significantly to the reduction proposed in the time-frame set. This modest trial alone has a twelve year time frame.		Noted	N/A
11	5	General	General		5. Cost- benefit The trial will cost \$210 million, is to be completed in 2030 and may demonstrate only that 110,000 tonnes of CO2 can be safely stored in an aquifer that is projected to be able to store megatonnes. This is too little, too late, and too expensive.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
11	6	General	General		6. Conflict of interest CTSCo's parent company, Glencore, has an interest in continuing to mine coal for industrial use. This is in direct conflict with its stated "global sustainability and climate change aspirations for the transition to a low carbon future". To attempt to slow down carbon emissions by carbon storage while profiting from adding to the burden of carbon emissions is the equivalent of claiming to want to control a vehicle running out of control downhill by demonstrating that a mechanical handbrake will stop a vehicle from starting to roll when stationary. The rate of growth of greenhouse gas emissions is not stationary. It must not wait another 7 years for a coal-mining company to find a solution to a problem from which it profits.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.3.1, and 2.3.4; and Chapter 4 Approvals, section 4.4.9.
11	7	General	General		7. False negative. Executive Summary 5.1 CTSCo/Glencore seems to suggest that "to do nothing" (about carbon storage) is the only option it has to assist in the reduction of CO ₂ pollution. This is misleading and should be removed from the EIS. Glencore could diversify into pumped hydro using its pits, voids, and mullock heaps. It could build solar or wind farms on its overburden piles and give off companies to produce green steel, aluminium and cement. It could even store more coal.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, section 5; and Chapter 2 Proposed Project Description, section 2.15.
11	8	General	General		In conclusion , this project should not proceed because it poses a long-term threat to - the integrity of Great Artesian Basin groundwater - the livelihood of Surat Basin landholders and urban dwellers - the timely achievement of carbon emission reduction goals - the integrity of government carbon-emissions reduction policy and funding Should accept our advice, the project be approved, much more stringent monitoring must occur.		Amended EIS	See Executive Summary, section 11; and Chapter 9 Groundwater, section 9.11.
11	9a	General	General		We request amendment to the Executive Summary and where otherwise referenced as follows -	Quote "Measurements from the well monitoring system will be transmitted via a 4G communication link (with satellite back-up) to allow remote monitoring, alarm notification and control (if required). P.31 ES West Moonie 1, and P 32 West Moonie 2. Monitoring wells and bores P.33 and Seismic testing P.33	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, sections 7.3.10 and 7.4.7; and Chapter 2 Proposed Project Description, sections 2.8.3, 2.11.5, 2.11.6, and 2.11.7.
11	9b	General	General			<i>Comment – It may need to be 5G by the time the project is running.</i> # Add That these measurements be also communicated in real time to DES along with all action taken in response. That DES independently and regularly verify the accuracy and reliability of the monitoring systems.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, sections 7.3.10 and 7.4.7; and Chapter 2 Proposed Project Description, sections 2.8.3, 2.11.5, 2.11.6, and 2.11.7.
11	9c	General	General			Quote "The findings of the Project will determine whether or not the Project wells are: - immediately plugged, abandoned and rehabilitated following completion of the anticipated 5-year period of injection and monitoring phases; or - suspended and shut-in for future development, subject to further approvals." P.31 #Amend to "The findings of the project and the current scientific, cultural, social, political, economic and legal requirements of that time will determine"	Adequately dealt within the EIS, no change to the EIS	N/A
11	9d	General	General			Quote "Seismic surveys will continue in the post-injection monitoring phase to verify the final plume position, being when the plume has ceased expansion plus two seismic surveys at a 6-monthly interval after the plume has ceased to expand, or 2 years, whichever is longer. P 33."	Adequately dealt within the EIS, no change to the EIS	N/A
11	9e	General	General			#Change 2 years to 5 years. The injection of CO ₂ on an industry-wide scale will be with the landscape into perpetuity and long-term impacts must be known before short-term experimentation is allowed to guide future expansion of CCS	Adequately dealt within the EIS, no change to the EIS	N/A
11	9f	General	General			Quote "Seismic monitoring of CO ₂ plumes is also an established and proven technology, with the majority of CO ₂ storage projects globally using the technology as their primary plume monitoring technique. Furthermore, some international CCS projects have eliminated monitoring wells from their reservoir surveillance programs in favour of time-lapse seismic monitoring."	Adequately dealt within the EIS, no change to the EIS	N/A
11	9g	General	General			# Change the frequency of seismic testing to weekly intervals, given that any escape of gas or critical fluid could have long term impact before being detected at six monthly intervals.	Adequately dealt within the EIS, no change to the EIS	N/A
11	10	General	General		Thank you for the opportunity to comment on this project.		Noted	N/A
12	1	General	General		We have recently acquired 10 properties between Taroom and Condamine, North of Roma, as a strategic investment for our group. We have spent a considerable amount of money on infrastructure including refencing, new roads, pasture improvement, solar power, and new bores on all properties in the Precipice Aquifer.		Noted	N/A
12	2	General	General		I find it wanting and in the very essence of stupidity to permit Glencore to put their poisonous waste in to any precipice aquifer. Over a period of time this will poison all of our farms, and all the farms in the area. All farms are reliant on bore water, so it is our belief that there won't be any farming on the areas that use the aquifers that are poisoned by Glencore.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.4.1; and Chapter 9 Groundwater, section 9.11.
12	3	General	General		I urge you to make an announcement to rural QLD that they will not permit the poisoning of our aquifers and secondly that the Government should implement action to prevent people pumping poisons into the aquifer. No doubt they will have all sorts of spurious arguments about the poisons, but I think the precautionary principle is very important. No one should be permitted to do this let alone foreign mining companies.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.4.1; Chapter 4 Approvals, sections 4.4.6, 4.4.9, and 4.4.22; and Chapter 9 Groundwater section 9.11.
12	4	General	General		IMAGE AND NOTES SUPPLIED BY CAMERON PASTORAL COMPANY		Noted	N/A
13	1	General	General		-		Noted	N/A
13	1	General	General		I am writing to you to voice my strong objections to Glencore CTSCo Environment Impact Statement (EIS) for the carbon capture and storage (CCS) project proposed in the Surat Basin.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
13	2	General	General		I manage a cattle trading and backgrounding property in the Moonie district. We rely solely on bore water to water all livestock on the property. Any disruption or contamination to this water supply could have devastating impacts on the welfare of all animals that reside on the property which would in turn destroy the business as well.		Amended EIS	See Chapter 8 Geology, section 8.7.6.3; and Chapter 9 Groundwater, sections 9.7.3.1, 9.9, and 9.10.
13	3	General	General		How does Glencore intend to make good if cross contamination was to occur? You cannot quantify a dollar value if a livestock business was to lose its only reliable water source.		Amended EIS	See Chapter 9 Groundwater, section 9.10.
13	4a	General	General		The proposed CCS project in the Surat Basin has serious potential to cross contaminate the aquifers in this area via: 1. Leakage of CO2 to overlying aquifers and the atmosphere through numerous poorly plugged historical deep petroleum exploration wells in the local Moonie area.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1; Chapter 8 Geology, sections 8.4.1, 8.4.2, 8.6, 8.7.1, and 8.7.6.3; and Chapter 9 Groundwater, section 9.7.4.
13	4b	General	General		2. Corrosion and damage to steel bore casing and cement leading to pathways for CO2 to the atmosphere.		Adequately dealt within the EIS, no change to the	See Chapter 2 Proposed Project Description, section 2.8.1.
13	4c	General	General		3. Acidification of the aquifer water quality leading to the dissolution and mobilisation of heavy metals (such as lead and arsenic) from the host rock through the aquifer, rendering the aquifer unsuitable for human or stock consumption.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.6.5, 9.9.4 and 9.10.
13	4d	General	General		4. Degassing and short-circuiting of CO2 back into the atmosphere through their own nearby bore and pumping activities.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2 and 9.9.2.
13	5	General	General		How does Glencore see the Precipice aquifer not holding any significance locally as a water resource? How can Glencore guarantee there won't be any environment impacts both now and into the future?		Amended EIS	See Chapter 9 Groundwater, section 9.7.
13	6	General	General		As earlier stated, as a concerned local employee, I strongly object to the Glencore CTSCo Environment Impact Statement (EIS) for the carbon capture and storage (CCS) project proposed in the Surat Basin.		Noted	N/A
14	1	General	General		Please find attached the DCHDE submission on the EIS for the Surat Basin Carbon Capture and Storage Project.		Noted	N/A
14	1	General	General		General The department notes the relevant impact assessment in the EIS and accepts that the proposed SIMP and Proponent Commitments in the EIS are satisfactory for managing the impacts of this modest short-term project.	For noting	Noted	N/A
14	2	11, and 13	Transport, and Noise and Vibration	Section Operation Impacts	Potential scalability of this project and potential ongoing use of the project site. The department notes that approval is being sort for a short duration project which is testing the feasibility of the project site for carbon dioxide storage at a small scale to determine the potential to viably store it at scale and potentially on this project site. Traffic, noise and vibration impacts on the occupants of housing in the township The department notes the project's modest scale of road based carbon dioxide transport through population centres and the potential for this transport mode (in a scaled-up project) to have significantly greater impacts on the occupants of private and social housing in these centres. Accordingly, the department is likely to consider requesting the investigation of alternative solutions to the current road-based carbon dioxide transport arrangement in a future EIS application for a scaled-up carbon	For future reference	Noted	N/A
15		General	General		The Queensland Farmers' Federation welcomes the opportunity to provide the attached comment to the Environmental Impact Statement - Surat Basin Carbon Capture and Storage Project. This submission is provided without prejudice to any additional submission from our members or individual farmers		Noted	N/A
15	1	General	General		The following planning submission has been prepared for and on behalf of the Queensland Farmers' Federation (QFF) in respect of the Surat Basin Carbon Capture and Storage Project. The submission has been made to the Chief Executive of the Department of Environment and Science, Queensland. In accordance with section 49 of the Environmental Protection Act 1994 (EP Act), the Department of Environment and Science (the department) has decided that the EIS can be publicly notified. Written submissions in relation to the EIS are invited from any person within the submission period. The submission period commences on 5 December 2022 and concludes on 23 February 2023.		Noted	N/A
15	2a	General	General		1.0 BACKGROUND 1.1 The Queensland Farmers' Federation The Queensland Farmers' Federation (QFF) is the united voice of intensive and irrigated agriculture in Queensland. It is a federation that represents the interests of 20 peak state and national agriculture industry organisations and engages in a broad range of economic, social, environmental, and regional issues of strategic importance to the productivity, sustainability, and growth of the agricultural sector. QFF's mission is to secure a strong and sustainable future for Queensland farmers by representing the common interests of our member organisations:		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
15	2b	General	General		<ul style="list-style-type: none"> - CANEGROWERS - Cotton Australia - Growcom - Nursery & Garden Industry Queensland (NGIQ) - EastAUSmilk - Australian Cane Farmers Association (ACFA) - Turf Queensland - Queensland United Egg Producers (QUEP) - Queensland Chicken Meat Council (QCMC) - Pork Queensland Inc - Bundaberg Regional Irrigators Group (BRIG) - Burdekin River Irrigation Area Irrigators Ltd (BRIA) - Central Downs Irrigators Ltd (CDIL) - Fairbairn Irrigation Network Ltd - Mallowa Irrigation Ltd - Pioneer Valley Water Cooperative Ltd (PV Water) - Theodore Water Pty Ltd - Eton Irrigation Co-operative Ltd - Lockyer Water Users Forum (LWUF) 		Noted	N/A
15	2c	General	General		QFF welcomes the opportunity to provide comment to the EIS Surat Basin Carbon Capture and Storage Project. This submission is provided without prejudice to any additional submission from our members or individual farmers.		Noted	N/A
15	3	General	General		<p>1.2 The Importance of the Great Artesian Basin (GAB) and the Precipice Aquifer</p> <p>The GAB is one of the largest underground freshwater resources in the world. It generates approximately \$13 billion per year. It is a vital resource for 180,000 people, 7,600 businesses and 120 towns. This natural resource is relied upon by agriculture and is the lifeblood for the future of industry and rural communities into the future.</p> <p>Groundwater from the Precipice aquifer provides an invaluable supply of water to numerous towns, agricultural enterprises and other regionally important facilities across southern QLD. This aquifer is currently being used for the production of livestock with a number of businesses having acquired licenses in this deeper but more secure aquifer for future expansion purposes.</p>		Amended EIS	See Chapter 9 Groundwater, section 9.7.
15	4a				<p>2.0 SUMMARY OF CONCERNS</p> <p>Whilst carbon injection into water aquifers is a tested and known technology for carbon storage, research suggests that the application of carbon capture and storage within a water resources aquifer is unprecedented. Carbon injection appears to normally be done into hyper saline groundwater or former gas reservoirs. The injection of CO2 into a water supply aquifer has never been done in the world and, in other projects, substantial efforts are made to protect and monitor overlying water supply aquifers.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.4.3, and 9.10.
15	4b				CTSCo's proposal to inject highly corrosive liquified carbon dioxide (CO2) into a GAB aquifer represents a significant threat to one of Australia's greatest natural resources and subsequently the businesses and communities, which rely on it. It is imperative that valuable groundwater is not put at risk. This proposed trial is the first of its kind into the GAB and there is genuine concern regarding the lack of scientific evidence that underpins protection of the GAB, and quite frankly, whether a water supply aquifer as important as the GAB is even an appropriate location for these types of projects.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.4.1; and Chapter 9 Groundwater, sections 9.2, 9.3, 9.4, 9.5, 9.6, and 9.7.
15	4c				The geological formation of the Precipice Sandstone is a regionally significant and high-quality GAB aquifer. The Precipice Sandstone is also the source aquifer for springs and supports numerous Groundwater Dependant Ecosystems. The groundwater from the Precipice aquifer provides an invaluable supply of water to numerous towns, agricultural enterprises, power stations and other important facilities across the southern Queensland region		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, and 9.7.
15	4d				This targeted injection of CO2 is proposed to occur into an aquifer that is important for supporting any future growth and intensification of agriculture in southern QLD.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, and 9.7.
15	4e				QFF notes that the CTSCo's EIS states that the Precipice Sandstone aquifer is 'unsuitable for irrigation water, stock water, and drinking water', however this aquifer is currently being used for the production of livestock with a number of businesses having acquired licenses in this deeper but more secure aquifer in the last few years for future expansion purposes. CTSCo's statement in this regard is incorrect.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, and 9.7.
15	4f				QFF understands that CTSCo were awarded 2 tenements for greenhouse gas exploration. One was deemed unsuitable and was opposed by the local community largely due to concerns around protecting the GAB, and they are now reliant on this tenement near Moonie. This project is identified as a trial and QFF understands that likely expansion will be proposed following the trial with further GAB sites subsequently to be considered for similar projects. This longer-term upscale potential is of significant concern.		Amended EIS	See Chapter 4 Approvals, section 4.4 9.
15	4g				CTSCo's EIS states water quality is poor and unsuitable for stock water. This statement is incorrect as industry has been using water of similar quality for many years. Water with fluoride concentrations above guidelines levels, has been used by agriculture for many years, without adverse impacts to livestock. QFF is advised that the salinity is slightly elevated but well below stock limits and the fluoride is high but those 'limits' are loose at best and water with this level of fluoride has been used for stock for many years. Regardless, intensive livestock and townships have no problem using reverse osmosis to remove any impurities. QFF believes that the EIS uses incorrect statements about the suitability of the water for stock use.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
15	4h				QFF seeks that a full investigation is undertaken into the technical material provided by CTSCo in their EIS and fact sheets, that does not reflect accurate information, which would otherwise prove more challenging for this project to be fulfilled. As discussed with the Department of Environment, QFF will be providing further information by way of an independent peer review within 15 days of the close of submissions to provide a scientific assessment of the assumptions CTSCo has made in their EIS relating to the quality of water and other important considerations.		Amended EIS	See Appendix 01D, submission 83 below.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
15	4i				Based on the flawed modelling completed for the EIS, CTSCo believe the CO2 is not expected to leave from the injection point but does not factor in pumping as noted below. There are genuine concerns that it will acidify the surrounding water (pH from 7 to 4). There is concern that this acidification could result in the release of heavy metals and other contaminants from the surrounding rock. These contaminants will then move with the groundwater flow. There are concerns that the proposed monitoring program is too narrow to identify potential impacts to groundwater quality. Liquid CO2 is highly corrosive and wherever the GHG plume moves there is a risk to water infrastructure and stock use of the water.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.9, and 9.10
15	4j				QFF notes that there are potentially technical issues in keeping the liquid CO2 stable in this site. QFF notes that CTSCo's groundwater modelling has not considered nearby extraction even though they were aware of the allocations. Other bore entitlements for these allocations have been approved by the Department clearly showing that industry has a future use intent for this water. The modelling has not considered extraction by nearby users. GAB groundwater within the Surat Basin is fully allocated and is the main constraint to further development of the region. Businesses looking for expansion opportunities through water supply will need to look to deeper more secure aquifers such as the Precipice Sandstone. Just it isn't being used now, doesn't mean community and industry won't seek to in the future and this should be considered in the EIS deliberations. Current and future users and entitlements need to be incorporated into the modelling.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, and 9.10
15	4k				The approval of this project is likely to set a precedent for future injection into water supply aquifers not only at this location, but other locations across the GAB in the future. The GAB is a highly valued natural resource that sustains both agriculture and regional communities and must be protected. It is currently. Injecting a regulated waste into a GAB aquifer is currently prohibited under existing regulation.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; and Chapter 6 Waste, section 6.3.2.
15	5a				Project - Carbon Capture and Storage into the Great Artesian Basin Carbon capture and storage has been utilised as a strategy to mitigate the impacts of climate change by limiting CO2 emissions from point sources such as coal-fired power stations, such as the one proposed in the CTSCo CCS project. Carbon dioxide (CO2) is captured from burning fossil fuels and injecting the liquified CO2 product deep underground of approximately 2km, into a suitable geological formation such as a saline aquifer. CTSCo CCS project are proposing to direct CO2 waste from the Millmerran coal-fired power station, deep underground, in the Precipice Sandstone.		Noted	N/A
15	5b				For CO2 injection it is important the aquifer is saline (Sodium Chloride) due to the reactive properties of the CO2 and NaCl which allow for a more alkaline water body, than adding CO2 into a more neutral environment, which will increase the acidity of the aquifer. It is also vital that no CO2 is injected into a water resource used for livestock or human consumption, which as stated, will contribute to acidification of the water body as the plume from the injection mobilises. In the CTSCo EIS Chapter 9: Groundwater, under section 9.7.4 residual impacts ¹ , CTSCo have highlighted that residual impacts are predicted to be limited and highly localised, however have not accounted for existing and future bore wells for agricultural use, noting: <i>"The groundwater is not predicted to have a significant change in pressure. The injection testing of the GHG stream will have a negligible impact on the local groundwater quality of the Precipice Sandstone and will not compromise identified groundwater use. The groundwater EVs and WQOs of the vast majority of the Precipice Sandstone aquifer will remain unaffected by the Project, with the exception of changes to pressure and water quality within a highly localised extent, within the injected GHG stream plume."</i> ²		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.9, 9.10 and 9.11.
15	5c				For what we understand to be a world first in a water resource aquifer, this is unacceptable that 'the vast majority' of the Precipice Sandstone aquifer will remain unaffected. The design of the project is to target a low quality, and confined aquifer to avoid and minimise impacts to higher value and more frequently used aquifers in the area, however the information provided in the EIS doesn't reflect that statement, given there has been no allowances made for future agricultural expansion utilising water from the Precipice Sandstone aquifer of the GAB.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, and 9.10.
15	5d				Under the <i>Environmental Protection Regulation 2019</i> , section 41, that for an activity involving direct release of waste into groundwater must refuse to grant an application if the authority considers under S41(2)part (b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or (c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater.		Amended EIS	See Chapter 9 Groundwater, section 9.11.
15	5e				QFF notes that a clear avenue for GHG stream plume, which will mobilise within the aquifer via the extraction of bore water has not been evaluated in the EIS. The geochemical modelling undertaken in the CTSCo EIS Appendix 9A: Groundwater impact assessment, technical report, identifies that the main predicted changes (without bore extraction or utilising the aquifer as a potable water resource) will change the mineralogical composition of the aquifer from a pH of around 8 to a 4. The modelling undertaken assumes the injection of the CO2 will dissolve to form carbonic acid, thus degrading the current alkaline environment of the water, rendering it then unusable for livestock consumption.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.7, 9.8, 9.9.4, 9.9.5, 9.9.6, 9.9.7, and 9.10; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
15	5f				The modelling work was focused on the plume migration; however, it is also worth noting that the foundation of this project is to reduce GHG's however, the geochemical modelling has also predicted the increase of sulphur dioxide (SO2) and nitrogen dioxide (NO2) as part of the associated impurities of the GHG injection stream. It is noted in the EIS that CTSCo that the impact of the impurities SO2 and NO2 would be negligible as their concentrations are relatively low, however this is inconclusive, as the ability for the stream flow integrated with bore extraction appears to not have been considered.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.7, 9.8, 9.9.4, 9.9.5, 9.9.6, 9.9.7, and 9.10; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
15	6a				Status of CO2 storage in deep saline aquifers Carbon capture and storage whilst continuing to allow continued large-scale use of fossil fuels is the only viable way to mitigate carbon emissions. Deep saline aquifers have been identified for quite some time as having the largest storage potential to store emissions. However injecting CO2 into deep saline aquifers leads to a complex series of nonlinear issues that can significantly impact the water quality of the aquifer, and the underlying geomorphological formations. ³		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.7, 9.8, 9.9.4, 9.9.5, 9.9.6, 9.9.7, and 9.10; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
15	6b				Various studies have been undertaken, that have identified two major issues associated with CCS, which are (1) the high energy demand and high cost of the capture process - approximately 30% of the energy from a power plant would be needed to per-form the capture, with current technology; and (2) the logistics of injecting large volumes of CO2 into deep underground formations and the potential for critical environmental consequences of such large scale project on. ⁴		Adequately dealt within EIS, no change to EIS	See Chapter 5 Climate, section 5.2.2.2

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
15	6c				The Precipice Sandstone is the basal unit of the Surat Basin, that contains a sequence of interlayered aquifers and aquitards, which overlay a regionally extensive GAB aquifer with typically low-salinity groundwater. Water abstraction in the Precipice Sandstone is currently used for town water, stock and domestic and industrial use, which is estimated to be between 4 and 13GL/year from approximately 800 water bores. ⁵ The exploration for groundwater and oil and gas resources have allowed for the combined use of hydrogeological and engineering data to evaluate the use of CCS in the GAB as a way of CCS for sequestration of superficial CO ₂ .		Amended EIS	See Chapter 9 Groundwater, section 9.7.
15	6d				The Precipice Sandstone however is believed to represent high-energy braided river deposits, due to the geomorphological make-up of the cross-stratified sandstone. The implications for this, in relation to the utilisation as a continued water source are the orientation, size and connectivity of the geobodies that comprise the flow units, which are believed to have a more limited lateral extent, greater clay content and more limited hydraulic connectivity. ⁶ From this, CTSCo cannot assure that no contamination of the water will occur in the flow units from the GHG stream plume.		Amended EIS	See Chapter 8 Geology, sections 8.6, 8.7, 8.8, 8.9, and 8.10.
15	7a				Limited protection policies in place An interesting aspect of CCS studies is the strong connection to water and water resources. Power plants such as the one at Millmerran are proposing an added capture facility to facilitate the CCS sequestration, require about twice the amount of cooling water as the original power plant. This will add to the already stretched water-demand to the capture design. For the subsurface storage part, possible migration or leakage of CO ₂ or brine, or both, into shallow drinking-water aquifers is a major concern. In the United States the federal Environmental Protection Agency (U.S. EPA) has developed regulations for CO ₂ injection, including creation of a new class of wells specifically for CO ₂ injection.		Amended EIS	See Chapter 8 Geology, sections 8.7.6, 8.9.2, 8.9.3, 8.10.2, and 8.10.3.
15	7b				The new wells overseen by the EPA are referred to as Class VI wells and are part of the Underground Injection Control (UIC) Program. The UIC Program was created as part of the Safe Drinking Water Act, so the primary focus of U.S. EPA regulations under the UIC is on the protection of underground sources of drinking water (USDW's), and not on reducing anthropogenic carbon emissions. In addition, brine extraction for the purpose of pressure control leads to a problem involving management of CO ₂ and water. ⁷		Not relevant to the EIS	N/A
15	7c				As shown in other parts of the world, water plays a significant role in both the technical aspects of CCS and in the associated regulations, and CCS in general has significant topical interest in the field of hydrology and the impacts to water used for livestock and regional communities. Protecting water as a resource and not as an avenue to reduce GHG's, needs to be implemented in Australia. Economic, policy and regulatory changes will not be without challenges, however creating and adhering to a regulatory system that cannot be amended or challenged as a result of storing waste in groundwater requires immediate intervention. Implementing mandatory regulation that restricts the degradation of our most valued resource, also requires strict policy instruments that restrict and deter this avenue of waste disposal as a mitigation practice for fossil-fuel generated power plants.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22.
15	8a				Carbon Storage and water security Not all CCS projects require an aquifer to store the CO ₂ stream. In 2009 a report was issued that assessed Australia's future potential for CCS. In this report the National Carbon Storage taskforce noted that the simplest form of CCS involves depleted oil or gas fields. ⁸ But for the CTSCo project, injection of the CO ₂ stream will use a very deep part of the Precipice Sandstone aquifer. Once the CO ₂ is injected, the actual injection zone will become unusable as a water source. The object for CO ₂ , is to be injected where it will remain underground. This means that the area of injection effectively becomes unusable as an aquifer.		Amended EIS	See Chapter 9 Groundwater, section 9.9.
15	8b				As has been previously noted, the EIS identified that high alkalinity, salinity, chloride and fluoride levels, make the Precipice Sandstone aquifer unsuitable for irrigation, stock and domestic use. This is however unsubstantiated, given that the many landholders in this vicinity currently extract groundwater for stock and domestic use, which requires treatment such as reverse osmosis.		Amended EIS	See Chapter 9 Groundwater, section 9.7; and Appendices 9E and 9F.
15	8c				Combining CCS, and climate change, it is understood that CCS is a large mitigation factor that will help contribute to Australia's net zero emissions, and help reduce the impacts of climate change, but one factor that was failed to be considered in the EIS is the impacts to the aquifer with increased extraction under climate change. There is no data that can assure landholders that the injecting of a CO ₂ stream will not cause environmental pollution within the aquifer, and more importantly the increased reliability of the aquifer to contain enough groundwater for extraction in periods of drought. Regardless of what the current water quality is brought forward in this assessment, protecting our groundwater for the future is critical for the future of water security in Australia. The IPCC has already indicated that the predicted impacts of climate change for Australia will see higher evaporation of surface water, longer periods of drought and increased flood events. A reliable groundwater source to maintain the water security of the GAB, needs to be held in higher regard than a place to dispose of unwanted industrial waste.		Amended EIS	See Chapter 5 Climate, sections 5.5.3 and 5.7.2.1; and Chapter 9 Groundwater, sections 9.6.2.1.4, and 9.9.2.4.
15	9a				3.0 Submission Recommendations QFF recommends the following: - QFF strongly encourages the government not to allow injecting waste into the GAB and does not amend legislation that would allow such an activity at any location in the GAB in the future.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22.
	9b				- QFF encourages legislative parameters are put in place to strongly guide and underpin where it is appropriate to explore carbon capture and storage projects and where it is not, ensuring the future protection of the GAB.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22.
	9c				- QFF strongly encourages that alternate sites are explored that sit outside the GAB, provide distinctly saline formations, cost effective injection sites that do not provide usable water that could otherwise support the future growth of agriculture and rural communities.		Amended EIS	See Chapter 4 Approvals, section 4.4.9.
	9e				- Treat trials of this nature extremely cautiously due to the potential risks they pose to the GAB and the possible precedent approvals may then set for future projects.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22.
	9f				- Ensure agriculture and rural communities are engaged in an authentic, effective manner moving forward in any future advancements of carbon capture and storage projects to ensure all impacts are understood and considered.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.5.3, and 3.5.4; and Appendix 3C.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
15	9g				- As discussed with the Department of Environment, QFF will be submitting a peer review in relation to the quality of water and other assumptions for consideration within 15 days of close of submissions.		Amended EIS	See Appendix 01D, submission 83 below.
15	10a				4.0 Conclusion There is increasing pressure on the global need to abate CO2 which in turn is driving the development of innovative and new methods of doing so. QFF submits that innovation, technology, and best practice that is underpinned by sound, scientific data has an important role to play in CO2 abatement targets being achieved in the future.		Noted	N/A
15	10b				QFF is concerned, however, that this project has the potential to be a poor "flagship" "first of its kind in QLD" trial for the Carbon Capture and Storage (CCS) Industry and the many industries that the technology aims to support. There is not enough scientific evidence to give comfort that the GAB will be safeguarded. The proposed aquifer is significant both from an environmental and economic perspective. This trial poses risks to the current and future operations for agriculture in the region. This aquifer is too close to affected users and contains good quality water which has the ability to support the future growth plans of the agricultural industry in that region.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	Chapter 2 Proposed Project Description; Chapter 8 Geology; Appendices 8A and 8B; Chapter 9 Groundwater; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
15	10c				QFF submits that consequently, the Surat Basin Carbon and Storage Project should not proceed and at the very least, further consultation with concerned business and industry should take place before further consideration for the project be given.		Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.5.3, and 3.5.4; and Appendix 3C.
15	10d				QFF welcomes the opportunity to provide comment to the EIS Surat Basin Carbon Capture and Storage Project and would welcome the opportunity to discuss the specific contents of this submission with you at your convenience.		Noted	N/A
15	11			Footnotes	1 09+Groundwater+(final+221108).pdf (ctsc.com.au) 2 09+Groundwater+(final+221108).pdf (ctsc.com.au)p.86. 3 Celia, M. A., S. Bachu, J. M. Nordbotten, & K.W. Bandilla (2015), Status of CO2storage in deep saline aquifers with emphasis on modelling approaches and practical simulations, Water Resource. Res., 51, 6846–6892. https://doi.org/10.1002/2015WR017609 4 Celia, M. A., S. Bachu, J. M. Nordbotten, & K..W. Bandilla (2015), Status of CO2storage in deep saline aquifers with emphasis on modelling approaches and practical simulations, Water Resource. Res., 51, 6846–6892. https://doi.org/10.1002/2015WR017609 5 Hydrogeology Journal (2020) 28:175–192; https://doi.org/10.1007/s10040-019-02079-9 6 Hydrogeology Journal (2020) 28:175–192; https://doi.org/10.1007/s10040-019-02079-9 7 Celia, M. A., S. Bachu, J. M. Nordbotten, and K. W. Bandilla (2015), Status of CO2storage in deep saline aquifers with emphasis on modeling approaches and practical simulations, Water Resour. Res., 51, 6846–6892. https://doi.org/10.1002/2015WR017609		Noted	N/A
16	1	General	General		Please find enclosed a copy of our submission letter opposing the Surat Basin Carbon Capture and Storage Project. I have also attached a hand signed copy.		Noted	N/A
16	1	General	General		We wish to make a submission against the proposed development by Carbon Transport and Storage Corporation Pty Ltd (CTSCo) for carbon capture and storage project. The grounds for our submission is the potential impacts of groundwater, used for agricultural and domestic purposes, and the misleading way in which CTSCo have conducted their public consultation.		Noted	N/A
16	2a	General	General		Background The [REDACTED] and we are now 5th generation farmers. We run a mixed farming operation that includes grains, irrigation, cattle, sheep, and intensive lamb and cattle feedlot. Our family live in this area and at present employee over 16 staff and their families directly and are part of a very large [REDACTED] part of the Western Downs.		Noted	N/A
16	2b	General	General		Since 1978, the [REDACTED] has continued to enlarge its intensive feeding operation from the original 1000 scu to now built capacity of 1000 sheep and 10000 head of cattle. In 2022 an DA approval 20000 head multi species feedlot that consists of 19500 cattle and 4000 standard sheep units. At present we rely on overland flow to sustain this intensive feedlot operation. After consultation it has been suggested that our site could potentially go to 50000 head if we were to obtain water security.		Noted	N/A
16	2c	General	General		After the 2019 drought we met with Michael Lucy Officer of Significant Regional projects and Jim Weller Water services to discuss that ability to obtain extra water via drilling a bore for our intensive feedlot operation. We have our concerns that we have not been able to explore this avenue and that the thought of pumping waste product down into our GAB could threaten our underground water and many other enterprises in the district.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; and Chapter 9 Groundwater, sections 9.6.2.1.4, 9.9.2.4, 9.9.6, and 9.9.7.
16	2d	General	General		Not only is our current and future intensive feedlotting practices threatened but our mainstream of income is our grain growing enterprise last year alone we sold over 30000t of grain to nearby cattle feedlots and piggeries. If these enterprises were to be threatened we would have a double wammy as our grain enterprise would be threatened.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; and Chapter 9 Groundwater, sections 9.6.2.1.4, 9.9.2.4, 9.9.6, and 9.9.7.
16	3	General	General		Groundwater Concerns The GAB is critical to all graingrowers and intensive feeders in the south East corner. At present our lower aquifers are overallocated. And the future of graingrowing and intensive feeding is hinged on the ability to keep our GAB clean. The water in the GAB may not be for irrigating crops but this water is very suitable for livestock. And if needed it is not hard to treat this water to bring it up to animal consumption. It is hard to believe that anyone would consider pumping Industrial waste into the GAB.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; Chapter 6 Waste, section 6.3.2; and Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11.
16	4	General	General		Community Consultation Concerns I have had two phone conversations with Helen D'arcy and was led to believe that the underground water that was to be affected was very salty and it was not fit enough for human or stock consumption. Which on undertaking my own research does not seem to be correct. Initially we were led to believe that Glencore had "not anticipated to impact on existing water bores or the operations of local livestock producers." Which we took at face value, however the threatening of the future of existing and future plans to grain growers and intensive feeders is huge and I feel that far more research is		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
17	1	General	General		As a private citizen concerned about the overuse and decline of Australia's Great Artesian Basin (GAB), I am strongly opposed to Glencore's attempts to change Australian law for what appears to be their own benefit, and to set legal precedent for future questionable injection into a precious and finite resource.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
17	2	General	General		I refer to Glencore's own admission that they were untruthful when stating that the site was "saline" and "unsuitable" for agriculture", when pastoralists are already using this water and surrounding aquifers. Allowing Glencore to pollute this aquifer with CO2 prevents future use of it. Questions regarding how Glencore can be certain that leaks will not occur need to be asked. I find it unbelievable that a non-Australian owned company would seek to change our laws in order to push through a project that it acknowledges "will not meet" a key criteria under Queensland's Environmental Regulation Act 2019.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; and Chapter 9 Groundwater, sections 9.7.5, and 9.11.
17	3	General	General		Summarily, my reasons for opposing this project are as follows: - Creates precedent for other resources companies to conduct similar projects in and around the GAB - Does not provide protection for the pastoralists already using this and neighbouring aquifers - Storage of CO2 in water takes greater than 5000 years to dissolve, setting a precedent for CO2 storage in the GAB creates a risk of leaks to great to ignore. By a state owned company should not be able to change Australian laws to suit their own agenda.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; and Chapter 9 Groundwater, sections 9.3.2, 9.6.4, 9.9, 9.9.4, 9.9.6, and 9.10.1.8.
17	4	General	General		The GAB needs to be considered as a resource that is too valuable to the Australian environment and primary production and should be protected as such.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.22; and Chapter 9 Groundwater, sections 9.3.2 and 9.10.1.8.
18	1	General	General		Please find attached my submission in reply to Glencore's CTSCo Carbon Capture Plan.		Noted	N/A
18	1	General	General		I'm writing to you to voice my objections to Glencore CTSCo Environment Impact Statement (EIS) for the carbon capture and storage (CCS) project proposed in the Surat Basin.		Noted	N/A
18	2	General	General		As a local livestock producer, I'm greatly concerned for the future viability of this invaluable water source were the proposed project to go ahead. This concern comes not only as a local producer whose business would be significantly impacted but also the greater impact this project could have on one of the largest underground freshwater resources in the world - the Great Artesian Basin.		Noted	N/A
18	3	General	General		I have a registered water bore for stock and domestic use (1337 metres deep in the Gubberamunda Sandstone aquifer) located approximately 40 km north of the proposed Glencore well site. This bore not only supplies our business but three neighbouring businesses via a share bore agreement between all four landowners.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
18	4a	General	General		The proposed CCS project in the Surat Basin has serious potential to cross contaminate the aquifers in this area via: 1. Leakage of CO2 to overlying aquifers and the atmosphere through numerous poorly plugged historical deep petroleum exploration wells in the local Moonie area.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1; Chapter 8 Geology, sections 8.4.1, 8.4.2, 8.6, 8.7.1, and 8.7.6.3; and Chapter 9 Groundwater section 9.7.4.
18	4b	General	General		2. Corrosion and damage to steel bore casing and cement leading to pathways for CO2 to the atmosphere.		Adequately dealt within the EIS, no change to the	See Chapter 2 Proposed Project Description, section 2.8.1.
18	4c	General	General		3. Acidification of the aquifer water quality leading to the dissolution and mobilisation of heavy metals (such as lead and arsenic) from the host rock through the aquifer, rendering the aquifer unsuitable for human or stock consumption.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.6.5, 9.9.4 and 9.10.
18	4d	General	General		4. Degassing and short-circuiting of CO2 back into the atmosphere through their own nearby bore and pumping activities.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2 and 9.9.2.
18	5	General	General		When our dams go dry, we are completely dependent on our bore to provide fresh, clean water to our livestock. If our water supply from the bore were to become contaminated, this could have serious health consequences and fatal outcomes for our livestock and essentially catastrophic consequences on our entire business.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
18	6	General	General		How does Glencore intend to make good if cross contamination was to occur? You cannot quantify a dollar value if a livestock business was to lose its only reliable water source.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
18	7	General	General		The CTSCo EIS states that the Precipice Sandstone aquifer does not hold any significance locally as a water resource, nor does it have any environmental value. The targeted Precipice Sandstone aquifer water quality is misleadingly labelled throughout the EIS as "saline". The salinity of the Precipice Sandstone groundwater measured by Glencore within the injection well was 1850 parts per million (ppm). This is well below the guideline drinking water level of 4000ppm for cattle and pigs and 5000ppm for sheep (ANZECC 2000). This shows that the aquifer holds huge significance locally and environmentally today and into the future.		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
18	8	General	General		The Great Artesian Basin is one of the largest freshwater resources in the world and the University of QLD Surat Deep aquifer Appraisal Project clearly highlights the high risk related to impacts on groundwater and existing groundwater uses, none of which are addressed within the CTSCo EIS. The Precipice Sandstone aquifer is both regionally significant and provides high-quality ground water to numerous towns, agricultural enterprises, power stations and other regionally important facilities across southern QLD.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
18	9	General	General		How does Glencore see the Precipice aquifer not holding any significance locally as a water resource? How can Glencore guarantee there won't be any environment impacts both now and into the future?		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
18	10	General	General		The EIS has overlooked many issues and potential short-and long-term consequences associated with this project. Before any further decisions are made, the accuracy of the EIS needs serious questioning.		Noted	N/A
19	1	General	General		Please see the attached correspondence from [REDACTED], CEO of National Farmers Federation.		Noted	N/A
19	1	General	General		The National Farmers' Federation (NFF) represents the interests of Australian agriculture. NFF members include state farming organisations and federal commodity councils. We are therefore widely recognised as the national representative body for the farm sector.		Noted	N/A
19	2	General	General		Through our constituent members, especially AgForce Queensland Farmers Ltd (AgForce) and Australian Pork Limited (APL), we are aware of a Glencore subsidiary (CTSCo) proposal to sequester carbon into the Great Artesian Basin aquifer (GAB), a nationally significant asset for agriculture and the communities that depend upon it. Those aforementioned organisations, and other affected stakeholders, will provide more detailed responses to the EIS process, and we commend those submissions to your close attention.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.1, 3.5.1, and 3.7; and Appendices 3A and 3C.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
19	3	General	General		NFF further understands that there are associated proposals to amend the (Queensland) law to facilitate the novel proposal for the sequestration of liquid CO2 into a working aquifer.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.13; and Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.23.
19	4a	General	General		Collectively, these proposals present concern for NFF and Australian agriculture from the following perspectives: - The GAB is a substantial and fundamental natural resource that is sustainably utilised by agriculture across a significant portion of the Australian landscape. Agricultural bore owners, in partnership with the Federal and state governments, have invested significantly into programs that support the sustainability of the GAB. Any action that risks compromising water quality, aquifer integrity, future utilisation capacity or disadvantages agriculture in favour of resource and energy development interests= is not supported;		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
19	4b	General	General		- The technology proposed (to dispose of, fundamentally, an industrial waste product) does not appear to be proven and to do so, in especially in the GAB, runs significant risk to aquifer health and agricultural viability given the precedent it seeks to set;		Adequately dealt within EIS, no change to EIS	See Chapter 2 Proposed Project Description, section 2.13
19	4c	General	General		- As appears to be becoming standard practice the energy sector (in this case a Glencore subsidiary but there are other contemporary examples) are doing an increasingly poor job of community and stakeholder engagement. To this end we include the NFF Industry Engagement Guidelines for On-farm activities as a generic guide to our expectations.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.1, 3 5.1, and 3.7; and Appendices 3A and 3C.
19	4d	General	General		- That the integrity of the GAB aquifer may be compromised and if it is the case no amount of restitution, compensation nor compliance penalty is likely to be able to adequately address the impact; and		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
19	4e	General	General		- While the scale of this proposal may be geographically modest it presents concerns that proponents will seek for this to become standard practice and have not only a potential cumulative adverse impact on the aquifer but also create broader community disharmony and potential dislocation if access to and utilisation of the GAB resource is in any way compromised. This may well set back the more appropriate deployment of CCS as a tool to mitigate carbon emissions, an area of interest to Australian agriculture.		Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, and 4.4.23; and Chapter 9 Groundwater, sections 9.3.2.5, 9.2.6, and 9.10.1.8.
19	5	General	General		The NFF urges the department most strongly to be extremely cautious in fully assessing the merits/benefits of such untested proposals without due regard to the consequential impacts of not only the proposal itself but also the implications of the setting of the precedent to the integrity of the GAB itself.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	Entire EIS and EIS process
19	6	General	General		Enclosed the National Farmers Federation, Industry Engagement Guidelines for On-farm Activities		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.1, 3 5.1, and 3.7; and Appendices 3A and 3C.
20	1	General	General		Please find attached our letter from Packhorse Pastoral Company highlighting concerns over the Carbon Capture and Storage Project in the Surat Basin.		Noted	N/A
20	1	General	General		This letter is to serve as an objection to the proposed carbon capture and storage project in the Surat Basin by the Carbon Transport and Storage Corporation and to voice concern over both the consultation and the environmental impact study we have been made aware of.		Noted	N/A
20	2	General	General		Packhorse pastoral Company owns and operates the Moolan Downs aggregation which is within 5klm of the injection site. We have recently equipped a new bore in the Gubberamunda Sandstone for livestock water 15klm from the proposed injection site and we are exploring our feedlot opportunity at a site within 5klm of the injection site. The relevance of this is that there is potential to source water from the Precipice Sandstone for a feedlot and intensive fodder production system at the same depth levels as the proposed CO2 injection well by Carbon Transport and Storage Corporation.		Amended EIS	See Chapter 9 Groundwater, section 9.7.4.2.
20	3	General	General		As an adjacent and immediate neighbor to the proposed injection site there has been zero consultation from CTSCo to Packhorse Pastoral Company on any level. To discover the details of the project third hand is disappointing to say the least and raises concerns over the level of transparency at which the consultation process has been conducted.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3 5.4, and 3.7; and Appendices 3A and 3C, section 3C.4.
20	4	General	General		Whilst I believe the methodology for disposing of this liquified CO2 waste back into the depths of our earth has merit, it baffles me how we could even consider polluting one of Australia's greatest protected assets the Great Artesian Basin. Maybe it is a simplistic view but why not just go deeper with the injection site so that we are not impacting our future water resource base, from which many communities, businesses and natural capital outcomes rely now and into the future.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.2.
20	5	General	General		I have two main concerns from the CTSCo EIS that we were briefed on by industry expert Ned Hammer. Firstly, the modelling of the leakage from the injection site (Plume) that didn't account for or allow for water extraction from the immediate area now or into the future and the impact that would have on the spread of the Plume. Secondly the fact that this CO2 waste will lower PH levels from 8 down to a PH level of 4 in the water demonstrates the toxic corrosive nature of the liquified CO2 waste. Are we really going to set a precedence with this project that allows for the pollution of one of Australia's greatest natural resources and limit the development opportunity that this resource offers now and into the future.		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.6, and 9 9.
21	1	General	General		Please find our submission attached to this email.		Noted	N/A
21	1	General	General		We are writing to you to voice our strong objections to Glencore CTSCo Environment Impact Statement (EIS) for the carbon capture and storage (CCS) project proposed in the Surat Basin.		Noted	N/A
21	2	General	General		As local residents and cattle and grain producers, we are greatly concerned for the future viability of this invaluable water source were the proposed project to go ahead		Noted	N/A
21	3	General	General		This concern comes not only as local food producers whose business could be decimated by such impact, but also the broader impact this project could have on the entire community and the entire Great Artisan Basin!		Noted	N/A
21	4	General	General		We strongly Object to Glencore's (CTSCo) Disclosures in the Environmental Impact Statement. We believe there is major Environmental concerns for our district.		Noted	N/A
21	5a	General	General		The proposed CCS project in the Surat Basin has serious potential to cross contaminate the aquifers in this area - for example: 1. Leakage of CO2 to overlying aquifers and the atmosphere through numerous poorly plugged historical deep petroleum exploration wells in the local Moonie area.		Amended EIS	See Chapter 2 Proposed Project Description, section 2 8.1; Chapter 8 Geology, sections 8.4.1, 8.4.2, 8.6, 8.7.1, and 8.7.6 3; and Chapter 9 Groundwater, section 9.7.4.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
21	5b	General	General		2. Corrosion and damage to steel bore casing and cement leading to pathways for CO2 to the atmosphere.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.8.1.
21	5c	General	General		3. Acidification of the aquifer water quality -- leading to the dissolution and mobilisation of heavy metals (such as lead and arsenic) from the host rock in the aquifer, rendering the aquifer unsuitable for human or stock consumption. Human and animal welfare would be critically impacted.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.6.5, 9.9.4 and 9.10.
21	5d	General	General		4. Degassing and short-circuiting of CO2 back into the atmosphere through their own nearby bore and pumping activities.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2 and 9.9.2.
21	6	General	General		The CTSCo EIS states that the Precipice Sandstone aquifer does not hold any significance locally as a water resource, nor does it have any environmental value. ----We strongly object to this!		Amended EIS	See Chapter 9 Groundwater, section 9.7.
21	7	General	General		The targeted Precipice Sandstone aquifer water quality is misleadingly labelled throughout the EIS as "saline". The salinity of the Precipice Sandstone groundwater measured by Glencore within the injection well was 1850 parts per million (ppm).		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
21	8	General	General		Please note - - This is well below the guideline drinking water level of 4000ppm for cattle and pigs and 5000ppm for sheep (ANZECC 2000). This shows that the aquifer holds huge significance locally and environmentally today and into the future.		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
21	9	General	General		The fact is that it is often the sole fresh water source for many businesses and homes in the district.		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
21	10	General	General		The Great Artesian Basin is one of the largest freshwater resources in the world and the University of QLD Surat Deep aquifer Appraisal Project, clearly highlights the high risk related to impacts on groundwater and existing groundwater uses, none of which are addressed within the CTSCo EIS. The Precipice Sandstone aquifer is both regionally significant and provides high-quality ground water to numerous towns, agricultural enterprises, power stations and other regionally important facilities across southern QLD.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
21	11	General	General		We hope you take careful consideration of these issues and hear our strong objections		Noted	N/A
22	1	General	General		Please find attached our Objection to the Surat Basin Carbon Capture and Storage project.		Noted	N/A
22	1	General	General		We are writing to voice our Objection to Glencore (CTSCo) Environmental Impact Statement (EIS) for the Carbon Capture and Storage (CCS) project proposed in the Surat basin. We believe there are major Environmental concerns for the district		Noted	N/A
22	2a	General	General		- We are Property owners in the EPQ10 area and are very concerned about the possible impact on the Ground Water. We would like to know Why the EPQ10 area has been chosen as it is a fertile Agricultural area reliant on Underground water for Stock and Grain Farming?		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, and 2.5; Chapter 7 Land, section 7.4; and Chapter 9 Groundwater, section 9.9.
22	2b	General	General		- Do you realise that there are water licences in the Precipice seam very close?		Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, and 9.6.
22	2c	General	General		- How will Glencore or the Government Federal and State "Make Good" or compensate if Serious Contamination occurs in water Aquifers? What if Liquid CO2 leaks out or escapes?		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals, section 4.4.23; and Chapter 9 Groundwater, section 9.10.1.8.
22	2d	General	General		- Why do Glencore say "Unused saline" water at 1850 ppm, isn't this within Australian Guidelines? Is this factually, correct?		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
22	2e	General	General		- If Contamination occurs have Glencore a plan for Animal welfare and compensation if water is contaminated? Our animals are solely reliant on Bore Water which is extremely close to that seam. We could lose our clean Green Animal Export markets.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.9, and 9.10.1.8.
22	2f	General	General		- Why was there no or lack of Consultation with land holders. We own properties in and nearby the EPQ10 and we were never informed of any meetings or discussions? We only found out by an article in the Queensland Country Life in Feb 2023. With Two Registered Bores in the area why weren't we informed?		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.3, and 3.5.4; and Appendix 03C.
22	2g	General	General		- Why was this released just before Christmas when everyone was preoccupied with Family and holidays? Were they trying to sneak it through while Farmers were having a break? As once the Trial is underway the gates are open!!		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 1 Introduction, section 1.3; and Chapter 4 Approvals, section 4.4.9.
22	2h	General	General		- What are the Costs -Environmental and Financial of Liquefying CO2 at Millmerran ? We have heard it is extremely expensive and possibly half the Cost of making the Power. Is it worthwhile?		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.3 and 2.14.
22	2i	General	General		- What impact on Roads and Environment will Nine B-Double trucks transporting the Liquefied CO2 have on our Roads travelling from Millmerran to west of Moonie every day?		Adequately dealt within EIS, no change to EIS	See Chapter 11 Transport, section 11.6.
22	2j	General	General		- How do you know the Great Artesian Basin will not be affected??		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8; Chapter 8 Geology, sections 8.7, 8.8, 8.9 and 8.10; and Chapter 9 Groundwater.
22	3	General	General		We hope you will consider our Questions and reasons for not supporting this Project.		Noted	N/A
23	1	General	General		I have tried my best to find the appropriate avenue to submit my feedback regarding the mining company Glencore's desire to liquify waste emissions and inject them into the Great Artesian Basin, specifically an aquifer 400km west of my hometown Brisbane (Glencore's own document)		Noted	N/A
23	2	General	General		I work in the sustainability industry with Carbon Credits and carbon neutrality, and I am extremely disturbed by Glencore's proposal to utilise our state's greatest source of reliable agricultural irrigation for a method of carbon capture that is dubious at best and at worst toxic.		Noted	N/A
23	3	General	General		I, and many others in the community, object to this proposed plan for several reasons.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
23	4	General	General		1. Carbon Capture and Storage is widely regarded to be perhaps the most useless and over-stated method of carbon sequestration which is almost exclusively used by the fossil fuel industry. My fear is that if this Glencore plan is allowed, not only will it set precedent for more ineffective CSS projects but we will soon see the likes on the Minerals Council et al pushing to cement this as a methodology with which they can generate ACCUs, something already underway by Oil extracting facilities operated by Chevron in WA pumping waste back into wells to re-pressurise the basin and extract more gas in a form of pseudo-fracking. They then use the credits generated by this "abatement method" to offset their emissions and claim carbon neutrality as an organisation - a blatant contradiction of the language used to describe their relationship with carbon emissions as well as a convenient way to dispose of waste while extracting additional product. If there's one thing we don't need, its more dodgy ACCU methodologies. Stories such as these make a mockery of carbon credits, carbon abatement, and in all honesty the entire industry and its leadership. It seems policy makers have zero self-awareness or appreciation for the irony of allowing fossil fuel giants to dictate the terms of our <i>sustainability revolution</i> . Furthermore, the efficiency of CSS has been heavily criticised globally for low levels of sequestration, and really is only practical for extending the life of legacy oil and gas businesses looking to "act" on climate without making any significant changes to the business model driving climate change. It's the definition of greenwashing on an industrial scale, that is appearing to take climate action and reaping the positive publicity while in reality increasing emissions and undermining meaningful change.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.3.
23	3	General	General		2. Glencore's own report apparently found that salinity levels in the proposed aquifer were suitable for irrigation and livestock, and farmers already use licenses to extract water for livestock from the very same aquifer Glencore wants to use for waste disposal, yet the company claims this is a zero-loss scenario as the water quality is too low to ever be useful for anything other than storing their toxic waste? An outsider may speculate that Glencore is perhaps interpreting results in the most convenient way for its operations, rather than the correct way. CO2 causes acidification in water, and in the industrial volume proposed by Glencore would utterly destroy this aquifer already in use by farmers removing yet another viable source of water in the arid outback. Furthermore, Glencore is pushing to forcefully compel landholders to host their toxic waste infrastructure on privately owned land for the transport of lovely chemicals in commercial quantities like ammonia, hydrogen, and liquified CO2. The lack of appreciation for the water and soil that keeps our community producing agricultural products in a land where drought is a borderline perpetual state and water security is highly important, strikes me as counterintuitive and makes me sceptical that Glencore's leadership have any respect for the land on which they make super profits year after year.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 7 Land; and Chapter 9 Groundwater.
23	4	General	General		3. The Australian Government is apparently offering up to \$35 million for Glencore to carry out its CTSCo CSS operation. This is to an organisation that raked in ~\$27 billion with \$0 net payable tax over three years (not to be conflated with royalties) and the Australian taxpayer is expected to fund their ridiculous sustainability charade? This is a bridge too far and is the ultimate spit-in-the-face for every organisation and individual who has taken legitimately meaningful steps towards sustainable practices. It frustrates me that foreign companies like Glencore extract billions of dollars of resources, destroy our natural endowments, and then thanks us for the privilege of operating on our shores by not paying their fair share as per the loopholes intentionally left in our tax laws and conveniently leaked by the likes of PWC and friends.		Adequately dealt within the EIS, no change to the EIS	See Chapter 1 Introduction, section 1.1.
23	5	General	General		Is it any wonder more and more Australians increasingly distrust the Government and think the system is rigged against them? Decisions such as this are alienating the major parties voting base and pushing an ever-growing number of disenfranchised voters towards single-issue parties that actually campaign for progressive reforms on issues that matter to real Australians.		Noted	N/A
23	6	General	General		In the last six months, there has been an avalanche of seriously damaging press coverage of ACCUS and the Chub Review, VERRA over issuance, NIHT and PNG Credit Scandal, Climate Active being referred to the ACCC, and a slew of (coal and gas) companies caught out for greenwashing while actually increasing their emissions. Trust in the government to make real change is low, and I find myself often needing to focus on remaining optimistic that it's not too late for altruism and responsible management to triumph over the basic greed and short-sightedness that currently seems to be driving the bus. As someone who works every day with businesses to reduce emissions and develop sustainably, it feels like a losing battle when the largest polluters are not pulling their weight after decades of denying a problem even exists.		Noted	N/A
23	7	General	General		In summary, Australia's climate action will never be taken seriously as long as we continue with the double-think of making a big song and dance over how green and sustainable we are, all the while undermining any practical reduction in emissions and actually funding further delays in meaningful action with our hard earned tax dollars. Anybody with half a brain can see the profits being privatised and the expenses being socialised, as is the great Australian tradition (ie paying for Glencore's waste disposal while they avoid tax and export billions in profit offshore). As person of average intelligence (perhaps even below average) I am offended that we are given such little credit for being able to put 2 and 2 together to learn why companies like Glencore always seem to get their way at our expense, and indeed the expense of the natural world which they routinely destroy.		Noted	N/A
23	8	General	General		I strongly advise The Department of Environment and Science, and the broader QLD Government to think more critically about Glencore's proposed plans and the cost/benefit to the community, and the message that it sends both to the people and industry if allowed to go ahead. There needs to be legitimate action that demonstrates that the Government is answerable to the people, not to a dozen or so mining executives that can offer lucrative roles upon retirement from public office. Allowing and funding this pipedream is not such an action.		Adequately dealt within the EIS, no change to the EIS	See Chapter 1 Introduction, sections 1.3, 1.4, 1.5 and 1.6; and Chapter 4 Approvals.
23	9	General	General		I appreciate any time given to reading this mammoth email, and I hope you understand this is one of the few avenues that is available for myself, or any other concerned people to express the frustration garnered by the continued special treatment of major polluters.		Adequately dealt within the EIS, no change to the EIS	See Chapter 1 Introduction, sections 1.3, 1.4, 1.5 and 1.6; and Chapter 4 Approvals.
24	1	General	General		Please find attached our submission against the CTSCo's EIS for the proposed carbon capture and storage project. Please confirm that our submission satisfies the criteria for a properly made submission no later than the COB 22/02/2023.		Amended EIS	See Chapter 1 Introduction, section 1.5; and Appendix 01D.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	1	General	General		I refer to the draft Environmental Impact Statement (EIS) for the carbon capture and storage project in the Surat Basin proposed by Carbon Transport and Storage Corporation Pty Ltd (CTSCo). I wish to make a submission against the proposed development and the false and misleading content of the EIS. The grounds for my submission are in relation to the potential impacts of groundwater, used for agricultural and domestic purposes, and the misleading way in which CTSCo have conducted their public consultation.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.3, and 3.5.4; Appendices 03A, and 03C; and Chapter 9 Groundwater, sections 9.4.1, 9.6.1, 9.6.2, 9.7, 9.9, and 9.10.1 8.
24	2	General	General		Documents comprising the submission include: - this cover letter, - a detailed submission document including: - the top 7 flaws in the EIS, - Summary of CPC concerns - A detailed table containing an EIS Section-by-Section review including EIS deficiencies and associated recommended changes, questions or comments. - QFF's late engagement presentation slide pack containing material which is inconsistent with their EIS and referred to within this cover letter.		Noted	N/A
24	3	General	General		We would appreciate a response to each and every comment, question and suggested flaw or change to the EIS.		Amended EIS	See Appendix 01D.
24	4a	General	General		Background The [REDACTED] have been farming on [REDACTED] and the surrounding region since the early 1900s when it was established by my grandfather [REDACTED]. For many years it was operated as a mixed enterprise (cattle and sheep grazing and dryland farming) until the first piggery was established by me in 1983. My brother, [REDACTED], and I both reside on [REDACTED] or adjoining properties.		Noted	N/A
24	4b	General	General		Since 1983, the Cameron Pastoral Company (CPC) piggeries (now SP Northern Farming Operations) on 'Lundavra' have grown to a capacity of approximately 80,000 standard pig units (SPU). A total of 131,000 SPU is approved for the three existing units and a further 138,000 SPU is proposed as part of a current development application. The future diversification of CPC interest includes a large-scale feedlot on 'Parkhurst' near the Moonie Highway. Initial feasibility assessments and pre-lodgement discussions with Western Downs Regional Council have identified that a capacity of at least 30,000 standard cattle units (SCU) is possible on this site (subject to council and state approvals).		Noted	N/A
24	4c	General	General		The CPC family business is currently undergoing succession planning and transition to the next generation of the family. The abovementioned piggery expansion and feedlot underpin the future generations of the [REDACTED]. Additionally, based on advice from expert consultants, the site holds the greatest potential for diversified intensive livestock growth in the country. It is potentially unique in Australian agriculture to find a property under single ownership with the physical and logistical characteristics of [REDACTED] and surrounding properties.		Noted	N/A
24	4d	General	General		All future development is underpinned by multiple groundwater allocations, linked to the Precipice and Hutton Sandstones, totalling 735 ML/year, as yet not accessed. Without this water, the future growth plans of the Cameron and Sunpork Groups of companies in both the pork and beef sectors is severely curtailed.		Amended EIS	Chapter 9 Groundwater, sections 9.4.1, 9.6.1, 9.6.2, 9.7, 9.9, and 9.10.
24	5	General	General		Groundwater Concerns The attached document provides a detailed summary of the inadequacies and failings of the EIS and proposed project. This document has been prepared with the assistance of hydrogeologist Ned Hamer, who has close to 30 years of experience in hydrogeological assessments for town water supplies, mining, energy, agriculture, and other industries, much of this work being conducted within the Great Artesian Basin (GAB).		Amended EIS	See Appendix 03A.
24	6a	General	General		Community Consultation Concerns CTSCo have failed to undertake community consultation in accordance with the objectives of the EIS as well as the Terms of Reference issued by the Department of Environment and Science. Every step of the engagement between CTSCo and myself or my consultants has been driven by me through various direct requests. As an adjacent landholder with substantial Precipice Sandstone allocations, I should have been identified as a major stakeholder during initial feasibility investigations and the public notification of the draft Terms of Reference. Such engagement occurred during the feasibility assessment of the EPQ7 tenement.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.3, and 3.5.4; Appendices 03A, and 03C.
24	6b	General	General		CTSCo have provided a detailed explanation of the community consultation that they have, and will, complete as part of the EIS process and prior to the commencement of the project. Section 3.2 of the EIS explains the objectives of the consultation project. I believe that CTSCo have already failed to meet these objectives in their consultation with myself and consultants Matt Norton and Ned Hamer. Below is a summary timeline of the consultation that has occurred:		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.3, and 3.5.4; Appendices 03A, and 03C.
24	6c	General	General		5 December 2022 – - Public consultation for the project commences, three weeks before Christmas. - No direct engagement from CTSCo. - Email sent to enquiries@ctsc.com.au requesting a copy of the EIS and summary of initial reasons for concern. - Generic email sent to me from Nikki Accornero outlining the process for community consultation and submissions as part of the EIS. - I emailed CTSCo requesting a full copy of the EIS.		Amended EIS	See Appendix 03A.
24	6d	General	General		5-19 December – various discussions between CTSCo and myself to organise a teleconference.		Amended EIS	See Appendix 03A.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	6e	General	General		<p>13 January 2023 – Ken Cameron, Matt Norton, Ned Hamer, Darren Greer, and Helen D’Arcy meet via teleconference to discuss the project. During this teleconference, the following occurred:</p> <ul style="list-style-type: none"> - CTSCo explained the project and the EIS content and process. - CTSCo stated they were aware of the Precipice allocations that are held across the properties owned by Cameron Pastoral Company. However, they had not modelled the extraction of this allocation as they were not yet linked to a pumping point. - It was explained to CTSCo that the water is suitable for stock without treatment, as water of this quality (salinity and fluoride) was being used by CPC from shallower aquifers. - CTSCo stated that they had spoken to some cattle and horse people about the suitability of the water. - It was explained that there was an existing 2.1km deep Precipice bore constructed at a feedlot in Condamine. - The potential use by CPC of this water was explained to CTSCo and the proposed location of the bore was explained. - CTSCo agreed to update the models to reflect the extraction of this water. - CTSCo referenced the Otway project as analogous to the proposed Moonie project. 		Amended EIS	See Appendix 03A; Chapter 9 Groundwater, sections 9.4, 9.6, 9.7, 9.9, 9.10, and 9.12.
24	6f	General	General		<p>18 January 2023 - Ned Hamer provided additional information on the allocations and requested information on well completion reports, Precipice permeability testing and information outlining the claimed low salinity of the target formation at the Otway Test Centre. Ned also advised that his research had identified that the target aquifer at Otway was saline and not suitable for water supply.</p>		Amended EIS	See Appendix 03A.
24	6g	General	General		<p>19 January 2023</p> <ul style="list-style-type: none"> - CTSCo requested more information on the bores and allocations across the CPC properties. Including the proposed location of the Precipice bore - Information was provided by Matt Norton to CTSCo on the current proposed expansion of the piggery - In response to the query about the comparison to the Otway project, CTSCo stated that CO2 was injected into the Waarre C formation which has a salinity of 1,000ppm TDS. A CSIRO paper was attached to justify the classification of the Waarre formation as ‘fresh’. - Upon review of the information provided by CTSCo, Matt Norton requested confirmation that the Otway target aquifer was used for water supply. Matt could not find any reference to such a use. The Otway project is referred to as ‘analogous’ to the Moonie project throughout the EIS. - In a further email, Ned Hamer stated that there was no reference to the Waarre formation groundwater quality in any of the documentation provided and asked for further direction on where this information could be found. - CTSCo provided a response to the piggery information provided by Matt Norton. <p>No response was received from CTSCo in relation to the other queries about the Otway project.</p>		Amended EIS	See Appendix 03A, and Appendix 03C, sections 3C.2.2 and 3C.2.6.
24	6h	General	General		<p>2 February 2023 – Queensland Country Life publish an article with the following quotes from a CTSCo spokesperson. It is understood that these quotes were obtained after the meeting of 13 January 2023.</p> <p><i>“There are currently no water bores accessing the sandstone targeted by CTSCo within the EPQ10 permit area due to the 2.3km depth and low quality of the water.”</i></p> <p><i>“The closest bores that extract water from the same sandstone are more than 30km away within the Moonie oil field. CTSCo’s injection well contains multiple physical barriers to ensure the shallower aquifers used by local producers are protected.”</i></p> <p>The spokesperson said the project was “not anticipated to impact on existing water bores or the operations of local livestock producers.”</p>		Amended EIS	See Appendix 03C, sections 3C.2.2 and 3C.2.6.
24	6i	General	General		<p>15 February 2023</p> <p>Ned Hamer provided CTSCo with significant additional information on CPC water licences and evidence for CPC’s long term programme, commenced in 2016 to obtain the licences and plan the Precipice Bore drilling programme. This was information that should have been proactively gained through consultation by CTSCo to incorporate in the groundwater impact modelling and other impact assessment components of the EIS. We have received no response from CTSCo by the date of our EIS submission.</p> <p>The failure of CTSCo to appropriately respond to the questions raised by Matt and Ned shows that CTSCo are not willing to abide by the objectives of their community consultation. These objectives are described in Section 8 of the EIS executive summary and Section 3.2 of the EIS. The below table describes some of these failures in detail.</p>		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.3, and 3.5.4; Appendix 03A, and Appendix 03C, sections 3C.2.2 and 3C.2.6.
24	6ja	General	General		Table 1 - Summary of Community Consultation Failures		Noted	N/A
24	6jb	General	General		Objective	Failure	Noted	N/A
24	6jc	General	General		Identify affected and interested stakeholders for the Project.	<ul style="list-style-type: none"> - During the teleconference, CTSCo stated that they were aware of the Precipice allocation held on property 9.5 km from the injection site. However, they had not engaged the owner of these properties prior to preparing the EIS. - The EIS states that similar concerns were addressed for EPQ7 during initial feasibility studies. - It is unclear why such consultation did not occur during feasibility studies for the Moonie injection site and was left until the mandatory consultation and submission period for the EIS. 	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.5; Appendix 03A, and Appendix 03C.
24	6jd	General	General		Establish open and transparent lines of communication with all stakeholders.	<ul style="list-style-type: none"> - As above, CPC should have been identified as a key stakeholder prior to the EIS. Regardless, lines of communication were first established by Ken Cameron and not CTSCo. - Further, based on the lack of a written response to the questions from Matt Norton and Ned Hamer (described above), there is a distinct lack of transparency in CTSCo’s engagement process. 	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.5; Appendix 03A, and Appendix 03C.
24	6je	General	General		Maintain and build on existing relationships between CTSCo and those stakeholders already engaged as part of consultation conducted for EPQ7	N/A – there was no existing relationship	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.5; Appendix 03A, and Appendix 03C.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	6jf	General	General		Ensure stakeholders have an understanding of the Project, how it may affect them, the EIS processes and how they can participate, be informed and consulted.	CTSCo have proposed to remodel the changes in groundwater with consideration of the extraction of groundwater from the CPC Precipice bores. CPC consultants have provided the requested data for further modelling.	Amended EIS	See Appendix 03A; and Chapter 9 Groundwater, section 9.4.1, and 9.6.
24	6jg	General	General		Provide accurate, timely, and relevant Project information to all stakeholders.	- CTSCo made inaccurate statements about the similarities between the Moonie project and the Otway project. - CTSCo provided information in response to questions about the similarities between the Moonie project and the Otway project. This information did appear to be correct either. - As they have failed to retract those statements, or provide written advice to answer the questions, in my opinion, the original statements were false and misleading. - Based on the above, some of the information relating to the Otway project is not relevant to the Moonie project. - CTSCo are quoted in a Queensland Country Life article that the lack of bores accessing this aquifer is due to depth and low-quality water. It is factually correct that there are no bores and a barrier to the construction of bores is the depth of the aquifer. However, it is misleading to state that this is because of the low quality of water. As explained to CTSCo prior to this quote, there is an existing 2.1km deep Precipice Sandstone bore at a feedlot near Condamine. This feedlot is less than 8 km north of the edge of EPQ10. CTSCo should be aware of this bore as it has been constructed for some time.	Amended EIS	Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	6jh	General	General		Identify stakeholder issues and concerns regarding the Project.	N/A – CTSCo have identified the relevant issues and concerns	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement; Appendix 03A, and Appendix 03C.
24	6ji	General	General		Identify potential project opportunities with stakeholders; and	N/A – some opportunities have been identified. Details of those opportunities are not yet confirmed.	Amended EIS	Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	6jj	General	General		Respond to stakeholder issues raised and identify appropriate strategies to address those issues.	As above, CTSCo have not responded to stakeholder issues raised.	Amended EIS	Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	6k	General	General		I have also been provided with the slides presented to the Queensland Farmers Federation (QFF) during their stakeholder engagement teleconference (13 February 2023). The written information on these slides no longer directly states that the water is not suitable for stock consumption. It also states that the water is non-potable for human consumption. However, water for human and stock (intensive) consumption is often subject to treatment using reverse osmosis. This would resolve both the high TDS and sodium concentrations for human consumption and, if required, the fluoride concentrations for stock. In my opinion, CTSCo's opinion of water use in agriculture is based on an out-dated understanding of agriculture. Although I wasn't present in that meeting to hear accompanying discussions. I am deeply concerned that CTSCo are changing their messaging as they progress through community consultation such that it is no longer consistent with the EIS.		Amended EIS	Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	7	General	General		I have serious concerns that CTSCo have already provided misleading information within the EIS and directly to me as a stakeholder of this project. If substantial amendments are not made to the EIS, particularly around statements of the suitability and use of Precipice Sandstone water, they will have intentionally provided false and misleading information to the Department of Environment and Science. Based on our significant experience and research I believe the water from the target aquifer is suitable for stock consumption as is and with minimal treatment would be suitable for human consumption. As such we request that the EIS, and the CTSCo project, is rejected.		Amended EIS	Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	1	General	General		Glencore CTSCo EIS Submission This submission has been prepared by Ken Cameron from Cameron Pastoral Company Pty Ltd (CPC) with technical support from: - Ned Hamer – Principal Hydrogeologist (Earth Search) - Matt Norton – Principal Consultant (Agricultural Development Services Australia Pty Ltd)		Amended EIS	See Appendix 01D, and Appendix 03A.
24	2	General	General		Introduction Representatives of Cameron Pastoral Company Pty Ltd (CPC) and the Sunpork Group have reviewed the EIS and object to the project. The pursuit of the targeted aquifer as a Carbon Capture and Storage (CCS) reservoir at the proposed location is in direct conflict with Legislation that protects this formation as a water resource within the Great Artesian Basin (GAB) for current and future communities in an arid and highly water-constrained region. We strongly discourage this direction and encourage exploration of other more viable means of meeting CO2 abatement targets. Major flaws in the EIS are summarised in the section below, with further detail provided in a table format suggested by the Queensland Government Department of Environment and Science (DES).		Amended EIS	Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	3a	General	General		General EIS Flaws: 1. Unsuitable CCS target formation. High value (yields and quality) protected GAB water resource aquifer in an arid and water-constrained region.		Amended EIS	Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	3b	General	General		2. Unorthodox and contentious approach. Conflicts with global CCS best practice and a global first proposal to inject CO2 into a water resource aquifer).		Amended EIS	Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	3c	General	General		3. The Impact assessment groundwater modelling ignores the effects of water bore pumping on the movement and expansion of the CO2 plume.		Amended EIS	Chapter 9 Groundwater, sections 9.6.2, 9.9.2, 9.9.4, and 9.9.6.
24	3d	General	General		4. Inadequate aquifer characterisation, and proposed monitoring of CO2 plume.		Amended EIS	Chapter 9 Groundwater, sections 9.6, 9.7, and 9.10.
24	3e	General	General		5. Misleading terminology throughout, particularly use of "saline" aquifer "unsuitable for aquatic ecosystems, stock water, and drinking water".		Amended EIS	Chapter 9 Groundwater, section 9.7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	3f	General	General		6. Misleading and inadequate consultation. This includes no consultation with adjacent landholder with Precipice Sandstone water licence.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement; Appendix 03A, and Appendix 03C.
24	3g	General	General		7. Misleading and inadequate communication of what the trial is leading to. (What is the extent and basic components of the scaled-up project?)		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, sections 1, 3, 4, and 12; Chapter 2 Proposed Project Description, sections 2.3, 2.5, 2.6 and 2.8; and Chapter 4 Approvals, section 4.4.9.
24	4a	General	General		General Notes: Unsuitable Project Location - Significant funding has been set aside by the federal and state governments to support the transition to renewable energy and the reduction of greenhouse gas emissions from existing sources. A proportion of this funding has been for the development of geological sequestration of CO2 as a viable and socially accepted mechanism.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.2 and 2.3.
24	4b	General	General		- It is important, then, that public engagement is carefully considered and a social license to operate is nurtured. A large component of this process relates to assessment and selection of appropriate geological storage formations (targets), that are technically, environmentally, and socially viable. This is why deep saline aquifers and/or conventional hydrocarbon reservoirs are the normal setting for injection feasibility assessments. The need to rapidly assess carbon abatement technologies for existing energy sources as part of the future energy mix is clear, but needs to be balanced with robust checks and balances through Government intervention to ensure targets are identified that have a strong chance of being scaled up without unacceptable impacts.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.2 and 2.3.
24	4c	General	General		- The identification of a good "showcase" first project in the region to demonstrate the technology is critical for future acceptance of the industry and approvals of scaled up projects. This proposal to inject into a valuable water resource is likely to set back broader CCS acceptance, be significantly detrimental to Queensland's path to be Net Zero by 2050, and result in a slowing of carbon abatement.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.2 and 2.3.
24	4d	General	General		- There is a lack of evidence for a systematic review of project alternatives from a higher-level carbon abatement options perspective, down to a review of geological formations evaluated. For example, it is unclear why the deeper Showground Sandstone below the GAB, was not considered. If there was a financial barrier, this should have been clearly communicated.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2 and 2.3; and Chapter 8 Geology, sections 8.4, 8.5, 8.6, and 8.7.
24	4e	General	General		- The geological formation targeted for CO2 injection is the Precipice Sandstone which is a recognised major aquifer within the Great Artesian Basin (GAB). It is regarded as a high-quality aquifer (in terms of groundwater yields and quality) across most of the Surat Basin where it occurs. Groundwater from this aquifer provides an invaluable supply of water to numerous towns (such as the city of Toowoomba, and the towns of Dalby and Miles), agricultural enterprises, power stations and other regionally important facilities across southern QLD. Given its depth and impressive aquifer properties, the formation provides high security of supply and is increasingly being targeted by high-value businesses and enterprises in the region. The progressive Western Downs Regional Council are currently drilling a bore into the deep Precipice Sandstone at Dalby to provide water security to the growing town and region.		Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	4f	General	General		- The pursuit of the Precipice Sandstone aquifer within the EPQ10 tenement as a CCS reservoir is in direct conflict with Acts which protect the formation as a water supply aquifer and interconnected system which supports springs and other Groundwater Dependant Ecosystems (GDE). We strongly discourage this direction and encourage exploration of other more viable means of meeting CO2 abatement targets.		Amended EIS	See Chapter 4 Approvals; Chapter 9 Groundwater, section 9.3; and Chapter 14B Aquatic Flora and Fauna, sections 14B.2, 14B.3.6, 14B.3.7, 14B.3.9, and 14B.5.3.
24	5a	General	General		Contentious Approach Inconsistent with Global Best Practice - Trials are typically designed to prove the feasibility of a larger CCS project. Glencore have not been transparent about key components of this larger project. The EIS should communicate what the uncertainties and risks are for the larger CCS project and how the pilot will address them. This work needs to be completed before the pilot. Even at a local scale the trial is risky and controversial. To obtain approval for a contentious trial which conflicts with global best practice there needs to be a clear vision of what the risks and opportunities lie ahead for a scaled-up project.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, sections 1, 3, 4, and 12; Chapter 2 Proposed Project Description, sections 2.3, 2.5, 2.6 and 2.8; and Chapter 4 Approvals, section 4.4.9.
24	5b	General	General		- Being a valuable aquifer suitable for water supply, the CO2 storage target is atypical compared to normal CCS project scenarios. In all other global CCS projects, the injection storage target is either a conventional hydrocarbon reservoir or a deep, highly saline formation (often both), where very poor groundwater quality means it has little value.		Amended EIS	See Chapter 9 Groundwater, section 9.4 and Appendix 09A.
24	5c	General	General		- Approval of CCS projects are usually conditional upon scientific studies to show that injectate leakage into overlying water supply aquifers are highly unlikely to occur. In stark contrast, this CTSCo projects seeks approval to deliberately target a water supply aquifer for waste storage.		Amended EIS	See Chapter 8 Geology, sections 8.5, 8.6, and 8.7; and Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, and 9.10.
24	5d	General	General		- A significant aspect of the feasibility of the CTSCo project rests on the incorrect interpretation that the CO2 injection target formation (Precipice Sandstone aquifer) contains a high salinity groundwater, which is not a viable water supply resource and therefore has no value.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
24	5e	General	General		- CTSCo drilled a pilot injection well into the Precipice Sandstone west of Moonie to test the salinity and other aquifer properties. Contrary to their expectations, this testing encountered low salinity groundwater (1850ppm total dissolved solids (TDS)). At this point in the project, exploration for a more suitable target formation should have shifted elsewhere. Instead CTSCo have requested approval to commence liquified CO2 injection into the Precipice Sandstone aquifer within the same injection well drilled during the initial exploration programme. This injection proposal forms the basis for their project and preparation of this EIS.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
24	FOOTNOTE BELOW	General	General		¹ QLD Government 2017, Water Plan (Great Artesian Basin and Other Regional Aquifers), 2 September 2017		Amended EIS	See Chapter 9 Groundwater, section 9.3.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	6a	General	General		Conflict with Existing and Future Aquifer Users - The GAB aquifers are protected by both the Environmental Protection Act 1994 and Water Act 2000. Within the Water Act, the GABORA Water Plan (2017 ¹) recognises the high value of the GAB water resource, the risk of overuse and other threats, and seeks to limit the take of GAB water to sustainable levels for the future protection of the Queensland communities who rely on the GAB. One key mechanism of the Water Plan is the requirement for assessment and approval of licenced water entitlement relocations, with the intent that these will only be approved if the relocation moves entitlements away from areas under water availability stress and close to users, towards areas under less stress and away from existing users. This includes areas under stress from over-pumping and close to receptors (existing entitlements (users), springs and groundwater dependant ecosystems (GDES)).		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 14B Aquatic Flora and Fauna, sections 14B.2, 14B.3.6, 14B.3.7, 14B.3.9, and 14B 5.3.
24	6b	General	General		- In the CTSCo project area, all overlying aquifers are fully allocated, and new water licences cannot be granted under the Water Plan. Water availability is the major constraint to expansion or intensification of agriculture and development of the region. This area is one of the few remaining areas within the Surat Basin Water Plan Area where Precipice Sandstone relocations are being approved, due to the significant distance from existing users and springs in the shallower north and east basin areas.		Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.4, 9.7.5, 9 9, and 9.10.
24	6c	General	General		- Existing entitlements within the Precipice Sandstone provide the last remaining secure water parcels for development of communities in the region and expansion of business. Strong, locally-established businesses and large employers across the broader region such as Sunpork Group, Cameron Pastoral Company, Australian Country Choice and Mort and Co all hold entitlements within the deep Precipice sandstone which they are either currently utilising or have invested for imminent future growth and security.		Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.4, 9.7.5, 9 9, and 9.10.
24	6d	General	General		- The depth of the Precipice Sandstone aquifer in the Southern Surat (Moonie) area makes it more attractive to larger-scale future water users due to:		Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.4, 9.7.5, 9 9, and 9.10.
24	6da	General	General		- Minimised interference from relatively sparse existing users that exist in a dense network (including stock and domestic bores) at shallower locations;		Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.4, 9.7.5, 9 9, and 9.10.
24	6db	General	General		- Distance from protected and highly vulnerable Precipice Sandstone source-aquifer springs and groundwater dependant ecosystems (GDEs) located in the north of the basin;		Adequately dealt within the EIS, no change to the EIS	See Chapter 14B Aquatic Flora and Fauna, sections 14B.2, 14B.3.6, 14B 3.7, 14B.3.9, and 14B.5.3.
24	6dc	General	General		- Long term security of supply supported by substantial sub-artesian pressure and "available head" above the aquifer (and pumps) in water supply bores; and		Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.3, 9.7.4, 9.7.5, 9 9, and 9.10.
24	6dd	General	General		- Higher chance of regulatory approval for the relocation of more substantial Precipice Sandstone aquifer water entitlements to the south of the basin under the GABORA Water Plan (2017) assessment rules.		Amended EIS	See Chapter 9 Groundwater, section 9.3, 9.6.2, 9.7.3, 9.7.4, 9.7.5, 9 9, and 9.10.
24	6ea	General	General		Cameron Pastoral Company own a 20,150 hectare property adjacent to the CTSCo injection site which hosts a mixed piggery, cropping, and grazing operation. They own a further 25,000 hectares in the broader Goondiwindi/Moonie districts. The piggery operation has an approved capacity of 131,000 standard pig units across three sites with a further 138,000 SPU proposed in two new sites. Subject to the approval, it is anticipated that there will be a total of 269,000SPU across the property which would be the largest piggery operation in Queensland. <u>CPC hold significant Precipice Sandstone aquifer entitlements which are attached to their property which adjoins the CTSCo project (see map).</u> CPC are partners within the Sunpork Group. SunPork is Australia's largest pork producer with almost a quarter of their production located at this adjacent property. CPC have invested heavily in the location given the proximity to secure GAB groundwater required for the health and welfare of the livestock in their care. Expansion is underpinned by the availability of the Precipice Sandstone aquifer water resources. CPC have an approved Development Permit (DP) for the drilling of a Precipice Sandstone water supply bore linked to their Precipice Water License which is located 9.5km from the CTSCo injection well. The overlapping effects of water supply pumping and CO2 injection have been ignored, and has not been modelled or assessed in the EIS.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, 9.7.4, 9.9 and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3, 20 5, and 20.6.
24	6eb	FIGURE			Modified Figure 9-9 Water licences and registered bores for groundwater within 50km of the West Moonie-1 Injection Well from draft EIS		Noted	draft EIS, Chapter 9 Groundwater, modified by submitter
24	6f	General	General		- The nearby Lillyvale Feedlot has a 2200m deep bore into the Precipice Sandstone (similar depth to the CTSCo injection well), drilled under a strong business case to support expansion and provide security of supply to their operations.		Amended EIS	See Chapter 9 Groundwater, sections 9.7.
24	6g	General	General		- Due to escalating demand, the cost of Precipice Sandstone aquifer entitlements has increased ten-fold from \$1,420/ML in 2016 when Sunpork and CPC purchased the final remaining Precipice Sandstone entitlement from the General Reserve available in the Water Plan, to a current value of approximately \$15,000/ML.		Amended EIS	See Chapter 9 Groundwater, sections 9.7.
24	6h	General	General		- The above examples prove the rapidly growing value of the deep Precipice Sandstone water resource within the immediate area to the community and businesses within the broader region.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
24	6i	General	General		- The aquifer is protected by legislation, and regulations do not allow waste products to be injected and thus deteriorate the aquifer. Queensland's regulatory landscape is not designed for sequestration projects of this type and so a precautionary approach must be adopted. The potential benefits of CCS must be considered with regard to Queensland's long term water security and the inherent value of the Great Artesian Basin groundwater.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals; and Chapter 9 Groundwater, sections 9 3 and 9.10.
24	7a	General	General		Inadequate Impact Assessment - The EIS notes that "The lowering of the pH has the potential to mobilise trace elements including arsenic, cadmium, chromium, copper, nickel, lead and selenium from the surrounding rock into the formation at concentrations which may initially exceed the Australian drinking water guidelines." The influence on the CO2 plume movement from approved future pumping from an adjacent Precipice Sandstone pumping bore, and likely increasing use of this aquifer in the area have been ignored and have not been modelled within the EIS studies. The risks of adverse outcomes such as CO2 degassing and short-circuiting to atmosphere through pumping bores, and aquifer rock/water geochemical interactions and metal mobilisation risks under a dynamic (pumping) hydraulic regime should be revisited, remodelled and the risks to the water resource reassessed.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09B, 09C, and 09D.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	7b	General	General		- Insufficient aquifer (reservoir) characterisation has been completed and inadequate monitoring of the CO2 injection and plume movement is proposed. Details of these inadequacies are provided in the tables below.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology; Appendices 08A and 08B; and Chapter 9 Groundwater; Appendices 09A, 09B, 09C, 09D, 09E, and 09F; and Chapter 22 Proposed EA Condition Amendments.
24	8a	General	General		Poor Stakeholder Engagement and Misleading Terminology - The use of misleading terminology throughout the EIS and associated “fact Sheets” and public consultation materials to characterise the target injection aquifer such as “saline” aquifer “unsuitable for aquatic ecosystems, stock water, and drinking water”. Given the viability of the project hinges on such aquifer characterisations, the terminology is deceptive.		Amended EIS	See Executive Summary, section 9.5.2; and Chapter 9 Groundwater, section 9.7 5.3, 9.7.7, and 9.9.7.1.
24	8b	General	General		- CTSCo’s public consultation process has been inadequate. CPC, the neighbouring property owner and holder of Precipice Sandstone licenced entitlements, were not consulted. Instead, CPC approached CTSCo after release of the EIS for a request to meet and explain the project and the EIS.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement; Appendix 03A, and Appendix 03C.
24	8c	General	General		- Poor stakeholder engagement by CTSCo, has meant that planned future groundwater abstraction from the target aquifer has not been correctly identified. Therefore, the EIS groundwater impact assessment modelling has not accounted for the future pumping of groundwater by Cameron Pastoral Company (CPC), or other potential future groundwater users, from the Precipice Sandstone aquifer. Groundwater impact assessment modelling is predictive and needs to be forward-looking, taking into account credible future groundwater abstraction scenarios. Future groundwater pumping for water supply purposes is a significant risk to the CTSCo project, both at the proposed pilot scale and at full-scale operation.		Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, 9.7, 9.8, 9.9 and 9.10; and Appendices 09A, 09B, 09C, and 09D.
24	1	General	General	About the Project	<i>“...only a relatively small volume of GHG stream to be injected and permanently stored as part of the injection testing”</i>	Pilot trials are conducted as a required pre-cursor to scaled up injection. As well as the pilot trial volumes (110ML/year), the EIS should be transparent regarding the intended future scale of injection if the testing phase is successful. CTSCo claim that the targeted GAB aquifer (Precipice Sandstone) has a storage capacity of up to 730 billion litres of CO2, but are not transparent about the spatial extent of the aquifer this would occupy and how many existing Precipice Sandstone bores supplying towns and businesses this would affect.	Amended EIS	See Chapter 4 Approvals, section 4.4 9.
24	2a	General	General	Geology and Groundwater	<i>“At the injection site, the existing water quality of the Precipice Sandstone aquifer is characterised as having low water quality that is saline, high in iron (long term), high in fluoride, and high in total dissolved solids. Compared to legislative policies and guidelines, the water is unsuitable for aquatic ecosystems, and unsuitable for irrigation water, stock water, and drinking water.”</i>	The terms “saline” and “unsuitable for irrigation water, stock water, and drinking water” are highly misleading. This is a crucial mischaracterisation of groundwater in the Precipice Sandstone at the site and should not be included in the EIS, “fact” sheet nor community consultation materials and presentations.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
24	2b	General	General	Geology and Groundwater		It should be clearly noted that the Precipice Sandstone is a valuable water supply aquifer, part of the Great Artesian Basin, a generally recognized important current and future groundwater resource, exhibits normal water quality ranges for GAB aquifers, is suitable for stock watering untreated and is easily improved via treatment or blending if required for higher value purposes such as town drinking water. The CTSCo project investigations (specifically drilling and testing of Precipice Sandstone groundwater quality and yields) has helped prove the value of the groundwater resource to stakeholders as an important outcome of the CTSCo exploration activities. The groundwater quality does not align with any common definitions of “saline groundwater”. It is not strictly “fresh” but instead falls within the slightly brackish range and therefore has significant agricultural value, and significant higher values with minimal treatment. One definition of saline formations in the context of CCS is given here (Benson and Cook, 2019, Ch5) ² : <i>“Saline formations are deep sedimentary rocks saturated with formation waters or brines containing high concentrations of dissolved salts. These formations are widespread and contain enormous quantities of water, but are unsuitable for agriculture or human consumption.”</i>	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
24	2c	General	General	Geology and Groundwater		The “high” iron and fluoride” statements are a very weak argument for the misleading claims that the water is “unsuitable for irrigation water, stock water, and drinking water.” Elevated iron and fluoride levels are very common in GAB aquifers and bores and are not known to be problematic for livestock use. Data is provided to support this further in the submission. In any case these compounds are easily addressed with through amendment/treatment or dealt with through balancing these minerals within the livestock food sources.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
24	3	General	General	Geology and Groundwater	<i>“With the injection of a GHG stream, the groundwater quality within the GHG plume is expected to reduce to pH 4, and the water within the GHG plume will still be unsuitable for use”</i>	Injection will result in a 10,000-fold increase in groundwater acidity (pH reduction from 8 to 4) within the plume. As noted in the EIS – Chapter 9: Groundwater, this would result in rock dissolution and mobilisation of metals such as arsenic and lead which would render the water unsuitable for use and negatively impact water quality beyond the immediate CO2 injectate plume within a dynamic injection and (landholder) pumping environment. See further comments provided regarding the deliberate omission of licenced pumping within groundwater impact assessment modelling.	Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7.5, 9.8, 9.9, and 9.10; and Appendices 09A, 09B, 09C and 09D.
	FOOTNOTE	General	General		² Negative Emissions Technologies and Reliable Sequestration: A Research Agenda (2019) National Academies of Sciences, Engineering, and Medicine, Washington DC.		Amended EIS	See Chapter 9 Groundwater, section 9.7.5.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	4a	General	General	Geology and Groundwater	<i>"Extensive sampling, testing and analysis including geological and groundwater modelling indicates that the injected GHG plume is predicted to remain within the Precipice Sandstone aquifer in perpetuity, have an extent of approximately 500 metre surrounding the injection site, staying within the boundaries of the properties that form the Project"</i>	This statement is misleading. Does the 500m extent relate to the "perpetuity"? What is meant by "perpetuity"? Why isn't this simply quantified in modelled years until the plume exits the site boundary?	Amended EIS	See Chapter 9 Groundwater, sections 9.6 and 9.9; and Appendices 09A, 09B, 09C and 09D.
24	4b	General	General	Geology and Groundwater		It should be noted that testing did not appear to include long-term test-pumping of the injection well to obtain large-scale aquifer hydraulic properties and assess boundary conditions. Only very short-term testing of the very local scale rock at the injection well was undertaken. Long term pump testing are a fundamental requirement for aquifer characterisation to obtain representative aquifer hydraulic and water quality data as inputs to hydrodynamic and geochemical modelling. Long term pump testing and monitoring should have been undertaken on the injection/monitoring bores.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8 and 9.9; and Appendices 09A, 09B, 09C and 09D.
24	4c	General	General	Geology and Groundwater		Modelling does not account for the effects of future water supply pumping in terms of risk to abstractor and to the CTSCo project. Modelled plume extent does not account for the likely changes in groundwater flow regime (namely hydraulic gradient and groundwater flow velocities) induced by pumping.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8 and 9.9; and Appendices 09A, 09B, 09C and 09D.
24	4d	General	General	Geology and Groundwater		What is the definition of "plume" in this context. It should include not just the portion of the aquifer containing liquid CO ₂ , but also the broader area around the CO ₂ plume which contains modified (by CO ₂ rock/water interactions) water quality.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09A, 09B, 09C and 09D.
24	5	General	General	Rehabilitation	A limited list of commitments is given.	Mention should be made of commitments to remediation of potential groundwater impacts and include a timeframe for CTSCo responsibility, to avoid passing any future clean-up costs and environmental damage legacy to the taxpayer	Amended EIS	See Chapter 9 Groundwater, section 9.10.
	6a	General	General	Proven Technology	CCS is correctly noted as a proven technology and mentions 30 global operating projects.	This is misleading. CCS into a water supply aquifer has not been attempted, nor proven. The factsheet should note that injection into a water supply aquifer and valuable groundwater resource has never been attempted before, anywhere in the world. This aspect of the project is novel, with no apparent existing case studies or other worldwide CCS projects planning (non-saline) aquifer injection. A 2022 report prepared by CSIRO ³ on 'Australia's Carbon Sequestration Potential' consistently talks of targeting saline aquifers and avoiding aquifers that are used for water supply. It may be that the CTSCo project in EPQ7 (Wandoan) is a suitable case study, but the lessons learned from this abandoned project (due to unacceptable risk of injection into the Precipice Sandstone aquifer), are not made explicit in the EIS. Normal CCS options are illustrated below ⁴ . Water supply aquifers are not included:	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.3 and 2.13; Appendix 09A.
24	6b	General	General	Proven Technology		Figure in submission	Noted	Noted
24	6c	General	General	Proven Technology		UQ-SDAAP ⁵ reports that: " <i>Community risk tolerance and trust (in both the industry and regulator) are thought to be low</i> ". Therefore, it is important that the technology can be demonstrated to be safe in an unproven and unorthodox setting prior to approval	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.3 and 2.13; Appendix 09A.
	FOOTNOTE	General	General		³ https://www.csiro.au/en/research/environmental-impacts/emissions/carbon-sequestration-potential ⁴ Negative Emissions Technologies and Reliable Sequestration: A Research Agenda (2019) National Academies of Sciences, Engineering, and Medicine, Washington DC. ⁵ Honari V, Gonzalez S & Garnett A (2019), Site appraisal plan, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report The University of Queensland		Noted	Noted
24	1a	0	Executive Summary	Section 1.	<i>"If future large-scale CCS is to be adopted, viable storage locations are required to be developed."</i>	There is a substantial need for CO ₂ abatement in Queensland and Australia. The credibility of future CCS projects and social licence to operate is put at risk if non-viable locations are developed. This is particularly relevant to this first "showcase" project for QLD. The viability of this project, which proposes to inject directly into a valuable water supply aquifer, is questionable.	Adequately dealt within the EIS, no change to the EIS	See Executive Summary, section 1.
24	1b	0	Executive Summary	Section 1.		A key risk identified by the UQ-SDAAP assessment work ⁶ is "R51" (maturity of assessment). This risk concerns the limited window of opportunity for CCS (to meet policy objectives) and need to gather convincing data for social acceptance and regulatory approvals. There is little point in undertaking pilot trials that are unlikely to proceed to full-scale operation, as it could be perceived by the public as using taxpayer money for a greenwashing exercise ⁷ . The EIS should repeatedly provide comment on the implications for full-scale approval using the study findings.	Amended EIS	See Chapter 4 Approvals, section 4.4 9.
24	FOOTNOTE	0	Executive Summary		⁶ Honari V, Garnett A & Underschultz J (2019), Risk register report, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ⁷ https://www.afr.com/companies/mining/green-groups-dob-in-glencore-for-greenwashing-20220907-p5bg35 ⁸ Garnett AJ, Underschultz JR & Ashworth P (2019), Executive Summary: Scoping study for material carbon abatement via carbon capture and storage, The University of Queensland Surat Deep Aquifer Appraisal Project, The University of Queensland.		Noted	Noted

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	2a	0	Executive Summary	Section 1.	<i>"The primary purpose of the proposed Project, being CTSCo's injection testing of a GHG stream, is to demonstrate the viability of geological storage of CO2 in the Surat Basin to allow the later assessment of the region for potential future large-scale CO2 storage. The Project has been scaled to adequately demonstrate the monitoring and verification technologies that would be required for any future large-scale GHG stream geological storage project, with only a relatively small volume of GHG stream to be injected and permanently stored as part of the injection testing."</i>	"Large-scale" should be defined and comments made concerning magnification of impacts observed from test phase being scaled up. Some inferences should be drawn regarding the feasibility of scaling up the pilot trial to a full-size project beyond just monitoring and verification technologies. For example, UQ-SDAAP8 assess that a fullscale project could result in "an area of around a 10 km radius of the Precipice Sandstone at a depth of over 2.3 km, immediately around the injection sites, would not be available for future groundwater abstraction."	Amended EIS	See Chapter 4 Approvals, section 4.4.9.
24	2b	0	Executive Summary	Section 1.		The EIS should be transparent regarding the intended future scale of injection if the testing phase is successful. CTSCo claim that the targeted GAB aquifer (Precipice Sandstone) has a storage capacity of up to 730 billion litres of CO2, but are not transparent about the spatial extent of the aquifer this would occupy and how many existing Precipice Sandstone bores and businesses this would affect.	Amended EIS	See Chapter 4 Approvals, section 4.4.9.
24	3a	0	Executive Summary	Section 1.	<i>"CTSCo completed an initial assessment on the capacity of the target reservoir in the EPQ10 tenement (being the Precipice Sandstone aquifer) for GHG storage"</i>	This was an assessment of 'capacity,' but many confined water-supply aquifers have similar sequestration capacity - it defines the formations as aquifers. Many of the criteria for high quality CCS reservoirs (storage capacity, permeability, etc) are the same criteria that make the formations high quality water supply aquifers. An exception is water quality which, if high is a negative criteria for CCS and a positive criteria for a water supply aquifer.	Adequately dealt within the EIS, no change to the EIS	See Executive Summary, section 1.
24	3b	0	Executive Summary	Section 1.		This EIS needs to be transparent about the water quality criteria which renders the Precipice Sandstone unsuitable as a CCS reservoir.	Amended EIS	See Executive Summary, section 1; and Chapter 9 Groundwater, sections 9.7, 9.9, and 9.10.
24	3c	0	Executive Summary	Section 1.		The positive findings of the capacity assessment appear to have overshadowed the high quality water finding and resulted in a project starting position of the Precipice Sandstone aquifer being a suitable injection target in more than just the capacity criterion. This goes against the acknowledged understanding within the CCS sector (and all other sectors) that water supply aquifers should not be targeted as they are a sensitive receptor. Where other projects have been approved it is conditional upon the avoidance of leakage from the target formation into aquifers like the Precipice Sandstone, rather than deliberately injecting into them. Academic research into CCS and groundwater impacts has a common standpoint of protecting water resources ⁹ .	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11 and 9.12.
	FOOTNOTE	0	Executive Summary		⁹ Lions, J. et al (2013). 'Potential impacts of leakage from CO2 geological storage on geochemical processes controlling fresh groundwater quality: A review'. International Journal of Greenhouse Gas Control 22 (2014) 165–175.		Noted	Noted
24	4a	0	Executive Summary	Section 1.	<i>"CTSCo does not propose the use of any novel or emerging technology as part of the injection testing."</i>	This is misleading. Although the technology is not novel, the storage target setting is novel as, globally, no other projects are known to target a water supply aquifer for CO2 storage. The preferred targets for receiving the waste stream are deep saline formations and often within the confines of existing or historic conventional oil and gas fields.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.3 and 2.13; Appendix 09A.
24	4b	0	Executive Summary	Section 1.		For example, the Bridgeport Energy project ¹⁰ in the southern Surat Basin is a proposed CCS project that also seeks to sequester CO2 from Millmerran power station into the Precipice Sandstone. However, this storage target setting is a defined, localised, structurally-bounded reservoir where the Precipice Sandstone hosts a mature and depleted conventional oil reservoir where groundwater is naturally (locally) impacted by hydrocarbons and of low value as a water resource.	Not relevant to the EIS	N/A
24	5	0	Executive Summary	Section 2.	<i>"CTSCo has not committed any breaches against the Acts and regulations of Queensland or Australia, and has not been prosecuted under any relevant Queensland or Australian environmental laws since its establishment."</i>	This statement is misleading. CTSCo is a relatively new subsidiary specifically established for this project. Reference should be made to relevant breaches and prosecutions concerning Glencore, as the parent company.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, section 2; and Chapter 1 Introduction, section 1.1.
24	6	0	Executive Summary	Section 3.	<i>"...consider feasible alternative ways to carry out the Project"</i>	Mention should be given to any alternative storage targets that have been assessed by CTSCo, and why they were considered unfeasible, especially those that fit the more usual highly-saline or hydrocarbon reservoir settings, as opposed to water-supply aquifers. This should include alternative geological targets outside the CTSCo tenements, as the selection of tenements themselves by the proponent, not just exploration within the tenements should form part of the required project assessment of alternatives. Why was this tenement chosen, and was there a "back-up" formation if the Precipice proved to be unfeasible (ie suitable as a water resource).	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.3, 2.5, and 2.15.
	FOOTNOTE	0	Executive Summary		¹⁰ https://newhopegroup.com.au/news-articles/?article_id=6321&&type=news		Noted	Noted

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	7a	0	Executive Summary	Section 3.	"...give information to other Commonwealth and State authorities to help them make informed decisions.	Later sections of the EIS give arguably insufficient and incorrect information and context, including discounting the Environmental Values assigned to the groundwater resource. Also, impacts to and from the project related to future groundwater users has not been fully assessed. "It is noteworthy to mention that the current availability of water in the GABORA is in the Precipice Sandstone and it is therefore expected to see growth for future use or requests for allocations. In addition, the Water Act and GABORA seek to protect groundwater resources which appears to be in direct conflict with large scale injection." ¹¹	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6, 9.7 and 9.9.
24	7b	0	Executive Summary	Section 3.		Prior to the EIS submission, were the state and federal governments clearly informed that the target formation: - is a GAB aquifer, - contains high quality groundwater at the injection site, - is an aquifer highly critical to future growth and expansion to the region, and - has a Precipice Sandstone licenced entitlement holder on the property adjacent to the project property?	Adequately dealt within the EIS, no change to the EIS	See Chapter 1 Introduction, section 1.3; and Chapter 3 Community and Stakeholder Engagement; and Appendix 03A.
	FOOTNOTE	0	Executive Summary		¹¹ Honari V, Garnett A & Underschultz J (2019), Risk register report, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ¹² Garnett AJ, Underschultz JR & Ashworth P (2019), Executive Summary: Scoping study for material carbon abatement via carbon capture and storage, The University of Queensland Surat Deep Aquifer Appraisal Project, The University of Queensland. ¹³ Honari V, Gonzalez S & Garnett A (2019), Site appraisal plan, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ¹⁴ Honari V, Garnett A & Underschultz J (2019), Risk register report, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ¹⁵ https://natural-gas.centre.uq.edu.au/ccs		Noted	Noted
24	8	0	Executive Summary	Section 4.1	"CTSCo's injection testing seeks to demonstrate the viability of storage in the Surat Basin for potential future large- scale CO2 storage"	Concerning viability, reference should be made to the novel hydrogeological scenario of the proposals and the clear conflict with current and potential future water licence holders. The assessment should more clearly and transparently describe local risks to groundwater resources, and wider risks to public acceptance of CCS projects which could be carried out in more orthodox settings. The UQ-SDAAP project "demonstrates that a material abatement opportunity is likely to be a feasible option in the Surat Basin" ¹² . SDAAP prepared a template for site appraisal ¹³ and a risk register ¹⁴ , in addition to many other publicly available reports ¹⁵ . It would be beneficial for the CTSCo project to be evaluated within the EIS against the risks that UQ-SDAAP identified.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09B, 09C and 09D.
24	9	0	Executive Summary	Section 4.1	The "Carbon Capture and Storage Method 2021 – Simple Method Guide" (CER, V1 September 2021) is referenced	This guide describes storage 'reservoirs' and does not mention viable water-supply aquifers as storage targets.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.3.1.
24	10	0	Executive Summary	Section 4.1.1.1	"Globally, the technology to capture, transport and inject a GHG stream into a deep reservoir is well proven."	Injecting GHG (or any wastes) into a water supply aquifer, albeit deep, is unproven and not countenanced by any other CCS projects. A summary review of Australian CCS projects was presented to the UK CCS Research Community by Professor Peter Cook of Melbourne University (dated February 2021) and is available online ¹⁶ . This notes (on slide 11) that CTSCo moved from area EPQ7 to EPQ10 due to good quality water being found in the target formation (Precipice Sandstone). CTSCo are quoted as stating "lessons were learned" from this exercise. It would be helpful if these learnings were included in the EIS.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.15; and Appendix 09A.
24	11a	0	Executive Summary	Section 4.1.1.1	"An internationally analogous CCS project is SaskPower's Aquistore/Boundary Dam Project in Canada,"	This statement is misleading in that it associates projects with 2 highly contrasting reservoir characteristics – one viable and one not viable. This is not an analogous project given that SaskPower's injection was into a highly saline formation. The proponent's literature ¹⁷ states: "While these formations are defined as aquifers because they contain water, they do not contain drinkable water, or water that could be used for any agricultural purpose; this water is four to five times saltier than the ocean. These formations cover a vast area in west-central North America. In the area targeted they have no currently identified economic potential, other than as storage units for greenhouse gases."	Amended EIS	See Chapter 9 Groundwater, section 9.4.3; and Appendix 09A.
24	11b	0	Executive Summary	Section 4.1.1.1		It would be less misleading to state that there are no fully analogous CCS projects. No industry experts that were informally contacted could give global examples and instead stated that injection into a viable water supply aquifer was 'unusual' and considered 'unlikely to be approved by regulators'.	Amended EIS	See Chapter 9 Groundwater, section 9.4; and Appendix 09A.
24	12	0	Executive Summary	Section 4.1.1.2	An example of an Australian CCS project is given as Chevron's Gorgon project.	It is noted that The Australia Institute published an independent report stating that the Gorgon project "...has a disastrous record to date." ¹⁸ Also, the storage target (Dupuy Formation) is a highly saline formation ¹⁹ .	Amended EIS	See Appendix 09A.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
	FOOTNOTE	0	Executive Summary		<p>¹⁶ https://ukccsrc.ac.uk/wp-content/uploads/2021/02/21.02.16-Peter-Cook.pdf</p> <p>¹⁷ Global CCS Institute (2015). Aquistore - Project Summary Report</p> <p>¹⁸ https://australiainstitute.org.au/wp-content/uploads/2021/10/P1110-Australia-Institute-submission-to-ERF-method-consultation-WEB.pdf</p> <p>¹⁹ Flett, Matthew et al. (2008). Gorgon Project: Subsurface Evaluation of Carbon Dioxide Disposal Under Barrow Island. Paper presented at the SPE Asia Pacific Oil and Gas Conference and Exhibition, Perth, Australia.</p>		Noted	Noted
24	13a	0	Executive Summary	Section 5.1	“...development by the administering authorities of suitable EA conditions for injection testing in EPQs, and injection within GHG storage leases (QLs) would not occur or be delayed for several years”	This is not a reason for a project, particularly an ill-conceived and rushed project. The development of template QLD Government EA Approval Conditions for CSG projects should occur separately and in advance of the EIS preparation in consultation between the QLD Govt, CTSCo and other interested parties. It should not be triggered by a rushed project.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 22 Proposed EA Condition Amendments
24	13b	0	Executive Summary	Section 5.1		The do nothing alternative should also discuss the potential negative impact to public relations for CCS in Australia and globally from proposing to inject into a valuable groundwater resource. Note that other options are being assessed such as by Bridgeport Energy in the Moonie Oil Field. The ‘delay’ is only for this particular project. However, it is recognised that there is no established regulatory pathway for CCS projects in Queensland ²⁰ . Consideration should be given to pausing pilot trails until this work has been progressed by the administering authorities.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 22 Proposed EA Condition Amendments
	FOOTNOTE	0	Executive Summary		²⁰ Robertson & Garnett (2018), Discussion document - A regulatory review of greenhouse gas storage - governance of pressure impacts in the GAB, Queensland, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Noted	Noted
24	14a	0	Executive Summary	Section 5 2	CTSCo give some reasons for not pursuing EPQ7 at Wandoan. These include the Precipice Sandstone being a water supply source and related risks to water quality. The rationale for moving to EPQ10 “...was that the Precipice Sandstone aquifer is saline”	This is misleading. Injection at EPQ10 presents the same risks, albeit slightly mitigated by depth of the formation. The depth of the formation at Moonie makes it more attractive to larger scale future water users due to the minimised interference from existing users distance from Springs and Precipice Sandstone groundwater-supported ecosystems, and the long term the security of supply provided by substantial “available head” above the aquifer (and pumps) in water supply bores.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.15.
24	14b	0	Executive Summary	Section 5 2		The Precipice Sandstone aquifer is <u>not</u> saline at West Moonie-1, as demonstrated in CTSCo’s own groundwater laboratory analysis of Total Dissolved Solids (TDS) (EIS Chapter 9). The rationale for choosing the site appears to be based on an early held assumption by CTSCo of salinity that CTSCo has since disproven with their own investigations. While the Precipice water quality is not as good as at Wandoan and the north of the basin (where it is largely spectacular), many of the site characteristics at EPQ10 are the same as those that made EPQ7 unsuitable. Discussion should be made of non-Precipice Sandstone storage alternatives (or Precipice oilfield reservoirs), and that groundwater was found by CTSCo to be better than expected and good enough for stock watering. Documents for the EPQ7 project are not available for review. It would be useful to understand why that storage target was identified by CTSCo as worthy of costly exploration and investigations when the groundwater is of established good quality and extensively used for town and farm supply.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, and 9.7.
24	14c	0	Executive Summary	Section 5 2		CTSCo persistently and incorrectly characterise the Precipice Sandstone groundwater in the project area as “saline” throughout the EIS documents. This is misleading, and given the viability of the project hinges on it, is deceptive. There is no agreed definitive classification of groundwater salinity. Almost all water sources, and particularly groundwater, has some levels of dissolved salts and therefore a salinity. However, a general understanding is that a salinity in TDS between 1,000mg/L and 3,000mg/L would be considered only “slightly brackish” and suitable for stock watering in most cases. To be classed as “saline”, water typically has a TDS value of over 5,000mg/L. Hem ²¹ describes a TDS range of 3,000-10,000mg/L as “moderately saline”. Freeze & Cherry ²² describe saline water as having a TDS above 10,000mg/L.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
24	15a	0	Executive Summary	Section 7 2	The monitoring period is to June 2030.	The monitoring period should be extended to allow for revised calculations of plume migration and impacts to future off-site water users abstracting from the Precipice Sandstone aquifer, including the proposed and approved bore at the CPC piggery located approximately 9.5km to the southeast. Depending on the induced gradient from Precipice Sandstone pumping by CPC and others, it could take until after 2030 for impacted water to reach the bore.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	15b	0	Executive Summary	Section 7 2		The monitoring proposed (from a single bore) is insufficient to accurately track plume movements. A monitoring network of bores in the same aquifer including at up and downgradient locations (minimum of 3 bores to allow measurement of hydraulic gradients and flow directions) is a minimum standard for most groundwater site monitoring networks. It should also be noted that UQ-SDAAP propose that monitoring bores should be installed into the Hutton Sandstone for projects of this type ²³ : "A basic well appraisal program would comprise a pair of wells per site. The 'main' well would be drilled through the BSR to a depth beneath the base-Surat unconformity. A second well would be drilled to the base of the Hutton Sandstone."	Amended EIS	See Chapter 9 Groundwater, sections 9.5, 9.8, and 9.10.
	FOOTNOTE	0	Executive Summary		²¹ Hem, J.D. (1992) <i>Study and interpretation of the chemical characteristics of natural water</i> . USGS Water Supply Paper 2254. ²² Freeze, A.R. and Cherry J.A. (1979). <i>Groundwater</i> . Textbook published by Prentice Hall. ²³ Honari V, Gonzalez S & Garnett A (2019), <i>Site appraisal plan</i> , The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Noted	Noted
24	16	0	Executive Summary	Section 7 3.1	"...corrosion resistant alloy casing,"	Potential well casing corrosion should be discussed in more detail given the known problem of CO2 impacts on metal pipework. Impact assessment should also include the potential for corrosion of future water bores and identify existing at-risk bores from future full-scale CCS operations. There are numerous petroleum exploration and production wells in the area which intersect the Precipice Sandstone. Risk mitigation methods addressing risks to cement and steel casing integrity within these wells should also be presented.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11.
24	17	0	Executive Summary	Section 7 3.1	"...regionally important aquifers, such as the Gubberamunda Sandstone"	The Hutton Sandstone (above the Precipice Sandstone) is also a regionally important aquifer (like the Precipice and Gubberamunda) and should be discussed in terms of its protection and monitoring. What is the rationale for not monitoring the immediately overlying aquifer and the intervening aquitard (The Evergreen Formation)?	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9 5, 9.8, and 9.10.
24	18a	0	Executive Summary	Section 7.4.7	Seismic monitoring to be used for plume delineation	Discussion should include methods for monitoring changes to the groundwater environment beyond the plume fringe, such as dissolved-phase contaminants moving via groundwater advection, dispersion and diffusion.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9 5, 9.8, and 9.10.
24	18b	0	Executive Summary	Section 7.4.7		What is the definition of "plume" in this context. It should include not just the portion of the aquifer containing liquid CO2, but also the broader area around the CO2 plume which contains modified (by CO2 rock/water interactions) water quality.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9 5, 9.8, and 9.10.
24	18c	0	Executive Summary	Section 7.4.7		Is seismic monitoring suitable for monitoring of these additional components of the plume which will demonstrate differing migration behaviours than the CO2 plume within a dynamic pumping-influenced hydraulic regime?	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9 5, 9.8, and 9.10.
24	19a	0	Executive Summary	Section 7 5	CTSCo identifies that leakage could occur into the Hutton Sandstone aquifer	The monitoring program should include monitoring of the Hutton Sandstone aquifer. This is a regionally important GAB aquifer.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9 5, 9.8, and 9.10.
24	19b	0	Executive Summary	Section 7 5		What is the rationale for not monitoring the immediately overlying aquifer and the intervening aquitard (The Evergreen Formation)?	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; and Chapter 9 Groundwater, sections 9 5, 9.8, and 9.10.
24	19c	0	Executive Summary	Section 7 5		At the Victorian Otway Test Centre, overlying aquifers (Port Campbell Limestone and Dilwyn Formations) above the saline Waarre Formation CCS injection target, are very closely monitored (Hortle, et al, 2011 ²⁴).	Amended EIS	See Chapter 9 Groundwater, section 9.4.3; and Appendix 09A.
	FOOTNOTE	0	Executive Summary		²⁴ Hortle A, de Caritat P, Stalvies C, Jenkins C; 2011; <i>Groundwater Monitoring at the Otway Project Site, Australia</i> , published in <i>Energy Procedia</i> pp5495-5503. ²⁵ Nisa C, Witt K, Ferguson M, Hodgson A & Ashworth P (2018), <i>Australian Energy Preferences and the place of Carbon Capture and Storage (CCS) within the energy mix</i> , The University of Queensland Surat Deep Aquifer Appraisal Project – Final Report, The University of Queensland.		Noted	Noted
24	20	0	Executive Summary	Section 8	CTSCo states they have applied learnings from the EPQ7 consultation.	The EPQ10 scenario is similar to EPQ7 in that the target is the Precipice Sandstone aquifer that has groundwater suitable for water supply. This was confirmed with water sampling analysis by CTSCo showing that the storage target is a valuable water supply aquifer. This early insight should have changed the project feasibility assessment direction and led to enhanced risk assessment work and consideration of alternative storage targets. CTSCo should state what the EPQ7 learnings were and how they have been applied. The UQ-SDAAP risk register could be used to assess the EPQ10 project against identified risks, especially those in the red and amber risk range.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.15 2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	21a	0	Executive Summary	Section 8	<i>"As a result of feedback from various stakeholders, alterations to the Project that have been included in the Project's description and approach, include: ...proposing to inject into a saline aquifer"</i>	The project is proposing to inject into a regionally important water supply aquifer that is part of the Great Artesian Basin. It should be stated in the EIS that it is not saline, and this type of CCS scenario is an unproven apparent world-first.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.
24	21b	0	Executive Summary	Section 8		Stakeholder engagement did not include contacting the neighbouring landowner (Cameron Pastoral Company (CPC) who holds substantial Precipice Sandstone licenced entitlement and has scoped, costed and approved plans to install a water supply bore into the Precipice Sandstone for stock intensive use.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4, 3.5, and 3.7; Appendices 03A and 03C; and Chapter 9 Groundwater, sections 9.6.2, 9.7.4, 9.9, and 9.10; and Appendix 09B.
24	22	0	Executive Summary	Section 9 2	<i>The project will "...contribute to the improved understanding of the feasibility of GHG stream geological storage in Queensland"</i>	Given the novelty and risk of injecting into a water supply aquifer, the project will not improve understanding of GHG storage feasibility in more normally accepted orthodox geological settings. If this trial is approved there is very limited potential for upscaling. The project may put at risk the widespread adoption of CCS by the public. This would be significantly detrimental to Queensland's path to be Net Zero by 2050 given the importance of CCS as a climate change abatement measure through the energy transition process. The UQ-SDAAP study ²⁵ found there were "low levels of knowledge and support for CCS" within the Australian public. Presenting a CCS scenario that proposes injecting into a water-supply aquifer as a feasible project further risks public acceptance and recognition of the potential benefits of alternate CCS projects.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.3, 2.5, 2.7, and 2.15.1; and Chapter 9 Groundwater.
24	23	0	Executive Summary	Section 9 5	<i>"The underlying Moolayember Formation and overlying Evergreen Formation are the primary geological seals preventing leakage of the stored GHG stream from the Precipice Sandstone."</i>	Leakage through the primary seal, via future licenced water bore installations and their approved future pumping, needs to be considered. There are numerous petroleum exploration and production wells in the area which intersect the Precipice Sandstone. Risk mitigation methods addressing risks to cement plugs and steel casing integrity within these wells should also be presented.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; Chapter 8 Geology, sections 8.5, 8.8, and 8.10; and Chapter 9 Groundwater, sections 9 5, 9 7, 9 8, 9.9, and 9.10.
24	24	0	Executive Summary	Section 9 5	<i>"...drilling of West Moonie-2 Monitoring Well was with a deviated trajectory"</i>	The surface and total depth position of this deviation should be shown clearly in the associated figures. How will this well be accessed for water quality monitoring if deviated? How can a water quality sampling pump be run in and out of a deviated well?	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8 and 2.11; Chapter 8 Geology, section 8 5.2; Chapter 9 Groundwater, sections 9.8 and 9.10.
24	25a	0	Executive Summary	Section 9 5	<i>"The peer reviewed models are deemed "fit for purpose" meeting industry standards."</i>	The models are fit for purpose only under the starting assumption that the Precipice Sandstone at the project location is a saline aquifer that has no value to other users.	Amended EIS	See Chapter 8 Geology, section 8.4.4; and Chapter 9 Groundwater, section 9.4.4.
24	25b	0	Executive Summary	Section 9 5		Another key modelling flaw is the omission of licenced Precipice entitlements such as those on the neighbouring CPC property. This property has an approved Development Permit for the drilling of a Precipice Sandstone bore and licences to take water from the Precipice.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, and 9 9; and Appendix 09B.
24	25c	0	Executive Summary	Section 9 5		Was it within the modelling scope to question these critical assumptions or were the modellers provided with the incorrect assumptions by the proponent? It would seem to be an uncharacteristic mistake by a competent modeller not to include such entitlements, irrespective of whether bores exist at least in a conservative case modelled scenario. Impact Assessment modelling is required to be inherently conservative through the model assumptions and input parameters. Licence entitlements are a publicly available data set that is normally searched and form critical model input data. The EIS appears to identify these entitlements but ignore them in the modelling. The models should be re-run given the incorrect assumption that the aquifer is not a suitable water supply resource, with planned and approved future abstraction 9.5km away.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, and 9 9; and Appendix 09B.
24	26a	0	Executive Summary	Section 9 5.1	Modelled predictions of plume behaviour are given.	As noted above, the predictions do not account for scoped, costed and regulator approved groundwater pumping from the target aquifer on the neighbouring property. This will likely result in the injection site being inside the new Precipice Sandstone water bore's pumping drawdown "cone of influence" under a dynamic groundwater flow regime and groundwater flow direction towards the pumping bore.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, and 9 9; and Appendix 09B.
24	26b	0	Executive Summary	Section 9 5.1		The CTSCo EIS Appendix 9A: Groundwater Impact assessment Technical Report (WSP Golder 2022) Section 6.0 Potential Impacts states as a key assumption that "Due to the isolated and deep nature of the injection site, there is no interaction with other human activities in the Surat Basin." The predictive modelling is forward looking and needs to model credible future extraction scenarios. This incorrect assumption ignores likely pumping from the neighbouring property.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, and 9 9; and Appendix 09B.
24	26c	0	Executive Summary	Section 9 5.1		The WSP Golder (2022) assessment does not appear to have assessed an obvious risk of a neighbouring Precipice bore being drilled and pumped thus altering the plume movement resulting in CO2 plume capture, degassing and entry to the atmosphere, nor associated impacts on users of the water supply. This scenario and associated risk exposure pathways needs to be modelled and properly assessed.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, and 9 9; and Appendix 09B.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	27	0	Executive Summary	Section 9 5.1.1.1	<i>"All sensitivity simulations confirmed effective containment of the plume within the lower Precipice Sandstone providing a high level of confidence that the maximum plume extent will be within 500 to 600 m from the West Moonie-1 Injection Well."</i>	See previous comment. The model would be sensitive to nearby pumping, and this scenario would need to be modelled to provide a "high level of confidence". The 500 to 600m modelling outcome would not apply to a plume movement in a dynamic pumping scenario. The plume extent would be much larger. Some further comment should be made regarding the potential plume extent if the pilot trial progresses to full-scale injection operations. UQ-SDAAP26 propose a plume footprint extending 10km from a notional Precipice Sandstone injection site under static (non-pumping) conditions. Pressure transmission would be over an even larger area, particularly within a dynamic pumping hydraulic regime.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, and 9 9; and Appendix 09B.
24	28a	0	Executive Summary	Section 9 5.2	<i>"Injection of a GHG stream (CO2) into water slowly reacts to produce carbonic acid and hydrogen ions, resulting in a weak acid, measured as a reduction in pH. Laboratory analysis and modelling have indicated that the predicted pH in the GHG plume in the Precipice Sandstone aquifer will be around pH 4."</i>	The reduction in pH within the aquifer due to the plume injection is reported by the EIS as being from pH8 to pH4. Given that the pH scale is logarithmic this is a ten thousand-fold acidification from natural conditions within the aquifer under equilibrium, and should be noted as such, rather than "resulting in a weak acid". There are numerous published papers on the potential risks to water quality from CCS ²⁷²⁸ available online.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, 9.6.4, 9.6.5, 9.7.5, 9.9.3, 9.9.4, 9.9 5, 9.9.6, 9.9.7 and 9 9.8; and Appendices 09C and 09D.
24	28b	0	Executive Summary	Section 9 5.2		The EIS notes that <i>"The lowering of the pH has the potential to mobilise trace elements including arsenic, cadmium, chromium, copper, nickel, lead and selenium from the surrounding rock into the formation at concentrations which may initially exceed the Australian drinking water guidelines."</i> Given the likely pumping influence from an adjacent Precipice Sandstone pumping bore, the risks of adverse outcomes such as CO2 degassing and short-circuiting to atmosphere by the pumping bore and aquifer rock/water geochemical interactions and metal mobilisation risks under a dynamic (pumping) hydraulic regime should be revisited, remodelled and the risks to the water resource reassessed.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6.2, 9.6.4, 9.6.5, 9.7 and 9.9; and Appendices 09B, 09C, 09D and 09F.
24	29a	0	Executive Summary	Section 9 5.2	<i>"The existing water quality of the Precipice Sandstone aquifer is characterised as having low water quality that is saline, high in iron (long-term), high in fluoride, and high in total dissolved solids, and is unsuitable for aquatic ecosystems, and unsuitable for irrigation water, stock water, and drinking water."</i>	The water characterisation as low quality and unsuitable is highly subjective and misleading terminology that is not widely shared. The water quality sits within the normal ranges of Surat Basin (sub-basin of GAB) aquifers. The EIS provides lab data that show groundwater in this area is <u>not</u> saline (rather it is slightly brackish), has relatively low total dissolved solids and is suitable for stock watering once consideration is given to fluoride, even in raw untreated form.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5; and Appendix 09A, 09E and 09F.
24	29b	0	Executive Summary	Section 9 5.2		GAB aquifers commonly have fluoride concentrations above the conservative <u>guideline</u> thresholds ²⁹ , which is easily managed and does not negate the Environmental Value ³⁰ . CSIRO reports: <i>"High fluoride concentrations of up to 10 mg/L have been observed in many parts of the GAB and have been attributed to water rock interactions involving igneous basement strata."</i> This is consistent with the fluoride concentration ranges detected in groundwater monitoring data collected by APLNG in the Surat Basin between 2010 and 2018 ³¹ extracted from a datalink in their Annual Report – see plot below. This shows fluoride concentrations in groundwater from all Surat Basin aquifers in APLNG monitoring bores. Most of the bores with high fluoride are in the Hutton Sandstone which is one of the most-utilised aquifers for stock use and probably most utilised aquifer in the Surat for stock intensive use. The Agricultural sector in the Surat are not aware of any detrimental effects from fluoride on stock. In any case, these compounds are easily addressed with through amendment/ treatment and would typically be managed through balancing these minerals within the livestock food sources.	Amended EIS	See Chapter 9 Groundwater, sections 9.7.4, and 9.7.5; and Appendix 09E.
	FOOTNOTE	0	Executive Summary		²⁹ https://www.dcceew.gov.au/sites/default/files/documents/background-review-aquifer-connectivity_0.pdf ³⁰ https://www.publish.csiro.au/hr/hr07007 ³¹ https://aplng.com.au/document-library/		Noted	Noted
	29c	0	Executive Summary			Figure: Temporal distribution of Water Quality analytes	Noted	Noted
24	29d	0	Executive Summary	Section 9 5.2		Similar ranges were reported in ANLEC studies. ³² Water quality generic Default Guideline Values (DGVs) should be used as part of a wider weight-of-evidence process to determine specific risks. The ANZECC documentation states the following ³³ : <i>Default guideline values (DGVs) can provide a generic starting point for assessing water quality. We recommend using DGVs for generic applications in the absence of more relevant guideline values (jurisdictional, site specific). It is important to know that the Water Quality Guidelines' DGVs are not mandatory and have no formal legal status</i>	Amended EIS	See Chapter 9 Groundwater, sections 9.7.4, and 9.7.5; and Appendix 09E.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
	FOOTNOTE	0	Executive Summary		³² Hoffman, H. (2022). Hydrogeology of the Southern Surat Basin – ANLEC Report for the project 7-C316. ³³ https://www.waterquality.gov.au/anz-guidelines/guideline-values/default		Amended EIS	See Chapter 9 Groundwater, sections 9.7.4, and 9.7.5; and Appendix 09E.
24	30a	0	Executive Summary	Section 9 5.6	<i>"The closest wells to the West Moonie-1 Injection Well that target the Precipice and Evergreen are 35 km north-east"</i>	CPC Pty Ltd, together with Sunpork, operate a large piggery operation at an adjacent property. CPC hold licenced groundwater entitlements for the taking of groundwater from the Precipice Sandstone for stock intensive purposes as follows:	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	30b	0	Executive Summary	Section 9 5.6		Table in submission	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	30c	0	Executive Summary	Section 9 5.6		As part of their water security strategy, CPC have been actively pursuing (and continue to pursue) additional Precipice Sandstone entitlement to trade and relocate into the property for piggery expansion since 2016.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	30d	0	Executive Summary	Section 9 5.6		The regulator has given approval for the drilling of a groundwater supply bore to abstract from the Precipice Sandstone approximately 9.5km to the southeast of Moonie West 1. This is scheduled to be drilled in 2023.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	30e	0	Executive Summary	Section 9 5.6		Groundwater impact assessment completely modelling ignored the potential future pumping of groundwater under these entitlements.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	31a	0	Executive Summary	Section 9 5.6	<i>"... it is very unlikely that the injection testing at West Moonie-1 will affect the groundwater levels or groundwater quality in any existing Precipice Sandstone bores and therefore no cumulative impacts or impacts to current users due to the Project are anticipated."</i>	The EIS Impact assessment modelling and this statement ignore the Precipice Sandstone entitlements on the adjacent property. Consideration should be given to future users as the Precipice Sandstone is an important water supply aquifer in the region and is being actively assessed for new stock watering bores, particularly as shallow aquifers are under increasing stress. Deeper, more secure groundwater resources are increasingly targeted in a region where all shallower aquifers are fully or over-allocated.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	31b	0	Executive Summary	Section 9 5.6		CTSCo identified Precipice Sandstone licenced groundwater entitlements within the EIS. However these were ignored in the EIS modelling because no associated bore was evident. The required conservatism in modelling assumptions mean that pumping scenarios that included these entitlements should have been modelled. It is incorrect to exclude entire licenced entitlements in future impact assessment modelling because a bore has not currently been drilled.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10; and Chapter 20 Cumulative Impacts, sections 20 3 and 20.5.
24	32	0	Executive Summary	Section 9 5.6	<i>"The nearest Hutton Sandstone bore is 50 km west of West Moonie-1 Injection Well"</i>	This appears to be the case based on Figure 9-9 in the document. However, this is inconsistent with the subsequent figure (9-10) which identifies a Hutton Aquifer registered water bore (RN87635) approximately 20km north-east of the West Moonie-1 injection well.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, 9.7.4, 9.7.5, 9 9, and 9.10.
24	33	0	Executive Summary	Figure 9-10	Map showing surrounding water bores	The map should include the approved Precipice Sandstone water bore scoped for drilling on the neighbouring property plus any others identified for future installation, after engaging with the Queensland government water resources department. For transparency, this map should also show land parcels with attached Hutton and Precipice Sandstone aquifer entitlements.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.6, and 9.7.4.
24	34	0	Executive Summary	Section 9.11	Lists of existing and future safety risks are presented	This should include potential risks associated with pumping from a nearby Precipice Bore. A section of the EIS should compare the project against the risks identified in the UQSDAAP risk register report ³⁴ for Surat Basin CCS.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
	FOOTNOTE	0	Executive Summary		³⁴ Honari V, Garnett A & Underschultz J (2019), Risk register report, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	35	0	Executive Summary	Section 9.14	Economic Assessment discusses costs and benefits associated with the project.	Economic impact to landholders should be accounted for if Precipice Sandstone aquifer water becomes unusable. Agricultural economic growth in the region is primarily constrained by consistent and reliable access to water. Despite its depth and temperature, groundwater from the Precipice is recognized as a valuable resource in this region, as it is in other areas of the Surat Basin. Limiting access to the aquifer's water resources due to CCS injection activity is effectively a limitation on the sustainable growth of other water-reliant industries in this region.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	36	0	Executive Summary	Table 10-1	<i>"c. The environmental authority authorises the release of a GHG stream to groundwater within the Precipice Sandstone aquifer"</i>	This should not be included if the groundwater is deemed valuable to other users. The proposed amendment to the EA conditions is based on the Precipice Sandstone being a saline aquifer. Work reported in the EIS demonstrates that it is an important water supply aquifer.	Amended EIS	See Executive Summary, Table 10-1; Chapter 9 Groundwater, section 9.13; and Chapter 22 Proposed EA Condition Amendments.
24	37	0	Executive Summary	Table 10-1	<i>"d. The environmental authority authorises the released GHG stream to remain in perpetuity within the Precipice Sandstone aquifer, and not be subject to the rehabilitation requirements of Condition 58 – Rehabilitation."</i>	Requirement for groundwater rehabilitation should be retained until it can be demonstrated that unacceptable impacts to the groundwater resource have not occurred. For example, the modelled timeframe of potential contaminant breakthrough to a new pumping bore at the neighbouring CPC property.	Amended EIS	See Executive Summary, Table 10-1; Chapter 9 Groundwater, sections 9 9, 9.10, 9.11, 9.12, and 9.13; and Chapter 22 Proposed EA Condition Amendments.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	38	0	Executive Summary	Table 10-1	CTSCo propose to remove this EA condition: "If the holder of this environmental authority becomes aware that environmental harm is caused or threatened to be caused, as a result of injection activities, injection must cease immediately."	This EA condition (41) should be retained.	Amended EIS	See Executive Summary, Table 10-1; Chapter 9 Groundwater, section 9.13; and Chapter 22 Proposed EA Condition Amendments.
24	39a	0	Executive Summary	Section 11	"The recommendation is made to approve the Project, so that administering authorities, regulators, industry, and the community can make an informed decision on the potential future development and permitting of GHG storage in the Surat Basin."	Project approval should be reserved until further assessment has been done regarding the Precipice Sandstone aquifer's water supply character, revised appraisal of groundwater environmental values, risks to future users of the groundwater resource and risks to other CCS projects from negative publicity of this unorthodox injection scenario.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, Chapter 2 Proposed Project Description, Chapter 8 Geology, Chapter 9 Groundwater, Chapter 21 Commitments, and Chapter 22 Proposed EA Condition Amendments.
24	39b	0	Executive Summary	Section 11		Project approval is not consistent with informed decision-making concerning GHG storage in the Surat Basin as a whole. Each CCS site has location-specific attributes and consideration must be given to the likelihood of full-scale CCS operations being approved, not just pilot trials. More orthodox sequestration targets would be better suited in terms of balancing the recognised benefits of CCS against the disbenefits associated with impacts to groundwater resources.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, Chapter 2 Proposed Project Description, Chapter 8 Geology, Chapter 9 Groundwater, Chapter 21 Commitments, and Chapter 22 Proposed EA Condition Amendments.
24	39c	0	Executive Summary	Section 11		The need to rapidly deploy technologies such as CCS as part of the future energy mix is real, but it requires robust checks and balances to ensure targets are identified that have a strong chance of being scaled up without unacceptable impacts.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Executive Summary, Chapter 2 Proposed Project Description, Chapter 8 Geology, Chapter 9 Groundwater, Chapter 21 Commitments, and Chapter 22 Proposed EA Condition Amendments.
24	1	9	Groundwater	9.2.1.2.1	The Act requires GHG storage activities to "minimise conflict with other land uses Follow responsible land and resource management"	These aspects of the Act cannot be considered to have been met. For example, there is a clear conflict with other groundwater users who are planning to use groundwater from the target formation for stock watering.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.6., 9.7, 9.9, and 9.10.
24	2	9	Groundwater	9.2.1.2.2	"Environmental Protection Act 1994 (EP Act) s.3 states that the objective of the Act is to protect Queensland's environment while allowing for developments that improve total quality of life, both now and in the future."	This objective has not been met in terms of protection of a valuable groundwater resource and its sustainable development. This is especially so regarding future development.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6., 9.7, 9.9, and 9.10.
24	3	9	Groundwater	9.2.1.2.2	"EA EPPG00646913 which authorises the drilling of GHG appraisal wells"	It is not clear in the EIS if more normal injection targets were considered by CTSCo, such as fully saline systems and former hydrocarbon reservoirs. A comment regarding alternatives should be made. For example, the conventional hydrocarbon reservoir setting of the nearby Moonie Oil Field and formations beneath the GAB aquifer system.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.3 and 2.15.
24	4	9	Groundwater	9.2.1.2.3	"Under the Environmental Protection Regulation 2019 (EP Reg), the Project must demonstrate that it can meet the relevant objectives and performance outcomes as set out in Schedule 8 which requires the Project to be operated in a way that protects the EVs of groundwater"	The EVs of Precipice groundwater are set out in the QMDBP ³⁵ . These EVs have been interpreted by the proponent to not be realised at the pilot site, but many stakeholders do not agree. A detailed review of the regulatory landscape for CCS in Queensland has been prepared by UQ-SDAAP ³⁶ . Among many regulatory hurdles to CCS described in the report is that: "the current provisions of the EP Act and Environmental Protection Regulation 2008 (EP Reg) limit the circumstances whereby a 'waste' can be injected into an aquifer. The GHG stream is the product of compressed carbon dioxide that has been separated from the other gases produced by the power generator or other industrial process. It would generally therefore come within the EP Act definition of 'waste'."	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13.
24	FOOTNOTE	9	Groundwater		³⁵ State of Queensland DES (2020). Queensland Murray-Darling and Bulloo River Basins Groundwater Environmental Values and Water Quality Objectives. ³⁶ Robertson & Garnett (2018), Discussion document - A regulatory review of greenhouse gas storage - governance of pressure impacts in the GAB, Queensland, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13.
24	5	9	Groundwater	9.2.1.2.3	The required outcomes of the Project will be: - no direct or indirect release of contaminants to groundwater from the operation of the Project - no actual or potential adverse effect on groundwater from the operation of the Project	These outcomes will clearly not be met by the project. The intention of the project is to release contaminants directly to groundwater.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13.
24	6	9	Groundwater	9.2.1.2.3	Section 41 of the EP Regulation considers the injectate a waste. The administering authority must refuse to grant approval if "the waste is likely to result in a deterioration in the EVs of the receiving groundwater"	Groundwater EVs will necessarily deteriorate in the project area due to changes in water quality modelled in the EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13.
24	7	9	Groundwater	9.2.1.2.4	Under the Water Act "The Project does 'interfere' with groundwater and as such, must demonstrate that it meets the specified outcomes of the GABORA" A list of outcomes and achievement measures is then given: "12(a)(ii) The GHG stream injection testing will not impact on the water availability within the aquifer 12(a)(iv) The GHG stream injection testing is unlikely to impact on water availability within the aquifer. There are no known existing water licenses or applications for taking of groundwater from the Precipice Sandstone aquifer within the Project Area. 12(b) The Groundwater Impact Assessment (GIA) identifies the existing state and potential changes from interfering with the groundwater within the Lower Precipice Sandstone. "	Achievement of measures 12(a)(ii), 12(a)(iv) and 12(b) cannot be considered to hold true given the discussions between the neighbouring landholder and the regulator regarding established plans to abstract groundwater from the target aquifer for stock watering.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13.
24	8	9	Groundwater	9.2.2.3	"This guideline has been used to consider the potential impacts on groundwater quality as they relate to farm supply use and other potential agricultural users."	Impacts have only been considered based on desk top reviews of historic data, not on agricultural users' future water security. Stakeholder engagement has been severely lacking in this regard. UQ-SDAAP ³⁷ notes that: "During the CO2 injection period, there is a risk of pressure increases leading to unwanted flow and or mechanical damage and changes to the water chemistry of third-party bores. The likelihood of this risk is considered to be high and it therefore needs further local assessments."	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	9a	9	Groundwater	9.2.2.4	<i>"EVs and WQOs as described in Queensland Murray-Darling and Bulloo River Basins Groundwater Environmental Values and Water Quality Objectives"</i>	These are generic guideline values and not prescribed thresholds for prohibiting water use. Users often must adapt to local conditions and context. The QMDBP highlights the presence of elevated Fluoride in groundwater of the "Basal GAB" aquifers in the Surat Basin. WQOs are a tool to protect groundwater resources from deterioration by anthropogenic-related activities. They promote stewardship rather than prohibit water use.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13; and Appendix 09E.
24	9b	9	Groundwater	9.2.2.4		WQOs for stock watering are based on trigger values sourced from the ANZECC Guidelines ³⁸ . A trigger value is one that prompts a management response such as further, more detailed, risk assessment. It is an opportunity to review the applicability of the generic conservative value based on local factors. Trigger values are called Default Guideline Values (DGVs) in ANZECC and are described as a <i>"generic starting point for assessing water quality."</i> They are not an end point and are not mandatory. Concerning livestock watering, the guidance ³⁹ states: "if a parameter does not meet a DGV, we recommend further investigation to determine the level of risk". In the project area the source-pathway-receptor linkage for fluoride in stock water is apparent. However, there is significant scope for mitigation due to management options.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13; and Appendix 09E.
	FOOTNOTE				³⁷ Honari V, Garnett A & Underschultz J (2019), Risk register report, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ³⁸ ANZECC & ARMCANZ 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra. ³⁹ https://www.waterquality.gov.au/anz-guidelines/guideline-values/default		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, and 9.13; and Appendix 09E.
24	10	9	Groundwater	9.2.4.1	<i>"...studies and site investigations conducted by CTSCo in EPQ7 between 2010 to 2018, which included drilling the West Wandoan-1 well"</i>	The referenced investigation was abandoned due to concerns over impacts to the Precipice Sandstone groundwater quality. Similar impacts are modelled for the EPQ10 study area but have been discounted by the proponent in the EIS. A fuller description of the lessons learnt from the EPQ7 study should be presented.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.8, and 2.15.2; Chapter 8 Geology, sections 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10; and Chapter 9 Groundwater, sections 9.4.2, 9.6, and 9.7.
24	11a	9	Groundwater	9.2.4.1	A 121page CTSCo-funded report (Hoffman et al 2022) is referenced. Conclusions were made in broad support of the CTSCo project. However, inadequate comment was made concerning the groundwater quality data from West Moonie 1 in terms of its value as a useable and valuable resource.	Some key findings of this study were ignored or the use of the outcomes in the EIS were an over-reach. Examples are given below:	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 09A, 09C, 09D, and 09E.
	11b	9	Groundwater	9.2.4.1		<i>"While the salinity in the Precipice Sandstone in the central part of the Surat Basin is moderate, it is too high for the water to be used as a drinking water supply"</i> . (Note that stock watering or other suitable uses are not mentioned and neither is treatment)	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 09A, 09C, 09D, and 09E.
24	11c	9	Groundwater	9.2.4.1		<i>"...some caution is required not to over interpret the results of the hypothesis testing models and the geochemistry, particularly due to sparse and contradictory data in some areas."</i> (Note that the moderately low TDS/EC value obtained from West Moonie 1 well are not discussed here, although they are below the reported median value. The value is presented, without discussion, much later in the report.)	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 09A, 09C, 09D, and 09E.
24	11d	9	Groundwater	9.2.4.1		<i>"It (central southern Surat Basin) is also assumed or inferred to have lower quality groundwater"</i> . (This assumption has been carried through the EIS process and yet is disproved by the West Moonie 1 water quality testing results.)	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 09A, 09C, 09D, and 09E.
24	11e	9	Groundwater	9.2.4.1		<i>"The F levels (range from 0.01 to 9.3 mg/l) in some groundwater bores exceed the World Health Organisation (WHO) drinking water limits of 1.5 mg/l."</i> (The report notes that F is elevated in many regional aquifers and in different areas of the basin, and only notes a single conservative (drinking water) limit for comparison).	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 09A, 09C, 09D, and 09E.
24	11f	9	Groundwater	9.2.4.1		<i>"The groundwater at West Moonie 1 in the central southern Surat Basin is of Na-Cl- HCO3 type, which is different to groundwater directly to the north and the east of this site. The presence of Cl in the well is surprising and at this point explanations are inconclusive."</i> (The inference is that the groundwater quality conceptual model retains much uncertainty)	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 09A, 09C, 09D, and 09E.
24	12	9	Groundwater	9.2.4.2	<i>"A detailed literature review of GHG storage projects has been completed to provide context for the Project and capture existing CCS project knowledge."</i>	No case study scenarios are reported that target a non-saline aquifer. Informal discussions with overseas academic CCS leaders confirm the CTSCo injection scenario to be highly unusual, not known to have been trialled before, and would be difficult to get regulatory approval. It is therefore unclear why CTSCo are pursuing this injection scenario rather than a project more like those in their literature review.	Amended EIS	See Chapter 9 Groundwater, section 9.4.3; and Appendix 09A.
24	13	9	Groundwater	Table 9-3	CTSCo's project is described as using a "saline formation". It has the highest permeability and porosity of all the case studies.	The formation is not saline in terms of normal understanding of more orthodox injection targets nor in terms of generally agreed salinity classifications. The relatively high permeability and porosity adds to the value of the formation as a groundwater resource. It also demonstrates the formation is unusual (albeit convenient) as an injection target. What is not clearly promoted is that while the CTSCo project has the highest permeability and porosity, it has the freshest water quality of all the case studies. The high permeability and porosity are also key properties which make it a high value water supply aquifer.	Amended EIS	See Chapter 9 Groundwater, section 9.7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	14	9	Groundwater	Table 9-4	"Aquifer consists of water not suitable for drinking or agricultural purposes."	The aquifer is arguably highly valuable as a resource for some agricultural activities. This is why the neighbouring landholder, CPC, has mature plans to install a water supply bore into the Precipice Sandstone. It is noted that CTSCo use the term aquifer rather than reservoir. The USGS ⁴⁰ definition of an aquifer is: "An underground body of porous materials, such as sand, gravel, or fractured rock, filled with water and capable of supplying useful quantities of water to a well or spring." The Precipice Sandstone at the injection site meets this definition in terms of supply of useful quantities of water to a well.	Amended EIS	See Chapter 9 Groundwater, section 9.7.
24	15	9	Groundwater	9.2.4.3	"Protection of groundwater resources was identified to be of high importance for most of the case studies reviewed."	It should be better explained why this high-importance attribution has not been afforded the Precipice Sandstone aquifer for this project.	Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.8, 9.9, 9.10, and 9.11, 9.12, and 9.13.
	FOOTNOTE				⁴⁰ https://pubs.usgs.gov/ha/ha747/pdf/definition.pdf		Noted	Noted
24	16	9	Groundwater	9.2.4.3	"...enabling loss of containment to be identified early."	Measures should be described to mitigate loss of containment if it is detected.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, 2.10, 2.11; Chapter 8 Geology, sections 8.5, 8.8, and 8.10; and Chapter 9 Groundwater, sections 9.4, 9.5, 9.7, 9.8, and 9.10.
24	17	9	Groundwater	9.2.4.4	"...findings from the case studies demonstrate that the Project can be completed safely, and that MMV (measurement, monitoring, and verification) methods can be effectively used to further reduce risk."	MMV methods need to be tailored to the local hydrogeological scenario – including future pumping by water users.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendix 09B.
24	18	9	Groundwater	9.2.4.4	"Those analogous settings..."	The referenced case studies are not analogous to CTSCo's project as no others inject into a water supply aquifer. In this regard the project is very much unique and unorthodox.	Amended EIS	See Chapter 9 Groundwater, section 9.4; and Appendix 09A.
24	19	9	Groundwater	9.2.6	"A desktop assessment was carried out for the regional assessment area to establish the baseline groundwater conditions, potential connectivity between aquifers, EVs, and potential receptors."	Published EVs were re-interpreted by the proponent to support the project. There is a strong counter argument that the baseline EVs are valid.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, and 9.7.
24	20	9	Groundwater	Table 9-8	"Hydrogeology of the Southern Surat Basin: Memo Report 1 (Wye, et al., 2019)"	This report is not included in the reference list and is not available on the ANLEC R&D website ⁴¹ for download. Only Memo Report 2 is available.	Noted	Noted
	FOOTNOTE				⁴¹ https://anlecrd.com.au/reports_storage/ ⁴² Olkowski, A., A.,(2009). Livestock Water Quality – A Field Guide for Cattle, Horses, Poultry, and Swine. Department of Agriculture and Agri-food Canada (AAFC) ⁴³ Annand, T.E. et al (1993). Phosphorous Supplements and Fluorosis in Cattle – a Northern Australian Experience. Australian Veterinary Journal. ⁴⁴ Hayes P, Nicol C & Underschlutz J (2019), Regional groundwater model, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Noted	Noted
24	21a	9	Groundwater	9.2.6.1.2	Reference is made to the Queensland Murray-Darling and Bulloo River Basins – Groundwater Environmental Values and Water Quality Objectives (DES 2020). The WQO for fluoride is not met at West Moonie 1.	A comment on the applicability of WQOs and trigger values is given elsewhere in this submission. Some germane notes from the Basin Plan: <i>Management goals for the basin plan are productive and resilient water-dependent industries, and communities with confidence in their long-term future.</i> <i>The management goal for farm supply use is that the quality of water provided for farm use is suitable for produce preparation and for domestic household uses other than drinking.</i>	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.7, 9.9, 9.10 and 9.11; and Appendices 09A, 09D, and 09E.
24	21b	9	Groundwater	9.2.6.1.2		<i>The management goal for stock watering is that the quality of water provided to stock watering does not cause deterioration in stock health or condition (noting that water quality requirements may differ by stock type).</i> There are many instances in the GAB of livestock consuming groundwater with naturally elevated fluoride above guideline levels. The most common source of concentrations at problematic levels is from industrial contaminated water, phosphate fertilisers, soil ingestion, feed supplements and insecticides. It is the overall dietary intake that is important and water quality guidelines are necessarily conservative and indicative, rather than prescriptive. Tolerance is also species and age specific and changes according to bioavailability of the form ingested. Holistic dietary guideline studies have been undertaken in the past. An example study using beef cattle gives a "potentially toxic" daily intake guideline threshold of >560mg/day ⁴² . To reach this level from consuming water from West Moonie 1 well, a cow would need to consistently drink over 90 litres per day, which is unrealistic. This is why there are no apparent examples in Australia of stock fluorosis attributable to groundwater ingestion, only through other ingestion routes ⁴³ .	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.7, 9.9, 9.10 and 9.11; and Appendices 09A, 09D, and 09E.
24	22a	9	Groundwater	Table 9-9	"Model aquifer and aquitard properties and changes in local and regional aquifer pressure conditions resulting from GHG stream injection."	The hydrogeological and other models do not account for changes in pressure conditions and the groundwater flow regime due to planned future groundwater abstraction from the Precipice aquifer. These should have been included as the licenced Precipice water entitlements were identified in the EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.5, 9.6, 9.7, 9.9, and 9.10; and Appendix 09B.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	22b	9	Groundwater	Table 9-9		A comment should be made in the EIS concerning the regional pressure changes that could occur if the pilot project scales up. Work done by UQ-SDAAP ⁴⁴ indicates significant changes in pressure conditions: "Groundwater modelling of the notional Field Development Plan (FDP) reference case shows that significant groundwater pressure increases (> 100 m water head) due to CO2 injection would likely occur in the Precipice Sandstone aquifer (injection reservoir) and overlying transition zone (Lower Evergreen Formation) in the deep southern Surat Basin. At known individual wells drilled for oil and gas exploration, pressure increases are predicted to exceed 250 m of groundwater head."	Amended EIS	See Chapter 4 Approvals, section 4.4.9.
24	23	9	Groundwater	Table 9-10	"Hydrogeology, and static reservoir models, as provided by CTSCo EPQ7 information"	The relevance of this model is unclear given it is for a different location. Although the subsurface conditions are likely to have some similarities to EPQ10 conditions, some of those same conditions resulted in abandonment of the EPQ7 project.	Amended EIS	See Chapter 8 Geology, section 8.6; and Chapter 9 Groundwater, section 9.6.
24	24	9	Groundwater	9.2.7.2.2	"...injection of the GHG stream (CO2 and associated impurities)"	The impurities in the waste stream should be listed and any associated risks discussed.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.4.
24	25	9	Groundwater	9.2.7.3.1	"The hydraulic head impact model was set up with closed boundary conditions"	The hydraulic head and particle tracking models should be re-run to include a scenario of off-site pumping for water supply. As a minimum, planned abstraction rates at the neighbouring CPC property should be assessed.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.5, 9.6, 9.7, 9.9, and 9.10; and Appendix 09B.
24	26	9	Groundwater	Table 9-14	"Abstraction and injection wells included in the hydrodynamic model"	The table should include proposed future abstraction bores based on discussions with stakeholders and the Precipice groundwater entitlements identified by CTSCo	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.5, 9.6, 9.7, 9.9, and 9.10; and Appendix 09B.
24	27	9	Groundwater	Figure 9-3	"Simplified hydrostratigraphic classification of aquifers"	The Lower Precipice Sandstone is classified the same as the Mooga Sandstone and Gubberamunda Sandstone: A Regional Aquifer. This indicates OGIA's understanding of the Precipice's status as a valuable groundwater resource. There should not be any uncertainty raised or challenge to this.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.5, 9.6, 9.7, 9.9, and 9.10; and Appendix 09B.
24	28	9	Groundwater	9.3.1.1	"Regionally, the lower Precipice Sandstone is dominated by braided river deposits that provide the high-quality reservoir characteristics of this unit."	To be more accurate regarding the current recognition as a water resource, 'reservoir' should be replaced with 'aquifer'. This should apply throughout the EIS. In a simple sense, this project involves the disposal of a waste into a water supply aquifer. The use of the term reservoir is misleading and more commonly associated with petroleum production and injection projects or conventional CCS target formations.	Amended EIS	See Chapter 2 Proposed Project Description, Chapter 8 Geology and Chapter 9 Groundwater.
24	29	9	Groundwater	9.3.1.2.1	"The Hutton Sandstone is the most extensive aquifer in the Great Artesian Basin"	There do not appear to be plans to establish local baseline conditions or monitor this overlying aquifer, nor the intervening Evergreen Formation. The UQ-SDAAP study ⁴⁵ indicates that a bore should be installed into the Hutton Sandstone aquifer to monitor containment. Monitoring should also target the Evergreen as an early warning network.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, and 2.11; and Chapter 9 Groundwater, sections 9.8, and 9.10.
24	30	9	Groundwater	9.3.1.3	"CTSCo proposes to complete a detailed 3D seismic survey over an area corresponding to approximately a 4 km radius from West Moonie-1 to enhance the current structural interpretation of the injection site."	This work could have a significant bearing on project feasibility and should be completed in advance of the EIS and approval to inject.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, and 2.11.
24	31	9	Groundwater	9.3.2	"CTSCo has completed porosity and hydraulic conductivity testing on core samples recovered from the West Moonie-1 well"	Core sample testing is very small scale. As noted in previous comments, it is standard practise to also test the formation at a larger scale using pumping tests. It is unclear why this has not been done given the scale dependency of hydraulic conductivity.	Amended EIS	See Chapter 8 Geology, section 8.5, 8.7, and 8.8; and Chapter 9 Groundwater, sections 9.5, 9.7 and 9.8; and Appendix 09A.
24	32	9	Groundwater	9.3.5.1	"Water quality data from the West Moonie-1 Injection Well is broadly consistent with the water quality within the Precipice Sandstone in the Moonie Oil Field."	Data presented in Table 9-19 contradicts this statement and shows better water quality at West Moonie 1 for multiple parameters, including TDS. The Moonie Oil Field is being assessed as a CCS target by another operator ⁴⁶ and its more orthodox setting may make it a better option. Also it should be noted that water quality within large parts of the Moonie Oil field is adversely affected by the presence of hydrocarbons and therefore is not "broadly consistent" with water quality at West Moonie 1.	Amended EIS	See Chapter 9 Groundwater, sections 9.5, 9.7 and 9.8; and Appendix 09A.
	FOOTNOTE				⁴⁵ Honari V, Gonzalez S & Garnett A (2019), Site appraisal plan, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ⁴⁶ https://newhopegroup.com.au/news-articles/?article_id=6321&&type=news		Noted	Noted
24	33a	9	Groundwater	9.3.5.2 Table 9-20	Baseline Water Quality	The recorded potassium concentration in West Moonie 1 injection bore of 150mg/L is unusually high. A high potassium concentration in a bore recently drilled on mud is a tell-tale sign of residual potassium-chloride mud presence. This possibility is acknowledged in the Appendix 9A: Groundwater Impact Assessment Technical Report (WSP Golder 2022), but is not mentioned in Chapter 8: Groundwater.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.3.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	33b	9	Groundwater	9.3 5.2 Table 9-20		It is considered likely that significant drilling mud residue is still present within the bore and influencing the sampled water quality. Deep water bores typically take weeks to months of production pumping to fully develop and reach a water quality equilibrium. Removal of drilling muds from deep bores is notoriously difficult due to the technical challenges in lifting mud cake from within lower sections of the bore and from within the near-bore formation itself. No information has been provided on how the well was developed nor how it was purged and sampled. Deep water bores are typically developed using extended airlifting methods after drilling to ensure all residual drilling fluids muds and fines are removed from the bore, are then test pumped for a minimum 24 hour period (typically longer) at a rate approaching or slightly exceeding the sustainable yield of the bore, and then, depending on the intended use of the water, are pumped for an extended period of days to weeks during commissioning to establish water quality equilibrium conditions before being brought on line. Was this undertaken? If not, the water quality results (including fluoride) aren't reliably representative of the aquifer formation water quality.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5.3.
24	33c	9	Groundwater	9.3 5.2 Table 9-20		The following graph is presented in Appendix 9A as an indication of chemical stability. On a broader temporal scale this graph could also be interpreted to show an unstable reducing concentration trend, indicative of inadequate development and purging.	Noted	Noted
24	33d	9	Groundwater	9.3 5.2 Table 9-20		Figure 14: Evolution of TDS, total alkalinity, chloride, sodium and potassium in West Moonie-1 Injection Well compared with produced water volume	Noted	Noted
24	33e	9	Groundwater	9.3 5.2 Table 9-20		There is no section in the report which describes the well development process. There is no section in the report which describes the well purging and development programme. Given the importance of a representative water sample from the target formation, much more information is required on specifically how the well was developed, purged and sampled. Appropriate sampling guidance documents should be referenced. Sample purge volumes are provided but these aren't compared to the total volume of stagnant water within the well.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Appendix 08A; and Appendix 09A.
24	33f	9	Groundwater	9.3 5.2 Table 9-20		Further long-term development of the bore should occur prior to re-purging and sampling.	Amended EIS	See Chapter 9 Groundwater, section 9.10.
24	33g	9	Groundwater	9.3 5.2 Table 9-20		For comparison and to illustrate the uncertainty with respect to the reliability of the water quality sample, the below graph shows potassium concentration ranges detected in groundwater monitoring data collected by APLNG in the Surat Basin between 2010 and 2018 ⁴⁷ extracted from a datalink in their Annual Report. This shows potassium concentrations (mg/L) in groundwater from all Surat Basin aquifers in APLNG monitoring bores. The maximum recorded potassium concentration was 62mg/L which casts doubt across the credibility of the 150mg/L concentration detected in the Moonie West 1 groundwater. This would suggest that the Moonie West 1 well was not fully developed or purged when it was sampled and still contained drilling fluids.	Noted	Noted
24	33h	9	Groundwater	9.3 5.2 Table 9-20		Figure	Noted	Noted
	FOOTNOTE				⁴⁷ https://aplng.com.au/document-library/		Noted	Noted
24	34	9	Groundwater	9.3 5.2	<i>"The Precipice Sandstone, which is the storage target for the GHG stream injection."</i>	This section should provide similar discussion of the Precipice Sandstone as the other listed aquifers. A lack of information here is misleading and leads to a downplaying of the aquifer's current and future value as a water supply resource which at this depth provides considerable water security benefits not afforded by shallow aquifers.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	35	9	Groundwater	9.3.6.1	<i>"Generally, the water quality at West Moonie-1 Injection Well indicates that the aquifer is naturally not consistent with the WQOs for the identified EVs."</i>	This is incorrect. In the strictest sense, only fluoride presents a minor management challenge (if at all) for stock watering. For general farm use such as washing or process water, there is unlikely to be a problem. As noted elsewhere in this submission, a comparison of EVs with WQOs is only the first step in an assessment of risk and should not be considered a mechanism to discount the value of Precipice groundwater to other users.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendices 09A, 09E and 09F.
24	36a	9	Groundwater	9.3.6.1	<i>"Additionally, the depth to the aquifer would be a limiting factor for most users. Shallower aquifers with better water quality would be used instead as a source of water."</i>	Depth is not a limiting factor for many high value users and will likely lessen as a limitation in the future. Shallower aquifers are at their sustainable yield levels and new water licenses are not available within the GABORA Water Plan (2017). CTSCo should discuss the availability of alternate groundwater supplies from shallower aquifers in the context of regulatory constraints not just logistical constraints.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendices 09A, 09E and 09F.
24	36b	9	Groundwater	9.3.6.1		To prove that depth is not a constraint it is noted that the Lillyvale Feedlot (near Condamine) has a 2200m deep bore into the Precipice Sandstone (similar depth to the CTSCo injection well), drilled under a strong business case to support expansion and provide security of supply to their operations	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	37	9	Groundwater	9.3.6.1.2	<i>"The main consideration for farm supply is limiting corrosion and fouling of farm water supply equipment."</i>	In many areas of the GAB, farmers contend with and use groundwater that can corrode ⁴⁸ and foul ⁴⁹ equipment. The need for water security frequently supersedes these inconveniences. CTSCo's standpoint of discounting the assigned Precipice Sandstone EVs is arguably unrealistic and myopic.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	38	9	Groundwater	Table 9-23	Fluoride short term trigger value is correctly given as 2mg/L.	Fluoride is the sole parameter that exceeds its WQO trigger value for stock watering. This is not unusual in the basin (see previous comments and specific examples) and is easily managed where necessary. As previously discussed, a trigger value is a generic conservative value used to trigger further investigations and refine the risk assessment. It does not signify that the water is unusable.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendix 09E.
	FOOTNOTE				⁴⁸ DNRME (2018). Minimum standards for the construction and reconditioning of water bores that intersect the sediments of artesian basins in Queensland. ⁴⁹ Department of the Environment (2014). Background Review, Bore Integrity. (https://www.dceew.gov.au/sites/default/files/documents/background-review-boreintegrity.pdf)		Noted	Noted
24	39	9	Groundwater	9.3.6.1.3	<i>"The natural occurring fluoride concentrations from the samples may be hazardous to livestock health (particularly young livestock). This is likely to render the in-situ groundwater from the Precipice Sandstone aquifer in the location of West Moonie-1 Injection Well unsuitable for livestock consumption."</i>	This statement is highly contentious. Trigger values are necessarily conservative, for guidance only, and cannot encompass all usage scenarios. Fluoride intake can be managed in many ways and is related to animal species, weight, lifespan, and overall diet. For example, pigs can safely consume up to 100mg/kg of dietary fluoride ⁵⁰ . Adult beef cattle can tolerate over 6mg/L ⁵¹ . Also, the detected fluoride concentration of 6mg/L is close to the limit of 5mg/L set for European bottled mineral water ⁵² . Discounting the value of the groundwater for stock watering based on this single, easily managed parameter, is not appropriate given the region's water security challenges. It is for the end-user to undertake a site-specific assessment of risk and management options.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendix 09E.
24	40	9	Groundwater	Table 9-24	The exceedance table lists TDS as a threshold parameter	TDS should not be listed in the table, as WQO are easily met for all stock types regarding TDS. The project starting assumption of a 'saline' aquifer has not been borne out. The early opportunity to reframe the project after good water quality results were obtained has been ignored.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendix 09E.
24	41	9	Groundwater	9.3.6.1.3	<i>"Overall, on this basis, the water is unlikely to be suitable for the purposes of stock water."</i>	This statement on suitability is incorrect and the water is currently being targeted at a neighbouring property for future stock watering. A scoped, costed and approved water supply bore is earmarked to be installed into the Precipice Sandstone in 2023, approximately 9.5km from the injection site. Risks from fluoride and pipe corrosion are overstated in the EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendix 09E.
24	42	9	Groundwater	9.3.6.1.4	<i>"The groundwater would require further treatment to be suitable for this EV."</i>	Further treatment is only proposed as an option for Drinking Water EV. Treatment or blending is a pragmatic option for irrigation and stock watering EVs and should be included.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendix 09E.
24	43	9	Groundwater	9.3.6.1.4	<i>"There are other aquifers (e.g., Gubberamunda Sandstone) at much shallower depths that are more economically viable to drill"</i>	Economic viability is not solely dependent on depth. Many other factors are important. Notably, water abstraction restrictions set by the regulator. These administrative restrictions should be discussed. Likewise the benefits of deep water supply with respect to higher security of supply should also be stated to provide a balanced perspective of viability.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7; and Appendix 09E.
	FOOTNOTE				⁵⁰ Ontario Ministry of Agriculture, Food and Rural Affairs. ⁵¹ https://veteriankey.com/fluoride-tolerance/ ⁵² https://www.gov.uk/guidance/natural-mineral-water-rules-for-local-authorities#physical-reports		Noted	Noted
24	44	9	Groundwater	9.3.6.2	<i>"Local groundwater use (within 50 km of the Project) has been characterised by searches of the Queensland groundwater database (GWDB)"</i>	Improved stakeholder engagement with the regulator and local landowners will necessitate re-characterising groundwater use. A desk-top review of the GWDB should only be considered a starting point for characterising groundwater use. This database only has information on current bores, not licenced entitlements for future bores. Predictive modelling and assessment needs to include credible future extractions. It is poor practice to ignore landholder's groundwater entitlements if no bore was present.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	45	9	Groundwater	9.3.6.2.1	<i>"The limited number of bores targeting the Precipice Sandstone reflects the large overburden depth (over 2 km) of the formation, the poor water quality, and the costs of drilling to these depths."</i>	Drilling cost and yield uncertainty are the sole limiting factors "poor water quality" is an incorrect statement and should be removed.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	46	9	Groundwater	9.3.6.2.2	A bullet point list is presented concerning the water licence search.	It should also be noted that it is normal practise to negotiate the reassignment of licences between aquifers based on water supply security and sustainability. This includes accessing deeper aquifers (Precipice) when shallower ones become stressed.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	47a	9	Groundwater	9.3.6.2.2	Three licences in the Precipice Sandstone aquifer account for 20% of total allocation in the 50km search zone (based on data obtained during the desk study).	This information indicates the high-value potential of the aquifer for future deeper abstraction.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	47b	9	Groundwater	9.3.6.2.2		A key intent of the GABORA Water Plan (2017) is to encourage the movement of licences away from areas of overuse to areas of less use, this includes rules for the moving of water licences down, such as from the Hutton to the Precipice, but does not allow the movement up from Precipice to Hutton. This has had the effect of driving increased interest in the Southern Surat Precipice for water supplies. So the 20% is noted above is likely to increase.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	48a	9	Groundwater	9.3.6.2.2	"...indicating that the Precipice Sandstone licences are currently not being utilised."	Unused Precipice Sandstone licences are held by CPC, with plans to utilise them imminently for reasons stated previously in the submission. Comment should be made regarding future utilisation of the licences and associated impact on the CTSCo project feasibility. The identification of unutilised licences should have prompted engagement with the licence holder given the potential impact to project feasibility.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	48b	9	Groundwater	9.3.6.2.2		It is incorrect to exclude licenced entitlements as potential aquifer pumping influences in impact assessment modelling if it is unclear whether a bore is drilled. All entitlements should be modelled to incorporate a necessary element of conservatism into the models.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	49a	9	Groundwater	9.3.7	"Regional groundwater levels suggest a flow divide just south of the Great Dividing Range. This separates the aquifer into a shallow northern flow system with many EVs and a more saline southern zone located at depth with limited to no EVs."	This conceptualisation does not account for the relatively low salinity groundwater at West Moonie 1 and there is disagreement regarding there being no EVs. The over-simplistic statement implies that there are limited to no EVs south of the flow divide. This is incorrect.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	49b	9	Groundwater	9.3.7		The generally held conceptualisation is that within the central portion of the Basin (encompassing the Taroom Trough and Mimosa Syncline) there is a central, roughly north to south flow component within the broader Precipice Sandstone. The groundwater quality is generally good within this central area. The Precipice Water quality data presented within the EIS supports this.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	50	9	Groundwater	Figure 9-13	"Flat hydraulic gradient at injection site"	The flat gradient is liable to change in the future with the planned abstraction of groundwater for agricultural use.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	51	9	Groundwater	9.4	"The key components of the Project in relation to groundwater"	This section should discuss the uniqueness of targeting a major aquifer for CCS injection, as part of the project's key components.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	52	9	Groundwater	9.4.1.1.1	"The well encountered 78 m of 'good to excellent reservoir' sandstone"	The lower BSF Precipice sandstone is also a highly valued "good to excellent" aquifer, in large part due to these same formation characteristics.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	53	9	Groundwater	9.4.1.1.2	"Both West Moonie-1 Injection Well and West Moonie-2 Monitoring Well are cased with corrosion-resistant alloy casing"	Comment should be made regarding the need for specialist casing to be installed by future water bore drillers given the corrosive nature of the injectate.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.8.1.2; and Chapter 9 Groundwater, section 9.10.1.8.
24	54	9	Groundwater	9.4.1.1.6	"Modelling and other studies"	The hydrodynamic and geochemical models should include scenarios for off-site pumping from planned (and as yet unplanned) future water supply bores.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	55	9	Groundwater	9.4.1.2	"Continuous monitoring of atmospheric CO2 concentration at the surface near West Moonie-1 Injection Well."	This surface monitoring should extend to any future new Precipice bores installed in the vicinity to confirm containment.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11.
24	56	9	Groundwater	9.4.1.3	"...ongoing pressure and water quality monitoring from West Moonie-2 Monitoring Well every 6 months after injection has ceased"	This monitoring should extend to any future new Precipice bores installed in the vicinity.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11.
24	57	9	Groundwater	9.5.1.1.1	"The plume is stable between the 5-year and 100-year shut-in period, with negligible vertical or lateral migration."	This base case scenario assumes no pumping-induced hydraulic gradient. As well as the effects of dislocating the plume, groundwater pumping could potentially result in the injectate expanding from a supercritical fluid into a gas phase. The risk of seismicity and containment in this scenario should be discussed in the EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	58	9	Groundwater	9.5.1.2.2	"While the pH stayed constant at approximately 4.4, Fe2+ increased to about 13 mg/L"	This is a significant (four orders of magnitude) acidification of the groundwater environment and increase in dissolved iron (one order of magnitude) from baseline conditions.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	59	9	Groundwater	9.5.1.2.2	"The static model described in Appendix 9A used a simplified sandstone mineralogy"	It is unclear why the detailed mineralogy data obtained from core data was not used. Why weren't core leaching studies undertaken on the core extracted from the Moonie West 1 well?	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09C and 09D.
24	60	9	Groundwater	9.5.1.2.3	"Overall, the concentrations of As and Pb at the end of mixed gas experiments were below 30 µg/kg"	Comparison of these toxic parameters should be made against pre-injection concentrations. The significance of 30µg/kg is unclear.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09C and 09D.
24	61	9	Groundwater	9.5.1.2.3	"Outside of the plume, there will be no change to the groundwater chemistry."	It is not clear if groundwater advection, dispersion and diffusion transport mechanisms have been assessed. It is unreasonable to assume the plume will remain static. It is assumed that the term 'plume' means the injectate plume. In contaminant hydrogeology the 'plume' can be defined/delineated as where change to groundwater chemistry occurs due to a source of contamination. Under a pumping scenario different components of the plume will likely migrate at different rates. This scenario should be modelled.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09B, 09C and 09D.
24	62	9	Groundwater	9.5 2.1.1 and Fig 9-20	"Results from the particle tracking model are presented in Figure 9-20 showing the predicted travel of four groundwater 'particles' over a 1,000-year simulation."	The model results indicate that after 1000 years no groundwater particle has moved more than 20m from its starting position. This is hard to fathom unless flow conditions are completely stagnant which is likely an over-simplistic view of the hydrodynamic regime. If there are stagnant conditions why is the salinity so low? Plume movement would be greatly influenced by a new abstraction bore operating nearby. More conservative (higher flow rate) flow regime scenarios should be modelled.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09B, 09C and 09D.
24	63	9	Groundwater	9.5 3	"An exposure pathway is a mechanism that connects a receptor to a hazard and is a fundamental aspect of the risk assessment process"	Not all potential receptors and exposure pathways have been fully considered in the EIS. Namely, planned future pumping from the Precipice Sandstone	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10; and Appendices 09B, 09C and 09D.
24	64	9	Groundwater	9.5 3	"Migration of the plume into unintended aquifers would have implications for the groundwater quality and/or EVs for those aquifers."	This statement is considered as true for the Precipice Sandstone aquifer as for those aquifers above it.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	65	9	Groundwater	9.5 3.1	"The schematic representation of the base case exposure pathway scenario is shown in Figure 9-21."	This schematic requires updating to show planned future groundwater abstraction on the adjacent property.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	66	9	Groundwater	9.5 3.1	"The lateral hydraulic gradients in the Precipice Sandstone are relatively flat and the reservoir is therefore stagnant"	These gradients are likely to change significantly as demand for deep groundwater resources increases. In the near term a water supply bore is to be installed into the Precipice Sandstone at a Government-approved location 9.5km from the injection site.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	67	9	Groundwater	9.5 3.1	"The injected GHG stream plume remains in place in the near-field environment around the well and does not migrate more than approximately 500 m away from the injection location, owing to a lack of driving pressure gradient."	Pressure gradients affecting the plume migration are likely to increase. A head difference of many metres would develop within the local Precipice Sandstone aquifer area when plans to abstract from a new bore on a neighbouring property (CPC) become operational.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	68	9	Groundwater	9.5 3.2	Four alternative exposure pathway scenarios are discussed and "considered highly improbable".	This should be changed to "probable" regarding the well integrity scenario and water management scenario as they relate to a new nearby water supply bore installed into the storage formation.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	69	9	Groundwater	9.5 3.2 and Fig 9-23	"In a worst-case scenario, GHG stream might be released into the near-surface environment."	This worst-case scenario could be realised given that a pumping bore could act as a conduit from the storage zone back to surface.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	70	9	Groundwater	9.5 3.2 and Fig 9-24	"Under this scenario, an enhanced hydraulic gradient develops within the Precipice Sandstone near EPQ10 causing the GHG stream plume to migrate away from the West Moonie-1 Injection Well. Eventually the GHG stream that has migrated may be extracted at the point of the water management activity."	This water-management scenario is real and likely within EPQ10 given that there are scoped, costed and approved plans to pump groundwater from a location 9.5km southeast of the injection site.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	71	9	Groundwater	9.5 3.3	"Currently there is no water abstraction taking place in close proximity to the West Moonie-1 Injection Well, which makes impacts from water abstraction unlikely."	Consideration must be given to realistic future abstraction scenarios, not just the current situation.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	72	9	Groundwater	9.6	"Due to the highly localised footprint, cumulative water quality impacts will not be associated with the Project."	The modelled project footprint is likely to become significantly dislocated and extended by future groundwater abstractions. Implications for a full-scale CCS project should also be presented.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	73	9	Groundwater	9.6.1	Summary of Impacts section	The content of this section presents a summary that has already been commented on in this submission. The repeated use of the word "demonstrate" is inappropriate for an assessment of this type where many uncertainties remain.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	74	9	Groundwater	9.6.1	"Water quality in the Precipice Sandstone at the injection site does not support any environmental values."	This statement is wrong. The water quality data collected by CTSCo provides increased support to the assigned Environmental Values of the aquifer. Investigations have enhanced understanding of the value of the groundwater resource to potential users going forward.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	75	9	Groundwater	9.6.1	"As the Precipice water quality at the injection location does not support any environmental values, the geochemical changes which are predicted to occur within the plume are not expected to cause any deterioration of environmental values."	This statement is important to the project and is highly controversial given that it is solely based on detected fluoride concentrations with respect to stock watering. Fluoride concentrations are within the expected range for the GAB, are easily managed, and would not deter abstraction for many different uses including stock watering. Fluoride tolerance varies between animal species ⁵³ and the levels detected do not automatically preclude the use of Precipice Sandstone groundwater for stock watering. The project is not expected to affect natural fluoride levels but will affect other parameters that impact EVs.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09E.
24	76	9	Groundwater	9.6.1.1	"There is no potential for..."	This wording is too absolute and should be changed.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	77	9	Groundwater	9.7.1	"CTSCo has taken the learnings from the CCS global case studies and is applying them to the Project."	It is evident that only learnings that support the project have been taken. All case studies seek to protect water supply aquifers. This a key criteria for all other global CCS cases that should form a critical learning to apply within the Australian setting. The CTSCo project proposal is globally unique in that the injection target is an aquifer with valuable water resources. Learnings in this regard from their EPQ7 West Wandoan trial appear to have been discounted.	Amended EIS	See Chapter 9 Groundwater, sections 9.4 and 9.8.
24	78	9	Groundwater	9.7 2	"The assessment of the base case did not identify any significant potential groundwater impacts and hence there are no proposed avoidance and mitigation measures attached to the base case"	The base case involves injection of a waste fluid into a major water supply aquifer, which is contrary to current thinking on CCS regarding water resource protection. It is also contrary to legislation that protects the target aquifer and existing and future water users. Significant potential groundwater impacts have been modelled by CTSCo and have only been deemed insignificant based on their interpretation of generic water quality trigger values.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
	FOOTNOTE				⁵³ https://veteriankey.com/fluoride-tolerance/		Noted	Noted
24	79	9	Groundwater	Table 9-29	"Summary of monitoring during the operation and monitoring"	Monitoring should allow for future changes to baseline conditions such as new bore installations and groundwater abstraction.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	80	9	Groundwater	9.7 2.4	"Therefore, no specific mitigation measures for potential impacts are required."	It is important that mitigation commitments are made and enforced over a suitable timeframe given the sensitivity of the groundwater receptor and potential impact to stakeholders in the future. This should include requirements for Glencore/CTSCo to make-good unacceptable impacts, should they occur.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	81	9	Groundwater	9.7 2.5	"A 3D seismic survey will be carried out prior to the injection and the results will identify any potential leakage pathways such as geological seal faults."	Investigations of this type should be completed prior to regulatory approval. Faults that are interpreted as sealing can in some cases be induced by CCS to reactivate and become conduits. The current 2D seismic data is considered too sparse.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11.
24	82	9	Groundwater	9.7 2.6	"The hydrodynamic modelling should be updated on an annual basis"	All affected models should be updated prior to project approval, to incorporate planned and unplanned future borehole drilling and pumping operations. Given the proven water quality of the Precipice Sandstone in the area, it is likely to attract more applications to abstract. Stakeholder engagement, such as with the QLD Government Department RDMW and Ag industry representation groups (Agforce, QFF, ALFA, etc), can provide greater clarity on this.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	83	9	Groundwater	9.7 2.7	"Management of Water Quality Impacts"	This section should include monitoring of new bores installed in EPQ10.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	84	9	Groundwater	9.7 2.8	"Table 9-30 summarises the groundwater monitoring parameter threshold values that would trigger an investigation"	In addition to investigation actions there should be commitments made regarding mitigation and remediation actions.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	85	9	Groundwater	Table 9-30	Table of investigation trigger values	The proposed trigger values for TDS, arsenic and lead are very high if detected at point of use and would render the water unusable. These should be revised down after a second tier, site-specific, risk assessment that moves beyond generic trigger values to refine the risk assessment.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10; and Appendix 09D.
24	86	9	Groundwater	9.7 2.10	"However, the registered bore database should be checked at least yearly to evaluate whether any new groundwater users are established in the area."	In addition, discussions should be held with the groundwater licencing authority to establish current and future plans for groundwater abstraction. Entitlement holders should have been engaged before the EIS was released for consultation.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 3 Community and Stakeholder Engagement, section 3.5.4; Appendix 03C; and Chapter 9 Groundwater, section 9.10.
24	87	9	Groundwater	9.7 2.10	"Future users should not be allowed to take groundwater supply from the zone impacted by the plume."	Despite the need for successful CCS projects in Australia, preference should be given to the aquifer as a valuable groundwater resource over a waste repository. The initially impacted zone and its potential dislocation will need to be regularly delineated by CTSCo. Also, the statement has potentially profound effects on other water users if CTSCo scale up the project beyond the trial phase.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	88	9	Groundwater	9.7 3	"Final rehabilitation will be in accordance with EPQ10 conditions, EA conditions and legislative requirements."	Rehabilitation or compensation measures should be proposed to account for potential contaminating impacts to groundwater supplies. There are examples of legacy groundwater contamination issues in Queensland that can be learnt from in this regard.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11 and 2.12; Chapter 9 Groundwater, section 9.10; and Chapter 19 Rehabilitation, sections 19.5 and 19.7.
24	89	9	Groundwater	9.7 3.2	"Future groundwater abstraction from the Precipice Sandstone should be restricted within the zone impacted by the GHG stream plume."	Much of the economic growth and sustainable development of agriculture in the region depends on water security. The baseline GHG stream plume predictions should be updated to account for the Precipice Sandstone aquifer being a key groundwater resource.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	90	9	Groundwater	9.7.4	"The existing water quality of the Precipice Sandstone groundwater prior to injection does not meet WQO Guidelines"	This interpretation is contentious, as discussed previously. WQOs are not met solely for fluoride with respect to stock watering. WQOs should not be leveraged to present a narrative whereby Precipice Sandstone groundwater is not of value. Its value is apparent in the aquifers inclusion in the GABORA Water Plan (2017), and the mature plans to install a water supply bore nearby and the licenced entitlements.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, and 9.7.
24	91	9	Groundwater	9.7.4	"Changes to groundwater quality are predicted within the GHG stream plume. These impacts will be long-term"	The changes will be detrimental to the water quality and should be reassessed considering future groundwater abstraction. Some effort should also be made to discuss the viability of progressing the project to full-scale operations.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	92	9	Groundwater	9.7.4	"The Project has specifically targeted an aquifer and an injection location that is isolated and remote from existing uses and users. The potential for others to use this aquifer is very limited"	This is inaccurate and shows a lack of consultation and disconnect to the QLD Government Dept RDMW who manage the water resource and the views of the agricultural and other sectors who see opportunities in the water resource. The targeting of a water supply aquifer is highly unorthodox. The potential for other stakeholders to use the aquifer is high (a certainty) as opposed to "very limited".	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	93	9	Groundwater	Table 9-31	"The design of the Project targets a deep, low quality, and confined aquifer"	This is highly subjective and misleading. This should read "The design of the Project targets a deep, high quality, and confined aquifer"	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	94	9	Groundwater	Table 9-31	"The injection testing of the GHG stream will have a negligible impact on the local groundwater quality of the Precipice Sandstone and will not compromise identified groundwater use."	Local groundwater quality will be impacted to the extent it could significantly compromise future groundwater use.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	95	9	Groundwater	Table 9-31	Objective: "The activity will be managed to prevent or minimise adverse effects on groundwater"	The activity will have adverse effects on the groundwater as a water supply resource. By deliberately targeting a water supply aquifer for CCS it is difficult to see how the stated objective will be met.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	96	9	Groundwater	Table 9-31	"The GHG stream plume will not cause a reduction in the EVs which apply to the Precipice Sandstone at the West Moonie- 1 injection well."	The existing EVs applicable to the Precipice Sandstone at this location should not be diminished by CTSCo's interpretation of them. There will be a reduction in the EVs as they appear in the Queensland Murray-Darling and Bulloo River basins plan	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	97	9	Groundwater	Table 9-31	"Corrective actions, such as cessation of the injection of the GHG stream"	This is a minimal corrective action; further commitments should be set out in terms of remedial and compensatory actions.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	98	9	Groundwater	Table 9-31	"In summary, the Project will be managed to prevent or minimise adverse effects on groundwater"	Only injection into an alternate, more orthodox, setting would prevent adverse effects on groundwater.	Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 2 Proposed Project Description; and Chapter 9 Groundwater, sections 9.8, and 9.10
24	99	9	Groundwater	Table 9-32	The administering authority must refuse to grant the application if the authority considers: c) the waste is likely to result in a deterioration in the EVs of the receiving groundwater"	The proponent assesses the groundwater to have no EVs and argue that deterioration doesn't matter. However, Precipice Sandstone groundwater in EPQ10 is a highly attractive target for agricultural users and has a high EV.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	100	9	Groundwater	Table 9-32	"These changes to water quality within the plume could be interpreted as a highly localised deterioration of the WQOs and EVs."	The assessed changes are interpreted by other stakeholders as a deterioration of the WQOs and EVs.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	101	9	Groundwater	Table 9-32	"As given in section 9.3.6, the existing water quality of the Precipice Sandstone does not meet WQOs for the EVs. Some of the WQOs and EVs within the plume do not strictly comply with s.41 C of the EP Regulation."	WQOs are met apart from for fluoride, which is a common component of GAB groundwaters ⁵⁴ that is not known to be problematic with in the Surat basin and would be easily managed if considered necessary.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09E.
24	102	9	Groundwater	9.8	Update the groundwater modelling on an annual basis. All model updates will be peer reviewed.	This should be done prior to project approval and after all regulatory and landowner stakeholders have been fully engaged. At the time of the EIS submissions period commencing, the neighbouring landowner (Cameron Pastoral Company Pty Ltd) had not been engaged regarding their approved plans for installing a Precipice Sandstone water supply bore.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 3 Community and Stakeholder Engagement, section 3.5.4; Appendix 03C; and Chapter 9 Groundwater, section 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	103	9	Groundwater	9.8	<i>"Undertake an annual monitoring review."</i>	Commitments should be made to an extended monitoring timeframe beyond project end, to include clean-up and/or compensation where appropriate.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	104a	9	Groundwater	9.9	<i>"Proposed Amendments to Environmental Authority Conditions"</i>	Existing EA Conditions for managed aquifer recharge operations have been used as a template and amended for GHG injection. The conditions are designed to protect the target aquifer and this stance should be applied for CCS. Aspects concerning threats of environmental harm have been removed by CTSCo and are thus problematic to stakeholders.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.16; Chapter 9 Groundwater, section 9.13; and Chapter 22 Proposed EA Condition Amendments.
24	104b	9	Groundwater	9.9		It is recognised that Queensland's regulatory landscape has not been designed for CCS and steps need to be taken to rectify this gap. However, this does not detract from concerns to target an important water supply aquifer for CO ₂ storage.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 1 Introduction, sections 1.4, 1.5, and 1.6; and Chapter 4 Approvals.
	FOOTNOTE				⁵⁴ https://www.mckinlay.qld.gov.au/downloads/file/1457/fluoride-fact-sheet		Noted	Noted
24	1	18	Economic Impacts	18	The chapter on Economic Impacts does not consider costs associated with groundwater contamination and treatment.	The economic modelling should account for the potential financial impacts to stakeholders, now and in the future, who are prohibited from using groundwater from the Precipice Sandstone or must pay to treat the water due to CTSCo project activities. As natural capital, water resources have an economic value as well as social and ecological value.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	1	A09	Appendix 09 Groundwater Impact Assessment	1.0	The GIA appendix presents information that is carried through to the main EIS documents.	Only key points are commented on here as many have already been covered earlier in this submission document. There is some duplication of comments to ensure key points are reiterated within the appropriate EIS sections.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	2a	A09	Appendix 09 Groundwater Impact Assessment	1.2	<i>"After years of research and baseline studies, CTSCo identified that the southern part of the basin would be more favourable for GHG stream injection into the Precipice Sandstone"</i>	This statement reads as if CTSCo undertook the years of studies. UQ's SDAAP project undertook the preliminary research and identified three nominal areas in the basin for further study. UQ state on the SDAAP website ⁵⁵ that <i>"The aim of the research project is not to advocate or oppose carbon storage in the Surat Basin, but to collect new data and develop new and informed knowledge about CCS scenarios and their potential impacts."</i>	Amended EIS	See Chapter 9 Groundwater, sections 9.4, and 9.5; and Appendix 09A.
24	2b	A09	Appendix 09 Groundwater Impact Assessment	1.2		CTSCo did not do this baseline work and initially identified EPQ7 as a suitable test area before abandoning the project due to unacceptable risks to the Precipice Sandstone aquifer.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, and 9.5; and Appendix 09A.
24	3	A09	Appendix 09 Groundwater Impact Assessment	2.2 3.5	<i>"The modelling results provide important insights in terms of geochemical processes within the plume extent."</i>	There does not appear to be any assessment of water quality changes beyond the CO ₂ injectate plume, such as migration of heavy metals within a dynamic pumping scenario.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	4	A09	Appendix 09 Groundwater Impact Assessment	2.2 3.6	<i>"This GIA identifies current and potential water users and uses."</i>	The GIA is primarily based on data sourced from contemporaneous government databases and does not address the future value of the water to other users. The likelihood of water supply abstraction in the future is repeatedly dismissed as unlikely. However, the neighbouring landholder has a scoped and approved plan to install a water supply bore into the aquifer for a large existing piggery. Also, licenced entitlements to take Precipice groundwater are identified in the GIA but are then discounted due to the current lack of a bore. The "potential" water users have not been modelled or assessed.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	5	A09	Appendix 09 Groundwater Impact Assessment	2.2 3.7	<i>"since the actual evolution of any system cannot be known with high certainty, in a deterministic way, alternative scenarios must be developed to map the system's range of possible future states."</i>	The system's range of future states should include one where the high-value groundwater of the target aquifer is increasingly relied on for agricultural productivity and to mitigate water stress in the region.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	6	A09	Appendix 09 Groundwater Impact Assessment	2.3.1	Previous studies relevant to the project are listed.	CTSCo's project at EPQ7 is mentioned but more information should be presented, especially regarding lessons learned. The UQ-SDAAP project has been a significant undertaking to assess the feasibility of CCS in the Precipice Sandstone of the Surat Basin. Significantly more reference should be made to the findings of this series of studies, including their appraisal project risk register. ⁵⁶	Amended EIS	See Chapter 9 Groundwater, sections 9.4, and 9.5; and Appendix 09A.
	FOOTNOTE	A09	Appendix 09 Groundwater Impact Assessment		⁵⁵ https://energy.uq.edu.au/project/scoping-study-material-carbon-abatement-carbon-capture-and-storage-ccs ⁵⁶ Honari V, Garnett A & Unterschultz J (2019), Risk register report, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Noted	Noted
24	7	A09	Appendix 09 Groundwater Impact Assessment	Table 16	<i>"Shortlist of prospective case studies"</i>	A summary of eleven case studies is presented and includes information on the storage target type. In all cases the storage is either in a saline formation or conventional hydrocarbon reservoir not utilised for water supply. Given that the CTSCo target is a water supply aquifer, which is only slightly brackish, these more orthodox case studies lose most of their relevance. It would be highly beneficial if CTSCo could present a case study that demonstrates successful injection into a water supply aquifer.	Amended EIS	See Chapter 9 Groundwater, sections 9.4, and 9.5; and Appendix 09A.
24	8	A09	Appendix 09 Groundwater Impact Assessment	4.2 3.1	<i>"The TDS content from West Moonie-1 Injection Well sample is about 1,850 mg/L ... indicating fresher groundwater."</i>	That the groundwater at the injection site is "fresher" than at the Moonie Oil Field is not given enough attention or weight in subsequent assessments and comes across as an inconvenient truth throughout the EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	9	A09	Appendix 09 Groundwater Impact Assessment	Figures 16 and 17	Comparison of groundwater quality data	This comparison exercise should include TDS concentrations.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	10	A09	Appendix 09 Groundwater Impact Assessment	4.5	<i>"A comparison of the groundwater quality sampled from West Moonie-1 Injection Well, with the WQOs for the listed EVs is discussed below. Generally, the water quality at West Moonie-1 Injection Well indicates that the aquifer is naturally not consistent with the WQOs for the identified EVs. Additionally, the depth to the aquifer would be a limiting factor for most users. Shallower aquifers with better water quality would be used instead as a source of water."</i>	This is a misleading statement that arguably wrongly characterises the Precipice Sandstone aquifer as a low value water supply resource. Groundwater within overlying aquifers is fully allocated within the GABORA Water Plan (2017). The lack of approved access to water from shallower aquifers, together with the good water quality, has led to scoped, costed and approved plans to take Precipice Sandstone groundwater for stock-intensive supply at a property next to the project plot.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	11	A09	Appendix 09 Groundwater Impact Assessment	4.5 2	<i>"The main consideration for farm supply is limiting corrosion and fouling of farm water supply equipment."</i>	While this is one consideration, appropriate quality and quantity for the intended use are primary considerations. Corrosion and fouling are common challenges across the GAB region and rarely overrides the need to access groundwater.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	12	A09	Appendix 09 Groundwater Impact Assessment	4.5 3	<i>"This EV aims to ensure that water provided to livestock is of sufficient quality to prevent any deterioration in the health or condition of watered livestock. The naturally occurring fluoride concentrations from the samples may be hazardous to livestock health (particularly young livestock). This is likely to render the in-situ groundwater from the Precipice Sandstone aquifer in the location of West Moonie-1 Injection Well unsuitable for livestock consumption."</i>	It is incorrect to state that fluoride concentrations render the water unsuitable for livestock consumption. The naturally occurring concentrations exceed the trigger value that is necessarily conservative and generic. An exceedence should trigger a more detailed appraisal on a case-by-case basis rather than a wholesale dismissal of stock watering value. Many landholders in the GAB are used to holistically managing fluoride intake as part of livestock care or have assessed and monitored it as not a risk.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5; and Appendix 09A, and 09E.
24	13	A09	Appendix 09 Groundwater Impact Assessment	4.5 3	<i>The groundwater is unsuitable for livestock consumption and would present a risk to stock based on the fluoride concentration." ... "on this basis, the water is unlikely to be suitable for the purposes of stock water."</i>	The risk of fluorosis is minimal and easily mitigated through diet management. The water is very suitable for the purposes of stock watering, which is why CPC is investing in a new Precipice water supply bore on a neighbouring property.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5; and Appendix 09A, and 09E.
24	14	A09	Appendix 09 Groundwater Impact Assessment	4.5.4	<i>The depth of the groundwater (approximately 2.3 km deep) would also preclude the economic viability of using groundwater for drinking water. There are other aquifers (e.g., Gubberamunda) at much shallower depths that are more economically viable to drill and access fresher groundwater for use as drinking water.</i>	Economic viability is always project-specific and must consider water access permissions and potential treatment costs, which can change over time. Although the Gubberamunda would be a preferred choice for most users, access is currently highly restricted and the aquifer is fully allocated (Gabora Water Plan 2017). Access restrictions to shallow Surat Basin aquifers are likely to increase in the future and necessitate using deeper groundwater resources, such as from the Precipice Sandstone.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	15	A09	Appendix 09 Groundwater Impact Assessment	4.5 5	<i>"There are no overarching WQOs relating to industrial use, as industry-specific requirements are case specific, and industries usually treat water supplies to meet their needs."</i>	Although the agricultural industry may not be intended in this context, for large scale and stock-intensive farming operations treatment options are a viable consideration.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	16	A09	Appendix 09 Groundwater Impact Assessment	4.5 5	<i>"The depth of the groundwater (approximately 2.3 km deep) would also preclude the economic viability of industrial use of groundwater. There are other aquifers (e.g., Gubberamunda) at much shallower depths that are more economically viable for industrial use.</i>	This is not true. Depth would not preclude economic viability in all cases. Shallower aquifers may be economically viable but unviable for other reasons. Regulatory restrictions should be discussed in this regard. As noted previously there are existing economic cases studies for deep bores. The Lillyvale Feedlot near Condamine drilled a 2200m deep bore into the Precipice Sandstone (similar depth to the CTSCo injection well), drilled under a strong business case to support expansion and provide security of supply to their operations.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	17	A09	Appendix 09 Groundwater Impact Assessment	Table 35	<i>"Aquifer attribution of registered water bores within 50 km of West Moonie-1 Injection Well"</i>	The table presents information on registered bores. This section omits a necessary discussion regarding future water supply bore plans. More comprehensive stakeholder engagement would have identified these plans for CTSCo's consideration as previously detailed in this submission.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	18	A09	Appendix 09 Groundwater Impact Assessment	4.5 9	<i>"The water quality analysed from Precipice Sandstone aquifer groundwater recovered from West Moonie-1 Injection Well indicates that at this location the existing groundwater is not consistent with the WQOs for the identified EVs. Additionally, the depth to the aquifer would be a limiting factor for most users. Shallower aquifers such as the Gubberamunda Sandstone (at approximately 1,200 m below surface), having better water quality, would be used instead."</i>	This characterisation reads as tailored to meet CTSCo project objectives. Using generic WQOs versus EVs is a valid first-pass approach but is only the first step in a location- and use- specific screening/assessment process. Groundwater from the target aquifer has already been deemed valuable for stock watering by the neighbouring property owner. Depth is a limiting factor for some but not all users. The repeated suggestion of using Gubberamunda Sandstone water should be balanced with the facts regarding the lack of available licences and the status of this aquifer in the Surat as fully allocated.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	19	A09	Appendix 09 Groundwater Impact Assessment	5.1	<i>"The injected GHG stream is incorporated in the model as a similar volume of water to simulate the pressure impact in the southern Surat Basin."</i>	Although this method was for regional pressure modelling, it would be beneficial to also understand the localised risk of fracking the aquifer and any subsequent effects on the particle tracking model, particularly if the injectate does not stay in liquid form.	Amended EIS	See Chapter 8 Geology, sections 8.5, 8.6, 8.7.6, 8.8, 8.9.2, and 8.10; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	20	A09	Appendix 09 Groundwater Impact Assessment	5.3 3	<i>"In general, the injection of the GHG stream (CO2 and associated impurities SO2, NO2, and O2) would result in substantial lowering of the pH of the Precipice Sandstone formation water within the plume, from 8.6 to 4.4."</i>	An attempt to estimate the proportion of impurities should be made with regard to "previous work" mentioned in this section. The significance of the large pH change should be commented on, given it is a logarithmic scale.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	21	A09	Appendix 09 Groundwater Impact Assessment	5.3.4	<i>"However, the fate and transport of trace elements was not addressed by the RP modelling due to limitations associated with relevant thermodynamic data and a lack of data related to trace element content of minerals present in the reservoir. Instead, the release of trace elements and their potential impact on the groundwater quality within the reservoir due to the injection of the GHG stream was evaluated in a more qualitative manner by comparing the Project with an analogue project, EPQ7."</i>	Many of the trace elements modelled to be released into the water are toxic heavy metals such as arsenic and lead. The fate and transport of these should be modelled quantitatively. The "lack of data" might for example be negated by core sample analysis. Why weren't core leaching studies undertaken on core cut from Moonie West 1? The usefulness of comparing results from EPQ7 is unclear, especially as the reasons for abandoning the EPQ7 project have not been presented and the formation mineralogy is different. Note that text in the same report section states: <i>"the chemical mineralogical composition, temperature, pressure, salinity (TDS) of the two reservoirs are different"</i>	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	22	A09	Appendix 09 Groundwater Impact Assessment	5.3.4	<i>"Elevated concentrations of trace metals will be restricted to the GHG stream plume"</i>	The modelling does not appear definitive enough to make this statement given that trace element fate and transport was not addressed quantitatively by the RP modelling. Trace metal fate should be considered with reference to the future water supply bore that has been scoped and approved for the neighbouring property.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	23	A09	Appendix 09 Groundwater Impact Assessment	6.1.1	<i>The injected GHG stream plume in supercritical state remains in place in the near-field environment around the well and does not migrate more than approximately 500 m away from the injection location, owing to a lack of driving pressure gradient.</i>	This base case scenario needs to be reconsidered in light of the stakeholder engagement process and planned future water supply abstractions from the Precipice Sandstone aquifer. Dislocation of the plume and the risk of liquid to gas phase change should be assessed in terms of nearby groundwater pumping.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	24	A09	Appendix 09 Groundwater Impact Assessment	6.1.1	<i>"Due to the isolated and deep nature of the injection site, there is no interaction with other human activities in the Surat Basin."</i>	This statement was only correct at time of writing and should be updated in light of identified future human activities planned nearby.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, 09B, 09C and 09D.
24	25	A09	Appendix 09 Groundwater Impact Assessment	6.1.2	<i>"This section of the report describes four hypothetical alternative exposure pathway scenarios which deviate from the base case scenario. There are no current data or interpretations to support any of these scenarios occurring, and section 6.1.3 describes how implausible they are. In this regard, these alternative scenarios are highly improbable, and only consider hypothetical situations."</i>	Describing the alternative scenarios as highly improbable and implausible is incorrect and contentious. This statement should be rewritten to incorporate the wholly plausible scenarios of future nearby water bore installation and groundwater abstraction.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09A, and 09B.
24	26	A09	Appendix 09 Groundwater Impact Assessment	6.1.2.1	<i>"Caprock integrity scenario"</i>	The risk to the caprock integrity should also discuss if there is potential for fracturing caused by the temperature contrast between the injectate and aquifer. Another caprock integrity scenario is future water pumping causing a pressure drop that causes the injectate to go into a vapour phase and expand within the pumping bore.	Amended EIS	See Chapter 8 Geology, sections 8.5, 8.6, 8.7.6, 8.8, 8.9.2, and 8.10; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09A.
24	27	A09	Appendix 09 Groundwater Impact Assessment	6.1.2.2	<i>"In a worst-case scenario, GHG stream might be released into the near-surface environment."</i>	This worst-case scenario regarding well integrity should include leakage via a future Precipice Sandstone water bore. Figure 70 should incorporate this. The current figure only shows future wells penetrating as far as the Upper Precipice rather than the more feasible target of the Lower Precipice Sandstone. It is important to note that plugged and abandoned wells in the region are unlikely to meet the abandonment requirements for CO2. This could be problematic if the project is scaled up.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	28	A09	Appendix 09 Groundwater Impact Assessment	Page 162	Missing heading	The title heading for this section is missing. The section mentions the prospectivity of geothermal energy, which, given the high groundwater temperatures, is deserving of further comment as part of the mix of technologies that can support Queensland's Net Zero aspirations.	Amended EIS	Appendix 09A.
24	29	A09	Appendix 09 Groundwater Impact Assessment	Figure 71	<i>"Increased Hydraulic Gradient May Result in GHG Plume Dislocation"</i>	This is a highly likely scenario and the report states: <i>"The chemical and hydraulic footprint of GHG stream in the aquifer will be extended across the migration pathway."</i> The implications of this scenario should be discussed in more detail.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	30	A09	Appendix 09 Groundwater Impact Assessment	6.1.2.3 and Figure 72	<i>"Water management scenario"</i>	This scenario considers future MAR injection but should also consider future abstraction from the Precipice Sandstone aquifer for water supply.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	31	A09	Appendix 09 Groundwater Impact Assessment	6.1.3	<i>"Water management – This highly unlikely scenario assumes interaction with current or future water management activities in the Precipice and Hutton sandstones."</i>	This scenario is mis-stated as highly unlikely when in fact planned and approved future water management activities in the project vicinity are likely to affect CTSCo's modelled outcomes.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	32	A09	Appendix 09 Groundwater Impact Assessment	6.1.3.1.1	<i>"Also, unforeseen over-pressuring of the host rock can occur when the formation is depressurised (i.e., through water production or GHG stream leakage) to a point where the formation pressure drops below the CO2 critical pressure. This induces a phase change in the stored CO2, such that the resulting expansion of the gas phase may lead to over-pressuring if the pressure does not dissipate."</i>	Over pressuring due to injectate phase change from liquid to gas due to water production should be discussed in terms of the planned water production bore at the neighbouring property. This scenario should be presented in the main EIS report.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	33	A09	Appendix 09 Groundwater Impact Assessment	6.1.3.3	<i>"Indeed, direct abstraction of groundwater from the reservoir may lead to dislocation and migration of the GHG stream plume, or extraction of the stored GHG stream."</i>	Given the high likelihood of this occurring, further discussion should be given to potential consequences for both the trial and full-scale phases of the project.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	34	A09	Appendix 09 Groundwater Impact Assessment	6.1.3.3	<i>"Extraction processes have potential to increase the hydraulic gradient towards the extraction point, which may result in enhancing GHG stream plume migration towards the extraction well/s. Based on current knowledge, there are no Precipice wells within 30 km of the West Moonie-1 Injection Well"</i>	The contemporaneous knowledge has evolved: Given that CTSCo failed to approach key stakeholders, stakeholders have sought out CTSCo to inform them that there will be a Precipice water supply bore within 9.5km of the injection site. Therefore, the enhanced plume migration risk needs to be reassessed.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	35	A09	Appendix 09 Groundwater Impact Assessment	6.1.3.4	<i>"The other mechanism which may affect the future evolution of the system studied is water extraction in the Hutton or Precipice Sandstones close to West Moonie-1 Injection Well. Complete migration pathways can be assumed if hydraulic head is reduced in the Hutton Sandstone due to future water management/usage. Currently no water abstraction takes place in the Hutton Sandstone or Precipice Sandstone close to operational lands which makes this scenario unlikely."</i>	Future water usage should be assumed rather than being considered unlikely. Migration pathways should be reevaluated based on probable and planned future groundwater pumping scenarios. That no abstraction is currently taking place does not make this scenario unlikely.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	36	A09	Appendix 09 Groundwater Impact Assessment	6.2.2.1	<i>Far-field groundwater pressure impacts</i>	Hydrodynamic modelling should make some effort to qualitatively address pressure management and dissipation risks for full-scale operations in addition to the initial test phase. Containment risks associated with induced seismicity and integrity of far-field bores and wells should be discussed. Pilot trials should be designed with the end point in mind.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	37	A09	Appendix 09 Groundwater Impact Assessment	6.2 3.1	"There will be no groundwater quality impacts outside of the GHG stream plume extents."	It is not clear that groundwater impacts associated with the injectate plume have been fully considered in terms of fate and transport. Especially, with respect to planned future water supply abstraction.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09B, 09C and 09D.
24	38	A09	Appendix 09 Groundwater Impact Assessment	6.2 5	"As such, no regional groundwater bores are predicted to be impacted by pressure change as a result of the Project."	Impacts to regional groundwater bores needs to be reconsidered in light of scoped, costed and approved plans to install a water supply bore on the neighbouring property. Also, pressure changes are likely to be significant if the project proceeds to full scale operations. Concerning full-scale sequestration, the UQ-SDAAP groundwater modelling work ⁵⁷ reported the following: "Groundwater modelling of the notional Field Development Plan (FDP) reference case shows that significant groundwater pressure increases (> 100 m water head) due to CO2 injection would likely occur in the Precipice Sandstone aquifer (injection reservoir) and overlying transition zone (Lower Evergreen Formation) in the deep southern Surat Basin. At known individual wells drilled for oil and gas exploration, pressure increases are predicted to exceed 250 m of groundwater head." CTSCo should be transparent about future scaled up plans and provide impact assessment information.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11.
24	39	A09	Appendix 09 Groundwater Impact Assessment	6.3 3.1	"Hydrodynamic modelling (Section 5.1) and dynamic reservoir modelling (Section 5.2) shows that groundwater movement of less than approximately 500 m in 1,000 years. Therefore, the impact of GHG stream injection on groundwater quality occurs only on a local scale and there is no change in water chemistry of the groundwater outside of the plume."	This assessment needs to be revisited to account for planned future groundwater pumping and the associated induced change in flow regime.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	40	A09	Appendix 09 Groundwater Impact Assessment	Table 55	Groundwater pH values in the Precipice Sandstone	Lowering of the pH from 8.35 to 4.4 is modelled to persist until beyond 100 years after injection. This indicates a limited capacity for neutralising reactions and persistent risk from dissolution of heavy metals wherever the injectate migrates and source minerals are present. It is noted that Bridgepoint Energy's studies ⁵⁸ of groundwater within the Moonie Oil Field reservoir rock (also Precipice Sandstone) indicate a high pH neutralising capacity. This is due to the carbonate-rich hydrogeochemical signature associated with the hydrocarbons.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 09B, 09C and 09D.
24	41	A09	Appendix 09 Groundwater Impact Assessment	6.3 5	"Section 6.2.5 concludes that there are no forecasted impacts to regional groundwater bores due to injection testing."	This conclusion is based on historic desktop interrogation of online bore registers. Information on existing groundwater entitlements attached to land parcels for future use is available and should be evaluated. In particular, the water supply bore proposed and approved to be installed in 2023 on a property adjacent to the injection site.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09B.
24	42	A09	Appendix 09 Groundwater Impact Assessment	6.4 3	"the poor existing water quality in the vicinity of the West Moonie-1 Injection Well which is unsuitable for the EVs which have been assigned to the Precipice Sandstone groundwater"	The water quality has been subjectively assigned a poor-quality rating in the report, but its quality is good enough for many uses with a high value added by amendment or treatment and the water is considered of high value for stock watering without treatment	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7.
24	43	A09	Appendix 09 Groundwater Impact Assessment	6.5	"There are no legacy or abandoned wells within 15 km radius of the injection site that may pose a risk of providing a leakage pathway for injected GHG stream plume migration out of the Precipice Sandstone target aquifer."	Consideration should be given to leakage potential at full-scale operation. It would be pragmatic to mitigate the risk of the trial phase (if approved) not then being permitted to progress to full scale operation.	Amended EIS	See Chapter 4 Approvals, section 4.4 9.
24	44	A09	Appendix 09 Groundwater Impact Assessment	7.1	"Implementation of lessons learned from global case studies"	This section should present the lessons learned from CTSCo's abandoned EPQ7 project further north in the Surat Basin	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.3, and 2.15.2; Chapter 8 Geology, and Chapter 9 Groundwater.
24	45	A09	Appendix 09 Groundwater Impact Assessment	Table 56	"Summary of monitoring during injection phase"	The rationale for not monitoring the Hutton Sandstone should be made clear. The UQ-SDAAP group indicate this as an activity in their reference site appraisal plan ⁵⁹ .	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10.
	FOOTNOTE	A09	Appendix 09 Groundwater Impact Assessment		⁵⁷ Hayes P, Nicol C & Underschultz J (2019), Regional groundwater model, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland. ⁵⁸ https://newhopegroup.com.au/news-articles/?article_id=6321&&type=news ⁵⁹ Honari V, Gonzalez S & Garnett A (2019), Site appraisal plan, The University of Queensland Surat Deep Aquifer Appraisal Project – Supplementary Detailed Report, The University of Queensland.		Noted	Noted
24	46a	A09	Appendix 09 Groundwater Impact Assessment	7.2 3	"there is a need to undertake groundwater quality monitoring every 6 months."	How will representative groundwater samples be collected from the deviated monitoring well at the injection site? Will monitoring be extended to include new off-site bores?	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10.
24	46b	A09	Appendix 09 Groundwater Impact Assessment	7.2 3		As previously commented, the single Precipice monitoring bore proposed may not be suitably located and does not form an adequate monitoring network.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10.
24	47	A09	Appendix 09 Groundwater Impact Assessment	7.2 5	"Future users should not be allowed to take groundwater supply from the zone impacted by the plume (Precipice Sandstone aquifer). This should include a zone around the impacted area from which water might be extracted by a well installed outside of the immediate residual impact zone"	This statement is highly problematic given the already mature plans to install a groundwater supply bore into the Precipice Sandstone aquifer 9.5km away on the neighbouring property and with significant interest in other nearby locations. Also, the ability of CTSCo to monitor the plume extent is questioned without improved seismic data	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Groundwater, section 9.10.
24	48	A09	Appendix 09 Groundwater Impact Assessment	8.8	"The Project has specifically targeted an aquifer and an injection location that is isolated and remote from existing uses and users, and is highly unlikely to be used by others in the foreseeable future. The potential for other projects to use this aquifer is very limited, and accordingly, the potential for cumulative residual impacts is very limited."	This statement is incorrect and should be changed. The aquifer is highly likely to be used by others in the foreseeable future and so the potential for cumulative residual impacts is high.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendix 09A.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	49	A09	Appendix 09 Groundwater Impact Assessment	10.0	"has a brackish water quality with high concentrations of fluoride and other analytes that render the groundwater unsuitable for a range of groundwater uses"	The "brackish" water quality is more appropriate than "saline" which is highly misleading, although "slightly brackish" would be a more accurate description. The fluoride and TDS concentrations do not render the groundwater unsuitable for many of the key agricultural uses required in the region. The statement should be amended to reflect this.	Amended EIS	See Chapter 9 Groundwater, section 9.7.5; and Appendix 09A.
24	1	8	Geology	8	It is not clearly articulated what the subsurface plan is if the pilot is successful	Please include the likely development for the CCS project in the event of a successful pilot. This plan should demonstrate what the uncertainties and risks are for the main CCS project and how the pilot will address them or not. This work needs to be completed before the pilot. For example, what is the status of regional wells that may be in the plume of a full-scale project? Can they be abandoned appropriately? Can the plume area be feasibly controlled contained and monitored?	Amended EIS	See Chapter 4 Approvals, section 4.4 9.
24	2	8	Geology	8	There is no integrated discussion regarding subsurface uncertainties and how these have been modelled.	Uncertainty modelling is a best practice for this type of project. An uncertainty management plan (UMP) should be developed that then informs integrated modelling workflows to ensure the uncertainty space is suitably explored. This will improve confidence in the forecasting (plume size, plume anisotropy, early CO2 breakthrough, pressure build-up, fault stability, seal behaviour etc) and should be used in conjunction with model outputs to drive the data acquisition program during the pilot. Currently there is no clear link between the data being acquired, the uncertainties they will narrow and how those data will impact decisions for the main project. This could lead to a sub-optimal pilot, poor conformance, and poor monitoring (in addition to being a poor use of capital).	Amended EIS	See Chapter 8 Geology, section 8.6; and Appendix 08B.
24	3	8	Geology	8	No discussion of economics for the main CCS project in the event of a successful pilot	Economics for the main project should be shared and show what carbon pricing is required to make the project economic. In addition, it is normal practice to carry out a value of information (VOI) analysis when acquiring appraisal data such as this pilot project, especially given the large cost of this pilot. This VOI should be shared to demonstrate that the approach adopted is the best way to progress the main CCS project.	Amended EIS	See Chapter 4 Approvals, section 4.4 9.
24	4	8	Geology	8.2	It is stated that the reservoir models have been peer reviewed but no output of the review/s has been shared	Please share the scope and output of the review (observations and recommendations), how recommendations were resolved. This is required to understand the reliability of the modelling, which underpins the pilot project.	Amended EIS	See Chapter 8 Geology, section 8.4; and Chapter 9 Groundwater, section 9.4.
24	5	8	Geology	8.2	Representative QC products have not been shared and properties assumed in the model are unknown	Please provide quality control products such as cross-sections through the static models at West-Moonie-1 showing reservoir properties (PHIT, Perm, NTG, Swirr as a minimum), average maps with well values posted on, and regional well averages to demonstrate the models are not biased.	Amended EIS	See Chapter 8 Geology, sections 8.4, 8.5, and 8.6; Chapter 9 Groundwater, sections 9.4, 9.5, and 9.6; Appendices 09B and 09C.
24	6a	8	Geology	8.2.6.1	The reservoir modelling and pilot planning has been carried out on a sparse 2D dataset, yet there is no discussion regarding uncertainty.	The proponent's approach to uncertainty from use of seismic data should be shared. If no uncertainty modelling has been carried out, then investigate structural uncertainty (stratigraphic / horizon pick and velocity uncertainty). This is likely to be very large given the dataset. This work should also address fault uncertainty. This is a challenging task given the paucity of data so the project team should seek out analogous areas with a 3D seismic dataset to determine the risk of faulting (typically with developments the identification and therefore number of faults increase as the project matures).	Amended EIS	See Chapter 8 Geology, sections 8.4, 8.5, and 8.6.
24	6b	8	Geology	8.2.6.1		The uncertainty in stratigraphy and faulting should be incorporated into the modelling and could impact CO2 breakthrough, pressure build-up, fault reactivation, plume outline, and storage efficiency. Therefore, impacting decisions for the pilot. This work will also influence the monitoring program. Additionally, please show plume maps with respect to seismic data, known faults and wells that penetrate the storage formation. This is a useful QC tool for CCS projects	Amended EIS	See Chapter 8 Geology; Appendix 08B; and Chapter 9 Groundwater.
24	7	8	Geology	8.2.6.3	The static model sensitivity cases are insufficient to test uncertainties for a project with this level of uncertainty (2D seismic data, sparse well control etc.) and does not conform to normally applied industry standards.	The sensitivities tested generally do not significantly impact dynamic behaviour. Please present an uncertainty table and associated uncertainty management plan in order to robustly test and identify key uncertainties. For example, changes in reservoir properties (total porosity, permeability, irreducible water saturation), changes in facies distribution, changes in discrete facies i.e. shale barriers, high perm streaks (varying variogram range typically is insufficient), structure (see comment above) etc. These parameters should be varied such that the full uncertainty space is investigated and carried through to dynamic simulation and project decisions updated appropriately (monitoring program, operating conditions etc.)	Amended EIS	See Chapter 8 Geology, sections 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
24	8	8	Geology	8.2.6.3	How is the clay volume used to create facies and how does it suitably capture reservoir variability?	Please show how clay volume (Vcl) is used. How does it link back to depositional facies that allows for distribution in the model? Does it enable capturing of permeability contrasts such that early CO2 breakthrough and pressure distribution can be adequately investigated? Please show the facies scheme with respect to core data porosity and permeability (sections and x-plots).	Amended EIS	See Chapter 8 Geology, section 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10; and Appendix 08B.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
24	9	8	Geology	8.2.6.3	There is good core coverage in the appraisal well and rock typing has been carried out with cuttings and core. However, rock typing is not suitable for distributing properties in reservoir models due to the poor link with deo-facies.	Please show how the rock typing and Vcl-derived facies are integrated.	Amended EIS	See Chapter 8 Geology, section 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10; and Appendix 08B.
24	10	8	Geology	8.2.6.4	Data supporting Kv/Kh of 0.01 is not provided.	Please provide data supporting Kv/Kh of 0.01 from the West Moonie-1 injection well. Present the dual packer test interval to show it is representative of the Precipice as a unit (as Kv/Kh is scalar). Please also show well correlations with surrounding wells and any additional core and production data to support use of 0.01	Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, and 9.9.
24	11	8	Geology	8.2.6.4	The integrity of regional wells is unclear	Please provide a summary of the integrity of regional wells i.e. what is their abandonment status, do they pose a containment risk if a larger scale CCS project goes ahead? If there are a prohibitively large number of wells and / or access is not possible then the main project is compromised - and thus the pilot is compromised.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.9, and 9.10.
24	12	8	Geology	Figure 8-22	There is a risk that the main seal for the storage formation is inadequate.	Figure 8-21 shows clear pressure differential between the Hutton and Precipice, with Hutton being higher pressure supporting an effective seal locally. Figure 8-22 provides a pressure plot from a regional well with only a marginal pressure offset between the Hutton and Precipice (a delta pressure plot should be made to show this more clearly) with the Hutton slightly lower pressure than the Precipice. These data do not support the inference of an effective regional seal between the Hutton and Precipice. Please provide more data to support that conclusion and update the pressure plots to show uncertainty in the pressure measurements. Based on these data there is a risk of seal failure for a larger project. A wide range of seal scenarios should therefore be considered in the modelling work to better inform decisions about the viability of this site for the pilot. More work is needed to generate this range: leverage additional regional pressure data, improved stratigraphic understanding (environment of deposition uncertainty for example). Putting the project on hold to obtain the 3D seismic will also help reduce uncertainty. Given containment is so critical for a CCS project, the seal uncertainty should be investigated, along with faulting uncertainty, and combined with the geomechanical modelling to better define the uncertainty space for this critical parameter.	Amended EIS	See Chapter 4 Approvals, section 4.4 9; Chapter 8 Geology, sections 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10.
24	13	8	Geology	8.5.1.2	The geomechanical model discussion states the risk of seal failure due to injection is negligible but there is very little presented on the uncertainty analysis carried out to support this conclusion.	The EIS should share what additional uncertainty work was carried out. If nothing more has been completed, then please adjust key parameters into the model leveraging regional wells. Please also provide the operating pressure of the injection well to better understand how close the pressure will be compared to potentially critically stressed faults.	Amended EIS	See Chapter 4 Approvals, section 4.4 9; Chapter 8 Geology, sections 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, and 8.10; and Chapter 9 Groundwater, sections 9.6, and 9.9.
24	14	8	Geology	8.6	The cumulative impacts section only refers to the pilot project and not the larger scale project that the pilot is trying to prove up.	Please show simulated plume maps for a full-scale project, with appropriate uncertainty, and update the section on cumulative impacts accordingly.	Amended EIS	See Chapter 4 Approvals, section 4.4 9.
24	15	8	Geology	8.7	The monitoring program outlined does not have sufficient lateral and vertical resolution	The proposed 2D seismic has both a poor lateral and vertical resolution. Please clarify how you are confident that the monitoring program will capture CO2 movement in the thin high permeability streaks 360 degrees around the injection point. Given there are so many 'gaps' in the monitoring program (2D seismic and 1 monitoring well) consider using the 3D seismic as a baseline for 4D seismic - generally the preferred tool for monitoring. Downhole fibre optic cables should also be considered as this will provide both improved lateral and vertical coverage thereby providing superior monitoring, risk management and better decision making for future projects	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
24	16	8	Geology	8.7.1.3	Seismic dataset is very sparse	Given the sparsity of seismic data (only 2D), and the criticality of these data for any subsurface modelling, consider deferring the pilot until the 3D seismic is acquired and update the subsurface work. There is a risk the 3D could show faulting near the injection site that would present a containment risk	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
24	17	8	Geology	8	Irreducible water saturation value was not shared	Given Swirr is a key parameter for CCS please share the value/s used, and associated uncertainty	Amended EIS	See Chapter 8 Geology, section 8.6.
24	18	8	Geology	8	Storage efficiency was not shared	Please share the storage efficiencies for the range of scenarios considered, and associated benchmarking to test reliability.	Amended EIS	See Chapter 8 Geology, section 8.6.
24	19	8	Geology	8	Injection rates for the pilot and how they compare to a potential full scale CCS project is unclear	Please clarify how the injection well will be operated and how this compares to a potential future large scale project.	Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 2 Proposed Project Description; and Chapter 4 Approvals, section 4.4.9.
24					CTSCo Presentation to QFF		Noted	N/A
25	1	General	General		-		Noted	N/A
25	1	General	General		We are writing to voice our Objection to Glencore (CTSCo) Environmental Impact Statement (EIS) for the Carbon Capture and Storage (CCS) project proposed in the Surat basin. We believe there are major Environmental concerns for the district.		Noted	N/A
25	2a	General	General		- We are Property owners in the EPQ10 area and are very concerned about the possible impact on the Ground Water. We would like to know Why the EPQ10 area has been chosen as it is a fertile Agricultural area reliant on Underground water for Stock and Grain Farming?		Adequately dealt within EIS, no change to EIS	See Chapter 2 Proposed Project Description, section 2 2, 2.3 and 2.5.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
25	2b	General	General		- Do you realise that there are water licences in the Precipice seam very close?		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
25	2c	General	General		- How will Glencore or the Government Federal and State "Make Good" or compensate if Serious Contamination occurs in water Aquifers? What if Liquid CO2 leaks out or escapes?		Amended EIS	See Chapter 9 Groundwater, section 9.10.
25	2d	General	General		- Why do Glencore say "Unused saline" water at 1850 ppm, isn't this within Australian Guidelines? Is this factually correct?		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5 and 9.7.
25	2e	General	General		- If Contamination occurs have Glencore a plan for Animal welfare and compensation if water is contaminated? Our animals are solely reliant on Bore Water which is extremely close to that seam. We could lose our clean Green Animal Export markets.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, and 9.10.
25	2f	General	General		- Why was there no or lack of Consultation with land holders. We own properties in and nearby the EPQ10 and we were never informed of any meetings or discussions? We only found out by an article in the Queensland Country Life in Feb 2023. With Two Registered Bores in the area why weren't we informed?		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.5 and 3.6; Appendices 03A, and 03C; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.6, 9.7, 9.9, and 9.10; Appendix 09B.
25	2g	General	General		- Why was this released just before Christmas when everyone was preoccupied with Family and holidays? Were they trying to sneak it through while Farmers were having a break? As once the Trial is underway the gates are open!!		Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 1 Introduction, section 1.3; and Chapter 4 Approvals, section 4.4.9.
25	2h	General	General		- What are the Costs -Environmental and Financial of Liquifying CO2 at Millmerran ? We have heard it is extremely expensive and possibly half the Cost of making the Power. Is it worthwhile?		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.3 and 2.14.
25	2i	General	General		- What impact on Roads and Environment will Nine B-Double trucks transporting the Liquified CO2 have on our Roads travelling from Millmerran to west of Moonie every day?		Adequately dealt within the EIS, no change to EIS	See Chapter 11 Transport, section 11.6.
25	2j	General	General		- How do you know the Great Artesian Basin will not be affected??		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8; Chapter 8 Geology, sections 8.7, 8.8, 8.9 and 8.10; and Chapter 9 Groundwater.
25	3	General	General		We hope you will consider our Questions and reasons for not supporting this Project.		Noted	See Appendix 01D.
26	1	General	General		Please see attached submission		Noted	N/A
26	1	General	General		I am sending this submission to express my concerns with the proposed development of capturing transport and storing carbon dioxide (CO2) in the Surat Basin.		Noted	N/A
26	2	General	General		I'm a third generation grazier at [REDACTED] on the Western Downs. My family has been in this area since the 1930's and we have seen many changes especially in my generation. We have two other properties, [REDACTED] and another very close to the proposed site for this project.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.6.
26	3	General	General		Currently we have 1 bore at our [REDACTED] " which is in the Gubberamunda aquifer and we have plans of drilling another bore here at [REDACTED] "		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6, 9.7, 9.9, and 9.10.
26	4	General	General		This water is regarded as the most valuable asset we have for livestock. The GAB is the largest and deepest artesian basin in the world, the multiple layers of sandstone, siltstone and mudstone are a very unique system that we rely on a daily basis. What guarantees do we have that none of the CO2 will contaminate our valuable GAB		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6, 9.7, 9.9, and 9.10.
26	5	General	General		I am not aware of anywhere else in the GAB that this has been done so we don't know the ramifications of this. I know of agricultural business that have access to the Precipice sandstones which is the proposed dumping place for the CO2. One feedlot in particular has shown me there is nothing wrong with the water to use for livestock.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6, 9.7, 9.9, and 9.10.
26	6	General	General		I have seen and read some of the data that has been provided by Helen Darcy and Darren Greer but I am still convinced this is not in the best interest of our Basin. I have asked for a written guarantee that no contamination will occur in our other aquifers. I am waiting to hear back from Glencore.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.6, 9.7, 9.9, and 9.10.
27	1	General	General		Attached, please find document for your attention from [REDACTED], CEO, Australian Country Choice.		Noted	N/A
27	1	General	General		Australian Country Choice (ACC) has reviewed the CTSCo environmental impact statement (EIS) and strongly objects to the project. We request Queensland Government Department of Environment and Science (DES) reject the EIS and project.		Noted	N/A
27	2	General	General		CTSCo's proposal to create five operational jobs sequestering waste carbon dioxide into a Great Artesian Basin (GAB) aquifer threatens our fourth-generation agribusiness and the 1400 employees it supports.		Noted	N/A
27	3a	General	General		About Australian Country Choice Our agribusiness operations in Queensland cover 1.4 million hectares, comprising 39 properties both owned & leased. The properties have a total capacity of more than 175,000 head of cattle. Additionally, we own and operate three feedlots with 56,000 standard cattle units (SCUs). We hold DA approval for future expansion to incorporate another 77,000 SCUs. We employ 200 staff in rural Qld and are based in Roma. We also have a property aggregation 'Tungamah', near Moonie, where the Western Downs Regional Council recently approved a 60 000hd feedlot DA.		Noted	N/A
27	3b	General	General		ACC also operates a Brisbane processing facility at Cannon Hill employing 1200 people with an annual payroll alone providing \$103m annually to the city's general economy.		Noted	N/A
	3c	General	General		Additional fiscal benefits of businesses such as ours are evidenced in an economic analysis undertaken by Meat & Livestock Australia. (2018 ¹). A single 30,000SCU (standard Cattle Unit) feedlot such as the ACC Opal Creek Feedlot (currently applying for expansion to 60,000SCU) contributes \$11.6M directly and \$14M indirectly into the local community and a total of \$89M indirectly across local, regional and state areas. The same feedlot contributes directly to 41 FTE's (full time equivalents) regionally and 677 FTE's indirectly across local, regional		Noted	N/A
27	3d	General	General		The total number of existing and ongoing jobs generated by ACC's operations dwarfs the CTSCo projected employment levels of five operational positions ² . ACC provides 300-times more jobs for Queenslanders than the CTSCo project proposes.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
27	3e	General	General		ACC has tens of millions of dollars of infrastructure, current business, future plans and development directly aligned to future water supply from the Precipice and other GAB aquifers. Further down the supply chain, the company has invested more than \$45m since 2019 on processing infrastructure.		Noted	N/A
27	REFERENCE FOOTNOTES				1 Meat and Livestock Australia (MLA); 2018, Regional Feedlot Investment Study, prepared by Deloitte Access Economics. 2 CTSCo EIS submission table 7-3, p26		Noted	N/A
27	3f	General	General		Over five decades we have built our family-owned and operated business into the largest of its kind in the world.		Noted	N/A
27	3g	General	General		While we don't have an objection to the principle of this toxic carbon waste injection, we are very concerned that in this instance the injection will be into a highly utilised GAB aquifer.		Noted	N/A
27	4a	General	General		Our reliance on the GAB Were it located above-ground, the Great Artesian Basin (GAB) would be internationally recognised as of equal ecological significance as the Great Barrier Reef.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	4b	General	General		All three of our feedlots and most of our grazing properties are completely reliant on the secure supply of high-quality groundwater sourced from GAB aquifers. Our recently approved feedlot property 'Tungamah' was selected for future feedlot development based primarily on the presence of three underlying GAB aquifers providing the necessary security of supply for such a significant investment.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	4c	General	General		ACC has struggled with serious limitations to GAB groundwater availability under the Water Act (2000) and GABORA Water Plan (2017) and our business is severely constrained due to the lack of availability of further GAB-licensed entitlements. However, we acknowledge that such restrictions are necessary for the protection of the GAB aquifers and those communities and businesses like ours that are fundamentally reliant on these water resources.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	4d	General	General		Two of ACCs feedlots (Opal Creek Feedlot near Cecil Plains, and Brisbane Valley Feedlot near Gatton) are reliant on stock-intensive licenced entitlements from the Precipice Sandstone aquifer. The feasibility of the recently approved Tungamah Feedlot near Moonie is underpinned by the availability of Precipice Sandstone groundwater. While the property overlies three stacked GAB aquifers, each with increasing security with depth, the overlying aquifers are fully allocated.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	4e	General	General		Through the GABORA Water Plan (2017) at least 30 different businesses on 55 individual land parcels have intensive water entitlements (some on multiple properties) in the Precipice Sandstone Aquifer.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	4f	General	General		The GAB largely underlies an area classified as arid/semi-arid and often critically water-constrained. There are a number of regional shires who have Precipice water entitlements for town water supply, including the city of Toowoomba and the large towns of Dalby and Miles. There are both active operating entitlements and inactive entitlements (acquired for future development) in the aquifer		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	5a	General	General		Our Concerns 1. Contamination The CTSCo project intends to permanently contaminate one of Australia's most vital water resources and one of the largest underground freshwater resources in the world.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	5b	General	General		Given the above-described reliance on the GAB, including our critical reliance on the Precipice Sandstone for future expansion and water security, it therefore comes as a shock to us to hear that the very same Precipice Sandstone aquifer is the proposed target for waste CO2 injection.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	5c	General	General		We are concerned that this proposal involves unacceptable imminent risk to the aquifer and users of the aquifer through the direct injection of a corrosive industrial waste. In its EIS, CTSCo admits that the outcome of its actions will leave the GAB in worse quality, saying: "With the injection of a GHG stream, the groundwater quality within the GHG plume will become more acidic." They also state further that "The lowering of the pH has the potential to mobilise trace elements including arsenic, cadmium, chromium, copper, nickel, lead and selenium from the surrounding rock into the formation at concentrations which may initially exceed the Australian drinking water guidelines."		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12; and Appendices 09B, 09C, and 09D.
27	5d	General	General		CTSCo claims this is acceptable because these contaminants will stay within the plume and the plume will not move far in a slow-moving groundwater. This is incorrect as these statements do not incorporate the rapid movement of the plume towards water-supply-pumping bores, effects which have been ignored in the EIS assessment and not included in their modelling (discussed further below).		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12; and Appendices 09B, 09C, and 09D.
27	5e	General	General		We are also concerned about the broader implications this precedent sets for the aquifer beyond this trial.		Amended EIS	See Chapter 4 Approvals, section 4.4.9.
27	5f	General	General		The EIS is evasive with respect to Glencore's longer-term plans for the aquifer and what this trial is "proving up".		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.3, and 2.5; and Chapter 4 Approvals, section 4.4.9.
27	5g	General	General		Trials are typically designed to prove the feasibility of a larger CCS project. Even at a local scale the trial is risky and controversial. The CTSCo proposal has the ultimate aim of securing "permanent CO2 storage at potential future industrial-scale." There is no information about the size, scope or projected operations of 'industrial-scale' pollution of the GAB.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.3, and 2.5; and Chapter 4 Approvals, section 4.4.9.
27	5h	General	General		This represents the most worrying information void of the CTSCo EIS submission and constitutes grounds to rule the entire document inadmissible.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.3, and 2.5; and Chapter 4 Approvals, section 4.4.9.
27	6a	General	General		2. Risky world-first CCS project Why is such a risky project being undertaken within Australia's most-important natural resource?		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, 2.3, and 2.5; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12; and Appendices 09B, 09C, and 09D.
27	6b	General	General		The CTSCo proposal would be the only geosequestration project in the world using an active aquifer to dump toxic waste. Hitherto, international best-practice has only allowed injection storage target in conventional hydrocarbon reservoirs or a deep, highly saline formations, either depleted or of very poor groundwater quality.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12; and Appendices 09B, 09C, and 09D.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
27	6c	General	General		The company's EIS statement cites SaskPower's Aquistore/Boundary Dam Project in Canada as being "internationally analogous". This project is not at all analogous in numerous key project criteria. The Canadian exemplar injects into a deep, highly saline geological formation, unsuitable for any use, in predominantly grain-cropping regions that preferentially utilise rivers over groundwater for water supply purposes.		Amended EIS	See Chapter 9 Groundwater, section 9.4; and Appendix 09A.
27	6d	General	General		We endorse all initiatives to sequester carbon in a safe manner and commit our company to continue reducing emissions across all our operations. However, we ask that the applicant considers exploration of deeper, high-salinity formations beyond the GAB.		Adequately dealt within the EIS, no change to the EIS and Amended EIS	See Chapter 2 Proposed Project Description; Chapter 8 Geology; and Chapter 9 Groundwater.
27	FOOTNOTES				3 Ibid, p50, 78 4 Ibid, p6		Noted	N/A
27	7a	General	General		3. Questionable project benefits The CTSCo EIS admits it is seeking the lowest-cost approach to disposing of its toxic waste and proposes land transport over pipeline delivery. This will amount to 18 B-double truck movements from Milmerran to Moonie six days a week. The EIS statement suggests, but does not itemise, the GHG-emissions impact of road transport, possibly wrapping it into Scope 1 ⁵ which accounts for almost 10% of total project GHG emissions. This omission verges on duplicitous.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.15 3; and Chapter 5 Climate, section 5.2.2 2.2.
27	7b	General	General		CTSCo proposes expending 266,368 tCO ₂ e to undertake the project, resulting in a total net reduction of only 57,032 tCO ₂ e over the three-year project ⁶ – a efficiency ratio of only 17.3%.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.
27	7c	General	General		Not only is this a poorly-considered sequestration project, it wastes an opportunity to showcase excellence in carbon abatement technology. Large amounts of public funds are being used to support GHG mitigation. Waste-disposal projects such as this should not be allocated those funds; it would add wasteful financial stewardship to a legacy of poor science and errant environmental outcomes.		Adequately dealt within the EIS, no change to the EIS	See Chapter 1 Introduction, section 1 2.
27	8	General	General		4. Ignorance of current and future aquifer use We are concerned to note that that existing Precipice Sandstone licences that have not yet had bores drilled, such as our own at Opal Creek feedlot and others close to the project CO ₂ injection site, have been ignored and have not been included in the EIS groundwater impact assessment modelling. <i>We demand that these entitlements are acknowledged and included in groundwater modelling.</i>		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	9a	General	General		5. Inadequate monitoring The anticipated seven-year lifespan of this project is dwarfed by the multi-generational damage it will impose. The scant two years of post-injection observation is inadequate and an insult to our business and the Queensland agricultural industry.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.7 and 2.11; and Chapter 9 Groundwater, section 9.10.
27	9b	General	General		CTSCo is proposing only one monitoring bore to assess the success of the project. There has to be doubts that one bore in isolation can correctly monitor the highly uncertain movement of the CO ₂ plume.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.7 and 2.11; and Chapter 9 Groundwater section 9.10.
27	10a	General	General		6. Incorrect assumptions Nothing about this proposal and its consultation process warrants confidence in its outcomes.		Noted	N/A
27	10b	General	General		We can find no independent, clear science-based justification for the project and note initial factual errors in its application. For example, the company claims that the Precipice Sandstone aquifer is 'unsuitable for irrigation water, stock water, and drinking water'. This is incorrect. The salinity of the aquifer in this area is 1850 parts per million, well below the recommended Australian Standards for cattle (4000ppm) and sheep (5000ppm).		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	10c	General	General		The Precipice Sandstone aquifer is currently used extensively for livestock production and reserves are highly valued for future expansion.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	FOOTNOTES	General	General		5 Ibid, table 9-1, p38 6 Ibid, table 9-1, p38		Noted	Noted
27	10d	General	General		In addition to the >800 registered Precipice Sandstone water supply bores (primarily for stock drinking use), the Beef City Feedlot (JBS Australia), Grassdale Feedlot (Mort and Co) both south of Dalby, and Lillyvale Feedlot south of Condamine all rely on Precipice Sandstone entitlements and bores. The Lillyvale Feedlot bore is 2200m deep, a similar depth to the Moonie West 1 injection well.		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	10e	General	General		These sophisticated businesses conduct thorough and regular monitoring of the suitability of their bore water supplies and livestock health in accordance with industry standards and stringent contracted customer quality control requirements.		Noted	N/A
27	11a	General	General		7. Poor public consultation Despite having strong Precipice Sandstone aquifer interest, ACC and our industry representative groups, were not contacted by CTSCo until approached by Agforce with a demand to share information on the project.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement; Appendices 03A, 03B, and 03C.
27	11b	General	General		The EIS was made public in November 2022 with comments closing 23 February 2023, a very short time frame incorporating the extended Christmas holiday period.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	Chapter 1 Introduction, section 1.3.
27	11c	General	General		The timing and short period of consultation is considered intentional and has meant little time for investigation and consultation.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	Chapter 1 Introduction, section 1 3.
27	12a	General	General		8. An unacceptable precedent The GAB aquifers are managed through the Great Artesian Strategic Management Plan, the Environmental Protection Act 1994 (EPA) and the Water Act (2000). Both the EPA and the Water Act protect the GAB from the release of contamination into GAB aquifers, while the GABORA Water Plan (2017) places strict controls on the taking and interference of GAB water. This trial is contrary to the two Acts and the Water Plan.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals; and Chapter 9 Groundwater, sections 9 3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	12b	General	General		We are deeply concerned that regulatory changes sought through this application would set a precedent for further GAB aquifer waste disposal projects.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
27	12c	General	General		We contend that this EIS is inadmissible under the amendment to the Environmental Protection Act 1994 (4A) Section 56A, namely: <i>"The chief executive must refuse to allow the submitted EIS to proceed if ... the chief executive is satisfied it is unlikely the project could proceed under this Act or another law, including, for example, because the project— (i) would contravene a law of the Commonwealth or the State; or (ii) would give rise to an unacceptable risk of serious or material environmental harm; or (iii) would have an unacceptable adverse impact on a matter of State environmental significance or a matter of national environmental significance; or (iv) would have an unacceptable adverse impact on an area of cultural heritage significance; or (b) the chief executive is required to refuse to allow the submitted EIS to proceed under a regulatory requirement."</i>		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See See Chapter 4 Approvals; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	12d	General	General		We request that DES does not provide any exceptions to the above requirement.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See See Chapter 4 Approvals; and Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	12e	General	General		If this proposal receives approval, there is the possibility that other GAB aquifers will be at risk to future CO2 reinjection projects.		Amended EIS	See Chapter 4 Approvals, section 4.4.9.
27	12f	General	General		In the past, businesses have accessed the more easily accessible water from shallower aquifers of the GAB. The Precipice, as a deeper and more costly-to-access aquifer, is a resource of increasing importance for future regional prosperity		Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12.
27	12g	General	General		If this proposal secures permission, it sets a precedent for all water-bearing aquifers within the GAB footprint. The CTSCo EIS statement notes: <i>"There are multiple power stations within the region of the Project that may utilise CCS."</i> ⁷		Amended EIS	See Chapter 4 Approvals, section 4.4.9.
27	12h	General	General		This risky, lowest-cost waste disposal project must be rejected in the strongest terms to ensure water security and Australia's agricultural output both now and well into the future.		Amended EIS	See Executive Summary, section 12.
27	13	General	General		Conclusion Above all, we expect the Queensland Government to show leadership around the dual future needs of emissions control and water security, for the sake of future generations.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 1 Introduction, Chapter 2 Proposed Project Description, Chapter 4 Approvals, Chapter 5 Climate, and Chapter 9 Groundwater
27	Footnote	General	General		7 Ibid, p13		Noted	Noted
28	1	General	General		Attached are DSDILGP comments on the Surat Basin Carbon Capture and Storage Project (trial project). The Planning, State Development (Darling Downs Regional Office) and Office of the Coordinator General have provided some comments. If you require any clarification on any of the comments please ask.		Noted	N/A
28	1a	0	Executive Summary	Section 3 of Executive Summary, page 11, last paragraph	IES and Project Approvals The majority of the subject land is mapped as 'Strategic Cropping Land' under the <i>Regional Planning Interests Act 2014</i> (RPI Act). The EIS makes no mention of this, the RPI Act, or its possible implications for the project.	Provide an assessment of the potential implications of the proposal with respect to the RPI Act. Liaise with the department regarding the future changes to the RPI Act 'exemptions'.	Adequately dealt within the EIS, no change to the EIS	See Chapter 7 Land, section 7.2, 7.3.7, 7.4.2, 7.5.2, 7.6.2, 7.7.2, and 7.9.
28	1b	0	Executive Summary	Section 3 of Executive Summary, page 11, last paragraph	The proponent notes (on page 11 of the Executive Summary) that, 'under the EP Act s107, a greenhouse gas (GHG) storage activity is considered a resource activity'. This is a relevant consideration for the RPI Act, as s13(b) of that Act states a 'resource authority' includes 'a GHG permit or GHG lease under the <i>Greenhouse Gas Storage Act 2009</i> '.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, sections 4.4.9, and 4.4.16.
28	1c	0	Executive Summary	Section 3 of Executive Summary, page 11, last paragraph	Under the RPI Act currently, a 'resource activity' that is proposed on Strategic Cropping Land requires a Regional Interest Development Approval (RIDA). A RIDA is required unless a relevant exemption under the RPI Act is applicable. A relevant exemption includes the agreement of the landholder (s22 of RPI Act).		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.8.1, and 2.16; Chapter 4 Approvals, sections 4.4.9, and 4.4.16; and Chapter 7 Land, section 7.2, 7.3.7, 7.4.2, 7.5.2, 7.6.2, 7.7.2, and 7.9.
28	1d	0	Executive Summary	Section 3 of Executive Summary, page 11, last paragraph	Relevantly, section 7.3 (page 20 of the Executive Summary) notes, 'A Conduct and Compensation Agreement (CCA) was agreed with the landowner prior to undertaking advanced exploration and appraisal activities'. Whilst a CCA would currently negate the need for the proponent to seek a RIDA, the proponent is advised that the Department of State Development, Infrastructure, Local Government and Planning (the department) is currently undertaking a review of the RPI Act and its associated processes. The current exemption process will change in the future, to the extent that the s22 exemption (landowner agreement) will be replaced by an applicant-driven self-assessment process. It is likely that process will be in place when the proponent is seeking further project approvals.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.8.1, and 2.16; Chapter 4 Approvals, sections 4.4.9, and 4.4.16; and Chapter 7 Land, section 7.2, 7.3.7, 7.4.2, 7.5.2, 7.6.2, 7.7.2, and 7.9.
28	2	17	Social	Section 17.4.3 Housing and Accommodation page 26	The SIA does not refer to nearby regional communities (NRCs) under the SSRC Act/ SIA Guideline. The Coordinator-General may need to make a discretionary decision on listing the project as a large resource project under the SSRC Act. The project would be listed as a LRP as it is subject to an EIS process (unless the Coordinator-General decides otherwise). It is noted the projected small numbers of in-field operational workers (five workers). NRCs are currently mapped as Goondiwindi, Tara and Yelarbon (i.e. towns of more than 200 people within 125km radius of the project). Only Goondiwindi (of the NRCs) is identified in the SIA as a possible source of local employment	Include information on nearby regional Communities to the project under the SSRC Act (Goondiwindi, Tara and Yelarbon).	Amended EIS	See Chapter 17 Social, sections 17.3.2.6.2 and 17.3.2.7.
28	3	17	Social	Sections 17.4.2 and 17.5.2	There is limited discussion in the SIA in the possible impact of new technologies (in the Surat Basin) and potential new labour requirements and opportunities for local training and development. The in-field local employment opportunities appear to be mainly traditional construction activities and truck drivers/service provision for the operations. It is noted that a small number of remote centre technicians will be based in Brisbane with in- field monitoring.	Discuss the types of (more specialised) local employment and training opportunities that may result from Carbon Capture and Storage in the Surat Basin/ or alignment with skills for the Coal Seam Gas Industry and local employment and training.	Adequately dealt within the EIS, no change to the EIS	See Chapter 17 Social, sections 17.4.2 and 17.5.2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
28	4	17	Social	Section 17.4.3 Housing and Accommodation page 26	<p>For all phases of the Project, for accommodation purposes, the workforce from the local area is anticipated to be able to go home each night.</p> <p>For all phases of the Project, personnel not already living in the local area, the workforce is anticipated to be housed in the existing local short-term accommodation options in Moonie (Moonie Crossroads), Westmar (Westmar Roadhouse), St George, Dalby, and/or Goondiwindi.</p> <p>For all phases of the Project, no new housing, worker accommodation facilities, camps or villages will be</p>	In the current housing shortage, the impact of even relatively small, short term increases in demand on housing stock should be given greater consideration and potential mitigation consideration.	Adequately dealt within the EIS, no change to the EIS	See Chapter 17 Social, sections 17.4.3 and 17.5.3.
28	5	17	Social	Section 17.4.4 Local Business and Industry Procurement page 26	<p>As a part of Glencore, CTSCo is guided by Glencore plc's procurement and supplier standards. Glencore's Global Supplier Standard set expectations regarding ethical business practices, safety and health requirements, adherence to human rights legislation and environmental stewardship.</p> <p>Further details are found at: https://www.glencore.com.au/suppliers CTSCo is responsible for managing its procurement activities.</p> <p>For general or more widely available plant, equipment, and materials, CTSCo will endeavour to source these from within Queensland, and regionally or locally where possible. Procurement or supplier opportunities will include but not limited to earthworks contractors; various trades; gravel, concrete, bitumen and similar supplies;</p>	There is a general undertaking to "endeavour" to source local "from within Queensland, and regionally or locally where possible", there is no undertaking to aim for a percentage of local spend nor any undertaking to support or develop local business to fill the supply chain.	Adequately dealt within the EIS, no change to the EIS	See Chapter 17 Social, section 17.4.4.
29	1	General	General		Please find attached a submission of objection to the Surat Basin Carbon Capture and Storage Project from both Qld United Egg Producers and Pork Qld being the representative of the two intensive livestock industries in Qld.		Noted	N/A
29	1	General	General		As the President of Pork Queensland Inc. (PQI) and CEO of Queensland United Egg Producers (QUEP), I wish to make a submission against the proposed carbon capture and storage project as defined in the Environmental Impact Statement (EIS) presented by Carbon Transport and Storage Corporation Pty Ltd (CTSCo) a subsidiary of Glencore		Noted	N/A
29	2a	General	General		Areas of Concern to the Intensive Livestock Industries <i>Lack of Engagement with Key Industry Stakeholders</i> Both PQI and QUEP are industry representative organisations with a key function to address issues impacting the respective industries by engaging with impacting businesses, governments and their departments, presenting and addressing cases of concerns		Noted	N/A
29	2b	General	General		In this case the CTSCo project impacts a significant sector of pig and egg production in Queensland as intensive livestock production positioned in close proximity to the major grain growing areas as in the Surat Basin and nearby regions. As a case in point Cameron Pastoral Company is one of Australia's largest pig farmers, has a property adjoining the proposed Glencore CO2 injection site near Moonie and has identified this property and water supply for expansion of their business. While the 3 year trial proposed by Glencore is of a limited quantity, the risk of damage to the Precipice Sandstone water reserve is too great and as supported by Queensland legislation should not go ahead		Noted	N/A
29	2c	General	General		From an egg industry perspective two of the largest egg farms operate in the Pittsworth and Millmerran areas and while not currently using the Sandstone supply, their expansion plans will need to access this reserve. Again, like Cameron Pastoral Company, there was no contact with either of these companies operating with more than 4 million birds, providing evidence of poor consultation with key stakeholders and major employers from my represented industries		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
29	3a	General	General		Water Supply Water is an essential to both intensive livestock farming and the grain production required for feed not to mention the demand from growing communities in regional Queensland. The use of the Great Artesian Basin's (GAB) aquifers provides water to a large number of enterprises and communities in Southern Queensland and with much of the upper levels of groundwater fully allocated the Precipice Sandstone aquifer is a resource that will supply the needs associated with the growth in population, agricultural enterprises and their aligned businesses. The GAB is one of the World's largest underground fresh water supplies and supports both rural communities, businesses and farming enterprises in Southern Queensland where rainfall is limited. Income from the region is estimated at \$13 billion per year.		Noted	N/A
29	3b	General	General		Glencore states in their EIS that the water is "saline" and unsuitable for livestock. However a number of my member farmers are using water with similar or even more saline levels and have done for many years without any negative impacts.		Amended EIS	See Chapter 9 Groundwater, section 9.7
29	3c	General	General		While research identifies CO2 being injected into highly saline water supplies around the world, industry concerns are centred around the intent to inject highly corrosive CO2 into the Precipice where the water is not highly saline and in fact is suitable for use with or without minimal treatment.		Amended EIS	See Chapter 9 Groundwater, section 9.4.3 and 9.7
29	3d	General	General		The current Queensland legislation in the Environmental Act 1994 and the Water Act 2000 opposes the injection of CO2 (as outlined in the EIS) into the GAB and with such a significant threat on one of Australia's greatest natural resources and as such this project should not proceed in this location.		Amended EIS	See Chapter 4 Approvals, section 4.4.23
29	4a	General	General			Recommendations: # That government not permit the Glencore or any other Carbon Capture and Storage project, injecting CO2 or regulated waste into the GAB.	Noted	See Chapter 9 Groundwater, section 9.11
29	4b	General	General			# Both PQI and QUEP are members of Queensland Farmers Federation (QFF) and support and endorse their submission with greater depth of technical information and reference.	Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
29	4c	General	General			# That should any further sites be considered, then earlier engagement with wider regional industry and their representative bodies be a priority.	Noted	N/A
29	4d	General	General			# PQI and QUEP understand and support the need to consider carbon abatement and as such do not oppose technologies and processes being developed to achieve targets, however NOT at the risk of detriment to natural and demanded resources like demanded water supply.	Noted	N/A
29	5	General	General		Conclusion: The Queensland Pork and Egg Industry representative bodies remain engaged and willing to discuss any aspects of this submission including evidence of current long term agricultural use of water of similar characteristics being suggested by Glencore as unacceptable to livestock.		Amended EIS	See Chapter 9 Groundwater, section 9.7
30	1	General	General		Please find attached our submission to the CTSCo EIS.		Noted	N/A
30	1	General	General		Corporate Carbon Group wishes to make this submission to the Environmental Impact Statement on the CTSCo Project.		Noted	N/A
30	2	General	General		Corporate Carbon Group is one of Australia's largest and most active carbon project owners and developers, with over 10 million carbon credits delivered to the Federal Government and corporate clients under the Emission Reduction Fund and over 3 million acres of land under active agricultural and environmental management, most of which is in Queensland. We specialise in land-based sector abatement but also work in industrial emissions abatement and carbon removal.		Noted	N/A
30	3	General	General		Now that Australia has committed to net zero emissions by 2050, a massive effort must be made across every sector of the economy to decarbonise. Abatement activity must occur at scale and be deployed quickly. Every available existing technology must be utilised and deployed, and new climate technologies must be developed and brought to the market as soon as possible. We do not have the luxury to discard solutions that are available if they actively reduce or remove carbon dioxide emissions.		Noted	N/A
30	4	General	General		The science of geological sequestration is well developed and established, including in Australia over the last 15 years by the CO2CRC with its research centre in Otway, Victoria. This broad body of science provides confidence of what can be expected to happen over time with CO2 injected as a supercritical fluid into a subsurface reservoir.		Noted	N/A
30	5	General	General		We therefore see a very important role for Carbon Capture and Storage (CCS). For existing fossil fuel assets, CCS provides a pathway to reduce these emissions. It is always better from an environmental perspective to avoid emissions through permanent storage than it is to release them into the atmosphere. CCS can therefore provide a verifiable reduction in emissions from existing assets.		Noted	N/A
30	6	General	General		CCS is also a pathway for carbon removal well beyond the life of existing fossil fuel facilities. Technologies are emerging in Direct Air Capture (DAC) to allow for carbon removal to occur to directly extract CO2 from the atmosphere, but for this to happen it needs to be paired with permanent storage. Injecting into depleted oil and gas reservoirs, or into deep saline aquifers, as per the proposed CTSCo project, can provide many millions or perhaps even billions of tonnes of storage across Australia, and make Australia an attractive destination for DAC projects. The IPCC 6th Assessment Report highlights a significant role for Carbon Dioxide Removal (CDR) in order to reach net zero by 2050, and CCS is a key pathway to enable this as it provides clear additionality and permanence.		Noted	N/A
30	7	General	General		Corporate Carbon is excited about the potential for the CTSCo Project to create a new industry in large scale carbon abatement and ultimately carbon removal in Queensland and Australia. If the project were to proceed, it would enable us to work towards achieving the net zero target by 2050 and provide a pathway for the reduction of existing fossil fuel emissions and carbon removal at scale. This opportunity could be a significant positive step towards mitigating climate change and building a more sustainable future for our planet.		Noted	N/A
30	8	General	General		As a large agricultural landowner ourselves, through our subsidiary Paniri Agricultural Co (PAC), Corporate Carbon is extremely live to the issues of landowner rights, access to groundwater and maintaining social licence to operate. All efforts must be made to understand any concerns raised and address them on a respectful and scientific basis. The EIS appears to have been diligent in assessing geology, groundwater, biodiversity, cultural heritage, flora and fauna, and other issues. PAC draws water for its operations from the Great Artesian Basin and is satisfied that the proposed project does not pose a risk to PAC's ongoing agricultural operations.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, Chapter 8 Geology, Chapter 9 Groundwater, Chapter 14A Terrestrial Flora and Fauna, Chapter 14B Aquatic Flora and Fauna, and Chapter 16 Cultural Heritage and Native Title.
30	9	General	General		We therefore commend the CTSCo Project and support a positive assessment through the relevant regulatory processes.		Noted	N/A
31	1	General	General		Please find attached correspondence from Toowoomba Regional Council detailing our submission on the draft EIS for the proposed Surat Basin Carbon Capture and Storage project. For any questions related to our submission, I can be contacted on the below.		Noted	N/A
31	1	General	General		Thank you for inviting Toowoomba Regional Council to comment on the Draft Environmental Impact Statement report (EIS) for the proposed Surat Basin Carbon Capture and Storage project pursuant to section 49 of the Environmental Protection Act 1994. Please find attached our submission table. If you require any further information, please do not hesitate to contact [REDACTED].		Noted	N/A
31	2	General	General		Toowoomba Regional Council has concerns relating to the impact on and protection of the Great Artesian Basin.		Noted	See Chapter 8 Geology and Chapter 9 Groundwater
31	3	11	Transport	11.4 (Existing environment) Section 11.4.1	The Draft EIS states that the proposed project will utilise the existing 15km of Moffatt Reserve Road and the Millmerran-Inglewood Road to Millmerran. The document does not however clarify that this section of road comprises both state and local road of which TRC is responsible for the local road Moffatt Reserve Road. Given this, the Draft EIS has not adequately assessed the impacts of the proposed project on Moffatt Reserve Road and therefore the analysis undertaken does not meet the requirements of the Terms of Reference (TOR) 11.2.1 and 11.2.2. in terms of Traffic Impact Assessment and Road Link Capacity Assessment.	Need to review and undertake a full Traffic Impact Assessment and Road Link Capacity Assessment for TRC road network affected by the proposed project.	Amended EIS	See Chapter 11 Transport, section 11.4.1 Table 11-2, 11.6.1

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
31	4	11	Transport	11.4.1 Table 11.2	The Western Downs Regional Council is shown in Table 11-2 as the 'owner' of Moffatt Reserve Road instead of TRC being the LGA responsible for Moffatt Reserve Road. Again, this demonstrates that the Draft EIS has not adequately assessed the impacts of the proposed project on TRC roads and therefore the analysis undertaken does not meet the requirements of TOR 11.2.1. and 11 2.2.	- Amend table 11-2 to show TRC as being the "owner" of Moffatt Reserve Road. - Need to review and undertake a full Traffic Impact Assessment and Road Link Capacity Assessment for TRC road network affected by the proposed project.	Amended EIS	See Chapter 11 Transport, section 11.4.1 Table 11-2, 11.6.1
31	5	11	Transport	11.5.3.1	As per the Guide to Traffic Impact Assessment Practice Note, there is need to include a Pavement Impact Assessment report where the Development Standard Axle Repetitions on TRC roads exceed 5% of the base case.	Need to include a Pavement Impact Assessment report for all TRC roads and for any other alternative route which includes local roads.	Amended EIS	See Chapter 11 Transport, sections 11.4.1, 11 5.3.2 2, and 11.6.1.
31	6	11	Transport	11.5.3 2	It is noted that the draft EIS makes no mention of Council Road maintenance arrangements associated with traffic impacts resulting from the project. This issue needs to be explicitly addressed.	Need to outline maintenance obligations for impacted Council roads.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2 9.1.
31	7	13	Noise and Vibration	13.5.2 Operation Impacts	TOR Section 9.7 (Noise and Vibration) states that "Where local and state-controlled roads are to be used, a noise impact assessment must be undertaken to assess potential impacts to noise at sensitive receptors." While Section 13.5 2 of the EIS addresses population centres such as Millmerran and Moonie, there is no specific statement relating to TRC controlled Moffat Reserve Road.	Include a specific statement of noise impacts to sensitive receptors at Moffatt Reserve Road.	Amended EIS	See Chapter 13 Noise and Vibration, section 13 5.2.1
31	8	17	Social	17.6.1 Community and Stakeholder Engagement	Dot point 3 notes that there will be "direct engagement with emergency services, DTMR, WDRC, the BNTAC"	Include TRC on this list.	Amended EIS	See Chapter 17 Social, section 17.6.1
32	1a	General	General		I [REDACTED] would like to place an objection to this project . The main basis is that I live in Tara and heard rumours about this project but was quoted as being many years in the future.		Noted	N/A
32	1b	General	General		When Tara is the main town near Moonie it seems that the consultation process has not informed all the stakeholders in this.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
32	1c	General	General		The objection period was over Christmas and not until the past couple has this been in the media. Has this be planned to be done in a period to limit objections to be made and in the media in the last minute. Would like more time to research the project as the GAC is the main underground water for everybody and once contaminated can never be fixed.		Noted	N/A
32	1d	General	General		Why was the first proposed site rejected by the Wondoan community whilst the Tara community knows nothing about it.		Adequately dealt within EIS no change to EIS	See Chapter 2 Project Description, section 2.15.2
32	1e	General	General		Would like to formally object to the project as it is experimental and high risk similar to the Linc Energy Contamination site. The risks that this experimental site is going to be similar to others where it is hidden so no objections can be made.		Adequately dealt within EIS, no change to EIS	See Chapter 2 Project Description, section 2.13
32	1f	General	General		The other question is that a overseas enity can apply for environmental laws to be changed,		Noted	N/A
32	1g	General	General		The facts remain that this dangerous to people and future generarions will suffer the consequences.		Noted	N/A
32	1h	General	General		Why is Glencore not proposing this near the Millmeran coal mine.		Adequately dealt within	See Chapter 2 Project Description, section 2.3.4
32	1i	General	General		This appears to have been secretive and again object strongly to this. Further time will allow a better submission from me and others		Noted	N/A
33	1	General	General		Please see the below advice from DSDSATSIP regarding the Surat Basin Carbon Capture Storage Project. The agency has reviewed the draft EIS at www.ctsco.com.au/about and advice was received from two areas of the department.		Noted	N/A
33	2	General	General		[REDACTED], Manager, Economic Participation ([REDACTED]), advised: The EIS has no reference to any commitment to Aboriginal and Torres Strait Islander employment, training or procurement from Aboriginal and Torres Strait Islander owned businesses. DSDSATSIP requests that the proponent considers in all phases of the project - specific strategies in relation to employment of Aboriginal and Torres Strait Islander Queenslanders; and efforts for inclusion of Aboriginal and Torres Strait Islander owned businesses in the project supply chain, including setting specific targets.		Adequately dealt within the EIS, no change to the EIS	See Chapter 17 Social, section 17.3 2.4.4
33	3	General	General		[REDACTED], Manager, Policy and Legislation, Seniors and Disability Services ([REDACTED]), advised: It is suggested that the draft EIS be amended to: - acknowledge that employment opportunities will include opportunities for traditionally underrepresented groups, such as people with disability and recognise actions for maximising employment opportunities for people with disability and older persons		Adequately dealt within the EIS, no change to the EIS	See Chapter 17 Social, section 17.4 2
34	1	General	General		Please see attached signed letter of objection to Surat Basin Carbon Capture and Storage Project		Noted	N/A
34	1	General	General		I would like to voice my objection to the whole idea of the Surat Basin Carbon Capture and Storage Project.		Noted	N/A
34	2	General	General		My concerns stem from the fact that you are wanting to dump your industrial by product (Co2) into the ground potentially polluting the aquifers in the surrounding area not to mention the ecological damage that could potentially occur if it leaks to the surface.		Amended EIS	See Chapter 9 Groundwater, section 9.9;
34	3	General	General		With the majority of the inhabitants of the area relying on this subterranean water to exist out here I don't feel that this proposal is worth the risks involved, if it fails the government would not be able to do a damn thing to rectify the problem so is this really worth the risk?		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9; and Chapter 2 Project Description, section 2.11.7 including Tables 2-10 and 2-11
34	4	General	General		The fragile environment of this part of the country has already been pushed to the edge with no help from the state or federal government with their neglect of the fragile brigalow belt ecosystem, with the toad being spread wherever the gas fields go and there being nothing done to control it and now you want to dump pollutants here!		Noted	N/A
34	5	General	General		The road infrastructure is already a disgusting mess in the south western area of Qld and undoubtedly these truck bringing co2 to dump here will only contribute to more road degradation and potentially put more lives at risk by them being on these poorly maintained roads.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4; and Chapter 11 Transport, sections 11.6 and 11.7
34	6	General	General		I hope that for once commonsense will prevale and you will see the errors of your ways and look at recycling your waste and not dumping.		Noted	N/A
35	1	General	General		For your urgent attention.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
35	1	General	General		We are vehemently opposed to the experimental injection of 330,000 tonnes of captured CO2 into the Precipice Aquifer of the Surat Basin at EPQ10.		Noted	N/A
35	2	General	General		We hold that interfering in the aquifers of the Great Artesian Basin poses a huge risk of polluting the most precious resource for human & animal life – underground & above ground, WATER. Australia is a very dry continent, dependent on WATER. Past experience has shown that - treating the ocean as a waste dump has had catastrophic results, and - treating the GAB as an infinite resource was unsustainable. We are also learning that - the atmosphere is not infinitely capable of taking our invisible emissions. - space is rapidly filling with space junk		Noted	N/A
35	3	General	General		It is not appropriate to add to our mistakes by injecting industrial-waste polluting CO2 into another resource-rich, and out-of-sight 'space'.		Noted	N/A
35	4	General	General		We know that dependence on the Precipice aquifer for farm and domestic purposes will be endangered if this trial is 'successful' and is followed by industrial-scale injection. The impacts of pressure changes in the aquifer at this pilot scale cannot predict the impact on groundwater throughout the aquifer during and after industrial-scale injection -		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4
35	5	General	General		The CTSCo EIS Executive Summary 9 5.1 "Predicted Plume behaviour" states that the highest pressure will be reached at the end of the 3 year injection pilot, and will reduce after that as the gas is absorbed into the water of the aquifer. This initial increase must be multiplied during large-scale injection, so this experiment cannot achieve its objective of demonstrating the safety of using the aquifer for industrial scale storage.		Not relevant to the EIS	N/A
35	6	General	General		The reference to other Australian projects is irrelevant.		Noted	N/A
35	7	General	General		The Surat Basin has significant differences from Western Australia's, Chevron's Gorgon Carbon Dioxide Injection Project which is injecting 2km down under Barrow Island. This does not pose the same dangers to terrestrial (including human) life either - from undetected inadvertent gas leakage during and after the injection process or - from the lengthy transport on Queensland rural roads from sources of capture to the Surat Basin.		Noted	N/A
35	8	General	General		In either case, the impacts of these projects on reducing the increase in GHG emissions will be negligible in light of the sequestration needed to keep them from spiralling into climate catastrophe.		Noted	N/A
35	9	General	General		I/We believe that this project is untimely/too late -		Noted	N/A
35	10	General	General		Given the present goal of reaching 30% emissions reduction in Qld by 2030, it is impossible that this pilot project will deliver in time for industry to be able to safely scale up to transporting and injecting sufficient tonnage in the Surat Basin to contribute significantly to the reduction proposed in the time-frame set.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4
35	11	General	General		This project is not financially defensible given its inadequate goals and inappropriate time frame -		Noted	N/A
35	12	General	General		The trial will cost \$210 million, is to be completed in 2030 and is designed to demonstrate only that 110,000 tonnes of CO2 can be safely stored in an aquifer that is projected to be able to store megatonnes. This is too little, too late and too expensive.		Noted	N/A
35	13	General	General		Conflict of interest CTSCo's parent company, Glencore, has an interest in continuing to mine coal for industrial use. This is in direct conflict with its stated "global sustainability and climate change aspirations for the transition to a low carbon future". To attempt to slow down carbon emissions by carbon storage while profiting from adding to the burden of carbon emissions is the equivalent of claiming to want to control a vehicle running out of control downhill by demonstrating that a mechanical handbrake will stop a vehicle from starting to roll when stationary. The rate of growth of greenhouse gas emissions is not stationary. It must not wait another 7 years for a coal-mining company to find a solution to a problem from which it profits.		Noted	N/A
35	14	General	General		CTSCo/Glencore also deceptively implies that to do nothing (about carbon storage) is the only option it has to assist in the reduction of CO2 pollution. This is quite false and should be removed from the EIS. Glencore could diversify into pumped hydro using its pits, voids, build solar or wind farms on its tailings dams and hive off companies to produce green steel, aluminium and cement.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, sections 2.3 and 2.15.1
35	15	General	General		In conclusion, this project should not proceed because it poses a long-term threat to - the integrity of Great Artesian Basin groundwater - the livelihood of Surat Basin landholders and urban dwellers - the achieving of carbon emission reduction goals - the integrity of the distribution of government carbon-emissions reduction funds		Noted	N/A
35	16a	General	General		Should the project be approved, much more stringent monitoring must occur. Amend Executive Summary as follows -	Quote "Measurements from the well monitoring system will be transmitted via a 4G communication link (with satellite back-up) to allow remote monitoring, alarm notification and control (if required). P.31 ES West Moonie 1, and P 32 West Moonie 2. Monitoring wells and bores P.33 and Seismic testing P.33	Amended EIS	See Chapter 2 Project Description, Section 2.11.7 including table 2-10; and Chapter 9 Groundwater, section 9.10
35	16b	General	General			# Add That these measurements be also communicated in real time to DES along with all action taken in response. That DES independently and regularly verify the accuracy and reliability of the monitoring systems	Amended EIS	See Chapter 2 Project Description, Section 2.11.7 including table 2-10; and Chapter 9 Groundwater section 9.10

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
35	16c	General	General			Quote "The findings of the Project will determine whether or not the Project wells are: - immediately plugged, abandoned and rehabilitated following completion of the anticipated 5-year period of injection and monitoring phases; or - suspended and shut-in for future development, subject to further approvals." P.31 #Amend to "The findings of the project and the current scientific, cultural, social, political, economic and legal requirements of that time will determine"	Noted	N/A
35	16d	General	General			Quote "Seismic surveys will continue in the post-injection monitoring phase to verify the final plume position, being when the plume has ceased expansion plus two seismic surveys at a 6-monthly interval after the plume has ceased to expand, or 2 years, whichever is longer. P 33."	Noted	N/A
35	16e	General	General			#Change 2 years to 5 years . The injection of CO2 on an industry-wide scale will be with the landscape into perpetuity and long-term impacts must be known before short-term experimentation is allowed to guide future expansion of CCS	Amended EIS	See Chapter 2 Project Description, Section 2.11.7 including table 2-10; and Chapter 9 Groundwater, section 9.10
35	16f	General	General			Quote "Seismic monitoring of CO2 plumes is also an established and proven technology, with the majority of CO2 storage projects globally using the technology as their primary plume monitoring technique. Furthermore, some international CCS projects have eliminated monitoring wells from their reservoir surveillance programs in favour of time-lapse seismic monitoring."	Noted	N/A
35	16g	General	General			# Change the frequency of seismic testing to weekly intervals , given that any escape of gas or critical fluid could have long term impact before being detected at six monthly intervals.	Amended EIS	See Chapter 2 Project Description, Section 2.11.7 including table 2-10; and Chapter 9 Groundwater section 9.10
36	1	General	General		Please find attached the submission from Mr Colin Boyce MP, Federal Member for Flynn in relation to the EIS Surat Basin Carbon Capture and Storage Project. These documents are for the attention of the EIS Co-ordinator, the Chief Executive of the Department of Environment and Science in Queensland		Noted	N/A
36	1	General	General		Please find attached my submission and attachments to the EIS currently being undertaken by CTSCo in relation to the carbon capture and storage (CCS) project in the Surat Basin. I trust that this information is of assistance to you and thank you for providing this opportunity to share my serious environmental concerns.		Noted	N/A
36	1	General	General		As a landholder in the Great Artesian Basin region, I am extremely concerned with the proposal by CTSCo to inject liquified carbon dioxide into the ground. It is even more concerning when reading their briefing notes, provided to me as the Federal Member for Flynn, which highlights the likely "deterioration in the environmental values of the receiving groundwater." Glencore Briefing Notes, page 4, point 24, to Section 41, point 2, clause c.		Noted	N/A
36	2	General	General		To allow Glencore to change the Environmental Protection Regulations in Queensland to allow them to potentially pump millions of tonnes of hypercritical CO2 fluid into the precipice water aquifer of the Great Artesian Basin is totally outrageous.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, sections 4.2, 4.4.6 and 4.4.9
36	3	General	General		The Great Artesian Basin (GAB) is the world's largest underground potable water source. It covers 70% of the area of Queensland and is the life blood of many rural communities and the agricultural sector in Queensland. It is the 8th natural Wonder of the World, the Outback's Great Barrier Reef in effect. To even contemplate compromising this treasured water asset on the earth's driest habitable continent is unthinkable madness.		Noted	N/A
36	4a	3	Community and Stakeholder Engagement	Table 3.2 page 6	3.0 Community and Stakeholder Engagement When reading the Summary of Interested and Affected persons (Table 3.2 page 6) it is concerning to note that CTSCo has identified the Queensland Great Artesian Basin Advisory Council as Interested but not Affected. Included in this list is the Office of Groundwater Impact Assessment, and State Members for Warrego and Southern Downs, even the Department of Resources is not considered Affected by this project.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	4b	3	Community and Stakeholder Engagement		This effectively limits their input into this process, and as such, implies that they are in agreement with the potential destruction of one of the world's largest water sources. Even the Federal Member for Maranoa has been thrown into this category, despite his electorate being one of the most affected by this potential disaster.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	4c	3	Community and Stakeholder Engagement		AgForce and the TSBE (Toowoomba and Surat Basin Enterprise) who are also relied upon as concerned community groups able to raise issues at earlier stages were also "Not Affected". I ask why, if CTSCo is committed to engaging with community this time, these representative groups were overlooked and unaware of these developments that will affect their members?		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	4d	3	Community and Stakeholder Engagement		Yet at 3.5.1 CTSCo states that it engaged with these regional representative bodies – did these meetings then deem that there was no impact on graziers and the local communities? Did no one raise the possibility that this could affect their water supply, that their businesses and families rely on? Was this why they were they determined to be "Not Affected"?		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	4e	3	Community and Stakeholder Engagement		From the Table 3-4 Summary of Issues and Views during consultation, it appears that not many groups or government departments wanted to discuss the Water Quality Impacts with CTSCo. I find it extremely difficult to understand how such a project could not have warranted questions from the local members about this. I would have expected that the majority of Stakeholders would have at least asked about impact to water quality. Without water, you have nothing. No food, no agriculture and no communities.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
36	4f	3	Community and Stakeholder Engagement		The Queensland Great Artesian Basin Advisory Council is listed in Appendix 3A as a Potentially Interested Person. CTSCo states that they have been engaged since March 2021. Was the subsequent Great Artesian Basin Stakeholder Advisory Committee (GABSAC) which was announced in March 2022 made aware of the EPBC proposal that had just been approved by the Federal Government's process? This is the committee established with 14 representatives across Australia who have been appointed to provide advice to governments and Ministers on relevant issues affecting the GAB, including the environmental impacts that projects such as these could have on this National resource. Or did the identification process of noting that they were only "Potentially Interested" exclude this panel of knowledgeable and skilled people from having any input into the resource that their own Great Artesian Basin Strategic Management Plan, reviewed 2019, sets out to protect?		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	4g	3	Community and Stakeholder Engagement		MAP			
36	4h	3	Community and Stakeholder Engagement		The map from the GAB Strategic Management Plan on page 4, shows a better view of the scope of the potential disaster that this EIS is proposing. In pale blue is the Surat Basin, as part of the larger Great Artesian Basin which underlies over 1.7 million square kilometres in 4 states of Australia.		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	4i	3	Community and Stakeholder Engagement		The ongoing issues identified in the Strategic Management Plan includes "maintaining continued recognition of the Basin as one of the world's largest and most significant groundwater resources".		Noted	N/A
36	4j	3	Community and Stakeholder Engagement		Their opportunities identified the need to "Increase stakeholder awareness that the Basin is a declining and finite resource (Smerdon et al. 2012). The Basin's water resources require judicious use and stewardship of the remaining water pressure, temperature and water quality to ensure that its benefits continue to be available for as long as possible. New demand should not affect the improvements coming from the previous plan."		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	4k	3	Community and Stakeholder Engagement		Eliminating this group of representatives, the Great Artesian Basin Stakeholder Advisory Committee (GABSAC), from the discussion table immediately raises questions as to what consultation has really been undertaken by CTSCo.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	5a	4	Approvals	Appendix 4A	4A EPBC Referral Decision For the EPBC to have determined that this is not a controlled action on 9 February 2022 simply beggars belief. However, when looking further into this decision, I would like to note the following: 1. The EPBC proposal 2021/9122 – Surat Basin Carbon Capture and Storage Proposal was lodged with the Department of Agriculture, Water and the Environment on 9 January 2022, and approved on 9 February 2022.		Noted	N/A
36	5b	4	Approvals	Appendix 4A	2. Given the timeframes on the EPBC referral and approval, I would not be surprised to see if there were no objections to this proposal. Firstly, it was not widely known and secondly, these companies are now able to "advertise" these projects invisibly - without the previous newspaper requirements that may actually have been seen by those most affected		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, section 4.3.4
36	5c	4	Approvals	Appendix 4A	3. When looking into the application by CTSCo to the EPBC, a desk scientist would be forgiven for not recognising the significance of the location proposed. a. The map of the project location does not mention that it is located in the Great Artesian Basin. Nor does the Study Focus Area. The Terrestrial ecological assessment report does not refer to the Great Artesian Basin, only the Surat Basin. Nor does the Matters of National Environmental Significance report. In fact, NONE of the paperwork sent to the EPBC for Federal Government approval under the Environmental Act mentions the Great Artesian Basin. This is deliberate and raises questions that CTSCo should have identified this project correctly. The other concern is that the decision maker, Mr Andrew McNee of the Department of Agriculture, Water and		Noted	N/A
36	5d	4	Approvals	Appendix 4A	4. Section 2 of the EPBC does not consider the Great Artesian Basin to be worthy of national environmental significance. It is not World Heritage listed. It is not a National Heritage place. It is not a Ramsar wetland.		Noted	N/A
36	5e	4	Approvals	Appendix 4A	Yet the Australian Government Department of Climate Change, Energy, the Environment and Water states that the GAB "must be carefully managed by all Basin jurisdictions as well as the Commonwealth and stakeholders". This is to "ensure water security for a large part of Australia. Great Artesian Basin - DCCEEW		Noted	N/A
36	5f	4	Approvals	Appendix 4A	The Department goes on to explain that the GAB generates approximately \$13B per year, as a vital resource for 180,000 people. They have also identified that the Aboriginal and Torres Strait Islander people have relied on this water source for more than 60,000 years, for their tribes to have lived in Australia's dry inland areas. Yet CTSCo want to inject carbon dioxide into this precious, valuable resource. Clearly the EPBC needs to apply more value to a water source of the size and importance as the Great Artesian Basin, and even add additional layers of protection to its own process to have prevented projects of potential destruction from proceeding this far, with		Noted	N/A
36	5g	4	Approvals	Appendix 4A	5. Section 3 of the EPBC when describing the project area, also fails to highlight that the GAB is affected in the hydrology 3.2, and in the outstanding natural features 3.4. I refer to my earlier point – did the Department know that this was about one of the world's most significant potable water supplies?		Noted	N/A
36	6	5	Climate	5.5.3.1 page 27	5.5.3.1 Climate Risk Considerations on page 27 identifies the issue with selectively highlighting the science data that one chooses to use. It states that "all of Queensland has warmed since 1910." Interestingly, when the original data that the Australian Bureau of Meteorology used to use, which dated back to 1900 – this is not actually the case. However, these 10 missing years have made all the difference when writing reports for a purpose. The second point refers to the 1900 data, which suggests that the climate report has been structured for a purpose as obviously the data was there to provide that information. Further bending of the science is shown on pages 33 and 34, with selected years to produce the required outcomes.		Amended EIS	See Chapter 5 Climate, section 5.5.3.1.
36	7	5	Climate	5.7	5.7 Cumulative Impacts – Greenhouse Gas Emissions The project itself is predicted to cause 266,368 tCO ₂ -e. The project is to inject emissions of 330,000 tCO ₂ -e. The risks of damaging a permanent, 60,000 years old+ water supply for the sake of 57,032 tCO ₂ -e should far outweigh any perceived emission reductions. Insignificant amounts when considering the world's carbon		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
36	8	7	Land	Page 33	7.0 Land Interestingly page 33 identifies that the development for GHG storage activities carried out under a GHG authority is exempt from Council approval in the Planning Regulation 2017 Act, under Schedule 6, part 5, item 24. This thereby prevents any local council from having any real input into decisions that may affect their community to this extent, increasing the risk that altering the need for an ERA to be obtained could potentially cause an environmental disaster. Have the Councils as affected stakeholders been able to mitigate these implications? As the Toowoomba Regional Council and the Goondiwindi Regional Council have only been engaged as stakeholders AFTER the EPBC approval, I would think that their concerns could fall on deaf ears.		Adequately dealt within the EIS, no change to the EIS	N/A
36	9a	8	Geology	Page 29 8.2.7 8.2.7.1	8.0 Geology With the abundance of technical reports here, I note that page 29 8.2.7 Previous Studies highlights that this is a test site. We are proposing to test GHG injection into a permanent water supply to test "the storage component of CCS in Queensland is not well established". In fact, 8.2.7.1 notes that previous projects in Queensland were abandoned due to unsuitable geology and why the test is proposed.		Noted	N/A
36	9b	8	Geology		Let's read that again. Testing into the Great Artesian Basin geology to see if the storage will work. As previous studies have shown that there are problems.		Noted	N/A
36	9c	8	Geology		"Key uncertainties related to ... lack of constraining seismic or well data in certain areas of the model ... where the suitability analysis suggests are the areas with the least risk for locating an injection site."		Noted	N/A
36	9d	8	Geology	8.7 page 43 Figure 8-16 Simplified classification of aquifers	8.7 "Leakage of the GHG stream into the Evergreen Formation and shallower formations ... is the primary containment risk". The shallower formations. This means that the plume that has been injected 2 258km underground could potentially leak into the other 18 layers below ground level (page 43 Figure 8-16 Simplified classification of aquifers).		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	9e	8	Geology		8.10 Proposed EA Condition amendments, specifically identifying and allowing the release of GHG stream into the groundwater of the Great Artesian Basin and is NOT subsequently required to rehabilitate if there is a problem.		Amended EIS	See Chapter 2 Project Description, 2.11.7 including tables 2-10 and 2-11; and Chapter 22 Proposed EA Amendments, sections 22.2 and 22.6
36	10a	9	Groundwater		9.0 Groundwater & 9A Groundwater Impact Assessment Technical Report CTSCo's own Groundwater Impact Assessment Technical Report clearly states that any site where CO2 is injected into the precipice water source will in effect render it useless to anyone else in the future.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
36	10b	9	Groundwater		The Groundwater Impact Assessment Technical Report is extremely interesting and detailed. It includes highlighting the potential issues that may occur, such as the GHG Plume extending beyond initial/anticipated extents and even GHG Plume Dislocation.		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	10c	9	Groundwater		These are very real possibilities that cannot be predicted, as this site is planned to be a "test" for Queensland's ability to absorb CO2. There is also the potential of human activities impacting on the plume and its migration. Pre-existing faults in the caprock, over pressuring of the host rock. These are complex underground formations that have been in existence for over 60,000 years.		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	10d	9	Groundwater		Even with these suggestions of possible outcomes, and the predicted limit of a 500m migration from the plume injection point in three years, it is still the impact on the water that is of greatest concern.		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	10e	9	Groundwater		These points, from their own report, state that the CO2 injection into the precipice water source will in effect render it useless to anyone else in the future.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.1.8
36	10f	9	Groundwater		7.2.5 Highlights that future Groundwater supply and users are unable to take water from the zone impacted by the plume.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.1.8
36	10g	9	Groundwater		7.3.2 Reiterates that the future users should not be allowed to take groundwater from the zones.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.1.8
36	10h	9	Groundwater		8.5 Groundwater users should not be allowed to take groundwater supply from the zone impacted by the plume.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
36	11a	15	Hazards and Safety		15.0 Hazards & Safety Increased underground pressure by injecting GHG CO2 in a liquid form has been linked to earthquakes, it is a potential hazard that has been experienced in recent years around the world. The largest documented and induced by fluid injection appears to have been a 5.8 magnitude in USA.		Noted	N/A
36	11b	15	Hazards and Safety	15.4.4.3 and figure 15-2	15.4.4.3 and figure 15-2 indicate that this testing region has already been the subject of quite a few earthquakes. The report by CTSCo implies that these have been hardly felt, yet there is a 5.3 magnitude earthquake shown on their map provided, in the immediate injection area. This is not a small earthquake, but rather a moderate one, which can cause damage to buildings and other structures. With the increased pressure by the injection, this is a potential hazard that has been discounted rather than addressed as important. Would an earthquake potentially cause the GHG plume to further migrate? Would it be forced further upwards through the precipice layers?		Adequately dealt within the EIS, no change to the EIS	Section 15 Hazards and Safety, sections 15.4.4.3, 15.7.2 and 15.8
36	12	19	Rehabilitation		19.0 Rehabilitation Rehabilitation success does not address potential impacts on the Great Artesian Basin underground water supply. The wells are to be plugged and abandoned. What is being considered for the potentially unusable water that has been left behind? Is there just a fee/fine for being environmentally irresponsible in the event that the worst case scenario happens? What would be an appropriate cost for the destruction of one of the world's largest water supplies?		Amended EIS	See Chapter 2 Project Description, section 2.12, Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11; and Chapter 19 Rehabilitation, sections 19.5, 19.6 and 19.7
36	13a	General	General		Technical Opinion from Emeritus Professor Ian Plimer, specialist in Geography, Earth and Atmospheric Sciences, FTSE Fellow of the Australian Academy of Technological Sciences and Engineering "The work of Farquhar et al. (2013) and Pearce et al. (2018) shows that the minor minerals in the Precipice Sandstone such as calcite, plagioclase, chlorite, muscovite and perhaps smectite could undergo dissolution after carbon dioxide injection and conversion to carbonic acid. Mineral dissolution could increase both the horizontal permeability determined by Shell as 541 mD and the vertical permeability of 5.41 mD of the Precipice Sandstone which may then stimulate migration of the carbon dioxide plume, stimulate aquifer flow in a rock that already at 20% porosity and mix bicarbonate and chloride aquifer waters.		Amended EIS	See Chapter 9 Groundwater, section 9.9
36	13b	General	General		Furthermore, Wray (2009) documented underground drainage conduits and, although fluid flow in the aquifer is generally regarded as from east to west, underground drainage conduits may stimulate northerly fluid flow in the aquifer. Wray (2009) states that there is a poor understanding of groundwater flow which has implications for groundwater management. For example, because of known discharge springs, carbon dioxide migration through rocks wherein the permeability has been increased by mineral dissolution and/or flow along underground drainage conduits took place could result in carbon dioxide release up bores and springs."		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCO Response	EIS Reference
36	13c	General	General		The question should be asked of Glencore/CTSCO – have they considered and assessed the work of Farquhar, Pearce and Wray et al.? What is the reasoning for their ambivalence to these findings?		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
36	14a	General	General		Summary While some may see this is a small experiment to test out the potential to inject 330,000 tonnes of CO2 in a plume, I fear for the consequences of these actions. This may be a small sample and may be a safe, secure, contained location for this experiment		Noted	N/A
36	14b	General	General		However, changing the Environmental Approval and Section 41 of the Environmental Protection Regulation (Qld) to enable repeated testing on the Great Artesian Basin should be ringing alarm bells for most departments.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, section 4.4.6; and Chapter 9 Groundwater, section 9.11.1
36	14c	General	General		The consequences of making these changes and approving this project can easily lead to the contamination of the world's largest underground potable water source, rendering it useless for future generations and ruining one of Australia's greatest and oldest assets. We need to be protecting our resources, not destroying them for experimental purposes.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, section 4.4.6; and Chapter 9 Groundwater, section 9.11.1
36	15a	General	General		Possible future ramifications of sequestration into the Great Artesian Basin: A. The implementation of the governments carbon safety net mechanism (Carbon Tax) will have huge impacts on big industry that emits over 100,000 tonnes of carbon – there are 215 industries identified, 30% of these are in Central Queensland		Noted	N/A
36	15b	General	General		B. It has not been identified clearly where or how carbon offsets will be available to these industries.		Not relevant to the EIS	N/A
36	15c	General	General		C. It is clear that these companies will require carbon offsets to continue to operate and to satisfy government requirements to lower carbon emissions with regard to the Safety Net Mechanism.		Not relevant to the EIS	N/A
36	15d	General	General		D. The adoption of carbon sequestration technology by these companies is highly likely to become more economically attractive, given the cost and availability of other carbon offset options. If Glencore CTSCO's proposal to change the Queensland Environmental Regulations (see Glencore Briefing Notes attached) is successful this will open up avenues for any company to drill a bore into the Great Artesian Basin and sequester millions of tonnes of hypercritical CO2 fluid into the water aquifers of the GAB. This could potentially lead to large areas of the world's largest underground potable water source rendered useless to any other users,		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, 2.3.4;
36	15e	General	General		E. Glencore's intentions are: a. to start mining operations at Wandoan in Central Queensland b. to build a coal gasification plant and produce hydrogen c. to build a hydrogen fuelled power station		Not relevant to the EIS	N/A
36	15f	General	General		These all hinge on the proposal to change the Environmental Regulations in Queensland.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, section 4.4.6; and Chapter 9 Groundwater, section 9.11.1
36	15g	General	General		These intentions were discussed at a meeting with myself as the Federal Member for Flynn, Senator Susan McDonald, Councillor for Banana Shire Council Terri Boyce and Glencore Executive Scott Elliott in Brisbane on Monday 12 December 2022.		Noted	N/A
36	15h	General	General		Furthermore, the Queensland Government must have knowledge of these intentions given the media release (The Courier Mail, 29 November 2022 – copy attached) stating that Glencore's mine at Wandoan will be one of twelve (12) coal mines still operating in Queensland after 2050 and up to 2090 and beyond.		Noted	N/A
36	15i	General	General		Glencore has stated to me at the same meeting, that they will not require access to the proposed extension to the Inland Rail Line to Gladstone.		Noted	N/A
36	16a	General	General		Glencore's Business Position It must be noted that Glencore are owners of the former MIM Xstrata coal lease at Wandoan in Central Queensland. It was proposed to be the largest thermal coal mine in the Southern Hemisphere with a capability of producing 100 million tonnes of coal per annum. The fact that they have not begun operations given the negativity of social licence and political legislation surrounding the use of coal in Australia, putting them in a difficult business position – 'what do we do with this huge coal lease that we have invested millions in?'		Noted	N/A
36	16b	General	General		It is my belief that Glencore's strategy is: 1. Further progress carbon sequestering technology. 2. Change the Queensland Environmental Regulations to allow sequestering of carbon dioxide into any water aquifer, including the Great Artesian Basin (refer Glencore briefing notes pages 1 – 4). 3. Start mining operations at Wandoan. 4. Build a coal gasification plant and produce hydrogen. 5. Build a Hydrogen fuelled power station and become a third party provider of electricity to the National Grid.		Noted	N/A
36	16c	General	General		If this is achieved: 1. Glencore will have "Green" credentials (social licence) to mine coal and produce hydrogen (alternate energy). 2. This will make them eligible for hundreds of millions of dollars of State and Federal Government funding. 3. Effectively the taxpayer will be subsidising Glencore to mine coal and destroy the Great Artesian Basin, Australia's greatest water source. 4. Glencore's proposal will achieve nothing in terms of reducing world carbon emissions. 5. It must also be noted that Glencore is a Swiss-based multi-national company that has no allegiance or obligation to the Australian people. They are in the business of making money.		Noted	N/A
36	17a	General	General		Conclusion It is clear to me that Glencore CTSCO has not revealed their intentions or the ramifications of their proposals to any stakeholders fully.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, 2.3.4; and Chapter 9 Groundwater, section 9.9
36	17b	General	General		This includes the Great Artesian Basin Management Authority, AgForce including all Agricultural producer bodies, Local, State and Federal Government representatives, Government Departments and the wider Public.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
36	17c	General	General		For example, was the Environmental Impact Statement, the Technical Water Assessment Report, the Safety Net mechanism, Glencore's intentions to mine coal and produce hydrogen / electricity at Wandoan all made available to Mr Andrew McKnee, the Government Environment Officer, who signed off on the project with respect to the Federal EPBC Act on the 9th of February 2022 and gave a decision that this project "is not a controlled action"? This is appalling.		Noted	N/A
36	17d	General	General		It is my view that Glencore has employed a deliberate strategy to advance their project with as little scrutiny as possible.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
36	17e	General	General		I believe that this proposal should immediately STOP until all ramifications are fully understood by those who make the law (Government) on behalf of the Australian people.		Noted	N/A
36	18	General	General		References/Attachments 1. Glencore Briefing Notes from meeting 12 December 2022, pages 1-4, specifically referring to amending the Qld Environmental Protection Regulation for Carbon Capture and Storage. 2. Glencore Briefing Notes from meeting 12 December 2022, in full pages 1 - 16, detailing future plans for hydrogen expansion. 3. CTSCo EIS 2023 chapters: About (ctscoco.com.au) a. Chapter 03 – Community and Stakeholder Engagement b. Chapter 03A – Interested Persons c. Chapter 03B – Affected Persons d. Chapter 04 - Approvals e. Appendix 04A – EPBC Referral Decision f. Chapter 05 – Climate g. Chapter 07 - Land h. Chapter 08 – Geology i. Chapter 09 – Groundwater j. Appendix 09A – Groundwater Impact Assessment Technical Report k. Chapter 15 – Hazards and Safety l. Chapter 19 – Rehabilitation 4. Australian Government, Department of Climate Change, Energy, the Environment and Water – the Great Artesian Basin. 5. Great Artesian Basin Strategic Management Plan released in 2019, accessed from Great Artesian Basin Strategic Management Plan - DCCEEW 6. Geochemistry of storing CO2 and NOx in the deep Precipice Sandstone: ASEG Extended Abstracts: Vol 2018, No 1 (tandfonline.com) Pearce et al.(2018) 7. Mineralogical characterisation of a potential reservoir system for CO2 sequestration in the Surat Basin:		Noted	N/A
36					Glencore Briefing Note in full		Noted	N/A
36					Glencore Briefing Notes p1-4		Noted	N/A
36					Great Artesian Basin - DCCEEW		Noted	N/A
36					Great Artesian Basin strategic-management-plan		Noted	N/A
37	1	General	General		-		Noted	N/A
37	1	General	General		I am objecting on the potential impacts to water quality on overlaying aquifers due to failures with the project (bore casing and cement failing allowing the CO2 to migrate upwards)		Amended EIS	See Chapter 2 Project Description, 2.11.7 including table 2-10; and Chapter 9 Groundwater section 9.9
37	2	General	General		I am seeking more concrete evidence and a guarantee that they will not ruin any bore by undertaking this project. They need to more clearly demonstrate why/how the injection plume is not going to impact on any bores		Amended EIS	See Chapter 9 Groundwater, section 9.9
37	3	General	General		I am concerned with all the deep gas activity in the area (4000m) punching through this layer (2200m) where they are hoping to store the CO2 that they will allow migration to overlying aquifers. This project may adversely impact on future generations ability to run farming operations - they are taking a very short-sighted view - once an aquifer is contaminated it can't be cleaned up		Amended EIS	See Chapter 2 Project Description, 2.11.7 including table 2-10; and Chapter 9 Groundwater, sections 9.7 and 9.9
37	4	General	General		Our roads are already in a state of disrepair. The additional trucks, 9 B doubles per day for a three-year period carting from Millmerran to Moonie, will only add wear and tear to the road structure.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4; and Chapter 11 Transport, sections 11.6 and 11.7
37	5	General	General		In relation to this current project, public notice of this project has been limited. It has to be noted that persons in the affected district and permit area know very little about this project, making it difficult to make a submission.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
38	1	General	General		Please find attached correspondence from [REDACTED], CEO of Mort & Co Ltd, in relation to the above mentioned subject. If you have any questions or difficulties opening the attachment please do not hesitate to contact me.		Noted	N/A
38	1	General	General		On behalf of Mort & Co Ltd, I am calling on the Department of Environment and Science to reject Glencore's submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
38	2	General	General		Glencore's Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
38	3	General	General		Nowhere in the world has the practice of CO2 injection been undertaken in a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are unknown.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 3, 9.7 and 9.9
38	4	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allows this kind of experimental procedure to proceed, it will be jeopardising the viability of our business, the communities of which we are part of, and the many of businesses who rely on safe, reliable water.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.9 and 9.10.1.8

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
38	5	General	General		Mort & Co has a developed bore and an existing entitlement of 1,500 megalitres from the Precipice Sandstone aquifer at its Grassdale Feedlot site, south of Dalby and east of Moonie. This quality, secure water supply underpins the existence of the largest single intensive cattle feeding operation in Australia with 78,000 cattle on feed and more than 250 employees.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.9 and 9.10.1.8
38	6	General	General		As a proud producer of safe, quality Australian grain fed beef and as a large contributor to the economic and social fabric of our region, and the nation, Mort & Co's operations support countless regional service providers and suppliers who benefit from the success and growth of our company.		Noted	N/A
38	7	General	General		As an innovative and environmentally proactive business, we are supportive of addressing carbon emissions, however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and put the quality of water in a precious resource (the GAB) at risk for the future sustainability and growth in Australian agriculture.		Noted	N/A
38	8	General	General		We implore the Queensland Government to reject the EIS submitted by GLENCORE and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A
39	1	General	General		Please see the attached letter in relation to the submission to proposed Surat Basin Carbon Capture and Storage Project - Environmental Impact Statement. If you have any queries please don't hesitate to contact me.		Noted	N/A
39	1	General	General		Reference is made to the Environmental Impact Statement for the proposed Surat Basin Carbon Capture and Storage Project, that we will refer to as "CTSCo". Thank you for the opportunity to make this submission on this project		Noted	N/A
39	2	General	General		Council is appreciative of the presentations that we have received from CTSCo; these have been informative. This is a highly technical subject and I note that Council does not purport to have any technical expertise on these complex hydrological matters. However, we are also aware that many of the risks associated with the development are now being ventilated in the public domain, and the injection of CO2 into the Great Artesian Basin ("GAB") requires a thorough evaluation by experts.		Noted	N/A
39	3	General	General		Several nearby landholders, who have large agricultural holdings and who are proposing large scale intensive agricultural projects, have expressed concerns that the CTSCo project risks causing impacts on the GAB and does not consider other developments that are proposing to use the GAB, and more specifically, the Precipice aquifer. The GAB underpins a significant amount of current economic activity in our region, and whilst the Precipice aquifer is generally underutilised, it is a critical water resource for the expansion of agricultural, industrial, and urban development. Indeed, our Council has existing Precipice bores used for urban water supply and one other in construction, albeit some distance from this site and requiring some minor treatment prior to use.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
39	4	General	General		It is important to note that CTSCo appear to have been diligent with the selection of an area of the Precipice where there were no active bores in that aquifer. However, Council is aware of some significant agricultural proposals in relative proximity to the CTSCo injection site that propose to access and rely on the Precipice aquifer. Whilst these developments are at the proposal stage only, there is a very large-scale project that has been subject to discussions with this Council for some time, and if developed, has the potential to have considerable economic value for our region. The proponents of the Agricultural use have stated that the Precipice aquifer is indeed suitable for stock use, and their concern is that the CTSCo project will either chemically deteriorate the water they propose to access or cause the aquifer to be no longer available for their use due to the risk of the release of the stored CO2.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
39	5	General	General		This CTSCo project is unlikely to create any significant economic activity for our region. However, the impacts to the GAB could risk the substantial agricultural developments that are in the pipeline; agricultural uses that have the potential to create hundreds of new jobs and would significantly strengthen our local economy and local supply chains. This is a very high-risk scenario.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.1.8; and Chapter 18 Economic Impacts, section 18.6
39	6	General	General		In this regard, the impacts of the CTSCo project on the Precipice resource proposed to be used by the rest of the community need to be considered, in terms of any contamination to the aquifer or the effective quarantining of that section of aquifer due to the risk of inadvertent release of the stored CO2 by other users.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.9 and 9.10.1.8
39	7	General	General		As we noted earlier, Council acknowledges that we do not have the technical expertise to properly evaluate these matters or to determine the veracity of the proponent's case or the matters being raised by community members. However, these are incredibly high-risk scenarios and we ask that the EIS decision makers prioritise the assessment of these GAB resource matters during the evaluation process and apply a high level of rigor to the matters relating to impact on other users of the Precipice resource.		Noted	N/A
39	8	General	General		The Western Downs Regional Council does not support this or any other project that has the potential to risk the important environmental values of the GAB, or any project that would effectively exclude other legitimate users from accessing the GAB for purposes that are productive and that would strengthen our local economy.		Noted	N/A
39	9	General	General		I thank you for considering our submission on the matter, and should you have any enquiries regarding this matter please don't hesitate to contact me on [REDACTED].		Noted	N/A
40	1	General	General		Please find attached our submission in regards to the EIS for the proposed CTSCo Pty Ltd project.		Noted	N/A
40	1	General	General		We are writing to express our concerns in relation to the EIS for the CTSCo Carbon Capture and Storage Pilot Project.		Noted	N/A
40	2	General	General		We understand that carbon capture and storage is of vital importance to Glencore/CTSCo Pty Ltd and the wider community, however we feel that their business interests must not be met by impinging on existing local businesses and industries within their project area and beyond.		Noted	N/A
40	3	General	General		We find there to be several concerns that have not been adequately addressed in the proposed EIS document provided by Glencore/CTSCo Pty Ltd which require much further consideration and are elaborated on below.		Noted	N/A
40	4a	General	General		Water Quality Issues & Contamination of the GAB Water, and in particular the water contained in the Great Artesian Basin, is a vital and precious commodity for the agricultural industries and rural communities alike. Any activity that has the potential to impact this resource needs to be looked at with extreme caution. Due to Australia's dry climate, we are struggling to understand why a government (or the proponent) would even contemplate such a project.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
40	4b	General	General		We are concerned that the proposal by Glencore/CTSCo Pty Ltd to inject CO2 into the Precipice Sandstone has the potential to contaminate and degrade an aquifer that is potentially useful in the future for stock watering.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
40	4c	General	General		We understand there are significant agricultural businesses with water licences for this targeted aquifer that are exercising those access rights at present in close proximity to the proposed project. Independent water analysis by these agricultural businesses indicates that the water analysis undertaken by Glencore/CTSCo Pty Ltd is misleading, as the water contained in the Precipice Aquifer has been found to be suitable for watering stock. How can Glencore/CTSCo Pty Ltd determine that the departure of plume behaviour from what is predicted, to be due to "Project" activities rather than natural fluctuations? By the time an impact is "monitored" in this aquifer it is too late. The damage will have already been done. The proposed potential mitigation measures offer little comfort and are very open to interpretation in favour of the proponent.		Amended EIS	See Chapter 2 Project Description, sections 2.3.4 and 2.11.7 including table 2-10; and Chapter 9 Groundwater, sections 9.7 and 9.9
40	4d	General	General		We are also concerned about the potential impacts to water quality on overlaying aquifers such as the Gubberamunda, due to failures with the project (bore casing and cement failing allowing the CO2 to migrate upwards) What if the plume spreads beyond the predicted spatial extents, leaks through the reservoir seal and into overlying aquifers via seal or well failures, changing water levels and pressures in overlying aquifers. CTSCo does not expect these departures to occur however there is a high likelihood that they could.		Amended EIS	See Chapter 2 Project Description, sections 2.3.4 and 2.11.7 including table 2-10; and Chapter 9 Groundwater, sections 9.9 and 9.10
40	4e	General	General		We are seeking a written guarantee from Glencore/CTSCo Pty Ltd that our bore will not be affected by undertaking this project. Furthermore, in the event that the project proceeds to injection activities, Glencore/CTSCo Pty Ltd are to incur the costs of independently baselining all bores for pressure, quality and mineral compositions, within EPQ10 and those bores within a 50km radius of the West Moonie 1 injection site that fall outside EPQ10. We find this action prudent so that any impacts can be monitored appropriately from the outset of the project. This action is a must do as the issue is that once these aquifers are contaminated there is no way to decontaminate them.		Amended EIS	See Chapter 2 Groundwater, section 9.9 and 9.10.1.8
40	4f	General	General		Glencore/CTSCo Pty Ltd is looking for a permanent storage area for the emissions from the Millmerran Power Station and other future energy projects in their pipeline. The proposed project is only small and for a short duration, so of course the expected plume is small and quite contained. However, once the test case is proven and the activity is expanded and ramped up (as indicated by CTSCo representatives), only then is when you will see the true impacts on affected parties and by then it will all be too late to remediate. The horse will have effectively already bolted.		Amended EIS	See Chapter 2 Project Description, sections 2.3.4 and 2.11.7 including table 2-10; and Chapter 9 Groundwater, sections 9.9 and 9.10
40	5a	General	General		Injection Well Construction & Location Concerns arise due to the potential for the corrosion and damage to steel bore casing and cement, allowing pathways for CO2 to be released to the overlying aquifers and the atmosphere. The risk of bore casing and cement failure throughout the gas industry in Australia and around the globe is not considered to be a small risk. We have heard reports from people that operate within those industries that the casings and cement structures fail quite frequently needing regular repair.		Amended EIS	See Chapter 2 Project Description, sections 2.8.1, 2.11.5 and 2.11.7 including table 2-10; and Chapter 9 Groundwater, sections 9.9 and 9.10
40	5b	General	General		Nowhere in the EIS does it state how Glencore/CTSCo Pty Ltd is going to mitigate these risks other than giving a token assurance that this catastrophe will not occur. The casing and cement are only corrosive resistant after all - not protected or guaranteed against corrosion occurring.		Amended EIS	See Chapter 2 Project Description, sections 2.8.1, 2.11.5 and 2.11.7 including table 2-10; and Chapter 9 Groundwater, sections 9.9 and 9.10
40	5c	General	General		We understand that carbon capture and storage has taken place in other locations around the globe however we do not feel that the underlying geological formations of the project area in EPQ10, particularly the interconnectivity of aquifers, are known well enough to draw the conclusions that have been made by Glencore/CTSCo Pty Ltd. The EIS indicates that extensive modelling shows "high confidence" that the injected CO2 would remain within the formation of the Precipice Sandstone permanently with limited movement. Further clarification is sought on what "limited movement" means exactly.		Amended EIS	See Chapter 8 Geology, section 8.7; and Chapter 9 Groundwater, sections 9.7 and 9.9
40	6a	General	General		Competing/Conflicting Uses We are seriously concerned about the possibility of leakage of CO2 into overlying aquifers and the atmosphere through poorly plugged historical deep petroleum exploration wells. Furthermore, deep tight gas exploration wells targeting depths lower than the Precipice Sandstone are popping up all over the region and even within the project area of EPQ10.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
40	6b	General	General		Gas exploration companies are currently preparing to drill to depths of 3000-4000m to obtain the tightly held gas, thereby drilling straight through this Precipice Sandstone layer at approx. 2200m where the proposed project is hoping to store the CO2. We are very concerned that these activities will allow migration out of the Precipice Sandstone aquifer into overlying aquifers.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
40	6c	General	General		The EIS mentions that there is no fracking from coal seam gas operations in the operational lands or land adjoining the operational lands, however this space is constantly evolving, and we are aware of the recent push for deep tight gas exploration (4000m) within 30km radius of the "operational lands". These wells will all require fracking. We do not therefore consider this risk of migration caused by mining and other underground activities to be highly unlikely - rather it is possible and likely.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
40	6d	General	General		Glencore/CTSCo Pty Ltd has made the decision to investigate EPQ10 as they indicate that the Precipice Sandstone aquifer is saline, and the closest entity that accesses the aquifer is for the purposes of oil and gas production. However, if the oil and gas industry is accessing this aquifer and extracting things, would the CO2 that is being injected into the aquifer then potentially be removed by another industry and therefore the carbon is not actually permanently stored in the aquifer?		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
40	7a	General	General		Conflicting Objectives in relation to Climate Change According to the executive summary of the proposed EIS the "activities of the project are not anticipated to change the climate of the region", however the fact of the matter is that Glencore is a major CO2 emitter which is in part contributing to "climate change"		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
40	7b	General	General		This is driving the elevated levels of evaporation of surface waters and climate variability mentioned in the EIS, and hence our increased reliance on underground aquifers in this part of the world. Therefore, we cannot understand the justification for potentially contaminating these life-giving aquifers by injecting waste products from major emitters.		Noted	N/A
40	8a	General	General		Economic Impacts Analysis of the economic impacts of the project is light on costs and quick to outline the potential huge benefits with a Nett Total of 57,032t CO2 emissions captured and put into storage - if all goes to plan. However, pumping down 330,000t CO2 to only have a nett total storage result of 57,032t CO2 seems short-sighted and perhaps another approach to tackle carbon emissions is required - one with significantly less risks should be considered.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4
40	8b	General	General		Limited Cost Benefit Analysis has been prepared in the EIS. The only impact cost factor that has been considered is a road/truck accident. This cost will be mainly worn by those locals who use these roads daily to conduct their business and family life (i.e. travel to school and appointments)		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4; and Chapter 11 Transport, sections 11.6 and 11.7
40	8c	General	General		The analysis is lacking when it comes to the other costs which would potentially arise if this project does not go as planned. Glencore/CTSCo Pty Ltd states that "due to the small size and scale of the Project, it is unlikely to have any significant impact on agricultural production from the existing areas," however we fail to understand how they can reach such a conclusion when you are talking about impacting on the Great Artesian Basin, which agriculture (being the main industry of the Western Downs) relies so heavily upon. One does ponder how do you accurately put a cost on potentially ruining an aquifer - just leave it out as they have done? Furthermore, short term cost benefit analysis as a tool in this instance is flawed because they are taking a short-term view of a project with a potentially permanent negative impact; which they are basically discounting to a zero cost in order to make the project appear beneficial overall.		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and tables 2-9 and 2-10; and Chapter 9 Groundwater, section 9.9
40	9	General	General		Transportation Issues We are concerned about the additional trucks on the road transporting the toxic waste liquid from Millmerran to Moonie at a rate of 9 B Doubles per day for 3 years. Our roads are already in a bad state of repair due to wet conditions, flooding, and day to day use as it is. This additional traffic will cause the roads to become more unsafe, thus potentially resulting in more accidents, despite CTSCo's assessment and conclusion that the project will not affect the performance of the existing road network. The proponent states that the transport route passes primarily rural residential properties and sparsely settled rural lands, however, each of these B Doubles will be approaching and turning at a notoriously dangerous intersection at the Moonie Crossroads which has not been considered for upgrading in the EIS. The route also passes through the township of Moonie, within a couple of hundred metres of the local state school, while also traveling a road (The Moonie Highway) which is used for a primary school bus service twice daily.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4; and Chapter 11 Transport, sections 11.6 and 11.7
40	10a	General	General		Social Impacts - Emergency Services The EIS for the project states that medical requirements beyond first aid will depend upon public facilities and services, putting further strain on our struggling health system in this part of the Western Downs. The closest fire services near the project site are volunteer led and run Rural Fire Brigades comprised of the rural landholders in the project area and its surrounding areas. It must also be brought to light that the Social Impacts Tables 17-11 through 17-13 indicate there are no Emergency Services available locally and this is of concern.		Adequately dealt within the EIS, no change to the EIS	See Chapter 15 Hazards and Safety, sections 15.6 and 15.7
40	10b	General	General		The proposed project area west of Moonie is generally serviced by the Ambulance in the township of Meandarra. A township that is not even considered in the EIS document despite falling within the boundaries of EPQ10. This project could potentially impact the wider community if it ties up those resources that are already at times stretched to their limits.		Adequately dealt within the EIS, no change to the EIS	See Chapter 17 Social, section 17.5 and 17.6
40	11a	General	General		Public Consultation As landholders and Gubberamunda aquifer bore water users within EPQ10 (within a 50km radius of the West Moonie 1 Injection Well) we find it disappointing that we were not notified directly of this project in writing or that an EIS was even out for public comment and submissions. We literally found out about this current EIS through an obscure post on a local community Facebook page made by a concerned landholder in the district. We do not find this to be adequate in terms of notifying the public of the planned activities and giving us an		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
40	11b	General	General		Also of mention, is that as land holders in the affected permit area we were not aware of any public consultation which related to the draft terms of reference for the EIS either. From the executive summary of the EIS, it appears Glencore/CTSCo Pty Ltd were going to engage with people like us after the EIS was approved.		Noted	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1
40	11c	General	General		It appears that Glencore/CTSCo Pty Ltd has put into practice the applied learnings from the previous activity in EPQ7 whereby they consulted the community which led to that project being shelved. This time around it seems they have not endeavoured very hard to consult with the public about the proposed project for fear of facing community backlash once again. Public notice of this project has not been satisfactory as not many in the affected district and permit area really knew about it taking place until it was almost too late to make a submission, and many have lacked the time to get a submission together.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
40	11d	General	General		According to the EIS, "the community and stakeholder engagement program has been designed to ensure the benefits of the project can be demonstrated to the community and stakeholders to enable long term sustainable economic growth for Queensland". However, upon talking to numerous locals within a 50km radius of the project in the past week, very few have even heard of the project let alone its demonstrable benefits. As landholders we do not find that Glencore/CTSCo Pty Ltd has been open and transparent with their intentions for this project. Bore users (of any description in any aquifer) should be identified and notified as interested or affected persons as there is potential (even if deemed minimal by CTSCo) for a negative impact to occur.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
40	11e	General	General		Underground aquifers don't follow "defined project areas" therefore it seems inappropriate to discount engaging with stakeholders that are not situated directly within operational land areas. It seems that everybody was notified by CTSCo Pty Ltd except for those many landowners that have the most to lose if their underground water supply is impacted		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C
40	12a	General	General		Future Issues This project may adversely impact on future generations ability to run their farming operations. The proponents are taking a very short-sighted view - as once an aquifer is contaminated you can't really "clean it up" Even the best modelling can and has been wrong in the past		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and tables 2-9 and 2-10; and Chapter 9 Groundwater, section 9.9

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
40	12b	General	General		We note that this approval process is only for a small-scale project, however if this small trial is deemed successful, this technology will potentially be rolled out on a much larger scale within the Surat Basin. We don't think the risks of this project are worth the potential 0.1 % contribution towards meeting Queensland's emission reduction target.		Noted	See Chapter 2 Project Description, section 2.3.4
40	12c	General	General		Given the history of environmental failures by the resources sectors operating within the Surat Basin, with particular reference to the Link Energy Contamination Disaster, we find little assurance that Glencore/CTSCo Pty Ltd will be operating at all times with the best interests of affected landholders in mind. Ultimately, if this project gets the approval to proceed to injection activities it will set a dangerous precedent for the entire region to become a toxic waste dumping ground at the expense of the agricultural industries and our rural communities.		Noted	N/A
40	13	General	General		In conclusion, we understand that Glencore/CTSCo Pty Ltd has outlined this project as being their pathway to decarbonization of their business to achieve their net 0 total emissions by 2050, however we do not feel that the pursuit of reaching these ambitious targets should be at the expense of businesses and rural communities that have been operating in this area for many generations with many generations coming through in the future.		Noted	N/A
40	14	General	General		We must exercise the precautionary principle in this instance, and pause and review the proposed project further, before leaping into a new innovation that may actually prove disastrous. There is a very present and real danger that this project has the potential for causing harm to the environment and the community, and the scientific knowledge in this area is still severely lacking.		Noted	See Chapter 2 Project Description, section 2.13; and Chapter 9 Groundwater, section 9.9
40	15	General	General		Thank you for your consideration of these vital matters.		Noted	N/A
41	1	General	General		Please find attached our submission on the EIS for the Surat Basin Capture and Storage Project as required by 23 February.		Noted	N/A
41	1	General	General		We as landholders of [REDACTED], which is utilised for agriculture production in the Hannaford area, have not been informed or consulted by Glencore or its subsidiary company, Carbon Transport and Storage Corporation, about the Carbon Capture and Storage pilot or expansion program details of its project located 44 km southwest of Moonie. We were not even aware of the EIS submission notice which was released in December 2022 and closes tomorrow. It has only been through neighbours contacting us in the last 2 days and through information, research and data we have gathered on this program ourselves that we are able to express our grave concerns regarding the processes proposed and the future impact on our grazing/ farming business. The overview details of the project on CTSCo website elaborated on the consultation process which occurred at a previous proposed location near Wandoan. I can say that any level of engagement and openness has not been forthcoming in regard to the site near Moonie and its future impacts on our operation. As this timeline for us has been very short, we would like to expand on our main concerns which are addressed below. These areas are definitely not exhaustive or inclusive of other detrimental environmental impacts this project may have on our agricultural land and business which may be already known to others, or which may arise in future if this project is to proceed.		Noted	See Chapter 3 Community and Stakeholder Engagement, section 3.4.1 and Appendix 3A, 3B and 3C; and Chapter 9 Groundwater, section 9.7
41	2a				MAJOR THREAT TO GROUNDWATER [REDACTED] is a 7500-acre property at Hannaford where our family breeds cattle for commercial consumption for the Australian food market and with future business plans for cropping. We have one share bore with 3 neighbours, drilled in 1959, which has been and is still used as the main water source for stock watering purposes across our entire property. The security of this resource is paramount to our beef cattle operation business and livelihood.		Noted	N/A
41	2b				Glencore through its subsidiary Carbon Transport and Storage Corporation, propose to store waste CO2 by injecting it into the Great Artesian Basin where they claim the aquifer targeted contains water which has already elevated levels of minerals including saline, so it is an unusable water resource for agricultural use. There are reports that have found, that this information is misleading and that their own water samples dispute this analysis claim. It is also stated that the waste storage will be injected in a sandstone layer of the earth that is plugged by an impermeable siltstone layer above and that farmers currently access only aquifers above this layer. We have discovered that Cameron Pastoral Company, less than 10km away from the pilot injection point, hold a license to extract water from the very same aquifer where CTSCo (Carbon Transport and Storage Company) is proposing to store waste.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
41	2c				The CTSCo EIS states that this project is viable and safe with reference made that there is no deep gas exploration within a 70km radius of the pilot site, therefore impact from this process is not an issue. This may be true for that location, but we have heard today that at the Moonie public consultation meeting recently, which we were not informed about, it was stated by their representative, that the roll out after the pilot phase of the program will be injection wells drilled 30km apart across the EPQ10 mapped area. "Mirri Mirri" is in this area. Our concern is that currently, there are 2 deep gas exploration wells under construction, one at the property "Moonbi" and the other at "Burenda". Both properties are in a very close proximity to our agricultural block. It concerns us that the tracking processes the gas companies will need to do to extract the deep gas will cause disturbance within earths layers. This will not only create points where gases from their processes can migrate up into landholder accessed aquifers, but also allows the CO2 waste, which is proposed to be injected, a means of escape.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
41	2d				The interconnectivity of the aquifers and the possible effects to the quantity and quality of our water resource is gravely concerning. To move forward, we would require a written guarantee by an independent hydrologist that the pilot program and subsequent expansion would not adversely affect the water being extracted by our bore and every other water bore in the EPQ10 mapped area. A baseline pressure and mineral study of the water would need to be executed before the pilot program CO2 injection commenced and then repeated at regular intervals, at least on an annual basis, across the project's timeline. This will be a necessary and vital requirement to mitigate issues that may arise from change of water structure which may affect the health and wellbeing of our stock. We expect Glencore or its subsidiary CTSCo to incur the costs of this initial testing and subsequent monitoring of water bores in the EPQ10 area. In the event that our water is contaminated we require Glencore and/or CTSCo to provide an agreement that suitable stock water will be provided to "Mirri Mirri" until the issue is rectified.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.1.8
41	2e				Another concerning factor is, if the water in the aquifers we currently access become unavailable then we no longer have the option to drill into deeper aquifers to support our agricultural business due to the waste product injection.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.1.8

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
41	3				SOIL DEGREGRATION There are many unknown repercussions from this project for future generations of landholders. It is a reported concern that the injection of this waste composition with elevated minerals poses a risk to soil degradation, which in turn will adversely affect our pastures and subsequent grazing capacity as well as our ability to maximise the planned cropping enterprise on our property. This issue needs to be explored and addressed further		Amended EIS	See Chapter 9 Groundwater, section 9.9
41	4				ROADS The project indicates that it requires road transport of the CO2 from the Millmerran Power Station to the pilot injection site, involving nine round trips per day. During this pilot and if expansion proceeds, we would like guarantee of collaboration between Glencore and/or its subsidiary CTSCo with relevant transport local and state government departments that this road infrastructure will at least be maintained (it will need it more often) and upgraded where and when required. The wear and tear and subsequent safety in regard to travelling on these horrendous roads, a concern for us and our family		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4; and Chapter 11 Transport, sections 11.6 and 11.7
41	5				CONCLUSION In a mission to reduce CO2 levels from big businesses and meet the low emission targets the Australian Government has agreed to, we feel that alliances have been formed with likely detrimental effects to the environment, including our property. We feel these effects have not been adequately explored, considered or communicated openly with stakeholders. Australia's agricultural industry and food security sustainability should be an integral focus of any process which addresses and combats the CO2 environmental issue. Until we have further consultation and are given evidence that this process is safe regarding the issues outlined above, then we adamantly oppose the CO2 waste underground injection pilot program and subsequent expansion proposed by Glencore and its subsidiary company Carbon Transport and Storage Corporation.		Noted	N/A
42	1	General	General		Please find attached our objection letter to the Submission on the Environmental impact statement for the Surat Basin Carbon Capture and Storage Project		Noted	N/A
42	1	General	General		We are concerned and wish to object to the Draft Queensland Resources Industry Development Plan, carbon capture and storage (CCS)		Noted	N/A
42	2	General	General		As a farming family, we are anxious and troubled by the potential risk to the water quality in the Gubberamunda aquifer, given that the water is of high quality in this agricultural region, producing grain and stock. The GAB is vital to producers of animals, given the changing seasons/droughts are becoming more prominent in our weather systems. During the last drought, many producers drilled bores to access the GAB system to keep herds alive, and many more will, to drought prepare their land for the future. A water resource vital to our industry that does not need tampering by depositing a waste product. Without water, there is no life.		Noted	N/A
42	3	General	General		If the CO2 were to leak through the sandstone layers, the salinity would be unsuitable for aquatic ecosystems and unusable for irrigation, stock, and drinking water. The project will be changing the environmental makeup, and we are concerned with gas leaking through the sandstone, in the future, it may be detrimental to our business, land preservation, the environment and future generations' ability to run their farming properties. If the project goes wrong, it is irreversible damage that will affect the environment.		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and tables 2-9 and 2-10; and Chapter 9 Groundwater, section 9.9
42	4	General	General		It also concerns me that for the next 3 years, 9 trucks will be traveling roughly a 250km round trip per weekday, on already horrendous roads. Potentially longer time frame if the project is successful and expands the CO2 injection wells <u>within the area mapped out</u>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4; and Chapter 11 Transport, sections 11.6 and 11.7
42	5	General	General		As producers we take Biosecurity very seriously due to the detrimental effect, it could have on running a productive business. If Foot and Mouth or parthenium weed, just two examples were transported into the region, there would be no containing the devastation.		Amended EIS	See Chapter 14A Terrestrial Flora and Fauna, sections 14A.5.7, 14A.6.2, and 14A.7; and Chapter 21 Commitments, Table 21-1.
42	6	General	General		While I understand our region has the correct soil makeup, we are extremely upset that Glencore is selfishly using our area as a rubbish dump for its waste emissions, in a region that is so highly productive at feeding our nation.		Noted	N/A
42	7	General	General		We do not support this project and hope that it does not continue or expand in our region		Noted	N/A
43	1	General	General		Please find submission attached		Noted	N/A
43	1	General	General		We are concerned and wish to object to the Draft Queensland Resources Industry Development Plan, Carbon Capture and Storage (CCS)		Noted	N/A
43	2	General	General		Any project that puts at risk the Great Artesian Basin (GAB), is not a risk worth taking.		Noted	N/A
43	3	General	General		We reside approx. 35km from the proposed site of Glencore's CCS project in the Moonie/Westmar area. It concerns us greatly that this CCS project has the potential to undermine the quality of water from local bores in the GAB. These bores are a major source of water for local agricultural industries as well as a water supply that is used domestically, especially in times of drought. As our rainfall patterns are becoming more erratic, this source of water will become more vital to sustain grazing industries as well as clean water for domestic use.		Noted	N/A
43	4	General	General		The risk may be small of a contamination issue. But if there were a leakage of CO2 and other elements from the waste collection process through the sandstone layers it could be catastrophic to all users of this valuable natural resource, the GAB. This potential contamination could deem the GAB unusable for industry and domestic use and could be irreversible. Affecting future generations to come.		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and tables 2-9 and 2-10; and Chapter 9 Groundwater, section 9.9
43	5	General	General		This is only a pilot project, but approx. 9 extra road trains will be running up and down the Moonie Highway each weekday. This highway can hardly carry the traffic in its current form, and further degradation of this roadway is inevitable. What does the future hold if this project gets the "tick" of approval. More trucks, a pipeline?		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.15.3; and Chapter 11 Transport, sections 11.6 and 11.7
43	6	General	General		I realise that this project, if successful, has wider benefits for the environment as a whole in the reduction of emissions into the atmosphere. Glencore's submission says that this is the right area for the project. But what if they are wrong.		Noted	N/A
43	7	General	General		We do not support this project in our area.		Noted	N/A
44	1	General	General		Please find my submission attached		Noted	N/A
44	1	General	General		I wish to submit the following points for your consideration during the EIS process for the Surat Basin Carbon Capture and Storage Project.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
44	2a	General	General		My points: - The Great Artesian Basin is an irreplaceable, iconic feature of the driest continent on earth. It surpasses the Great Barrier Reef as it is unique.		Noted	N/A
44	2b	General	General		- Your government is willing to risk this resource with an experiment. This experiment has the potential to contaminate water utilised by towns and farms relying on their right to supply of a traditional quality resource.		Noted	See Chapter 9 Groundwater, section 9.7
44	2c	General	General		- Food security is paramount to Australia		Noted	N/A
44	2d	General	General		- Overseas owned corporations have no interest in long term maintenance of our environmental assets. They have no interest in truth, shown by the fact that Glencore has already lied about the quality of the sampled water, claiming it is unsuitable for cattle, sheep or pigs. In fact it is well within safety limits for all those stock.		Amended EIS	See Chapter 9 Groundwater, section 9.7
44	2e	General	General		- As for stating they are maintaining monitoring and will continue to monitor, this is a hollow promise as remediation will be impossible once the aquifer is diminished in quality as it won't be able to be reversed.		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and tables 2-9 and 2-10
44	2f	General	General		- The whole concept of liquid Carbon dioxide is untested especially as the product is to be transported by much used roads and research into the safe handling of the product is outdated and inconclusive. There is little attention paid by governments world-wide, of risk management to community, as the present disaster in Ohio, USA shows.		Adequately dealt within the EIS, no change to the EIS	See Chapter 9 Groundwater, section 9.4.3; and Chapter 15 Hazards and Safety, section 15.5.3.1
44	2g	General	General		- As a tax payer I find no solace in the fact that this action by Glencore would be subsidised to my potential detriment.		Noted	N/A
45	1	General	General		Attached is our submission in response to the public notification of the proposed Surat Basin Carbon Capture Storage EIS. As stated our business is very much against this project. It has created anxiety and has us worried in many regards.		Noted	N/A
45	2	General	General		Our property, "Green Hills" is a place of natural beauty and has fertile soils. It is the host to so much biodiversity. You only have to look at an aerial map to understand that these trees and this landscape has been well looked after. It is special. I hope we are granted the right to continue to look after it for generations to come without the threat of contamination and unnecessary greenhouse gas well/pipeline construction. We are proud of what our business accomplishes, and do not want such a pristine area jeopardized by a CCS project that has been largely unsuccessful and unreliable in other parts around the world. The risk to the Great Artesian Basin, the regions food security and our livelihood is simply too great in our opinion.		Noted	N/A
45	3	General	General		At this final date (23rd February) for submissions in response to the EIS, we can state with 100% certainty that the overwhelming majority of landholders and community members that reside within EPQ10 are still completely unaware of this project being proposed in their own backyard and some of the potential risks it may pose to the future of their businesses. This is a shocking failure by CTSCo (Glencore) to engage and inform the wider community in the Meandarra/Inglestone area. It has only been in the last two weeks through 'word of mouth' that people are becoming aware of the project for the first time and we are desperate for more information. Some people like ourselves have been taking time off work and rushing to prepare submissions to the government in response to the EIS but many others will miss the deadline. Consequently, the number of submissions received by the DES by the deadline will in no way reflect the amount of concern that is felt by landholders and businesses within the community. Therefore, we request an extension to the submission deadline for at least 30 days to allow others to respond. Also, we request a proper community meeting to be held with representatives from CTSCo (Glencore) before a final determination or any subsequent approval is given from the Queensland government to this project.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A, 3B and 3C; and Chapter 9 Groundwater, section 9.7
45	4	General	General		I do hope care is taken reading this submission and our concerns are considered in a serious manner.		Noted	N/A
45	1	General	General		Green Hills Grazing Company is a mixed enterprise of cropping and cattle. We grow winter and summer crops as well as breed cattle. We have a shared bore that is 1615 m deep and used for stock water.		Noted	N/A
45	2	General	General		We appreciate the opportunity to complete a submission to the Environmental Impact Statement (EIS) for the Surat Basin Carbon Capture and Storage Project.		Noted	N/A
45	3a	General	General		Introduction: Our concerns range from business impacts, lack of consultation, water contamination and nature conservation. Our business would like to see long term science-based evidence that this project will have no negative consequences to our water and land in the immediate and long-term future. We are custodians of the land and there is a great responsibility with making sure that it is preserved and looked after to help reduce impacts of climate change. It would be a huge economic loss to our business if our bore and water infrastructure was compromised by this project, to the extent we would not be able to continue our business.		Noted	N/A
45	3b	General	General		Over decades of managing this landscape the Kidd family has always prioritized conservation over short-term profit and truly believe that we are custodians of the land.		Noted	N/A
45	3c	General	General		Our business was not consulted about this project. We received no letter, no e-mail and no one came to discuss it with us as land holders. As a district we agree consultation has been disappointing and insufficient. A neighbor informed us on Friday, 17th of February after seeing a FaceBook post from a concerned community member whom had visited the public library in Moonie and noticed a small 'information booth' run by company representatives. However, there has been no formal community meeting or engagement from CTSCo or the Queensland government within the wider community that reside on EPQ10 in the Meandarra/Inglestone area. Please provide evidence that notices and emails were sent out. We do have a lease to a shared bore, but no notice of this project has been made clear to any of the lease holders.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A, 3B and 3C; and Chapter 9 Groundwater, section 9.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
45	4a	General	General		Below are the concerns we want addressed: We are asking you to prove the security and safety of both our above and underground (bore) water. Both are critical for our business enterprise as well as personally. Please provide evidence of projects where CCS technology has been injected into a water resource. How long has it been down and were there any issues? We are aware of projects overseas, but that science and geology may not be relevant to our Australian environment. We would like to know how the CO2 will remain in the sandstones and if it will alter the sandstone. Also, what mitigation will be available if/when the bore casings deteriorate. Our land is here for the long term, but this project may terminate if not successful. We did not see a discussion of how the situation would be handled.		Amended EIS	See Chapter 9 Groundwater, section 9.9; and Chapter 2 Project Description, section 2.11.7 and table 2-9
45	4b	General	General		The number of holes already drilled through the many aquifers has us concerned that this may allow escape of the CO2 as it is being injected. Can you reassure us specifically how this will be prevented?		Amended EIS	See Chapter 9 Groundwater, section 9.9; and Chapter 2 Project Description, section 2.11.7 and table 2-9
45	4c	General	General		The quote that "CO2 storage is not expected to impact future ground water users", BUT "future users should not be allowed to take ground water supply from the zone impacted by the waste CO2 plume", is a concern. Can you provide information on how you would "make good" the lack of water availability to a farming enterprise that needs this underground water for its very survival.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10.18
45	4d	General	General		Could we also have an explanation for why there is no requirement of rehabilitation under condition 58 please. What rehabilitation can be applied if there are unforeseen consequences and long term damage occurs. For us and future family the time frame of hundreds of years is relevant.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.12; and Chapter 19 Rehabilitation
45	4e	General	General		If this pilot program is approved and it is proven to be successful (in the short-term) what are the expansion plans? Will there more injection points? If so, how many and where could they be? Could there be pipelines constructed through our land? Roads in the district are already struggling to cope with the current amount of trucks and traffic. Without basic road maintenance already happening the roads will become even more dangerous.		Noted	See Chapter 2 Project Description, section 2.3.4
45	4f	General	General		In relation to nature conservation, we are deeply concerned about the clearing of native flora and fauna during any construction for this project. What are the future stages to this project being planned?		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, sections 2.9 and 2.3.4
45	4g	General	General		We are uncomfortable with a dumping ground for carbon waste just 34 km from Green Hills. We are currently benchmarking Green Hills through AgCare. We do not want development projects going ahead on this property while we are trying to gain scientific-based knowledge about its natural capital. Our current and future goals are to preserve our eco and water systems. We want to understand and embrace the power of our natural landscapes and our business model is very strong in this regard.		Noted	N/A
45	5a	General	General		Conclusion: As stated above you can see we have many concerns and we have very little time to process this proposal. Within the last couple of days we have tried to read the voluminous quantities of data and reports and make sense of this project within our own capabilities. I am seeking an extension of time to make sure we have time to properly address all our reservations. There is an urgent need to have our bore independently tested for pressure, flow rate and water quality. This is a cost that Glencore needs to accept, as it's their project and is affecting us. Once tested it will allow us to monitor for any changes.		Noted	See Chapter 9 Groundwater, section 9.9
45	5b	General	General		Again, I want to take this opportunity to say thank you for the letting us submit our questions and concerns.		Noted	N/A
46	1	General	General		Please find attached, Goondiwindi Regional Council's EIS submission for the proposed Surat Basin Carbon Capture and Storage Project. Should you have any queries regarding this letter please do not hesitate to contact this office		Noted	N/A
46	1	General	General		Goondiwindi Regional Council (GRC) opposes the proposed Surat Basin Carbon Capture and Storage Project for key reasons as detailed in this submission below. Council responds to the Glencore Carbon Transport and Storage Corporation Pty Limited (CTSCo) draft Environmental Impact Statement (EIS).		Noted	N/A
46	2	General	General		Council acknowledges efforts to mitigate the impact of anthropogenic climate change and supports in principle collective efforts to reduce and compensate for atmospheric carbon emissions on a regional, national and global scale. Greenhouse gas emissions are a global issue and despite our nation making significant contribution through multiple mechanisms, Council holds the firm view that projects proposing sequestration technology should be considered with an abundance of caution. By way of comparison, recent application of emerging underground technology in the resource industry at the failed Linc Energy Hopeland site just over 100km away from the Proponents' site, serves as a stark reminder of the permanent damage that can occur to aquifers when unanticipated consequences result from underground projects.		Noted	N/A
46	2	General	General		Community Consultation Details of the proposed CTSCo trial project were initially identified through a direct approach by the Proponent to Council last year. More recently, concerned ratepayers representing significant agricultural businesses within our region have highlighted their concerns with Council. Council is disappointed that nearby landholders were not targeted by the project's public engagement plan. Further, it is Council's understanding that important consultation providing information about the project was not undertaken with existing licensees holding allocation from the precipice sandstone formation of the Great Artesian Basin (GAB) across a larger geographic area. It is Council's position that the EIS document misleads the reader in relation to the suitability of the quality of water in the aquifer and the extent to which it is relied upon for water supplies across the GAB.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A, 3B and 3C; and Chapter 9 Groundwater, section 9.7
46	3a	General	General		Targeted Water Supply Aquifer Following review of the EIS documents, Council is particularly concerned at the identification of the target Carbon Capture and Storage (CCS) reservoir within the GAB and identification of the Precipice Sandstone formation as a saline water aquifer. It is clear that the precipice sandstone aquifer currently supplies reliable stock and town water supplies broadly across the GAB. Water quality adequately meets requirement for stock water supplies, particularly for intensive livestock operations, and is one of the few alternatives available for expansion of our Council region.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
46	3b				Further, overlying aquifers are critical to the viability of much of the economy of regional Queensland and to Goondiwindi Regional Council. Council is concerned that these critical aquifers could be inadvertently impacted by the pilot project targeting the underlying formation. Additionally, damage to bore and pumping infrastructure through corrosion and loss of gaseous carbon dioxide from the proposed storage through nearby licenced or abandoned facilities are credible risks of the project		Amended EIS	See Chapter 9 Groundwater, section 9.9
46	4				Impact on the Regional Economy In common with our neighbouring local Councils of Moree Plains, Southern Downs, Western Downs and Toowoomba, primary production is central to the regional economy and is a major contributor at State and Federal level. Agriculture offers continuing opportunity for growth, particularly for aligned industries. The GAB has long been the lifeblood for much of Queensland and Northern New South Wales and any project with any potential to impact the GAB must be dealt with the utmost caution. Recent favourable seasonal conditions and resulting short term capacity of surface water supplies have not dulled Council's focus on water security, particularly for existing and new enterprises and those dependant on water supplies from the GAB.		Noted	N/A
46	5a				Road Transport Risk The EIS identifies that road transport will be utilised to transport compressed gas from the source at Millmerran Power Station. While the identified route utilised the State Highway Network, the local road network could be utilised to significantly reduce travel distance but would not be desirable. Council holds concerns that unless transportation operations are closely managed, additional traffic could utilise Council's network, creating road safety and maintenance risk. Expansion to a full-scale project would clearly increase risk associated with road transport of the compressed gas.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.10.1; and Chapter 11 Transport
46	5b				While not the focus of the EIS, the pilot project is clearly a precursor to a much larger project with significantly expanded storage capacity and zone of influence. Goondiwindi Regional Council expresses opposition to the current project and consequent expansion to a full-scale sequestration project.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4
46	6	General	General		Council recommends use of the "precautionary principle" in consideration of the draft EIS. It is Council's position that the application to proceed with the carbon sequestration project within the GAB presents unacceptable environmental risk. While the benefits of carbon storage are accepted, Council position remains that risk of serious and irreversible environment damage outweighs benefit, given current experience with the technology. Examples offered in the EIS do not include water supply aquifers, particularly formations with the vital importance and physical extents of the GAB. It is recommended that the pilot project should not be approved.		Noted	See Chapter 9 Groundwater, section 9.9
47	1	General	General		To whom it may concern Please find attached some short comments on the Glencore EIS		Noted	N/A
47	1	General	General		I provide a high-level review on the above EIS which involves injecting liquified CO2 into the Precipice Sandstone of the Surat portion of the Great Artesian Basin (GAB).		Noted	N/A
47	2	General	General		I do not have the time availability to under so such a review and meet the EIS review deadline. This would require a detailed scrutiny of the entire EIS. However, I have provided some initial generalized thoughts and comments. Even form this initial look I have some misgivings about the concept of the project.		Noted	N/A
47	3	General	General		As a background the GAB contains vast quantities of potable and useable groundwater. It is by far the largest groundwater (this can be read) as water resource in Australia. It contains 60-65 times the volume of the entire volume of the combined surface waters and groundwater resources of the Murray-Darling Basin.		Noted	See Chapter 9 Groundwater, section 9.7
47	4	General	General		The groundwater of the GAB are resilient, in the terms of they are very old and are not affected by contamination or the impacts of any modern day climate change.		Noted	N/A
47	5	General	General		It seems a strange idea to inject liquified CO2 into a what is a usable aquifer. The aquifer of the Precipice Sandstone of has a salinity of ~1850 ppm which has many uses of economic value. I do not understand the value of injecting in essences "waste water" into a useable water resource. This is amplified by the importance of the GAB to the nation.			
47	6	General	General		Aquifers that contain more saline water could have been targeted.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.15
47	7	General	General		I am not an expert on policy or law in Queensland, but I would think that this is not a legal activity under Queensland Law. Surely it is not possible to inject wastewater into a usable aquifer. Also, this activity is unlikely to be allowed under the Environmental Protection Act. This would preclude this scheme from occurring?		Amended EIS	See chapter 4 Approvals, sections 4.4.4 and 4.4.23
47	8	General	General		I can't see any plans to monitor other useful water resources such as the overlying aquifers such as the Hutton Sandstone (overlying useable aquifer) or the Evergreen Formation? to assess the potential impact/or not on the injection activity		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and table 2-9; and Chapter 22 Proposed EA Amendments section 22.6
47	9	General	General		Injecting an acidic solution into the slightly alkaline groundwaters of the GAB can have potentially deleterious results. I am unsure if the complexity of these potential reactions has been fully addressed.		Noted	See Chapter 9 Groundwater, section 9.9
47	10	General	General		The impact that injection may/or may not have on potential GDE (including springs) needs to be addressed in more detail		Amended EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.3.7.2
47	11	General	General		If this is to be used as an example of carbon caption and storage for future upscaling – In my opinion, it does not achieve this and other sites could be looked at		Noted	N/A
48	1	General	General		Please see attached letter Thankyou.		Noted	N/A
48	1	General	General		I draft this letter on behalf of my family organisation as a submission for opposing the proposed development of the carbon capture and storage project in the Surat Basin proposed by Carbon Transport and Storage Corporation Pty Ltd (CTSCo). I believe the Environmental Impact Statement (EIS) is not sufficient to guarantee the continued quality of our groundwater resources for both agricultural and domestic use. The information, if not false, in my opinion is misleading and I don't believe CTSCo have conducted appropriate public consultation.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
48	2a	General	General		Background I am part of a generational farming family with my parents, brothers and our families. All of whom make a living from agriculture in the Balonne and Western Downs shires. My family have been on "██████" 35 km west of Westmar since 1915. Additional holdings include: - "██████" 20 km West of Westmar, - "██████" 20 km West of Westmar,		Noted	N/A
48	2b	General	General		"██████" 000 ha, "██████" cattle and goats with a dryland cropping component totalling 5 000 ha. We have an approved 10 000 head sheep feedlot and 50 000 standard cattle unit (SCU) cattle feedlot site which is due to start development in late 2023.		Noted	N/A
48	2c	General	General		This operation currently has several bores drawing out of the Surat Basin for livestock and domestic purposes. The intention is to buy further allocations for the Intensive livestock development.		Noted	N/A
48	2d	General	General		Current and future operations are crucially dependant on the Surat Water basin water supply and to jeopardise that water supply would greatly affect this business.		Noted	N/A
48	3a	General	General		Groundwater Concerns The concerns I have regarding this proposal are as follows:		Noted	N/A
48	3b	General	General		- The targeted Precipice Sandstone aquifer is labelled as "saline" at 1850 parts per million (ppm) according to groundwater measured by Glencore within the injection site. Through my research I believe this is well below the Australian guideline drinking water level of 4000 ppm. Why allow a potentially harmful highly corrosive liquified CO2 to be pumped into the Precipice Sandstone water source. This aquifer is measured to be of suitable quality for agricultural and domestic use.		Noted	See Chapter 9 Groundwater, section 9.7
48	3c	General	General		- The GAB groundwater within the Surat Basin is fully allocated. Future opportunities for water supply in aquifers such as the Precipice Sandstone need to be protected.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.10
48	3d	General	General		- This project is unprecedented in terms of injecting liquified CO2 into a usable water source. A trial site for future developments.		Noted	See Chapter 9 Groundwater, section 9.7
48	3e	General	General		- The chance of CO2 leakage is high.		Amended EIS	See Chapter 9 Groundwater, section 9.9
48	3f	General	General		- CTSCo's EIS states that this aquifer does not hold any significance locally as a water resource, nor does it have any environmental value. This statement is of great concern as to the lack of importance CTSCo and their researchers have given this water source. We believe that this aquifer is the vital in securing a future of the agricultural industry and surrounding communities.		Amended EIS	See Chapter 9 Groundwater, section 9.7
48	3g	General	General		- I would like to point out that liquified CO2 is a waste product that cannot be disposed of into a GAB aquifer, which is protected by both the Environmental Protection Act 1994 and Water Act 2000.		Amended EIS	See chapter 4 Approvals, sections 4.4.4 and 4.4.23
48	4a	General	General		Community Consultation Concerns I would like to point out that community consultation is not relevant if the information provided by the CTSCo is false and therefore misleading.		Noted	N/A
48	4b	General	General		- At the very minimum I would like to discuss the risk management strategies CTSCo have in place. What plans do you have in place to monitor water quality and what are the trigger points and your action plan when deterioration is detected not only within the targeted Precipice Sandstone aquifer but all other water sources?		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and table 2-9; and Chapter 22 Proposed EA Amendments, section 22.6
48	4c	General	General		- What are Glencore's procedures for acting on any potential problems when: - CO2 is found to be leaking back into the atmosphere through an uncontrolled site. - Water quality drops to a level not suitable for livestock or human consumption. - The water source becomes acidified to the point that well casings must be replaced to maintain the infrastructure investment many have made.		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and table 2-9; and Chapter 22 Proposed EA Amendments, section 22.6
48	5	General	General		Australia's underground water supply is crucial to the agricultural industry. Despite various reports and studies, I believe the entire system is still not largely understood. Aquifers and their seepage movement cannot be documented with certainty. This is not more evident than the fact that a water bore cannot be drilled with 100% certainty of accessing water. Neither volume, quality nor temperature can be predicted. How can one company with invested interest jeopardise such an important water source?		Amended EIS	See Chapter 8 Geology, section 8.7; and Chapter 9 Groundwater, sections 9.7
49	1	General	General		Please find attached the submission from Property Rights Australia into CTSCo Surat Basin Carbon Capture and Storage Project. If you have any queries do not hesitate to contact me.		Noted	N/A
49	1	General	General		Thankyou for your email. I am not sure why the pdf we sent would not open. I have sent you the submission again in both the pdf and word document. Could you please let me know you have received it. If you have any queries please do not hesitate to contact me.		Noted	N/A
49	1	General	General		Property Rights Australia (PRA) was formed in 2003 to protect the property rights of those unfairly targeted by the Vegetation Management Act 1999. We are a non-profit organisation of primary producers and small business people mostly from rural and regional Queensland who are concerned about continuing encroachments on the rights of private property owners. The organisation was formed to seek recognition and protection of the rights of private property owners in the development, introduction and administration of policies and legislation relating to the management of land, water and other natural resources. Set up in South West Queensland in January 2003, PRA's membership now extends across most states and all major rural industries. PRA is not affiliated with any political party.		Noted	N/A
49	2a	General	General		Summary a) The Great Artesian Basin (GAB) is an icon and under no circumstance should it be damaged		Noted	N/A
49	2b	General	General		b) The GAB is an important resource economically and environmentally to agriculture and rural and regional communities		Noted	N/A
49	2c	General	General		c) No harm should be done to present users or potential users of the resource for the purpose of carbon capture		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
49	2d	General	General		d) No special treatment should be given to the transport of "hydrogen" and "ammonia" under the Petroleum and Gas Act		Not relevant to the EIS	N/A
49	2e	General	General		e) There should be no compulsory access powers given to this experimental project		Not relevant to the EIS	N/A
49	2f	General	General		f) It should not be forgotten that this procedure is experimental with outcomes unknown		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.13

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
49	3	General	General		The Great Artesian Basin is iconic, and no harm should be permitted to be done to it under any circumstance. Many landowners, some supported by government, spent hundreds of thousands of their own money to cap bores and pipe water sourced from the Great Artesian Basin under the GABSI scheme in order to preserve the resource and restore pressurisation. We already know that the pressure of the resource can be changed. Why would it be considered acceptable to pump many tons of a material, possibly contaminated, into an aquifer and potentially super-pressurise it.		Amended EIS	See Chapter 9 Groundwater, section 9.9
49	4	General	General		Other methods of dealing with Carbon Dioxide need to be found other than the possible contamination and pressurisation of a system which supports a significant portion of Queensland. All sorts of carbon projects in the present climate are being put forward as socially beneficial. These projects all need to be balanced against any negatives that they may cause whether they be economic or environmental.		Noted	N/A
49	5	General	General		This project is not the only CCS project under consideration and if the regulation requiring environmental factors to be taken into consideration is removed it will open the door for other projects of a similar nature and more damage to aquifers.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals, sections 4.2 and 4.4.9
49	6	General	General		The publicly available information on which the decision is being made all comes from the company itself.		Noted	N/A
49	7	General	General		The Queensland Government needs to have an independent evaluation, also publicly available, done by a group such as the Independent Expert Scientific Committee (IESC) which the government obtains advice from for Mining and CSG applications.		Noted	N/A
49	8	General	General		The proponent claims that no damage will be done to existing bore owners while acknowledging that no new user will be permitted in the footprint area in future. Does this mean that existing owners will not be permitted to drill replacement bores or new bores?		Amended EIS	See Chapter 9 Groundwater, section 9.10.1.8
49	9	General	General		How will owners be compensated if their bores are affected and what standard of proof will they require? This has been a hard fought area under Petroleum and Gas Law and is vitally important to landowners.		Amended EIS	See Chapter 9 Groundwater, section 9.10.1.8
49	10	General	General		It is also claimed that the aquifer is too deep for normal users. Landowners over much of the Artesian Basin regularly construct bores which are a kilometre or more deep. Local councils in regional areas also rely on underground water for isolated communities. Would they be considered a "normal" user?		Amended EIS	See Chapter 9 Groundwater, section 9.7
49	11	General	General		In the future, with better technology and perhaps greater demand for water all users will expect to get to the depth of the proposed aquifer. Uncontaminated water will continue to be a premium resource.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
49	12	General	General		The proponents do not consider the water potable. They also claim that it does not fall within the parameters considered acceptable for livestock. Such parameters are often arbitrary. As a research assistant in a previous life for a best management group and handling test results of all sorts for a large group, this board member knows that much of the underground water on which livestock thrive, does not always fall within parameters. Livestock owners who adjoin this experimental area will attest to the fact that it is suitable for production. The claims of the company on this matter do not give a reasonable excuse for damaging the aquifer.		Amended EIS	See Chapter 9 Groundwater, section 9.7
49	13	General	General		They also claim that it is a confined aquifer. Identifying the exact underground topography is always ongoing and subject to revision. Indeed, the IESC has been known to request more surveying and modelling to be done including well outside the proponents footprint.		Amended EIS	See Chapter 8 Geology, section 8.7
49	14	General	General		This is meant to be a three year trial of new technology. What safeguards would the government have in place to discontinue the trial, and in what timeframe, if environmental harm, or more environmental harm than expected resulted?		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and table 2-9; and Chapter 22 Proposed EA Amendments section 22.6
49	15	General	General		Landowners are currently already forced by government to host a plethora of players on their land including mining and CSG, power lines and other infrastructure. It is not unknown for landowners to be conducting negotiations with up to a dozen external projects, all of whom want a piece of their land and time. This is regarded as a one-sided negotiation by landowners. CCS projects can conduct commercial negotiations at commercial rates if they expect landowners to host their infrastructure.		Noted	N/A
49	16	General	General		Glencore proposes to insert "hydrogen" and "ammonia" more clearly in the relevant sections of the P&G Act so as to give it greater right to operate pipelines and facilities on the land held by private businesses.		Not relevant to the EIS	N/A
49	17	General	General		This experimental project is high risk and should be treated as such. Concessions to companies seeking to perform these sorts of experimental procedures should not be given and they should be severely scrutinised.		Noted	N/A
50	1	General	General		Please find attached the Australian Lot Feeders' Associations (ALFAs) submission into Surat Basin Carbon Capture and Storage Project.		Noted	N/A
50	1	General	General		The Australian Lot Feeders' Association (ALFA) would like to take this opportunity to thank the Department of Environment and Science (DES) for allowing consultation on the Environmental Impact Statement (EIS) Surat Basin Carbon Capture and Storage Project.		Noted	N/A
50	2	General	General		As the Peak Industry Council (PIC) representing grainfed beef producers, water security remains a key priority for our members. Ensuring access to reliable ground water for current and future food and fibre production, in the face of an ever more volatile climate, is of paramount importance to our industry, consumers, our export markets and the contribution to the Australian economy.		Noted	N/A
50	3	General	General		Please find attached ALFA's submission which provides our industry perspective on the proposed Surat Basin Carbon Capture and Storage Project.		Noted	N/A
50	4	General	General		We welcome the opportunity to further discuss the current issues facing industry in relation to water security and opportunities in which industry and government may work to resolve these.		Noted	N/A
50	5a	General	General		EXECUTIVE SUMMARY The Australian Lot Feeders' Association (ALFA) is the Peak Industry Council (PIC) for grainfed beef producers. Representing approximately 380 accredited feedlots in Australia and a total capacity of 1 532 million head. Our industry contributes approximately 4.4 billion dollars to Australia's economy each year.		Noted	N/A
50	5b	General	General		Queensland has the largest number of feedlots, with the state accounting for 62% of feedlots and a carrying capacity of approximately 689,000 head. In the last fifteen years the Queensland feedlot industry expanded significantly, which was supported in many respects by the ability to access reliable, high-quality water. The expansion has continued to improve the productivity, efficiency and environmental performance of the entire beef industry.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
50	5c	General	General		Feedlots enable cattle to meet market specification in a significantly shorter period than that of extensive grazing systems, irrespective of environmental conditions. This becomes increasingly important when reviewing the highly unpredictable climate conditions over the last 5 years. Dry conditions throughout Australia place significant demand on the feedlot sector to sustain and finish cattle, to enable the beef industry to meet demand for beef here in Australia and overseas.		Noted	N/A
50	5d	General	General		The feedlot industry provides significant economic, social and environmental benefits to regional communities. The economic contribution generated by feedlot industry was estimated to be 500 million directly and 3,881 million indirectly in 2017 ¹ . The feedlot sector creates long term benefits for regional communities ensuring sustainable economic growth and employment.		Noted	N/A
50	5e	General	General		ALFA strongly believes that water suitable for livestock and cropping should be reserved for use by industries that in fact utilise the water for production purposes.		Noted	N/A
50	5f	General	General		Feedlots use water for several purposes including drinking water for livestock, feed manufacturing, washing and domestic use. Industry research suggests that feedlots require approximately 24 ML/1000 head on feed.		Noted	N/A
50	5g	General	General		Whilst feedlots draw water from both surface water and underground water supplies, increased climate volatility has meant industry is increasingly investing in access to deeper water reservoirs such as the GAB to ensure reliable access and growth.		Noted	N/A
50	5h	General	General		Below ALFA has outlined our primary concerns of the Environmental Impact Statement (EIS) submitted by CTSCo to utilise the Surat Basin to store highly corrosive liquified carbon dioxide (CO2).		Noted	N/A
50	6a				MISLEADING INFORMATION CONTAINED IN THE EIS CTSCo claim that 'the existing water quality of the Precipice Sandstone aquifer is characterised as having low water quality that is saline, high in iron (long-term), high in fluoride, and high in total dissolved solids, and is unsuitable for aquatic ecosystems, and unsuitable for irrigation water, stock water, and drinking water'.		Amended EIS	See Chapter 9 Groundwater, section 9.7
50	6b				This claim is fundamentally inaccurate. The salinity of the Precipice Sandstone groundwater measured by CTSCo within the injection site was 1850 parts per million (ppm). This is well below the Australian guideline for cattle drinking water of 4000ppm, meaning it is a safe and suitable source of water for livestock production ² .		Amended EIS	See Chapter 9 Groundwater, section 9.7
50	6c				A total of 187 businesses have been granted water entitlements to the Precipice Sandstone aquifer, with many of these businesses relying on this water source to support current food production and to expand their businesses.		Noted	See Chapter 9 Groundwater, section 9.7
50	6d				CTSCo have submitted an EIS stating that the water within the Precipice aquifer is not suitable for any other purpose and implying that it is not currently being used by industries outside the natural resource sector, which is false and misleading for those considering the EIS proposal.		Amended EIS	See Chapter 9 Groundwater, section 9.7
50	7a				PRECEDENT OF THE PROPOSAL The GAB is one of the largest underground freshwater resources in the world. It generates an economic contribution of approximately \$13 billion per year and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. ³		Noted	N/A
50	7b				Injection of CO2 into a water source which is used by communities and businesses across rural and regional Australia is untested anywhere in the world. The proposal to do so sets a dangerous precedent for further applications of this nature.		Noted	N/A
50	7c				The effect this could have on water quality and ground formation are completely unknown and untested, and therefore threaten the current and future viability of those rural and regional Australian businesses who rely on the Precipice Sandstone aquifer and the wider GAB.		Amended EIS	See Chapter 9 Groundwater, sections 9.9
50	7d				There are currently 187 license holders for the Precipice Sandstone aquifer, of these 33 license entitlements are for intensive stock, irrigation, town water and natural resources.		Amended EIS	See Chapter 9 Groundwater, sections 9.7
50	7e				If the Queensland Department of Environment and Science was to approve the EIS submitted by CTSCo it sets a dangerous precedent for other natural resource companies to inject regulated waste product into aquifers which local communities are utilising.		Noted	N/A
50	7f				Industry opposes the EIS submitted by CTSCo, and supports further exploration of an alternate injection site, one not directly servicing the production of food, fibre, and regional communities.		Noted	See Chapter 2 Project Description, section 9.15
50	8a				DIRECT THREAT TO ECONOMIC CONTRIBUTION OF THE INDUSTRY Feedlots play an important role in rural and regional economies, as buyer of goods and services and as employers of staff. ⁴		Noted	N/A
50	8b				A study published by Meat and Livestock Australia in 2018 concluded that a single 30,000 SCU feedlot has a direct economic contribution of \$11.6 million and an indirect contribution of \$14 million at a local level.		Noted	N/A
50	8c				The table below represents the estimated economic contribution of a 30,000 standard cattle unit (SCU) feedlot in 2017. TABLE		Noted	N/A
50	8d				If we examine this at a state level, without prejudice, the indirect contribution is estimated to be \$51 million on an annual basis, at a minimum.		Noted	N/A
50	8e				The Queensland economy stands to lose this contribution should this trial permanently damage the quality of water currently available for grain fed beef production.		Noted	N/A
50	9a				LIMIT FUTURE GROWTH OF THE SECTOR The feedlot sector has been on a growth trajectory for the past 20 years, particularly in Queensland where the growth has seen a 58% increase in feedlot capacity. This growth has been highly dependent on access to suitable ground water.		Noted	N/A
50	9b				Hampering the growth or productivity of the feedlot sector by impacting the reliability, quality or access to water has significant consequences for not just individual businesses but the local community that resides, the region and the State.		Noted	N/A
50	9c				Whilst there are a limited number of feedlots with water entitlements within the Precipice Sandstone aquifer, our industry insights suggest that the planned expansion of feedlots in this region will increase by 120,00 SCUs in the next 5 years. Using the above principles, we anticipate these expansions will result in an additional direct economic contribution of approximately \$46 million to the Queensland economy on an annual basis.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
50	9d				The Queensland economy stands to lose this additional contribution should this trial permanently damage the quality of water currently available for grain fed beef production.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
50	9e				ALFA believe that water use that provides tangible benefits to communities should be afforded priority over the dumping and storage of regulated waste product. Ensuring that ground water utilisation provides significant benefits to those operating within the wider community will ensure that the economic value of the GAB is maximised.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
50	10a				EXPERIMENTAL NATURE OF THE PROPOSAL As mentioned above there are currently 187 license holders for the Precipice Sandstone aquifer, of these 33 license entitlements for intensive stock, irrigation, town water and natural resources. We also reiterate that we are not oppose to the science that is Carbon Storage, however given the experimental nature of this project and the natural resource which it is putting at risk, ALFA opposes the EIS submitted by CTSCo.		Noted	N/A
50	10b				Since becoming aware of the EIS, we have been unable to find a precedent for the injection of CO2 into a water aquifer in use for food production and community purposes anywhere in the world.		Noted	N/A
50	10c				The CTSCo claims that 'an internationally analogous CCS project is SaskPower's Aquistore/Boundary Dam Project in Canada'. ALFA, however, considers this statement to be misleading in that it associates projects with 2 highly contrasting reservoir characteristics – one viable and one not viable. This is not an analogous project given that SaskPower's injection was into a water source that is 'four to five times saltier than the ocean ⁵ ' and therefore not suitable for production of livestock.		Noted	N/A
50	10d				The trial volumes proposed in the EIS present substantial risks to the quality of Precipice water, it is in our mind an experiment on one of Australia's largest natural resources presents a significant threat to businesses, communities, and the environment. Until a time that sufficient research is conducted which provides the necessary confidence that CO2 injection into a used water source will not degrade or limits it's use for domestic or production purposes, ALFA advocates that an alternate location of carbon storage, is identified.		Amended EIS	See Chapter 9 Groundwater, section 9 9
50	10e				Furthermore, ALFA would support the EIS being submitted to the Australia Governments Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) for expert scientific advice on the potential water-related impacts of the proposal. This is imperative to ensure that the potential risks of any EIS are identified.		Noted	N/A
50	11a				CONCLUDING STATEMENT ALFA has grave concerns that the CTSCo proposal will degrade Australia's greatest underground water supply and by so doing threatening the existing and potential food security of Australia and the globe.		Noted	N/A
50	11b				As an industry we remain supportive of initiatives which help reduce the release of CO2 into the atmosphere and have our own industry commitments to become Carbon Neutral by 2030. We do however believe that a carbon capture and storage that threatens other components of the environment is not an effective way to demonstrate environmental stewardship.		Noted	N/A
50	11c	General	General		It is our view that the Queensland Department of Environment and Science reject the proposal submitted by CTSCo to inject liquid CO2 in the Sandstone Precipice aquifer within the GAB.		Noted	N/A
51	1	General	General		We are pleased to attach our submission in response to the EIS Surat Basin Carbon Capture and Storage Project by the Carbon Transport and Storage Corporation Pty Ltd. Please let me know if you require any further information, otherwise please may you confirm receipt of this submission by return email.		Noted	N/A
51	1	General	General		Australian Pork Limited (APL) is the peak representative body for Australian pork producers. The industry contributes around \$5.3 billion in gross domestic product per annum to the Australian economy, employs 36,000 mostly skilled workers nation-wide and is regionally based.		Noted	N/A
51	2	General	General		APL's submission opposes the proposal by Carbon Transport and Storage Corporation Pty Ltd (CTSCo) a subsidiary company of Glencore, to develop a carbon capture and storage project in the Surat Basin (the Project). We have a number of concerns about the Project which are identified in this submission.		Noted	N/A
51	3	General	General		We believe the Project represents an unacceptable risk to the water quality of this unique aquifer, putting at risk the livelihoods of current and future agricultural enterprises, including pork. Questions have been raised about the characterisation of the water quality at the site in the EIS and we share the concerns raised by other agricultural industry representative bodies about the limited consultation with those bodies, impacted producers and the broader community.		Amended EIS	Chapter 3 Community and Stakeholder Engagement, Appendix 3A, 3B and 3C; and Chapter 9 Groundwater, section 9.7
51	4	General	General		Fundamentally, we do not agree with the proposed use of an underground water source, which is suitable for agricultural use, to facilitate waste disposal. We are not only concerned about the localised impacts to this aquifer and the Great Artesian Basin, Australia's most significant hydrogeological feature, but also the precedent that may be set by approval of this project.		Noted	N/A
51	5a	General	General		The grounds for APLs opposition are: - Potential impacts on groundwater, which is currently being used for agricultural and domestic purposes.		Amended EIS	See Chapter 9 Groundwater, section 9 9
51	5b	General	General		- Incorrect assumptions within the EIS which state the water from the Precipice Sandstone Aquifer is not suitable for livestock, when water of similar quality is already being used by other licenced users and has been used for decades as a stock and domestic water source.		Amended EIS	See Chapter 9 Groundwater, section 9.7
51	5c	General	General		- Concerns regarding the precedent being set through the proposed exemptions required to allow a project of this scope to proceed.		Noted	N/A
51	5d	General	General		- The inequality of the regulatory system which allows considerations for exemptions for unproven science while hampering on farm investment with farmers currently wading through environmental red tape to invest in proven technologies with measurable emissions reduction capacity.		Noted	N/A
51	5e	General	General		- Incompatibility with the guiding principles of the Great Artesian Basin Springs Adaptive Management Plan, both national and QLD.		Noted	N/A
51	5f	General	General		- The inappropriate priority being placed on the potential of an unknown, untested and untrilled science versus the potential long-term impact on sustainable farming, indigenous culture and community expectations around the protection of water sources.		Amended EIS	See Chapter 9 Groundwater, section 9 9 and 9.11

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
51	5g	General	General		- The unnecessary potential impacts on the local pig industry due to the limitations it will place on the potential expansion and future sustainable development of the Cameron Pastoral Company farm, vs a multinational company being given access to our most significant national water resource for their industrial waste.		Amended EIS	See Chapter 9 Groundwater, section 9.9
51	5h	General	General		- Incompatibility with best practice processes regarding transparent and accountable consultation.		Amended EIS	Chapter 3 Community and Stakeholder Engagement, Section 3.3 and Appendix 3A, 3B and 3C
51	6a	General	General		Australian Pork Limited APL is the peak national representative body for Australian pork producers. It is a producer-owned company combining marketing, export development, research and innovation and strategic policy development to assist in securing a profitable and sustainable future for the Australian pork industry.		Noted	N/A
51	6b	General	General		The domestic pork industry is a vital part of Australia's food supply chain. It is the second most consumed meat in Australia and all fresh pork consumed in Australia is produced domestically. 90% of production supports food security for Australians, with nine percent exported at a value of about \$173 million.		Noted	N/A
51	6c	General	General		The industry contributes around \$5.3 billion in gross domestic product to the Australian economy. A total of 36,000 jobs are supported nation-wide, they are located predominantly in regional Australia, are skilled and are generally permanent employees. This provides significant stability to the economic and social prosperity of local communities and the wellbeing of individuals.		Noted	N/A
51	6d	General	General		The industries' footprint is in regional Australia, with the largest volume of production derived from Queensland, followed by Victoria and South Australia, respectively. Australia's domestic sow herd numbers are around 279,000 and are housed in approximately 4,300 registered sites nationwide. In 2021, the Australian pork industry produced around 443,000 metric tonnes of pork.		Noted	N/A
51	7a	General	General		The importance of the Great Artesian Basin APL has significant concerns about the risk posed by this application to the Great Artesian Basin (GAB), a hydrological feature of national significance. It is Australia's, and one of the world's, largest under-ground freshwater resources and has international significance.		Noted	N/A
51	7b	General	General		The GAB lies beneath parts of the Northern Territory, Queensland, South Australia, and New South Wales. It includes the Eromanga, Surat, and Carpentaria geological basin. At almost 1.7 million square kilometres it is located in one-fifth of the Australian continent. It is a vital resource for 180,000 people, 7,600 businesses and 120 towns.		Noted	N/A
51	7c	General	General		Indigenous communities maintain cultural, social and spiritual connections with the springs and their associated ecological communities and landscapes.		Noted	N/A
51	7d	General	General		The Precipice Sandstone aquifer services a number of towns, agricultural enterprises and other regional facilities with water across southern QLD. The assertion in the CTSCo EIS the Precipice Sandstone aquifer is 'unsuitable for irrigation water, stock water, and drinking water', is not correct. Water of similar quality is currently used for production of livestock and a number of those businesses have licences to access the Precipice Sandstone aquifer with a view to expanding their use of this deeper, secure aquifer. Groundwater dependent ecosystems also rely on the water.		Amended EIS	See Chapter 9 Groundwater, section 9.7
51	7e	General	General		GAB groundwater within the Surat Basin is fully allocated and is the main constraint to further development of the region. Significant investments have and continue to be made to protect the water resources of the GAB, including capping of bores. Businesses looking for expansion opportunities through water supply have investigated options to utilise deeper more secure aquifers such as the Precipice Sandstone. Future needs for the area, especially use to support sustainable agricultural development, should be considered within the EIS deliberations.		Amended EIS	See Chapter 9 Groundwater, section 9.9
51	7e	General	General		It does not appear the groundwater modelling, undertaken by the proponent has adequately considered nearby extraction even though they were aware of the existing allocations. The bore for these allocations is already approved.		Amended EIS	See Chapter 9 Groundwater, section 9.9
51	7f	General	General		Both current and future uses and entitlements should have been incorporated into the required modelling.		Amended EIS	See Chapter 9 Groundwater, section 9.9
51	7g	General	General		The approval of this project is likely to set a precedent for future injection into water supply aquifers across the GAB. As our climate changes, secure water resources, such as the GAB aquifers are increasing in their significance and importance.		Noted	N/A
51	7h	General	General		Given the importance of the GAB, the agricultural and community uses of the Precipice aquifer, we find it difficult to understand why a trial of a waste disposal project would even be contemplated. Our understanding is that carbon injection is usually done into hyper saline groundwater or former hydrocarbon (oil and gas) reservoirs which are rarely used by other parties as a water source. The injection of CO2 into a water supply aquifer seems unprecedented. In addition, the trial implies that further GAB sites may subsequently be considered for similar projects. This longer-term intent for expansion is of significant concern.		Noted	N/A
51	8a	General	General		Importance of the GAB to the Australian pork industry The targeted injection of CO2 is proposed to occur into an aquifer that is important for supporting any future growth and intensification of agriculture in southern QLD. The potential impact this will have on a long-term water source must be adequately considered with the primary objective being to understand where the proposal would impact the long-term plans across the region.		Amended EIS	See Chapter 9 Groundwater, section 9.9
51	8b	General	General		As noted in Queensland Farmers' Federation Ltd, GHD (2018) NuWater Project Feasibility Study Volume 1 – Preliminary Business Case 1: "Growth in agricultural and industrial production and associated regional economic benefits (particularly as measured in regional jobs) in the Lockyer Valley and the Darling Downs is being significantly constrained by the lack of opportunities and access to traditional water source supplies and need to develop alternate supplies for the region."		Noted	N/A
51	8c	General	General		The report noted the increased demand for intensive horticulture and animal industries on the Darling Downs. APL agrees that intensive livestock industries are by necessity concentrated around local feed grain supply. Of growing importance with the increasing cost of fuel, damage to regional roads and lack of available workforce to support long distance grain transport.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
51	8d	General	General		According to the Western Downs Regional Council Economic Development 2017-2022 Strategy: Key economic drivers in terms of the agricultural industry over the next five years within this region include investment in broad acre cropping and intensive livestock. Consequently, access to water is recognised as core to economic development.		Noted	N/A
51	8e	General	General		Other benefits of increased water supply include increased water security for intensive animal producers and industrial producers. The pork industry requires access to a consistent and well understood supply of water. The known quality and quantity of the water is important as it allows for the capital investment and systems to maintain a consistency of water quality.		Noted	N/A
51	8f	General	General		As outlined in the CSIRO published report, Water quality and management in the Australian pig industry: "Water is the first nutrient and an essential component of all agricultural production systems. Access to drinking water of an appropriate physio-chemical and microbiological quality, free of deleterious or toxic substances is imperative for farm to fork supply chain traceability and food safety. The availability of a reliable water source is critical but an awareness of the quality of that water is of equal importance.		Noted	N/A
51	8g	General	General		Typically, producers were reliant on their local water source with bore water being the most common available source. Of the 57 piggeries surveyed, only 7 had access to mains water supply which would suggest that the majority of water sources being utilised are impacted by many factors such as local topography, seasonal fluctuations and weather events.		Noted	N/A
51	8h	General	General		Access to a clean and plentiful water supply of optimal mineral and chemical composition with a negligible microbiological load is fundamental to optimising animal production." ²		Noted	N/A
51	9a	General	General		The Pork industry: food security through sustainable expansion APL, like other peak agricultural bodies have been part of the development of the National Farmers Federation Commitment to the 2030 Roadmap. The goal is to support agriculture to exceed \$100 Billion in farm gate value by 2030. 2030 Roadmap - National Farmers' Federation (https://nff.org.au/policies/roadmap/). Access to water resources will be a critical limiting factor in the agriculture industries ability to meet the goal.		Noted	N/A
51	9b	General	General		With the Federal Government commitments to net zero by 2050 there are opportunities for the pork industry to provide solutions through the production of low emission protein. The intensive nature of pork production can provide significant job opportunities within rural and regional towns assisting with decentralisation of the population and reducing the need for urban sprawl.		Noted	N/A
51	9c	General	General		The pork industry's ability to support the broader move towards emissions reductions, to innovate and adapt can be reliant on access to water. The pork industry has the potential to be a leading innovator in the circular economy. Supporting investment in the expansion of sustainable agriculture has long-term economic, environmental and social benefits.		Noted	N/A
51	10a	General	General		A lack of genuine consultation In line with the submissions from other agricultural representative bodies, APL agrees there was not genuine consultation prior to the Project proposal being submitted.		Amended EIS	Chapter 3 Community and Stakeholder Engagement Appendix 3A, 3B and 3C
51	10b	General	General		Genuine consultation would not only engage with peak bodies and representative organisations like APL, who represent their member's interests, but also with the landholders who are most impacted by the Project. Feedback from one impacted pork producer indicates there has been very little genuine consultation.		Amended EIS	Chapter 3 Community and Stakeholder Engagement Appendix 3A, 3B and 3C
51	10c	General	General		APL believes the lack of agreed facts regarding key elements of the Project has created an environment of distrust, where it appears genuine consultation has not been expected of the proponent. This in turn will reduce community confidence in both the regulatory framework and the legitimacy of similar projects. It is important that projects aimed at testing new science meet high standards of probity and transparency.		Amended EIS	Chapter 3 Community and Stakeholder Engagement Appendix 3A, 3B and 3C
51	10d	General	General		Accurate analysis of the impact of the Project has been difficult for stakeholders to gauge given:		Noted	N/A
51	10e	General	General		- The lack of agreed facts regarding the accessibility of water from the impacted aquifer and misinformation regarding the quality and useability of that water.		Amended EIS	See Chapter 9 Groundwater, section 9.7
51	10f	General	General		- The bore licences have not been accurately described within the documentation nor has impact on those bore licences, within the vicinity of the Project, been adequately assessed.		Amended EIS	See Chapter 9 Groundwater, section 9.7
51	10g	General	General		- The water is treatable and is used for livestock purposes. That means it should not be considered to be equivalent to the type of highly saline, unusable water, for example from ex-mining sites, which have been deemed suitable elsewhere for this sort of project. Dismissing the useability of the water was disingenuous and has created a lack of trust between stakeholders and the proponent.		Amended EIS	See Chapter 9 Groundwater, section 9.7
51	10h	General	General		- Due to the unique nature of the Project, there has been a lack of peer reviewed science-based evidence to support it. A pilot, by its very nature, comes with enhanced uncertainty and risk around outcomes and impacts. However, the consultation documents imply the Project is not unique, creating an inaccurate picture of the veracity of the science behind the Project.		Amended EIS	See Chapter 9 Groundwater, section 9.9; and Chapter 3 Community and Stakeholder Engagement Appendix 3A, 3B and 3C
51	11a	General	General		Precedent set undermines genuine sustainability or emissions reductions Australian pork producers have a strong history of environmental improvement. Since 1980, the industry has reduced its carbon footprint by more than 60 percent and water use by 80 percent. APL supports the industry to find new approaches for climate friendly farming, with a goal of adopting closed loop systems for both carbon and water.		Noted	N/A
51	11b	General	General		The Pork Sustainability Framework was launched in 2021 and outlines how our industry will commit to continuous improvement across the entire pig production system. It is centred around the four key pillars of our industry – People, Pigs, Planet and Prosperity. We take the planet pillar seriously and our community goal is for the industry to be a livestock leader with low Greenhouse Gas (GHG) emissions and an adopter of closed loop systems for carbon and water.		Noted	N/A
51	11c	General	General		The industry has, and continues, to actively work on: - Carbon cycling and nutrient accounting - Pork is a low emissions protein, - Farm biodiversity and natural resource stewardship, - Water recycling on farm initiatives, and - Closing the loop to reduce waste: - the goal of 60% of production using waste recycling and renewable energy technology. - the goal of 30% of pork production undertaken using food waste, by-products, insects or other sustainable		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
51	11d	General	General		Individual pork producers are making changes on farm to improve their carbon emissions as well as better manage other nutrients such as nitrogen and phosphorus. APL is supporting producers through this transition via both an environmentally focused research program and dedicated extension resources. Our extension program provides on farm support to adopt research.		Noted	N/A
51	11e	General	General		Reducing greenhouse gas emissions from pork production are a major priority for the industry. As part of APL's 2020-2025 Strategic Plan and the Pork Sustainability Framework, the industry has committed to reducing its GHG emissions and moving towards carbon neutrality. Although pork only contributes 0.4% to Australia's overall GHG emissions, the industry sees great opportunity to reduce resource inputs and minimise its environmental footprint in line with growing community expectations.		Noted	N/A
51	11f	General	General		The pork industry is fortunate in that its biggest source of emissions, piggery waste, can be managed. The mixture of methane and carbon dioxide emitted from ponds (also known as biogas) has a moderate energy content, which can be used to generate heat, or electricity. Or it can be captured and burned to destroy the methane and eliminate the global warming contribution.		Noted	N/A
51	11g	General	General		The Australian pork industry is playing its part in responding to the global need to abate CO2. We accept that the fossil fuel industry also needs innovative solutions to reduce its carbon footprint. Carbon capture and storage seems one of those technologies which could assist that sector to reduce its carbon footprint. APL's concern is that the Project is a poor demonstration of the use of CCS technology in Queensland, given it poses risks to an aquifer which contains good quality water which can support future growth of agriculture.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
51	12a	General	General		Conclusion Under the <i>Environmental Protection Regulation 2019</i> , section 41, an activity involving direct release of waste into groundwater must be refused if the authority considers under S41(2) part (b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or (c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater.		Amended EIS	See Chapter 9 Groundwater, sections 9.11
51	12b	General	General		The EIS contends the Project design is to inject into a low quality, confined aquifer to avoid impacts or minimise impacts to higher value, more frequently used aquifers in the area. However, APL has concerns that the consequences of the Project have not been adequately contemplated. Nor any consideration given to the impact on the modelling from the additional licences that been granted which substantially changes the potential use and movement of water within the aquifer. The effect of increased extraction from aquifers nearby to the target aquifer may lead to unintended pollution to nearby high value water resources, an untenable proposition.		Amended EIS	See Chapter 9 Groundwater, section 9.9
51	12c	General	General		APL believes the Project proposal lacks adequate modelling, has not been subject to genuine consultation and is reliant on being granted an exemption to the Environmental regulations which sets a concerning precedent. APL do not believe the Project should proceed.		Amended EIS	See Chapter 9 Groundwater, section 9.9; and Chapter 3 Community and Stakeholder Engagement Appendix 3A, 3B and 3C
51	12d	General	General		Thank you for the opportunity to provide a submission, should additional independent scientific information become available APL reserve the right to have it as a supplement to this submission, noting the process timelines.		Noted	N/A
52	13	General	General		We are members of the Upper Dawson Wildlife Preservation Society, Queensland. We are appalled and aghast at this company coming back again to inject CO2 into the Precipice Aquifer. We had 3 meetings with this company going to 'trial' putting CO2 into the Precipice Aquifer near Wandoan. Fortunately for the Taroom/ Wandoan area, the CTSCo group did not go ahead. We believe this same project with Federal Government support is wanting to inject CO2 from the Millmerran PowerStation into the same Aquifer and Nikki Accornero, Community and Stakeholder Engagement Manager CTSCo Pty Ltd- A Glencore Company who came to all our meetings is still part of this next project. She certainly was left in no doubt at our meetings that this could be very dangerous and irreversible if this waste CO2 was to be placed into the Precipice Aquifer. It is hard to believe that any company would be allowed to put any waste into the Great Artesian Basin which is one of the greatest assets inland Australia has. We therefore deeply oppose that this should be allowed and we hope common sense will prevail.		Noted	N/A
53	1	General	General		Please find attached Hancock Prospecting Pty Ltd's submission in accordance with section 55(1) of the <i>Environmental Protection Act 1994</i> (Qld) regarding CTSCo's Environmental Impact Statement for its proposed carbon capture and storage project in the Surat Basin. I would be grateful if you would acknowledge receipt		Noted	N/A
53	1	General	General		The letter together with the attached Report entitled <i>Technical Groundwater Review of the Surat Basin Carbon Capture and Storage Project Draft EIS</i> prepared by hydrogeologist.com.au constitutes formal feedback on the draft EIS for the Project, in accordance with sections 54 and 55 of the <i>Environment Protection Act 1994</i> (Qld).		Noted	N/A
53	2	General	General		Hancock Agriculture (a division of Hancock Prospecting Pty Ltd) owns several properties across the Surat Basin and is currently actively pursuing the expansion of its interests in the western Surat area.		Noted	N/A
53	3	General	General		The western Surat has been identified as key to: - Alleviating drought risk in other parts of Hancock Agriculture's portfolio, which requires the use of ground water that is fit for animal consumption - Growing crops as part of a portfolio approach to supply our regional feedlot assets, which requires the use of groundwater for irrigation purposes.		Noted	N/A
53	4a	General	General		The Report has identified a number of key concerns with the draft EIS for the Project. These include:		Noted	N/A
53	4b	General	General		- Uncertainty in the geology/hydrogeology within the region		Amended EIS	See Chapter 8 Geology, section 8.7; and Chapter 9 Groundwater, section 9.7
53	4c	General	General		- Limited groundwater sampling which was been too distant from the injection site		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	4d	General	General		- Lack of compliance with the regulations and uploading of data to Queensland Globe for groundwater bores		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
53	4e	General	General		- The assumption of high fluoride levels in the groundwater, which is incorrectly stated as impacting upon water usage for animal consumption		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	4f	General	General		- Water within the aquifer is brackish, rather than saline as erroneously stated on numerous occasions in the draft EIS. The Precipice Sandstone in fact yields usable water on a local and regional basis		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	4g	General	General		- Lack of acknowledgement of and engagement with existing water extraction licensees within the aquifer zone		Amended EIS	See Chapter 9 Groundwater, section 9.7.4
53	4h	General	General		- That the six-monthly groundwater monitoring will not comply with Queensland government guidelines, and that the number of monitoring bores proposed is insufficient.		Amended EIS	See Chapter 2 Project Description, sections 2.11.5 and 2.11.7; and Chapter 9 Groundwater, sections 9.9 and 9.10
53	5	General	General		The concerns raised in the Report are specific to the Project being pursued in this location and the inadequacies identified in the draft EIS.		Noted	N/A
53	6	General	General		We look forward to the opportunity to engage further with the Queensland Government in the assessment and decision-making process for the Project.		Noted	N/A
53	1a	General	General		1. Introduction hydrogeologist.com.au has been engaged by Hancock Prospecting Pty Ltd (Hancock) to undertake a technical groundwater review of the Surat Basin Carbon Capture and Storage (CCS) Project Environmental Impact Statement (EIS). The draft EIS has been submitted by Carbon Transport and Storage Corporation (CTSCo) Pty Limited		Noted	N/A
53	1b	General	General		The project is seeking to conduct greenhouse gas (GHG) (predominantly carbon dioxide [CO ₂]) storage injection testing and would be located approximately 44 kilometres (km) south-west of Moonie, Queensland. The project covers a disturbance area of approximately 13.6 hectares (ha) of 1,079 ha of operational lands within GHG exploration tenement EPO10		Noted	N/A
53	1c	General	General		The project will involve injection testing of up to 110,000 tonnes of GHG stream (CO ₂) per year for up to three (3) years, totalling 330,000 tonnes. The project will include transport of the GHG stream by truck along 260 km of existing local and State controlled roads from Millmerran Power Station to the site, approximately 640 m of road improvements to Harts Road, a Transportation Facility, 9.5 km of flowline, an injection well and associated monitoring infrastructure. The project's expected life is seven (7) years, including construction, operation, monitoring and rehabilitation.		Noted	N/A
53	1d	General	General		The technical groundwater review has been carried out by Daniel Barclay. Daniel has a Bachelor of Applied Science (Hons) in Geology from the Queensland University of Technology. Daniel has over 25 years' experience as a hydrogeologist within the consulting, government and mining sectors. He has carried out numerous groundwater impact assessments in Queensland, New South Wales, South Australia and Victoria; and has provided third party technical reviews on a number of large mining projects.		Noted	N/A
53	1e	General	General		Since 1999, Daniel has been involved with groundwater studies in the Great Artesian Basin (GAB) and has been involved with numerous drilling programs, conceptualisation assessments and the numerical modelling of groundwater flow within the various aquifers of the GAB. He has an intimate knowledge of the GAB, has worked on specific projects involving the Precipice Sandstone, and is appropriately qualified and experienced to undertake this technical groundwater review of the draft EIS.		Noted	N/A
53	2	General	General		2. Data review The draft EIS submission is available to view and download from the CTSCo website ¹ . This technical review considered the following chapters/appendices from the draft EIS: - 00 Executive Summary; - 08 Geology; - 09 Groundwater; - 20 Cumulative Impacts; - Appendix 8 – Well completion reports; and - Appendix 9 – Groundwater Impact Assessment Technical Report. In addition to the draft EIS documentation, the following publicly available reports were also considered: - Hoffman et al., 2020. Hydrogeology of the Southern Surat Basin. Final report for the Australian National Low Emissions Coal Research & Development (ANLEC) Report for the project 7-C316 ² .		Noted	N/A
53	3a	General	General		3. Review 3.1. Geology and hydrogeology The draft EIS is supported by the following site bores: - West Moonie-1 Injection Well; - West Moonie-2 Monitoring Well; - West Moonie Shallow Monitoring Bore, and - Subsurface Monitoring Bore		Noted	N/A
53	3b	General	General		Page 21 states that these have been <i>designed, drilled, constructed and equipped by or on behalf of CTSCo comply with the relevant Australian Standards, code and guidelines, including the "Code of Practice for the construction and abandonment of petroleum wells and associated bores in Queensland" (DNRME, 2019)</i> . However, according to Queensland Globe the above bores are not registered facilities and it is unclear whether these groundwater monitoring bores were supervised by a Class 3 water bore driller as required under the Water Act 2000. Only details of the West Moonie-1 Injection Well and West Moonie-2 Monitoring Well are provided in Appendix 8 (Well Completion Reports). Full details of the monitoring bores should be provided and		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.8.1
53	3c	General	General		Page 23 of the executive summary states that <i>the 3D seismic program is scheduled to be undertaken in Quarter 1 (Q1) 2023, depending upon weather and ground conditions</i> . From this it is understood that no 3D seismic testing has been completed to date, and therefore with the exception of the well (point) data and an initial 2D seismic survey, there is no detailed understanding of the geology and structural geology on the project site. It is not unreasonable to suggest that this data acquisition should be available to inform the draft EIS prior to		Amended EIS	See Chapter 2 Project Description, section 2.8.1; and Chapter 8 Geology, sections 8.6 and 8.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
53	3d	General	General		Hoffman et al., (2020) states that the Precipice Sandstone is <i>assumed or inferred to have lower quality groundwater and the potential for CO2 enhanced water recovery as has been investigated elsewhere (e.g., Garnett et al., 2019; Harfoush et al., 2019; La Croix et al., 2019; Pearce et al., 2019a). However, uncertainties remain around the central southern Surat Basin hydrogeology such as flow paths and the connection to the Clarence-Moreton Basin in the east, connectivity of faults (e.g., between the Precipice and Hutton sandstones around the Burunga-Leichardt / Moonie-Goondiwindi fault) and water chemistry/hydrochemistry distribution.</i>		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	3e	General	General		The information presented on a local and regional scale highlights significant uncertainty associated with the Precipice Sandstone geology and its horizontal and vertical hydraulic relationships on a local, sub-regional and regional basis.		Amended EIS	See Chapter 8 Geology, section 8.7; and Chapter 9 Groundwater, section 9.7
53	3f	General	General		The draft EIS often shows a differing extent of mapped Precipice Sandstone in the region. For example, the extents shown in Figure 9-19 and Figure 9-26 (Chapter 9) are different. It is unclear why this difference would occur, and this brings into question which datasets have been used and the reliability and comparability between the various assessments		Amended EIS	See Chapter 8 Geology, section 8.7; and Chapter 9 Groundwater, section 9.7
53	3g	General	General		Hoffman et al., (2020) goes on further to state <i>salinity is low to moderate and slightly higher in the Precipice Sandstone with electrical conductivity (EC) values ranging from 775 to 6350 $\mu\text{S}/\text{cm}$ (median 2000 $\mu\text{S}/\text{cm}$) in the Hutton Sandstone, 656 to 7750 $\mu\text{S}/\text{cm}$ (median 1800 $\mu\text{S}/\text{cm}$) in the Evergreen Formation and 193 to 8301 $\mu\text{S}/\text{cm}$ (median 2468 $\mu\text{S}/\text{cm}$) in the Precipice Sandstone.</i>		Noted	N/A
53	3h	General	General		<i>The EC, as a proxy for the total dissolved solids (TDS), increases with depth in all formations. A gradual increase in salinity occurs from the northern edges of the Surat Basin towards the central north and central south Surat Basin. A further increase occurs with flow directions to the east across the Cecil Plains into the Clarence-Moreton Basin. The highest salinity samples (EC 6769 – 8301 $\mu\text{S}/\text{cm}$) from the Precipice Sandstone are in the Chinchilla and Condabri regions east of the Burunga-Leichardt fault zone, which are at a medium depth. They are closer to the eastern margin of the basin and the subcrop areas of the Hutton and Precipice sandstones. Potential leakage from shallow, higher salinity waters may be the cause of the higher salinities. This is consistent with previous work focussed on the northern Surat Basin (Raiber and Suckow, 2017; Suckow et al., 2018). The two lowest salinity samples of the Precipice Sandstone in this study were sampled from bores near Cecil Plains.</i>		Noted	N/A
53	3i	General	General		<i>Local differences deviating from the general north-south trend were observed, for example, groundwater bores in the Precipice Sandstone around the Moonie Oil Field have much lower TDS values than other parts of the Precipice Sandstone. Heterogeneities in permeability and dual porosity effects are potential reasons, where higher groundwater fluxes occur in higher permeability units and macro pores, leading to generally higher exchange rates of water volumes. Groundwater in finer, low permeability units on the other hand often has higher TDS due to low flow or stagnant conditions. The Moonie Oil Field has been pumped for decades and groundwater is most likely drawn from higher permeability units, producing the lower salinities.</i>		Noted	N/A
53	3j	General	General		Further to our above statement, the information presented highlights significant uncertainty associated with the Precipice Sandstone flow paths on a local, sub-regional and regional basis. This uncertainty needs to be addressed prior to project approval.		Amended EIS	See Chapter 8 Geology, section 8.7; and Chapter 9 Groundwater, section 9.7
53	4a	General	General		3.2. Groundwater quality Page 14 of the executive summary states <i>CTSCo previously held EPQ7 in the northern Surat Basin. At an identified development site 16 km west of Wandoan township, CTSCo conducted extensive studies of the feasibility of GHG injection testing between 2009 and 2019, including the drilling of the West Wandoan-1 well to a depth of 1,293 m below surface into the Moolayember Formation, the acquisition of detailed geological and hydrogeological data from the Glenhaven 3D Seismic Survey, studies into existing CO2 atmospheric dynamics, and various baseline studies of surface water quality, groundwater quality, air quality and the atmosphere. The characteristics of the site included:</i> - a freshwater source for existing community and shared bores that draw water from the Precipice Sandstone aquifer for agriculture and community use, including the drinking water supply of Wandoan township; - water quality that meets various water quality objectives including for aquatic ecology, town water supply, and irrigation, stock and domestic use; and - potential for community opposition to GHG storage injection testing at this location due to the community's existing use of the water drawn from the Precipice Sandstone aquifer.		Noted	N/A
53	4b	General	General		<i>Given the potential impacts associated with water quality within the predicted plume, and community concerns from users of water from the Precipice Sandstone aquifer, in close consultation with Department of Resources, CTSCo made the decision to cease activities in EPQ7 with EPQ7 fully relinquished in 2019</i>		Noted	N/A
53	4c	General	General		<i>The decision to investigate EPQ10 and locate the West Moonie-1 Injection Well in its current location was that the Precipice Sandstone aquifer is saline, and the closest entity that accesses the aquifer is for the purposes of oil and gas production.</i>		Noted	N/A
53	4d	General	General		The basis for the development of the project at its proposed location is the assumption that the Precipice Sandstone is saline, and the closest user is oil and gas production at Moonie. Hoffman et al. (2020) broadly describes the existing salinity data (total dissolved solids - TDS) for the Precipice Sandstone in the range of 210 to 5700 mg/L with a median of 2120 mg/L and a mean of 2344 mg/L. Hoffman et al. (2020) goes on to state that <i>the highest salinities occur around the Burunga-Leichardt Fault and the salinity at the EPQ10 site is 2849 $\mu\text{S}/\text{cm}$ (TDS of 1822 mg/L).</i>		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	4e	General	General		Chapter 9 of the draft EIS states that <i>the TDS content from West Moonie-1 Injection Well sample is about 1,850 mg/L, which is very close to the TDS in the 2018 samples ranging from 887 to 1,550 mg/L, indicating fresher groundwater.</i> In fact, the TDS of groundwater from the West Moonie-1 Injection Well is fresher than the median TDS concentration of 2120 mg/L and mean TDS concentration of 2344 mg/L identified from the larger Surat Basin assessment (Hoffman et al. 2020).		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	4f	General	General		Table 9-19 of the draft EIS states that there are only three representative groundwater quality samples available from West Moonie 1 with which to characterise local Precipice Sandstone groundwaters in the project area. This number of groundwater samples is considered insufficient to characterise baseline conditions and on which to base an impact assessment for a GHG CCS project. Furthermore, the spatial and temporal extent of the project dataset (three sample points taken on the same day in 16/7/2021 at one bore) is insufficient on which to base an impact assessment for a GHG CCS project. The closest datapoint in excess of 20 km away from the injection site.		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	4g	General	General		Brackish water is typically regarded ³ as water with TDS between 1500 mg/L and 5000 mg/L. The information provided in the draft EIS strongly indicates that the local and regional groundwaters of the Precipice Sandstone are indeed brackish and not saline as the draft EIS would suggest.		Amended EIS	See Chapter 9 Groundwater, section 9.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
53	4h	General	General		Further to the comment above, Appendix 9 (Section 4.5.5) of the draft EIS goes on to describe the Precipice Sandstone aquifer has yielding brackish groundwater which conflicts with the premise or assumption outlined in the executive summary (Section 9.5.2) of the draft EIS. If the Precipice Sandstone aquifer is not saline, surely this should impact the high level decision to investigate EPQ10 and locate the injection trial in its current location.		Amended EIS	See Chapter 1 Executive Summary, section 9.5.1; and Chapter 9 Groundwater, section 9.7
53	4i	General	General		In regards to fluoride concentrations, page 89 of Hoffman et al. (2020) states <i>F concentrations are high in some of the groundwaters with values for the whole dataset ranging from 0.01 to 9.32 mg/l. Highest F concentrations occur in the Precipice Sandstone (min=0.03, max=9.32, median=0.85 mg/l), the Evergreen Formation (min=0.10, max=6.70, median=0.7 mg/l) and the Hutton Sandstone (min=0.02, max=8.60, median=1.3 mg/l). The F levels (range from 0.01 to 9.3 mg/l) in some groundwater bores exceed the World Health Organisation (WHO) drinking water limits of 1.5 mg/l and exceed the levels that can cause severe health hazards of 3 mg/l. Concentrations increase with depth and distance in these units and the highest concentrations occur in the central northern and central southern Surat Basin around the Burunga-Leichardt Fault, the Moonie-Goondiwindi Fault and the EPQ10</i>		Noted	N/A
53	4j	General	General		High fluoride is well known in the GAB and there are certain regions such as the Flinders that are well known to have high fluoride values. The high fluoride in these regions does not restrict the use of the GAB groundwaters for stock watering purposes.		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	5a	General	General		3.3. Environmental values Page 50 of the executive summary states <i>the existing water quality of the Precipice Sandstone aquifer is characterised as having low water quality that is saline, high in iron (long-term), high in fluoride, and high in total dissolved solids, and is unsuitable for aquatic ecosystems, and unsuitable for irrigation water, stock water, and drinking water</i>		Amended EIS	See Chapter 1 Executive Summary, section 9.5.1; and Chapter 9 Groundwater, section 9.7
53	5b	General	General		As discussed above, page 35 of Hoffman et al. (2020) describes the groundwater quality of the Precipice Sandstone as follows <i>a broad analysis of the existing data for the Precipice Sandstone classifies the water to be Na-HCO₃ to Na-Cl type with TDS in the range of 210 to 5700 mg/L with a median of 2120 mg/L and a mean of 2344 mg/L</i>		Amended EIS	See Chapter 1 Executive Summary, section 9.5.1; and Chapter 9 Groundwater, section 9.7
53	5c	General	General		There is consistent misinterpretation presented in the draft EIS that the Precipice Sandstone is saline. This assessment is incorrect and the Precipice Sandstone yields brackish, usable water on a local and regional basis.		Amended EIS	See Chapter 1 Executive Summary, section 9.5.1; and Chapter 9 Groundwater, section 9.7
53	5d	General	General		Chapter 9 of the draft EIS (Page 42) states <i>under the EPP, groundwater within the Precipice Sandstone aquifer in the Project Area is characterised as belonging to the Basal Great Artesian Basin Zone, in the Eastern Central Area, with the applicable EVs presented in Table 9-21. A comparison of the groundwater quality sampled from the Precipice Sandstone aquifer via West Moonie-1 Injection Well, with the WQOs for the listed EVs is discussed below. Generally, the water quality at West Moonie-1 Injection Well indicates that the aquifer is naturally not consistent with the WQOs for the identified EVs. Additionally, the depth to the aquifer would be a limiting factor for most users. Shallower aquifers with better water quality would be used instead as a source of water.</i>		Noted	N/A
53	5e	General	General		It is not clear what the term “the aquifer is naturally not consistent with the WQOs for the identified EVs” means. This statement is illogical. We would also argue that the depth of the aquifer or bore is irrelevant when considering all but aquatic ecosystems. If suitable water quality is available at a certain depth, the issue of drilling depth and bore construction costs becomes an economic consideration rather than relevant to the assessment of environmental values		Amended EIS	See Chapter 1 Executive Summary, section 9.5.1; and Chapter 9 Groundwater, section 9.7
53	5f	General	General		Chapter 9 of the draft EIS (page 52) summarises the Precipice Sandstone as <i>a regional sandstone aquifer, representing the deepest and oldest unit of the Surat Basin. Regional groundwater levels suggest a flow divide just south of the Great Dividing Range. This separates the aquifer into a shallow northern flow system with many EVs and a more saline southern zone located at depth with limited to no EVs</i>		Noted	N/A
53	5g	General	General		Once again there is misinterpretation presented in the draft EIS that the Precipice Sandstone is saline, and this has influenced the assessment of EVs. The Precipice Sandstone yields fresh to brackish water and is suitable for livestock watering purposes over much of the GAB. Irrigation and farm use/supply EVs are both relevant to the Precipice Sandstone and it can be argued that Precipice Sandstone groundwaters are used extensively for farm use / supply in the GAB. Furthermore groundwaters of the Precipice Sandstone may be blended with surface waters where available to provide further flexibility in its environmental value.		Amended EIS	See Chapter 1 Executive Summary, section 9.5.1; and Chapter 9 Groundwater, section 9.7
53	5h	General	General		Chapter 9 of the draft EIS (page 43) states <i>this EV aims to ensure that water provided to livestock is of sufficient quality to prevent any deterioration in the health or condition of watered livestock. The natural occurring fluoride concentrations from the samples may be hazardous to livestock health (particularly young livestock). This is likely to render the in situ groundwater from the Precipice Sandstone aquifer in the location of West Moonie-1 Injection Well unsuitable for livestock consumption (Table 9.24)</i>		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	5i	General	General		<i>The groundwater is unsuitable for livestock consumption and would present a risk to stock based on the fluoride concentration. In addition, as discussed in section 9.3.6.1.2, the water is likely to be corrosive and foul equipment used to pump water to troughs for drinking. Overall, on this basis, the water is unlikely to be suitable for the purposes of stock water.</i>		Noted	N/A
53	5j	General	General		As stated above, other areas and aquifers of the GAB have high fluoride concentrations and are successfully used for livestock watering purposes.		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	6a	General	General		3.4. Groundwater users Chapter 9 of the draft EIS (page 46) states <i>there are no registered bores associated with the three licences allocated to the Precipice Sandstone, indicating that the Precipice Sandstone licences are currently not being utilised</i>		Noted	N/A
53	6b	General	General		Chapter 20 of the draft EIS (page 7) states <i>a search of the Queensland database for water entitlements (DMRDW 2022) was undertaken to identify sub-surface water licences within 50 km of the West Moonie-1 Injection Well. This search identified three water licences for the Precipice Sandstone as shown in Figure 20-3. These licences have a combined allocation of 515 ML/y. No registered bores are associated with these water licences, indicating that no bores have been drilled, and that the Precipice Sandstone water licences are currently not utilised. For two of the properties, water licences and registered bores have been drilled and are operating, both accessing the Gaboronada Sandstone aquifer</i>		Noted	N/A
53	6c	General	General		Further, Chapter 20 of the draft EIS (page 9) states <i>CTSCo will continue to check whether registered bores are drilled within the identified lot on plans under the water licences, and where appropriate, engage directly with the holders of the water licences</i>		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
53	6d	General	General		It is our understanding of the water licence application process that water licences are generally only issued once it can be demonstrated that the aquifer is present, and the supply can be extracted from a constructed bore. This is typically carried out with a pumping test carried out on a suitably constructed bore. We find it difficult to believe that the government would issue a licence without a development application and proven ability to take the groundwater.		Noted	N/A
53	6e	General	General		The proponent should be engaging now with the holders of these water licences and the government to confirm the presence of groundwater bores. Regardless, the holders of these water licences are entitled to take water from the Precipice Sandstone and the proponent should assess impacts against these properties.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A and 3C; and Chapter 9 Groundwater, section 9.9
53	7a	General	General		3.5. Monitoring and mitigation As part of the monitoring and mitigation measures proposed by the proponent, six monthly groundwater monitoring is proposed for the EA conditions. We are of the opinion that six monthly monitoring is vastly inadequate for establishing a baseline data set and assessing compliance for a project with a three year injection schedule.		Amended EIS	See Chapter 2 Project Description, section 2.11.7; and Chapter 9 Groundwater, section 9.10
53	7b	General	General		The Queensland guidelines ⁴ should be followed for assessing trigger levels and contaminant limits and they define a statistically relevant dataset for baseline characterisation. Six monthly groundwater monitoring will not allow compliance against the guidelines.		Amended EIS	See Chapter 2 Project Description, section 2.11.7
53	7c	General	General		Table 9-30 provides a 5000 µS/cm trigger value for electrical conductivity (EC). The application of this trigger will allow for a 270% increase (deterioration) in EC before an investigation is triggered. This method of defining trigger levels is based on an inadequate baseline dataset, is flawed and does not allow for the protection of groundwater quality and EVs in a regionally significant aquifer of the GAB.		Amended EIS	See Chapter 2 Project Description, section 2.11.7; and Chapter 9 Groundwater, sections 9.9 and 9.10
53	7d	General	General		We are also concerned about the lack of proposed groundwater monitoring in the Hutton Sandstone. The Hutton Sandstone is present between the Gubberamunda Sandstone and the Precipice Sandstone and would be considered at higher risk of impact than the Gubberamunda Sandstone. The monitoring strategy for the project should include monitoring within the Hutton Sandstone.		Amended EIS	See Chapter 2 Project Description, sections 2.8.1, 2.11.5 and 2.11.7; and Chapter 9 Groundwater, sections 9.9 and 9.10
53	7e	General	General		The groundwater impact assessment is currently based on the approach that one monitoring bore in the Precipice Sandstone (180 m from the injection well) will be sufficient to confirm predictions and the success of the injection trial. We would strongly recommend that the monitoring network within the Precipice Sandstone be improved substantially to better understand the baseline conditions and the spatial and temporal changes within the Precipice Sandstone. The current assessment assumes radial flow and homogenous conditions within the project area. There is sufficient uncertainty in the impact assessment to warrant additional monitoring bores in the Precipice Sandstone. Monthly monitoring from a ring of six monitoring bores at 500 m from the injection well would confirm baseline conditions and would allow for spatial variation to be assessed. These bores could then be used to verify the modelled extent of the CCS plume.		Amended EIS	See Chapter 2 Project Description, sections 2.8.1, 2.11.5 and 2.11.7; and Chapter 9 Groundwater, sections 9.9 and 9.10
53	8a	General	General		4. Closure We are of the opinion the CCS is a valuable technology and appropriate for tackling the current issues of climate change. However, we are opposed to the location of the CCS trial within the GAB and the targeting of a major aquifer with regional significance and value. The inference of the Precipice Sandstone as saline with no environmental value is incorrect and the conclusions of the draft EIS have been influenced by this presumption.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
53	8b	General	General		The primary purpose of the project is to demonstrate the viability of geological storage of CO ₂ in the Surat Basin to allow the later assessment of the region for potential future large-scale CO ₂ storage. Similarities are drawn between this project and the underground coal gasification (UCG) projects which were approved by the Queensland government in the 2000s. The Linc Energy UCG trial was located nearby Lagoon Gully power station in the Surat Basin, the Cougar Energy UCG trial was located near the Tarong power station in the Tarong Basin and the Carbon Energy UCG trial ⁵ was located near Bloodwood Creek (Dalby) near the Braemar power station. These trials were approved at the time by the Queensland government as emerging technologies and strategically located to benefit from what was considered to be suitable geological conditions and existing infrastructure.		Noted	N/A
53	8c	General	General		However, history informs us that these projects were poorly informed on the technology and the suitability of the local environment and geological conditions. The UCG trials were approved yet are widely considered unsuccessful and have or are likely to have resulted in local contamination of groundwater resources ⁶⁷ . The UCG sites remain in the hands of the Queensland government as legacy sites that will cost significant resources and cost to rehabilitate (if at all possible).		Noted	N/A
53	8d	General	General		The draft EIS states quite clearly that the decision to investigate EPQ10 and locate the West Moonie-1 Injection Well in its current location was based on the assumption that the Precipice Sandstone aquifer is saline. It can be demonstrated that this inference and assumption is incorrect.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.15
53	8e	General	General		Further the draft EIS incorrectly assesses the environmental values of the Precipice Sandstone. The Precipice Sandstone is suitable for livestock watering and farm use purposes and this needs to be recognised by the Queensland government prior to approval of this project.		Amended EIS	See Chapter 9 Groundwater, section 9.7
53	8f	General	General		There is sufficient uncertainty identified within the various studies to recommend that additional work is carried out prior to approval. This uncertainty relates to the understanding of baseline conditions within the Precipice Sandstone and the overlying stratigraphy. There is also uncertainty relating to the groundwater users of the Precipice Sandstone, and the spatial variation on a project site scale. Additional monitoring and data is required to inform the EIS process.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
53	8g	General	General		We thank you for the opportunity to provide this technical review of the draft EIS.		Noted	N/A
54	1	General	General		Please accept the attached submission and accompanying report to the draft EIS for the SBCCS Project.		Noted	N/A
54	1	General	General		The Queensland Conservation Council (QCC) welcomes the opportunity to provide the following comments and recommendations to the draft Environmental Impact Statement (EIS) for the Surat Basin Carbon Capture and Storage (SBCCS) Project as proposed by the Carbon Transport and Storage Corporation (CTSCo) Pty Ltd.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	2	General	General		In summary, this submission addresses: 1. The failure of the proponent to address the Terms of Reference for the EIS, 2. Other matters that need to be addressed and considered, 3. Inadequacies with the current regulatory framework for projects involving carbon capture and storage in Queensland, 4. Questions that should be asked by decision-makers when CCS assessing projects, 5. Issues with CCS, both generally and in relation to the SBCCS Project and, 6. Our recommendation that the EIS should not be accepted and the SBCCS Project should be rejected		Noted	N/A
54	3	General	General		1. Failure to address the TOR for the EIS Examples of the proponent's failure to address the TOR for the EIS includes, but is not limited to:		Noted	N/A
54	4a	General	General		1.1 Assessment of cumulative impact Under section 8.3 of the TOR, the proponent is required to assess the cumulative impacts to environmental values and public health from the proposed project, in combination with adverse impacts potentially caused by other development activities and infrastructure proposals that are adjacent, upstream and downstream of the proponent's proposal in consideration of the combined scale, intensity, duration and frequency of the impacts.		Noted	N/A
54	4b	General	General		In doing this, the TOR stipulates the proponent must make every effort to find information from all sources relevant to the assessment of cumulative impacts including from other major projects or development.		Noted	N/A
54	4c	General	General		Despite this requirement, the proponent has not assessed the potential cumulative impacts from their project in combination with other potential carbon storage projects in the Surat Basin, which has been identified by the 2009 National Carbon Storage Taskforce report and the Queensland Government CO2 Storage Atlas as a key geo-storage area with the potential to permanently store approximately three billion tonnes of CO2, including 1.3 billion tonnes in the Precipice Sandstone aquifer.		Amended EIS	See Chapter 9 Groundwater, section 9.9.8
54	4d	General	General		Given the primary purpose of the proponent's project is to gather data to inform the development of other underground CO2 storage projects, the proponents failure to assess the cumulative impacts to environmental values and public health potentially caused by their project in combination other potential underground CO2 sequestration projects in the Surat Basin is a gross failure to comply with section 8.3 of the TOR for the EIS.		Amended EIS	See Chapter 9 Groundwater, section 9.9.8
54	4e	General	General			Recommendation: Require the proponent to assess potential cumulative impacts to environmental values, public health and existing and future groundwater users from their proposed project in combination with adverse impacts potentially caused by other underground CO2 storage projects in the Surat Basin.	Amended EIS	See Chapter 9 Groundwater, section 9.9
54	5a	General	General		1.2 Remediation options Under section 9.3.1 of the TOR, the proponent is required to develop a rehabilitation strategy which must include suitable options for remediation and or reinstatement of the groundwater resource and geological formations should the project fail and or achieve project outcomes		Amended EIS	See Chapter 2 Project Description, section 2.11.7 including table 2-10
54	5b	General	General		Despite this requirement, the proponent has not provided any information in the draft EIS about suitable options for remediating impacts that occur to groundwater resources and geological formations if the project fails due to technical economic environmental or any other issues		Amended EIS	See Chapter 2 Project Description, section 2.11.7 including table 2-10
54	5c	General	General			Recommendation: Require the proponent to provide information about options for remediating impacts to groundwater resources if the project fails due to technical, economic, environmental or any other issues.	Amended EIS	See Chapter 2 Project Description, section 2.11.7 including table 2-10
54	6a	General	General		1.3 Water quality Under section 9.4.1 of the TOR, the proponent must operate the proposed project in a way that protects the environmental values of groundwater and any associated surface ecological systems.		Noted	N/A
54	6b	General	General		Based on information provided in the draft EIS, the proponent's proposed project will permanently degrade the quality of groundwater in the Precipice Sandstone, which does not comply with the purpose of the <i>Environmental Protection (Water and Wetland Biodiversity) Policy 2019</i> to protect the quality of Queensland's surface and underground water resources		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.11
54	6c	General	General			Recommendation: As it does not comply with the <i>Environmental Protection (Water and Wetland Biodiversity) Policy 2019</i> , the proposed project should not be approved under the <i>Environmental Protection Act 1994</i> .	Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.11
54	7a	General	General		1.4 Future use of groundwater Under section 9.4.2 of the TOR, the proponent must describe present and potential users and uses of water in areas potentially affected by the proposed project, including municipal, agricultural, industrial, recreational and environmental uses of water. Despite the requirement, the proponent has not provided sufficient information about the potential use of water from the Precipice Sandstone for future municipal, agricultural, industrial, environmental or other purposes		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
54	7b	General	General			Recommendation: Require the proponent to provide information about the potential use of water from the Precipice Sandstone for future municipal, agricultural, industrial, environmental or other purposes	Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
54	8a	General	General		2. Other matters that need to be addressed and considered Other matters that need to be addressed and considered when assessing the proponents proposed project includes:		Noted	N/A
54	8b	General	General		2.1 Monitoring As the potential impacts to groundwater resources are likely to occur over an extended period of time, the proponent's proposal to monitor the project for a total of 3 years after ceasing to inject CO2 into the Precipice Sandstone is manifestly inadequate		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	8c	General	General		Given that it is permanent and that adverse impacts may not occur for some time into the future, it's essential that the proponent is required to monitor the effect of the CO2 plume on the economic, environmental and social values of the region for at least 100 years.		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11
54	8d	General	General			Recommendation: Require the proponent to monitor (and manage) the project site for at least 100 years.	Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11
54	9a	General	General		2.2 Additional commitments Along with the commitments contained in the draft EIS the proponent must also commit to:		Noted	N/A
54	9b	General	General		- Fully remediating groundwater resources if the project fails due to technical, economic, environmental or any other issues at any point in the future and,		Amended EIS	See Chapter 2 Project Description, section 2.11.7 including table 2-10
54	9c	General	General		- Monitoring and managing the project site for at least 100 years,		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11
54	9d	General	General			Recommendation: Require the proponent to implement the above additional commitments if their project is approved	Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11
54	10a	General	General		2.3 Chapter 3 of the Water Act As the proponent's project is classified as a resource activity under section 107 (b) of the Environmental Protection Act 1994 and is located within the Surat Cumulative Management Area, the proponent should be required to comply with Chapter 3 of the Water Act 2000 to ensure that impacts to groundwater from their proposed project are managed in accordance with the framework that impacts to groundwater from other resource activities in the Surat Basin are managed.		Amended EIS	See Chapter 4 Approvals, section 4.4 23
54	10b	General	General			Recommendation: Require the proponent to comply with Chapter 3 of the Water Act 2000 if their project is approved.	Amended EIS	See Chapter 4 Approvals, section 4.4 23
54	11a	General	General		2.4 Section 41 of Environmental Protection Regulation 2019 Given that it will continue to degrade the quality of groundwater in the Precipice Sandstone into the future, the CO2 plume the proponent is seeking approval to inject into the Precipice Sandstone should be classified as a waste under the <i>Environmental Protection Act 1994</i> .		Amended EIS	See Chapter 4 Approvals, section 4.4.6; and Chapter 9 Groundwater, section 9.11
54	11b	General	General		As a classified waste that will continue to degrade the environmental values of the receiving aquifer into the future, the proponent's application for an Environmental Authority should be refused under section 41 (2)(c) of the <i>Environmental Protection Regulation 2019</i> .		Amended EIS	See Chapter 4 Approvals, section 4.4.6; and Chapter 9 Groundwater, section 9.11
54	11c	General	General			Recommendation: Refuse the proponents Environmental Authority application under section 41 (2)(c) of the <i>Environmental Protection Regulation 2019</i>	Amended EIS	See Chapter 4 Approvals, section 4.4.6; and Chapter 9 Groundwater, section 9.11
54	12	General	General		3. Inadequacies with existing regulatory framework We would like to use this submission as an opportunity to highlight the inadequacies with the current regulation of CCS in Queensland. In particular, we refer to and rely on the attached report prepared by the Environmental Defenders Office Ltd, which is included in this submission as Attachment A: 'Improving Regulation of Carbon Capture and Storage in Queensland'		Noted	N/A
54	13a	General	General		4. Questions that decision makers must ask when assessing CCS projects There are a number of critical questions that must be asked when assessing CCS projects to ensure that environmental, economic and social impacts are fully considered. We recommend that when assessing the SBCCS Project, the questions listed below should be asked by the decision-maker. Our response to these questions in context of the SBCCS Project are included below.		Noted	N/A
54	13b	General	General		Will the Project contribute meaningfully to emissions reductions? Has the project been designed with indefinite CO2 sequestration as the one and only goal?	Our response: This project is a demonstration of CO ₂ sequestration in the Precipice Sandstone Aquifer. There is a disconnect, as the project requires millions of dollars to set up plants for trapping and transporting the CO ₂ , yet the project duration is only a couple of years. Therefore, the project does not make sense economically or in terms of energy use for construction. There is insufficient information to evaluate whether the CO ₂ captured by this project will exceed the amount produced by construction of infrastructure and transportation of CO ₂ to injection. Given the relatively low volumes of CO ₂ injected, it is unlikely that the project lifecycle would be, overall, emissions negative. More information is required to understand the long-term plans for these facilities. If the plan would be to continue trucking the CO ₂ beyond the lifetime of this project, the project requires additional impact statements to review the social impacts and risk of road injury on communities along the transportation route. Moreover, trucking CO ₂ is among the most energy consumptive modes of transporting CO ₂ .	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4;
54	13c	General	General		Is the CCS activity relevant at climate-change scale?	Our response: No, the SBCCS Project will inject a relatively small amount of CO ₂ , and not impact state or national goals at a meaningful level. The technologies demonstrated by this project are already well established; the difficulties with CCS exist when upscaling to a meaningful volume (E.G: Martin-Roberts et al., 2021), and this project will not address those difficulties.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4;
54	13d	General	General		Q3. Are other toxic/noxious by-product gases (E.G: H₂S, NO_x) released to the atmosphere during the carbon capture stage? Does the application include rigorous examination of such fugitive GHG emissions at all steps, including the carbon-capture stage compression and transport stages, and the injection stage?	Our response: No information about fugitive gases is provided in the draft EIS. There is one acknowledgement of fugitive gases during transportation in Chapter 2 of the draft EIS, which states: "Couplings for connections between an iso tank container and a tank will be designed to minimise fugitive emissions of the GHG stream". However, no further details are given as to how "minimise" is achieved, monitored, or quantified.	Amended EIS	See Chapter 2 Project Description, section 2.11; Chapter 5 Climate, sections 5.5.1 and 5.5.6; and Chapter 15 Hazards and Safety, section 15.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	13e	General	General		Is this CCS project for an industry that is especially hard to decarbonize (e.g., the cement and iron and steel industries)?	Our response: No. The SBCCS Project is a post-combustion retrofit of an existing coal-fired power plant. The CO ₂ will be of relatively low concentration in the source, and therefore the process of trapping and concentrating the CO ₂ is inefficient. Moreover, the MEA system of carbon capture, which is typical of post-combustion capture at coal-fired power plants, and which will be used in this demonstration project, reduces the efficiency of the power plant. As described by Gingerich and Mauter, "MEA solvent regeneration imposes a significant energy penalty on CFPPs".	Not relevant to the EIS	See Chapter 2 Project Description, sections 2.3.4 and 2.4
54	13f	General	General		Is CCS economically viable regarding operational costs of installing CCS at a power plant or for resource generation, whether the future revenue stream is sufficient to cover all of the investment in the upfront drilling and infrastructure, the costs associated with the injection phase operations and the continuance of monitoring during the post-injection phase, whether the CCS is economically viable without subsidies and is there sufficient supply of CO ₂ over many years?	Our response: As the Millmerran Power Plant is already operating, the supply of CO ₂ is sufficient for the amount needed for demonstration. No details are given as to the economic viability of this project; the outlays for construction of facilities are substantial. The Project has been granted \$210 million by the Australian Government to capture carbon dioxide from the Millmerran power station and store it underground in the Surat Basin in Queensland. Therefore, this project is not economically feasible without subsidies. Moreover, Millmerran Power Plant is hoping to extend its operating life to 2056 (E.G. beyond the 2050 zero emissions goal), and the carbon capture will no doubt be used as an excuse to continue local coal mining and coal burning at the expense of the transition to carbon neutral technologies. Thus, it is not in the long-term interest of Australia.	Not relevant to the EIS	See Chapter 2 Project Description, sections 2.3.4 and 2.4
54	13g	General	General		Is the proposed site suitable for long term storage of CO ₂ , including:	<i>(Please note that we are unable to provide our response to some of the suggested questions in this section due to the lack of information and that the SBCCS Project is regarded as demonstration project.)</i>	Noted	N/A
54	13h	General	General		What means is used to convey the CO ₂ to the injection site, including if it is a former natural-gas pipeline, have the risks of leaks or rupture been critically evaluated regarding length, age and state of pipeline, number of compression stages, incidental damage (including seismic events—esp. subsea pipelines) and human error, and is the CO ₂ to be thoroughly dried if it's to be transported by pipe to mitigate corrosion?	Our response: The CO ₂ will be transported via the surface road system; trucked 2 hours from the capture site to the injection site, adding road traffic and burning additional fossil fuels. There is no economic analysis to show under what conditions it would be economically feasible to use CCS as an effective offset for this power station for the long-term. It is obvious that this demonstration study is intended to "prove" that the aquifer is suitable for storage; however, the monitoring will not continue for a sufficient period. Corrosion is addressed in the draft EIS, and there are no long pipelines of concern in this project. However, Millmerran Power Station is located 260 km from the injection site across two townships; therefore, transportation of CO ₂ to the injection site over the long-term (beyond the 3-year lifespan of the project) would be a challenge and a large expense requiring further	Not relevant to the EIS	See Chapter 2 Project Description, section 2.3.4
54	13i	General	General		If geo-sequestration is to be used as the storage means, have the geological strata or feature/s been validly proven for long-term retention (centuries to millennia)?	Our response: The geological and hydrological studies for this project have been done in consultation with the University of Queensland, which is one of the strongest points of the application.	Noted	N/A
54	13j	General	General		Has rigorous risk assessment been made of the likelihood of contamination of adjoining aquifers during injection or subsequent storage, including indirect mobilisation of toxicants?	Our response: There is only one injection bore, which carries the CO ₂ to a depth of 2.5 km. This is well below the aquifers typically used for domestic and agricultural purposes. Information on how the borehole will be monitored to make sure there is no contamination are not within the	Amended EIS	See Chapter 2 Project Description, sections 2.8.1 and 2.11.5; and Chapter 9 Groundwater. Section 9.10
54	13k	General	General		Has evaluation of induced seismicity and the potential of pressurisation and or depressurisation to cause caprock fracture been made as a result of CO ₂ injection?	Our response: No, as this will be done as part of the project after shut-in of the West Moonie-1 Injection Well	Amended EIS	See Chapter 8 Geology, section 8.9.2
54	13l	General	General		Has an assessment of the possibility of geohazards (E.G. earthquakes) been made as to the integrity of CO ₂ storage in the long term?	Our response: N/A	Noted	N/A
54	13m	General	General		If a depleted hydrocarbon reservoir is to be used for CO ₂ sequestration, how is well integrity to be guaranteed and monitored in the long term?	Our response: N/A	Noted	N/A
54	13n	General	General		Is the monitoring sufficient to ensure containment of CO ₂ , including: - Will the transport stage/s be actively monitored for leaks or inadvertent releases of CO ₂ ?	Our response: There is no mention in the draft EIS about monitoring for leaks during the transport stage of the project.	Adequately dealt within the EIS, no change to the EIS	See Chapter 15 Hazards and Safety, section 15.6 and 15.7
54	13o	General	General		Will the site be monitored for at least 100 years?	Our response: According to table 2-5 in section 2.7 of the draft EIS, monitoring of the proponent is proposing to only monitor the site until 2030 which is clearly insufficient.	Amended EIS	See Chapter 2 Project Description, sections 2.11.7 and 2.11.11
54	13p	General	General		Who is financially responsible for monitoring if the company is no longer solvent?	Our response: From the draft EIS, it is unclear who would be responsible for dealing with leaks after 2030 when the "rehabilitation" stage of the project has concluded.	Noted	See Chapter 2 Project Description, sections 2.12; and Chapter 19 Rehabilitation.
54	13q	General	General		What are the consequences for long-term land use?	Our response: The proposed injection of CO ₂ into the Sandstone Precipice will essentially preclude the use of water from this aquifer for future consumptive purposes forever.	Noted	See Chapter 9 Groundwater, section 9.9
54	13r	General	General		What is the management plan if leaks are discovered?	Our response: On p.51 of the draft EIS under Project Description, it mentions development of a Trigger Action Response Plan for leaks, but the proponent has provided no information about how leaks will be actually managed.	Amended EIS	See Chapter 2 Project Description, section 2.11.7
54	13s	General	General		What are the consequences of a leak?	Our response: Sudden leaks may produce fatalities. Concentrations of CO ₂ over 10% even in the presence of oxygen can be fatal (IPCC, 2005: 392). Leaks may also change the geochemistry of the groundwater, which will alter water quality. Information about this issue has not been provided in the draft EIS.	Amended EIS	See Chapter 15 Hazards and Safety, section 15.6 and 15.7; and Chapter 9, section 9.9

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	13t	General	General		<i>Is there public acceptance of the project (social license), including whether the public has been provided with adequate information regarding the proposed project, whether the proponent has provided the public with meaningful opportunities to raise any concerns and whether the public's concerns have been adequately addressed.</i>	Our response: The proponent has not provided sufficient information in the draft EIS regarding how the public and stakeholder concerns about the SBCCS Project have been addressed.	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A, 3B and 3C
54	13u	General	General		<i>Is there adequate planning to evaluate whether this project contributes meaningfully to state/national emissions goals, including whether the entities that validate CCS projects are truly independent, objective and scientifically credible and the remedial actions and consequential penalties for lack of compliance are sufficient to deter breaches of compliance</i>	Our response: No, there has not been adequate evaluation of whether this project will contribute meaningfully to state/national emissions goals.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
54	14	General	General		5.Fundamental issues with CCS Key issues regarding the viability of CCS includes, but is not limited to:		Noted	N/A
54	15a	General	General		5.1 CCS will be used to justify continued fossil fuel emissions There are concerns that CCS will be a greenwashing tool that will be utilised to justify continued emission of fossil fuels, rather than investment in renewable energy technologies. Of particular concern are arguments made by coal and gas companies that CCS will be used to allow the continued operation of fossil fuel power plants long after they would otherwise have been shut down.		Not relevant to the EIS	See Chapter 2 Project Description, section 2.3.4
54	15b	General	General		This is the case for the Surat Basin Carbon Capture and Storage Project. Although it is only a demonstration project that will operate over three years, it is clear that it will encourage continued fossil fuel emissions from the Millmerran Power Station where it's proposed to be captured.		Not relevant to the EIS	See Chapter 2 Project Description, section 2.3.4
54	15c	General	General		An application has been made to extend the operation of the Millmerran Power Station and associated Commodore Coal Mine until 2056, which if approved would allow the production of 4.0 Mtpa of thermal coal solely for the Millmerran Power Station. This would amount to approximately 170 million tonnes of CO2 generated over 32 years.		Not relevant to the EIS	
54	15d	General	General		If this extension is approved, then CCS technology will be needed to ensure compliance with Queensland's and Australia's emissions reduction targets. Intergen, one of the joint owners of the Millmerran Power Station, has even stated that it is 'involved in the early stages of a carbon capture and storage project at Millmerran', clearly		Not relevant to the EIS	
54	15e	General	General		It is therefore clear the SBCCS Project will be used to justify continued fossil fuel emissions from a coal-fired power station until 2056, which "would run entirely counter to the aim of achieving net zero emissions by 2050".		Not relevant to the EIS	See Chapter 2 Project Description, section 2.3.4
54	16a	General	General		5.2 The long-term effectiveness of CCS is uncertain There are concerns about the long-term effectiveness of CCS, particularly given that its being relied on to offset GHG emissions. This is particularly concerning in the context of the SBCCS Project, which only proposes to monitor the injected CO2 plume for 3 years.		Noted	See Chapter 2 Project Description, section 2.3
54	16b	General	General		In order to ascertain whether the CO2 plume will not cause any adverse impacts to economic, social and environment values into the future, the proponent should be required to monitor the CO2 plume in perpetuity.		Noted	N/A
54	17a	General	General		5.3 CCS projects are resource intensive Retrofitting CCS to existing power stations, whether coal or gas-fired, is highly resource intensive, making the use of energy from these power stations more expensive and less efficient. There are also outstanding questions about the efficiency of coal-powered retrofit technology, which suggest that such CCS facilities 'may not be as financially viable as predicted'. This renders arguments that CCS technology can justify continued investment in these energy sources entirely counter-intuitive and unsustainable.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
54	17b	General	General		For example, a 2020 desktop study by the Victoria Energy Policy Centre and Victoria University concluded that CCS applied to coal generation can be expected to cost at least six times as much as comparably firm renewable generation. The gap between gas generation and CCS and comparably firm renewable generation is even bigger.		Not relevant to the EIS	
54	17c	General	General		The Surat Basin Carbon Capture and Storage Project involves the retrofitting of carbon capture facilities to the existing Millmerran Power Station, meaning it will be more costly and complex than other applications due to the diluted CO2 in the flue gas stream.		Not relevant to the EIS	
54	17d	General	General		Further, the CO2 captured from the Millmerran Power Station will need to be transported 260km as a cryogenic liquid in B-double trucks. This is estimated to require 9 B-double trucks making 9 return trips per day, up to 6 days a week. Not only is it highly inefficient to transport CO2 in this manner, but it is also significantly more costly and risky, and will involve the emission of significant amounts of CO2 which do not appear to be quantified in the EIS.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1
54	17e	General	General		The GHG stream will then need to be converted into a supercritical fluid for injection and piped along a 9.5km flowline to the injection site, creating further costs and greater risk of fugitive emissions from CO2 leakage, which are also not quantified in the EIS.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1
54	17f	General	General		It is clear that the Surat Basin Carbon Capture and Storage Project will be highly resource intensive, even though it is merely a demonstration project, and will create significant inefficiencies both in terms of cost, complexity and emissions.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1; and Chapter 2 Project Description, section 2.3.4
54	18a	General	General		5.4 CCS Projects do not contribute meaningfully to carbon abatement CCS projects generally focus on the volume of CCS captured. However, this value is an incomplete representation of the performance of CCS projects. This is because CCS projects also involve the emission of CO2 into the atmosphere, through activities such as absorbance, dehydration, compressions, transportation and injection. As a result, many CCS projects are much less efficient at carbon abatement than they are promoted to be.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1
54	18b	General	General		For example, the Surat Basin Carbon Capture and Storage Project will only inject 330,000 tonnes of CO2, at a cost of approximately \$210 million (AUD). However, the Scope 1, 2 and 3 emissions of the Project amount to 266,368 tCO2-e, meaning that the Project will only reduce emissions to the atmosphere by 57,032 tCO2-e – significantly less than the 330,000 tonnes of CO2 captured.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1
54	18c	General	General		While the SBCCS Project is only a demonstration project, it nonetheless fails to significantly abate the emissions that it produces, demonstrating instead that CCS will not contribute significantly to the achievement of net-zero or negative emissions that will be necessary to avoid the destructive impacts of climate change.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1; and Chapter 2 Project Description, section 2.3.4
54	19a	General	General		5.5 CCS has not been proven to be viable at scale A major barrier to the viability of CCS, particularly CCS retrofitted to a coal-fired power station, is that there are very few successful examples of CCS implemented at the scale required to meet international emissions reduction targets.		Not relevant to the EIS	See Chapter 2 Project Description, section 2.3

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	19b	General	General		It is estimated that to meet these targets, approximately 5.6 Gtpa of CO ₂ will need to be captured and stored globally by 2050 using CCS technologies. However, as of 2020 only approximately 40 Mtpa of CO ₂ is being captured globally.		Noted	See Chapter 2 Project Description, section 2.3
54	19c	General	General		What is needed to demonstrate the viability of CCS at these scales is not more demonstration projects – even the proponent acknowledges in the draft EIS for the SBCCS Project that ‘the infrastructure, technology and monitoring techniques proposed by CTSCo are established and have proven successful in CO ₂ geological storage projects worldwide and within Australia’. Instead of wasting \$210 million on investigating the viability of CCS, which may encourage and create continued fossil fuel emissions, those funds should be used to install more renewable energy generation and storage infrastructure, such as large batteries.		Not relevant to the EIS	See Chapter 2 Project Description, section 2.3
54	20	General	General			6. Recommendation Given that the proponent has failed to adequately comply with the TOR for the EIS, the other matters mentioned in section 2 and our concerns outlined in sections 4 and 5 of this submission, QCC is strongly opposed to the proponent’s proposal to permanently store CO ₂ in the Precipice Sandstone, and as such we urge you to categorically reject the proponent’s application for an Environmental Authority to undertake their proposed activity.	Noted	N/A
54	21	General	General		7. Conclusion Please do not hesitate to contact me should you require any further information or clarification regarding the matters raised in this submission		Noted	N/A
54	1	General	General		Environmental Defenders Office			
54	2	General	General		Improving Regulation of Carbon Capture and Storage in Queensland			
54	3	General	General		Projects involving carbon capture and storage (CCS) are regulated by a complex range of Acts that have not been drafted to address the unique characteristics of CCS activities. Given the risks posed by CCS in hindering efforts to reduce greenhouse gas emissions, there is a need for the regulatory framework to be amended to ensure that the assessment and decision-making process prevents CCS being approved where it would hinder greenhouse gas emissions reductions efforts.		Noted	N/A
54	4	General	General		Queensland was one of the first jurisdictions in the world to establish a comprehensive legislative framework for CO ₂ storage, through the introduction of the <i>Greenhouse Gas Storage Act 2009</i> (Qld) and later the <i>Greenhouse Gas Storage Regulation 2021</i> (Qld). However, this legislation has not been well-integrated into the wider environmental regulatory framework. This lack of targeted CCS regulation in Queensland has led to significant uncertainty, both for proponents and members of the wider community, and risk with respect to how the unique impacts of these activities on the environment and agriculture will be avoided and managed.		Noted	N/A
54	5a	General	General		This paper addresses the following key issues with the currently regulatory framework for CCS:		Noted	N/A
54	5b	General	General		1. The assessment criteria for CCS must be amended to ensure that CCS proposals do not jeopardise efforts to reduce greenhouse gas emissions;		Noted	N/A
54	5c	General	General		2. There is no requirement to conduct long-term monitoring of GHG stream migration;		Noted	N/A
54	5d	General	General		3. It is unclear whether a water licence is needed for carbon injection and storage;		Amended EIS	See Chapter 4 Approvals, section 4.4 23
54	5e	General	General		4. Enhanced Oil Recovery is not regulated under the <i>Greenhouse Gas Storage Act 2009</i> (Qld) and is considered a minor amendment under the <i>Environmental Protection Act 1994</i> (Qld);		Not relevant to the EIS	
54	5f	General	General		5. Waste regulation is not drafted to suit carbon injection and storage activities.		Noted	N/A
54	6	General	General		Given the reliance being placed on CCS as a technology that will enable humanity to reach key global energy and climate goals, it is essential that it be appropriately regulated.		Noted	N/A
54	7a	General	General		EDO recommends the following changes be made to the existing regulatory framework:		Noted	N/A
54	7b	General	General			- Recommendation 1: Provide assessment criteria which ensure that CCS functions effectively and does not jeopardise efforts to reduce greenhouse gas emissions.	Noted	N/A
54	7c	General	General			- Recommendation 2: Draft environmentally relevant activity (ERA) standards for GHG injection and storage which include mandatory standard conditions requiring the proponent to monitor and report the long-term impacts of these activities	Noted	N/A
54	7d	General	General			- Recommendation 3: Amend the Water Act 2000 (Qld) to clarify whether carbon injection and storage activities will require a water licence, and how the unique impacts of those activities on water will be regulated.	Noted	See Chapter 4 Approvals, section 4.4 23
54	7e	General	General			- Recommendation 4: Amend the EP Act to clarify that EA amendment applications to conduct EOR will be considered a ‘major amendment’ requiring public notification.	Noted	N/A
54	7f	General	General			- Recommendation 5: Amend the EP Act to clarify that a GHG stream is to be considered a waste where the stream will contaminate an aquifer, and review whether current regulation of waste under the EP Act and Regulation is appropriate to manage CCS activities	Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	8a	General	General		<u>Current regulatory framework</u>			
54	8b	General	General		Projects that involve the capture, injection and storage of carbon in aquifers in Queensland will generally require the following permits, licences and authorities: - A GHG exploration permit under the <i>Greenhouse Gas Storage Act 2009</i> (Qld); ¹ - A GHG injection and storage lease under the <i>Greenhouse Gas Storage Act 2009</i> (Qld); ² - An Environmental Authority that authorises GHG injection and storage under the <i>Environmental Protection Act 1994</i> (Qld) (EP Act); A water licence under the <i>Water Act 2000</i> (Qld)		Noted	N/A
54	8c	General	General		The criteria for assessing and deciding whether to grant the above permits, licences and authorities for CCS activities are listed in Appendix A .		Noted	N/A
54	9	General	General		<u>Critique of regulatory framework</u> There is currently significant uncertainty regarding the application of this legislation to CCS activities, including how different types of CCS activities will be regulated. In addition, there is a need for more specificity in the assessment and decision-making requirements to ensure that CCS is properly assessed, and is not allowed to go ahead where it would jeopardise emissions reductions efforts. These issues with the regulatory framework for CCS are set out in further detail below.		Noted	N/A
54	10a	General	General		1) <i>Assessment criteria must be provided to ensure CCS does not jeopardise emissions reductions efforts</i>		Noted	N/A
54	10b	General	General		CCS technology is new and potentially high risk, requiring unique analysis and specialist skills in assessment to ensure that CCS projects are properly assessed and cannot be approved where they may jeopardise emissions reductions efforts – particularly where the main purpose of these projects is the reduction of carbon emissions.		Noted	N/A
54	10c	General	General		The EDO have put together a number of questions which should be considered as part of the assessment and decision-making criteria for CCS. These questions could form the basis of new relevant regulatory requirements for CCS assessment in the <i>Environmental Protection Regulation 2019</i> (Qld). We have provided these questions in Appendix B .		Noted	N/A
54	10d	General	General			Recommendation 1: Provide assessment criteria which ensure that CCS functions effectively and does not jeopardise efforts to reduce greenhouse gas emissions.	Noted	N/A
54	11a	General	General		2) <i>There is no requirement to conduct long-term monitoring of GHG stream migration</i>		Noted	N/A
54	11b	General	General		The holder of a GHG injection and storage lease is only responsible for the monitoring of the GHG stream during the term of the lease. Once the GHG lease is surrendered, the GHG stream becomes the property of the State. ³ This means that the proponent responsible for GHG injection and storage is not required to monitor the long-term effects of such activities beyond the monitoring requirements throughout the term of the lease. ⁴		Noted	N/A
54	11c	General	General		While an EA may include conditions for monitoring before, during and post injection, there are no eligibility criteria or standard conditions associated with GHG storage. ⁵ As a result, there is no guidance for Departmental officers assessing an EA application, meaning they may be guided by the conditions proposed by the proponent, which will likely not suggest rigorous long-term monitoring obligations. ⁶		Noted	N/A
54	11d	General	General		This is particularly concerning given that CCS technology is being relied upon to offset fossil fuel emissions from polluting industries. For example, the proposed Galilee Power Station Project is reliant on CCS to support its claim to be 'a net-zero power producer operating at base load'. ⁷ If the injected GHG stream migrates in the long-term and is released into the atmosphere, then those offsets will be rendered ineffectual. Long-term monitoring is therefore essential to properly regulating CCS, and should be the responsibility of the GHG lease holder and not the State.		Noted	N/A
54	11e	General	General			Recommendation 2: Draft ERA standards for GHG injection and storage which include conditions requiring the proponent to monitor the long-term effects of these activities.	Noted	N/A
54	12a	General	General		3) <i>It is unclear whether a water licence is needed for carbon injection and storage</i>		Noted	See Chapter 4 Approvals, section 4.4 23
54	12b	General	General		The holder of a GHG permit or a GHG lease must also apply for a water licence under the <i>Water Act 2000</i> (Qld) if the relevant activities would involve the taking or interference with water. ⁸ However, the Water Act does not provide any guidance as to whether injection of a GHG stream into an aquifer is considered 'interference' with water.		Noted	See Chapter 4 Approvals, section 4.4 23
54	12c	General	General		Bowkill J found recently in respect of the impacts of coal mining that the word interference 'bears its ordinary meaning, which in this context is a broad one meaning to obstruct, hinder, get in the way of or prevent the flow of water'. ⁹ It is arguable that GHG injection and storage would involve an interference or obstruction, as it would cause the movement of underground water, but this has not been established at law. It is therefore unclear whether a water licence will be required for CCS activities.		Noted	See Chapter 4 Approvals, section 4.4 23
54	12d	General	General		It is clear that the <i>Water Act 2000</i> (Qld) was drafted with extractive activities in mind, and not GHG injection activities, leading to significant uncertainty about how the impacts of carbon injection and storage on water will be regulated. ¹⁰		Noted	See Chapter 4 Approvals, section 4.4 23
54	12e	General	General			Recommendation 3: Amend the <i>Water Act 2000</i> (Qld) to clarify whether carbon injection and storage activities will require a water licence, and how the unique impacts of those activities on water will be regulated.	Noted	See Chapter 4 Approvals, section 4.4 23
54	13a	General	General		4) <i>Enhanced Oil Recovery is not adequately regulated</i>		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	13b	General	General		Another form of CCS is Enhanced Oil Recovery (EOR), which involves injection of a GHG stream for the purpose of extending oil recovery while also sequestering the injected CO ₂ . Existing environmental legislation in Queensland does not adequately regulate this activity, leading to uncertainty regarding the approvals process and the risk that impacts of the activity will not be appropriately managed.		Noted	N/A
54	13c	General	General		Firstly, EOR is not considered GHG stream storage under the GHG Storage Act, meaning a GHG exploration permit and GHG lease are not required for EOR activities. ¹¹ The reason for this is unclear, as EOR also involves both the injection and storage of CO ₂ , albeit for the purpose of extracting further hydrocarbons.		Noted	N/A
54	13d	General	General		Further, if an EA amendment application is made to allow EOR activities as part of an approved petroleum activity, it appears to be considered only a 'minor' amendment, which would not attract extensive public consultation processes under the EP Act. ¹² This is highly concerning given that EOR still involves carbon injection and storage, a new and risky activity needing proper assessment, and arguably it should attract the same level of public consultation as any other CCS activity.		Noted	N/A
54	13e	General	General		Environmental legislation in Queensland has clearly not been drafted to specifically regulate EOR, leading to significant uncertainty about how such activities will be regulated and the impacts and risks managed.		Noted	N/A
54	13f	General	General			Recommendation 4: Amend the EP Act to clarify that EA amendment applications to conduct EOR will be considered a 'major amendment' requiring public notification.	Noted	N/A
54	14a	General	General		5) Waste regulation is not drafted to suit carbon injection and storage activities		Noted	N/A
54	14b	General	General		Environmental legislation in Queensland that regulates waste has not been drafted to suit carbon injection and storage activities, creating uncertainties about how it will be regulated under these provisions.		Noted	N/A
54	14c	General	General		A GHG stream, which is a stream of carbon dioxide captured for injection and storage or utilisation, appears to come within the definition of waste under the <i>Environmental Protection Act 1994</i> (Qld) (EP Regulation), being 'a left over, or an unwanted by-product, from an industrial, commercial, domestic or other activity'. ¹³ This means it is regulated under the EP Act and Regulation as a waste, even though the provisions relating to waste were not drafted with CCS in mind.		Noted	N/A
54	14d	General	General		For example, if a captured GHG stream is considered waste, then an EA application involving injection of a GHG stream into an aquifer would be regulated by s 41(2)(c) of the EP Regulation. This provision requires the administering authority assessing an EA application to refuse an application involving the release of waste directly to groundwater if it considers the waste is likely to result in a deterioration in the environmental values of the receiving groundwater. ¹⁴ This provision of the EP Regulation was drafted with injection of CSG water in mind, and not injection of captured carbon. ¹⁵		Noted	N/A
54	14e	General	General		In order to comply with this provision, the administering authority will need to immediately refuse any EA application on the basis injection of significant levels of CO ₂ into an aquifer will cause a deterioration of the environmental values of the receiving groundwater system. In the alternative, the applicant will need to characterise the aquifer as having no environmental value to be deteriorated, as done by CTSCo for the Surat Basin Carbon Capture and Storage Project, ¹⁶ which runs counter-intuitive to the purpose of the EP Act, being to protect Queensland's environment. ¹⁷		Noted	N/A
54	14f	General	General		It is also currently unclear whether a GHG stream could be considered an 'end of waste resource'. This is because there is currently no 'end of waste code' relating to GHG streams, and no end of waste approval has been applied for to trial whether a GHG stream is suitable to be used as a resource. ¹⁸ Even if an end of waste approval was applied for, there are significant uncertainties regarding whether such an application could be approved, as arguably the injection of a GHG stream into an aquifer is likely to cause serious environmental harm, material environmental harm or environmental nuisance. ¹⁹		Noted	N/A
54	14g	General	General		Where CCS activities could contaminate an aquifer, it should be clarified that EP Regulation s 41(2) does apply to CCS activities to prevent this contamination from occurring.		Noted	N/A
54	14h	General	General			Recommendation 5: Amend the EP Act to clarify that a GHG stream is to be considered a waste where the stream will contaminate an aquifer, and review whether current regulation of waste under the EP Act and Regulation is appropriate to manage CCS activities.	Noted	N/A
54	15	General	General		APPENDIX A - CRITERIA FOR CCS PERMITS, LICENCES AND AUTHORITIES			
54	16	General	General		Permit, Licence or Authority: GHG exploration permit Legislation: <i>Greenhouse Gas Storage Act 2009</i> (Qld) s 42	Criteria for GHG permits In deciding whether to grant a GHG permit or deciding its provisions the Minister must consider: (a) any special criteria proposed to be used to decide whether to grant the GHG permit or to decide its provisions; and (b) the applicant's proposed initial work program; and (c) the capability criteria, being the extent to which the Minister is of the opinion that the tenderer is capable of carrying out authorised activities for the GHG permit, having regard to the tenderer's— (i) financial and technical resources; and (ii) ability to manage GHG storage exploration.	Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	17a	General	General		Permit, Licence or Authority: GHG injection and storage lease Legislation: <i>Greenhouse Gas Storage Act 2009</i> (Qld) s 118	Requirements for grant of GHG lease The Minister may grant a GHG lease applied for under a permit-related application only if the Minister is satisfied the requirements mentioned below have been complied with. The application must be refused if the Minister is not satisfied any requirement for grant has been complied with, other than the requirement that the conditions of the relevant GHG permit have been substantially complied with. The requirements for grant are each of the following— (a) the applicant is an eligible person; (b) the proposed area of the proposed GHG lease— (i) is appropriate for the authorised activities proposed to be carried out; and (ii) contains an adequately identified GHG stream storage site that is adequate for the proposed purpose of the GHG lease; (c) the conditions of the relevant GHG permit have been substantially complied with; (d) the Minister has approved the applicant's proposed initial development plan for the GHG lease; (e) a relevant environmental authority has been issued; (f) the applicant has established that— (i) GHG stream storage in the GHG lease's area is or is likely to happen within 5 years after the lease is to take effect; or (ii) the applicant has entered into a contract, GHG coordination arrangement or other arrangement for GHG stream storage in the GHG lease's area (a relevant arrangement); (g) the applicant has paid the annual rent for the first year of the proposed GHG lease; (h) the applicant has given under section 271, security for the GHG lease; (i) the Minister is of the opinion that the applicant is capable of carrying out	Noted	N/A
54	17b	General	General		Permit, Licence or Authority: GHG injection and storage lease Legislation: <i>Greenhouse Gas Storage Act 2009</i> (Qld) s 132	In considering whether to grant a GHG lease or its provisions the Minister must consider the development plan criteria, capability criteria and any special criteria. The Minister may give the weight to each of the development plan, capability and special criteria that the Minister considers appropriate in the circumstances.	Noted	N/A
54	18aa	General	General		Permit, Licence or Authority: Environmental Authority Legislation: <i>Environmental Protection Act 1994</i> (Qld) s 176	In deciding a site-specific EA application, the administering authority must: (a) comply with any relevant regulatory requirement; and (b) subject to paragraph (a), have regard to each of the following— (i) the application; (ii) any standard conditions for the relevant activity or authority; (iii) any response given for an information request; (iv) the standard criteria. There are no standard conditions for CCS activities.	Noted	N/A
54	18ab	General	General		Permit, Licence or Authority: Environmental Authority Legislation: <i>Environmental Protection Act 1994</i> (Qld) s 176	The standard criteria include: (a) the following principles of environmental policy as set out in the Intergovernmental Agreement on the Environment— (i) the precautionary principle; (ii) intergenerational equity; (iii) conservation of biological diversity and ecological integrity; and (b) any Commonwealth or State government plans, standards, agreements or requirements about environmental protection or ecologically sustainable development; and (d) any relevant environmental impact study, assessment or report; and (e) the character, resilience and values of the receiving environment; and (f) all submissions made by the applicant and submitters; and (g) the best practice environmental management for activities under any relevant instrument, or proposed instrument, as follows— (i) an environmental authority; (ii) a transitional environmental program; (iii) an environmental protection order; (iv) a disposal permit; (v) a development approval; and (h) the financial implications of the requirements under an instrument, or proposed instrument, mentioned in paragraph (g) as they would relate to the type of activity or industry carried out, or proposed to be carried out, under the instrument; and (i) the public interest; and (j) any relevant site management plan; and (k) any relevant integrated environmental management system or proposed integrated environmental management system; and (l) any other matter prescribed under a regulation. For more detail on these criteria, see the Guidelines for Assessing applications prepared by the Department of Environment and Science.	Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	18b	General	General		Permit, Licence or Authority: Environmental Authority Legislation: <i>Environmental Protection Act 1994</i> (Qld) s 35(1)	<u>Regulatory requirements</u> The administering authority must, for making an environmental management decision relating to an environmentally relevant activity, other than a prescribed ERA: (a) carry out an environmental objective assessment against the environmental objective and performance outcomes mentioned in schedule 8, part 3, divisions 1 and 2; and (b) consider the environmental values declared under this regulation; and (c) if the activity is to be carried out in a strategic environmental area—consider the impacts of the activity on the environmental attributes for the area under the Regional Planning Interests Act 2014; and (d) consider each of the following under any relevant environmental protection policies— (i) the management hierarchy; (ii) environmental values; (iii) quality objectives; (iv) the management intent; and (v) if a bilateral agreement requires the matters of national environmental significance to be considered—consider those matters.	Noted	N/A
54	18c	General	General		Permit, Licence or Authority: Environmental Authority Legislation: <i>Environmental Protection Regulation 2019</i> (Qld) s 41(2)	When making an environmental management decision relating to an activity that involves, or may involve, the release of waste directly to groundwater, the administering authority must refuse to grant the application if the authority considers: (a) for an application other than an application relating to an environmental authority for a petroleum activity—the waste is not being, or may not be, released entirely within a confined aquifer; or (b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or (c) the waste is likely to result in a deterioration in the environmental values	Noted	N/A
54	19a	General	General		Permit, Licence or Authority: Water licence Legislation: <i>Water Act 2000</i> (Qld) s 105	The chief executive may grant water licences for taking water and interfering with the flow of water.	Noted	See Chapter 4 Approvals, section 4.4 23
54	19b	General	General		Permit, Licence or Authority: Water licence Legislation: <i>Water Act 2000</i> (Qld) s 113	In deciding whether to grant or refuse the application for a water licence, the chief executive must consider the application together with: (a) if a water plan would apply to any water licence granted—the water plan; and (b) if the application relates to the Murray-Darling Basin—the long-term average sustainable diversion limits included in the Basin Plan; and (c) if additional information has been given to the chief executive under section 111—the additional information; and (d) if notice of the application has been published under section 112—all properly made submissions about the application; and (e) if a water plan would not apply to any water licence granted— (i) existing water entitlements and authorities to take or interfere with water; and (ii) any information about the effects of taking, or interfering with, water on natural ecosystems; and (iii) any information about the effects of taking, or interfering with, water on the physical integrity of watercourses, lakes, springs or aquifers; and (iv) strategies and policies for water resource management in the area to which the application relates; and (v) the public interest.	Noted	See Chapter 4 Approvals, section 4.4 23
54	20	General	General		APPENDIX B - QUESTIONS TO ASK WHEN ASSESSING CCS ACTIVITIES			
54	21	General	General		<u>Will the Project contribute meaningfully to emissions reductions?</u> 1) Has the project been designed with indefinite CO ₂ sequestration as the one and only goal? 2) Is the CCS activity relevant at climate-change scale? 3) Are other toxic/noxious by-product gases (e.g. H ₂ S, NO _x) released to the atmosphere during the carbon capture? Does the application include rigorous examination of such fugitive GHG emissions at all steps, including: a) the carbon-capture stage, b) the compression and transport stages, and c) the injection stage? 4) Is this CCS project for an industry that is especially hard to decarbonize (e.g., the cement and iron and steel industries)?		Noted	N/A
54	22	General	General		<u>Does the Project make sense economically?</u> 1) What are the operational costs of installing CCS at a power plant or for resource generation? 2) Will the future revenue stream be sufficient to cover all of the investment in the upfront drilling and infrastructure, the injection phase operations and the continuance of monitoring during the post-injection phase? 3) Is the CCS activity economically viable without subsidies? 4) Is there sufficient supply of CO ₂ over many years?		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
54	23	General	General		<p><u>Is the site suitable for storage?</u></p> <p>1) What means is used to convey the CO₂ to the injection site?</p> <p>a) If it is a former natural-gas pipeline, have the risks of leaks or rupture been critically evaluated regarding length, age and state of pipeline, number of compression stages, incidental damage (including seismic events—esp. subsea pipelines) and human error?</p> <p>b) Is the CO₂ to be thoroughly dried if it is to be transported by pipe to mitigate corrosion?</p> <p>2) If geosequestration is to be used as the storage means, have the geological strata or feature/s been validly proven for long-term retention (centuries to millennia)?</p> <p>3) Has rigorous risk assessment been made of the likelihood of contamination of intervening aquifers during injection or subsequent storage, including indirect mobilisation of toxicants?</p> <p>4) Has evaluation of induced seismicity and the potential of pressurisation/depressurisation to cause caprock fracture been made as a result of CO₂ injection?</p> <p>5) Has an assessment of the possibility of geohazards (e.g. earthquakes) been made as to the integrity of CO₂ storage in the long term?</p> <p>6) If a depleted hydrocarbon reservoir is to be used for CO₂ sequestration, how is well integrity to be guaranteed?</p>		Noted	N/A
54	24	General	General		<p><u>Is the monitoring sufficient to ensure containment of CO₂?</u></p> <p>1) Will the transport stage/s be actively monitored for leaks or inadvertent releases of CO₂?</p> <p>2) Will it be monitored for at least 40 years?</p> <p>3) What are the consequences for long-term landuse?</p> <p>4) Who is financially responsible for monitoring if the company is no longer solvent?</p> <p>5) What is the management plan if leaks are discovered?</p>		Noted	N/A
54	25	General	General		<p><u>What are the consequences of a leak?</u></p> <p>Sudden leaks may produce fatalities. Concentrations of CO₂ over 10%, even in the presence of oxygen, can be fatal (IPCC, 2005: 392). Leaks may also change the geochemistry of the groundwater, impacting water quality or taste</p>		Noted	N/A
54	26	General	General		<p><u>Is there public acceptance of the project? (Social license)</u></p> <p>1) Have the public been provided with adequate information with respect to the proposed project, and meaningful opportunities to have any concerns or helpful information heard?</p> <p>2) Have the common public fears been adequately addressed, such as the risks of seismicity, leaks and costs?</p>		Noted	N/A
54	27	General	General		<p><u>Is there adequate planning to evaluate whether this project contributes meaningfully to state/national emissions goals?</u></p> <p>1) Are the organisations validating CCS truly independent, objective and scientifically credible?</p> <p>2) What are the remedial actions and consequential penalties if a CCS activity does not meet its targets?</p>		Noted	N/A
54	28a	General	General		<p>Footnotes - Current regulatory framework</p> <p>Page -2-</p> <p>1 Greenhouse Gas Storage Act 2009 (Qld) s 30.</p> <p>2 Greenhouse Gas Storage Act 2009 (Qld) s 110.</p> <p>3 Greenhouse Gas Storage Act 2009 (Qld) s 181(2).</p> <p>4 For the monitoring requirements during the GHG lease, see Greenhouse Gas Storage Act 2009 (Qld) ss 141(1)(c)(iii); 145; 254; 177(2)</p> <p>Page -3-</p> <p>5 Environmental Protection Regulation 2019 (Qld) Sch 7.</p> <p>6 For example, for the Surat Basin Carbon Capture and Storage Project, CTSCo only proposes to undertake monitoring until the GHG stream plume has stabilised and reached quasi-equilibrium conditions plus two seismic surveys at a 6-monthly interval after the plume as ceased to expand, or 2 years, whichever is longer: CTSCo, Surat Basin Carbon Capture and Storage Project Environmental Impact Statement, Ch 9 p 59.</p> <p>7 Waratah Coal, Response to Ministerial Information Request, Revision: A (27 June 2022) section 4.1.2.</p> <p>8 Greenhouse Gas Storage Act 2009 (Qld) ss 84 and 165; Water Act 2000 (Qld) ss 105, 808</p> <p>9 Bowskill J in New Acland Coal Pty Ltd v Smith & Ors (2018) 230 LGERA 88.</p> <p>10 'Interfering' with water 'bears its ordinary meaning, which in this context [of a mining lease] is a broad one, meaning to obstruct, hinder, get in the way of or prevent the flow of water': New Acland Coal Pty Ltd v Smith & Ors [2018] QSC 088 at [200] per Bowskill J.</p>		Noted	N/A
54	28b	General	General		<p>Page -4-</p> <p>11 Greenhouse Gas Storage Act 2009 (Qld) s 14(2).</p> <p>12 See e.g., Bridgeport Energy's EA Amendment Application for the Moonie Oil Field CO₂ EOR Project, which seeks a minor amendment to commence EOR activities.</p> <p>13 Environmental Protection Act 1994 (Qld) s 13(1).</p> <p>14 Environmental Protection Regulation 2019 (Qld) s 41(2)(c). Environmental value is defined as 'a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety' or a 'quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation': EP Reg s 9. The environmental values for waters are set out in s 6 of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (Qld).</p> <p>15 Explanatory Notes to the Environmental Protection Amendment Regulation (No. 1) 2011, p 4.</p> <p>Page -5-</p> <p>16 CTSCo, Surat Basin Carbon Capture and Storage Project Environmental Impact Statement, Ch 9 p 41.</p> <p>17 Environmental Protection Act 1994 (Qld) s 3.</p> <p>18 Waste Reduction and Recycling Act 2011 (Qld) s 173I.</p> <p>19 Waste Reduction and Recycling Act 2011 (Qld) s 173J(1)(a). See also, J Robertson and A Garnett, 'Discussion document - A regulatory review of greenhouse gas storage - governance of pressure impacts in the GAB, Queensland' (31 December 2018) 8-10</p>		Noted	N/A
55	1	General	General		Please accept the attached submission from SunPork in relation to the Surat Basin Carbon Capture and Storage Project.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
55	1	General	General		The following planning submission has been prepared by the SunPork Group in respect of the Surat Basin Carbon Capture and Storage Project. The submission has been made to the Chief Executive of the Department of Environment and Science, Queensland. The SunPork Group makes this submission in accordance with section 49 of the Environmental Protection Act 1994 (EP Act) where the Department of Environment and Science (the department) has decided that the EIS can be publicly notified. This written submission has been made within the submission period which commenced on 11.11.2023.		Noted	N/A
55	2a	General	General		The SunPork Group submits that the Surat Basin Carbon Storage and Capture Project should not proceed for the following reasons:		Noted	N/A
55	2b	General	General		1. Claimed consultation with potentially affected landholders has been poor or non-existent		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A
55	2c	General	General		2. The EIS contains misleading information, particularly in relation to water quality		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	2d	General	General		3. The Great Artesian Basin and the water within it is one of the most important natural resources in Australia and cannot be put at any risk under any circumstance		Noted	N/A
55	2e	General	General		4. SunPork Group's existing operations and future developments would be severely compromised if water from the Precipice Sandstone aquifer was contaminated and unusable as a result of this trial or future injection of regulated CO2 waste		Amended EIS	See Chapter 9 Groundwater, section 9.9
55	2f	General	General		5. Mitigation of CO2 emissions cannot be at the expense of other resources and it is inappropriate to hastily pursue poorly planned carbon capture and storage projects on the justification they are needed to meet corporate or Government net zero emission targets and timelines.		Noted	N/A
55	3	General	General		This submission is made in addition to a submission from [REDACTED] on behalf of the Cameron Pastoral Company Pty Ltd, noting Mr Cameron references the SunPork Group in his submission with our endorsement and that the SunPork Group are responsible for management of Cameron Pastoral Company's existing piggery operations and hence are exposed to all consequences highlighted in the technical notes that accompany Mr Cameron's submission		Noted	N/A
55	4a	General	General		Background The SunPork Group is Australia's largest pork producer responsible for 20% of overall production. We also own and operate the Swickers Kingaroy Bacon Factory, the only export-accredited abattoir in Queensland and processes 95% of all pigs grown in Queensland. A snapshot of the SunPork Group and our operations is presented below:		Noted	N/A
55	4b	General	General		PICTORIAL IMAGE OF SUNPORK INFO		Noted	N/A
55	4c	General	General		In Queensland, the SunPork Group farming operations are predominantly located between Goondiwindi, Millmerran, Pittsworth, Toowoomba and Warra, so are not only in direct proximity to the proposed waste injection site but share a lot of the already stretched road infrastructure that will be used to relocate the		Noted	N/A
55	4d	General	General		In 2016, the SunPork Group invested heavily to secure additional groundwater from the Precipice aquifer and bring our total entitlements to 780 ML from a combination of the Hutton and Precipice Sandstone aquifers. As an end-to-end value chain, our motivation was to protect our existing and planned production. With nearly all higher-level aquifers fully allocated, together with the potential impacts of coal-seam gas extraction from the Walloon Coal Measures and potential impacts on the Hutton aquifer, we took advantage of the purchased the		Noted	N/A
55	4e	General	General		If the SunPork Group water supply from the GAB was compromised, we risk the welfare of 250,000 pigs at any point in time, we potentially render useless more than \$200 million in production infrastructure and the \$170 million Swickers abattoir would not have sufficient volume to operate leaving more than 800 individuals unemployed and a 10% shortfall in national pork supply through all major retailers. Further, the bulk of our plans to increase Queensland production by 50% in the next 5 years depend on on-going access to water from the Precipice sandstone aquifer. With this much at stake from just one organisation it beggars' belief that any		Noted	See Chapter 9 Groundwater, section 9.9
55	5a	General	General		Summary of Concerns The SunPork Group's concerns reflect those detailed in [REDACTED] submission. We think the EIS is flawed due to:		Noted	N/A
55	5b	General	General		1. Unsuitable CCS target formation. (High value (yields and water quality) protected GAB water resource aquifer in an arid and water-constrained region).		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5c	General	General		2. Unorthodox and contentious approach. (Conflicting with global CCS best practice and a global first proposal to inject CO2 into a water resource aquifer).		Noted	N/A
55	5d	General	General		3. The Impact assessment groundwater modelling ignores the effects of water bore pumping on the movement and expansion of the CO2 plume.		Amended EIS	See Chapter 9 Groundwater, section 9.9
55	5e	General	General		4. Inadequate aquifer characterisation, and proposed monitoring of CO2 plume.		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5f	General	General		5. Misleading terminology throughout, particularly use of "saline" aquifer "unsuitable for aquatic ecosystems, stock water, and drinking water".		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5g	General	General		6. Misleading and inadequate consultation. Including no consultation with adjacent landholder with Precipice Sandstone water licence.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement Appendix 3A
55	5h	General	General		7. Misleading and inadequate communication of what the trial is leading to.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3.4
55	5i	General	General		It is not our intention to repeat the detail of the concerns outlined above. We do, however, take particular umbrage to the claims that the water in the proposed disposal site is unsuitable for stock use, an area where SunPork and myself (as an internationally recognised pig nutritionist and scientist in my own right) have extensive expertise		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5j	General	General		SunPork maintains a detailed water monitoring program across all of our sites in Australia. Quality varies and we have numerous methodologies to manage high levels of particular components if necessary. Through our Swickers abattoir, where water source and quality is highly variable with a need for food-grade outputs, we have long-term experience with the management and operation of detailed water filtration and reverse osmosis systems		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5k	General	General		From a nutritional perspective, Table 1 shows outputs from routine analysis of water from the Gubermunda aquifer in close proximity to the proposed CO2 waste disposal site, two Precipice bores and a Hutton bore.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
55	5l	General	General		From Table 1, it is clear the water is more than suitable for pig consumption and meets standards higher than some of our other sites across Australia (information available on request). Most notable is the TDS level in water currently being used for livestock (6,000ppm+) versus the levels stated as "too saline" for livestock (1,850ppm) in the water samples from the proposed disposal site quoted in the EIS.		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5m	General	General		Fluoride is not routinely monitored for pig diets because the incidence of fluorosis is either limited to dental fluorosis, or the consequences do not manifest in any form of production loss or welfare compromise. Upper limits for fluoride in pig diets are very poorly defined, and it should be noted that acute lethal poisoning and many of the chronic effects of fluoride involve alterations in the chemical activity of calcium by the fluoride ion. Natural calcium fluoride with low solubility and toxicity from ingestion is distinct from fully soluble toxic industrial fluorides. The toxicity of fluoride is determined by environmental conditions and the positive cations present. At a pH typical of gastric juice, fluoride is largely protonated as hydrofluoric acid HF. For these reasons, the EIS claims pertaining to fluoride levels rendering the water unsuitable for livestock are superficial at best.		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5n	General	General		In circumstances where certain constituents of water elevate to levels of concern, as nutritionists we are able to alter the overall composition of our formulated vitamin and mineral premixes included in all diets, in addition to major components of the diet such as salt and animal protein meals, to accommodate the elevations. It is also critical to note that most vitamins and minerals cannot be considered in isolation – many interact with others and must be considered together when examining potential for adverse production or health effects (eg. as described above, high calcium diets may suppress fluorine activity).		Amended EIS	See Chapter 9 Groundwater, section 9.7
55	5o	General	General		One aspect of water contamination that we are unable to mitigate nutritionally, and one that poses significant risk to livestock and consumers of livestock products, is the liberation of heavy metals. If local pumping activities near the disposal site degas and short circuit the stored CO2 back into the atmosphere (making the entire project a waste of time), it would also result in acidification of the aquifer and dissolution and mobilisation of heavy metals that subsequently render the water unsuitable for human and stock consumption.		Amended EIS	See Chapter 9 Groundwater, section 9.9
55	6	General	General		Conclusion and recommendations SunPork is supportive of efforts to mitigate CO ₂ emissions, including underground capture, but cannot accept the risk to our priceless water resources associated with a world's first attempt to inject corrosive liquified CO ₂ waste into a water aquifer that services significant agricultural enterprises and numerous rural communities. The applicants need to accept the environmental cost of their emissions will have matching costs for mitigation that may include disposal sites well beyond water containing aquifers. It is not acceptable to justify a project of this nature on the basis of looming corporate emission minimisation targets and timelines. On the basis of erroneous water quality claims alone, this trial cannot proceed at the proposed location.		Noted	N/A
55	7	General	General		TABLE 1		Noted	N/A
56	1	General	General		Please find attached a submission for Teys Australia regarding the Environmental Impact Statement – Surat Basin carbon Capture and Storage Project Thanks for the opportunity to comment.		Noted	N/A
56	1	General	General		Tey Australia is requesting that the Department of Environment and Science reject the current CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
56	2	General	General		The CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for livestock and horticulture.		Noted	N/A
56	3	General	General		This practice of waste CO2 injection has never been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are unknown.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 3 and 9.9
56	4	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, without a complete understanding of the potential consequences they could be jeopardising the viability of our business, the businesses and families who rely on us; and the many of businesses and communities who rely on safe reliable water in rural and regional Australia.		Noted	N/A
56	5	General	General		The Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (the ISEC) has received a request from the QLD State Government to provide an assessment on Glencore's EIS. The ISEC has raised many questions about the EIS. Glencore should consider and respond to the Independent Expert Scientific Committee (IESC) advice on the use of an aquifer as the target site, the risks to the environmental values and other users, and the adequacy of the methodologies used and proposed to be used by the proponent ¹ If Glencore reply, potentially affected industries and communities must be given an additional opportunity to comment further on the amended submission.		Noted	N/A
56	6	General	General		We understand that Glencore had not consulted with the peak representative body for Agriculture in Queensland, Agforce until Agforce raised the issue. Most of our supplying producers will be relying on having access to safe water supply to which the GAB is a significant contributor. Several the surrounding communities will also be reliant on the GAB for their water supplies.		Amended EIS	See Chapter 3 Community and Stakeholder Engagment, Appendix 3A
56	7	General	General		We are a proud contributor to the economic and social fabric of our region. Our business employs 3000 Queenslanders, supporting hard working Queensland families, and our operations support countless, producers, regional service providers and suppliers who rely on the success and growth of our business.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
56	8	General	General		Research conducted by the Australian Meat Processors Corporation highlighted the fact that in Queensland (FY 18-19) ² the total impact of the red meat processing industry, including flow-on effects, in Queensland in 2018-19 was as follows: - Employment (FTE) - 40,300 (1.9% of the State total); - Industry value added - approximately \$6.5 billion (1.9% of the State total); and Household income - approximately \$2.2 billion (1.3% of the State total)		Noted	N/A
56	9	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB. We would support further exploration of an alternate injection sites, that do not directly service the production of food for consumers both domestically and internationally. This includes previously developed petroleum and gas reservoirs, or deep, acutely saline formations that represent no opportunity for alternative users, such as agriculture		Noted	N/A
56	10	General	General		Teys Australia implores that the Queensland Government not to proceed with this proposal at this time given the lack of consultation, the many unanswered questions particularly those from the IESC, and the potential for detrimental effect on food security domestically, and the potential detrimental effect on the food export industry in the great state of Queensland.		Noted	N/A
56	11	General	General		The Queensland Government must reject the current EIS submitted by CTSCo to ensure that rural and regional communities and businesses continue to access safe and reliable water resources.		Noted	N/A
57	1	General	General		Please find the Lock the Gate Alliance's submission on CTSCo Surat Basin CCS project - EIS attached, along with an appendix - EDO report on improving CCS regulation in Queensland. If you have any trouble with the attachments please let me know.		Noted	N/A
57	1	General	General		Lock the Gate Alliance welcomes the opportunity to comment on the Environmental Impact Statement for CTSCo/Glencore's Surat Basin carbon capture & storage project ('the Project').		Noted	N/A
57	2	General	General		Lock the Gate Alliance is a national collection of grassroots organisations made up of over 120,000 supporters and numerous local groups who are concerned about risky coal mining, coal seam gas and fracking. These groups are located across Queensland and around Australia, and include farmers, traditional custodians, conservationists and urban residents. The Lock the Gate Alliance has a vision of healthy, empowered communities that have fair, democratic processes available to them to protect their land and water and deliver sustainable solutions to food and energy needs.		Noted	N/A
57	3	General	General		We are concerned about the Project, and other CCS projects proposed for various regional and rural locations around Australia, for three key reasons: first, the direct damage these experiments could cause to the surrounding environment, especially groundwater resources; second, the clear risk under most current regulatory systems that local residents and taxpayers will ultimately bear the costs of dealing with this damage; and third, the fact that CCS is being used by the fossil fuel industry in Australia to justify its continued expansion of coal and gas, despite the many obvious barriers to CCS ever resulting in the meaningful avoidance of fossil fuel-related emissions, and certainly not within the timeframe required to limit global warming to 1.5-2°C.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.3; and Chapter 9 Groundwater, section 9.9
57	4	General	General		These concerns are not mitigated by the information provided in the EIS for the Project, for reasons set out in the remainder of this submission.			
57	5a	General	General		Outline of submission 1. Project justification and status of CCS technology: 1.1. <i>References to DACCS and BECCS are not backed up by any evidence of their deployment in the region. The most likely source of commercial CO2 emissions is coal-fired power generation, which will be substantially scaled down in coming years.</i> 1.2. <i>The project justification is not balanced against an assessment of the necessity, risks or feasibility of large-scale CO2 storage in the Surat Basin.</i> 1.3. <i>CCS for the purpose of large-scale emissions avoidance is not an established or successful technology, as</i>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, sections 2.3, 2.13 and 2.15
57	5b	General	General		2. Specific issues in the EIS impact assessment and mitigation proposals: 2.1. <i>Inadequate assessment and mitigation of risks to groundwater quality.</i> 2.2. <i>Insufficient evidence of the lack of local faulting/fracturing necessary to ensure the Evergreen Formation acts as an effective seal for the GHG plume.</i> 2.3. <i>Incomplete consideration of project's impact on emissions levels.</i> 2.4. <i>Fail re to provide information about remediation options.</i>		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11.7 Table 2-10.; Chapter 5 Climate, section 5.2.1.4.1; Chapter 8 Geology, section 8.7; Chapter 9 Groundwater, section 9.9
57	5c	General	General		3. Regulatory framework and proposed changes to EA: 3.1. <i>Uncertainty in how the GHG plume will be regulated under Queensland's environmental and CCS legislation.</i> 3.2. <i>Unclear trigger for operations to cease in the event of environmental 'harm' given proposed amendments to EA.</i>		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and Table 2-10; and Chapter 22 Proposed EA Amendments
57	5d	General	General		4. Ongoing conflict between fossil fuel exploitation and agriculture: 4.1. <i>Queensland agriculture has been severely impacted by fossil fuel exploitation. Allowing CCS to go ahead in agricultural regions would create yet another threat to agricultural production merely to enable fossil fuel greenwashing</i>		Noted	N/A
57	5e	General	General		5. Glencore's record of unethical corporate behaviour: 5.1. <i>Glencore plc has proven itself incapable of acting as a responsible corporate citizen and should not be trusted to protect Queensland's precious groundwater resources</i>		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
57	6a	General	General		<p><u>1. Project justification and status of CCS technology</u></p> <p><u>1.1 Questionable project justification in relation to climate change and emissions reduction</u></p> <p>CTSCo states that the primary purpose of the project is to demonstrate the viability of CO₂ storage in the Surat Basin as a necessary first step in the future development of large-scale CO₂ storage in the region. Although CTSCo explicitly states that any emissions reduction¹ realised through this project is an additional benefit and not the primary goal, large-scale emissions avoidance (or drawdown) through the future storage of significant volumes of CO₂ is presented as the ultimate promise of the Project's activities. Large-scale CO₂ sequestration is, conceptually at least, presented in the EIS as both an inevitable and an important part of mitigating climate change, thus justifying the Project at hand.</p> <p>There are several flaws in this project justification, which together raise serious questions about whether the potentially significant environmental costs of the Project (especially in relation to groundwater contamination) are warranted.</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	6b	General	General		<p><u>Direct air capture/bioenergy + CCS is not the same as coal-fired power generation + CCS</u></p> <p>The EIS refers to analysis from the International Energy Agency indicating that CC(U)S has a role to play in the removal and storage of atmospheric CO₂ via direct air capture ('DACCS') and bioenergy equipped with CCS ('BECCS').² CTSCo says the Project is justified by the need for 'viable storage... irrespective if CO₂ is stored from fossil fuel emissions or extracted directly from the atmosphere using direct air capture'.³</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	6c	General	General		There are no public plans for DACCS or BECCS in Queensland. DACCS is at a very early stage of development, within only two small-scale plants currently operational worldwide. ⁴ BECCS is further advanced, but does not yet exist in Australia, and faces significant concerns relating to its overall energy and emissions efficiency, land use and water requirements. ⁵		Not relevant to the EIS	N/A
57	6d	General	General		As alluded to in the EIS, the more likely CO ₂ source for the 'large-scale' storage ⁶ hub envisaged by CTSCo is waste gas from the multiple coal-fired power stations in the region, including the Millmerran station.		Not relevant to the EIS	N/A
57	6e	General	General		However, what is not made clear in the EIS is that unlike DACCS or BECCS, CCS attached to coal-fired power generation does not result in the net reduction of greenhouse gas emissions, or even their complete avoidance.		Not relevant to the EIS	N/A
57	6f	General	General		Even if the Project was designed to capture and store 100% of the power station's combustion emissions, it would not address the upstream emissions released through extraction and processing of the source coal. These emissions are significant: fugitive emissions from coal production accounted for approximately 12.5% of Queensland's entire greenhouse gas inventory for 2020. ⁷ Fugitive emissions from coal mining are predominantly methane, which has 84x the global warming potential of CO ₂ over a 20-year period, meaning that fossil fuel production has a disproportionately severe impact on climate stability.		Amended EIS	See Chapter 5 Climate, section 5.2.1.4.1.
57	6g	General	General		The prospect of carbon capture technology installed at a coal-fired power plant ever achieving a 100% capture rate, meanwhile, is so slim as to be virtually impossible, ⁸ and the cost of retrofitting carbon capture equipment to coal-fired power plants is extremely high, especially when the considerable additional energy requirements of the capture equipment is taken into account. As illustrated in analysis from the International Energy Agency, retrofitting carbon capture technology to coal-fired power plants is uncompetitively expensive when compared to switching to renewables: just the CO ₂ capture element of the overall CCS process could cost US\$50-100 per tonne of CO ₂ , ⁹ and that's without factoring in the costs of transporting, storing and responsibly monitoring the CO ₂ over the long term.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	6h	General	General		There are thus serious questions in CTSCo/Glencore's justification for the Project: with no DACCS or BECCS on the horizon for central Queensland, CCS unable to result in the complete avoidance of emissions from coal-fired power generation, and much cheaper forms of power generation than coal+CCS readily available, what is the need for either this Project or large-scale CO ₂ storage in this location from a climate mitigation perspective?		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	6i	General	General		<p><u>Coal-fired power generation has no role in the energy system or meeting emissions targets</u></p> <p>There is no viable pathway to swift and cost-effective emissions reduction that involves the continued use of coal for power generation in Australia. This is reflected in Queensland's Energy and Jobs Plan, which includes specific targets for renewable energy generation as well as overall emissions reduction goals. These targets would see Queensland's electricity system powered by 85% renewable sources by 2035, requiring a planned and imminent scaling-down of coal-fired power. Contrary to what CTSCo says in the EIS, neither the Project nor any future large-scale CCS development in the Surat is aligned with achieving Queensland's targets.</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	6j	General	General		CTSCo contends that 'fossil fuels will continue to play an important part in Australia's energy mix for at least the short to medium-term', but given Queensland's renewable ¹⁰ energy targets and the absence of any evidence provided in support of this statement, this is not convincing.		Not relevant to the EIS	N/A
57	6k	General	General		Further, it has taken Glencore over 10 years to develop this project, and it is not scheduled to be operational until 2025 at the earliest. No timeframe is given for the development of a future large-scale storage hub, but given the lengthy lead times for major projects (especially those involving novel technologies), another decade or more is a reasonable expectation. In light of Queensland's 2030 and 2035 emissions reduction and renewable		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	7a	General	General		<p><u>1.2 No consideration of the feasibility or risks of large-scale CCS</u></p> <p><u>Project does not inherently improve feasibility of future large-scale CCS</u></p> <p>Even if huge DACCS or BECCS initiatives were announced for Queensland as a way of meeting emissions targets, it is far from clear that the Project does indeed lay the groundwork for those endeavours to the extent implied in the EIS.</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
57	7b	General	General		Large-scale emissions reduction delivered through a 'CCS Hub' is held out as the ultimate promise of this project, but the information about the site's hydrogeology and the project's design presented in the EIS indicate that its success is premised entirely upon the specific properties of the relevant geological formations and modelling of how these formations will respond to the injection of a small volume of CO ₂ at relatively low pressure over 3 years. Specifically: the depth and relative stasis of the Precipice Sandstone at the injection location, and the ability of the Evergreen Formation to withstand CO ₂ injection at the relevant pressure.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	7c	General	General		Each CCS project is a highly bespoke engineering exercise, and there is no indication that these necessary conditions for success would be replicable in a large-scale CCS context. In particular, the Precipice Sandstone is a widely utilised and valuable groundwater resource (contrary to the way CTSCo describes it in the EIS), and it is highly unlikely that using it to store large volumes of CO ₂ would be remotely environmentally or socially acceptable .		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	7d	General	General		None of these barriers are acknowledged by CTSCo, with large-scale CCS instead presented as the unqualified benefit and justification of the Project.			
57	7e	General	General		<u>Project justification is not balanced against risks of large-scale CCS development</u> The EIS gives the reader (whether a community member or the relevant decision-maker) an unbalanced understanding of the potential benefits and costs of this project because although the benefits of large-scale CCS are outlined (emissions reduction), the costs (environmental, social, economic) of such a development are not. For example, in the assessment of the 'project alternatives' provided in the EIS, the 'do nothing' option refers to CO ₂ emissions continuing, but does not refer to the avoided risks to groundwater.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	7f	General	General		There are multiple known and serious environmental, social and economic risks associated with major CCS developments, from groundwater contamination, to induced seismicity, to pipeline failures, to loss of agricultural productivity. ¹¹		Adequately dealt within the EIS, no change to the EIS	
57	7g	General	General		If CTSCo is to draw on the benefits of large-scale CCS as a justification for this project, the EIS should also canvas these risks. As it stands, the EIS gives a very unbalanced - and arguably misleading - picture of the relative costs and benefits of the project.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	8a	General	General		1.3 CCS for CO₂ storage is not an established or common technology CTSCo states that 'technology to capture, transport and inject a GHG stream into a deep reservoir is well proven'. ¹² This is somewhat true, though the actual success rate of these technologies is variable, but the obviously intended implication that CCS as a whole is a proven technology is false.		Adequately dealt within the EIS, no change to the EIS	
57	8b	General	General		There are only 27 operational CCS projects worldwide, of which 22 are in fact 'Enhanced Oil Recovery', where CO ₂ is pumped into depleted oil reservoirs to extract more oil, creating a source of revenue for the projects. ¹³ There is no attempt to ensure the CO ₂ remains underground long term, because this is not the objective of the process, nor any monitoring of storage volumes or duration. As a result, the pool of knowledge about the effectiveness of CCS as a means of long-term storage and emissions reduction is in fact very small, and it is far from a 'well proven' technology.		Adequately dealt within the EIS, no change to the EIS	
57	8c	General	General		Further, most of the flagship carbon capture projects - including those for EOR - have experienced chronic technical difficulties: - Chevron's Gorgon LNG plant, WA - committed to store 80% of waste CO ₂ from gas processing, or about 12.3Mt over 2016-21. Due to ongoing technical problems including leaks, corroded valves and issues with the storage pressure management system, the project only started injecting CO ₂ 3 years late, and the WA Government subsequently ordered Chevron to reduce the carbon storage volumes due to safety issues. As a result, the project injected only 4.9Mt CO ₂ in total over its first five-year compliance period, missing the target by ~60%.		Noted	N/A
57	8d	General	General		- Boundary Dam, Canada - carbon capture on a coal-fired power plant, with the CO ₂ used to extract oil. The project cost US\$1.5bn to construct and due to a series of problems with the capture equipment has never met its 90% capture target, averaging closer to 50%.		Not relevant to the EIS	N/A
57	8e	General	General		- Petra Nova, US - carbon capture retrofitted to a power plant, again with the CO ₂ to be used to extract additional oil. The project operated for 3 years, during which time it experienced frequent outages and missed its target by 17% before it shut down at a cost to investors of US\$150m.		Not relevant to the EIS	N/A
57	8f	General	General		- In Salah, Algeria - target capture and storage capacity of 1-1.2Mt/year. Injection commenced in 2004 but was suspended in 2011 due to concerns about the integrity of the cap rock seal. The project only stored 3.8Mt over its lifetime, missing its target by about 4.6Mt or 55%.		Noted	N/A
57	8g	General	General		As a whole, CCS of all kinds is still a very nascent and largely unproven process, and it is misleading for CTSCo to present it as anything else.		Adequately dealt within the EIS, no change to the EIS	
57	9a	General	General		2. Issues in the EIS impact assessment and mitigation measures 2.1 Inadequate assessment of risks to groundwater <u>Incomplete assessment of contamination impacts</u> The sections of the EIS covering the site geology, hydrogeology and potential impacts to groundwater fall short of describing and assessing the significance of the consequences of groundwater contamination.		Amended EIS	See Chapter 9 Groundwater, sections 9.9, and 9.11
57	9b	General	General		While the possibility of injected CO ₂ making its way into overlying aquifers and affecting groundwater is acknowledged as a potential project risk in the EIS, including through the description of several 'alternative exposure pathways', there does not appear to be any consideration of the environmental, social and economic impacts that would result if groundwater exposure did occur.		Amended EIS	See Chapter 9 Groundwater, section 9.9
57	9c	General	General		Such impacts could include loss of income to the nearby agricultural businesses, damage to groundwater-dependent ecosystems along the nearby Moonie River, and health impacts to regional communities reliant on groundwater for public water supply.		Amended EIS	See Chapter 9 Groundwater, section 9.9
57	9d	General	General		Even if CTSCo considers, on the basis of its own risk assessment, that groundwater contamination is not a probable outcome of the project, it is nonetheless a possible outcome, and as such its full set of consequences of aquifer acidification and contamination should be included in the EIS to give the decision-maker a fulsome understanding of the project costs and benefits.		Amended EIS	See Chapter 9 Groundwater, section 9.9
57	10a	General	General		<u>Failure to acknowledge permanence of groundwater impacts</u> Similarly, the EIS glides over the fact that, even if it proceeds exactly as planned, the Project will permanently change groundwater quality at the location of the CO ₂ plume, affecting its use value in perpetuity.		Amended EIS	See Chapter 9 Groundwater, sections 9.9, and 9.11

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
57	10b	General	General		This has been a source of considerable concern for agricultural producers near the injection site, who have raised fears about the impact of the Project on their prospects of using water from the Precipice Sandstone given water from shallower formations is close to fully allocated. ¹⁴		Amended EIS	See Chapter 9 Groundwater, section 9.9
57	10c	General	General		Under the terms of reference for the EIS, CTSCo was required to describe 'present and potential users and uses of water in areas potentially affected by the proposed project, including municipal, agricultural, industrial, recreational and environmental uses of water' (section 9.4.2). In failing to acknowledge the possibility of agricultural and other users needing access to the Precipice Sandstone in future, the EIS does not meet this requirement.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
57	10d	General	General		CTSCo should be required to comprehensively assess the potential future uses and users of affected water as a critical part of providing an accurate picture of the potential impacts of the Project.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
57	11a	General	General		<i>Insufficient baseline data collection</i> From the information presented in Chapter 9 of the EIS, it appears that CTSCo has only sampled three locations on 1-3 occasions to collect baseline data about groundwater quality. While the data obtained is supplemented with regional studies, these studies appear to have focussed on other parts of the Surat Basin and it is not clear that their results are directly applicable to the project site.		Amended EIS	See Chapter 9 Groundwater, section 9.7
57	11b	General	General		We are concerned that this is not a sufficient baseline data collection program for a project with the potential to have serious impacts on groundwater quality. For comparison, gas companies in the Northern Territory intending to undertake hydraulic fracturing - another industrial process which inherently threatens groundwater quality - are required to install multi-level monitoring systems in bores and measure water quality data for at least six months continuously prior to any fracturing. ¹⁵		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.12 and 9.13
57	11c	General	General		We are also concerned that sampling to three depths at three locations is insufficient to gain a proper understanding of the values of groundwater systems in the area, including in relation to potential future uses, noting that the CO ₂ plume will - irrespective of whether it remains static as planned or not - remain present underground in perpetuity.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.12 and 9.13
57	11d	General	General		Accordingly, we submit that CTSCo should be required to undertake a much more comprehensive baseline data collection program, preferably involving close-to-continuous monitoring for at least 6 months, prior to final approval for injection.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.12 and 9.13
57	12a	General	General		<i>Inadequate monitoring period and investigation trigger values</i> CTSCo contends that the CO ₂ plume will attain its final form within 5 years of injection ceasing, and will remain relatively static in that position and shape in perpetuity (or at least until the end of the 100-year period modelled for the EIS). This conclusion is critical to the overall assessment in the EIS that the project poses minimal risks to local groundwater dependencies.		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.9
57	12b	General	General		However, CTSCo is only proposing monitoring for movement of the CO ₂ plume and impacts to groundwater quality for 2 years after injection ceases (or 2 surveys at six monthly intervals after the plume has ceased to expand).		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.9
57	12c	General	General		We consider that this is far too short a period of monitoring, considering both the novelty of CCS in the Surat Basin and the critical importance of the groundwater resources that stand to be affected.		Amended EIS	See Chapter 9 Groundwater, section 9.9
57	12d	General	General		Further, monitoring for groundwater quality changes is only proposed to occur at six-monthly intervals, despite the groundwater impact assessment concluding that 'continual groundwater sampling' is highly important for the speedy identification and remediation of CO ₂ leakage. ¹⁶ Again, this is too infrequent a monitoring program in light of the risks and impacts involved.		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10
57	12e	General	General		Finally, the groundwater values proposed to trigger an investigation (see Chapter 9) appear to involve very significant changes which would severely impact water quality and use value. Without any justification or explanation provided in the EIS for the trigger values chosen, we are concerned that they represent too high a threshold for investigation, and that substantial water quality degradation could occur without CTSCo being obliged to investigate the cause.		Amended EIS	See Chapter 2 Project Description, section 2.11.7; and Chapter 9 Groundwater, section 9.9
57	13a	General	General		2.2 Insufficient information about localised, small-scale faulting As evident from the EIS, the impermeability of the Evergreen Formation and its ability to act as an effective 'seal' for the CO ₂ plume is integral to the Project's success, and particularly to the avoidance of leakage into overlying formations including the Gubberamunda Sandstone.		Amended EIS	See Chapter 8 Geology, sections 8.6 and 8.7
57	13b	General	General		CTSCo presents various reports assessing the characteristics of the Evergreen Formation and other relevant formations at a regional level, includes information about regional-scale faulting and fracturing, and has conducted pressure testing of the Evergreen at the injection site to assess its resilience to pressure changes resulting from the CO ₂ injection.		Amended EIS	See Chapter 8 Geology, sections 8.6 and 8.7
57	13c	General	General		However, CTSCo has not yet conducted the 3D seismic survey to identify the presence of local faults, instead proposing for it to be undertaken after the EIS is assessed (and approval for the project obtained).		Amended EIS	See Chapter 8 Geology, sections 8.6 and 8.7
57	13d	General	General		The possibility of faults in and around the injection site is of critical importance to assessing the likelihood of failures in the reservoir seal, whether through existing faults or new ones triggered or exacerbated by the plume injection. This is directly relevant to an understanding of the potential impacts to groundwater and to the risk of induced seismic activity.		Amended EIS	See Chapter 8 Geology, section 8.9
57	13e	General	General		Injection of CO ₂ increases pore pressure within the target reservoir, which can trigger tremors and earthquakes if there are existing, potentially active faults at or near the injection site. ¹⁷ As geologists Mark Zoback and Steven Gorelick write, although CCS site selection would presumably avoid large faults - as CTSCo has done here - 'site characterisation studies can easily miss the much smaller faults associated with small to moderate earthquakes'. ¹⁸ Although such minor earthquakes would not pose a danger to people, 'several centimetres of slip [created by a minor earthquake] would be capable of creating a permeable hydraulic pathway that could compromise the seal integrity of the CO ₂ reservoir'. ¹⁹		Amended EIS	See Chapter 8 Geology, section 8.9
57	13f	General	General		Given that overlying formations at the injection site include an aquifer relied upon by agriculture and for public water supply, we consider that it is unacceptable that CTSCo has not yet undertaken the thorough seismic surveying required to identify the presence of small faults around the project area. Without the results of this surveying, it is impossible to arrive at a comprehensive understanding of the potential risks to groundwater and other receptors, which is the goal of the EIS process - and required for a responsible, informed approval decision.		Amended EIS	See Chapter 8 Geology, sections 8.6 and 8.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
57	14a	General	General		2.3 Incomplete consideration of project's impact on emissions levels <u>No assessment of fugitive emissions from coal</u> The EIS includes an assessment of the Project's expected emissions footprint, with a tabled breakdown of the sources and volumes of scope 1, 2 and 3 emissions from the project.		Amended EIS	See Chapter 5 Climate, section 5.2.1.4.1
57	14b	General	General		While emissions from powering the post-combustion capture plant at Millmerran station are included, the fugitive emissions from mining the coal for the power station (ultimately the source of CO ₂ emissions stored in the project) are not. Given that the coal is sourced from a nearby open-cut coal mine, and there is growing evidence that open-cut coal mines in Queensland may be under-estimating methane emissions, ²⁰ this is a concerning omission which could - if rectified - significantly change the net emissions impact of the project.		Amended EIS	See Chapter 5 Climate, section 5.2.1.4.1
57	15a	General	General		<u>No consideration of role of project in prolonging coal production and use</u> As discussed earlier, in its justification for the project CTSCo recites at length the emissions reduction prospects of large-scale CCS, and the alleged role CCS must play in climate mitigation. However, CTSCo does not acknowledge the role this project - located in a region where the major sources of CCS-compatible CO ₂ are coal-fired power stations - could have in perpetuating coal production and use for power generation.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	15b	General	General		Although the Project will only store less than 2% of Millmerran's scope 1 emissions, it is heavily implied that it is just the first step towards a large-scale CCS hub which will someday make a tangible difference to the emissions impact of the region's coal-fired power stations. Media articles quoting coal industry advocates in relation to the Project echo this justification. ²¹		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	15c	General	General		The evident aim of this framing for the Project is that CCS in the Surat Basin will make coal-fired power generation "cleaner", and thus more acceptable in the face of increasingly tangible climate change. If this is to be part of the Project's justification and listed benefits, then it should be accompanied by a discussion of the climate, health and social impacts that the continued production and use of coal envisaged under this scenario can be expected to have. This should include the opportunity cost to Queensland from deploying uncertain and risky coal + CCS technology instead of proven and cheap renewable energy generation.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
57	16a	General	General		2.4 Rehabilitation strategy and remediation options <u>Failure to provide options for remediation of the groundwater resource</u> Under section 9.3.1 of the terms of reference for the EIS, CTSCo was required to develop a rehabilitation strategy, including 'suitable options for remediation and/or reinstatement of the groundwater resource and geological formations should the project fail and/or achieve project outcomes'.		Amended EIS	See Chapter 2 Project Description, section 2.11.7 and Table 2-10; Chapter 9 Groundwater, section 9.10 2; and Chapter 19 Rehabilitation, section 19.5
57	16b	General	General		The 'Rehabilitation' section of the EIS fails to provide any information at all about options to remediate the groundwater resource and geological formations, in a clear failure to meet the terms of reference. Possibly, this is because such remediation would not be possible - if this is the case, CTSCo should be required to make that clear in its EIS documentation (and, in our view, the Project should not be permitted to go ahead).		Amended EIS	See Chapter 9 Groundwater, sections 9.10 and 9.11; and Chapter 2 Project Description, section 2.11.7 and Table 2-10;
57	17	General	General		<u>Commitment to rehabilitate in the event of project failure and/or unintended consequences</u> Along with the commitments already contained in the draft EIS, we submit that CTSCo should be required to commit to fully remediating groundwater resources if the Project does not proceed as planned due to technical, economic, environmental or any other issues in future. This should include remediation following any unexpected or unintended consequences of the Project (even if CO ₂ is successfully injected as planned).		Amended EIS	See Chapter 9 Groundwater, sections 9.10 and 9.11; and Chapter 2 Project Description, section 2.11.7 and Table 2-10;
57	18a	General	General		3. Problems in the regulatory framework for the project 3.1 The Greenhouse Gas Storage Act Queensland was an early mover in introducing legislation to regulate CO ₂ storage, with the <i>Greenhouse Gas Storage Act</i> passed in 2009. However, according to analysis from the Environmental Defenders Office, this legislation has not been well-integrated into Queensland's wider environmental regulation framework, leading to 'significant uncertainty... and risk with respect to how the unique impacts of these activities on the environment and agriculture will be avoided and managed'. ²²		Noted	N/A
57	18b	General	General		The EDO's analysis is included at Appendix A to this submission. Key findings relevant to the Project and its management through the EIS process include:		Noted	N/A
57	18c	General	General		- The holder of the GHG injection and storage lease is only responsible for the monitoring of the GHG stream during the term of the lease, with the stored GHG plume then becoming the property of the state upon relinquishment of the lease. This means that, in this case, CTSCo will not be required to monitor - or remediate - the long-term effects of its activities.		Noted	N/A
57	18d	General	General		- It is unclear whether a water licence is required for CCS activities and, in turn, how the impacts of carbon injection and storage on water resources will be regulated.		Amended EIS	See Chapter 4 Approvals, section 4.4 23
57	18e	General	General		- It is also unclear whether the GHG stream would be considered 'waste' under the <i>Environmental Protection Act 1994</i> , and, in turn, how its possibly deleterious effects on the surrounding environment would be managed under this legislation			
57	19a	General	General		3.2 Unclear trigger for operations to cease CTSCo proposes various amendments to its Environmental Authority throughout the EIS, including the deletion of the current requirement 'if the holder of this EA becomes aware that environmental harm is caused or threatened to be caused as a result of injection activities, injection must cease immediately'. ²³		Amended EIS	Chapter 22 Proposed EA EPPG00646913 Condition Amendments, section 22.1
57	19b	General	General		There is no explanation given for this proposed edit, but presumably it has been suggested in recognition of the fact that the very nature of the Project's activities constitutes environmental 'harm', in that they involve the deliberate acidification of an aquifer.		Noted	N/A
57	19c	General	General		CTSCo suggests replacing this clause with an obligation to conduct 'targeted monitoring' and 'implement mitigation measures as described in the GHG stream Management Plan'.		Amended EIS	Chapter 22 Proposed EA EPPG00646913 Condition Amendments, section 22.1
57	19d	General	General		This Plan has not yet been developed, with CTSCo proposing it will be developed and submitted to DES prior to injection commencing. Notably, the bulk of the list of matters to be covered in the Plan in fact relates to monitoring and detection activities rather than mitigation of environmental damage.		Amended EIS	Chapter 22 Proposed EA EPPG00646913 Condition Amendments, section 22.1
57	19e	General	General		We submit that if this clause is removed from the EA, it must be replaced with one that clearly sets out the circumstances in which CTSCo must cease injecting CO ₂ , to ensure that additional environmental harm from the		Amended EIS	Chapter 22 Proposed EA EPPG00646913 Condition Amendments, section 22.1

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
57	20a	General	General		4. Ongoing conflict between fossil fuel exploitation and agriculture Two recent reports highlight the dramatic impact the fossil fuel industry is having on land available for agriculture in Queensland.		Noted	N/A
57	20b	General	General		The Queensland Mine Rehabilitation Commissioner states that the coal industry has a net disturbed area of 173,220ha with just 22% of historically disturbed land rehabilitated ²⁴ . This does not include the areas of infrastructure, buffers, biodiversity offsets, neighbouring land impacted by groundwater drawdown.		Noted	N/A
57	20c	General	General		Meanwhile the Gasfields Commission Queensland state that 3.5M ha of Queensland is currently under granted petroleum lease (PL) with 702 water bores in the Surat cumulative management areas alone predicted to be impaired over the life of the CSG industry ²⁵ .		Noted	N/A
57	20d	General	General		Any decision to enable another novel fossil fuel technology that interferes with groundwater will have land use conflicts and impact agricultural land uses. We submit that the risks of this industry are not worth the impacts.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, sections 2.3 and 2.15
57	21a	General	General		5. Glencore's record of poor corporate behaviour Finally, we also hold serious concerns about Glencore's capacity and willingness to operate as a good corporate citizen in Queensland including directing the operations of its subsidiary CTSCo.		Noted	N/A
57	21b	General	General		In June 2022, Glencore pleaded guilty to paying US\$28m in bribes to secure preferential access to oil across its African operations. ²⁶ In May, it pleaded guilty to bribery and market manipulation spanning a decade, following years of investigation into the company in the UK, the US and Brazil.		Not relevant to the EIS	N/A
57	21c	General	General		This project involves the deployment of complex, relatively novel technologies in the context of a highly valuable groundwater system, existing industries and an uncertain regulatory framework. Any failure to observe the highest degree of responsible health, safety and environmental conservation practices could have very serious and possibly irreparable consequences. In this context, we consider that Glencore is not an appropriate entity to be ultimately responsible for dictating how the Project is operated and that the project should not be approved.		Noted	N/A
57		General	General		ATTACHMENT 2 IS THE EDO DOCUMENT, SAME AS THE QCC ATTACHMENT 2		Noted	N/A
58	1	General	General		On behalf of [REDACTED], Chief Executive Officer, please see the attached letter for the attention of [REDACTED].		Noted	N/A
58	1a	General	General		AgForce is a peak organisation representing Queensland's cane, cattle, grain and sheep, wool & goat producers. The cane, beef, broadacre cropping and sheep, wool & goat industries in Queensland generated around \$10.4 billion in on-farm value of production in 2021-22. AgForce's purpose is to advance sustainable agribusiness and strives to ensure the long-term growth, viability, competitiveness and profitability of these industries. Over 6,500 farmers, individuals and businesses provide support to AgForce through membership. Our members own and manage around 55 million hectares, or a third of the state's land area. Queensland producers provide high-quality food and fibre to Australian and overseas consumers, contribute significantly to the social fabric of regional, rural and remote communities, as well as deliver stewardship of the state's natural environment.		Noted	N/A
58	1b	General	General		Thank you for the opportunity to provide a submission to the Environmental Impact Statement (EIS) for the Surat Basin Carbon Capture and Storage Project (the Project) proposed by the Carbon Transport & Storage Corporation (CTSCo) Pty Limited (the Proponent) near Moonie.		Noted	N/A
58	2a	General	General		Introduction Water is a vitally important resource and needs to be managed to secure its environmental, social and economic values. To sustain access and associated ecosystems, planning and management should avoid risks to the long-term sustainability of water resources. Sustainable management is vital to meet future consumptive and environmental water requirements. AgForce supports the cost-effective use of objective, scientific information to guide water resource management decisions.		Noted	N/A
58	2b	General	General		As part of a wider policy, AgForce endorses the following policy positions relating to the management and use of water from the Great Artesian Basin (GAB):		Noted	N/A
58	2c	General	General		- Groundwater planning and management should ensure the security, reliability and quality of the supplies of primary producers, including at least maintaining associated water pressures.		Noted	N/A
58	2d	General	General		- Support making further groundwater available for economic development in a responsible and sustainable way where this does not reduce the certainty, security and reliability of current entitlements, or increases the risk of adverse environmental impacts.		Noted	N/A
58	2e	General	General		- Monitoring needs to be cost-effective and risk-proportionate, targeting those areas of greatest risk of over-allocation or other unsustainable use.		Noted	N/A
58	3a	General	General		Carbon Capture and Storage in an Aquifer As noted in our submission to Minister for Resources, Scott Stewart, on 11 February 2022 concerning the Draft Queensland Resources Industry Development Plan, carbon capture and storage (CCS) could be of large potential benefit if undertaken with no impact on useable underground water resources and aquifers of importance to agriculture.		Noted	N/A
58	3b	General	General		We hold significant concerns that the project as proposed will have impacts on an aquifer of the GAB currently used for agricultural purposes and expected to be of increasing importance for our sector's continued operations and growth into the future. As such we are not supportive of the project as proposed.		Amended EIS	See Chapter 9 Groundwater, section 9.9
58	3c	General	General		The project proposes to demonstrate the effective permanent storage of captured carbon dioxide (CO ₂) through injecting up to 110,000 tonnes of liquified CO ₂ per year for three years into the Precipice Sandstone Aquifer, with associated transportation from the Millmerran Power Station and construction of supporting infrastructure. Monitoring is proposed to occur prior to and during the injection period and for two years after injection has ceased for a period of at least five years.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
58	3d	General	General		Briefly, our concerns are as follows: - The unconventional use of a valuable, high quality GAB aquifer for storage of an industrial waste product and the setting of a precedent that such a use is appropriate - Selection of an aquifer that is supporting agricultural activity and planned future expansion - Unclear application of derived pilot study findings to any subsequent expansion project, presumably also in a GAB aquifer given those are the conditions under test - Close location of the injection site to an existing water access entitlement with risks to the exercise of those rights - Inadequate proposed monitoring including of subsequent impacts to the aquifer, water quality in the vicinity and ongoing use of the aquifer for stock watering and other purposes - Poor characterisation of the quality of the water in the aquifer, including that it is saline and has characteristics making it unsuitable for aquatic ecosystems and unsuitable for irrigation, stock and drinking water - Limited consultation undertaken with interested parties, including AgForce and our members.		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.9 and 9.10
58	3e	General	General		We support the submissions to the EIS made by other interested agricultural stakeholders and seek for the issues raised within our and those submissions to be fully addressed by the proponent.		Noted	N/A
58	4a	General	General		Waste Disposal into an Aquifer (incl TOR 7.4) Recognising that CCS technology could make a positive contribution to reducing CO ₂ emissions into the atmosphere, AgForce are not opposed to exploration of more proven/conventional reservoir sites for CCS. This includes previously developed petroleum and gas reservoirs unused for agriculture or other purposes, or deep, actually saline formations (see below) that represent no opportunity for alternative users, such as agriculture.		Noted	See Chapter 2 Project Description, sections 2.3 and 2.15
58	4b	General	General		Further triple bottom line information on why more conventional reservoir alternatives were not selected for the project as feasible alternatives should be provided by the Proponent to enable a real assessment of the need to use as the target formation an agriculturally important aquifer delivering secure water supplies.		Noted	See Chapter 2 Project Description, section 2.15
58	4c	General	General		AgForce supports existing legislative and regulatory protections of GAB aquifers and does not support changes of those to enable waste disposal into the GAB, a valuable natural resource with environmental values concerning stock watering, farm use, agricultural industry use and cultural significance that must be protected. As per our GAB and land use protection ¹ policy positions, the precautionary principle must be applied and the benefits of the proposed project weighed against the benefits of aquifer integrity, long term water security and the socio-economic benefits that flow from protecting those values.		Noted	N/A
58	5a	General	General		Selection of the Target Formation for a Pilot Study From information provided by our members, AgForce understands that CCS into a water resource aquifer has not been undertaken elsewhere in the world and so is untested. The GAB is a critical water source for Queensland, its communities and agricultural industry, not to mention its great environmental and cultural value. AgForce has been a long-standing and strong supporter of GAB sustainability initiatives, with our members being significant investors and does not support taking any risks with the integrity of this resource.		Noted	N/A
58	5b	General	General		It is unclear what value the Project will bring as a pilot unless the intention is to develop the site, or other sites, to undertake more extensive CCS operations into similar water resource aquifers. Full details of the planned larger expansion of the Project should be made clear and how the design of the pilot will provide the robust and comprehensive data needed to assess, avoid and mitigate any risks to the GAB or other aquifers and their users, should the approvals to use aquifers for waste disposal be forthcoming. Locating the project into more conventional reservoir sites would deliver more widely applicable additional understanding for future CCS projects than using the currently identified target aquifer.		Noted	See Chapter 2 Project Description, section 2.3
58	5c	General	General		Following state government referral, the Proponent must consider and respond to the Independent Expert Scientific Committee (IESC) advice ² on the risks to the environmental values and other users and the adequacy of the methodologies used and proposed to be used by the Proponent. AgForce notes the following shortfalls identified in the IESC advice that should be addressed:		Noted	N/A
58	5d	General	General		- Requires improved baseline groundwater quality data prior to CO ₂ injection and setting of appropriate trigger values		Amended EIS	See Chapter 9 Groundwater, sections 9.7, 9.9 and 9.10
58	5e	General	General		- Inadequate documentation about the regional groundwater and plume migration models design, parameterisation and calibration		Amended EIS	See Chapter 9 Groundwater, section 9.9
58	5f	General	General		- Requires improved groundwater data and modelling and estimates of extent of plume migration, including the actions of other users with pre-existing rights of access		Amended EIS	See Chapter 9 Groundwater, section 9.9
58	5g	General	General		- More comprehensive monitoring network and sampling program needed, extending further spatially and temporally, for groundwater quality and impacts on shallower aquifers and injectate containment		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
58	5h	General	General		- More clearly justified impact management activities, including adequate, justified and comprehensive trigger values, and associated response actions and 'stop work' provisions.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
58	5i	General	General		AgForce are concerned that the IESC seems to be adopting an adaptive management approach to the identified deficiencies – this is concerning given the immediate interests of the users in the aquifer. We reject the IESC implication that future (but already approved) agricultural developments should be avoided to prevent potential migration of the plume. These pre-existing rights should dictate an alternate injection site is selected in the first instance		Noted	See Chapter 9 Groundwater, section 9.9
58	5j	General	General		The IESC advice identified additional measures needed to inform any scaling up of CCS into an aquifer in the future given the proposed proof-of-concept project rationale, specifically including:		Noted	N/A
58	5k	General	General		- Additional groundwater quality and pressure monitoring sites across multiple aquifers		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10
58	5l	General	General		- Adding existing landholder bores to the groundwater monitoring program to verify that important groundwater resources are not being adversely impacted by the project		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10
58	5m	General	General		- Extending the post-injection monitoring period to at least three years		Amended EIS	See Chapter 2 Project Description, section 2.11.11; and Chapter 9 Groundwater, section 9.10

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
58	5n	General	General		- Where impact predictions are exceeded, requiring additional monitoring, modelling and investigation		Amended EIS	See Chapter 9 Groundwater, section 9.10
58	5o	General	General		- Expanded monitoring of groundwater quality to address any potential risks to the future usability of the groundwater		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10
58	6a	General	General		Consideration of Actions of and Impacts on, other Users of the Aquifer (incl TOR 8.3, 9.2, 9.4, 9.12) Shallower aquifers within the GAB have a long history of take for agricultural purposes, including watering of livestock however, these shallower aquifers in the project area are at full sustainable allocation. This is recognised in the GAB and Other Regional Aquifers Water plan ³ and an increasing emphasis by users on deeper aquifers for the secure supply of water, including for relocating water resources or entitlements. This value is reflected in the increasing use and escalating cost of entitlements in these aquifers and is directly relevant to achieving the Murray Darling Basin Plan outcomes of communities with sufficient and reliable water supplies that are fit for a range of intended purposes and productive and resilient water-dependent industries and communities with confidence in their long-term future. The achievement of these outcomes when using GAB aquifers for CCS in this pilot and subsequent expanded projects needs to be more clearly identified and justified by the Proponent.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
58	6b	General	General		There are also Groundwater Dependent Ecosystems (GDEs) of environmental significance which are protected in the Water Plan and must be considered in any relocation proposal, which is why deeper aquifers in the project region are of interest to support further growth of food and fibre production.		Adequately dealt within the EIS, no change to the EIS	See Chapter 14B Aquatic Flora and Fauna
58	6c	General	General		As climate change exacerbates pre-existing rainfall variability such reliable and secure supplies of water will become increasingly vital to buffer impacts and support existing and increasing agricultural production levels. Indeed, CCS can help with addressing the climate change challenge, but only if it does not compete for the source of those very water supplies.		Adequately dealt within the EIS, no change to the EIS	Chapter 5 Climate, sections 5.5.3.1 and 5.7 2.1, Table 5-8
58	6d	General	General		AgForce support the integrity of primary production property rights, and economic development that occurs in a responsible and sustainable way where this does not reduce the certainty, security and reliability of current entitlements or increases the risk of adverse environmental impacts.		Noted	N/A
58	6e	General	General		A range of local businesses, including AgForce members, hold entitlements in the Precipice Sandstone for the human use environmental values of stock watering and farm use and these interests should be respected and protected. This contradicts the IESC advice that 'Given the depth of the Precipice Sandstone at the Project location and the limited predicted extent of impacts to groundwater quality, it appears unlikely that environmental values (EVs) will be affected should the Project operate as predicted'.		Amended EIS	See Chapter 9 Groundwater, section 9.9
58	6f	General	General		The Project is expected to greatly alter water quality in the aquifer and the IESC advises impact risk reviews lack site-specific data and plume modelling required expanded scenario analysis ⁴ . Acidification of the aquifer and associated mobilisation of elements, such as arsenic and lead, would make the water at the site unusable for other purposes.		Amended EIS	See Chapter 9 Groundwater, section 9.9
58	6g	General	General		Conservative impact assessment modelling needs to be provided which includes the interests and activities of other existing, or imminent, users in the vicinity of the Project. Environmental Approval conditions should retain the requirement to cease injection immediately the holder becomes aware that environmental harm has been caused or is likely due to the proponent's activities. This is consistent with AgForce's land use protection principles.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.12 and 9.13
58	6h	General	General		The economic benefits resulting from stock intensive uses of water can justify the costs of drilling bores greater than 2,000m deep into the Precipice. As other entitlements have been overlooked in the development of the EIS, the potential economic impacts and any costs of compensation for or remediation of those rights should be examined and included by the Proponent. This should be across a timeframe of retained responsibility appropriate to the identified risks of the propagation of impacts, which must be more clearly understood.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
58	7a	General	General		Adequacy of Proposed Monitoring (incl TOR 8.4, 9.4) The final Terms of Reference (TOR) for the Project identifies monitoring infrastructure including the 2021 West Moonie-2 Monitoring Well, a Gubberamunda Sandstone Aquifer Monitoring Bore (to be drilled in 2023) and a Shallow Alluvium Monitoring Bore.		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10
58	7b	General	General		Given a key outcome of the project is to provide critical data on all aspects of GHG stream plume behaviour, it is unclear how a single monitoring bore will be able to achieve this goal, compared to a more comprehensive network into all surrounding formations. This should be clarified and addressed by the proponent, as also identified by the IESC.		Amended EIS	See Chapter 2 Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10
58	7c	General	General		The EIS also proposes the injection site is located in a formation not in use by other users. A water supply bore in the Precipice Sandstone within 10km of the injection site is licensed and is being constructed, which is expected to change how any plume will propagate. The proponent should clarify how this evolving water use environment will be addressed by their modelling and monitoring program and impacts avoided.		Amended EIS	See Chapter 9 Groundwater, section 9.9 and 9.10
58	8a	General	General		Characterisation of the Quality of the Water in the Aquifer (incl TOR 9.4) The EIS indicates that water quality testing at the Project site showed that the water quality was indeed suitable for ongoing use for stock and other farm purposes. That is clearly why the aquifer is of significant past and future interest to other users and this should be clearly recognised by the Proponent. For example, low salinity (1,850 ppm total dissolved solids ⁵) levels are within what is useable for a range of livestock and less than what could be classed as saline. It is consistent with the stock water EV Water Quality objectives of no adverse effects on stock ⁶ . Similar water quality characteristics exist elsewhere within the GAB aquifers and there is no evidence that AgForce is aware of, that such quality characteristics have caused deterioration in stock health or condition. Management practices are also available to address any issues identified, such as elevated fluoride levels, including 'shandy' groundwater with other water supplies or making dietary adjustments within feedlot rations.		Amended EIS	See Chapter 9 Groundwater, section 9.7
58	8b	General	General		This is contrary to the interpretation applied in the EIS and the associated assumption that the water is unsuited to other uses. The proponent should review their interpretation of water quality used in relation to agricultural purposes and its implication throughout the EIS in relation to alternative uses and the suitability of the proposed site for CCS activities.		Amended EIS	See Chapter 9 Groundwater, section 9.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
58	9a	General	General		Limited Consultation with Interested Parties, including AgForce (incl TOR 6) AgForce members and our Land Use Protection Committee have had significant past interactions with the Proponent in relation to their earlier Wandoan project, including ensuring good communication and exchange of views. That earlier project was discontinued, at least partly in response to community concerns about the use of an aquifer containing good quality water for that CCS initiative. Those experiences do not seem to have		Amended EIS	See Chapter 9 Groundwater, sections 9.4 and 9.7
58	9b	General	General		In relation to the current Project, only limited interaction by the Proponent has occurred with our Land Use Protection Committee, who only have an advisory role to the AgForce Board. There has been no engagement with senior elected representatives at AgForce, at either a state-wide or regional level (our Southern inland Queensland Council for example) and with affected AgForce members close to the Project site prior to the EIS being released. The lack of engagement of our members near the site has meant that vital information, such as development intentions concerning the Precipice and associated groundwater take in the local area, has not been incorporated into the EIS and its supporting modelling. Relevant staff such as our Chief Executive Officer or water policy lead were also not contacted prior to the release of the EIS.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, Appendix 3A
58	9c	General	General		In our view this does not represent best practice consultation processes and should be remedied by the proponent in addressing the TOR requirements.		Noted	See Chapter 3 Community and Stakeholder Engagement, section 3
58	10a	General	General		Other Matters (TOR 9.13, 9.5) The Project involves road transportation of the CO ₂ from the Millmerran Power Station for 260 km to the injection site involving about nine round-trips per weekday. This is a significant additional usage with associated wear and tear on the road network and safety implications for other road users.		Adequately dealt within the EIS, no change to the EIS	See Chapter 11 Transport, section 11.6 and 11.7
58	10b	General	General		Biosecurity management plans for primary production properties being accessed in the course of the project should be respected and followed by the proponent and all associated entities, in addition to any statutory obligations as part of establishing good relationships should the project proceed.		Amended EIS	See Chapter 14 A Terrestrial Flora and Fauna, sections 14A5.7 and 14A.7
58	11	General	General		Conclusion AgForce has raised a range of concerns about the Project, including the use of an important and unique aquifer for waste disposal purposes, the precedent that might set for further use of the GAB for CCS, the impacts on the aquifer and other users, inadequate monitoring of impacts, poor characterisation of water quality at the site and its suitability for other uses and the limited consultation to date of AgForce and its members. For these reasons AgForce does not support this CCS project as currently proposed. For further information or to discuss this submission, please contact [REDACTED], General Manager – Policy on [REDACTED] or via email [REDACTED].		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9; and Chapter 3 Community and Stakeholder Engagement, Appendix 3A
59	1	General	General		Please find attached a submission into the CSTCo Surat Basin Carbon Capture and Storage Project from the Australasian Centre for Corporate Responsibility.		Noted	N/A
59	1a	General	General		Introduction ACCR welcomes the opportunity to provide input into the consideration of the Surat Basin Carbon Capture and Storage Project and the CTSCo EIS.		Noted	N/A
59	1b	General	General		The Australasian Centre for Corporate Responsibility (ACCR) is a not-for-profit, philanthropically-funded shareholder advocacy and research organisation that engages with listed companies and investors globally, enabling and facilitating active stewardship. Our research team undertakes company-focused research into the climate transition plans of listed companies, offering analysis, research and insights to assist global institutional capital understand investment risks and opportunities during the energy transition.		Noted	N/A
59	1c	General	General		ACCR holds significant concerns regarding the Surat Basin Carbon Capture and Storage Project as proposed by CTSCo based on the information that is currently available.		Noted	N/A
59	1d	General	General		ACCR notes there are key concerns with this project due to the potential contamination risks to aquifers linked to the Great Artesian Basin, and lack of detailed information available on groundwater as noted in the review by the Independent Expert Scientific Committee. We encourage greater scrutiny and independent scientific investigation of the groundwater impacts of this project.		Amended EIS	See Chapter 9 Groundwater, section 9.9
59	1e	General	General		Our expertise relates to the emissions profile of the proposal, and therefore this ACCR submission focuses on the climate related claims made in the proposal, particularly in relation to the emissions reductions opportunities from this proposed carbon capture project. There is a high level of public interest in this proposal, particularly as Glencore has already received \$35million in public funding in 2022 for this project linking it with the transition to a low emission future, ¹ with \$5million provided by the Federal Government for the project in 2021. ²		Noted	N/A
59	1f	General	General		ACCR acknowledges that, subject to the resolution of various “economic, political and technical” ³ issues, CCS may have a role in the decarbonisation of hard to abate industries such as steel and cement. Our concern is that to date, it has primarily been embraced and endorsed by the fossil fuel industry, with it being used to “rationalise - and subsidise - continued investment in fossil fuel infrastructure that would lock in emissions of CO ₂ and other pollutants for decades to come” ⁴		Noted	N/A
59	1g	General	General		ACCR has recently released detailed research into Glencore’s forward emissions profile for the company’s investors, which included a short analysis of the CTSCo project. We include insights from that research in this submission. Our analysis also considers the bigger picture for this project, as the proponent Glencore has released to shareholders a plan to investigate the potential of a Wandoan coal to hydrogen/ammonia project underpinned by the CTSCo EPQ10 storage project. ⁵		Not relevant to the EIS	N/A
59	1h	General	General		In essence, ACCR is concerned that this initial Surat Basin Carbon Capture and Storage Project may facilitate the creation of far more carbon emissions than it will ever sequester. While proposed to be a project contributing to emissions reduction goals, the opposite may eventuate. This project is a pilot, with the actual CTSCo Carbon Storage project several years away. The project is linked to a coal fired power station in a transitioning state moving away from coal fired electricity. The future project is being investigated to form a part of much larger projects including a 20Mtpa coal mine to hydrogen and CCS project, plus CCUS for enhanced oil recovery. Under the assumption that the linked projects proceed, there would be a net increase in emissions.		Noted	See Chapter 2 Project Description, section 2.3
59	1i	General	General		Our research suggests that this project and its long term intended use could have detrimental impacts and exacerbate climate change.		Noted	See Chapter 2 Project Description, section 2.3

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
59	1j	General	General		Our submission is in three parts: 1) An assessment of the emissions from the CTSCo pilot. 2) Emissions forecasts for the project if the potentially interconnected proposal for enhanced oil recovery at the site is considered - including a recommendation for the Qld Government to obtain more information from both proponents before assessment decisions are made. 3) Assessment the longer term emissions impact of the project if it is successful and becomes the carbon capture site for the Wandoan coal to hydrogen/ammonia project, as is being studied by proponent Glencore.		Noted	N/A
59	1k	General	General		Please feel free to be in touch with ACCR to discuss any element of this submission.		Noted	N/A
59	2a	General	General		Response to the EIS 1. EIS Climate Section - Assessment of Net Impacts Within the EIS, as a key justification for pursuing the project, Glencore asserts that CTSCo has the potential to “contribute to Australian and Queensland Government climate and emission reduction goals”. However, by the end of the third operational year, the project’s EIS documents note it will have only contributed net GHG emissions savings of 0.1% towards the Queensland’s 2030 emissions reductions target.		Adequately dealt within the EIS, no change to the EIS	Chapter 1 Introduction, section 1.2; Chapter 2 Proposed Project Description, section 2.3; and Chapter 5 Climate, section 5.8.1.
59	2b	General	General		To further understand the efficacy of CTSCo’s sequestration potential, ACCR has analysed Glencore’s summary of modeled GHG emissions for the project in the climate section of the EIS.		Noted	N/A
59	2c	General	General		The total scope of 1, 2, and 3 emissions during the pilot phase will be approximately 266 kt, while the total sequestration will be around 330 kt, with GHG stream impurities estimated to be 2% or 6.6 kt. Based on this, the net CO2 efficiency of the project is expected to be 55% ⁶ , indicating the percentage of CO2 sequestered from the total project emissions.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1.
59	2d	General	General		When excluding emissions from the construction phase, the project’s emissions equate to ~250 kt. This implies CO ₂ efficiency post-pilot phase would be at best 56%.		Adequately dealt within the EIS, no change to the EIS	See Chapter 5 Climate, section 5.5.1.
59	2e	General	General		Additionally, the project will only capture a small proportion of emissions from the Millmerran Power station (MPS). With total annual MPS emissions of 5.1 MtCO ₂ , the total annual capture rate of the CSTCo carbon capture project in its first three years would equate to only 2% of MPS emissions.		Noted	See Chapter 2 Project Description, section 2.3
59	2f	General	General		While this CTSCo project is only proposed as a pilot at this stage, the International Energy Agency states, “The reduction in net electricity output of a coal-fired power plant unit retrofitted with CO ₂ capture is around 20%.” ⁷		Noted	See Chapter 2 Project Description, section 2.3
59	2g	General	General		This small emissions reduction figure may be inflated if additional emissions from the CO ₂ sequestration process are caused due to utilisation of the CO ₂ for enhanced oil recovery at the Moonie Oil Field, as outlined below.		Not relevant to the EIS	N/A
59	3a	General	General		2. Enhanced Oil Recovery The captured CO ₂ from the CTSCo project may be utilised by Bridgeport Energy for enhanced oil recovery (EOR) in the Moonie Oil Field. ⁸ This process involves injecting CO ₂ into an oil reserve, which will increase the amount of oil that can be extracted. The project will require 960 kt of CO ₂ to be injected into the well, with 768 kt of it being sequestered in the ground. This represents 14.5% of the reservoir’s capacity and will result in the recovery of 1.3 Mt of crude oil, based on the relative substance density of 741 kg/m ³ for Moonie Crude Oil.		Not relevant to the EIS	N/A
59	3b	General	General		Proponent Bridgeport Energy notes in its Moonie Oil Field EA Amendment Application, publicly accessible via New Hope Group’s website ⁹ , that access to CO ₂ for its EOR process may likely come from the CTSCo project, stating: ¹⁰ <i>The refined CO₂ delivered from the CTSCo owned post combustion capture plant located at the Millmerran Power Station (or from other sources) will be transported by truck to the receiving cryogenic storage tanks (-20C and 300psi) to be located on the well pad alongside M27.</i>		Not relevant to the EIS	N/A
59	3c	General	General		The application also notes: <i>Bridgeport Energy will enter into a supply agreement with CTSCo the owner of the PCC plant being constructed at the Millmerran Power Station. This agreement specifies that CTSCo will have to present on delivery to the Moonie Oil Field a certified gas composition specification from a NATA accredited analysis laboratory validating that the quality of the CO₂ and other gases being supplied.</i>		Not relevant to the EIS	N/A
59	3d	General	General		It is important to consider the downstream emissions associated with this EOR process. Using Australian National Greenhouse Accounts Factors, this additional oil from the full Bridgeport proposal as currently drafted will result in approximately 4 million tonnes of CO ₂ , which is more than five times the amount that the Bridgeport project is designed to sequester. This means that the project will ultimately put more CO ₂ into the atmosphere than it will avoid.		Not relevant to the EIS	N/A
59	3e	General	General		TABLE OF MOONIE OIL EMISSIONS		Not relevant to the EIS	N/A
59	3f	General	General		ACCR recommends further investigation by the Queensland Government into the volume of CO₂ from the CTSCo project site that is proposed to be utilised for oil recovery. Further information should be sought from both proponents into the overall net emissions impact of these potentially linked proposals, including the scope 3 considerations of the estimated emissions from burning the recovered crude oil.		Not relevant to the EIS	N/A
59	4a	General	General		3. Wandoan coal Glencore states that the “CTSCo’s injection testing of the CO ₂ storage is a potential pathway to an industrial scale storage hub in Queensland, capable of servicing multiple industries, including power generation, hydrogen production, cement manufacturing, steel manufacturing, fertiliser production and chemical manufacturing”. ¹¹ The company’s goal is to validate the site for the injection testing project and to offer fundamental data for future industrial scale CO ₂ storage.		Noted	See Chapter 2 Project Description, section 2.3
59	4b	General	General		According a Glencore investor presentation from December 2022, ¹² the proposed Wandoan coal mine in the Surat Basin could be linked to an industrial scale pathway hinging on storage at the CTSCo EPQ10 carbon storage site. Glencore has stated it is studying the possibility of using Wandoan coal as a feedstock for the production of blue hydrogen and ammonia. See the slide from the Glencore 2022 Investor Day presentation below. Under the ‘Glencore Surat Hydrogen project’, hydrogen would be synthesised through coal gasification, with the majority of the CO ₂ produced to be captured at the CTSCo EPQ10 carbon storage site.		Noted	See Chapter 2 Project Description, section 2.3

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
59	4c	General	General		SLIDE 11 FROM GLENCORE'S DEC 2021 INVESTOR DAY PRESENTATION		Noted	Noted
59	4d	General	General		However, coal gasification is a highly intensive fuel process, producing 183 kg of CO ₂ e per GJ of energy ¹³ . Even if coupled with 90% efficient CCS, this method would still likely produce more lifecycle emissions than natural gas.		Not relevant to the EIS	N/A
59	4e	General	General		Regardless of industry, to fully sequester emissions from Wandoan coal, Glencore would need to capture approximately 45Mt per year of emissions. This is more than the largest coal-related CCUS plant in operation today, the Great Plains Synfuels Plant in the US, with a capacity of 3 Mt, and even greater than the total combined sequestration capacity of the entire coal-related CCUS pipeline due for completion in 2030 ¹⁴ .		Not relevant to the EIS	N/A
59	4f	General	General		CHART OF EST ANNUAL EMISSION FROM WANDOAN COAL		Noted	Noted
59	4g	General	General		ACCR is concerned that Glencore could use the CTSCo pilot project to justify investment in a highly emissions intensive coal to hydrogen/ammonia project in the Surat basin that is a net contributor to significant CO ₂ emissions. The current proposals could set unrealistic expectations for the sequestration opportunities from the proposed CTSCo EP010 storage site.		Noted	See Chapter 2 Project Description, section 2.3
60	1	General	General		Please find attached submission for proposed Surat Basin Carbon Capture and Storage Project.		Noted	N/A
60	1	General	General		Introduction: We are the owners and operators of 2 grazing properties, "██████████" and "██████████", approximately 35 km north of the proposed site of the Carbon capture and storage project. We are in the northern area detailed in the EIS. Both properties are fully watered by a bore on each property and reticulated through poly pipe. The bore on "██████████" is 1600 m deep and "██████████" is 1200 m deep.		Noted	N/A
60	2a	General	General		Concerns: 1. No consultation - we have not been advised that we are in the area potentially impacted by the proposed project. We have not been contacted by the proponent.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4 and 3.5
60	2b	General	General		2. Likely impact on underground water - it appears highly likely that the proposed project as per the EIS will have an impact on the underground water tables.		Amended EIS	See Chapter 9 Groundwater, section 9.9
60	2c	General	General		3. Irreversible impacts - given the nature and scale of the proposed impacts to underground water tables, make		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and
60	2d	General	General		4. Proponent unqualified - the proponent has no track record in the business of carbon storage. In their EIS they have demonstrated their lack of understanding of the underground water by referring to the water in the proposed injection site as saline at 1850 ppm. Up to 4000 ppm is still suitable for use by cattle and sheep.		Amended EIS	See Chapter 1 Executive Summary, section 9.5, Chapter 9 Groundwater, sections 9.4.4 and 9.7
60	2e	General	General		5. Polluting of Great Artesian Basin - the Great Artesian Basin is a natural wonder that is heavily relied on by many rural industries and towns. Water is a necessary resource that should not be jeopardised. It is very clear the risks to the Great Artesian Basin from the proposed project are real and the proponents application should be refused.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.9
60	2f	General	General		6. Expert advice - we request that the expert advice used by your department in considering this proposal be made available to the affected community via a community meeting with your experts as soon as possible. Speaking with a number of landowners in the impacted area, no one has expressed support for this proposal and all expressed a need for information from experts other than the proponents experts.		Noted	N/A
60	2g	General	General		7. Precautionary Principle - the proposed project is high risk that it will impact on the Great Artesian Basin with no possibility of make good or remediation. The Precautionary Principle is well known and must be used in assessing this proposal.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
60	2h	General	General		8. Alternative Carbon storage options - there are many ways of storing Carbon. Many of these are no risk, safe and beneficial. Increasing soil Carbon is one of these which we are involved in and there is a huge potential for expansion. The alternative options for Carbon storage means it is unnecessary to store Carbon in a way that will impact on the Great Artesian Basin.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, sections 2.3 and 2.15
60	3	General	General		Conclusion: We submit that the proponent has not satisfied their requirement to consult the community and request that they be instructed to revisit this requirement and consult with the community in a satisfactory manner that would include individual notification and well run and advertised community meetings with their experts available to answer questions. We request that your own experts also attend these meetings and also provide expert advice to the community. We request that you adopt the precautionary principle and refuse the proponents application.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4 and 3.5
61	1	General	General		Please find attached a submission to the Chief Executive regarding the Draft EIS for the Surat Basin Carbon Capture and Storage Project. I would be happy to discuss this submission if required and would appreciate being informed of any responses		Noted	N/A
61	1	General	General		I take this opportunity to make a submission on behalf of Southern Queensland Landscapes regarding the Environmental Impact Statement (EIS) for the Proposed Surat Basin Carbon Capture and Storage Project. In the first instance I thank the Department and Carbon Transport and Storage Corporation (CTSCo) for providing access to the Draft EIS along with extensive related information. The information and animations on the CTSCo website provide a great process introduction and overview to allow feedback to be provided in context and		Noted	N/A
61	2	General	General		Southern Queensland Landscapes is a community owned organisation dedicated to connecting and supporting our communities to take care of their landscapes. The Flourishing Landscapes and Healthy Communities Plan has been developed with and for the Community, supported by Southern Queensland Landscapes, through funding from the Australian Government's National Landcare Program. Guided by the plan we:		Noted	N/A
61	3	General	General		- Help land managers find ways to ensure profitable, sustainable and ethical food and fibre production whilst taking care of our waterways, biodiversity and soil. - Partner with land managers, First Peoples, governments, industry, academia, Landcare and community groups to learn more about our landscapes and share this knowledge. - Find opportunities for land managers, First Peoples, communities and industries to improve their economic,		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
61	4	General	General		Southern Queensland Landscapes have been contacted by interested parties who have raised concerns about aquifer water pressure, aquifer water quality and aquifer integrity. They have also advised that bores drilled into the Precipice Sandstone aquifer in the vicinity of proposed works are in fact used for stock and domestic purposes.		Noted	N/A
61	5	General	General		Following a limited review of data made available by CTSCo, SQ Landscapes has some concerns about the adequacy of the groundwater and geological monitoring described for the project. The project is presented with a strong indication of low risk and capacity to secure systems immediately if anomalies are encountered. It is also highlighted, however, in the Draft EIS that this is new science and there remain some unknowns. The following are therefore provided for consideration in taking a precautionary approach to monitoring impacts on the injection aquifer and risks to adjacent aquifers.		Amended EIS	See Chapter 2 Project Description, sections 2.11.2 and 2.11.5; and Chapter 9 Groundwater, section 9.10
61	6	General	General		Monitoring outlined for the project includes only one monitoring bore in the injection aquifer and no monitoring bores in the immediately overlying aquifers, in particular the Hutton Sandstones		Amended EIS	See Chapter 2 Project Description, sections 2.11.2 and 2.11.5; and Chapter 9 Groundwater, section 9.10
61	7	General	General		With only a single monitoring bore in the Precipice Sandstone it is suggested that calibration and validation of modelling and seismic monitoring will be limited. Pressure gradients and chemical dispersion are likely to be nonlinear, making single point of truth monitoring for calibration questionable. It is not clear from the monitoring information provided whether the monitoring bores are equipped with a Fluid Recovery System (FRS) as was recommended in learnings from previous studies.		Amended EIS	See Chapter 2 Project Description, section 2.11.5; and Chapter 9 Groundwater, section 9.10
61	8	General	General		With no monitoring set up in the Hutton Sandstone, any leakage will have limited likelihood of being detected in the life of the project. There are two layers between the Huttons and the Gubberamunda where the first overlying aquifer monitoring bore is placed.		Amended EIS	See Chapter 2 Project Description, section 2.11.5; and Chapter 9 Groundwater, section 9.10
61	9	General	General		Public confidence in the process and any evolving risk management would be enhanced if the documented continuous remote access to monitoring data was made available to the public, or at least to an independent body.		Adequately dealt within the EIS, no change to the EIS	See Chapter 3, Community and Stakeholder Engagement, section 3.3
61	10	General	General		From the summary of observed changes in groundwater (to 2021) listed in Appendix 9A it seems the Precipice Sandstone aquifer is losing pressure near Moonie at 2 to 5 m/yr. SQ Landscapes has been unable to access any raw data for the associated monitoring bore to determine if time series monitoring of pressures and regular monitoring of water quality is taking place at this existing monitoring site. Assurances of such monitoring prior to injection and during the project period, and of access to the data would be encouraging and would increase the public confidence in monitoring for the project. Without some pre-injection detailed pressure and trend data it will be difficult to evaluate any change in or near the modelled plume area. Given this is a pilot for potential ongoing injection into this aquifer, measuring even what is expected to be a small impact on the aquifer is critical to inform ongoing management decisions.		Amended EIS	See Chapter 9, sections 9.7 and 9.9
61	11	General	General		In matters not related to the groundwater, it is noted that works will try to minimise impacts on the floodplain, Stephen's Creek and stands of Brigalow. In project operations and in rehabilitation works consideration could be given to multispecies planting with a view to stabilizing soils and improving native ecosystem extent and connectivity.		Noted	See Chapter 19 Rehabilitation, section 19.5.5
61	12	General	General		During operations and rehabilitation, consideration could also be given to best practice land management with consideration of grazing management, fire risk management and biodiversity management. Such considerations should include liaison with neighboring properties to ensure management of biodiversity and fire are coordinated at a suitable scale.		Noted	See Chapter 19 Rehabilitation, section 19.5.5; and Chapter 15 Hazard and Safety, sections 15.7.2.4 and 15.7.2.5
61	13	General	General		In closing, I again thank the Department and CTSCo for the opportunity to comment on the Draft EIS. I would welcome the opportunity to clarify any of the points made above or to identify opportunities for SQ Landscapes to work with the project proponents to support flourishing landscapes and healthy communities.		Noted	N/A
62	1	General	General		The Department of Regional Development, Manufacturing and Water (RDWM) thanks you for the opportunity to review the draft Environmental Impact Statement (EIS) for the proposed Surat Basin Carbon Capture and Storage Project.		Noted	N/A
62	2	General	General		Please find attached RDMWs preliminary submission. I have been advised RDMW will continue to engage with Department of Environment and Science regarding legislative responsibilities.		Noted	N/A
62	3	General	General		I would also like to point RDMWs general comment (reference 1) in the attached preliminary submission: <ul style="list-style-type: none"> - There are several towns that rely solely on GAB bore water for their drinking water supply. - Carbon capture and storage (CCS) can impact groundwater for drinking water through potential leakage or seepage of the stored carbon dioxide (CO2) into the surrounding aquifers. Leaking CO2 can lead to a decrease in pH levels of the groundwater via the formation of carbonic acid, which can cause changes in the chemical composition of the water. <ul style="list-style-type: none"> - The changes in the chemical composition of water can also affect the solubility of metals in the groundwater, potentially leading to the release of heavy metals and other pollutants into the water supply. The risk of CCS impacting groundwater for drinking water can vary depending on the geological and hydrogeological characteristics of the storage site, as well as the design and construction of the storage mechanism. - Evidence and risk-based monitoring and management of CCS sites, as well as the selection of appropriate sites, can help minimize the potential impacts of CCS on groundwater for drinking water. 		Amended EIS	See Chapter 2 Project Description, Chapter 8 Geology, Chapter 9 Groundwater.
62	4	General	General		Please do not hesitate to contact me with any questions or concerns.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	1	General	General		<p>The Department of Regional Development, Manufacturing and Water offers the following comments:</p> <ul style="list-style-type: none"> - There are several towns that rely solely on GAB bore water for their drinking water supply. - Carbon capture and storage (CCS) can impact groundwater for drinking water through potential leakage or seepage of the stored carbon dioxide (CO₂) into the surrounding aquifers. - Leaking CO₂ can lead to a decrease in pH levels of the groundwater via the formation of carbonic acid, which can cause changes in the chemical composition of the water. - The changes in the chemical composition of water can also affect the solubility of metals in the groundwater, potentially leading to the release of heavy metals and other pollutants into the water supply. - The risk of CCS impacting groundwater for drinking water can vary depending on the geological and hydrogeological characteristics of the storage site, as well as the design and construction of the storage mechanism. - Evidence and risk-based monitoring and management of CCS sites, as well as the selection of appropriate sites, can help minimize the potential impacts of CCS on groundwater for drinking water. 	For consideration and noting.	Amended EIS	See Chapter 2 Project Description, Chapter 8 Geology, Chapter 9 Groundwater.
62	1a	General	General		RDMW notes the site is located in the Murray Darling Basin. Therefore, the Australian Government may have an interest in the proposed project.	For consideration and noting.	Amended EIS	See Chapter 9 Groundwater, section 9.4.5.
62	1b	General	General		It is recommended the proponent seek advice from RDMW regarding the Aboriginal and Torres Strait Islander water reserves.	The proponent should seek advice from RDMW regarding Aboriginal and Torres Strait Islander water reserves.	Amended EIS	See Chapter 9 Groundwater, section 9.6.2.1.4.3.
62	1c	0 10	Executive Summary Surface Water	Section 3, EIS and Project Approvals Process, page 11 Section Section 10.7.2.1.1 Sediment Generation page 26	<p>Text: <i>"Concurrently or subsequent to amendment of the Environmental Authority (EA), other approvals to be sought by CTSCo include, but may not be limited to:</i></p> <ul style="list-style-type: none"> • <i>permit/s for crossing of watercourse/s or waterway barrier works, unless otherwise exempt. "</i> <p>In the event a Riverine Protection Permit, Riverine Protection permit exemption is required, contact water services for discussion.</p>	The proponent is encouraged to contact the Department of Regional Development, Manufacturing and Water's (RDMW) Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300, for discussion on Riverine Protection Permit and Riverine Protection permit exemption requirements.	Amended EIS	See Executive Summary, sections 3, and 9.6; Chapter 4 Approvals, section 4.4.23; Chapter 10 Surface Water, sections 10.7.2.1.1 and 10.8; Chapter 21 Register of Commitments, Table 21-3; and Chapter 22 Proposed EA Condition Amendments, Table 22-1.
62	2	0 2 8 9	Executive Summary Chapter 2 Project description Chapter 8 Geology Chapter 9 Groundwater	Section 7.4 and 7.5 Section 2.11 Section 8 9 Section 9 3.5.1	<p>Summary of issue: There is a requirement to monitor groundwater quality and groundwater pressure with a monitoring bore in the Hutton Sandstone Aquifer.</p> <p>The draft EIS currently states there are no plans to monitor water quality within the Hutton Sandstone Aquifer (Section 7.4 and Section 7.5 page 34).</p> <p>The Hutton Sandstone is the most heavily used aquifer by water bores in the Surat Basin (although not in the local vicinity of the injection site) and is located closer to the Precipice Aquifer than the Gubberamunda Sandstone, which is proposed to be monitored for water quality.</p> <p>It is noted a large part of the monitoring strategy depends on seismic and neutron density data. There will be greater community and regulator confidence in the monitoring if the seismic monitoring is complemented with a monitoring bore in the Hutton Sandstone.</p> <p>At the proponent's draft EIS agency briefing held on 6 February 2023, it was indicated if other monitoring, such as neutron density or seismic monitoring, is required water quality monitoring in the Hutton could be undertaken. It was also suggested that if CO₂ was moving upward from the storage site behind the casing of the injection bore or Precipice monitoring bore, then the project would sample water quality in the Hutton by shooting slots through the casing of the Precipice monitoring bore and sample the Hutton groundwater through this reconstructed bore.</p> <p>This would result in the Precipice monitoring bore tapping both the Precipice and the Hutton aquifers and would disrupt future monitoring of the Precipice Aquifer. The water sample taken from the Hutton would not be able to be compared with any baseline water quality data, making such monitoring of limited value.</p> <p>Reconstruction of the monitoring bore is also in contravention of water bore construction standards, which require bores to only tap a single aquifer.</p> <p>RDMWs preferable approach would be to establish a dedicated monitoring bore in the Hutton aquifer and establish a baseline water quality for this bore before CO₂ injection occurs.</p>	Include a monitoring bore in the Hutton Sandstone Aquifer to the proposed monitoring regime for the CO ₂ injection site in the final EIS.	Amended EIS	See the Executive Summary, sections 7.3 2, and 7.4.6 2; Chapter 2 Proposed Project Description, sections 2 8.1.2 2, 2.11.5 2, 2.11.7; and Chapter 9 Groundwater, sections 9.8 and 9.10.
62	3	0	Executive Summary	Section 7.4.6.4, 2nd paragraph	<p>Summary of issue: Clarify whether the Gubberamunda monitoring bore would only be converted to a water bore for irrigation or stock and domestic purposes (if the relevant rules for such water bores are adhered to).</p> <p>Converting the Gubberamunda monitoring bore to a water bore for irrigation or stock and domestic purposes may require the landholder to obtain a development permit. Any physical changes to the bore construction will need to be undertaken by a licenced water bore driller.</p>	Amend the paragraph in the final EIS to state the following: <i>"Subject to negotiations with the landowner, and their receipt of relevant approvals from the Department of Regional Development Manufacturing and Water, the Gubberamunda Monitoring Bore may be converted to a water supply bore for stock and domestic or irrigation purposes during the rehabilitation phase of the Project, using an appropriately licenced water bore driller to undertake any modifications to the bore construction. Otherwise, the bore will be fully rehabilitated."</i>	Amended EIS	See Executive Summary, section 7.4.6.5; Chapter 2 Proposed Project Description, sections 2.12 and 2.16; and Chapter 9 Groundwater, section 9.10.2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	4	0 2 8 9 20 21 Appendix 9A	Executive Summary Chapter 2 Project description Chapter 8 Geology Chapter 9 Groundwater Chapter 20 Cumulative impacts Chapter 21 Commitments Appendix 9A Groundwater impact assessment	Section 5 2 page 15, Section 8 Consultation, pages 35-36 Section 2 3.1 page 6, Section 2.15.2 p56 Section 8 5.1.1, Section 8.6 Page 69, Section 8.7, section 8.7.3 Section 9 2.7.2.1, Section 9 2.7.3, section 9.3.6.2.2, Section 9 5.3.3, Section 9.7.4 Section 20.5 2.2	Summary of issue: Consider potential effects of CO ₂ injection on Precipice water licence holders, and the effects of these long-term water licences on the long-term CO ₂ plume. The draft EIS has not adequately considered the effects of the proposed project on <u>existing and potential future water licence holders</u> in the Precipice Sandstone Aquifer, or the potential effects of these water licence holders on the proposed long-term CO ₂ plume. The rules within the Great Artesian Basin and Other Regional Aquifers (GABORA) Water Plan 2017 for granting unallocated water, granting stock and domestic water licences, and relocating water licences, allow for future new water licences to be located within the immediate vicinity of the proposed CO ₂ injection scheme, at any time. Currently there is a water licence located within 10km of the proposed injection site as per the GABORA Water Plan 2017 rules. Studies undertaken for the draft EIS have not accounted for the foreseeable circumstance of there being more water licences granted in the future, within the vicinity of the proposed CO ₂ plume. Section 8.7 of the draft EIS states “ <i>the Project’s Monitoring and Verification Plan is designed ... to achieve 2 distinct objectives: containment and conformance.....Ensure containment: to protect groundwater resources (and other factors)....Ensure conformance by demonstrating that actual storage performance is consistent with expectations .</i> ”	The following should be assessed and explained in the final EIS: 1. The potential for groundwater extraction under existing and future new water licences in the Precipice Sandstone to move or alter the nature of the stored CO ₂ plume. 2. The potential for the quality of the groundwater extracted under existing and future new Precipice Sandstone water licences to be affected by the CO ₂ plume. Groundwater modelling for the final EIS should account for potential future take from the Precipice. The final EIS should include avoidance and mitigation measures for any consequences caused by this eventuality or any other factor that causes the plume to move beyond the expected extent. The final EIS should include appropriate monitoring and adaptive management arrangements that deal with these issues. And in a way that can be easily understood by existing water licence holders, RDMW, and any potential future water licence holders who might in the future consider applying for a water licence in the Precipice Sandstone, within 50km of the proposed injection site. These arrangements should be planned to be well established and in place	Amended EIS	See Executive Summary, section 9.5; Chapter 2 Proposed Project Description, section 2.11; and Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4 2, 9.9 2, 9.9.6, 9.10, 9.10.1.8, 9.11, 9.12, and 9.13.
62	5	0 2	Executive Summary Chapter 2 Project Description	Section 5 3, Infrastructure Alternatives, page 15. Section 7.1 Proposed Project Site and Locality Description, page 16 Section 2.6, page 16	Text: “...Using horizontal directional drilling (HDD) to install a 107 m section under South Branch Stephens Creek”. Using horizontal direct drilling may reduce impacts on surface water. However, given the ephemeral nature of the water feature it is likely water may be present in the bed sands of the feature. Groundwater may also be affected depending on the depth of the drilling.	The proponent is encouraged to contact RDMW’s Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300, to discuss the depth of horizontal drilling and any legislative requirements.	Amended EIS	See Executive Summary, section 5.4; and Chapter 2 Proposed Project Description, section 2 9.3.
62	6	0 2 9A	Executive Summary Chapter 2 A comment made by Emeritus Professor Sue Golding from the University of Queensland at the draft EIS agency briefing on 6th February 2023 Appendix 9A Groundwater impact assessment	Section 2.11.1 Sections 5.3.2 and 5.3.3	Summary of issue: Clarify the expected long-term nature of the proposed CO ₂ plume in the Precipice Sandstone Aquifer. The draft EIS Section 2.11.1 states the plume is expected to remain in perpetuity. Appendix 1C of the draft EIS states “ <i>Emeritus Professor Sue Golding (University of Queensland) was involved in gas, rock and water interactive chemistry experiments and geochemical modelling for the draft EIS .</i> ” At the proponent’s draft EIS agency briefing held on 6 February 2023, RDMW officers noted that Professor Golding indicated “ <i>The plume won’t last forever, particularly the geochemistry impacts .</i> ” The final EIS should clarify the length of time the plume is expected to be present. This will allow stakeholders and RDMW to better understand the long-term impacts of the proposed CO ₂ injection testing and it will also inform long term monitoring and management of the CO ₂ plume. The EIS appears to have inadequately identified the expected long-term water quality within the storage site of the Precipice Sandstone. In particular, further discussion of the following is required: 1- The fates of residual CO ₂ gas and dissolved HCO ₃ ⁻¹ and their long- term effects on groundwater quality and the matrix of the Precipice Aquifer and Evergreen aquitard. 1- The consequences of increased Fe ²⁺ levels and decreased Mg ²⁺ and Ca ²⁺ levels in groundwater and their long- term effects on groundwater quality and the matrix of the Precipice Aquifer. 1- The increased CO ₂ at the Precipice/Evergreen contact will potentially continue dissolution in water and reacting with the rock matrix. 1- The potential variability in the composition of the injection fluid or the reaction regimes that result in gases such as SO ₂ and NO ₂ having negligible impacts. 1- Whether the batch experiments were done under similar conditions as the proposed storage site, especially in relation to temperature and pressure, and the presence of catalysts. This is important because of the potential mobilisation of heavy metals (Pb, As, Cd) and other metals (Zn and Mo), which needs to be also understood and	Identify the long- term groundwater quality around and within the CO ₂ storage site of the Precipice Sandstone in the final EIS. The final EIS should clarify the expected long-term nature of the CO ₂ plume and explain the long-term monitoring and management arrangements that will be required for managing the effects of the CO ₂ plume on existing and future groundwater users in the Precipice Sandstone. These long-term arrangements need to be explained for a time frame that covers the expected period over which the plume will remain in the aquifer; not just over the two-year period following the injection testing. An explanation is required regarding: 1. The fates of residual CO ₂ gas and dissolved HCO ₃ ⁻¹ and their long- term effects on groundwater quality and the matrix of the Precipice Aquifer and Evergreen aquitard. 2. The consequences of increased Fe ²⁺ levels and decreased Mg ²⁺ and Ca ²⁺ levels in groundwater, and their long- term effects on groundwater quality and the matrix of the Precipice Aquifer. 3. The increased CO ₂ at the Precipice/Evergreen contact because it will potentially continue dissolution in water and reacting with the rock matrix. 4. The potential variability in the composition of the injection fluid and the reaction regimes that result in gases such as SO ₂ and NO ₂ having negligible impacts. 5. Whether the batch experiments were done under similar conditions as the proposed storage site, especially in relation to temperature and pressure, and the presence of catalysts. This is important because of the potential mobilisation of heavy metals (Pb, As, Cd) and other metals (Zn and Mo), which needs to be also understood and explained in the EIS.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.4.1; Chapter 9 Groundwater, sections 9.6.4, 9.6.5, 9.7.5, 9 9.3, 9.9.7; and Appendices 9C and 9D.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	7	0 4	Executive Summary Chapter 4 Approvals	Section 9.5.2 Section 4.4.6.4	<p>Summary of issue: The draft EIS suggests that the rights of water licence holders to take water from an aquifer, are dependent on the native water quality in that aquifer being in adherence to the environmental values or water quality objectives established under the Environmental Protection (Water and Wetland Biodiversity) Policy, 2019.</p> <p>RDMW has concerns with the suggestion that the existing water quality of the Precipice Sandstone Aquifer is unsuitable for stock watering.</p> <p>There is a water licence holder in the Precipice Sandstone (located approximately 10km from the proposed injection well) and plans to use the local Precipice groundwater for watering stock for intensive agricultural purposes.</p> <p>The groundwater within this part of the Precipice Sandstone aquifer is only slightly saline and the moderately high fluoride concentrations in the groundwater do not render the water unsuitable for many stock watering applications; especially if the fluoride concentration is diluted with water from other sources such as the Gubberamunda Sandstone, or if the water is treated, or if the exposure of animals to the elevated fluoride water is appropriately managed.</p> <p>The Precipice Sandstone Aquifer is currently used for industrial and intensive animal production and there are users willing to treat saline water before use. Precipice Aquifer water licences are also authorised for Town Water Supply and other uses across the aquifer.</p> <p>Furthermore, the EIS should not use the environmental values and water quality objectives criteria identified in Queensland Murray-Darling and Bulloo River Basins; Groundwater Environmental Values and Water Quality Objectives (Environmental Protection (Water and Wetland Biodiversity) Policy, 2019) as justification for not assessing the effects of the proposed CO2 injection on current and future water licence holders in the Precipice Sandstone Aquifer, or for not assessing the effects of the proposed CO2 plume on the quality of groundwater that these current and future water licence holders extract.</p> <p>The Environmental Protection (Water and Wetland Biodiversity) Policy 2019 is not intended to be used to</p>	<p>Include commentary in the final EIS to explain:</p> <ol style="list-style-type: none"> The Precipice Sandstone groundwater is suitable for many stock watering applications, even though it does not naturally meet the environmental values and water quality objectives criteria identified in Queensland Murray-Darling and Bulloo River Basins; Groundwater Environmental Values and Water Quality Objectives (Environmental Protection (Water and Wetland Biodiversity) Policy, 2019). There is a water licence holder in the Precipice aquifer located 10km from the proposed injection well that is developing a business based on their intent to use the Precipice groundwater to water stock. <p>The potential for diluting the concentrations of minerals such as fluoride, by mixing the groundwater with water from other sources such as the Gubberamunda Sandstone, or through treatment, or by managing the exposure that stock have to the elevated fluoride water, is required to be addressed as part of this explanation.</p> <p>The final EIS should not use the environmental values and water quality objectives criteria identified in Queensland Murray-Darling and Bulloo River Basins; Groundwater Environmental Values and Water Quality Objectives (Environmental Protection (Water and Wetland Biodiversity) Policy, 2019) as justification for not assessing the effects of the proposed CO2 injection on current and future water licence holders in the Precipice Sandstone Aquifer, or for not assessing the effects of the proposed CO2 plume on the quality of groundwater that these current and future water licence holders extract.</p> <p>The Environmental Protection (Water and Wetland Biodiversity) Policy 2019 is not intended to be used to diminish the rights of water licence holders to take water.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.6, 9.7, 9.9.3, 9 9.4, 9 9.6, 9.9.7, 9.9 8, 9.9.9; and Appendices 9E and 9F.
62	8	Executive Summary 2 8 9 17 20 Appendix 09A 21	Executive Summary Chapter 2 Proposed Project Description Chapter 8 Geology Chapter 9 Groundwater Chapter 17 Social and Proposed EA Condition Amendments, page 70 Appendix 09A Chapter 21 Commitments	Section 7.4.6.4, page 33 Gubberamunda Monitoring Bore, Section 9.15 Rehabilitation, page 68 Table 10.1 Summary of Key Commitments and Proposed EA Condition Amendments, page 70 Section 2.6 Proposed Project Site and Locality Description, page 16 Table 2-11 Summary of Commitments page 58 Section 2.12, Chapter 02 Project Description, page 53 (rehabilitation)	<p>Text: <i>"Subject to negotiations with the landowner, the Gubberamunda Monitoring Bore may be converted to a water supply bore for stock and domestic or irrigation purposes during the rehabilitation phase of the Project. Otherwise, the bore will be fully rehabilitated."</i></p> <p>If the agreement results in the conversion of the Gubberamunda Monitoring Bore into a water supply bore for stock and domestic or irrigation purposes during the rehabilitation phase of the Project, it will need to comply with relevant Water Plan.</p> <p>Water licences will also need to be obtained for the use of the bore as a water supply bore.</p> <p>Obtaining an authorisation may be difficult and unattainable depending on the volume and locations.</p>	<p>Identify the relevant water plan requirements for these works in the final EIS.</p> <p>The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300, to discuss entitlement options.</p>	Amended EIS	See Executive Summary, section 7.4.6.5; Chapter 2 Proposed Project Description, sections 2.12 and 2.16; and Chapter 9 Groundwater, section 9.10.2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	9		Chapter 2 Project description Chapter 21 Commitments	Section 2.7, Section 2.11.1 Table 21-7	<p>Summary of issue: Monitoring and reporting on the location and nature of the CO₂ plume over the long term.</p> <p>The draft EIS indicates it will be important to verify the final position of the CO₂ plume within the Precipice Sandstone Aquifer. The draft EIS is also seeking to have the EA authorise the greenhouse gas (GHG) plume to remain in the Precipice Aquifer in perpetuity, and to not be rehabilitated.</p> <p>It is unclear whether the proposed changes to the EA conditions establish monitoring and reporting requirements that are suited to informing the public, water users, and agencies such as RDMW, in a transparent and timely way, about the location and nature of the CO₂ plume and whether it is behaving as predicted.</p> <p>RDMW is of the view the “final plume position” is potentially flawed when the plume occurs in an aquifer that contains an active water trading market.</p> <p>RDMW has concerns the draft EIS stating there is little chance of new bores being drilled in this area in the future. Three water licences were granted in the Precipice Sandstone within 50km of the proposed CO₂ injection site between 2016 and 2022, totalling 515ML of entitlement to take water.</p> <p>RDMW expects a similar number of licences to be relocated to this area in the next decade, as demand for water for agricultural purposes is expected to remain high in this part of Queensland. The GABORA Water Plan 2017 allows for such relocations to occur.</p> <p>RDMW would like to understand the potential impacts of any new water bores in the area on the plume location, and the effects of the plume on the produced water quality for potential new and existing water licence holders in the area. The draft EIS does not provide this information.</p> <p>RDMW considers a long term, integrated, and adaptive groundwater modelling and monitoring framework may be required to manage the long-term effects of the CO₂ plume on water trading and future potential water licence holders in its vicinity.</p>	<p>The EA conditions should clearly establish monitoring and reporting requirements that are suited to informing the public, water users, and agencies such as RDMW, in a transparent and timely way, about the location and nature of the CO₂ plume and whether it is behaving as predicted.</p> <p>The final EIS should explain how the following matters will be monitored and understood over the long term:</p> <ol style="list-style-type: none"> 1. The location and constitution of the plume as it degrades. 2. The potential effects of the plume on water quality for future new water licence holders in the vicinity of the plume. 3. The potential effects of future new water licence holders in the vicinity of the plume on the plume’s constitution and location. <p>RDMW welcomes the proponent’s suggestion made at the agency briefing 6 February 2023, that additional groundwater modelling would be undertaken to get a better understanding of this issue. This modelling should cover the period of the plume’s expected existence, and a strategy developed for monitoring and managing:</p> <ol style="list-style-type: none"> 1. The location, constitution, and degradation of the CO₂ plume within the aquifer over the long term. 2. The potential for future new water licence holders in the vicinity of the CO₂ plume to access the plume material through their water bores 3. The potential for future new water licence holders in the vicinity of the CO₂ plume to affect the plume’s location by their potential to reduce groundwater pressures in parts of the aquifer around the plume. <p>The results of this proposed modelling work will need to be reviewed by RDMW.</p> <p>RDMW’s review will need to be appropriately addressed before the</p> <p>The EA should only authorise injection testing at or near the location of West Moonie 1 injection well.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.5, 9.6 2, 9.6.4, 9.6.5, 9.7.3, 9.7.4, 9.7.5, 9.9.2, 9.9.4, 9.9.5, 9.9.6, 9.9.7, 9.9.8, 9.9.9.2, 9.9.9.3, 9.10, 9.10.1 8, and 9.11.
62	10	2	Proposed Project Description	Section 2.7	<p>Summary of issue: Limiting the EA to only authorise the injection of CO₂ at the location in the Precipice aquifer that has been assessed by the EIS.</p> <p>The draft EIS proposes a change to the EA conditions to authorise the carrying out of GHG stream injection testing anywhere on EPQ10.</p> <p>RDMW is aware EPQ10 covers a large area of land, and the draft EIS has only considered the effects of injection testing around the West Moonie 1 injection well and not elsewhere within the EPQ10 tenure area.</p>	<p>The EA should only authorise injection testing at or near the location of West Moonie 1 injection well.</p>	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.7, and 2.16; Chapter 21 Register of Commitments, Table 21-1; and Chapter 22 Proposed EA Condition Amendments, Table 22-1.
62	11	2	Proposed Project Description	Section 2.15	<p>Summary of issue: Consideration of other alternatives to the project.</p> <p>The draft EIS has not considered any alternatives for the project involving the use of deeper or more western aquifers, or geosequestration by mineral carbonation in rocks such as basalt (rather than in an aquifer) occurring in southern Queensland, where impacts on water licence holders and aquifers are likely to be significantly lower than in the Precipice Aquifer.</p>	<p>Include commentary on whether alternatives to the current proposal have been considered in the final EIS. Such as, the use of deeper or more western aquifers, or geosequestration by mineral carbonation in rocks such as basalt (rather than in an aquifer) occurring in southern Queensland, where impacts on water licence holders and aquifers are likely to be significantly lower than in the Precipice Aquifer.</p>	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2 5
62	12	3	Community and Stakeholder Engagement	Section 3.4.2, page 7 Section 3.4.3, page 10 Section 3 5.3, page 12	<p>Summary of issue: There is a requirement to consult Precipice Aquifer water licence holders as stakeholders in the aquifer and the proposed project.</p> <p>There are water licence holders in the vicinity of the proposed CO₂ injection site that do not appear to have been adequately considered in the EIS.</p> <p>Groundwater bores within a 50 km radius of the West Moonie 1 Injection Well are identified in the draft EIS in section 3.4 2 as interested parties in the project.</p> <p>Water licence holders in the Precipice Sandstone Aquifer should also be identified as interested parties or ‘Interested or Affected Persons’ and engaged with accordingly. These water licence holders have a right to take water from the Precipice Sandstone Aquifer and could commence extraction at any time once they have a water bore drilled.</p> <p>There are currently three Precipice Aquifer water licences within 50 km of the proposed injection well, and this number could increase at any time as a result of the rules established in the GABORA Water Plan 2017.</p> <p>Water licence holders in the Precipice Sandstone Aquifer are significant stakeholders in how the aquifer is used. The proposed project has the potential to affect these water licences.</p> <p>A history of use, a drilled water bore, the depth of an aquifer, or the quality of groundwater in an aquifer, do not alter the water rights established by a water licence governed by a legislative water plan such as the GABORA Water Plan 2017.</p> <p>It is also worth noting the groundwater is only slightly saline (using the USGS definition for slightly saline groundwater https://www.usgs.gov/special-topics/water-science-school/science/saline-water-and-salinity), and well within the boundaries of usability for many purposes. Especially given the increasing ease with which</p>	<p>Acknowledge the rights of water licence holders within the Precipice Sandstone Aquifer to take water in the final EIS.</p> <p>Chapter 3 of the final EIS should identify water licence holders in the Precipice Sandstone Aquifer as interested parties or ‘Interested or Affected Persons’. Water licence holders should be part of the group the proponent continues to engage with (as mentioned in section 3.5 3 of the draft EIS).</p> <p>The proponent should regularly check for new water licences being granted in the Precipice Sandstone Aquifer within a 50km radius of the injection well, and the holders of those licences should also be directly engaged with by the proponent as the project progresses.</p> <p>The final EIS should explain how the holders of water licences in the Precipice Sandstone Aquifer have been and will be consulting during the life of the proposed CO₂ plume. Water licence holders should be consulted and informed about this proposal, regardless of whether they have a water bore drilled to access their licence, or a history of using water under their water licence. The results of this consultation should be included in the final EIS.</p> <p>A strategy for identifying new water licences as they are granted in the vicinity of the proposed project, how the project will engage with these new water licence holder and the existing water licence holders during the life of the CO₂ plume, should be included in the final EIS.</p>	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3 5.4, and 3.7; Appendices 3A and 3C, section 3C.4; and Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.10.1.6, and 9.10.1.8.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	13	3	Community and Stakeholder Engagement	Section 3.4.1, Table 3-2, pages 6-7	<p>Summary of issue: Section 3.4.1, Table 3-2 does not identify RDMW as having an interest in the proposed project as the manager of Queensland's groundwater resources.</p> <p>As the manager of Queensland's water resources, including the groundwater resources of the Precipice Sandstone Aquifer, RDMW has an interest in the proposed project.</p>	<p>Acknowledge that RDMW has an interest in the proposed project as the manager of Queensland's water resources, including the groundwater resources of the Precipice Sandstone Aquifer in the final EIS.</p> <p>This information should be included in the Context column of Table 3-2.</p>	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.1, 3.5.4, and 3.7; and Appendices 3A and 3C.
62	14	3	Community and Stakeholder Engagement	Section 3.4.3 Regional Context page 10	<p>Text: "Entitlements to surface waters are provided in Chapter 10 Surface Water. No known groundwater bore users with registered bores which extract water from the Precipice Sandstone aquifer have been identified within the operational lands, lands adjoining the operational lands, or within EPQ10". The statement should be reviewed.</p> <p>Groundwater bores were not required to be registered until March 2002. Therefore, unregistered bores may be accessing water from the same aquifer. Therefore, dataset from the Groundwater Database may be incomplete.</p> <p>Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322.</p>	The proponent is encouraged to consider an on-ground bore survey to identify unregistered bores.	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.4.3; and Chapter 9 Groundwater, section 9.4.1.
62	15	4	Approvals	Section 4.4.20 Water Act 2000, page 12	<p>Text: "It is intended that the Project activities are carried out in accordance with the RPP exemption requirements ('Riverine protection permit exemptions requirements' WSS/2013/726; DNRME, 2019), and therefore CTSCo will be exempt from the requirement to hold an RPP in respect of the Project".</p> <p>If a Riverine Protection Permit or a Riverine Protection permit exemption is required, the proponent should contact Water Services.</p>	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300, for discussion on Riverine Protection Permit and Riverine Protection permit exemption requirements.	Amended EIS	See Executive Summary, sections 3, and 9.6; Chapter 4 Approvals, section 4.4.23; Chapter 10 Surface Water, sections 10.7.2.1.1 and 10.8; Chapter 21 Register of Commitments, Table 21-3; and Chapter 22 Proposed EA Condition Amendments, Table 22-1.
62	16	4, 8	Approvals Geology	Section 4.4.8, Greenhouse Gas Storage Act 2009 Section 8 2.2.1 Greenhouse Gas Storage Act 2009	<p>Text "In accordance with the GHG Act, s.24 CTSCo already has an approved work program for EPQ10."</p> <p>Text "As outlined in Chapter 2 Proposed Project Description, section 2.11, and Chapter 4 Approvals, section 4.4.8, an Injection Test Plan (ITP) and a Monitoring and Verification Plan (MVP) are required to be prepared in accordance with the Greenhouse Gas Storage Act 2009 (GHG Act). Information in the ITP and MVP will be consistent with the information contained in the EIS. Under s.24 of the GHG Act, CTSCo is to prepare and submit a later work program for the Project."</p> <p>As per the above bold text, there are conflicting statements in the draft EIS on whether there is currently an approved work plan, or if this is still yet to be written/ provided.</p>	Provide clarification on these statements and update accordingly in the final EIS.	Amended EIS	See Chapter 8 Geology, section 8.3.1.1.
62	17	5	Climate	Section 5 3.3.1 Rainfall, pages 16-19	<p>The mean rainfall statistics (average annual rainfall) provided in Chapter 5 are different to those provided in Chapter 10 and 12.</p> <p>While each of the three chapter references different datasets, the difference between Chapter 5 (11-103mm) and Chapter 12 and 10 (650mm and approx. 600mm) seems an unusual variance.</p> <p>Chapter 5 Climate Figures 5-3, 5-4 and 5-5 represents annual average rainfall at three locations nearby to the project site. These three figures show annual totals of 11mm- 103mm. Table 5-3 Maximum, minimum and median rainfall datasets also reflect these numbers.</p> <p>Ch 10 Surface Water, 10.4.3.1 Rainfall page 15 indicates a mean of just under 600mm in Figure 10-5 Annual Rainfall for the Operational Lands – SILO Data Drill (1900 – 2021), which corresponds to Figure 10-6 Mean monthly rainfall and evaporation for the Operational Lands (1900 – 2022) which shows an average of just under 50 mm/ month (approx. 600mm annually).</p> <p>Chapter 12 Air Quality, Section 12.3.2.4 Temperature and Rainfall Statistics, page 13 Figure 12-5 Mean rainfall at Miles Constance Street and Oakey Aero (Bureau of Meteorology, 2022) shows an average of 650mm.</p> <p>There is no explanation provided regarding the differences in average annual rainfall between Chapter 5 (11-103mm) and Chapter 12 and 10 (650mm and approx. 600mm).</p>	Review statistics and figures provided for rainfall in Chapters 5, 10 and 12 and update if required for the final EIS.	Amended EIS	See Chapter 5 Climate, section 5.3.3.1.
62	18	5	Climate	Section 5 3.3.1, Rainfall, pages 16-19	<p>There appears to be errors in the data presented in Chapter 5:</p> <p>'- Rainfall is presented in graphs as 'Annual Average Rainfall' however it presents annual totals for 3 stations (not averages).</p> <p>Annual rainfall for this area is presented as less than 100mm, however the Bureau of Meteorology suggests it is 400-600mm for this area.</p>	Check and validate the data in Chapter 5 Climate, and update if required for the final EIS.	Amended EIS	See Chapter 5 Climate, section 5.3.3.1
62	19	8	Geology	Section 8 3.2.3.7, Gubberamunda Sandstone, page 48	<p>Text: "The Gubberamunda Sandstone is a regional aquifer and is the only aquifer that is used in the vicinity of the Operational lands. The nearest Gubberamunda Sandstone bores to West Moonie-1 are RN107326, RN23075 (the Milgarra bore), RN16039, RN77289, and RN77289 "</p> <p>"Figure 8-19 Nearest water bores to West Moonie-1 and the operational lands coloured by aquifer" shows 3 bores in Mooga Aquifer, 1 bore in Grimman Creek Formation and 1 bore in Hutton Aquifer. This indicates the Gubberamunda Sandstone is not the only aquifer used in the vicinity of the operational lands.</p> <p>Three water licences with currently undrilled bores have also been issued for the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322.</p> <p>The bold text requires review.</p>	Please clarify the bold text and update if required for the final EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.6 2.1.4, 9.7.1, 9.7.4, and 9.9.2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	20	8	Geology	Section 8.6	<p>The draft EIS states "The Milgarra bore, located 17.3 km east southeast of the WestMoonie-1 Injection Well, is the nearest groundwater abstraction bore to the Project Area."</p> <p>There is a stock water licence and associated Gubberamunda bore 10km east southeast. It has a linked bore RN107326 which is not identified in the draft EIS. This is the closest bore in the Gubberamunda Sandstone.</p> <p>The final EIS should be amended to acknowledge this existing entitlement.</p>	Amend the final EIS to acknowledge bore RN 107326 being the closet bore in the Gubberamunda Sandstone.	Amended EIS	See Chapter 9 Groundwater, section 9.7.1.3.
62	21	8	Geology	Section 8 3.2.3.7, Gubberamunda Sandstone, page 48	<p>Text: "The nearest Gubberamunda Sandstone bores to West Moonie-1 are RN107326, RN23075 (the Milgarra bore), RN16039, RN77289, and RN77289".</p> <p>This sentence requires review. One bore is listed twice, and bores are missing when compared to Figure 8-19.</p>	Review text to remove duplicates and missing information for the final EIS.	Amended EIS	See Chapter 9 Groundwater, section 9.7.1.3.
62	22	8	Geology	Section 8.6, Cumulative Impacts, page 69	<p>Text: "There are no registered bores into the Precipice Sandstone extracting groundwater bores within 50 km of West Moonie-1 Injection Well"</p> <p>Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322. The cumulative impacts statement is likely to need revision.</p>	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300, for further information.	Amended EIS	See Chapter 9 Groundwater, sections 9.6 2.1.4, 9.7.1, 9.7.4, and 9 9.2.
62	23	8	Geology	Section 8 9.2, Wells, page 73	<p>Text: "The Gubbermunda Sandstone is the closest aquifer to the operational lands that water is extracted for agricultural and stock use, with the Milgarra Bore being the closest water bore at 17.3 km east-southeast of the West Moonie-1 Injection Well."</p> <p>This statement is incorrect.</p> <p>Figure 8-19 Nearest water bores to West Moonie-1 and the operational lands coloured by aquifer shows RN 107326 as a bore accessing Gubberamunda Sandstone at a closer distance of 10km, which QLD Globe/ GWDB</p>	Update in the final EIS to reflect the closer bore or provide an explanation why RN 107326 is not considered a closer bore than the Milgarra bore.	Amended EIS	See Chapter 9 Groundwater, sections 9.7.1 and 9.7.4 2.
62	24	9	Numerous sections, including in: Chapter 9 Groundwater	Section 9 2.1.2.4 Section 9.7.2.10	<p>Summary of issue: Clarification is required regarding the proponent's suggestion about what should happen in the Precipice Aquifer in the vicinity of the proposed injection site in relation to:</p> <ul style="list-style-type: none"> '- limiting future groundwater use under water licences '- limiting bore drilling under water licences '- altering the operation of the rules for allocating and managing water established under the GABORA Water Plan 2017. <p>RDMW is concerned the project has the potential to impact the ways in which groundwater resources are managed and allocated in the Precipice Aquifer, and these impacts have not been sufficiently assessed in the draft EIS.</p> <p>The draft EIS currently makes vague references in several locations about the need to limit future water use and bore drilling within the Precipice Sandstone in the vicinity of the CO₂ plume, without clearly explaining why this is necessary, the precise parts of the aquifer in which this is needed, how this is proposed to be achieved, or who will do it.</p> <p>The EIS should clarify the effects of the proposed injection activities on potential future water licence relocations, future grants of stock and domestic water licences, and the future allocation of unallocated water from the GABORA Water Plan 2017.</p> <p>The draft EIS fails to explain how the proposed CO₂ plume will coexist within the Precipice Sandstone Aquifer alongside existing and future groundwater users authorised to take groundwater through the GABORA Water Plan 2017.</p> <p>The project should be using the proposed CO₂ injection testing as a way of demonstrating the viability of potential future large scale CO₂ storage in the Surat Basin (Project Description section 2.3.1 page 6). The draft EIS does not explain how the proposed injection testing will be used to achieve this.</p> <p>Water licence holders in the Precipice Sandstone aquifer and the GABORA Water Plan 2017 will need to coexist with any potential future large scale CO₂ storage activity</p>	<p>The final EIS should assess:</p> <ol style="list-style-type: none"> 1. The effects of the project on <u>existing and future</u> water licences within the Precipice Sandstone Aquifer, including potential stock and domestic water licences, potential licences granted from unallocated water in the GABORA Water Plan, and potential water licence relocations under that Water Plan. 2. The effects of <u>existing and future</u> water licences within the Precipice Sandstone Aquifer on the nature and location of the proposed CO₂ plume. <p>The final EIS should identify whether the project needs to, or is proposing to, limit future water use and bore drilling within the Precipice Sandstone aquifer in the vicinity of the CO₂ plume, to either manage the long-term nature or location of the plume, or to protect the water quality of groundwater that will be extracted under water licences.</p> <p>If such limits are needed, the final EIS should clearly why this is necessary, the parts of the aquifer in which this is needed, how it is proposed to be achieved, and who the proponent proposes should do this.</p> <p>The proponent should consult with RDMW regarding these assessments. RDMW can advise the proponent about the locations in the Precipice Aquifer where there is potential for water licences to be granted under the GABORA Water Plan 2017.</p> <p>The proponent is encouraged to contact RDMW Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.5, 9.6 2, 9.6.4, 9.6.5, 9.7.3, 9.7.4, 9.7.5, 9.9.2, 9.9.4, 9 9.5, 9 9.6, 9.9.7, 9.9 8, 9.9 9.2, 9.9.9 3, 9.10, 9.10.1 8, 9.11, and 9.12.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	25	9	Numerous sections, including in: Chapter 9 Groundwater	Section 9 2.1.2.4 Section 9.7.2.10	<p>Summary of issue: Clarify what the tenure approvals process would be for the proposed project to move from the current exploration permit stage to a possible future stage of large scale GHG storage in the Precipice Aquifer, and how this would relate to the legislated GABORA Water Plan 2017.</p> <p>The draft EIS does not explain that before any future large-scale CO₂ storage occurs in the Precipice Aquifer that potential impacts of this on the GABORA Water Plan 2017 and related water licences will need to be assessed, and that this will occur separately to assessment of the current injection testing proposal.</p> <p>Such a future assessment would be made as part of an assessment of any potential future application for a GHG storage lease, where the Minister responsible for the Water Act 2000 would need to approve the initial development plan for such a lease before it was granted.</p> <p>A key consideration for such an approval is likely to be the potential impacts of such large-scale CO₂ storage on the outcomes of the GABORA Water Plan 2017, and the holders of water licences managed under that plan.</p> <p>Detailed consideration of the potential for the locations of water licences to regularly change in such a water market, and that the grant of new licences could occur at any future time within the vicinity of any proposed CO₂ storage area within the aquifer, will need to occur.</p> <p>Within the water management and allocation framework established by the GABORA Water Plan 2017, current water bore, and water licence locations are imprecise indicators of where future groundwater extraction might occur.</p>	<p>The final EIS should explain that before any future large-scale CO₂ storage occurs in the Precipice Aquifer, that potential impacts of this on the GABORA water plan 2017 and related water licences will be assessed separately to the current injection testing proposal, as part of a potential future application for a GHG storage lease, where the Minister responsible for the Water Act would need to approve the initial development plan for such a lease, before it was granted.</p> <p>A key consideration for such an approval is likely to be the potential impacts of such large-scale CO₂ storage on the outcomes of the GABORA Water Plan 2017, and the holders of water licences managed under that plan.</p> <p>Detailed considerations will be needed to assess the effects of the potential grant of new licences and potential changes in locations of water licences occurring under that water plan, and the effects of this on the CO₂ plume and on the quality of groundwater extracted under those water licences, within the vicinity of any proposed CO₂ storage area within the aquifer.</p>	Amended EIS	See Chapter 4 Approvals, sections 4.4.9, and 4.4.23; and Chapter 9 Groundwater, section 9.3.2, 9.9.6 2, and 9.10.1.8.
62	26	9	Groundwater	Section 9 2.1.2.4, Water Act 2000, page 9	<p>Text: "These water plans are developed to balance water allocations (that is, human use) with environmental flows (that is, leaving water in a watercourse or aquifer to maintain natural processes)."</p> <p>Current wording should be amended as water allocations are one type of water entitlement which are authorised under the <i>Water Act 2000</i> and not all 'human use' requires a water entitlement and may be authorised under the <i>Act (relevant Plan)</i>.</p>	Suggested edit "These Water Plans are developed to balance consumptive use (human use) with environmental flows (that is, leaving water in a watercourse or aquifer to maintain natural processes)."	Amended EIS	See Chapter 9 Groundwater, section 9 2.1.2.4.
62	27	4, 9	Approvals Groundwater	section 4.4.20 Section 9 2.1.2.4	<p>Summary of issue: A water licence authorising the interference with underground water will be required for the proposed injection testing.</p> <p>The draft EIS has not identified the approval required under the Water Act 2000 for interfering with underground water.</p> <p>It should be noted the GABORA Water Plan 2017 requires licences to interfere with underground water in the Precipice Aquifer, and the Greenhouse Gas Storage Act 2009 does not authorise a tenure holder to interfere with underground water without such an authorisation.</p>	<p>The final EIS should identify the approvals required under the <i>Water Act 2000</i> for interfering with underground water.</p> <p>It should be noted the GABORA Water Plan 2017 requires licences to interfere with underground water in the Precipice Aquifer, and that section 84 of the <i>Greenhouse Gas Storage Act 2009</i> indicates a tenure holder is not authorised to interfere with underground water without such an authorisation.</p>	Amended EIS	See Chapter 4 Approvals, sections 4.4.9, and 4.4.23; and Chapter 9 Groundwater, section 9.3.2, and 9.10.1.8.
62	28	9	Groundwater	Section 9 2.5	<p>The draft EIS states that "the depth of the West Moonie Shallow Monitoring Bore is 45m however the drill log shows its depth is 48m."</p> <p>Clarification is required on the correct depth of this monitoring bore.</p>	Clarify the correct depth of the West Moonie Shallow Monitoring Bore in the final EIS.	Amended EIS	See Chapter 9 Groundwater, section 9.5.
62	29	9	Groundwater	Section 9 3.6.2.2, Licensed Groundwater Use, page 46	<p>Text: "Groundwater use within the Surat Basin is regulated under the Water Act 2000 which imposes restrictions and conditions on the take of groundwater." This statement is not correct.</p> <p>Groundwater use within the Surat Basin, specifically within the area of the Project's operational lands is regulated under the GABORA Water Plan 2017 and the Water Plan (Condamine and Balonne) 2019.</p> <p>The <i>Water Act 2000</i> provides for the planning framework and any groundwater taken is done so through a statutory authorisation or entitlement under the Act.</p>	Revise wording for the final EIS.	Amended EIS	See Chapter 4 Approvals, sections 4.4.9, and 4.4.23; and Chapter 9 Groundwater, section 9.3.2, and 9.10.1.8.
62	30	9	Groundwater	Section 9 3.2, Hydraulic Properties, page 33	<p>Text: "A summary of these data is presented in Figure 9-6 (with the data from the aquitard of the Evergreen Formation and the Precipice Sandstone highlighted)"</p> <p>Figure 9.6 does not appear to have the correct ranges highlighted. Boxvale Sandstone and Bowen Group are highlighted.</p> <p>Clarification is required to determine if this is an error (i.e., the wrong ranges highlighted) or have these two</p>	Review Figure 9.6 to ensure correct ranges have been highlighted in the final EIS or clarify whether the two formations have been used by accident in the examples.	Amended EIS	See Chapter 9 Groundwater, section 9.6.2.1.1 and Figure 9-1.
62	31	9	Groundwater	Section 9 3.6.1	<p>Summary of issue: The effects on EIS studies of the limited information available about the water chemistry in the Precipice Aquifer at the proposed CO₂ injection site need to be addressed.</p> <p>Representation of water quality in the aquifer is based on only three samples from only one location taken on the same day. This places low confidence on the EIS representation of Precipice aquifer water quality in the area.</p>	Explain and acknowledge the limited amount of information that is available about water quality in the Precipice aquifer in the area, and how this limited information affects the analyses done for the final EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.4.1, 9.4.2, 9.5, 9.6.4, 9.6.5, 9.7.5, 9.7.6, 9.7.7, 9.9.4, 9.9.7, and 9.10.1.4; and Appendices 9A, 9C, 9D, 9E and 9F.
62	32	9	Groundwater	Section 9 3.6.1	<p>Summary of issue: Explain that the Hutton or Precipice aquifers in the vicinity of the proposed CO₂ injection site can be the best option as a water supply for some water users.</p> <p>The draft EIS states that shallower aquifers with better water quality than in the Precipice would be used preferentially.</p> <p>Water licences exist in the Precipice close to the injection site and for many water users the Precipice or Hutton can be the best option available to them for accessing water. This will continue to be the case for many future new water users and is due to the shallower aquifers already being close to fully accessed for a range of water</p>	<p>Acknowledge in the final EIS that aquifers below the Gubberamunda are currently good targets for new water users and are increasingly being accessed by water bores for a range of high value water uses.</p> <p>The final EIS should also acknowledge that the Hutton or Precipice Sandstone Aquifers can sometimes be the best options available to some water users.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, and 9.7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	33	9	Groundwater	Section 9 3.6.1, Groundwater Bores, page 45	Text: "A search of the GWDB has identified 124 existing registered groundwater bores that are within 50 km of the West Moonie-1 Injection Well as displayed in Figure 9-9." Groundwater bores were not required to be registered until March 2002. Therefore, unregistered bores may be accessing water from the same aquifer. As such, dataset from the Groundwater Database may be incomplete.	The proponent is encouraged to consider an on-ground bore survey to identify unregistered bores.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, and 9.7.
62	34	9	Groundwater	Section 9 3.6.1, Groundwater Bores, page 45	Text: "Based on the adopted aquifer attribution, there are no registered bores accessing the Precipice Sandstone within a 50 km radius of the West Moonie-1 Injection Well as displayed in Figure 9-9." Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322	The proponent is encouraged to contact RDMW Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, and 9.7.4.
62	35	9	Groundwater	Section 9 2.6.1.2, Identification of EVs and Sensitive Receptors, page 21	Text: "A search of the Queensland Groundwater Database (GWDB) (Department of Manufacturing, Regional Development and Water, 2021) to identify groundwater bores in the Project region." Groundwater bores were not required to be registered until March 2002. Therefore, unregistered bores may be accessing water from the same aquifer. Dataset from the Groundwater Database may be incomplete.	The proponent is encouraged to consider an on-ground bore survey to identify unregistered bores.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, and 9.7.
62	36	9	Groundwater	Section 9 3.6.2.2, Licensed Groundwater Use, page 46	Text: "Most consumptive use of groundwater requires a water licence, with a licence required for all consumptive groundwater use except for domestic use and some stock use in some areas." This reads as a general statement. The Office of Groundwater Impact Assessment report refers to specific circumstances in the Condamine and Balonne and the Great Artesian Basin Water Plan areas. In general terms, it may be beneficial to use broader terminology (water entitlement) as water licences only	Revise wording for the final EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.9.2, 9 9.3, 9 9.5, 9.9.6, 9.10, 9.11 and 9.12.
62	37	9	Groundwater	Section 9 3.6.2.2, Licensed Groundwater Use, page 46	Text: "There are no registered bores associated with the three licences allocated to the Precipice Sandstone, indicating that the Precipice Sandstone licences are currently not being utilised." Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322. It is correct to state that there are no bores associated with these licences currently.	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, and 9.7.4.
62	38	9	Groundwater	Section 9.7.2.10	Summary of issue: Clarify the purpose and operation of annually checking the groundwater database for new water bores drilled in the area. The draft EIS states that the groundwater database should be checked yearly to ensure no bores have been drilled in the area. It does not explain why this check is needed, who will do it, how it will be reported on, and what it will achieve.	Explain why an annual check of the groundwater database is needed, who will do it, how will it be reported on, and what will this annual check result in, and how it will affect water bore owners in the final EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.10.1.6 and 9.10.1.8.
62	39	9, 22	Groundwater Proposed EA amendments	Section 9 9, Proposed EA amendments (s41 Groundwater)	Summary of issue: Detail the proposed measures that would replace the need for the EA having a condition about ceasing injection activities if environmental harm is caused or threatened to be caused. The draft EIS does not appear to detail the proposed measures that would replace the need for the EA condition requiring the cessation of injection activities if environmental harm is caused or threatened to be caused. This makes it difficult to assess the effects of this proposed change to the EA.	Detail the proposed measures that would replace the need for the EA condition requiring the cessation of injection activities if environmental harm is caused or threatened to be caused in the final EIS.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11.; and Chapter 9 Groundwater, section 9.10.
62	40	9, 22	Groundwater Proposed EA amendments	Section 9 9, Condition 42	Summary of issue: Explain why a water quality impact zone and a hydraulic impact zone are not needed for the project. RDMW does not agree that the extent of the GHG plume should replace the water quality impact zone. The draft EIS proposes to remove requirements that RDMW considers will be useful for the public and regulators in understanding and managing the impacts of the project on groundwater users and aquifers, by removing the requirement to clearly identify a water quality impact zone and a hydraulic impact zone. The draft EIS has not explained why this proposed change is beneficial. The draft EIS proposes to remove the requirement to identify a water quality impact zone and replace it with the GHG plume. The draft EIS also suggests the risk assessment required should include surrounding aquifers as well as the Precipice Sandstone. RDMW agrees with the risk assessment covering the Precipice Sandstone and surrounding aquifers. However, RDMW does not agree with the change limiting the risk assessment to within the GHG plume, because the stability and nature of the CO ₂ plume will be dependent on potential groundwater pumping from water bores in the Precipice aquifer, and a water quality impact zone will identify the area in which such water bores might	Explain how the project will effectively and transparently manage the effects of changes in water quality and groundwater pressure in the aquifer, without clearly identifying a water quality impact zone or a hydraulic impact zone in the final EIS. EA condition 42 should: - continue to refer to a water quality impact zone and a hydraulic impact zone - continue to refer to a water quality impact zone and not be limited to the extent of the GHG plume - relate to surrounding aquifers as well as the Precipice sandstone.	Amended EIS	See Chapter 9 Groundwater, section 9.13.
62	41	9, 22	Groundwater Proposed EA amendments	Section 9 9, Condition 42	At the agency briefing held on 6 February 2023, the proponent indicated that modelling work was proposed to be undertaken between the draft EIS and final EIS. RDMW would need to review this modelling work.	The proponent is encouraged to consult with RDMW in preparing the modelling work and provide RDMW with the opportunity to review and comment on this modelling work before publication of the final EIS. The proponent is encouraged to contact RDMW Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300.	Amended EIS	See Chapter 9 Groundwater, sections 9.6 and 9.9.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	42	10	Surface Water	Section 10.3 3, Water Act 2000, page 6	Text: "For water licences under s.104, the holder of a GHG tenure under the Greenhouse Gas Storage Act 2009 is a prescribed entity. Under s.107, CTSCo will not require a water licence to take or interfere with water for the Project." In relation to prescribed entities; while the holder of a GHG tenure is a prescribed entity, the activity undertaken as part of the project is not a prescribed activity as defined by Schedule 3 of the Water Regulation 2016. Therefore, interfering with water would require an authorisation from RDMW. The statement relating section 107 of the Water Act 2000 is incorrect. Section 107 of the Water Act 2000 discusses which entity may make an application for a water licence. It does not discuss entities that do not require a water licence.	Revise wording for final EIS. The proponent is encouraged to contact RDMW Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to discuss entitlement options.	Amended EIS	See Chapter 4 Approvals, section 4.4 23; and Chapter 9 Groundwater, sections 9.3.2.1, 9.3.2 5, 9.10.1 8, and 9.12.
62	43	10	Surface Water	Section 10.3 3.1, Water Plan (Border Rivers and Moonie) 2019, page 7	Text: "As defined by the Water Plan, s.7, underground water declared to be overland flow water is not more than 6m below the surface." Section 7 does not provide that all underground water to which this plan applies is declared to be overland flow water. Section 7 states underground water from the specified sub-area may be declared as overland flow water if it is: - within the Border Rivers Fractured Rock in the Granite Belt underground water sub-area, and - is not more than 6 m below the surface. The operational area is not located within the underground water sub-area therefore, this provision is not relevant to the project.	Revise wording for the final EIS.	Amended EIS	See Chapter 10 Surface Water, section 10.3.4.1.
62	44	10	Surface Water	Section 10.3 3.1, Water Plan (Border Rivers and Moonie) 2019, page 7	Text: "Queensland has 22 Water Plans for catchments and basins across the State." This statement is not correct. Queensland has 23 Water Plans across the State. The GABORA Water Plan 2017 provides for the 23rd Water Plan.	Update in the final EIS.	Amended EIS	See Chapter 10 Surface Water, section 10.3.4.1.
62	45	10	Surface Water	Section 10.3 3.1, Water Plan (Border Rivers and Moonie) 2019, page 7	Water management area zones F and G under Schedule 3, Part 2, of the Water Plan (Border Rivers and Moonie) 2019 applies.	Include a description of Schedule 3, Part 2 and include reference to zones F and G of the Moonie Water management area.	Amended EIS	See Chapter 10 Surface Water, section 10.3.4.1.
62	46	10	Surface Water	Section 10.3.4.2, Queensland Border Rivers – Moonie (2019) Water Resource Plan, page 7	Text: "The operational lands are covered by the Queensland Border Rivers-Moonie (2019) Water Resource Plan." The accurate reference to the plan is the 'Queensland Border Rivers-Moonie Waters Resource Plan (2019)'. This plan is made up of a number of documents. Accredited versions of these documents can be accessed via the Murray Darling Basin Authority website: https://www.mdba.gov.au/sites/default/files/pubs/QLD-border-rivers-moonie-WRP-2019.PDF Edit to appropriately reference the plan and to clarify wording.	Suggested edit "The operational lands are located within the area managed under the Queensland Border Rivers-Moonie Waters Resource Plan (2019)."	Amended EIS	See Chapter 10 Surface Water, section 10.3.4.1.
62	47	10	Surface Water	Section 10.4.1, Watercourses, page 11	Text: "The Moonie River is classified as a Stream Order 5 watercourse in accordance with the Water Act 2000." The Water Act 2000 does not define stream orders.	Amend sentence in final EIS.	Amended EIS	See Chapter 10 Surface Water, section 10.4.1.
62	48	10, 15	Surface Water Hazards and Safety	Section 10.4.1, Watercourses, page 11 Section 15.4 3, Flowline and Walls, page 10	Text: "Stephens Creek is not defined as a watercourse in the Queensland Series Watercourse Identification Map (Water Act 2000, s.5AA) and is classified as Stream Order 1 waterway." Stephens Creek is currently an unmapped (undefined) feature in the Water Information Map, as such no determination has been made. The Stream Order classification system is not used under the Water Act 2000.	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to request a watercourse determination on South Branch Stephens Creek and Stephens Creek.	Amended EIS	See Chapter 10 Surface Water, section 10.4.1.
62	49	10	Surface Water	Section 10.4 2, Existing water users, pages 11-13	This section does not reference unsupplemented water allocation holders located in Moonie Water management area zones F and G under Schedule 3, Part 2, of the Water Plan (Border Rivers and Moonie) 2019	Include information on water allocations in Water management area zones F and G of the Moonie Water management area. There are 5 water allocations in zone F, being: Lots 4, 7, 11, 12 and 5003 on Plan AP13210; 2 water allocations in zone G, being: Lots 2 and 10 on Plan AP12210	Amended EIS	See Chapter 10 Surface Water, section 10.4.2.
62	50	10	Surface Water	Section 10.5 Proposed Project Description, page 23	Text: "Figure 10-10 shows the location of these watercourses in relation to the Project's key features." It should be noted that the reference to watercourses is not in reference to a determined watercourse under the Water Act 2000, and investigations are required to make this determination.	Suggest wording change to "water features" or similar in the final EIS. The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to request a watercourse determination.	Amended EIS	See Chapter 10 Surface Water, section 10.5.
62	51	13	Noise and Vibration	Section 13.4 2 Operations, page 19	Text: "Exploration and appraisal activities associated with rehabilitation of the well site will: - be subject to agreement by the landowner conversion of the Gubberamunda Bore to a bore for stock or domestic supply;" If the agreement results in the conversion of the Gubberamunda Monitoring Bore into a water supply bore for stock and domestic purposes during the rehabilitation phase of the Project, it will need to comply with relevant Water Plan. Water licences will also need to be obtained for the use of the bore as a water supply bore. Obtaining an authorisation may be difficult and unattainable depending on the volume and locations. This statement also differs from Executive Summary, Section 7.4.6.4, page 33, Gubberamunda Monitoring Bore, which states "Subject to negotiations with the landowner, the Gubberamunda Monitoring Bore may be converted to a water supply bore for stock and domestic or irrigation purposes".	Identify the relevant Water Plan requirements for these works in the final EIS. Ensure the potential post-monitoring purpose of the bore is consistent, as ability to be granted an authorisation for a stock and domestic bore compared to an irrigation bore is very different. The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to discuss entitlement options.	Amended EIS	See the Executive Summary, section 7.4.6.4; and Chapter 13 Noise and Vibration, section 13.4.4

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	52	14A	Terrestrial Flora and Fauna	Section 14A.3.2, Wetlands and Waterways, page 14	Text: "Two small watercourses (stream order 2) intersect the Disturbance Area north of Currajong State Forest, being South Branch Stephens Creek (in Lot 60 SP199322) and Stephens Creek (in Lot 33 PG223)." South Branch Stephens Creek and Stephens Creek are currently unmapped (undefined) features in the Water Information Map, and as such cannot be referred to as watercourses under the <i>Water Act 2000</i> . The Stream Order classification system is not used under the <i>Water Act 2000</i> . Stream order references also differ between the draft EIS chapters: - Chapter 10 Surface Water, Section 10.4.1 Watercourses page 11: "Stephens Creek is ... is classified as Stream Order 1 waterway." - Chapter 14B Aquatic Flora and Fauna, Section 14B.3 2.5 Waterways that provide for fish passage page 13: "Stephens Creek and South Branch Stephens Creek are stream order 1 waterways that are mapped as having moderate (pink) importance for fish passage" - "Two small watercourses stream order 2) intersect the Disturbance Area north of Currajong State Forest, being	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to request a watercourse determination on South Branch Stephens Creek and Stephens Creek. Ensure consistent stream order references throughout the chapters in the final EIS.	Amended EIS	See Chapter 10 Surface Water, sections 10.4.1, Chapter 14A Terrestrial Flora and Fauna, section 14A 3.2, and Chapter 14B Aquatic Flora and Fauna, multiple sections now refer to waterway.
62	53	14B	Aquatic Flora and Fauna	Section 14B.3.7.2	Summary of issue: Clarify the difference between groundwater in the Griman Creek Formation and alluvial aquifers and whether stygofauna sampling is needed in alluvial aquifers The draft EIS states "the standing water level of the Griman Creek formation in the Study Area and operational lands is <10m; thus, the alluvial aquifer has a suitable depth to watertable for supporting stygofauna". The Griman Creek formation has a shallow watertable, but it is not an alluvial aquifer. Clear distinction should be made between references to alluvial aquifers and the Griman Creek Formation aquifer.	The final EIS should clarify if the Griman Creek formation is deemed suitable for supporting stygofauna because of its shallow watertable. Or clarify whether the EIS means to refer to an alluvial aquifer, in which case, the proponent will need to sample an alluvial bore to ascertain if the alluvial aquifer is suitable to support stygofauna.	Amended EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.3.7.2
62	54	14B	Aquatic Flora and Fauna	multiple sections throughout chapter	References to "watercourse" are provided throughout the documentation. South Branch Stephens Creek and Stephens Creek are currently unmapped (undefined) features in the Water Information Map, and as such cannot be referred to as watercourses under the <i>Water Act 2000</i> .	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to request a watercourse determination on South Branch Stephens Creek and Stephens Creek.	Amended EIS	Chapter 14B Aquatic Flora and Fauna, multiple sections now refer to waterway
62	55	14B	Aquatic Flora and Fauna	Section 14A.5 Potential Impacts, page 27	A risk matrix would make this section more usable. While risks are stated, it is unclear if these are considered a very low risk, or a high risk? It would make statements such as "A significant fuel spill to waterways (in the order of tens or hundreds of litres) is likely to have a locally significant impact on both flora and fauna, with the size of spill and the volume of water in the creeks being the most significant factors influencing the length of stream impacted." more readable in the	Consider using a risk matrix to illustrate the risk of each potential impact in the final EIS.	Amended EIS	See Chapter 14B Aquatic Flora and Fauna, sections 14B.2.2.4 and 14B.6, and Appendix A14B Aquatic Ecology and Stygofauna Study, sections 4.4, 6.1, 6.2, 6.3, 6.4, and 7.
62	56	14B	Aquatic Flora and Fauna	Section 14B.3.4, Flow Regime of Watercourses, pages 18-19	There is insufficient information on flow regime for Stephens Creek flow. Stephens Creek is also noted as having an ephemeral flow. RDMW would welcome any further information on the flow patterns of Stephens Creek, especially in relation to aquatic biota? Or if this is not available, state this, and confirm if any monitoring or further investigations are	Provide further on the flow patterns of Stephens Creek if available. If further information is not available, this should be stated, and confirm if any monitoring or further investigations are planned in the final EIS.	Amended EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.3.4
62	57	14B	Aquatic Flora and Fauna	Section 14B.5.1, Waterway Crossings, page 27	This section does not mention the previously discussed and preferred option of horizontal direct drilling under the waterway. This should be mentioned within this section and reference made to 14B.6.1 Water Way Crossings within 14B.6 Avoidance and Mitigation Measures	Update in final EIS to reference the preferred option of horizontal direct drilling under the waterway and make reference to 14B.6.1 Water Way Crossings within 14B.6 Avoidance and Mitigation Measures.	Amended EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.5.1
62	58	14B	Aquatic Flora and Fauna	Section 14B.5.1, Waterway Crossings, page 27	RDMW clarification on whether downstream users been considered in the risk of bank erosion and partial blockages. This has not been identified as a potential risk in the previous chapters. Bank erosion and partial blockages may impact the project's ability to align with the outcomes of the Borders River and Moonie Water Plan (i.e., availability of water). The potential risk is not noted in other chapters more relevant to water users. A sentence at the end of this section would be useful that references the mitigation measures (HDD) listed	Update the final EIS to clarify whether downstream users been considered in the risk of bank erosion and partial blockages and consider including a sentence at the end of the section that references mitigation measures (HDD) listed within 14B.6.1.	Amended EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.5.1
62	59	14B	Aquatic Flora and Fauna	Section 14B.5.2, Fuel and Oil Spills, page 27	Text: "Fuels, oils and other chemicals (e.g. lubricants and solvents) required for the operation of vehicles and machinery are toxic to aquatic flora and fauna at relatively low concentrations. Spilt fuel is most likely to enter waterways or shallow groundwater systems via an accidental spill, with risks to waterways increased with proximity of a spill to the waterway." This risk is not noted in the groundwater and surface water chapters. RDMW would like clarification on what is the impact on water users and whether it is considered a very low risk,	Update the final EIS to clarify risk and impact on water users.	Amended EIS	See Chapter 14B Aquatic Flora and Fauna, sections 14B.5.2 and 14B.6.2
62	60	15	Hazards and Safety	Section 15.4.4.3	The draft EIS indicates little to no earthquake activity in the Study Area. Figure 15-2 Locations of recorded earthquakes in Queensland appears to show 5.6 magnitude earthquake at boundary of EPO10 ~ 30km SE of operational area within 50 km radius	Clarify the interpretation of earthquake data for the site in the final EIS.	Amended EIS	See Chapter 15 Hazards and Safety, sections 15.7.2.2 and 15.7.2.4.
62	61	19	Rehabilitation	Section 19.3.1 Rehabilitation Objectives, page 4	Text: "As soon as practicable after the end of the GHG storage exploration activities that have caused significant disturbance to land, the holder of the environmental authority must: viii. promoting establishment of vegetation of similar species composition and density of cover the surrounding undisturbed land; " Clarification is required to establish if any water is required to promote vegetation establishment, or will it be	If additional water is required for vegetation establishment, that will not be provided by a third party (i.e., on-site bore water will be used), the proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300, to discuss water permit options.	Amended EIS	See Chapter 19 Rehabilitation, section 19.5.5.2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	62	19	Rehabilitation	Section 19.5.4.3.4 Gubbermunda Monitoring Bore, page 11	Text: "The Gubberamunda Monitoring Bore may be transferred to the landowner for future conversion to a farm water supply bore, subject to regulatory approval. Otherwise, the bore will be plugged and rehabilitated in accordance with the relevant codes." If the agreement results in the conversion of the Gubberamunda Monitoring Bore into a water supply bore for stock and domestic or irrigation purposes during the rehabilitation phase of the Project, it will need to comply with relevant Water Plan. Water licences will also need to be obtained for the use of the bore as a water supply bore. Obtaining an authorisation may be difficult and unattainable depending on the volume and locations.	Identify the relevant Water Plan requirements for these works. The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 to discuss entitlement options.	Amended EIS	See Chapter 19 Rehabilitation, section 19.5.4.3.4.
62	63	20	Cumulative Impacts	20.3.1.2 Existing groundwater extraction from the Precipice Sandstone, page 5	Text: "The closest wells drilled into the Precipice Sandstone are located approximately 30 km north-east of West Moonie-1 Injection Wells in the Moonie Oil Field, being conventional oil and gas exploration and/or production from Petroleum Lease (PL) 1, held by Bridgeport (Surat Basin) Pty Ltd." There are six registered bores accessing the Precipice Sandstone within a 50 km radius of the West Moonie-1 Injection Well as shown in Figure 20-2, and all associated with petroleum exploration. Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322. While these bores have not yet been drilled, they should be considered. The	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information.	Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.9.2, 9.9.3, 9.9.5, 9.9.6, 9.10, 9.11 and 9.12; and Chapter 20 Cumulative Impacts, sections 20.3.1.2, 20.3.2.2, 20.5.1.2, 20.5.2.2, and 20.6.
62	64	20	Cumulative Impacts	Section 20.3.2.2 Proposed groundwater extraction from the Precipice Sandstone, page 7	Text: "A search of the Queensland database for water entitlements (DMRDW 2022) was undertaken to identify sub-surface water licences within 50 km of the West Moonie-1 Injection Well. This search identified three water licences for the Precipice Sandstone as shown in Figure 20-3. These licences have a combined allocation of 515 ML/y. No registered bores are associated with these water licences, indicating that no bores have been drilled, and that the Precipice Sandstone water licences are currently not utilised. For two of the properties, water licences and registered bores have been drilled and are operating, both accessing the Gubberamunda Sandstone aquifer." Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322. While these bores have not yet been drilled, they should be considered.	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information.	Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.9.2, 9.9.3, 9.9.5, 9.9.6, 9.10, 9.11 and 9.12; and Chapter 20 Cumulative Impacts, sections 20.3.1.2, 20.3.2.2, 20.5.1.2, 20.5.2.2, and 20.6.
62	65	20	Cumulative Impacts	Section 20.5.1.2 Existing Groundwater extraction from the Precipice Sandstone, page 9	Text: "As discussed in detail in Chapter 8 Geology and Chapter 9 Groundwater and above in section 20.3.2.2, no potential cumulative impacts are anticipated on existing groundwater extraction wells or bores. Therefore, no avoidance and mitigation measures are proposed." Water licences have recently been granted to drill bores within the Precipice Sandstone, including immediately adjacent to Lot 60 on SP199322. While these bores have not yet been drilled, they should be considered.	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information on these water licences.	Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.9.2, 9.9.3, 9.9.5, 9.9.6, 9.10, 9.11 and 9.12; and Chapter 20 Cumulative Impacts, sections 20.3.1.2, 20.3.2.2, 20.5.1.2, 20.5.2.2, and 20.6.
62	66	20	Cumulative Impacts	20.5.2.2 Proposed groundwater extraction from the Precipice Sandstone, page 9	Text: "The existence of the three water licences means that bores could be drilled in the future to activate the water licences, creating a potential for cumulative impacts." The proponent will need to continue to check whether registered bores are drilled within the identified lot on plans under the water licences, and where appropriate, engage directly with the holders of the water licences.	The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information on these water licences. It is recommended the proponent engages directly with the holder of the water licences.	Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.9.2, 9.9.3, 9.9.5, 9.9.6, 9.10, 9.11 and 9.12; and Chapter 20 Cumulative Impacts, sections 20.3.1.2, 20.3.2.2, 20.5.1.2, 20.5.2.2, and 20.6.
62	67	21	Commitments	Table 21-1 Register of Commitments for the Project - General and/or all phases of the Project, page 10	Text: "For all phases of the Project, dust management will consider: - ground disturbance activities to cease if significant dust is observed being blown from Disturbance Area until control measures are implemented; and - prevent visible dust emissions from the Disturbance Area, by water spraying or other dust suppression measure." It is unclear what source of water is proposed to be used for dust suppression, given no water authorisations or permits to take water have been requested or are held by the proponent.	Advise on the source of water for dust suppression in the final EIS. The proponent is encouraged to contact RDMW's Water Services St George office via email Waterservices.StGeorge@rdmw.qld.gov.au, or phone 07 4534 3300 for further information.	Amended EIS	See Chapter 21 Register of Commitments, Table 21-1.
62	68	9	Appendix 09A Groundater	Section 2.1.2.4 Water Act, page 11	Text: "The Water Act 2000 provides for Water Resource Plans to be prepared on a catchment-by-catchment basis, as part of a consultative process." This statement is incorrect. Water Resource Plans are no longer part of the Water planning framework in QLD (only applies to the Murray Darling Basin Water Plans under the Australian Government's Water Planning framework. Queensland has Water Plans which manage the water resources across the state in a catchment to catchment basis.	Revise wording in the final EIS.	Amended EIS	See Appendix 09A, section 2.1.2.4.
62	69	9	Appendix 09A Groundater	Section 2.1.2.4 Water Act, page 11	Text: "These Water Resource Plans are developed to balance water allocations (that is, human use) with environmental flows (that is, leaving water in a watercourse or aquifer to maintain natural processes)." Wording requires updating as water allocations are one type of water entitlement which are authorised under the Water Act and not all 'human use' requires a water entitlement and may be authorised under the Act (relevant Plan).	Suggested edit "These Water Plans are developed to balance consumptive use (human use) with environmental flows (that is, leaving water in a watercourse or aquifer to maintain natural processes)."	Amended EIS	See Appendix 09A, section 2.1.2.4.
62	70	9	Appendix 09A Groundater	Section 2.1.2.4 Water Act, page 11	Text: "The Water Act 2000 relates to the Project through its focus on maintaining the health of ecosystems, water quality, and ecological processes relating to aquifers, as outlined in Chapter 3 of the Act." Wording should be aligned with the purpose of the chapter (section 361). Chapter 3 manages the impacts of underground water caused by the exercise of underground water rights by resource tenure holders through a regulatory framework. The proposed project falls outside the scope of a resource tenure activity under the Water Act (also noted in Chapter 10 Surface water).	Revise wording in the final EIS.	Amended EIS	See Appendix 09A, section 2.1.2.4.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
62	71	9	Appendix 09A Groundwater	Groundwater impact assessment, Sections 5.1.3 and 5.2.4	<p>Summary of issue: A better explanation regarding the groundwater modelling undertaken for the draft EIS is required.</p> <p>It is not clear what is meant by the assumption that head change in the aquifer at the storage site can be modelled using closed boundary conditions.</p> <p>An explanation/justification is required to explain the effects of regional groundwater flow/hydraulic gradient in the aquifer, and the potential of groundwater extractions near the storage site to affect heads at the storage site.</p> <p>The assumption "Faults do not impact the flow in the model domain" is poorly justified and requires a clear explanation.</p>	<p>A better explanation is required for what is meant by the assumption that head change in the aquifer at the storage site can be modelled using closed boundary conditions.</p> <p>An explanation/justification is required to explain the effects of regional groundwater flow/hydraulic gradient in the aquifer, and the potential of groundwater extractions near the storage site to affect heads at the storage site.</p> <p>The nature of faults within the area should be clearly explained and assumptions about the nature of faults clearly justified in the final EIS.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.9, and 9.10; and Appendix 09B.
62	72	9	Appendix 09A Groundwater	Section 6 2.5, Groundwater water supply and users, page 176	<p>Text: "The Water Act 2000 defines a water level trigger threshold of a decline in water level of 5 m for a consolidated aquifer."</p> <p>The Water Act defines bore trigger threshold and not a water level trigger threshold. The bore trigger threshold prescribes the threshold for the decline in water level to be 5 m for a consolidated aquifer.</p> <p>Revise wording for consistency with the Water Act.</p>	Revise wording for the final EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.9.4 and 9.9.5.
62	73	9	Groundwater	RDMW response to draft TOR (items not addressed)	<p>1.2 Clearly identify the water resources (natural waters in aquifers) that will be permanently unavailable for access by future generations of potential water users as a result of the proposed activity.</p> <p>2.1 Provide an options analysis to demonstrate why the Precipice is preferable to other aquifers for long term carbon storage</p>	Address the issues raised by RDMW in its response to the draft TOR for the EIS.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.1, 9.7, 9.9, and 9.11.
63	1	General	General		Please see attached, submission regarding the Proposed Surat Basin Carbon Capture and Storage Project.		Noted	N/A
63	1	General	General		As a concerned primary producer with valuable agricultural assets across Queensland, I would like to formally object to Glencore's Carbon Capture and Store project (CCS) in the Surat Basin. Our company utilises various aquifers from the Great Artesian Basis (GAB) and the ability to continue to utilise this water source, in its current state is vital to the long-term viability of our organisation.		Noted	N/A
63	2	General	General		The Environmental Impact Statement (EIS) supplied by CTSCo describes water at the Lower Precipice Sandstone Aquifer of the GAB as unsuitable for stock water, irrigation, and farm use. Demonstrated evidence, contrary to the EIS, are the current agricultural enterprises successfully utilising this aquifer for the afore-mentioned purposes.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
63	3	General	General		At a minimum, I would like to request an extension of time to the public notification period for the EIS. I believe additional time is necessary to assess the information laid out in the EIS and the potential implications to our own business and that of the wider agricultural industry.		Noted	N/A
63	4	General	General		I would request that an independent review of the supplied EIS be conducted to ensure the validity of the claims made by CTSCo and to report findings back to your department. These findings should be made available to the public.		Amended EIS	See Chapter 1 Introduction, Appendix 1D EIS submission responses from OGIA, IESC and CSIRO; and Chapter 9 Groundwater, section 9.4.5.
63	5	General	General		I respectfully ask that you give careful consideration to this request for an extension of time, given the potential negative ramifications of the project.		Noted	N/A
64	1	General	General		Thank you for the opportunity to review the draft EIS for the Surat Basin Carbon Capture and Storage Project. The Department of Transport and Main Roads has reviewed the draft EIS and provides the attached submission for DES and the Proponent's consideration.		Noted	N/A
64	1	11 2	Transport Proposed Project Description	11.6.2 Intersection Performance Impacts 2.9.1 – Access Road	The draft EIS indicates that the project will provide "a minimum extended design domain (EDD) channelised right-turn treatment for two-lane, two-way roadways without medians" at the Moonie Highway/Harts Road intersection. TMR cannot accept the application of EDD turn treatments or warrants unless there are extenuating circumstances that demonstrate its appropriateness. TMR's District Director is required to approve any EDD variation through an EDD report in accordance with TMR's Road Planning and Design Manual (current edition) and presented in accordance with TMR's Drafting and Design Presentation Standards Manual and the requirements of the <i>Transport Infrastructure Act 1994</i> .	Amend the EIS to not reference to EDD and only use Normal Design Domain for turn warrant assessments and intersection treatments unless supporting documentation is provided which demonstrates the appropriateness of applying EDD to the Moonie Highway/Harts Road intersection.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.9.1, Chapter 11 Transport, sections 11.3.3.4 and 11.6.2, and Chapter 21 Commitments, Table 21-3
64	2	11	Transport	11.7.2 – Access Road Upgrades	Table 11-3 recommends advance warning heavy vehicle signage (W5-22) is to be installed at the Harts Road intersection to inform drivers of the increased heavy vehicle movements at the intersection. TMR advise that these signs are NOT installed. This sign would be typically used where it is necessary to warn of frequent heavy vehicle movements. There are other intersections on this road (that is, Surat Development Rd) that have higher heavy vehicle turning traffic volume without truck warning signage.	Amend the EIS to remove recommendation for installation of advance warning heavy vehicle signage (W5-22) on the Moonie Highway. TMR recommend installation of crossroad intersection warning sign (W2-1) with supplementary name plates (G5-1) on both approaches to the intersection, to highlight the presence of the intersection. Amend the EIS	Amended EIS	See Chapter 11 Transport, section 11.7.2, Table 11-13
64	3	2	Proposed Project Description	2.9.1	<p>Section 2.9.1 proposes an infrastructure agreement between the Proponent and TMR. Given the simplicity of the mitigations works, and the fact that TMR is not a co-contributor, TMR's preference is to not proceed with an infrastructure agreement.</p> <p>TMR's preference is that all mitigation roadworks are identified upfront in the updated EIS traffic report and the proponent is conditioned (via conditions on the environmental authority) to provide the works prior to commencing construction of the project. This is the simplest and most effective option for clarifying and establishing obligations with respect to the mitigation works.</p>	<p>Amend the EIS to:</p> <ul style="list-style-type: none"> - remove references to any infrastructure agreement between TMR and the proponent. - indicate DES will place a condition on the environmental authority to require to necessary mitigation works to be constructed and in place prior to construction commencing for the project. - indicate the applicant will apply to TMR for approval under 33 of the <i>Transport Infrastructure Act 1994</i> to construction the necessary mitigation works within the State-controlled road corridor. <p>Depending on the content of the update draft EIS, TMR will likely be able to provide draft conditions for the environmental authority to address the</p>	Amended EIS	See Executive Summary, sections 3, 7.4.3, 8, 9.13, and 10; Chapter 2, sections 2.9.1 and 2.16; Chapter 4, sections 4.4.13 and 4.4.18; Chapter 11, sections 11.3.1 and 11.7.2; Chapter 17, sections 17.4.4 and 17.8; Chapter 21, Table 21-3; and Chapter 22, Table 22-1.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
64	4a	11	Transport	11.4.5 Railway Level Crossing	<p>Operational traffic</p> <p>TMR notes that section 11.4.5 states that QR has indicated to the proponent that the level crossing across the Gore Highway in Millmerran is currently not in use. TMR has confirmed with QR that the line is currently closed between Millmerran and Brookstead. However, it should be note that the majority of the track remains in situ and can be reopened at any time.</p> <p>Construction traffic</p> <p>Although the EIS clearly defines the route of the project's operational traffic (in Figure 11-2), it does not clearly identify the route of the project's construction traffic. It is therefore unclear if the project's construction traffic will use any railway crossings. TMR requires additional information from the applicant to assess the potential impact of the project's construction traffic on railway level crossings.</p> <p>This impact needs to be clarified in the EIS in accordance with the project's Terms of Reference (extract below) to ensure the project is not reducing the safety or efficiency of the road and rail environment at level crossings.</p> <p><i>identify, assess and mitigate the project's impacts on all existing and future railway corridors, particularly railway level crossings and any aspect of the project interfacing or interfering with existing and future railway corridors in accordance with relevant standards and requirements such as the SDAP, the Guide for Development in a Transport Environment: Rail, the Manual of Uniform Traffic Control Devices, Part 7: Railways and railway manager standards. This is to include the construction and operation impacts of the project. Traffic data should be provided for development generated traffic during construction and operation, background traffic growth and timelines for development staging, construction and delivery.</i></p>	<p>Amend the Draft EIS to demonstrate how the project will comply with PO35 and PO38 of the State Code 2: Development in a Railway Environment of the State Development Assessment Provisions and Section 2.2 of the Guide to Development in a Transport Environment: Rail. In particular, the following should be provided for all railway level crossings impacted by the project's traffic (i.e. any level crossing that is used by the project's traffic, during both construction and operation).</p> <p>[see 4b, 4c and 4d for further details]</p>	Amended EIS	See Chapter 11 Transport, sections 11.4.5 and 11.6.4.
64	4b	11	Transport	11.4.5 Railway Level Crossing		<p>1) Traffic information for use in ALCAM</p> <ul style="list-style-type: none"> - the expected timeframe for the delivery of the project including the commencement of construction and the commencement of use (including any stages). - existing traffic flows (expressed as vehicles per day) over the impacted railway level crossing/s, including daily (peak hour) fluctuations, and number and percentage of heavy vehicles and buses (workforce transport). - the expected background traffic growth (expressed as vehicles per day) over the impacted railway level crossing/s, including the number and percentage of heavy vehicles and buses. This should include background traffic growth from the anticipated commencement of construction and each development stage to a ten year horizon. - the expected project generated traffic (expressed as vehicles per day), including daily fluctuations (peak hour) and percentage of heavy vehicles and buses, that will pass over the impacted railway level crossing/s from the commencement of construction, and each development stage to a ten year design horizon.the maximum size and type of vehicle (including length, width, height and weight) anticipated over the impacted railway level 	Amended EIS	See Chapter 11 Transport, section 11.4.5.
64	4c	11	Transport	11.4.5 Railway Level Crossing		<p>2) Short stacking</p> <p>The project's traffic must not worsen vehicular queuing (short stacking) issues over impacted railway level crossing/s. In particular, provide the following for each impacted railway level crossing:</p> <ul style="list-style-type: none"> - Demonstrate that there is sufficient clearance between each railway level crossing and the relevant intersection/vehicular access location to allow the maximum size of vehicle used in the operation to queue. The minimum clearance should be 5m from the edge running rail (of the closest railway track) as per Section 5.4 – Short Stacking and Figure 3.2 – Yellow Box Marking of AS1742.7:2016 Manual of Uniform Traffic Control Devices, Part 7: Railway plus the length of the maximum design vehicle. - Provide a plan accurately showing the available clearance between the railway level crossing and relevant intersection/access point and demonstrate how the maximum vehicle length can be accommodated with 	Amended EIS	See Chapter 11 Transport, section 11.4.5.
64	4d	11	Transport	11.4.5 Railway Level Crossing		<p>Overdimensional Road Loads (Queensland Rail)</p> <p>In addition, please note that under the <i>Transport Infrastructure (Rail) Regulation 2006</i> permission from the Railway Manager (Queensland Rail) is required to take overdimensional road loads across Queensland Rail infrastructure (e.g. railway level crossings and rail bridges). Further information can be obtained from Queensland Rail's website at: http://www.queenslandrail.com.au/forbusiness/overdimensionalloads</p>	Amended EIS	See Chapter 2 Proposed Project Description, section 2.9.4; and Chapter 11 Transport, section 11.4.5.
65	1	General	General		Please find attached my submission in relation to the CTSCo EIS.		Noted	N/A
65	1	General	General		Thank you for the opportunity to provide a submission to the Environmental impact statement (EIS) for the Surat Basin Carbon Capture and Storage Project proposed by the Carbon Transport and Storage Corporation (CTSCo) Pty Limited near Moonie.		Noted	N/A
65	2	General	General		Water is a vitally important resource and needs to be managed to secure its environmental, social and economic values. To sustain access and associated ecosystems, planning and management should avoid risks to the long-term sustainability of water resources. Sustainable management is vital to meet future consumptive and <u>environmental water requirements. It is our life blood</u>		Noted	N/A
65	3	General	General		I would like to express my concerns that the following have not been adequately addressed (basically glossed over with token responses or ignored altogether so as to sell their project -we require full open honest disclosure on all points of issue) by Glencore/CTSCo in the proposed EIS document.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
65	4	General	General		- The unconventional use of a valuable, high quality GAB aquifer for storage of an industrial waste product, and the setting of a precedent that such a use is appropriate. I believe in the existing legislative and regulatory protections of GAB aquifers and do not support changes of those to enable waste disposal into the GAB, a valuable natural resource with environmental values that must be protected. The precautionary principle must be applied, and the benefits of the proposed project weighed against the benefits of aquifer integrity, long term water security and the socio-economic benefits that flow from that. The CO2 injectate is a regulated waste that cannot be disposed into a GAB aquifer, which is protected by both the Environmental Protection Act 1994 and Water Act 2000. The GAB is one of the largest underground freshwater resources in the world. It is Australia's largest groundwater basin. The GAB generates approximately \$13 billion per year. It is a vital resource for 180,000 people, 7,600 businesses and 120 towns (Australian Government Department of Climate Change, Energy, the Environment and Water website). Glencore (CTSCo) propose to dispose of 110 million litres per year of highly corrosive liquified CO2 into a Great Artesian Basin (GAB) aquifer. How can we allow such a huge risk to the GAB when there is no solutions if Glencore/CTSCo have a failure, unexpected incident or some other disaster that was "considered " not likely so as to justify this risk/project being approved		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 4 Approvals, sections 4.4.4, 4.4.6, 4.4.9, 4.4.22, and 4.4.23; Chapter 9 Groundwater, sections 9.9 and 9.11
65	5	General	General		- Selection of an aquifer that is supporting agricultural activity and expansion. Why more conventional reservoir alternatives were not selected for the project as feasible alternatives should be provided by the Glencore/CTSCo to enable a real assessment of the need to use as the target formation an agriculturally important aquifer delivering secure water supplies.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.15
65	6	General	General		- Unclear application of derived pilot study findings to any subsequent expansion project, presumably also in a GAB aquifer given those are the conditions under test. What value the project will bring as a pilot unless the intention is to develop the site, or other sites, to undertake more extensive CCS operations into similar aquifers. Full details of the planned larger expansion of the project should be made clear, and how the design of the pilot will provide the robust and comprehensive data needed to assess, avoid, and mitigate any risks to the GAB or other aquifers and their users, should the approvals to use aquifers for waste disposal be forthcoming. Locating the project into more conventional reservoir sites would deliver more widely applicable additional understanding for future CCS projects than using the currently identified target aquifer. This is a trial for future up-scaling. CTSCo claim that the targeted GAB aquifer (Precipice Sandstone) has a storage capacity of up to 730 billion litres of CO2. Global leaders in the field are not aware of Carbon Capture and Storage (CCS) injection into water resource aquifers anywhere in the world. Only high salinity formations are targeted. Key outcome monitoring is questionable when there is one monitored bore and also given there is a bore already under construction in same area that has not even been mentioned or considered - how will this affect monitoring and modelling?		Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.9 and 9.10; and Chapter 2 Project Description, section 2.15
65	7	General	General		- Close location of the injection site to an existing water access entitlement with risks to the exercise of those rights, and inadequate proposed monitoring of subsequent impacts to the aquifer, water quality in the vicinity and ongoing use of the aquifer for stock watering purposes. Following state government referral, Glencore/CTSCo must consider and respond to the Independent Expert Scientific Committee (IESC) advice on the use of an aquifer as the target site, the risks to the environmental values and other users, and the adequacy of the methodologies used and proposed to be used by the Glenco/CTSCo. At time of writing this submission that advice was not yet available on the IESC website. Glencore/CTSCo need to more clearly demonstrate why and how the injection plume is not going to impact on our bores and offer concrete evidence and guarantee that this project will not be detrimental to the bores in the area. When pumping the water supply bores we don't want it to result in the degassing and return of CO2 back into the atmosphere.		Amended EIS	See Chapter 9 Groundwater, section 9.9
65	8	General	General		- Poor characterisation of the quality of the water in the aquifer, including that it is saline and has characteristics making it unsuitable for aquatic ecosystems and unsuitable for irrigation, stock and drinking water. This interpretation applied in the EIS and associated assumptions is contrary to the fact that the water is suitable for other uses including stock water, drinking water and irrigation.		Amended EIS	See Chapter 9 Groundwater, section 9.7
65	9	General	General		- Limited consultation undertaken with interested parties, the community, and the nation. Public notice of this project has not been satisfactory as very few in the affected district and permit area really knew about it until it was almost too late to make a submission. There was an attempt to get a similar project up and going in Central Queensland - where there was more community consultation and the community said No and that project didn't go ahead. This community has not been engaged properly with regards this project. The described project is a poor "flagship" "first of its kind in QLD" trial for the Carbon Capture and Storage (CCS) industry and the many industries that the technology aims to support. We are concerned that this will be another Hopeland Linc Energy Trial which was an embarrassment for QLD. As with Hope land, what happens if things go wrong or worse still very wrong-who is responsible, who pays what compensation, and can this be guaranteed?		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4 and 3.5 ; and Chapter 9 Groundwater, sections 9.9 and 9.10
65	10	General	General		- The potential impacts to water quality on overlying aquifers due to failures with the project (bore casing and cement failing allowing the CO2 to migrate upwards) and with all the deep gas activity in the area (4000m) punching through this layer (2200m) where they are hoping to store the CO2 that may result in migration to overlying aquifers. This project may adversely impact on future generations- it appears Glencore/CTSCo is taking a very short-sighted view - once an aquifer is contaminated you can't really "clean it up".		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
65	11	General	General		- The additional trucks on the road carting from Millmerran to Moonie - 9 B Doubles per day on our already struggling road infrastructure. The waste CO2 is proposed to be trucked along existing roads from the Millmerran Power Station to the injection site west of Moonie (a 520km round trip) over a period of 3 years.		Adequately dealt within the EIS, no change to the EIS	See Chapter 11 Transport, sections 11.6 and 11.7
65	12	General	General		- If this project is deemed successful after the initial 3 year period it will be expanded and we will be the area to get many more CO2 injection wells, pipeline and trucks etc being the dumping ground for the emissions of Glencore. This is not acceptable.		Noted	N/A
65	13	General	General		- The impact on the local communities - for example the emergency services. The nearest Fire service is the local Rural Fire Brigade which are manned by local volunteer landholders, the closest ambulance is in Meandarra which has not even been mentioned in the EIS. Then the traffic from the project in regard to schools and the school buses in Moonie and surrounds.		Adequately dealt within the EIS, no change to the EIS	See Chapter 11 Transport, sections 11.6 and 11.7

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
65	14	General	General		I trust that with the information brought forward from all the submissions regarding this project that a true and accurate appraisal of the massive risks and potential dangers involved are made evident, very clear and public so if any progression forward could only take place if a cautious, meticulous and genuine approach to each and every aspect of the project was adopted.		Noted	N/A
66	1	General	General		Thank you for your consideration of these crucial matters. We are landholders in the Western Downs who count as interested persons in the above project. We produce beef cattle and strive to continue to operate a sustainable agribusiness with long term growth, viability and profitability. There is potential from Glencore's project to severely impact ours and other farmer's ability to do this.		Noted	N/A
66	2	General	General		We are objecting to the Surat Basin Carbon Capture and Storage project proposed by Glencore for the Western Downs on the basis of potential impacts to the groundwater quality on overlying aquifers. There needs to be a more concrete guarantee that groundwater and property bores in the local region will not be adversely affected.		Amended EIS	See Chapter 9 Groundwater, section 9.9
66	3	General	General		Chapter 9 pages of the EIS discuss the potential outcomes of the project with the word unlikely used in several places. This is not adequate reassurance for local land holders who are not listed as interested or affected persons.		Amended EIS	See Chapter 9 Groundwater, section 9.9
66	4	General	General		SUBMITTER EDITED IMAGE THAT IS FROM THE EIS		Noted	Noted
66	5	General	General		It appears that a very short sighted view is being taken. This project may have an adverse affect on current and future farming operations. Once aquifers are impacted it will be virtually impossible to clean up. If this project is deemed a success it will be expanded, making this area of the Western Downs a carbon storage "tip". Really not fair for a region which produces food for ours and other nations.		Amended EIS	See Chapter 9 Groundwater, section 9.9
66	6	General	General		Thank you for the opportunity to provide a submission to the Environmental impact statement (EIS) for the Surat Basin Carbon Capture and Storage Project.		Noted	N/A
66	1	General	General		SUBMITTER EDITED IMAGE THAT IS FROM THE EIS		Noted	Noted
67	1	General	General		I wish to register my strong objection to the Glencore carbon capture and storage project in the Surat basin Qld. Having worked in the Australian energy and resources industry for over 30 years (6 years in Queensland CSG industry) I understand the area, its geology and how important water is to the local community and Australia's economy. I have developed and built most types of power stations and gas plants in Australia, and I am currently the CEO of an energy development company.		Noted	N/A
67	2a	General	General		The proposed project should be rejected for the following reasons: 1. Carbon capture and storage has never been successfully completed at any scale in the world. The WA Gorgon gas project received its planning and environmental approval based on a large carbon capture project which has never worked and has now been abandoned. There are many such examples around the world. CCS was developed by the global coal industry to enable them to keep burning coal for longer than we know they should, by creating the illusion that CCS technology might one day work.		Noted	See Chapter 2 Project Description, section 2.3
67	2b	General	General		2. Given the terrible history of the Link energy underground gasification project (also in the Surat basin and not far from the proposed project site) where the underground syngas process was started and continues to this day in a completely uncontrolled manner, how could something like this project even be conceived. The EPA tried very hard to jail the directors of Link energy, almost succeeding. The state of Queensland (and the local community) now own the legacy and liability for this environmental catastrophe.		Noted	N/A
67	2c	General	General		3. The value of the GAB water resource is immeasurable to Australia and thousands of Australian regional communities. It would be absurd to risk this priceless resource to an experiment that has no useful purpose or benefit. Any value that the project might create would be insignificant compared to the contribution this region and the Agricultural sector makes to the Australian economy, all secured by the GAB.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.3
67	2d	General	General		4. The project is 100% research and development, it should not be even attempted on the actual GAB until the technology is understood and de-risked. The way it is currently proposed there is no de-risking of the technology before implementing it no one of sound mind would do this.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Project Description, section 2.13
67	2e	General	General		5. Given the risks posed to the community, the GAB and many other regional communities Glencore should be required to put in place an unlimited indemnity and bank guarantee so that in the event of the aquifer and the GAB being damaged or degraded for generations, and impacting thousands of peoples livelihoods, then there is no requirement to go through a protracted court battle against Glencore which no one would win given their money and power, the Queensland government would certainly not win.		Noted	N/A
67	2f	General	General		6. If this project ever got approved, the approval must require Glencore to decommission and rehabilitate the facility at the end of its life, and not walk away. The decommissioning requirement must be secured by a decommissioning bond as an irrevocable bank guarantee.		Adequately dealt within the EIS, no change to the EIS	See Chapter 19 Rehabilitation
67	3	General	General		I would happy to talk to any of the above points in detail at anytime.		Noted	N/A
68	1	General	General		Please find attached a submission for the CCS Project		Noted	N/A
68	1	General	General		I am objecting on the potential impacts to water quality on overlaying aquifers due to failures with the project (bore casing and cement failing allowing the CO2 to migrate upwards). How can there be certain reassurance that there will be no impact on useable underground water resources in the Great Artesian Basin and aquifers that are of great importance to agriculture. Disposal of CO2 waste into viable aquifers needs to be opposed.		Amended EIS	See Chapter 9 Groundwater, section 9.9
68	2	General	General		I am seeking more concrete evidence and a guarantee that they will not destroy the bores in the area that are used for livestock purposes by undertaking this project. We need more evidence that clearly demonstrates why/how the injection plume is not going to impact on these bores.		Amended EIS	See Chapter 9 Groundwater, section 9.9

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
68	3	General	General		I am concerned with all the deep gas activity in the area (4000m) punching through this layer (2200m) where they are hoping to store the CO2 that they will allow migration to overlying aquifers. I want evidence of how can one single monitoring bore be able to accurately monitor stream plume behaviour across the comprehensive network of surrounding formations. The Great Artesian Basin spans almost 1.7million square kilometres. Can we really afford to contaminate this great resource with waste product, turning it into a dumping ground? There has been poor characterisation of the water quality, it is indeed used for livestock and irrigation throughout the region.		Amended EIS	See Chapter 9 Groundwater, sections 9.7 and 9.10
68	4	General	General		This project may adversely impact on future generations ability to run their farming operations - they are taking a very short sighted view- once an aquifer is contaminated you can't "clean it up".		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
68	5	General	General		I am also concerned about the additional trucks on the road carting from Millmerran to Moonie nine B Doubles per week day for 3 years. Our roads are already in a bad state of repair. This is going to impact on daily travel to school, education and medical appointments with the further deterioration of roads.		Adequately dealt within the EIS, no change to the EIS	See Chapter 11 Transport, sections 11.6 and 11.7
68	6	General	General		I have raised a range of concerns about the project, including the use of an important and unique aquifer for waste disposal purposes, the impacts on the aquifer and other users, inadequate monitoring of impacts, poor characterisation of water quality at the site and its suitability for other uses, and there has been extremely limited consultation with community members. The only advertising of community consultation was through Facebook. It was not widely circulated throughout the community through normal channels.		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4 and 3.5 ; and Chapter 9 Groundwater, sections 9.7 and 9.10
68	7	General	General		I do not support this CCS project as it is currently proposed.		Noted	N/A
69	1	General	General		Please find attached our letter of opposition for the Glencore Surat Basin Carbon Capture and Storage Project.		Noted	N/A
69	1	General	General		We are writing to express our concern for the proposed underground Carbon Storage Project.		Noted	N/A
69	2	General	General		We are aware of the importance of finding new and environmentally friendly ways to reduce our carbon impact on the world for future generations however it has come to our attention that this pilot program may not be as environmentally safe and the outcomes to this project may have far reaching and devastating negative effects greater than the proposed "positive" impacts that Glencore/CTS Co are expecting from carbon storage.		Noted	N/A
69	3	General	General		It is of the utmost importance to us as primary producers that this type of storage is not considered in this area or any other area of primary production or rural communities. Glencore/CTS Co cannot guarantee that cross over contamination or leakages will not occur into different water aquifers and that puts our industry at extreme risk in the future as well as our communities that rely on the Great Artesian Basin for their water.		Amended EIS	See Chapter 9 Groundwater, sections 9.9.1 and 9.9.9
69	4	General	General		You would already be aware of existing water licences into this aquifer and it would seem incomprehensible to allow this project to proceed with the possibility of this project potentially contaminating that aquifer. Due to the unreliable weather conditions in the Western Downs, we have been considering the installation of a bore on our property that will not only secure our livelihood during drought but will also increase our production through the development of a small feedlot that can be utilised during drought conditions. This project is of considerable expense to us and any contamination to our water supply would be disastrous for us financially and ecologically.		Amended EIS	See Chapter 9 Groundwater, section 9.9
69	5	General	General		We would like to point out that Glencore/CTS Co do not have the ability to reverse any damage that this project could cause and are not directly affected by a failure of this project however the damage would be felt for the rest of our lives and beyond. The use of bore casing and cement has been proven to be unreliable in some existing bores so the use of this method is not acceptable as a means of guaranteeing the safety of this project. Glencore/CTS Co also does not have the financial ability to cover any leakage, long term health complaints, animal welfare claims, and environment damage or provide adequate lifelong compensation to those affected. Should Glencore/CTS Co be allowed to proceed with this project and safety cannot be guaranteed, it could potentially spell the collapse of our business should the projects safety be compromised and in years to come we may not find it feasible to continue our industry in an area our family has thrived for over five generations.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.10
69	6	General	General		In terms of the immediate impact however, this project is guaranteed to cause damage to infrastructure that our community uses daily with no apparent benefit to the people of this community. Living in this community we often find that the roads are substandard at the best of times. Should this project go ahead, road usage by heavy trucks and machinery will increase and as a result the roads that our community rely on daily to conduct our business and travel with family to and from school and various appointments will become substantially more deteriorated making them increasingly unsafe for the community. As you may appreciate from what has already		Adequately dealt within the EIS, no change to the EIS	See Chapter 11 Transport, sections 11.6 and 11.7
69	7	General	General		The Surat Basin area is important to many different agricultural industries as well as being home to many unique pockets of conservation areas including many important river systems and National Parks. If this proposal goes ahead this unique area runs the risk of becoming an environmental disaster zone for the benefit of Glencore/CTS Co who will only see our valuable land and community as a future dumping ground. Considering the future needs for our state and even our country, any activity that puts primary productions and food		Noted	N/A
70	1	General	General		Please find attached submission to the CTSCo Surat Basin Carbon Capture and Storage Project for inclusion. Should you have any questions, please do not hesitate to contact me		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
70	1	General	General		<p>Summary</p> <p>The Great Artesian Basin is one of the largest underground freshwater resources in the world. It is Australia's largest groundwater basin. It lies beneath parts of the Northern Territory, Queensland, South Australia, and New South Wales. It includes the Eromanga, Surat, and Carpentaria geological basins.</p> <p>The Basin spans almost 1.7 million square kilometres which is over one-fifth of the Australian continent. There is around 65 million GL of groundwater in the Basin which is enough water to fill the Sydney Harbour 130,000 times.¹</p> <p>Any project that has any possibility of leading to irreparable damage to aquifers, and resulting in devastating consequences for the water used by the more than 120 communities for general urban use along with that used by our agricultural producers must not be permitted under any circumstance.</p>		Amended EIS	See Chapter 9 Groundwater, section 9.9
70	2	General	General		Other methods of dealing with Carbon Dioxide need to be found other than the possible contamination and pressurisation of a system which supports a significant portion of Queensland. There are realistic scenarios under which CO2 could migrate from the deep storage formation(s) to shallower aquifers, and very little		Amended EIS	See Chapter 9 Groundwater, section 9.9
70	3	General	General		The environmental impact of carbon capture and storage (CCS) is a critical issue, and whilst the process proposed is being presented as socially favourable, the potentially devastating consequences to the very core of sustainable development and community survival cannot be overstated or overlooked.		Amended EIS	See Chapter 9 Groundwater, section 9.9
70	4	General	General		This project is not the only CCS project under consideration and if the regulation requiring environmental factors to be taken into consideration is removed a precedence will be set for projects of a similar nature and more damage to aquifers.		Amended EIS	See Chapter 9 Groundwater, section 9.9.8
70	5	General	General		In their evaluation entitled Induced Seismicity Potential in Energy Technologies (NRC 2012), NRC came to the following conclusions regarding the potential risk of induced seismicity [within the Aquifer within the Great Artesian Basin]		Amended EIS	See Chapter 8 Geology, section 8.8
70	6	General	General		Apart from the induced pressure gradients and flow rates acting to change the dynamics of the flow system, subsurface connectivity could be altered at a fault by the offset of the aquifer and aquitard layers. The permeability of the fault may also change following an earthquake for reasons mentioned earlier. In addition, aquitard integrity may be decreased as the result of brittle deformation in the vicinity of the fault following displacement ³		Amended EIS	See Chapter 8 Geology, section 8.9; and Chapter 9 Groundwater, section 9.9
70	7	General	General		The potential for the acidic liquified waste CO2 causing structural changes to surrounding rock formations leading to leaching of corrosive and dissolved heavy metals from the aquifer to groundwater.		Amended EIS	See Chapter 9 Groundwater, section 9.9
70	8	General	General		It is also a logical conclusion to draw that these contaminants will flow from the highly pressurized site within the aquifer to a low-pressure area, being existing stock bores and water supplies.		Amended EIS	See Chapter 9 Groundwater, section 9.9
70	9	General	General		The publicly available information on which the decision is being made all comes from the company itself.		Noted	N/A
70	10	General	General		The Queensland Government needs to have an independent evaluation, also publicly available, done by a group such as the Independent Expert Scientific Committee (IESC) which the government obtains advice from for Mining and CSG applications.		Noted	N/A
70	11	General	General		The proponent claims that no damage will be done to existing bore owners while acknowledging that no new user will be permitted in the footprint area in future. Does this mean that existing owners will not be permitted to drill replacement bores or new bores?		Amended EIS	See Chapter 9 Groundwater, section 9.9
70	12	General	General		CTSCo states that it has deliberately identified "a very deep, 2.3 kilometre, low-quality sandstone aquifer 50km from the nearest bore used for agricultural purposes, and where water quality is low and cannot be used for drinking or agricultural use". ⁴ Such parameters are often arbitrary. Hydrogeologist Ned Hamer, principal of groundwater consulting practice Earth Search states:		Amended EIS	See Chapter 9 Groundwater, section 9.7
70	13	General	General		"The guidelines are very conservative based on assumed high fluoride intake in food and no other water source for the animals life." Additionally, the guidelines were not intended as an absolute cutoff, rather, they served as a trigger to observe animal health and check with nutritionist if needed. The fluoride issue was "easily managed" through fluoride levels in feed and "could easily be reduced in water by blending, amendment and treatment		Amended EIS	See Chapter 9 Groundwater, section 9.7
70	14	General	General		Livestock owners who adjoin this experimental area will attest to the fact that it is suitable. The claims of the company on this matter do not give a reasonable excuse for damaging the aquifer.		Amended EIS	See Chapter 9 Groundwater, section 9.7.4
70	15	General	General		Landowners over much of the Artesian Basin regularly construct bores which are a kilometre or more. Local councils in regional areas also rely on underground water for isolated communities. Would they be considered a "normal" user?		Amended EIS	See Chapter 9 Groundwater, sections 9.7.4 and 9.9.3 and 9.9.6
70	16	General	General		In the future, with better technology and perhaps greater demand for water all users will expect to get to the depth of the proposed aquifer.		Amended EIS	See Chapter 8 Geology, section 8.7
70	17	General	General		They also claim that it is a confined aquifer. Identifying the exact underground topography is always ongoing and subject to revision. Indeed, the IESC has been known to request more surveying and modelling to be done including well outside the proponent's footprint.		Noted	See Chapter 9 Groundwater, sections 9.10 and 9.12
70	18	General	General		Whilst this trial period for this new technology is three years, by what safeguarding mechanism can government halt the trial should environmental or economic harm result within the trial period?		Noted	N/A
70	19	General	General		Have Carbon Transport and Storage Corporation (CTSCo) been obligated to set aside a substantial bond to cover impacts to users in the affected area during the trial if it progresses to compensate for any and all economic loss and potential remediation. How will owners be compensated if their bores are affected and what standard of proof will they require? Even if made a requirement, no amount of compensation can replace the irreplaceable.		Noted	N/A
70	20	General	General		The project in its current form and location is best summed up by those from a neighbouring property less than 10km away, "This is a preposterous project that Glencore has got on the table," he said.		Noted	N/A
70	21	General	General		"Their proposal is to pump industrial waste into the Great Artesian Basin, and the Great Artesian Basin is the lifeblood of much of regional Australia." ⁶		Noted	N/A
70					Collated and prepared by Directors, [REDACTED]		Noted	N/A
					Submitted on behalf of Green Shirts Movement Queensland			

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
70	22	General	General		REFERENCES OF DOCUMENT			
71	1	General	General		Please find attached my submission to the Surat Basin Carbon Capture and Storage Project.		Noted	N/A
71	1	General	General		I welcome the opportunity to be able to provide feedback and voice my concerns on the Environmental Impact Statement (EIS) for the Glencore CTSCo Surat Basin Carbon Capture and Storage Project.		Noted	N/A
71	2a	General	General		The Importance of the Great Artesian Basin (GAB) and the Precipice Sandstone Aquifer We are farmers on the Darling Downs and are highly reliant on groundwater, as are all in our region, hence why we are deeply concerned by this proposed trial project to inject up to 110,000 tonnes of highly corrosive liquified carbon dioxide (CO2) into an aquifer of the Great Artesian Basin (GAB).		Noted	N/A
71	2b	General	General		The GAB is one of the largest underground freshwater resources in the world. It is Australia's largest groundwater basin. This natural resource is relied upon by agriculture and is the lifeblood for the future of industry and rural communities. Groundwater from the Precipice Sandstone aquifer provides an invaluable supply of water to numerous towns, agricultural enterprises and other regionally important facilities across southern QLD. This aquifer is currently being used for the production of livestock with a number of businesses having acquired licenses in this critical water supply aquifer, for future expansion purposes.		Noted	See Chapter 9 Groundwater, sections 9.7 and 9.9
71	2c	General	General		With the onslaught of coal seam gas in the Surat Basin, and the subsequent depletion of water bores, rendering them inoperative and unproductive, the Precipice Sandstone will become ever more valuable and critical, as regional communities and landholders are forced to find alternative, deeper water sources in order to survive and exist in the affected areas.		Noted	N/A
71	2d	General	General		It appears that this proposal to inject CO2 into a water resource aquifer has never been done in the world. Existing carbon dioxide injection is only ever done into hyper saline groundwater formations or former gas reservoirs, and for good reason. CTSCo's proposal to inject CO2 into a GAB aquifer represents a significant threat to one of Australia's greatest natural resources and subsequently the businesses and communities, which rely on it. It is imperative that valuable groundwater is not put at risk. This proposed trial is the first of its kind into the GAB. There is a severe lack of scientific evidence to provide the required assurances that no adverse impacts will occur to the GAB. If it cannot be guaranteed that precious groundwater will not be put at risk, then the precautionary principle must be applied.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 3, 9.9, 9.10 and 9.11
71	2e	General	General		The geological formation of the Precipice Sandstone is a regionally significant and high-quality GAB aquifer. The Precipice Sandstone is also the source aquifer for springs and supports numerous Groundwater Dependant Ecosystems (GDEs). It outcrops and forms the spectacular sheer sandstone walls of Carnarvon Gorge in Central QLD, and extends southwards well beyond the NSW border. The groundwater from the Precipice aquifer provides an invaluable supply of water to numerous towns, agricultural enterprises, power stations and other important facilities across the southern Queensland region. This targeted injection of CO2 is proposed to occur into an aquifer that is important for supporting any future growth and intensification of agriculture in southern QLD.		Amended EIS	See Chapter 9 Groundwater, section 9.7
71	2f	General	General		CTSCo state in the EIS that the water quality in the Precipice Sandstone is poor and 'unsuitable for irrigation water, stock water, and drinking water'. However, this is an erroneous statement as the aquifer is currently being used for the production of livestock in the local area. It is understood that the salinity is slightly elevated but well below stock limits and the fluoride is high but those 'limits' are loose at best and water with this level of fluoride has been used for stock for many years, without adverse impacts to livestock: <i>"The water samples in the CTSCo EIS found that the total dissolved solids (TDS), including salt, in the water at its injection well in the Precipice Sandstone aquifer was about 1,800mg/L – official livestock water quality guidelines¹ state that cattle, pigs and sheep can tolerate between 4,000 and 5,000mg/L of TDS respectively,</i>		Amended EIS	See Chapter 9 Groundwater, sections 9.7.4 and 9.7.5
71	2g	General	General		The Cameron Pastoral Company (CPC) – a major pork business - holds a licence to extract water less than 10km from the same aquifer CTSCo is proposing to store waste CO2. Despite CTSCo stating that the project is not expected to impact any future water extraction at these landholdings, their EIS says: <i>"Future users should not be allowed to take groundwater supply from the zone impacted by the plume (Precipice Sandstone aquifer). This should include a zone around the impacted area from which water might be extracted by a well installed outside of the immediate residual impact zone. Although it is noted that the Precipice Sandstone is deep at this location and not likely to be used for water supply by regular users."</i>		Amended EIS	See Chapter 9 Groundwater, section 9.9
71	2h	General	General		The Cameron Pastoral Company produces about 3,000 pigs each week and employs about 130 people. Should their future sustainability, food production and the jobs they provide, be put at risk by the injection of an industrial waste product into a water supply aquifer they already hold licences for?		Amended EIS	See Chapter 9 Groundwater, section 9.9.9
71	3a	General	General		Contamination concerns As stated by the Office of Groundwater Assessment (OGIA): <i>"All geological materials are permeable to an extent and all adjacent geologic formations are therefore connected to a degree."³</i>		Amended EIS	See Chapter 9 Groundwater, sections 9.7.1 and 9.7.3
71	3b	General	General		There is a significant concern for connectivity pathways to allow for the flow and subsequent contamination of the CO2 from the target formation to the valuable overlying aquifers.		Amended EIS	See Chapter 9 Groundwater, sections 9.9.1, 9.9.6 and 9.9.9
71	3c	General	General		There are genuine concerns that it will acidify the surrounding water (pH from 7 to 4). There is concern that this acidification could result in the release of heavy metals and other contaminants from the surrounding rock. These contaminants will then move with the groundwater flow.		Amended EIS	See Chapter 9 Groundwater, section 9.9
71	3d	General	General		There are concerns that the proposed monitoring program is too narrow to identify potential impacts to groundwater quality. Liquid CO2 is highly corrosive and wherever the GHG plume moves there is a risk to water infrastructure and stock use of the water. There are potentially technical issues in keeping the liquid CO2 stable in this site. CTSCo's groundwater modelling has not considered nearby extraction even though they were aware of the allocations.		Amended EIS	See Chapter 9 Groundwater, section 9.9
71	3e	General	General		The geochemical modelling has also predicted the increase of sulphur dioxide (SO2) and nitrogen dioxide (NO2) as part of the associated impurities of the GHG injection stream. It is noted in the EIS by CTSCo, that the impact of the impurities SO2 and NO2 would be negligible as their concentrations are relatively low, however this is inconclusive, as the ability for the stream flow integrated with bore extraction appears to not have been considered.		Amended EIS	See Chapter 9 Groundwater, section 9.9

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
71	3f	General	General		Other bore entitlements for these allocations have been approved by the Department clearly showing that industry has a future use intent for this water. The modelling has not considered extraction by nearby users. GAB groundwater within the Surat Basin is fully allocated and is the main constraint to further development of the region. Businesses looking for expansion opportunities through water supply will need to look to deeper more secure aquifers such as the Precipice Sandstone. Potential future use of Precipice Sandstone ground water must be considered in the EIS assessment process and included in the modelling.		Amended EIS	See Chapter 9 Groundwater, section 9.9
71	3g	General	General		This project is identified as a trial and it is understood that likely expansion will be proposed following the trial, with further GAB sites subsequently to be considered for similar projects. This longer-term upscale potential is of significant concern, it could lead to the injection of waste CO2 into the GAB at an industrial scale.		Noted	N/A
71	4a	General	General		A breach of existing environmental legislation Injecting a regulated waste into a GAB aquifer is currently prohibited under existing regulation. The EIS even acknowledges the project "will not meet" a key criteria under Queensland's <i>Environmental Regulation Act 2019</i> , whereby the direct or indirect release of contaminants to groundwater is not permitted. Section 41 (2) (c) requires the administering authority to refuse the application if the authority considers the waste is likely to result in a deterioration in the environmental values of the receiving groundwater. For this reason alone, the		Amended EIS	See Chapter 4 Approvals, section 4.4.6.4; and Chapter 9 Groundwater, section 9.11.1
71	5a	General	General		Seismic Testing CTSCo admit at section 8.9.1 of the EIS, that they have not completed seismic testing of the area around the proposed injection site. Therefore, they cannot determine if faults are, or aren't present. The CO2 injection/pressurisation activity has the potential to reactivate faults and/or cause fracturing. Faults and fractures can create leakage and contamination pathways, allowing CO2 & other chemicals to migrate into the precious shallower aquifers above, where gassy bores could result. As the Precipice Sandstone is pressurised by the injected CO2 gas, it is natural for fluids to want to travel from a pressurised zone to a less pressurised zone		Amended EIS	See Chapter 8 Geology, sections 8.6.2 and 8.7.6
71	5b	General	General		Submitter image		Noted	N/A
71	5c	General	General		It is a critical and essential prerequisite that seismic testing be carried out prior to any environmental approvals being assessed. Without such, severe negligence is at play.		Amended EIS	See Chapter 8 Geology, sections 8.6.2 and 8.7.6
71	6a	General	General		Further oil production smokescreen This proposed project coincidentally is also an enabler for further oil production from the Moonie Oilfield ⁴ :		Not relevant to the EIS	N/A
71	6b	General	General		Submitter image		Not relevant to the EIS	N/A
71	6c	General	General		The CEO of Bridgeport Energy (New Hope Group) even states in an ASX announcement in 2021, that the CTSCo CO2 injection site, constitutes an enhanced oil recovery program for them, resulting in it going from 2C to 2P reserves at their Moonie Oilfield i.e. taking it from being not currently considered to be commercially viable to a probable area to produce oil: <i>"Bridgeport has progressed procurement of a reliable source of CO2 for the Company's enhanced oil recovery and storage project at our Moonie oil field in southeast Queensland, to a provisional gas sales agreement with CTSCo, which when executed, will see it in the conversion of 2C reserves to 2P reserves."</i> ⁵		Not relevant to the EIS	N/A
71	6d	General	General		That is 7.9 million barrels of oil (a GHG emitting fossil fuel), that would otherwise have not been commercial and ordinarily stayed in the ground, potentially being produced. This subsequent and supplementary oil production will negate and wipe out all the projected carbon emissions being saved from sequestering the CO2 from the Millmerran Power Station. An extra "3.4 million tCO2e in the atmosphere once consumed. You don't need to be a mathematician to work out that, 3.4 million tCO2e > 0.96 million tCO2e. Therefore, rendering the project a fraud and failure in its planned removal of carbon from our atmosphere. A case of one step forward and three giant steps back		Not relevant to the EIS	N/A
71	7a	General	General		Conclusion The GAB is a highly valued natural resource that sustains agriculture, the environment and regional communities; not only in Queensland, but also interstate in New South Wales and South Australia. Because of its intrinsic value, it must be protected. A reliable groundwater source to maintain the water security of regional communities reliant on the GAB, needs to be held in higher regard than a place to dispose of industrial waste.		Noted	N/A
71	7b	General	General		I strongly implore that the government does not to allow the injection of waste CO2 into the GAB and does not amend legislation that would allow such an activity at any location in the GAB in the future.		Noted	N/A
71	7c	General	General		I submit that, based on the grounds raised above, the Surat Basin Carbon Capture and Storage Project should not proceed.		Noted	N/A
71	8	General	General		REFERENCES OF DOCUMENT		Noted	N/A
72	1	General	General		Further to my email below, please find attached here our approved submission on the draft Terms of Reference for the Surat Basin Carbon Capture and Storage Project.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
72	1	4	Approvals		<p>The <i>Fisheries Act 1994</i> is not included in the Queensland State legislation and Policies.</p> <p>Trenching of the pipeline through the northern branch of Stephens Creek and upgrading or constructing new access roads over Stephens Creek and South Branch Stephens Creek are waterway barrier works.</p> <p>While the works will not be assessable due to Planning Act exclusions, the works should be done with best practise in mind to minimise impacts to matters of state environmental significance (waterways).</p> <p>Both trenching (temporary waterway barrier) and upgrading or constructing new waterway crossings for access are likely to be able to comply with Fisheries Accepted development requirements for constructing or raising waterway barrier works.</p> <p>This document will guide the applicant on best practise construction designs and recommendations, including for post works restoration of the waterway.</p>	Inclusion of the <i>Fisheries Act 1994</i> with specific reference to constructing or raising waterway barrier works in fish habitats.	Amended EIS	See Chapter 4 Approvals, section 4.4.7
72	2	10	Surface Water		<p>There is no reference to waterways as defined within the <i>Fisheries Act 1994</i> and possible impacts to fish passage.</p> <p>Stephens Creek, South Branch Stephens Creek and Moonie River are within or adjacent to the proposal. These are all waterways providing for fish passage and are displayed on the Queensland Waterways for Waterway Barrier Works Spatial Data Layer (Qld Globe).</p> <p>There are additional waterways within tenement EPQ 10.</p> <p>No reference to waterways or the data layer have been made in this section of the EIS.</p>	Include a note in this section that waterways as defined within the <i>Fisheries Act 1994</i> are discussed in Chapter 14B: Aquatic Flora and Fauna.	Amended EIS	See Chapter 10 Surface Water, section 10.3.3.
72	3	14B	Aquatic Flora and Fauna	14B.5.1 Waterway Crossings	<p>(p. 27) Include reference to accepted development requirements for operational work in relation to constructing or raising waterway barrier works.</p> <p>This document prescribes designs for waterway crossings that will ensure impacts to fish passage are mitigated.</p>	Include reference to accepted development requirements for operational work in relation to constructing or raising waterway barrier works.	Adequately dealt within the EIS, no change to the EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.6.1
72	4	21	Commitments		<p>There is no commitment to construct or upgrade any waterway crossings in accordance with accepted development requirements.</p>	<p>Include a reference to accepted development requirements for operational work in constructing or raising waterway barrier works.</p> <p>The applicant should make a commitment to designing any new or upgrades to waterway crossings in accordance with the accepted development requirements where necessary. (Table 1 or Table 2)</p> <p>Include a commitment to remove all access tracks that are no longer required at the end of their use, and to rehabilitate waterways to pre-works condition or</p>	Adequately dealt within the EIS, no change to the EIS	See Chapter 14B Aquatic Flora and Fauna, section 14B.6.1, and Chapter 21 Commitments, Table 21-3
72	5	General	General		<p>The EIS states that the project will have limited impacts on groundwater in the vicinity of the project based on similar case studies and modelling, and that MMV (measurement, monitoring and verification) methods can effectively further reduce risk.</p> <p>DAF has concerns over any adverse impacts to quality and reliability of groundwater which may naturally release into adjoining waterways from the Surat Precipice Aquifer. An assessment should also be provided on the potential risk to aquatic life and fisheries resources should contamination of local waterways occur.</p> <p>DAF notes that the EIS includes a number of groundwater monitoring triggers which will initiate remedial actions should the modelling of expected scenarios prove incorrect. DAF is concerned that this applies only to the target confined aquifer. However, DAF would like the EIS to consider a broader scope to include local waterways to monitor for any adverse impacts.</p>	<p>The EIS should include information on:</p> <ul style="list-style-type: none"> - The risks and consequences of adverse impacts to groundwater and the potential risk to fisheries resources should contamination occur from groundwater sources. - The proponent's management strategies, actions and commitments, including remedial actions to ensure any impacts to groundwater and waterways are avoided, minimised and mitigated. - Details of the monitoring and reporting of complaints received from potentially affected stakeholders. 	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11.7; Chapter 3 Community and Stakeholder Engagement, section 3.6.1; Chapter 9 Groundwater, section 9.9, and Chapter 14B Aquatic Flora and Fauna, section 14B.5.3
72	6	7	Land	7.7 Avoidance and Mitigation Measures State Planning Interests 7.7.3 Land Uses	<p>(p. 42) Although the EIS acknowledges that the project will impact the Border Ranges Important Agricultural Area (IAA) and ALC Class A land, no information has been provided quantifying the amount of land that will be directly impacted or indirectly impacted as a result of construction and associated activities, including delivery options via a pipeline from Millmerran.</p> <p>Further, there is no detail or discussion provided on how the project intends to avoid, minimise and/or mitigate any impacts to either the IAA or ALC Class A land in this instance.</p>	<p>The EIS should include information on:</p> <ul style="list-style-type: none"> - The amount of IAA impacted directly (through construction etc) and indirectly (changes to overland flow etc). - The amount of ALC Class A impacted. - The risks and consequences of these impacts to agricultural productivity, and ongoing farming activities undertaken on that land. - The proponent's management strategies, actions and commitments to ensure any impacts are avoided, minimised and mitigated. - Detail the monitoring and reporting of complaints received from 	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.6, and 2.15.3; and Chapter 7 Land, sections 7.4.2.2, 7.4.2.3, 7.5.2.2, 7.5.2.3.1, 7.6.2.2, 7.6.2.3.1, and 7.7.2.3.1.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
72	7	General	General		<p>The EIS states that the project will have limited impacts on groundwater and agriculture in the vicinity of the project based on similar case studies and modelling, and that MMV (measurement, monitoring and verification) methods can effectively further reduce risk.</p> <p>DAF has concerns over any adverse impacts to quality and reliability of groundwater which landholders have water allocations for from the Surat Precipice Aquifer.</p> <p>DAF notes that the EIS includes a number of groundwater monitoring triggers which will initiate remedial actions should the modelling of expected scenarios prove incorrect. DAF is concerned that this applies only to the target confined aquifer. However, DAF would like the EIS to consider a broader scope to include the regional groundwater implications to any adverse impacts to the Surat Precipice Aquifer.</p> <p>Further, there appears to be no information on compensation or remedial actions for any agribusiness potentially impacted by adverse impacts to the quality, quantity and reliability of groundwater secured from water allocations in the Surat Precipice Aquifer.</p>	<p>The EIS should include information on:</p> <ul style="list-style-type: none"> - The risks and consequences of adverse impacts to the supply of groundwater, and farming activities that rely on that groundwater resource. - The proponent's management strategies, actions and commitments, including remedial actions to ensure any impacts to groundwater and farming activities dependent on that water resource are avoided, minimised and mitigated. - Details of the monitoring and reporting of complaints received from potentially affected landholders. 	Amended EIS	See Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11; and Chapter 3 Community and Stakeholder Engagement, sections 3.5.4 and 3.6
72	8	General	General		<p>Rigorous consultation must be undertaken to ensure that all interested and affected landholders and key agricultural industry stakeholders and representatives are fully informed on the project, including its risks, consequences and remediation actions should any adverse impacts occur.</p> <p>This engagement should also detail any potential benefits that may arise for regional agricultural enterprises.</p>	<p>The EIS should commit the proponent to targeted consultation to ensure that appropriate details about the project, including benefits and risks, and remediation actions/compensation should impacts occur, are provided to landholders in and adjacent to the project area, landholders with water allocations from the Surat Precipice Aquifer, and relevant agricultural peak industry bodies including AgForce and Queensland Farmers' Federation.</p>	Amended EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3 5.3 and 3 5.4, and Chapter 9 Groundwater, sections 9.12
72	9	4	Approvals	8/4.4.7 Forestry Act Description	<p>This description does not adequately refer to interference with State-owned quarry material, and does not include Land Act leases where the State can also own the forest products/quarry material.</p>	<p>Please make the following additions in RED FONT to the Forestry Act Description in order to include quarry material and other associated land tenure where state-owned products can occur.</p> <p>The <i>Forestry Act 1959</i> establishes a system of management for forest resources on Crown land such as State forests, timber reserves and forest entitlement areas, and also leasehold land and some freehold lands, to ensure a continuous supply of timber, quarry material and associated products, and to protect watersheds in perpetuity. For the Project, Currajong State Forest is recognised as land adjoining operational land, sharing the western boundary of Lot 60 SP199322. The Transportation Facility, access road (along Harts Road) and the flowline will be constructed adjacent and parallel to this boundary with Currajong State Forest but will not interfere or cause significant impacts to the resource value and ecology</p>	Amended EIS	See Chapter 4 Approvals, section 4.4 8.
72	10	General	General		<p>The <i>Forestry Act 1959</i> is administered jointly by DAF and DES and provides the framework for the management of state forests and timber reserves. Under the Act, DES has the primary responsibility for the management of these areas. DAF administers the commercial use of State-owned quarry material, forest products and timber on these tenures, as well as other relevant lands such as leasehold, reserves and some freehold lands, where these resources are reserved to the State.</p> <p>DAF manages the commercial use of quarry material, forest products and commercial timber under the Act through:</p> <ul style="list-style-type: none"> - following legislation and policies for the protection of environmental, social, cultural, and economic values - gathering information on the above resources - allocating and issuing authorities or permits for the use or interference of these resources - ensuring permits include conditions to satisfy legislation including safety and environmental requirements. <p>The project will need to consider what potential impact it will have on State-owned timber or quarry material and provide advice back to DAF Forestry for further consideration.</p> <p>DAF Forestry advises that compensation may be sought if the project sterilises resources or access to State-owned forest products, timber or quarry material. The proponent will also need to consider if an authority is required under the <i>Forestry Act 1959</i> to interfere with State-owned forest products, timber or quarry material.</p>		Amended EIS	See Chapter 7 Land, sections 7.4.2.1, 7.5 2.1, 7.6.2.1.2, 7.7.2.1.2, and 7.8; and Chapter 14A Terrestrial Flora and Fauna, sections 14A.5.4, 14A.6, and 14A.7.
73	1	General	General		<p>Dear Sir</p> <p>I, [REDACTED], a member of the Upper Dawson Branch of Wildlife Qld, am opposed to the experimental injection of 330,000 tonnes of captured CO2 into the Precipice Aquifer of the Surat basin at EPQ10. I hold that interfering in the aquifers of the Great Artesian Basin poses a risk of polluting a most precious resource for human life...groundwater.</p> <p>It is not appropriate to add to our mistakes by injecting industrial waste polluting CO2 into another resource rich and out of sight 'space'</p>		Noted	N/A
74	1	General	General		<p>Please find attach our submission to the Proposed Surat Basin Carbon Capture and Storage Project</p>		Noted	N/A
74	1	General	General		<p>On behalf of Smithfield Cattle Company I am calling on the Department of Environment and Science to reject CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone. Smithfield has 2 feedlots feeding 40,000 head of cattle and employing 110 staff. Half of this operation located at Goondiwindi and is totally reliant on water from the Gubberamunda aquifer. We currently have 2 licenses totalling 612ML. This water is reliable and is the sole reason we expanded our feedlot using this water supply. This Goondiwindi feedlot value adds 50,000 head of cattle and 100,000 tonnes of feed annually.</p>		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
74	2	General	General		CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture.		Noted	See Chapter 9 Groundwater
74	3	General	General		Nowhere in the world has this practice of CO2 injection been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are completely unknown. The trial CO2 injection volumes proposed in the EIS present an unacceptable risk to the quality of Precipice water; let alone the potential for this trial to lead to a greater volume of CO2 injection causing even more irreversible damage. The terminology in the report refers to a "saline aquifer unsuitable for aquatic ecosystems, stock water and drinking water. These statements are just simply not true. No where in the world does liquified CO2 go into aquifers used for stock water and drinking water. The water tests clearly show this water to be highly suitable for Agriculture and rural communities.		Noted	See Chapter 9 Groundwater
74	4	General	General		Given that this aquifer is used by Agriculture, what understanding is there of the movement of the CO2 plume when pumping occurs for agricultural use. There is no allowance for this.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.9.9
74	5	General	General		Given that this aquifer flows at times out of the bores, injecting CO2 into this aquifer will only increase the pressure in these bores and potential increase flows and potentially waste water. Our Gubberamunda bore standing water level is 6m and it comes to zero at times and will flow.		Amended EIS	See Chapter 9 Groundwater, section 9.9
74	6	General	General		What research has been done to find out what this liquified CO2 actually does to and aquifers water quality. Liquified CO2 could potentially mobilise heavy metals and react with other elements in the aquifer to produce products that are not safe for human or animal consumption. To my understanding there is no research and if that is the case how could we possibly approve the injection of CO2 into an aquifer used by agriculture and rural communities.		Amended EIS	See Chapter 9 Groundwater, sections 9.9 and 9.9.4
74	7	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, they will be jeopardising the viability of our business, the businesses and families who rely on us; and the many of businesses who rely on safe reliable water.		Noted	See Chapter 9 Groundwater
74	8	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB.		Noted	See Chapter 9 Groundwater
74	9	General	General		We implore the Queensland Government to reject the EIS submitted by CTSCo and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A
75	1	General	General		-		Noted	N/A
75	1	General	General		On behalf of DK AG CO Pty Ltd, owners of Old Bombine and Mamaree Feedlots I am calling on the Department of Environment and Science to reject CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
75	2	General	General		CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture.		Noted	See Chapter 9 Groundwater
75	3	General	General		Nowhere in the world has this practice of CO2 injection been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are completely unknown. The trial CO2 injection volumes proposed in the EIS present an unacceptable risk to the quality of Precipice water; let alone the potential for this trial to lead to a greater volume of CO2 injection causing even more irreversible damage.		Noted	See Chapter 9 Groundwater
75	4	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, they will be jeopardising the viability of our business, the businesses and families who rely on us; and the many of businesses who rely on safe reliable water.		Noted	See Chapter 9 Groundwater, section 9.9.9
75	5	General	General		We are a proud contributor to the economic and social fabric of our region. Our business 8 staff, supporting hard working Australian families, and our operations support countless regional service providers and suppliers who rely on the success and growth of our business.		Noted	N/A
75	6	General	General		Research conducted by Meat and Livestock Australia (MLA) indicates that a single 5,000 SCU feedlot, annually contributes 1.9 million dollars directly and 2.3 million dollars indirectly at a local level. If we extrapolate this to a regional level, the indirect contribution increases to 5.3 million dollars annually ¹ .		Noted	N/A
75	7	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB.		Noted	See Chapter 9 Groundwater
75	8	General	General		We implore the Queensland Government to reject the EIS submitted by CTSCo and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A
75	9	General	General		References / Footnotes of attachment: ¹ Deloitte Access Economics, Regional feedlot investment study (Sydney: Meat and Livestock Australia, 2018)		Noted	N/A
76	1	General	General		-		Noted	N/A
76	1	General	General		On behalf of Australian Country Choice Brindley Park Feedlot, I am calling on the Department of Environment and Science to reject CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
76	2	General	General		CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture.		Noted	See Chapter 9 Groundwater
76	3	General	General		Nowhere in the world has this practice of CO2 injection been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are completely unknown. The trial CO2 injection volumes proposed in the EIS present an unacceptable risk to the quality of Precipice water; let alone the potential for this trial to lead to a greater volume of CO2 injection causing even more irreversible damage.		Noted	See Chapter 9 Groundwater

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
76	4	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, they will be jeopardising the viability of our business, the businesses and families who rely on us; and the many of businesses who rely on safe reliable water.		Noted	See Chapter 9 Groundwater, section 9 9.9
76	5	General	General		We are a proud contributor to the economic and social fabric of our region. Our business employs 32 staff, supporting hard working Australian families, and our operations support countless regional service providers and suppliers who rely on the success and growth of our business.		Noted	N/A
76	6	General	General		Research conducted by Meat and Livestock Australia (MLA) indicates that a single 30,000 SCU feedlot, contributes 11.6 million dollars directly and 14 million dollars indirectly at a local level annually. If we extrapolate this to a regional level, the indirect contribution increases to 32.1 million dollars annually ¹ .		Noted	N/A
76	7	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB.		Noted	N/A
76	8	General	General		We implore the Queensland Government to reject the EIS submitted by CTSCo and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A
76	9	General	General		References / Footnotes of attachment: ¹ Deloitte Access Economics, Regional feedlot investment study (Sydney: Meat and Livestock Australia, 2018)		Noted	N/A
77	1	General	General		-		Noted	N/A
77	1	General	General		On behalf of McNamee Partners Pty Ltd of Lemontree Feedlot I am calling on the Department of Environment and Science to reject CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
77	1	General	General		CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture.		Noted	See Chapter 9 Groundwater
77	2	General	General		Nowhere in the world has this practice of CO2 injection been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are completely unknown. The trial CO2 injection volumes proposed in the EIS present an unacceptable risk to the quality of Precipice water; let alone the potential for this trial to lead to a greater volume of CO2 injection causing even more irreversible damage.		Noted	See Chapter 9 Groundwater
77	3	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, they will be jeopardising the viability of our business, the businesses and families who rely on us, and the many of businesses who rely on safe reliable water.		Noted	See Chapter 9 Groundwater, section 9 9.9
77	4	General	General		We are a proud contributor to the economic and social fabric of our region. Our business 28 staff, supporting hard working Australian families, and our operations support countless regional service providers and suppliers who rely on the success and growth of our business.		Noted	N/A
77	5	General	General		Research conducted by Meat and Livestock Australia (MLA) indicates that a single 30,000 SCU feedlot, contributes 11.6 million dollars directly and 14 million dollars indirectly at a local level annually. If we extrapolate this to a regional level, the indirect contribution increases to 32.1 million dollars annually ¹ .		Noted	N/A
77	6	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB.		Noted	N/A
77	7	General	General		We implore the Queensland Government to reject the EIS submitted by CTSCo and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A
77	8	General	General		References / Footnotes of attachment: ¹ Deloitte Access Economics, Regional feedlot investment study (Sydney: Meat and Livestock Australia, 2018)		Noted	N/A
78	1	General	General		-		Noted	N/A
78	1	General	General		On behalf of (Hatcham Downs Cattle Co Pty Ltd/ Hatcham Downs) I am calling on the Department of Environment and Science to reject CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
78	2	General	General		CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture.		Noted	See Chapter 9 Groundwater
78	3	General	General		Nowhere in the world has this practice of CO2 injection been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are completely unknown. The trial CO2 injection volumes proposed in the EIS present an unacceptable risk to the quality of Precipice water; let alone the potential for this trial to lead to a greater volume of CO2 injection causing even more irreversible damage.		Noted	See Chapter 9 Groundwater
78	4	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, they will be jeopardising the viability of our business, the businesses and families who rely on us, and the many of businesses who rely on safe reliable water.		Noted	See Chapter 9 Groundwater, section 9 9.9
78	5	General	General		We are a proud contributor to the economic and social fabric of our region. Our business employs 14 staff, supporting hard working Australian families, and our operations support countless regional service providers and suppliers who rely on the success and growth of our business.		Noted	N/A
78	6	General	General		Research conducted by Meat and Livestock Australia (MLA) indicates that a single 5,000 SCU feedlot, annually contributes 1 9 million dollars directly and 2.3 million dollars indirectly at a local level. If we extrapolate this to a regional level, the indirect contribution increases to 5.3 million dollars annually ¹ .		Noted	N/A
78	7	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB.		Noted	N/A
78	8	General	General		We implore the Queensland Government to reject the EIS submitted by CTSCo and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
78	9	General	General		References / Footnotes of attachment: ¹ Deloitte Access Economics, Regional feedlot investment study (Sydney: Meat and Livestock Australia, 2018)		Noted	N/A
79	1	General	General		Please see letter attached.		Noted	N/A
79	1	General	General		On behalf of Australian Country Choice – Opal Creek Feedlot I am calling on the Department of Environment and Science to reject CTSCo submission to inject liquified CO2 into the Great Artesian Basin (GAB) aquifer, the lower Precipice Sandstone.		Noted	N/A
79	2	General	General		CTSCo Environmental Impact Statement (EIS) proposes the injection of CO2 - a highly corrosive and regulated waste product - into the lower Precipice Sandstone aquifer, a high-quality water source used directly by communities and businesses for the production of livestock and horticulture.		Noted	See Chapter 9 Groundwater
79	3	General	General		Nowhere in the world has this practice of CO2 injection been done into a high-quality water aquifer used by communities. As an untested practice, the impacts this could have on water quality and ground formation in the lower Precipice Sandstone and wider GAB are completely unknown. The trial CO2 injection volumes proposed in the EIS present an unacceptable risk to the quality of Precipice water; let alone the potential for this trial to lead to a greater volume of CO2 injection causing even more irreversible damage.		Noted	See Chapter 9 Groundwater
79	4	General	General		The GAB is one of the largest underground freshwater resources in the world and is a vital resource for 180,000 people, 7,600 businesses and 120 towns. If the Queensland Government allow this kind of experimental procedure to proceed, they will be jeopardising the viability of our business, the businesses and families who rely on us, and the many of businesses who rely on safe reliable water.		Amended EIS	See Chapter 9 Groundwater, section 9.7.
79	5	General	General		We are a proud contributor to the economic and social fabric of our region. Our business employs 45 staff, supporting hard working Australian families, and our operations support countless regional service providers and suppliers who rely on the success and growth of our business.		Noted	N/A
79	6	General	General		Research conducted by Meat and Livestock Australia (MLA) indicates that a single 30,000 SCU feedlot, contributes 11.6 million dollars directly and 14 million dollars indirectly at a local level annually. If we extrapolate this to a regional level, the indirect contribution increases to 32.1 million dollars annually ¹		Noted	N/A
79	7	General	General		As a business we remain supportive of addressing carbon emissions however we strongly object to Carbon Capture and Storage (CCS) methods that are unproven and risk the quality of water in the GAB.		Noted	N/A
79	8	General	General		We Implore the Queensland Government to reject the EIS submitted by CTSCo and continue to protect the rights of communities and businesses to access safe and reliable water resources.		Noted	N/A
79	9	General	General		References / Footnotes of attachment: ¹ Deloitte Access Economics, Regional feedlot investment study (Sydney: Meat and Livestock Australia, 2018)		Noted	N/A
80	1	General	General		The following comments are provided in addition to the Department of Regional Development, Manufacturing and Water's (the department) preliminary submission of 23 February 2023 on the draft EIS:		Noted	N/A
80	2	General	General		General comments - Western Downs Regional Council (council) operates a non-potable water scheme in Moonie. Council provides water to the residents, but water is not supplied for drinking purposes. - The department is unable to advise whether the water is connected internally to the houses or not. - The department does not regulate non-potable supplies to the same degree as drinking water schemes.		Amended EIS	See Chapter 9 Groundwater, section 9.7.4.2.
80	3	General	General		Development approval – taking or interfering with water (bore) The State Assessment and Referral Agency recently granted development approval for an associated water licence to construct a water bore in the Precipice Sandstone unit of the Great Artesian Basin for stock intensive purposes. The proposed water bore is situated on Lot 2 on SP318366, Lienassie Road, Goondiwindi within Western Downs Regional Council, and approximately located within 10km of CTSCo's injection site. CTSCo may not have been aware of the development application at the time of preparing its draft EIS. To view the application material and development approval visit https://planning.statedevelopment.qld.gov.au/planningframework/state-assessment-and-referral-agency/sara-application-material and search application reference 2212-32428 SDA.	RECOMMENDATION: The department requests clarification from CTSCo about potential impacts to this entitlement holders bore water supply and any mitigation that CTSCo would propose.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.9.2, 9.9.3, 9 9.5, 9.9.6, 9.10, 9.11, and 9.12.
81	1	General	General		The Queensland Police Service (QPS) has reviewed the Environmental Impact Statement (EIS) for the proposed Surat Basin Carbon Capture and Storage Project and provides the following comments.		Noted	N/A
81	2	11	Transport		The EIS materials are considered to adequately address the potential impacts to emergency services, as raised during stakeholder engagement with the proponent (CTSCo). It is acknowledged that Chapter 11: Transport appropriately addresses traffic flow, road upgrades, driver fatigue management and the traffic/road use management, and QPS has noted the roads/routes anticipated to be affected by the project. The QPS strongly support the proposed engagement strategies with emergency services during all phases of the Project and the preparation of an emergency response plan in consultation with QPS. In this regard, the QPS has no further comments.		Adequately dealt within the EIS, no change to the EIS	See Chapter 3 Community and Stakeholder Engagement; Chapter 11 Transport; and Chapter 15 Hazards and Safety.
81	3	General	General		We appreciate your engagement with QPS throughout the EIS process and look forward to further engagement as the project progresses.		Adequately dealt within the EIS, no change to the EIS	See Chapter 3 Community and Stakeholder Engagement, sections 3.4.1, and 3.7; Chapter 15 Hazards and Safety, sections 15 2.3, 15.7.2.5, and 15.8; and Chapter 21 Register of Commitments, Table 21-1.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	1	General	General		Advice to decision maker on carbon capture and storage project IESC 2022-139: Surat Basin Carbon Capture and Storage Project (EPPG00646913) – New Development Requesting agency: The Queensland Department of Environment and Science Date of request: 06 December 2022 Date request accepted: 21 December 2022 Advice stage: Assessment		Amended EIS	See Chapter 9 Groundwater, section 9.4.5.
82	2a	General	General		The Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (the IESC) provides independent, expert, scientific advice to the Australian and state government regulators on the potential impacts of coal seam gas and large coal mining proposals on water resources. Additionally, at the request of a relevant New South Wales, Queensland, South Australian or Victorian Minister and with the written agreement of the Australian Government Environment Minister, the IESC can provide advice on any other matter within the expertise of the IESC. The advice is designed to ensure that decisions by regulators on coal seam gas or large coal mining developments or any other matter within the expertise of the IESC are informed by the best available science.		Amended EIS	See Chapter 9 Groundwater, section 9.4.5.
82	2b	General	General		The IESC was requested by the Queensland Minister for the Environment and Queensland Department of Environment and Science to provide advice on the Carbon Transport and Storage Company Pty Ltd's Surat Basin Carbon Capture and Storage Project in Queensland. The request has been approved in writing by the Australian Government Environment Minister. This document provides the IESC's advice in response to the requesting agency's questions. These questions are directed at matters specific to the project to be considered during the requesting agency's assessment process. This advice draws upon the available assessment documentation, data and methodologies, together with the expert deliberations of the IESC, and consideration of the IESC Information Guidelines (IESC, 2018).		Amended EIS	See Chapter 9 Groundwater, section 9.4.5.
82	3a	General	General		Summary The Surat Basin Carbon Capture and Storage Project (the project) is a proposed greenhouse gas (GHG) stream injection and storage testing site located in the Darling Downs of Queensland. The project will inject GHG as a supercritical fluid into the Precipice Sandstone aquifer within the southern Surat Basin at a rate of up to 110,000 tonnes annually for three years (CTSCo 2022a, p. 6). Within the project's operational lands, the Precipice Sandstone aquifer is approximately 2,300 m below ground level. The injected GHG is expected to remain trapped and stored as a mixture of dense fluid and mineral solids within the aquifer and within the bounds of the operational lands (CTSCo 2022a, p. 47) with increasing storage containment over time.		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description.
82	3b	General	General		Substantial project infrastructure was constructed by the proponent in 2021 as permitted under Queensland Environmental Authority (EA) EPPG00646913, including West Moonie-1 Injection Well and West Moonie-2 Monitoring Well, both targeting the Precipice Sandstone aquifer, and a water quality monitoring bore targeting the shallow Grimman Creek formation (CTSCo 2022a, Table 7-2, p. 21). Construction of a final monitoring bore targeting the Gubberamunda Sandstone aquifer is planned for 2024. In addition to the existing infrastructure, the project will require the construction of a 7.35-ha Transportation Facility and a 9.5-km buried flowline to carry the GHG stream from the Transportation Facility to West Moonie-1 Injection Well (CTSCo 2022a, p. 16).		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description.
82	3c	General	General		Limited site-specific data have been used to develop the models relied on by the proponent to predict plume behaviour and potential impacts from the project. Despite this, given the small scope of the project and geological stability of the storage complex at the project location, impacts from the project are expected to be minimal and manageable in both the immediate and long term.		Amended EIS	See Chapter 8 Geology, sections 8.4, 8.5, 8.6; Appendices 8A and 8B; Chapter 9 Groundwater, sections 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
82	3d	General	General		<u>Potential impacts</u> from this project that require further consideration are: - changes to groundwater quality in the Precipice Sandstone aquifer, within the GHG plume extent, which may have implications for future usability; and - leakage of GHG into aquifers overlying the Precipice Sandstone due to corrosive-mechanical failure of bore casings and seals, resulting in groundwater quality and pressure changes.		Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.8, 9.9, 9.10, and 9.11; and Appendices 9B, 9C, and 9D.
82	3e	General	General		The IESC has identified additional work to address the potential impacts, as detailed in this advice. These are summarised below. - Improved baseline groundwater quality data for the Precipice Sandstone aquifer near the injection site are required to enable the proponent to establish a robust baseline and set appropriate trigger values for water quality.		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.5, 9.6.4, 9.7.4, 9.7.5, 9.8, 9.9.3, 9.9.4, 9.9.6, 9.9.7, 9.10, and 9.11; and Appendices 9C, and 9D.
82	3f	General	General		- Improved estimates should be made of the maximum likely extent of plume migration. Once the local-scale groundwater model has been updated with information from the planned 3D-seismic survey, a scenario analysis should be conducted, considering combinations of possible factors that could maximise plume migration. These results should also be used to inform adaptive management.		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.6.1, 9.6.2, 9.9.1, 9.9.2, 9.9.3, 9.10, and 9.11.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	3g	General	General		<p>- A more comprehensive spatial monitoring network and sampling program should be established to reflect the project's status as a feasibility study which aims to provide 'proof-of-concept' for geological storage of GHG in the Surat Basin. This should include:</p> <ul style="list-style-type: none"> - Collection of data to measure groundwater quality within the Precipice Sandstone aquifer beyond the predicted GHG plume extent. Monitoring should continue throughout the project, and for at least 3 years after injection ceases, to enable the proponent to confirm the prediction that groundwater quality will not be impacted outside of the GHG plume extent. - Additional bores targeting shallower aquifers should be added to the groundwater monitoring program to ensure that groundwater resources are not being impacted by the project. Sampling of these bores should be undertaken prior to GHG injection to establish a baseline which will facilitate detection of any impacts. - The integrity of the caprock seal and containment of injected GHG without impacts to the environment could also be verified by suitable environmental tracers (e.g., carbon-13), and monitoring of soil gas at several key sites (e.g., near the injection bore) above the expected plume and at unimpacted reference sites. 		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.6, 2.8.1, 2.11.5, and 2.11.7; Chapter 9 Groundwater, section 9.10.
82	4a	General	General		<p>Context The Surat Basin Carbon Capture and Storage Project (the project) is located in the southern Surat Basin approximately 44 km west of Moonie in the Darling Downs of Queensland. The operational lands of the project are located in the Moonie River catchment, which forms part of the Murray-Darling Basin (CTSCo 2022b, p. 8). The project will target the Precipice Sandstone aquifer, which is within the Basal Great Artesian Basin (CTSCo 2022a, p. 50).</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description.
82	4b	General	General		Exploration and appraisal activities for the project commenced in 2019 under Queensland Greenhouse Gas (GHG) Exploration Permit EPQ10 and Environmental Authority (EA) EPPG00646913 (CTSCo 2022a, p. 20). These activities included the construction of West Moonie-1 Injection Well and West Moonie-2 Monitoring Well, both targeting the Precipice Sandstone aquifer (CTSCo 2022a, p. 21).		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.8.
82	4c	General	General		The project was assessed by the then Department of Agriculture, Water and the Environment under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), and determined to be not a controlled action (DAWE 2022). The proponent is now seeking amendments to the existing Queensland EA to allow GHG stream injection testing, which is currently expressly prohibited under Condition 1 (CTSCo 2022c, p. 4). The proponent has developed an Environmental Impact Statement (EIS) to support the requested amendments.		Adequately dealt within the EIS, no change to the EIS	See Chapter 4 Approvals; and Appendix 4A.
82	4d	General	General		During the three-year injection phase of the project, up to 330,000 tonnes of GHG will be injected into the Precipice Sandstone aquifer as supercritical fluid (CTSCo 2022a, p. 6). Once the injection is complete, the GHG is expected to remain trapped within the Precipice Sandstone aquifer and the project's operational lands (CTSCo 2022a, p. 47) with increasing storage containment over time, as a mixture of dense fluid and mineral solids.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description; and Chapter 9 Groundwater, sections 9.9.2, and 9.9.4.
82	4e	General	General		The project will require the construction of a 7.35-ha Transportation Facility for the receipt and conversion of GHG to a supercritical fluid (CTSCo 2022a, p. 28), and installation of a 9.5-km buried flowline to convey the supercritical GHG stream to the West Moonie-1 Injection Well for injection into the aquifer (CTSCo 2022a, p. 30). Construction of the flowline will require clearing of 0.06 ha of vegetation (CTSCo 2022d, p. 31). The proponent will use conventional trenching to install the flowline across Stephens Creek, but utilise horizontal directional drilling to install it under South Branch Stephens Creek and a stand of brigalow (<i>Acacia harpophylla</i>) to avoid impacts on these assets (CTSCo 2022a, p. 30).		Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description
82	4f	General	General		The project's operational lands are located adjacent to the Currajong State Forest and Southwood National Park (CTSCo 2022a, p. 16) in an area otherwise dominated by grazing (CTSCo 2022a, p. 39). It is unlikely that the project will significantly impact any surface water or shallow groundwater-dependent ecosystems (GDEs) as no extractive activities or water releases are planned or permitted under the EA, and the project's disturbance area is small (CTSCo 2022a, p. 17). The project is expected to significantly alter groundwater quality within the Precipice Sandstone aquifer; however, it is expected that these impacts will remain contained within the project's operational lands with increasing storage containment over time.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 7 Land, section 7.4.3; Chapter 9 Groundwater, section 9.9.2, 9.9.3, and 9.9.4; Chapter 10 Surface Water; Chapter 14B Aquatic Flora and Fauna; and Appendix 14B.
82	5	General	General		<p>Response to questions The IESC's advice in response to the requesting agency's specific questions is provided below.</p>		Noted	N/A
82	6a	General	General		<p>Question 1: The IESC is requested to provide comment on the groundwater and surface water assessments presented in the EIS, especially in relation to the adequacy of the:</p> <ul style="list-style-type: none"> - identification and assessment of potential impacts and risks including their predicted duration, extent and magnitude - hydrogeological characterisation and conceptualisation - assumptions and calibration of models used to predict potential impacts. 		Noted	N/A
82	6b	General	General		1. The groundwater assessment is constrained by limited site-specific data and requires further information to characterise the duration, extent and magnitude of predicted impacts and improve the hydrogeological characterisation and conceptualisation (Paragraphs 2 and 3). There is particular uncertainty about groundwater quality, and a more robust spatial baseline data set is needed (Paragraph 4). The groundwater modelling is not fully documented and could explore a wider range of possibilities, particularly when more data (e.g., from the 3D seismic survey) are available (Paragraph 3). The surface water assessment is constrained by limited site-specific data but impacts are predicted to be minimal because of the small spatial scale of surficial disturbance (Paragraphs 6 and 7).		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 9 Groundwater, sections 9.3.2, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, and 9.11; Appendices 9A, 9B, 9C, 9D, 9E and 9F.; and Chapter 10 Surface Water, sections 10.4.3, 10.4.4, 10.5, 10.6.2 and 10.7.2.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	6c	General	General		<p><u>Groundwater</u></p> <p>2. The groundwater impact assessment provided includes a detailed review of available literature and data from a range of studies and projects within the Surat Basin and beyond to inform modelling, assessment and monitoring. Site-specific data are limited. Further site-specific data will be collected during the project. The IESC suggests that once these data are obtained:</p> <p>a. a detailed review of impact predictions and risks should be undertaken (e.g., caprock integrity, well integrity, faulting, palaeochannels) to confirm the current risk assessment and update monitoring and management requirements (see CTSCo 2022e, Table 9-29, p. 81), and</p> <p>b. the plume-migration modelling should be updated as planned (CTSCo 2022e, p. 88) and the scenario analysis expanded to include a broader range of possible combinations of parameters that could maximise plume migration (see Paragraph 3).</p>		Amended EIS	See Chapter 8 Geology, sections 8.5.2, 8.7.6, 8.9.2, 8.9.3, 8.10, and 8.11; Chapter 9 Groundwater, sections 9.6.2, 9.9.2, 9.10, 9.11, and 9.12; and Appendix 9B.
82	6d	General	General		<p>3. The assessment of potential impacts to groundwater included modelling of the GHG plume migration, groundwater movements and pressure changes, and geochemical modelling of potential reaction pathways. The IESC notes that the following further information would be useful for fully characterising the duration, extent and magnitude of these potential impacts:</p> <p>a. additional work to understand groundwater movement and to explore alternative conceptualisations of the southern Surat Basin (see WSP Golder 2022, Section 4.6.7, pp. 120-121). This work is needed given the uncertainty that exists regarding groundwater flow paths to build an understanding of whether any future developments may need to be avoided, and where, to prevent potential migration of the plume.</p> <p>b. extended analysis to more fully explore site characterisations to support ranges of parameters which will influence groundwater impacts; at a minimum, simulating (i) a parameter combination likely to increase maximum pressure changes, and (ii) a parameter combination likely to increase the spatial extent of the plume. This should also consider the possibility of geological features which may enhance permeability through the injection area.</p> <p>c. improved reporting (as per the Australian Groundwater Modelling Guidelines (Barnett et al. 2012)) with a particular focus on calibration and the scenario outcomes to increase the understanding of the parameter ranges and potential extents, magnitudes and durations of impacts. This may also require some modelling to be extended for multi-decadal time periods.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6, 9.7, 9.9, 9.10 and 9.11; and Appendices 9A, 9B, 9C and 9D.
82	6e	General	General		<p>4. The hydrogeological conceptualisation provided is consistent with other available information. The site-specific characterisation remains limited but the planned seismic studies should improve this. Groundwater quality data are also limited to one or two sampling events (CTSCo 2022e, Table 9-6, p. 19) from bores which have been installed. The IESC recommends that the Gubberamunda Monitoring Bore be installed as soon as possible. Additional sampling (e.g., at least four sampling campaigns from the Gubberamunda aquifer) is needed for a robust baseline which will enable the proponent to set appropriate trigger values and achieve a more credible 'proof-of-concept'.</p>		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.8 and 2.11; and Chapter 9 Groundwater, section 9.10.
82	6f	General	General		<p>5. Assumptions and calibration of models are discussed in the response to Question 2.</p>		Noted	See below for responses.
82	6g	General	General		<p><u>Surface water</u></p> <p>6. The surface water assessment presented in the EIS is limited. Site-specific water quality data are restricted to measurements taken at four sites within the project's operational lands as part of an aquatic ecological survey undertaken over only two days in June 2021 (CTSCo 2022b, p. 22). This is contextualised with regional water quality data for the Moonie River at Nindigully gauging station (CTSCo 2022b, pp. 21-22), over 150 km downstream of the project's operational lands.</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 10 Surface Water, sections 10.4.3, 10.4.4, 10.5, 10.6.2 and 10.7.2; and Chapter 14B Aquatic Flora and Fauna, sections 14B.3.3, 14B.5 and 14B.6.
82	6h	General	General		<p>7. Despite the limited data presented, the IESC considers that the potential risks to surface water from the project (e.g., increased sedimentation during the project's construction and rehabilitation phases, accidental spills, introduced weeds) are likely to be minimal. These risks have been adequately identified by the proponent, along with appropriate management and mitigation measures to reduce potential impacts (CTSCo 2022b, pp. 26-28).</p>		Adequately dealt within the EIS, no change to the EIS	See Chapter 10 Surface Water, sections 10.4.3, 10.4.4, 10.5, 10.6.2 and 10.7.2; and Chapter 14B Aquatic Flora and Fauna, sections 14B.3.3, 14B.5 and 14B.6.
82	7a	General	General		<p>Question 2: The IESC is requested to provide comment on the adequacy of the EIS models (including plume migration and geochemical models), assumptions, input data and interpretation of outputs and conclusions on potential impacts from the proposal including the modelling predictions of near-field plume extents and water quality changes as well as far-field pressure changes to EVs associated with the Precipice Sandstone Aquifer.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 and 9.11; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
82	7b	General	General		<p>8. It is not possible to be certain of the adequacy of the regional groundwater and plume migration models because of the lack of documentation provided. The approach appears to be broadly suitable given the limited site-specific data. However, the information provided did not include comprehensive descriptions of model design and parameterisation. Model calibration was not clearly discussed for any model. The approach will require significant data collection and model updating during the project to verify impact predictions. The proponent will need to justify management activities to be implemented to ensure that impacts are quickly detected and operations ceased if needed.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6.2, 9.7, 9.8, 9.9.2, and 9.10; and Appendix 9B.
82	7c	General	General		<p>9. The IESC suggests that additional scenario-testing be undertaken using the regional groundwater and plume migration models to enable full consideration of a range of potential impact scenarios. This would inform monitoring, mitigation and management plans to be developed to enable rapid detection of changes that may signal deviations from the base-case predictions (see response to Question 5).</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6.2, 9.7, 9.8, 9.9.2, and 9.10; and Appendix 9B.
82	7d	General	General		<p>10. Geochemical modelling of potential CO₂-water-rock interactions has adequately described changes in pH, major ions and trace metal concentrations (CTSCo 2022f, pp.28-29, 68-69). Geochemical models were based on geochemical data and rock core observations and at likely pressure and temperature conditions within the Precipice Sandstone aquifer. Geochemical models predicted that there would be no change to groundwater chemistry outside the plume. The IESC recommends that the geochemical modelling be validated with additional experimental (cf. Pearce et al. 2022) or project-site data on actual changes in groundwater chemistry and hydraulics around the injection point.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6.4, 9.7.4, 9.7.5, 9.8, 9.9.3, 9.9.4, 9.9.7 and 9.10; and Appendices 9C and 9D.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	7e	General	General		11. The IESC notes that far-field pressure changes are not predicted to extend to the outcrop areas of the Precipice Sandstone (CTSCo 2022e, Figure 9-19, p. 66) where GDEs supported by the Precipice Sandstone aquifer have been identified by the proponent. The IESC agrees with this conclusion and considers that pressure changes during this feasibility project are likely to be limited in magnitude and positive, thus are unlikely to have material impacts on GDEs and other environmental values that occur at the outcrop some 250 km north (CTSCo 2022a, p. 52).		Amended EIS	See Chapter 9 Groundwater, section 9.9.5.
82	9f	General	General		12. Given the depth of the Precipice Sandstone aquifer at the project location and the limited predicted extent of impacts to groundwater quality, it appears unlikely that environmental values (EVs) will be affected should the project operate as predicted. As it is possible that a loss of well integrity could create a pathway to EVs supported by overlying aquifers, the IESC suggests that any relevant wells and EVs be identified, and appropriate monitoring implemented (see Paragraphs 2, 13 and 15-18).		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6.1, 9.6.3, 9.7.1, 9.7.4, 9.7.5, 9.8, 9.9.1, 9.9.5, 9.9.7, 9.9.9.1, and 9.10.
82	10a	General	General		Question 3: The IESC is requested to provide comment on the adequacy of the exposure pathway assessment to examine the potential for fracturing to open new pathways to potential receptors such as other aquifers, groundwater dependent ecosystems, and surface EVs from the injection of supercritical CO ₂ .		Amended EIS	See Chapter 8 Geology, section 8.7.6, 8.9.2, 8.9.3, and 8.10; and Chapter 9 Groundwater, section 9.9.
82	10b	General	General		13. The provided exposure pathway assessment (CTSCo 2022e, pp. 70-76; WSP Golder 2022, pp. 166-175) was focussed on groundwater impact pathways. It considered four potential scenarios including a loss of caprock integrity (damage to the Evergreen Formation), loss of well integrity (existing, legacy or future bores), impacts to the plume from mining and other underground activities, and impacts to the plume from water management actions (extraction or managed aquifer recharge). Potential improvements to the assessment would include:		Noted	See below for responses.
82	10c	General	General		a. Clarification of the time-scales over which these scenarios were considered.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, and 9.9.2; and Appendices 9A and 9B.
82	10d	General	General		b. Assessment of potential future changes (e.g., increased water scarcity, improved drilling technologies, reduced drilling costs, improved water treatment) which may make currently unattractive or uneconomic water sources more viable.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2, and 9.9.2; and Appendices 9A and 9B.
82	10e	General	General		c. Analysis of the type and location (through scenario analysis in the relevant model/s) of future activities that could allow impact pathways to develop. This analysis is needed to understand whether, and where, exclusion zones may need to be enacted to prevent future impacts.		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.10.1.8, and 9.11; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
82	10f	General	General		d. Discussion of the potential future risks (including long-term well integrity) of drilling into, or through, the Precipice Sandstone.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2, 2.10.4, 2.11, 2.12; and Chapter 9 Groundwater, sections 9.9, 9.10 and 9.11.
82	10g	General	General		e. Documentation of the geomechanical testing and modelling should be provided, in addition to the high-level review provided (WSP Golder 2022, pp. 167-169). Direct test evidence and the 1D geomechanical model indicated that the proposed injection pressures would not compromise the integrity of the caprock seal. However, information on the model code (1D MEM) and its limitations and uncertainty with the available data at this site were not discussed, and the testing and modelling reports were not presented.		Amended EIS	See Chapter 8 Geology, sections 8.6.2.4, 8.7.6, 8.9.2, and 8.14 (See reference Mildren, S. 2021); Appendix 8B.
82	10h	General	General		f. Given the limitations of 1D geomechanical models based on well logs, additional geomechanical models were run to evaluate the risk of fault reactivation that could be associated with induced seismicity and potential hydraulic connectivity through the caprock. However, information on the fault-shear model code (assumed to be 2D) and its limitations were not presented, and the modelling reports were not presented. The IESC supports the recommendation that the 3D seismic survey be completed to identify faults within the project area (WSP Golder 2022, p. 100, 184).		Amended EIS	See Chapter 8 Geology, sections 8.6.2.4, 8.7.6, 8.9.2, and 8.14 (See reference Mildren, S. 2021); Appendices 8A (see FMI logs) and 8B.
82	11a	General	General		Question 4: The IESC is requested to provide comment on the adequacy of the assessment of all water-dependent ecological assets, including but not limited to stygofauna, GDE assessment areas 1 and 2, riparian and floodplain ecosystems and associated threatened species habitats and connectivity areas, and whether sufficient information is provided to support conclusions regarding these assets and the level of proposed impact made in the EIS.		Adequately dealt within the EIS, no change to the EIS	See Chapter 14B Aquatic Flora and Fauna
82	11b	General	General		14. The proponent has done a cursory assessment of water-dependent ecological assets including stygofauna, GDEs, riparian and floodplain ecosystems and associated threatened species habitats and connectivity areas. Given that the proposed project's impacts on these assets are likely to be minimal, this assessment is probably sufficient for this small-scale feasibility study. However, if the project is scaled up in future, a more extensive assessment of these assets will be required.		Adequately dealt within the EIS, no change to the EIS	See Chapter 14B Aquatic Flora and Fauna
82	12a	General	General		Question 5: The IESC is requested to provide comment on the adequacy of the proposed mitigation, management and monitoring to be implemented by the project. Does the IESC consider that any additional measures are needed to reduce risks and projected levels of impact?		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
82	12b	General	General		15. The proposed mitigation, management and monitoring program has been developed through a review of several carbon capture and storage (CCS) projects globally to inform the selection of appropriate measures. The IESC commends this approach. However, given the proof-of-concept nature of the project and the potential for 'scaling up' sometime in the future, the following measures would provide additional valuable information for verifying impact predictions and managing potential risks.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
82	12c	General	General		a. Monitoring of groundwater quality and pressure is limited both spatially and temporally, with the locations strongly influenced by the modelling outcomes of the base case. Additional monitoring sites with multi-level piezometers surrounding the injection bore and targeting several aquifers at different depths are needed to sample and track changes in water quality and pressure and verify the predicted impacts.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1, 2.11, 2.11.5, 2.11.7; and Chapter 9 Groundwater, section 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	12d	General	General		b. A selection of existing landholder bores within several kilometres of the site should be added to the groundwater monitoring program to verify that important groundwater resources are not being adversely impacted by the project (either through water quality or pressure changes). Two sampling campaigns may be sufficient as impacts from the project are considered unlikely.		Amended EIS	See Chapter 9 Groundwater, section 9.10.
82	12e	General	General		c. The post-injection monitoring period should be at least equal to the duration of the injection period (i.e., three years), in line with the project's status as a feasibility study intended to provide proof-of-concept.		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, section 2.7; and Chapter 9 Groundwater, section 9.9.2.
82	12f	General	General		d. Should monitoring show that impact predictions are being exceeded, additional monitoring, modelling and investigation are recommended to determine the magnitude and spatial extent of the actual impacts.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
82	12g	General	General		e. The predicted changes to groundwater quality (e.g., the reduction of pH to approximately 4, potentially leading to mobilisation of metals) could limit the future usability of the groundwater. Although the changes to groundwater quality are only predicted to occur within the plume (CTSCo 2022a, p 53), additional monitoring (e.g., polycyclic aromatic hydrocarbons, and other organics) and measures may be required to manage this potential risk to future uses.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.7.4, 9.7.5, 9.9.3, 9.9.4, 9.9.6, 9.9.7, 9.10, and 9.11; and Appendices 9C and 9D.
82	12h	General	General		f. If the project outcomes indicate that there is potential for 'scaling up' of CCS in the area, then monitoring should be continued over a wider area and for a longer period.		Amended EIS	See Chapter 4 Approvals, section 4.4.9.
82	12i	General	General		16. The integrity of the caprock seal and containment of injected GHG without impacts to the environment could also be verified by using suitable environmental tracers (e.g., carbon-13 in water) and monitoring soil gas at several sites above the expected plume and reference sites. Suitable environmental tracers are required that can distinguish sources of CO2 from the injected GHG stream and natural subsurface processes and that can identify mixing and leakage at this site. Monitoring sites above the expected plume such as fault zones identified by the planned 3D seismic survey and near well casings (e.g., using soil gas monitoring) could verify containment and provide evidence that induced fracturing of the caprock seal has not occurred during injection operations.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1, and 2.11; and Chapter 9 Groundwater, sections 9.10, and 9.10.1.8.
82	12j	General	General		17. The proponent has proposed groundwater investigation trigger values for the Precipice Sandstone aquifer (CTSCo 2022e, Table 9-30, p. 84). These trigger values are inadequate.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
82	12k	General	General		a. The trigger values are based on insufficient baseline data (i.e., one data point/parameter from one bore (West Moonie-1) in July 2021) with no justification provided for the selected trigger values, parameters or how they were derived.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.10; and Appendices 9C and 9D.
82	12l	General	General		b. As a broad range of parameters is being monitored by the proponent, trigger values should be included for relevant additional parameters (e.g., other metals).		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.10; and Appendices 9C and 9D.
82	12m	General	General		c. The monitoring locations to which the trigger values will apply need to be clearly specified and justified.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.10; and Appendices 9C and 9D.
82	12n	General	General		d. How the proposed investigation trigger values will be used to identify exceedances and prompt remedial actions requires further detail to ensure that actions are timely.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.10; and Appendices 9C and 9D.
82	12o	General	General		18. The IESC suggests that the proponent develop a trigger action response plan (TARP) that includes trigger values for a range of parameters and processes that enable the early identification of potential deviation of impacts from predicted levels. The TARP should incorporate early-warning triggers to initiate investigations, trigger values to initiate timely mitigation and management actions to limit impacts, and triggers for ceasing injection.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.10; and Appendices 9C and 9D.
82	13a	General	General		Date of advice: 05 February 2023 Source documentation provided to the IESC for the formulation of this advice: CTSCo 2022. Surat Basin Carbon Capture and Storage Project Environmental Impact Statement. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Surat Basin CCS Project EIS).		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	13b	General	General		<p>References cited within the IESC's advice: Barnett, B, Townley, LR, Post, V, Evans, RE, Hunt, RJ, Peeters, L, Richardson, S, Werner, AD, Knapton, A, and Boronkay, A 2012. Australian groundwater modelling guidelines, Waterlines report, National Water Commission, Canberra. Available [online]: Groundwater Modelling Guideline accessed 2 February 2023. CTSCo 2022a. Surat Basin Carbon Capture and Storage Project Executive Summary. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Executive Summary of the Surat Basin CCS Project EIS). CTSCo 2022b. Surat Basin Carbon Capture and Storage Project Chapter 10: Surface Water. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Chapter 10 of the Surat Basin CCS Project EIS). CTSCo 2022c. Surat Basin Carbon Capture and Storage Project Chapter 22: Proposed Environmental Authority EPPG00640913 Condition Amendments. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Chapter 22 of the Surat Basin CCS Project EIS). CTSCo 2022d. Surat Basin Carbon Capture and Storage Project Chapter 14A: Terrestrial Flora and Fauna. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Chapter 14A of the Surat Basin CCS Project EIS). CTSCo 2022e. Surat Basin Carbon Capture and Storage Project Chapter 09: Groundwater. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Chapter 9 of the Surat Basin CCS Project EIS). CTSCo 2022f. Surat Basin Carbon Capture and Storage Project Chapter 08 Geology. Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. November 2022. (Chapter 8 of the Surat Basin CCS Project EIS). DAWE 2022. Referral Decision – Not Controlled Action – Surat Basin Carbon Capture and Storage Project, Queensland (EPBC 2021/9122). Department of Agriculture, Water and the Environment. 9 February 2022. (Appendix A to Chapter 4 of the Surat Basin CCS Project EIS). IESC, 2018. Information Guidelines for proponents preparing coal seam gas and large coal mining development proposals. Available [online]: Information guidelines for proponents preparing coal seam gas and large coal mining development proposals iesc accessed 2 February 2023. Pearce, JK, Dawson, GW, Golding, SD, Southam, G, Paterson, DJ, Brink, F, and Underschultz, JR 2022. Predicted CO2 water rock reactions in naturally altered CO2 storage reservoir sandstones, with interbedded cemented and coaly mudstone seals. International Journal of Coal Geology 253:103966. https://doi.org/10.1016/j.coal.2022.103966 WSP Golder 2022. Surat Basin Carbon Capture and Storage (CCS) Project Groundwater Assessment Technical Report. Prepared for Carbon Transport and Storage Corporation (CTSCo) Pty Ltd. 28 September 2022. (Appendix</p>		Noted	N/A
82	0-1	General	General		<p>Background: The Department of Environment and Science (the department) has reviewed the environmental impact statement (EIS) submitted by Carbon Transport and Storage Company (CTSCo) Pty Ltd in October 2022 and publicly notified from 5 December 2022 to 23 February 2023. Critical matters to be addressed in the amended EIS are summarised below. These critical matters, as well as other matters that require further detailed assessment and consideration, including recommendations on how to adequately address these matters in the EIS are also provided. These matters are described in more detail in the table below. Where amendments are made to the EIS in response to submissions, these changes will need to be applied within the relevant amended EIS chapters and appendices, as well as summarised with clear referencing to relevant sub-section numbers. A clean amended EIS version as well as a track-changes version of the amended EIS would be helpful which details EIS amendments in response to submissions, including a suitable cross-reference guide. Furthermore, advice to the department received from the Independent Expert Scientific Committee (IESC) is attached as Annexure 1. It is the department's expectation that all technical matters raised in the IESC advice are addressed in the EIS.</p>		Noted	As applicable
82	0-2a	General	General		<p>Critical matters: 1.DES considers that the Precipice sandstone aquifer water quality is generally suitable for stock-water, potentially as is, or via blending or treatment. More information is required, including a robust technical justification for discounting of Environmental Values (EVs) for this aquifer based on the fluoride monitoring result.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.5, 9.7.5, 9.7.6, 9 9.3, 9 9.4, 9.9.6, 9.10, and 9.11; and Appendices 9A, 9C, 9D, 9E and 9F.
82	0-2b	General	General		<p>2.Limited datasets and modelling are used in the baseline assessment of local groundwater and overlying aquifers, and as a result, the environmental values of the Sandstone Precipice and other aquifer groundwater are not adequately considered in the impact assessment nor for the proposed mitigation and management approaches. It is critical in determining the acceptability of potential impacts and the design of the groundwater monitoring and verification program to obtain sufficient site-specific baseline data for the proposed new monitoring bores before GHG injection commences.</p>		Amended EIS	See Chapter 9 Groundwater, sections 9.1, 9.3.2, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12; Appendices 9A, 9B, 9C, 9D, 9E and 9F.
82	0-2c	General	General		<p>3.Insufficient detail is provided in the EIS regarding: a.the level and types of baseline groundwater quality data b an effective and robust monitoring network c.proposed environmental protection conditions, including site-specific triggers and limits to monitor and verify the dissolved phase plume extent andcontaminant movement within the Precipice Sandstone aquifer and overlying aquifers.</p>		Amended EIS	See Chapter 2 Proposed Project Description, section 2 8.1, and 2.11; and Chapter 9 Groundwater, sections 9 3.2, 9.4, 9.6.3, 9.6.4, 9.6.5, 9.7.4, 9.7.5, 9.7.6, 9.10; and Appendices 9C and 9D.
82	0-2d	General	General		<p>4.The EIS lacks a comprehensive air emission inventory of all potential point sources.</p>		Amended EIS	See Chapter 12 Air Quality, sections 12.2.1.2, 12 2.3, 12.3.1, 12.3.3.2, 12.4.2.1, 12.4 2.2, 12.5, 12 5.2.1, 12.6, 12.7, and 12.8.
82	0-2e	General	General		<p>5.Site-specific background noise measurements have not been undertaken and presented in the EIS.</p>		Amended EIS	See Chapter 13 Noise and Vibration, sections 13.3.1, 13.3.2, 13.5.2, 13.6 and 13.7.
82	0-3	General	General		<p>Note: Advice to the department from the Office of Groundwater Impact Assessment and the Commonwealth Scientific and Industrial Research Organisation on the proposed project is yet to be received. The department would appreciate if CTSCo would address these comments in the EIS, when received.</p>		Noted	See CTSCo responses for submitter 84.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	1	6	Waste	Section 6.5.2, 6.5.3, 6.7, 6.8 ToR 9.8	<p>The EIS states treated sewage will be managed as per the Queensland Plumbing and Wastewater Code during construction, operation, and monitoring stages. The justification provided is that during operations the capacity is expected to be less than 21 equivalent persons (EP). The EIS inconsistently presents the maximum daily peak design capacity requirements proposed for the onsite wastewater management systems. In Sections 6.5.2 and 6.5.3 these are listed as being less than 21 equivalent persons (EP). However, in sections 6.7 and 6.8 are listed as being with a design capacity of 21 EP.</p> <p>Note: If the proposal is for a single on-site sewage treatment plant (STP) and this has a design capacity of less than 21 EP then this is not categorised as an environmentally relevant activity (ERA). However, if the design capacity is at 21 EP (cumulatively) or greater it is categorised as an ERA which will require inclusion in an amended Environmental Authority (EA). Whether ERA 63 is triggered or not is also dependent on the number of on-site STPs and their cumulative design capacities with respect to EP.</p> <p>Sewage wastes are currently planned to be disposed on-site within the Transportation Facility; however, no further detail is presented regarding the technical aspects of potential discharge(s) to land, in terms of STP(s) location, discharge methods and location(s), size of irrigation area, level of STP treatment or disinfection processes. This information should be included in the EIS, if required.</p>	<p>The EIS should clarify the sequence and number of proposed on-site STPs that will be installed and operated at the facility across various project phases (as well as EP peak designs both separately and cumulatively across phases). If only one STP in total is planned for all project phases, clarify this in the amended EIS, specifically across Section 6.5.2, Table 6-7, Table 6-8, and Table 6-10. If the proposal includes peak design capacity with a design capacity of 21 EP or above appropriately apply Environmental Protection Regulation 2019, Schedule 2, Environmentally Relevant Activity 63 – Sewage Treatment.</p> <p>The amended EIS should provide further information about the type of sewage treatment technologies planned to be used. If treated sewage is proposed to be released/disposed of to land, the amended EIS should fully consider whether the Environmental Protection Regulation 2019, Schedule 2, environmentally relevant activity 63 – sewage treatment may be triggered at any stage of development, operation, or rehabilitation. Details STP(s) location, discharge methods and location(s), size of irrigation area, level of STP treatment or disinfection processes, as required.</p>	Amended EIS	See Chapter 6 Waste, sections 6.5.1, 6.5.2, 6.7 and 6.8.
82	2	7	Land	7.6.2.1.2 7.7.2.1.2 ToR 9.2	<p>These sections discuss environmentally sensitive areas (ESAs). The EIS proposes to amend the current environmental authority condition to allow GHG storage exploration activities to be undertaken within 200m of category A, B or C ESAs (protection zone) and within 1 km of a Category A ESA or within 500m of a Category B or C ESA (buffer zone).</p> <p>Further justification is required for relaxing the existing buffer distances and protection zones for the relevant ESAs.</p>	<p>The EIS states that during construction, disturbance activities will be associated with sealed road access to the Transportation Facility, construction of the flowline and construction of the Transportation Facility, all within 200m (protection zone) and/or 500m (buffer zone) of the Category C ESA boundary.</p> <p>This section of the EIS does not adequately describe potential impacts to ESAs if buffer distances and protection zones are relaxed.</p> <p>Provide further details on any proposed mitigation or avoidance measures for ESAs and why a relaxation of the buffer distance conditioned in the current EA is required.</p>	Adequately dealt within the EIS, no change to the EIS; and Amended EIS	See Chapter 7 Land, sections 7.6.2 and 7.7.2; Chapter 14A Terrestrial Flora and Fauna, sections 14A.5.4, 14A.6, and 14A.7; and Chapter 14B Aquatic Flora and Fauna, section 14B.3.2.2.
82	3	7	Land	7.6 and 7.7 ToR 9.2	There is no reference to Schedule 8 of the <i>Environmental Protection Regulation 2019</i> .	The EIS must include an environmental objective assessment and demonstrate that the proposed project can meet the environmental objectives and performance outcomes for Land in Schedule 8 of the <i>Environmental Protection Regulation 2019</i> .	Amended EIS	See Chapter 7 Land, section 7.8.
82	4	8, 9	Geology, Groundwater	Chapter 9 Groundwater and Chapter 8 Geology (and associated Appendices) ToR 9.4	<p>The EIS discounts the assigned Environmental Values (EVs) of water contained in the Precipice Sandstone aquifer on the basis that:</p> <ol style="list-style-type: none"> 1. there are no existing water extraction bores with a 50km radius 2. that levels of fluoride exceed stock watering guidelines (sampling from effectively one day only) and other EV WQOs comparisons; and 3. that the water is too deep to currently be economically feasible to extract. <p>The remainder of the EIS assessment of potential impacts and proposed mitigation and management measures is made under the assumption that EVs do not apply to the Precipice Sandstone aquifer.</p> <p>The proponent notes that there are scheduled EVs and water quality objectives (WQOs) relevant to the waters of the Precipice Sandstone aquifer (under Schedule 1 of the Environmental Protection (Water and Wetland Biodiversity) Policy (EPP) 2019, specified on Page 30 as Eastern Central Area of the Basal Zone of the Great Artesian Basin (GAB), Plan reference GWQ4168, Queensland Murray-Darling and Bulloo River Basins (QMDB) region ground and surface waters, see: https://environment.des.qld.gov.au/management/water/policy/murray-darling-bulloo</p> <p>The lines of evidence used by the proponent to discount Precipice EVs suggest that bores are not currently sunk to similar depths due to economic reasons. However, the EIS presents figures showing several bores sunk deeper than West Moonie 1 in the region more broadly. In addition, water licences to the Precipice Sandstone aquifer have been allocated to stock industries within 10-50km, and current Precipice Sandstone aquifer water use to the north of the proposal for intensive cattle feedlot should be included in the EIS. Across the Surat Basin, bores to the Precipice Sandstone use this aquifer for agricultural and/or human drinking water use.</p>	<p>DES considers that the Precipice Sandstone aquifer water quality is generally suitable for stock-water, potentially as is, or via blending or treatment. Provide a reasoned, science-based discussion and technical justification for the discounting of EVs for this aquifer.</p> <p>Discuss the EVs of the Precipice Sandstone aquifer water in terms of both current or potential future needs of future generations (including generational equity) to potentially extract, treat, and use the water resource. Adequately address the value and rights that landowners may have to the future use of the water resource.</p> <p>In responding, adequately address the national GAB plan and groundwater quality protection guidelines.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.3.2, 9.4, 9.5, 9.7.4, 9.7.5, 9.7.6, 9.9, 9.10, 9.11, and 9.12; Appendices 9A, 9E and 9F.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	5	8, 9	Geology, Groundwater	Chapter 9 Groundwater and Chapter 8 Geology (and associated Appendices) ToR 9.4	<p>Given CO₂ is a waste product which, if injected, will likely deteriorate pH levels in groundwater, and increase various dissolved metals levels (which are generally currently satisfactory for the stock watering EV) within the confined aquifer and Section 41 of the Environmental Protection Regulation (2019) applies, that is:</p> <p><i>Activity involving direct release of waste to groundwater</i></p> <p>(1) This section applies to the administering authority for making an environmental management decision relating to an activity that involves, or may involve, the release of waste directly to groundwater (the receiving groundwater). Example of direct release of waste to groundwater— an activity involving the release of contaminated water to groundwater through a well, deep-well injection or a bore</p> <p>(2) The administering authority must refuse to grant the application if the authority considers—</p> <p>(a) for an application other than an application relating to an environmental authority for a petroleum activity—the waste is not being, or may not be, released entirely within a confined aquifer; or</p> <p>(b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or</p> <p>(c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater.</p> <p>(3) In this section — <i>confined aquifer means an aquifer that is contained entirely within impermeable strata.</i></p> <p>And note:</p> <p>Section 6(1) The environmental values for water to be enhanced or protected under this policy are- (a) for water mentioned in schedule 1, column 1 – the environmental values stated in the document opposite thewater in schedule 1, column 2</p> <p>The EVs of the Precipice Sandstone aquifer are scheduled and include stock watering (among other EVs). It is unclear what legislative or guidance-based mechanism is used in the EIS to support the argument to discount the environmental values - other than using the monitoring result for fluoride compared with stock watering guideline (see Australian and New Zealand guidelines for fresh and marine water quality (ANZG 2018)). The EIS does not provide a legislative or guidance document mechanism used to validate this assessment approach and EIS conclusions.</p>	<p>The EIS must demonstrate that the proposed activity will not result in a deterioration of the Precipice Sandstone aquifer or other groundwater aquifer EVs.</p> <p>The EIS must:</p> <ul style="list-style-type: none"> - establish the true EVs of the groundwater and incorporate existing licenses to the Precipice Sandstone aquifer within 50km of EPQ10 (rather than simply the West Moonie 1 well). - recognise the potential for future groundwater extraction and model groundwater extraction. This must identify the full extent of potential migration of the CO₂ plume (supercritical fluid and dissolved phase impacted groundwater) that may arise from the influence of other extraction uses. Establish an exclusion zone whereby groundwater extraction will need to be prohibited in perpetuity to prevent migration forces on the plume, including a reasoned argument as to why this should be the preferred outcome. - Propose an adequate level of monitoring that can be suitably conditioned in any future EA to monitor and verify the dissolved phase plume. This proposed program would need to adequately assess the vertical and lateral migration potential of the plume, monitor CO₂ migration, and water quality, and verify assumptions made in modified plume models. This information should also be used to calibrate models. - Characterise the potential impacts to groundwater. Most discussion about the CO₂ plume considers the supercritical CO₂ containment only. Address the potential for a dissolved phase plume to impact water quality within the aquifer. 	Amended EIS	See Chapter 9 Groundwater, sections 9.6, 9.7.4, 9.7.5, 9.9, 9.10, 9.11, 9.13; and Appendices 9A, 9B, 9C, 9D, 9E and 9F.
82	6	8, 9	Geology, Groundwater	Chapter 9 Groundwater and Chapter 8 Geology (and associated Appendices) ToR 9.4	<p>Insufficient baseline monitoring in the Precipice and other aquifers has been presented in the EIS and needs to be undertaken. If approved, bore specific triggers for the various aquifers will be needed in any amended Environmental Authority (EA).</p> <p>Typically, this would require sampling bores for a broad range of indicators on a quarterly basis for approximately 2 years prior to disturbance to derive, for example, a statistically robust data set to investigate water quality outliers, trends, possible seasonal influences and define protective triggers.</p>	<p>The proponent must establish a baseline for each aquifer and potentially each monitoring bore. Set appropriate trigger values for water quality as part of a broader robust groundwater quality and water level monitoring and verification program. The proponent should follow the requirements in appropriate guidance documents to assist in the derivation of bore specific guidelines including “Using monitoring data to assess groundwater quality and potential environmental impacts” (see: Using monitoring data to assess groundwater quality and potential environmental impacts (publications.qld.gov.au)). The EIS should clearly state whether samples have been collected in accordance with the <i>Monitoring and Sampling Manual (Environmental Protection (Water) Policy 2009</i>.</p>	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, and 2.11; Chapter 8 Geology, sections 8.5.2, 8.7.5, 8.7.6, 8.8; Appendices 8A and 8B; Chapter 9 Groundwater, sections 9.3.2, 9.4.1, 9.4.2, 9.5, 9.6.4, 9.7.4, 9.7.5, 9.7.6, 9.9.3, 9.9.4, 9.9.6, 9.9.7, 9.10, 9.10.1.4, and 9.10.1.5; and Appendices 9A, 9C, 9D and 9F.
82	7	8, 9	Geology, Groundwater	Chapter 9 Groundwater and Chapter 8 Geology (and associated Appendices) 9.7.4 ToR 9.4	<p>The EIS has proposed a monitoring strategy to assess the potential impacts of the GHG stream within the Precipice Sandstone aquifer groundwater. Proposed monitoring and verification involve monitoring at just one monitoring location within the predicted plume, and generally lacks adequate near- and mid-field monitoring of the Precipice Sandstone or overlying aquifers (other than 1 bore proposed in the Gubberamunda aquifer).</p> <p>Monitoring is only proposed to be undertaken 2 years post injection ceasing.</p> <p>The EIS presents insufficient details regarding the proposed EA conditions. Limited scientific justification is provided in support of the proposed investigation trigger values (Table 9-30 Chapter 9). The pH trigger value of 3.5, TDS of 5000 mg/L, Arsenic of 1 mg/L, Lead of 10 mg /L are not justified in terms of being required from predictive modelling results (which for example predict worst case pH of 4.5), nor in terms of environmental protection. The proposed lead trigger value is 4 orders of magnitude above presented baseline data for the same indicator.</p>	<p>The EIS should present an adequate level of monitoring and verification to inform the regulator, the proponent, and the community about all relevant risks, and to provide an early warning system to cease injection (if unintended cross aquifer contamination is observed). Currently, the proposed monitoring and data collection will not provide sufficient information about the potential impacts nor allow for responsive compliance or effective management responses.</p> <p>The proposed monitoring and verification program must continue until the proponent can demonstrate there will be no degradation to groundwater quality, environmental values and movement of the plume is limited.</p> <p>The EIS must present a complete set of draft conditions for the proposed groundwater monitoring and verification program and all recommended triggers and limits should be suitably justified both technically and scientifically.</p>	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11 and 2.16; Chapter 8 Geology, sections 8.10 and 8.13; Chapter 9 Groundwater, sections 9.10 and 9.13; and Chapter 22 Proposed EA Condition Amendments.
82	8	8, 9	Geology, Groundwater	Chapter 9 Groundwater and Chapter 8 Geology (and associated Appendices)	<p>A recent discussed monitoring option is that West Moonie 2 may be used to sample both the Precipice Sandstone within the predicted GHG zone of impact and other overlying aquifers such as the Hutton or Gubberamunda aquifer.</p>	<p>Any suggestion that involves this approach requires a clear description and assessment that would satisfy the concerns that the use of a single bore to target multiple aquifers would not represent a potential conduit for cross aquifer and GHG plume cross-contamination within itself.</p>	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2.2 and 2.11.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	9	12	Air Quality	(Section 12.4.2: Operation), Section 12.5 and Table 12-5 ToR 9.6	Section 12.4 2 states that the GHG stream will be pumped through a water bath heater and injection pump. The heat source for the water bath heater will be an LPG burner. The burner can operate at up to 100 kg/h. It is also stated that GHG stream will be continually pumped to the well at approximately 15 tonnes/hour via two pumps (one duty, one standby) at 31°C and up to 1,500 psi (10 MPa). However, it is not clear what sort of energy sources will be used to compress and pump the GHG into the wellhead. There is possibility that LPG fired compression and reciprocating injection pump will be used at this facility. Air emissions from these point sources were not discussed in the EIS. Potential impacts for each aspect of transfer GHG are generally assigned "negligible impacts expected".	The EIS must provide a comprehensive air emission inventory of all potential point sources (including LPG burner or other planned energy source/s) that includes at least the following information: - a complete list of emissions to the atmosphere including SO _x , NO _x , VOC, CO, CO ₂ , and particulates (PM ₁₀ , PM _{2.5}) - present the flue gas concentrations at standard temperature and pressure and relevant oxygen reference level. Also, provide the pollutants mass emission rate and the flue gas temperature, exit velocity and volume flow rate, and stack height - estimation of emission rates should be based on actual measurements on samples taken from similar facilities, either full-scale facilities operating elsewhere, or experimental or demonstration-scale facilities. Where this is not possible, use published emission factors and/or data supplied by manufacturers of process and control equipment - compare the proposed level of emissions with the best practice national	Amended EIS	See Chapter 2 Proposed Project Description, section 2.10 2.4, and Chapter 12 Air Quality, sections 12.2.1.2, 12.2.3, 12.3.1, 12.3.3 2, 12.4.2.1, 12.4.2.2, 12.5, 12.5.2.1, 12.6, and 12.8.
82	10	12	Air Quality	ToR 9.6	While Chapter 12 presents air quality objectives from the Environmental Protection (Air) Policy 2019, it lacks an environmental objective assessment according to Schedule 8, Part 3, Division 1 of the Environmental Protection Regulation 2019.	The amended EIS Air chapter is to include an environmental objective assessment which demonstrates that the proposed project can meet the environmental objectives and performance outcomes for Air in Schedule 8 of the Environmental Protection Regulation 2019	Amended EIS	See Chapter 12 Air Quality, section 12.7.
82	11	5	Climate	Section 5 2.2.2.2, Chapter 5: Climate Page 10-14 ToR 9.6	The Greenhouse Gas (GHG) emissions inventory excludes some relevant potential sources.	The EIS must provide an estimation of GHG emissions from the following additional sources: - Land clearing (Scope 1) - Fabrication of flowline (Scope 3).	Amended EIS	See Chapter 5 Climate, sections 5.2.1.4.1, and 5.2.2 2.2.
82	12	5	Climate	Section 5 5.1, Chapter 5: Climate Page 25-26 ToR 9.6	While acknowledging that the EIS has applied the Input-Output analysis for estimating GHG emissions, it is not clear how these input parameters outlined in Table 5-4 in Chapter 5 are derived, and how representative they are to the proposed activities.	The EIS should provide calculations to justify the choice of those input variables, including breakdown estimates for the use of LPG for operation of: - Water bath heater - Pump for injection - Monitoring equipment.	Amended EIS	See Chapter 2 Proposed Project Description sections 2.9.2 and 2.10.2.4; and Chapter 5 Climate, section 5 2.2.2.2.
82	13	5	Climate	Section 5.6.2, Chapter 5: Climate Page 30-31 ToR 9.6	The EIS does not adequately consider possible avoidance measures to minimise the use of LPG.	The EIS should assess and present GHG emission abatement analysis of the use of solar water heating systems to heat the GHG stream. This analysis should consider partially or fully substituting the burning of LPG which is a carbon intensive approach. Solar water systems are commercially available and for example are widely used in residential buildings.	Amended EIS	See Chapter 2 Proposed Project Description section 2.15.6, and Chapter 5 Climate, sections 5.2.2 2.2 and 5.6.2.1.
82	14	13	Noise and Vibration	Section 13.3.1, 13.5 ToR 9.7	Background noise measurements have not been undertaken and presented in the EIS. The department's EIS guideline for noise and vibration states "The EIS must identify and address the following three key areas relating to noise matters: - environmental values of the receiving environment and any nearby sensitive places" The EIS has not adequately considered the existing environmental values for noise and vibration. Some project activities (noise sources) have been assessed against noise and vibration criteria that are relatively permissive (especially in the construction phase). The assessment criteria applied do not appear to accurately consider the possible characteristics of the surrounding rural area. Residents' sensitivity to noise is highly dependent on the existing natural environmental noise levels where they reside. No mention of Southwood National Park as a sensitive receptor – whereas national parks are included in EPP Noise Schedule 1.	The EIS is required to conduct a background noise assessment in accordance with the EIS guideline for noise and vibration. Existing background noise level is the baseline used to assess the potential impacts posed from the proposed project. The EIS has not properly assessed the project impact until the predicted impact is compared to the existing environment. While there is a methodology to set a noise limit using an "assumed level" in the department's "assessment process", this is not the same as assessing the existing environmental values. Although it is always preferred to use a real assessment of the existing environment, if deemed levels were to be used, further technical justification must be presented using comparable values from like environment(s), as a minimum. Apply protective assessment criteria to background noise studies to appraise the level of predicted impact (with a focus on the construction phase). Ensure that all relevant sensitive receptors are accurately identified in the EIS	Amended EIS	See Chapter 13 Noise and Vibration, sections 13 3.1, 13.3.2, 13.5.2, 13.6 and 13.7.
82	15	13	Noise and Vibration	Section 13.3 3 ToR 9.7	While the EIS identifies sensitive receptors, the Figure presented is unclear and difficult to read. Figure 13-1 is zoomed out and includes 100 km of area to a page.	Amend the EIS is to include maps and figures (at the appropriate scale) which clearly depict the proposed facilities and the nearby sensitive receptors at a sufficient resolution and scale to allow the reader to discern 0.1km intervals	Amended EIS	See Chapter 13 Noise and Vibration, section 13 3.1 and Figure 13-2.
82	16	13	Noise and Vibration	Section 13.5 ToR 9.7	Chapter 13 does not present low frequency specific assessments from the proposed project. The EIS does not conduct any octave or 1/3 octave spectral breakdown for planned equipment.	The EIS should include spectral analysis of each proposed equipment used and all potential noise sources and ensure that low frequency impact is adequately assessed and presented in detail.	Amended EIS	See Chapter 13 Noise and Vibration, sections 13 5.2, 13.6 and 13.7.
82	17	13	Noise and Vibration	General ToR 9.7	Other than the predicted noise considerations and setting of "offset distances", there is no real monitoring of noise levels considered.	Despite the seemingly low risk of noise emissions other than the construction phase, the TOR requires that the EIS "Describe how the environmental management objectives for noise and vibrations would be achieved, monitored, audited and reported, and how corrective actions would be managed." A Noise and vibration management plan including monitoring program is needed to address the Terms of Reference requirement.	Amended EIS	See Chapter 13 Noise and Vibration, sections 13.6 and 13.7; and Chapter 21 Commitments, Table 21-7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	18	14A	Terrestrial Flora and Fauna	Chapter 14A and Table 14A-8, Appendix 14AA – 6.2 ToR 9.5, 9 5.1, 9,5 2	Section 6 2 of Appendix 14AA identifies impacts on Matters of State Environmental Significance (MSES). Chapter 14A Table 14A-8 outlines the MSES likely to be impacted by clearing for construction of the flowline. However, the "Significant residual impact after mitigation" column refers to assessment under the EPBC Act Significant Impact Guidelines instead of the State guidelines.	The EIS must include an assessment of MSES under the <i>Environmental Offsets Act 2014</i> (EO Act). Prescribed environmental matters are defined in section 10 of the EO Act. The State can require environmental offsets for significant residual impacts to matters of state environmental significance (MSES) that are prescribed environmental matters. These are listed in schedule 2 of the <i>Environmental Offsets Regulation 2014</i> . Proposed clearing or disturbance to regulated vegetation and protected wildlife habitat requires assessment of potential impacts using the Significant Residual Impact Guideline 2014. The study area must consider the disturbance zone when undertaking any assessment of impacts to MSES due to access required to construct the flowline, as follows: - amend Table 14A-8 to remove references to the EPBC Act Significant Impact Guidelines - amend Table 14A-8 to align with MSES categories - amend Table 14A-8 to include impacted regional ecosystems under the 'Regulated vegetation' category. Note this includes any regional ecosystems that intersect with areas of essential habitat and regional ecosystems that intersect within a defined distance of a watercourse - amend Table 14A-8 such that the koala, squatter pigeon, grey snake, glossy-black cockatoo and Latham's snipe are assessed under the 'Protected wildlife habitat' category - amend Table 14A-8 to include 'Waterway providing for fish passage' - depict on relevant figures and provide shapefiles of the disturbance area to enable the department to assess and identify potential impacts to MSES.	Amended EIS	See Executive Summary section 9.10, Chapter 14A Terrestrial Flora and Fauna, sections 14A.2.1 2.4, 14A.5.4, 14A.6.3, 14A.7, and 14A 9, and Appendix 14A Terrestrial Flora and Fauna technical report (Appendix E), and Chapter 21 Commitments, Table 21-1.
82	19	2, 19	Proposed Project Description; Rehabilitation	Section 19.3.1 and Chapter 2 Section 2.7 ToR 9.3 ToR 9.4 2	The EIS addresses rehabilitation as per the conditions of the current EA (condition 58 – rehabilitation). However, the proposed rehabilitation methodology appears primarily focussed on rehabilitation of surface activities, with the objectives to obtain a safe, stable, and non-polluting landform like that of adjacent surface areas. The EIS does not adequately address the rehabilitation objectives for groundwater and the subsurface environment to ensure the post land use is safe, stable, and non-polluting relevant for potential groundwater or other sub-surface impacts. The proponent requests changes to the EA to enable the proposed project to inject a GHG stream (CO ₂) into EPQ10 for injection testing, including: d) The environmental authority authorises the released GHG stream to remain in perpetuity within the Precipice Sandstone aquifer, and not be subject to the rehabilitation requirements of Condition 58 –Rehabilitation.	To allow all potential impacts to be considered and adequately assessed the EIS should provide all information for the groundwater and subsurface rehabilitation objectives, and associated information and conditions. The EIS must establish rehabilitation outcomes and demonstrate criteria for successful rehabilitation. Successful rehabilitation must consider the desired rehabilitation outcome for the site considering the storage of CO ₂ in perpetuity. The EIS should outline how those rehabilitation outcomes will be met to demonstrate groundwater and subsurface areas are safe, stable, and non-polluting. Furthermore, the EIS must adequately describe the monitoring and verification requirements to demonstrate that rehabilitation outcomes have been effectively met. If for example the plume movement is greater than EIS modelling suggests or contamination occurs outside the predicted plume area, describe effective rehabilitation measures for Precipice Sandstone aquifer in those regions. Provide further information as to the rehabilitation measures which will be employed to ensure there are no ongoing negative impacts to groundwater quality, that GHG plume movement is limited and that GHG is not being released to air. It should be noted that stable in this instance should not only include physical stability - such as preventing collapse of any bores or other subsurface structures - but also ensuring that the activity will not result in any impacts to the surface landform through issues such as subsidence or seismic activity. The EIS should demonstrate that following cessation of the activity and the completion of any rehabilitation works, the physiochemical environment is also stable, by being able to demonstrate that there are no cumulative changes to the chemistry of groundwaters outside the plume zone.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11, and 2.12; and Chapter 9 Groundwater, sections 9 8, 9.9, 9.10, 9.12, and 9.13.
82	20	19	Rehabilitation	Section 19.5.4.3.2 ToR 9.3 ToR 9.4 2	This EIS section indicates that West Moonie-1 Injection Well and West Moonie-2 Monitoring Well after 3 years will be shut down and may be used for future monitoring. The wells are anticipated to be plugged and abandoned. Monitoring will continue for 2 years then monitoring will be ceased.	The EIS provides information on monitoring for 5 years (3 years during injection and 2 years post injection) in the project area. The EIS must provide a science-based reasoned discussion, including further calculations and specific technical studies which led to the decision to limit monitoring of the potential impacts from GHG injection to a 2-year post	Amended EIS	See Chapter 9 Groundwater, sections 9.4, 9.6.2, 9.7.3, 9.7.4, 9 8, 9.9 2, and 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	21	19	Rehabilitation	Section 19.7.4 ToR 9.3 ToR 9.4.2	<p>The EIS states that changes to groundwater quality are predicted within the GHG plume. These potential impacts will be long-term, and the extent is predicted to be contained within approximately 525m of the West Moonie-1 injection well. Residual impacts associated with the long-term storage of CO₂ beyond the proposed 3 years after cessation of injection has been modelled to be stable. However, until sufficient site-specific monitoring data has been collected to confirm this modelling prediction, potential residual impacts remain.</p> <p>Ownership and responsibility after EIS project completion are unclear from the EIS document. The guideline on "Carbon Capture and Storage Methods 2021" developed by the Clean Energy Regulator requires CCS projects to outline how the long-term risk of reversal from the storage site will be managed, even though the risk may be considered low in some publications.</p>	<p>The EIS must consider the residual risk framework under the EP Act.</p> <p>The EIS must outline remedial actions that may be required in response to a hypothetical/ potential exposure pathway at the proposed project site post-surrender. Remedial actions should be pro-active including, but not be limited to, groundwater sampling, monitoring and geotechnical assessments. Residual risk and ongoing liability to potentially affected landholders will need to be included in the EIS.</p> <p>The EIS should develop site rehabilitation processes and responsibilities, including managing longer-term residual risks and/ or liabilities after project completion (for example, reversal of carbon storage, seismic activity, groundwater level alterations, declining groundwater quality and liability to landholders).</p>	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1, 2.11, 2.12, and 2.16; Chapter 8 Geology, sections 8.10, 8.11, 8.12 and 8.13; and Chapter 9 Groundwater, sections 9.10, 9.11, and 9.12; and Chapter 19 Rehabilitation.
82	22	19	Rehabilitation	Section 19.5.4 2.2.3 ToR 9.3	This section indicates that visual monitoring of key areas (South Branch Stephen Creek, Stephens Creek, and the patch of Brigalow) will be undertaken during cementing of the flowline during the rehabilitation phase.	The EIS should provide further detail on the key objectives of the proposed visual monitoring program, including the potential impacts, response and outcomes which are anticipated from using visual monitoring.	Amended EIS	See Chapter 19 Rehabilitation, section 19.5.4.2 2.3.
82	23	20	Cumulative Impacts	20.3.1 ToR 8.3	<p>Within the operational lands and land adjoining the operational lands, there is existing infrastructure relating to the resource tenements, for example:</p> <ul style="list-style-type: none"> - Petroleum Pipeline Licence (PPL) 6 Jackson to Moonie Pipeline, owned by Santos Limited; and - lot 41 PG463 and easement G PG463, as the site and access track to an existing telecommunications tower owned by Santos Limited, being lands lease for purposes of communications. 	<p>The EIS states ongoing oil production at Moonie has resulted in local depressurisation of the Precipice Sandstone in the region of the Project (OGIA, 2019).</p> <p>The EIS should detail the potential impacts to the GHG plume in the event the Precipice Sandstone continues to depressurise as a result of ongoing or recommencing oil production.</p>	Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, 9.7.3, 9.7.4, 9.9.2, 9.9.3, 9.9.5, and 9.9.6.
82	24	20	Cumulative Impacts	ToR 8.3	<p>The EIS does not consider GHG exploration and development projects proposed on tenures adjacent to the project area, including agricultural developments accessing or proposing to access the groundwater aquifers in the project area. Potential impacts and interaction between GHG plumes arising from those proposed projects should be fully considered and assessed.</p> <p>The EIS outlines overlapping tenures with EPQ10. Chapter 9 Groundwater, section 9.3.7.2 describes the existing groundwater extraction bores and wells, including those within 50 km of the operational lands. There are six registered bores accessing the Precipice Sandstone within a 50 km radius of the West Moonie-1 Injection Well. The closest wells drilled into the Precipice Sandstone appears to be located approximately 30 km north-east of West Moonie-1 Injection Well in the Moonie Oil Field, being conventional oil and gas exploration and/or production from Petroleum Lease 1, held by Bridgeport (Surat Basin) Pty Ltd.</p>	The EIS must consider potential impacts and interaction of the GHG plume should development of projects proposed on tenures adjacent to the project area proceed within the Precipice Sandstone. The EIS assessment should also consider any existing, proposed or expanding agricultural developments.	Amended EIS	See Chapter 9 Groundwater, sections 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11 and 9.12.
82	25	0	Executive Summary	Chapter 1, Section 1.1	<p>The activity (geological sequestration) is described as not being novel – yet this is the first time the activity has been undertaken within Queensland in this geological formation.</p> <p>It is understood that there were earlier attempts at carbon sequestration within Queensland (e.g., ZeroGen Pty Ltd), however, this proposal involved a significantly smaller volume of GHG stream for injection. That project was abandoned prior to the project being completed.</p>	<p>The EIS must be clear and forthright in presenting data delineating the few projects in mainland Queensland and Australia involving the geological carbon sequestration, rather than referencing the number of CO₂ injection projects globally.</p> <p>The EIS should present a balanced summary of the rate of success or failure of carbon sequestration projects, including further technical detail as to how the proposed activity differs from other activities (in the Executive Summary and other relevant EIS sections).</p>	Amended EIS	See Executive Summary, section 4.1.1; Chapter 2 Proposed Project Description, section 2.3; Chapter 9 Groundwater, section 9.4.3; and Appendix 9A.
82	26	2	Proposed Project Description	Section 2.6, 2.7, 2.8 and 2.9 ToR 1.2.2	The sections identify well locations, the pipeline and the transportation facility but do does not identify in sufficient detail other infrastructure proposed (i.e., cryogenic gas storage, refrigeration infrastructure, water storage, septic systems etc).	The EIS should provide detailed technical information on other infrastructure proposed (i.e., cryogenic gas storage, refrigeration infrastructure, heating facilities, water storage, septic systems) and potential outputs, waste streams and emissions from each.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, sections 2.9.2 and 2.10.2; Chapter 12 Air Quality, sections 12.4.2 and 12.5.2; and Chapter 13 Noise and Vibration, sections 13.4, 13.5, 13.6 and 13.7.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
82	27	2	Proposed Project Description	section 2.11 ToR 1.1	The EIS lacks environmental management plans detailing how environmental risks and impacts are to be avoided, minimised, managed, monitored, reported, audited, or trigger cease-injection responses.	Include an environmental management plan setting out the framework for continuing management, mitigation, and monitoring programs for the project's relevant impacts, including any provision for independent environmental auditing.	Adequately dealt within the EIS, no change to the EIS, and Amended EIS	Chapter 2 Proposed Project Description, section 2.11; Chapter 3 Community and Stakeholder Engagement, sections 3.5, 3.6, and 3.8; Chapter 4 Approvals; Chapter 5 Climate, sections 5.6 and 5.8; Chapter 6 Waste, sections 6.5, and 6.7; Chapter 7 Land, sections 7.7, 7.8 and 7.9; Chapter 8 Geology, sections 8.8, 8.10, and 8.12; Chapter 9 Groundwater, sections 9.8, 9.10, 9.12 and 9.13; Chapter 10 Surface Water, sections 10.5, 10.6, 10.7, and 10.8; Chapter 11 Transport, sections 11.5, and 11.7; Chapter 12 Air Quality, sections 12.4, and 12.6; Chapter 13 Noise and Vibration, sections 13.4, 13.5, 13.6, and 13.7; Chapter 14A Terrestrial Flora and Fauna, sections 14A.4, 14A.6, and 14A.7; Chapter 14B Aquatic Flora and Fauna, sections 14B.4, 14B.5, 14B.6, 14B.7, 14B.8, and 14B.9; Chapter 15 Hazards and Safety, sections 15.5, 15.6, 15.7, and 15.8; Chapter 16 Cultural Heritage and Native Title, sections 16.5, 16.6, 16.7, and 16.8; Chapter 17 Social, sections 17.4, 17.5, 17.6 and 17.8; Chapter 18 Economic Impacts, section 18.7; Chapter 19 Rehabilitation, sections 19.5, 19.7 and 19.8; Chapter 20 Cumulative Impacts, sections 20.4, 20.5, and 20.6; Chapter 21 Register of Commitments; and Chapter 22 Proposed Environmental Authority Condition Amendments
82	28	15	Hazards and Safety	Section 15.8 Page 32 ToR 9.9	Insufficient practices for control of LPG ignition or other sources presented in the EIS.	The EIS should include details regarding engagement with a qualified third party for a Hazards Area Classification assessment of the LPG gas line to identify hazardous zones and avoidance measures to minimise potential LPG ignition and explosion. This should include, but not be limited to: - Use of explosion proof electrical devices in the hazardous zones identified by the Hazardous Area Classification - Installation of a flame arrestor near the LPG tanks to arrest any potential flame flashback.	Adequately dealt within the EIS, no change to the EIS	See Chapter 2 Proposed Project Description, section 2.10 2.4, and Chapter 15 Hazards and Safety, section 15.5.3.2.
82	29	15	Hazards and Safety	sections 15.4.4.3, 15.6.2.1.1, 15.6.2 2.1, 15.6.2 3.1, 15.6.2.4.1 and 15.7.2.1.1 ToR 9.9	The EIS states there were two earthquakes (one 5.3 magnitude) that intersected with EPQ10. The EIS should discuss what this incidence demonstrates about earthquake risk for the proposed project. Potential impacts from earthquakes during operation are outlined (15.6.2.2.1) but are not addressed in the Avoidance and Mitigation section (15.7.2.2.1).	The EIS requires clear commitments in the avoidance and mitigation section for earthquakes. For example, what automated mitigation aspects of the operation would be triggered during an earthquake to minimise environmental harm or hazard potential.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11.5; and Chapter 15 Hazards and Safety, section 15.7.2.2.1.
82	30	15	Hazards and Safety	Chapter 15, sections 15.7 and 15.8 ToR 9.9	No overall risk assessment or residual risk assessment presented on the safeguards that would reduce the likelihood and severity of hazards, consequences, and risks to persons, within and adjacent to the proposed project area.	The EIS must describe effective measures that would be taken to respond to a well blow-out, serious leak, or other operational upset conditions, particularly if the project is being monitored remotely. The EIS should provide an adequate assessment of the potential environmental, health and safety risks associated with any leaks. The EIS should identify the residual risk following application of proposed mitigation measures. Present an assessment of the overall acceptability of the impacts of the proposed project considering the residual uncertainties and risk profile. Present an overall risk assessment and residual risk assessment in the EIS, including a description of risk management system to identify, assess and manage operational risks. This information should be science based and rigorous, yet practical, in approach.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.11, 2.12 and 2.16; and Chapter 9 Groundwater.
82	31	9, 15	Groundwater; Hazards and Safety	sections 9.6.1 and 9.5 3.3 sections 15.5.1, 15.6.2 2.5 ToR 9.9	Risks are not assessed in relation to induced seismic activity because of the proposed project. Statements such as "no induced seismicity is expected from the Project" (s15.6 2.2.5) should be supported by an evidence based discussion. There is no evidence or data offered in Chapter 8 or Chapter 9 on why this induced seismicity is considered zero risk.	Consider specific assessment of the risks of induced seismic activity created by the proposed project. Address the flow on consequences of such activity, including, but not limited to, potential impacts on the safety and stability of the aquifer and associated GHG stream plume and the potential impacts on the integrity of local infrastructure.	Amended EIS	See Chapter 8 Geology, sections 8.7.6, 8.9.2, 8.10.2, and 8.11.
82	32	15	Hazards and Safety	sections 15.4.4.4, 15.6.2 2.2, 15.6.2 3.2 and 15.6.2.4.2 ToR 9.9	Further explanation required for the hazard frequency scoring values for cyclone probability presented and further evidence for probability of heatwaves being low (what does this mean in terms of frequency).	Address the potential cyclone and severe wind hazard and risk to the proposed project and the heat and heatwave risk management - refer to the State Heatwave Risk.	Amended EIS	See Chapter 15 Hazards and Safety, section 15.7.2.1 2 and 15.7.2 2.2.
82	33	8	Geology	Appendix 08A, Pages 177 to 198	Appendix 3 to Appendix 22 and Enclosure Logs have headings only and no information presented under these headings.	The EIS must include the information intended for these aspects.	Amended EIS	See Appendix 8A Well Completion Report, page 2 for link.
83	1	General	General		In our submission dated 21 February 2023, we advised that we would be submitting further information in the form of an independent peer review. This information is now attached. We would greatly appreciate your consideration of this information as part of our submission.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
83	1	General	General		In the submission from the Queensland Farmers' Federation's to the Department of Environment and Science regarding the Environmental Impact Statement - Surat Basin Carbon Capture and Storage Project, we advised that we wish to further submit an independent peer review. This independent hydrogeological review has been undertaken and is enclosed. We would appreciate the Department's consideration of this further information and the concerns we have raised regarding the project. If you would like to discuss this or need further information, please don't hesitate to contact me directly on [REDACTED] or ceo@qff.org.au.		Noted	N/A
83	2	General	General		I have been contracted by the Queensland Farmers' Federation (QFF) to provide an independent expert review of groundwater related matters in the abovementioned EIS. This document supports QFF's earlier submission and has been approved by DES to be lodged after the published deadline of 23 February 2023 due to my late knowledge of the EIS being open for public consultation.		Noted	N/A
83	3	General	General		I am a hydrogeologist with more than 25 years' professional experience in groundwater characterisation, assessment and management. My areas of specialist expertise include quantifying inter-aquifer leakage through aquitards, use of environmental tracers (chemistry and isotopes) to improve knowledge of aquifer processes and surface watergroundwater interaction, and numerical simulation of groundwater flow and solute transport. For the past eight years I have been the Commonwealth Minister-approved Suitably Qualified Water Resources Expert reviewer for Arrow Energy's Surat and Bowen Gas Projects. I have also worked in other parts of the Great Artesian Basin including recharge beds in Far North Queensland and the southwest margin in South Australia.		Noted	N/A
83	4	General	General		Due to insufficient time I have not reviewed the EIS in its entirety, instead focussing only on hydrogeological aspects: • Chapter 9 – GROUNDWATER • Appendix 9A – GROUNDWATER IMPACT ASSESSMENT TECHNICAL REPORT		Noted	N/A
83	5	General	General		I have tabulated my comments, questions and recommendations below in order to facilitate assessment by DES and response by CTSCo. To summarise, I am concerned about the way in which the salinity of the Precipice Sandstone has been misrepresented as being unsuitable for many purposes including livestock. The disregard for existing licensed allocations from this aquifer and potential future users means that the impact assessment is incomplete. Moreover, the isotope interpretation is lacking substance and the numerical modelling falls well short of industry best practice, as promoted through efforts such as the Groundwater Modelling Decision Support Initiative.		Amended EIS	See Chapter 9 Groundwater.
83	1a	9	Groundwater	Water quality for future groundwater users 9.2.4.2, 9.3.5.1, 9.3.6.1.2	Despite multiple claims that the Precipice Sandstone is a "saline formation" and that the groundwater is brackish and "unsuitable for livestock consumption", the measured TDS concentration of 1,850 mg/L is very suitable for most livestock and many irrigated crop types.		Amended EIS	See Executive Summary, section 9.5; and Chapter 9 Groundwater, sections 9.7.5, and 9.7.6.
83	1b	9	Groundwater	Water quality for future groundwater users 9.2.4.2, 9.3.5.1, 9.3.6.1.2	Therefore, it seems strange to intentionally compromise the viability of the resource for future generations through the mobilisation of trace elements and heavy metals etc. Have alternative target reservoirs (e.g., deeper and more saline aquifers with sufficient permeability and porosity) been investigated within EPQ10 to avoid having impacts to current and potential future users of a good quality Precipice resource?		Adequately dealt within the EIS, no change to the EIS, and Amended EIS	See Chapter 2 Proposed Project Description, sections 2.2, and 2.5; Chapter 8 Geology, sections 8.4, and 8.5.
83	1c	9	Groundwater	Water quality for future groundwater users 9.2.4.2, 9.3.5.1, 9.3.6.1.2	The statement that "water quality data from the West Moonie-1 Injection Well is broadly consistent with the water quality within the Precipice Sandstone in the Moonie Oil Field" is false and misleading – the TDS at the latter is 54% (~1,000 mg/L) higher than the TDS at West Moonie-1.		Amended EIS	See Chapter 9 Groundwater, sections 9.7.4 and 9.7.5.
83	2	9	Groundwater	Impacts on existing licences for taking of groundwater from Precipice Sandstone 9.2.1.2.4, 9.3.6.2.2	The report states "there are no registered bores associated with the three licences allocated to the Precipice Sandstone (within 50 km of the West Moonie-1 Injection Well), indicating that the Precipice Sandstone licences are not currently being utilised." This may be true, however the licences will have an owner and property details, so why have the cumulative impacts on these existing licences not been assessed?		Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4, 9.7.5, 9.9.2, 9.9.3, 9.9.5, 9.9.6, 9.9.8, 9.10.1.8, 9.11, and 9.12.
83	3a	9	Groundwater	Measurement, monitoring and verification (MMV) methods 9.2.4.3, 9.7.2	There are statements that continuous groundwater sampling and shallow subsurface techniques are suitable for "rapid" detection of CO ₂ leakage out of the target reservoir and into groundwater resources. Whilst these techniques are both critical and appropriate, it must be stressed to all stakeholders that timeframes for leakage through an aquitard – even through a relatively higher permeability fracture zone – are not "rapid" and will be far longer than the duration of most previous CCS case studies and the proposed injection timeframe of the CTSCo Project. For example, it could easily be many hundreds to thousands of years, if not tens or hundreds of thousands of years.		Amended EIS	See Chapter 9 Groundwater, section 9.10.
83	3b	9	Groundwater	Measurement, monitoring and verification (MMV) methods 9.2.4.3, 9.7.2	Accordingly, pressure monitoring in aquitards and aquifers that immediately overlie the target reservoir is critical to provide lead indicators of the potential for plume leakage. There should be a commitment to install Vibrating Wire Piezometers (VWP) in the Evergreen Formation, as well as a groundwater monitoring bore in the lower Hutton Sandstone, at the West Moonie-1 Injection Well site.		Amended EIS	See Chapter 9 Groundwater, section 9.10.
83	3c	9	Groundwater	Measurement, monitoring and verification (MMV) methods 9.2.4.3, 9.7.2	The West Moonie Shallow Monitoring Bore (45 m depth) is way too shallow to ever detect any water quality (and most likely any pressure) change caused by the Project. It is also questionable whether six monthly groundwater level/ pressure monitoring of the Gubberamunda Monitoring Bore will be able to detect any impacts of the Project, as this is monitoring is too infrequent and too shallow with multiple intervening aquitards and aquifers.		Amended EIS	See Chapter 9 Groundwater, section 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
83	4a	9	Groundwater	Water quality monitoring of Precipice Sandstone 9.7.2	Six monthly monitoring of West Moonie-2 Monitoring Well is too infrequent for delineation of plume arrival time. The proposed Investigation Trigger Value of TDS = 5,000 mg/L is too high compared with ambient TDS (1,850 mg/L) and the WQO value (4,000 mg/L), so should be revised downwards to circa 2,500 mg/L.		Amended EIS	See Chapter 9 Groundwater, section 9.10.
83	4b	9	Groundwater	Water quality monitoring of Precipice Sandstone 9.2.4.2, 9.2.4.4, 9.2.5	"Operational water quality monitoring has shown that no statistically significant deviations in trace or heavy metals have occurred outside of the plume area in the five CCS case study projects, which is consistent for the predictions for the Project." This is a very misleading statement; why would anyone expect there to be deviations outside the plume extent, when it's the plume of CO ₂ that drives pH downwards causing mobilisation of trace and heavy metals and weathering of aquifer minerals?		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.9.7; Appendices 9C and 9D.
83	5	9	Groundwater	Geochemical modelling 5.3, 9.5.1.2, App9A-2.3.3.5	A key assumption in the reaction path modelling is that CO ₂ fully dissolves once injected into the target reservoir (lower Precipice) and instantaneously forms carbonic acid. However, the dynamic reservoir modelling results (section 5.2.2) suggest it may take significant time for the CO ₂ to dissolve in groundwater. Accordingly, the geochemical modelling is too simple and instead needs to consider progressive mixing and dissolution processes over time as the plume expands.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, 9.9.4, and 9.9.7; Appendices 9C and 9D.
83	6	9	Groundwater	Isotope data App9A-4.2.3.2	This section of the EIS is extremely poor. I have not reviewed the original work by Rodger et al. (2020) but the interpretation as presented is too simplistic and the inferences are unjustified; this is particularly the case for δ ¹⁸ O, ¹⁴ C and ³⁶ Cl/Cl.		Amended EIS	See Chapter 8 Geology, sections 8.3.2, 8.5.2; Chapter 9 Groundwater, sections 9.4.3, 9.5, 9.5.1, 9.6.3, 9.6.4, 9.7.6, 9.7.7, 9.8.2, and 9.10.1.8; and Appendix 9A.
83	7a	9	Groundwater	Evergreen Formation hydraulic conductivity 9.2.7.3.1, App9A-5.1.1.1, 5.1.1.2	The value of hydraulic conductivity (K) used for the regional hydrodynamic model was "at the lower end of the calibrated OGIA model" however this selection is not justified. It is claimed that "this is expected as the hydrodynamic model reflects the deeper Evergreen Formation aquitard in the southern Surat Basin, while OGIA's model considers the whole Evergreen Formation from shallow outcrop to deep in the basin", but this is only a hypothesis and needs to be supported with local data. Note the base case model used a Kv value of 5 x 10 ⁻⁸ m/day (Table 9-12) that is 200,000 times (five orders of magnitude) lower than the value measured on Evergreen Formation core from the West Moonie-1 Injection Well. A more appropriate value for Kv would change many of the predictions for head and plume migration.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, 9.7.3, 9.9.1, and 9.9.2; and Appendices 9A and 9B.
83	7b	9	Groundwater	Evergreen Formation hydraulic conductivity 9.2.7.3.1, App9A-5.1.1.1, 5.1.1.2	The reservoir model section (5.2.1) has lots of discussion regarding permeability-porosity relationships, relative permeability curves and kv/kh ratios based on West Wandoan-1 Well, however there is no presentation of the raw data or even summary statistics (mean and stdev) for kh and kv of the lower Precipice Sandstone. These should be tabulated and discussed with reference to representativeness and confidence limits.		Amended EIS	See Chapter 9 Groundwater, section 9.7.3; and Appendix 9A.
83	7c	9	Groundwater	Evergreen Formation hydraulic conductivity 9.2.7.3.1, App9A-5.1.1.1, 5.1.1.2	Regardless, a more robust range of hydraulic and particle tracking predictions using a calibration-constrained uncertainty analysis is warranted from the hydrodynamic model, especially given the requirement for other proponents in the Surat Basin (e.g. CSG and coal mining) to undertake such assessments. The simple sensitivity analysis, as presented, is not adequate because it has only explored slight changes in K and storage coefficient for the Precipice Sandstone (no changes for Evergreen Formation) and failed to consider the effects of parameter correlations. Improved predictions could, for example, be easily achieved using the full ensemble of realisations from the calibrated OGIA model.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.1, 9.6.2, 9.7.3, 9.9.1, 9.9.2, and 9.9.5; and Appendices 9A and 9B.
83	7d	9	Groundwater	Evergreen Formation hydraulic conductivity 9.2.7.3.1, App9A-5.1.1.1, 5.1.1.2	However, it should be stressed that the range of K values derived for the Evergreen Formation in the calibrated OGIA model was not constrained by targets (heads or fluxes) anywhere near the proposed West Moonie-1 Injection Well. Accordingly, a wider range of plausible K values for this aquitard should be tested.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, 9.7.3, 9.9.1, and 9.9.2; and Appendices 9A and 9B.
83	7e	9	Groundwater	Evergreen Formation hydraulic conductivity 9.2.7.3.1, App9A-5.1.1.1, 5.1.1.2	There is neither local data nor regional data to support an anisotropy (Kv/Kh) value as low as what has been implemented in the hydrodynamic model (0.0008, Table 44). The sensitivity analysis for the reservoir model clearly demonstrates the effect of changing kv/kh in the lower Precipice Sandstone on upward plume migration. Therefore, similar anisotropy values need to be explored for the Evergreen Formation in the hydrodynamic model.		Amended EIS	See Chapter 8 Geology, sections 8.6.2, and 8.7.6; Chapter 9 Groundwater, sections 9.6.1, 9.6.2, 9.7.1, 9.7.2, 9.7.3, 9.9.1, 9.9.2, and 9.9.5; and Appendix 9A.
83	8	9	Groundwater	Plume migration distances 9.5	Notwithstanding the previous comment that a more robust range of hydraulic and particle tracking predictions using a calibration-constrained uncertainty analysis is warranted from the hydrodynamic model, the significant difference between net particle displacement of 20 m over 1,000 years from the hydrodynamic model and predicted plume migration of maximum 500-600 m (or sometimes 525 m) from the dynamic reservoir model needs to be reconciled and discussed.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, and 9.9.2; and Appendices 9A and 9B.
83	9	9	Groundwater	Role of faults on aquitard integrity 9.2.7.3.2, App9A-5.1.1.2, 5.2	The sensitivity analysis on the hydrodynamic model included a scenario in which a fully-penetrating hypothetical fault of high K was implemented 7 km east of the West Moonie-1 Injection Well. However, the rationale for this location is not clear when it is known from the reservoir modelling that the plume is unlikely to extend beyond 500-600 m of the injection site. Also, it is stated there are no known faults within 2 km but how would such features be known in the absence of a local seismic survey? A more responsible sensitivity analysis scenario would be to test the impacts of having a fault very close to (e.g., within 50 m of) the injection well.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.3, and 2.11.6; Chapter 8 Geology, sections 8.7, and 8.12; Chapter 9 Groundwater, sections 9.6.2, and 9.9.2; and Appendices 9A and 9B.
84	1	General	General		Request for advice on proposed CTSCo Surat Basin Carbon Capture and Storage Project Environmental Impact Statement Thank you for your request for advice dated 9 February 2023 in relation to the Proposed CTSCo Surat Basin Carbon Capture and Storage (CCS) Project (the Project) Environmental Impact Statement (EIS).		Noted	N/A
84	2	General	General		You requested the Office of Groundwater Impact Assessment's (OGIA) advice in terms of eight specific questions relating to groundwater impact assessment in the Environmental Impact Statement (EIS). For ease, the advice and response to those questions (the advice) is grouped in three categories: assessment and modelling; monitoring and risk assessment; and remediation plan.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
84	3	General	General		This advice is provided in the context of assessing risk associated with injecting liquid CO ₂ at about 2,300 m deep into the Precipice Sandstone. Particular attention is given to the potential implications for the long-term viability of the aquifers in the area for water supply. The Precipice Sandstone and the overlying Hutton Sandstone are two of the most important regional aquifers of the Great Artesian Basin (GAB) which support existing and future water supplies. It is understood that many elements of the proponent's assessment are still progressing as a continuum in the post-EIS period. Some of these elements were made available to OGIA as work in progress.		Noted	N/A
84	4	General	General		Details of the advice are provided in Attachment 1 . In general, the proponent's assessment is comprehensive and broadly commensurate with the potential risks. However, some additional bolt-on assessment is necessary to firm up on the core conclusion that the extent of the plume is likely to be limited to within a few hundred metres of the injection. This will result in a more complete assessment beyond a reasonable doubt and assist in the management of associated risks. Broadly, the proposed monitoring and remedial approach is also appropriate but some strengthening of the approach is necessary to provide more certainty.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, 2.10, 2.11, and 2.12; and Chapter 9 Groundwater, sections 9.6.2, and 9.9.2; and Appendix 9B.
84	5a	General	General		Key additional assessments suggested by OGIA in the attached advice include: - an uncertainty analysis to improve confidence in the extent and migration of the plume		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, and 9.9.2; and Appendix 9B.
84	5b	General	General		- scenario testing to assess potential remobilisation of the plume in response to changes in groundwater pressure around the injection site from the exercise of existing entitlements, release of unallocated water and future closure of the Moonie oil field		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, and 9.9.2; and Appendix 9B.
84	5c	General	General		- additional monitoring in the Hutton Sandstone and the Precipice Sandstone		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2.2, and 2.11; and Chapter 9 Groundwater section 9.10.
84	5d	General	General		- further details on the effectiveness of the seismic monitoring		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.3.2, 2.6, 2.7, 2.8.1, 2.11, 2.11.6; Chapter 8 Geology, sections 8.4.2, 8.5.1, 8.6, 8.8, 8.10, and 8.12; and Chapter 9 Groundwater, sections 9.4.2, 9.4.3, 9.6.2.2, 9.7.2, 9.8, 9.10, and 9.12.
84	5e	General	General		- a firmer commitment to remediation actions beyond monitoring, such as the pump out of injected CO ₂ and the consequences of any accidental leakage into a water supply bore.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; and Chapter 9 Groundwater, section 9.10.
84	6	General	General		I trust this meets your requirement. Please do not hesitate to contact me if you require further clarification on any aspect of the advice.		Noted	N/A
84	1	General	General		Basis for the advice Data and information Advice is formulated on the basis of: - information provided by the Department of Environment and Science (DES) dated 9 February 2023 - a meeting between the OGIA team and the proponent on 24 February 2023 to seek further clarification and information - following the above meeting, additional information requested by OGIA from the proponent on 28 February 2023, which was provided to OGIA on 3 March 2023 (Attachment 2).		Amended EIS	See Chapter 3 Community and Stakeholder Engagement, section 3.7; Appendix 3A; and Chapter 9 Groundwater, section 9.4.5.1.
84	2a	General	General		Contextual understanding Based on the information provided by the proponent and OGIA's understanding of the geology and hydrogeology of the area, key contextual understandings relevant to the advice are as below.		Noted	N/A
84	2b	General	General		- The Precipice Sandstone and the overlying Hutton Sandstone are two of the most important regional aquifers of the GAB supporting existing and future water supply.		Noted	N/A
84	2c	General	General		- The project proposes to inject about 0.5 ML/day of liquid CO ₂ into the Precipice Sandstone at about 2,300 m below ground (Attachment 3) for three years.		Noted	N/A
84	2d	General	General		- The Precipice Sandstone is deep in the proposed project area and becomes progressively shallower to the north and east. In these other areas, groundwater quality is fresh and supports water supplies and springs.		Noted	N/A
84	2e	General	General		- In the project area, the Precipice Sandstone is more brackish, with the salinity of the groundwater being about 1,800 mg/L total dissolved solids.		Noted	N/A
84	2f	General	General		- The project is for testing purposes only, with injection proposed to commence in 2025 and last for three years until 2028.		Noted	N/A
84	2g	General	General		- The proposed injection site is 35 km west of the existing Moonie oil field and in the same formation from which oil is extracted.		Noted	N/A
84	2h	General	General		- The proponent's assessment suggests that the CO ₂ plume will remain within between 500 and 600 m of the injection site at any time in the future.		Amended EIS	See Chapter 9 Groundwater, section 9.9.2.
84	2i	General	General		- The proponent states that the nearest water supply bore is 17 km away from the injection site. However, information from DRDMW suggests that there are existing entitlements in the area which could result in potential water supply bores being located closer than this in future.		Amended EIS	See Chapter 9 Groundwater, sections 9.3.2, 9.4.1, 9.6.2, 9.7, 9.7.4, 9.9.2, 9.9.3, 9.9.5, and 9.9.6 and Appendix 9B.
84	2j	General	General		- The proponent's assessment of plume migration primarily includes: - building static geological models both regional (Southern Surat Basin) and local (EPQ10 and West Moonie) based on geological, geophysical and petrophysical data - using the geological models to build regional and local groundwater flow models to assess pressure propagation in response to injection - building geochemical models, supported by laboratory generated data, with simplified assumptions to assess the extent of the CO ₂ plume and associated changes to groundwater chemistry.		Amended EIS	See Chapter 8 Geology, section 8.6; Appendix 8B; Chapter 9 Groundwater, section 9.6; Appendices 9A, 9B, 9C and 9D.
84	2k	General	General		- The proposed monitoring strategy includes: - a monitoring bore in the Precipice Sandstone within 200 m of the injection well - neutron pulsed monitoring in the overlying Hutton Sandstone - a once-off 3D seismic survey scheduled for 2023, followed by a 2D seismic monitoring program to commence three months prior to operations, then six-monthly to track the extent and migration of the plume in the Precipice Sandstone - two monitoring bores in the shallower aquifers.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, 2.10, and 2.11; Chapter 8 Geology, sections 8.5, 8.8, and 8.10; Chapter 9 Groundwater, sections 9.8, and 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
84	2l	General	General		- The remediation plan hinges primarily on monitoring and investigation, and suspension of injection in the event of departure from predicted behaviour.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; Chapter 9 Groundwater, section 9.10.
84	3a	General	General		Assessment and modelling Summary of proponent's assessment - Multiple geological models were constructed for the Southern Surat Basin, EPQ10 and West Moonie – these form the structural framework for hydrodynamic aquifer modelling, dynamic flow simulations, and geochemical reactive transport models. Details on the development and construction of the static geological models are reported in Chapter 8 of the EIS and in supplementary documents provided: <i>201126_Southern Surat Static Modelling Report Final and 210217 WM2 Plume Modelling Inputs</i> .		Amended EIS	Noted, and see Chapter 8 Geology, sections 8.4.2, and 8.6; Appendix 8B; Chapter 9 Groundwater, sections 9.4.2, and 9.6; Appendices 9A, 9B, 9C and 9D.
84	3b	General	General		The objective of the local West Moonie static and dynamic models was to identify the optimum location for the placement of the Precipice Sandstone monitoring well. Model design is detailed in the supplementary documents provided: <i>201126_Southern Surat Static Modelling Report Final and 210217 WM2 Plume Modelling Inputs</i> .		Amended EIS	Noted, and see Chapter 8 Geology, sections 8.4.2, and 8.6; Appendix 8B; Chapter 9 Groundwater, sections 9.4.2, and 9.6; Appendices 9A, 9B, 9C and 9D.
84	3c	General	General		- A regional groundwater flow model was prepared to assess impacts on groundwater pressure resulting from CO ₂ injection. Sensitivity analysis was also conducted for a number of cases, all of which show small head increases of less than 1 m.		Amended EIS	See Chapter 9 Groundwater, section 9.6.
84	3d	General	General		- A reservoir model was subsequently prepared to assess the likely distance of CO ₂ migration following injection. Properties were populated based on data from the West Moonie-1 injection well and some limited sensitivity analysis was undertaken to explore the impact of variogram range and relative permeability curves. Based on this, the maximum modelled plume travel distance was between 500 and 600 m.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2 and 9.9.2.
84	3e	General	General		- Geochemical models were prepared that simulate the extent of CO ₂ migration and likely changes to groundwater chemistry, particularly the potential for mobilisation of trace metals, such as lead and arsenic. Geochemical modelling reported in the ANLEC document (7-0320-C323) is substantially more sophisticated than the modelling presented in the EIS submission. On the understanding that this model supersedes previous modelling presented in the EIS, comments related to geochemical modelling refer only to the models in 7-0320-C323.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, and 9.9.4; and Appendices 9C and 9D.
84	3f	General	General		- 2D and 3D geochemical reactive transport models have been prepared with parameters based on laboratory measurements of core from the West Moonie-1 well. A summary of OGIA's understanding of the workflow and input datasets used in geochemical modelling is provided in Attachment 4 . Both 2D and 3D reactive transport models indicated that, within the extent of CO ₂ migration, dissolution of CO ₂ will result in reduction of pH to between 4 and 6, and dissolution of carbonate minerals in the aquifer introducing trace elements to solution. Trace element concentrations are variable through time but, within the extent of CO ₂ migration, may remain at levels which constrain potential water uses after 100 years.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.4, and 9.9.4; and Appendices 9C and 9D.
84	4a	General	General		Comments and advice on the assessment - Conclusions based on the regional flow model – that head increases from the proposed activity are likely to be small – are considered reasonable and are supported by the modelling work. However, the particle tracking results are at odds with both the reservoir modelling and reactive transport modelling, which are considered more suitable to explore plume travel distance.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.6, and 9.9; and Appendices 9A, 9B, 9C and 9D.
84	4b	General	General		- The regional deterministic static model and the West Moonie plume movement model have very limited assessments of the influence of variograms on the CO ₂ plume dimensions. The tested variogram ranges are likely to lead to an underestimation of the lateral plume migration distance.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2 and 9.9.2; and Appendix 9B.
84	4c	General	General		- The above limitation has, however, been largely addressed in the reactive transport modelling, which assumes laterally continuous permeability.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.6, and 9.9; and Appendices 9A, 9B, 9C and 9D.
84	4d	General	General		- The 3D geochemical model was terminated after 10 years of simulation, limiting the conclusions that can be drawn from the model results. Additionally, the injected CO ₂ reached the edge of the model domain after 5 years, meaning the maximum distance of CO ₂ plume migration could be greater than 800 m.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2 and 9.9.2; and Appendix 9B.
84	4e	General	General		- The radial 2D geochemical model ran for 100 years of simulation time, indicating CO ₂ would migrate 500–600 m from the injection site. However, this model did not account for the regional dip of the Precipice Sandstone, which could lead to underestimation of the modelled travel distance. This is considered a material assumption and its implications are unclear.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.6, and 9.9; and Appendices 9A, 9B, 9C and 9D.
84	4f	General	General		- No parametric sensitivity analysis was undertaken and so it has not been demonstrated whether the parameter values used are conservative, nor has any uncertainty analysis been undertaken to explore the range of possible/likely outcomes.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.6, and 9.9; and Appendices 9A, 9B, 9C and 9D.
84	4g	General	General		- Geochemical models simulate changes in porosity of the Precipice Sandstone due to mineral dissolution and precipitation, but any potential affects this may have on rock properties/geomechanics are not discussed.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.6, and 9.9; and Appendices 9A, 9B, 9C and 9D.
84	4h	General	General		- Work to constrain parameterisation and design of the reactive transport model is considered more rigorous than commonly applied methods and exceeds the standard of many EIS submissions.		Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.6, and 9.9; and Appendices 9A, 9B, 9C and 9D.
84	5a	General	General		Suggestions for additional work - The current assessment does not sufficiently explore the implications of parametric and conceptual uncertainty on plume migration and extent. Therefore, the latest model should be subjected to a rigorous analysis of sensitivity – and, ideally, uncertainty – to support conclusions about the maximum potential extent of the plume.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2 and 9.9.2; and Appendix 9B.
84	5b	General	General		- Additional scenario testing should also be undertaken to assess potential remobilisation of the plume, or groundwater affected by the plume, in response to changes in pressure (hydrostatic head) around the injection site resulting from the exercise of existing entitlements, release of unallocated water and future closure of the Moonie oil field.		Amended EIS	See Chapter 9 Groundwater, sections 9.6 2 and 9.9.2; and Appendix 9B.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
84	6a	General	General		Monitoring Summary of the proponent's proposal - Six-monthly groundwater pressure and chemistry monitoring of the shallow Griman Creek Formation and the Gubberamunda Sandstone.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	6b	General	General		- Continuous groundwater pressure and six-monthly groundwater chemistry monitoring in the deeper Precipice Sandstone (West Moonie-2).		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	6c	General	General		- Six-monthly pulsed neutron logging of the injection well (West Moonie-1) and the deeper monitoring well (West Moonie-2) to monitor plume migration in the vicinity of the injection well.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	6d	General	General		- A 2D seismic survey (32 km) three months prior to operation, and every six months thereafter to evaluate plume migration and extent within the Precipice Sandstone. Supplementary material on case studies in the application of these methods was provided by the proponent: 210600_Aquistore, 110000_Weyburn, 130000_Ketzin and 170919_Glenhaven Seismic M&V Modelling Results		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	6e	General	General		- A once-off 3D seismic survey (40 km ²) to provide structural information and to refine geological understanding in the vicinity of the injection site.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	7a	General	General		Comments and advice on the assessment - The monitoring program is primarily designed to assess the migration of the plume within the Precipice Sandstone and vertically around the injection well. An additional monitoring point in the Precipice Sandstone beyond the maximum predicted extent of the plume will provide additional data for calibration and will act as a safeguard to assess potential migration		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	7b	General	General		- The overlying Hutton Sandstone is a regionally important aquifer, separated from the Precipice Sandstone by the Evergreen Formation. Continuous monitoring of groundwater pressure, and six-monthly groundwater chemistry in the Hutton Sandstone at West Moonie-2, should provide an additional safeguard to assess the potential migration of the plume into this aquifer		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2 2, 2.11.5 2, and 2.11.7; and Chapter 9 Groundwater, section 9.10.
84	7c	General	General		- Site-specific feasibility studies are not available for the seismic monitoring program. 3D and 2D time-lapse seismic surveys are commonly applied internationally to evaluate plume migration within the reservoir but supporting information is limited due to commercial-in-confidence arrangements.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1.3.
84	8a	General	General		Suggestions for additional work - Following the initial 2D surveys, it is recommended that the effectiveness of this monitoring tool for this specific hydrogeological setting and purpose be evaluated.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	8b	General	General		- Additional monitoring in the Hutton Sandstone should be considered.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2 2, 2.11.5 2, and 2.11.7; and Chapter 9 Groundwater, section 9.10.
84	8c	General	General		- Additional monitoring in the Precipice Sandstone around the injection site should also be considered.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	9a	General	General		Mitigation of risks and remedial actions Inferred summary of the proponent's proposal - The approach to mitigation and remedial actions is included in the proponent's Monitoring and Verification Plan (MVP)		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	9b	General	General		- The purpose of the MVP is to manage departures from the predicted behaviour of the plume, i.e. in the event that the plume spreads further than predicted in the Precipice Sandstone and/or leaks into the overlying Hutton Sandstone.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	9c	General	General		- The plan hinges primarily on monitoring and investigation, and suspension of injection in the event of departure from predicted behaviour.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	9d	General	General		- A Trigger Action Response Plan (TARP) is proposed that may include a pump-and treat program to remove the plume.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	10a	General	General		Comments and advice on the assessment - The management plan is primarily focused on monitoring and investigation when the plume extends beyond what is predicted, instead of firm actions for removal of the plume in such an event.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	10b	General	General		- The proposed pump-and-treat approach is based on (1) plume spreading beyond 2 km from the injection well rather than the currently predicted 500 m extent of the plume; and (2) the TARP being developed in consultation with the administrative authorities.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	11a	General	General		Suggestions for additional work - Although a remedial action does not need to be linked to the extent of the predicted plume, a clear upfront plan and basis is still required to ensure that the actions are effective and timely.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
84	11b	General	General		- Effectiveness of the remedial plan needs to be demonstrated through supporting modelling or conceptual assessment.		Amended EIS	See Chapter 2 Proposed Project Descriptions, sections 2.8, and 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
84	11c	General	General		- To develop an appropriately comprehensive risk profile, two further assessments are necessary: - Characterisation of consequences in the event of an accidental leak of CO ₂ into another aquifer or a groundwater asset, such as a water supply bore, even though the likelihood of such an event may be low. - Additional scenario testing to assess potential remobilisation of the plume in response to changes in pressure (hydrostatic head) around the injection site resulting from the exercise of existing entitlements, release of unallocated water and future shut-down of the Moonie oil field.		Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.4.2, 9 5, 9.6, 9.7, 9.8, 9 9, 9.10, 9.11, and 9.12; and Appendices 9A, and 9B.
84	1a	General	General		1. Provide some justification and supporting information on the West Moonie local static model parameterisation, particularly on horizontal continuity variogram ranges and for the adopted anisotropy. Construction of the regional static structural and property model is described in "201126_Southern Surat Static Modelling Report Final". The "210217 WM2 Plume Modelling Inputs" report provides information on the local West Moonie static model design (see page 5 of that report). The objective of the local West Moonie model was to identify the optimum location for the placement of a deep Precipice Monitoring well (West Moonie-2 Monitoring Well) (WM-2)) at a distance from the West Moonie-1 (WM-1) Injection Well at which we would be confident that CO ₂ saturation would be observed after 1 year of injection. This was achieved by modelling the injected plume characteristics during and post injection. Parameter values were varied to determine which had most impact on the plume movement and this analysis was also informed by earlier modelling work conducted		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	1b	General	General		The structure for the local West Moonie reservoir model was a subset of the regional structural model that had been built from seismic and well information (refer to "201001_Regional Depth Structure Mapping" report) and was flexed to the well picks in the West Moonie-1 well. Structural dip adhered to the regional model. The intent of the selected horizontal variogram ranges was to model low and high case reservoir quality heterogeneity scenarios. The shorter the variogram range the smaller the continuity of the modelled porosity and permeability property (ie greater heterogeneity). The objective was not to model facies geometries as these would often have variogram lengths longer than the local model dimensions. Vertical variogram sensitivity on heterogeneity was tested by increasing the resolution of the laverina from 1 m to 0.1524 m.		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	2	General	General		2. Details of any sensitivity analysis, if undertaken, for the dynamic model based on varying key geological parameters for the underlying static geological model (e.g. vshale (VSL) and permeability) The sensitivities tested in the West Moonie injection model are described in the "210217 WM2 Inputs" report. Porosity and permeability variability is controlled by the high-resolution porosity and permeability datasets acquired at the WM-1 location and by the various variogram models used to distribute these values throughout the 3D grid model away from the well location. Vertical permeability/horizontal permeability ratio was the primary parameter controlling plume migration (see page 17 of the "210217 WM2 Inputs" report). This parameter was later measured in WM-2 by the dual packer MDT and was found to be 0.01, which is the mid-case		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	3	General	General		3. Supporting information and/or reference to examples and applicability the adequacy of the 2D seismic for plume monitoring – including sensitivity of the method in terms of the plume boundaries and concentration. Examples of the effectiveness of seismic as an effective monitoring tool is provided the "210600_Aquistore Site Case study" "110000_Weyburn Site case study" and the "130000_Ketzin Site case study" (see attached). CTSCo has access to many more examples and studies, however as these studies are not in the public domain, they cannot be shared due to being commercial in confidence. CTSCo carried out fluid substitution studies using seismic and well data at the EPQ7 Glenhaven site (West Wandoan-1 log data) to investigate amplitude variation that would result from increasing CO ₂ saturation and to determine the minimum saturation value that could be detected from the seismic data (refer to the "170919_Glenhaven Seismic M&V Modelling Results" report). The analysis concluded that the amplitude change from 0% CO ₂ saturation (water saturated and no CO ₂) to 10% CO ₂ saturation is detectable on seismic. However, although the amplitude changes from 10% to 20% is relatively small prestack inversion volumes could be used to predict the CO ₂ plume migration. Similar work will be carried out using the West Moonie dataset.		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	4	General	General		4. Details of inferences and learnings drawn from the Glenhaven 3D seismic for the purpose of this project. The Glenhaven 3D seismic in EPQ7 provided high resolution structural control (refer to "170925_CTSCo FSP17 Report Chapter 5 Geophysics", section 5.3.1). Prestack inversion modelling allowed the prediction of the distribution of rock properties (refer to "170925_CTSCo FSP17 Report Chapter 5 Geophysics", report section 5.3.3) allowing flow units and baffles to be deterministically included in the Glenhaven reservoir models. CTSCo anticipates that the West Moonie 3D Seismic Survey will provide similar information that can be incorporated into the West Moonie injection models.		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	5	General	General		5. Details of the latest geochemical modelling for the EPQ10 project, including model design, calibration data, analogue studies, and model results and findings. The radial and 3D reactive transport models (RTM) were run over 100 years and 10 years, respectively, with 3-year injection scenarios of pure CO ₂ and CO ₂ -SO ₂ -NOx-O ₂ in TOUGHREACT software, as documented in "230217_7-0320-C323_ANLEC South Surat Final Report 3", section 5. A similar assessment was previously conducted for the EPQ7 Glenhaven site, that also informed the EPQ10 work. TOUGHREACT has been used for CO ₂ storage sites and research domestically and overseas. The 3D RTM used the geological structure from the dynamic plume model, with 20 hydrostatic units (HSU) identified from the WM-1 and WM-2 well logs and from the WM-1 core. The experimental and characterisation data was used to create and parameterise kinetic reaction path models using the Geochemist's Workbench software for each HSU including minerals specific to WM-1 that contained trace metals, and the effects of adsorption. Models were upscaled to develop the RTM HSU. Poro-perm data was provided by CTSCo and UQ characterisation data. Relative permeability and capillary data was from the digital core analysis results of West Wandoan-1 in EPQ7, and groundwater data from WM-1 water sampling and rock equilibration were used to populate the model. The "230217_7-0320-C323_ANLEC South Surat Final Report 3" report contains further details. Analogue studies tend to either have studied trace metal behaviour in sites with naturally occurring CO ₂ migration over geological time periods (USA), or in field studies of shallow alluvial sediment CO ₂ injection tests (Europe, USA). General geochemical changes have been studied in field trials for example 1600 t of CO ₂ were injected at 1500 m depth into a sandstone section of the Frio Formation, a regional brine and oil reservoir in the U.S. Gulf Coast, with a temporal drop in pH and increase in metals such as Fe (references can be supplied if needed).		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
84	6	General	General		<p>6. Details of sensitivity analysis in geochemical simulations, e.g. for variations in temperature, concentration of impurities in the GHG stream, porosity, mineralogy, surface area, etc</p> <p><i>A comprehensive geochemical input characterisation included mineral and element content and sequential extractions over a wide range of WM-1 core depth sections including the Precipice, upper Precipice and Moolayember Formation. Gas–water–rock experiments at reservoir pressure and temperature were performed with CO₂-SO₂-NOx-O₂ or with a pure CO₂ end member for 16 drill core sections from WM-1 well covering a range of mineralogy, poro-perm lithology and HSU. Variations in temperature have not been tested so far. Note that the EPQ7 site experiments and models were performed at lower temperatures of 60°C given the shallower depths at that site (for further details see “230217_7-0320-C323_ANLEC South Surat Final Report 3”). Both selected experiments and models for EPQ10 WM-1 used pure CO₂ end members and CO₂-SO₂-NOx-O₂ with 400 ppm O₂. The RTM for EPQ10 WM-1 used pure CO₂ or CO₂-SO₂-NOx-O₂ with 400 ppm O₂. Variations in the O₂ content of the gas stream with 100 ppm and 400 ppm were previously tested for the EPQ7 site in the RTM. The 20 model HSU’s and the 16 experiments for WM-1 covered a range of rock mineral contents, porosities and rock types. Sequential extraction and whole rock element characterisation data covered a larger suit of core samples from WM-1 (see “230217_7-0320-C323_ANLEC South Surat Final Report 3”). Reactive surface areas were first estimated from the core and then validated by using the reaction path models of the experimental data to fit the mineral surface areas (e.g. see “141104_Pearce 2015 SO₂ impurity impacts CO₂_CG” and “190813_Pearce 2019 geochem modelling O₂ SO₂ CO₂ reservoir caprock overlying core”). These were subsequently upscaled for the EPQ10 WM-1 reservoir and are consistent with other studies (Kharaka 2016, Viswanathan, Xu 2007, Zheng etc and detailed in “230217_7-0320-C323_ANLEC South Surat Final Report 3” section 5.2.3). Adsorption site densities were estimated from the experiments and sequential extraction data. Models were run for EPQ7 varying adsorption sites 10x higher, 0.5 and 10x lower to understand sensitivity of</i></p>		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	7	General	General		<p>7. Justification for lack of monitoring in the Hutton Sandstone.</p> <p><i>CTSCo does propose regular monitoring of the Hutton Sandstone as part of the monitoring program described in the draft EIS, see Chapter 2, section 2.11. CTSCo propose regular pulsed-neutron wireline logging to both confirm the vertical location of the plume within Precipice Sandstone, and to monitor for the presence of CO₂ in any overlying formations (including the Hutton Sandstone). This pulsed-neutron logging is proposed for both the injection and monitoring wells. CTSCo has proposed regular water sampling from the West Moonie-2 Monitoring Well to confirm water quality changes and to verify the geochemical model. The option to also perforate the West Moonie-2 Monitoring Well at the Hutton Sandstone and re-complete this well to allow selective water sampling from the Precipice and Hutton Sandstones remains an option if the pulsed-neutron logging indicates the presence of CO₂ above the Precipice Sandstone.</i></p>		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	8	General	General		<p>8. Numerical or conceptual uncertainty in the predictions of plume extent and migration – including inference drawn from the sensitivity analysis in this context.</p> <p><i>The purpose of the plume modelling was to investigate plume movement and geochemical changes to water quality that could be expected to occur under various injection scenarios. Sensitivities on key parameter values were run in both the reservoir and geochemical plume models (refer to “210217_WM2 Plume Modelling Inputs” report and “230217_7-0320-C323_ANLEC South Surat Final Report 3” report). The sensitivity analyses showed that in all cases the plume remained well within the areal boundary of the Operational Lands and that there were no changes to water quality outside of the plume extent. The accuracy of the models will be tested by the conformance monitoring program planned for the injection and shut-in phases of the injection testing.</i></p>		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	9	General	General		<p>9. A firm plan for remediation actions (beyond monitoring) in case if injected CO₂ does migrate to beyond that is predicted and/or leaks into an existing groundwater asset (e.g. a water bore)</p> <p><i>CTSCo has provided brief commentary within the EIS of the remedial option to remove some of the injected GHG stream by pumping water from the existing wells (from the formation where CO₂ removal is desired), separating and liberating the CO₂ at surface, treating the produced water, and reinjecting the produced water. Attached is “230302_Draft Concept Study - Groundwater Amendment Treatment Plant” which provides a summary for a potential groundwater amendment system in the very unlikely case that CO₂ is required to be extracted.</i></p>		Noted	Incorporated into Chapter 2 Proposed Project Description, Chapter 9 Geology and/or Chapter 9 Groundwater.
84	10	General	General		<p>10. Provide ANLEC R&D Research projects and others keys references in the EIS in the context of above queries.</p> <ul style="list-style-type: none"> - 110000_Weyburn Site case study - 130000_Ketzin Site case study - 141104_Pearce 2015 SO₂ impurity impacts CO₂_CG - 170919_Glenhaven Seismic M&V Modelling Results - 170925_CTSCo FSP17 Report Chapter 5 Geophysics - 190813_Pearce 2019 geochem modelling O₂ SO₂ CO₂ reservoir caprock overlying core - 200601_Geophysical Database Final Report - 200601_Petrophysical Database Final Report - 200801_Geological Database Final Report - 201001_Regional Depth Structure Mapping - 201019_Petrophysical Evaluation Final - 201126_Southern Surat Static Modelling Report Final - 210217_WM2 Plume Modelling Inputs - 210600_Aquistore Site case study - 210726_ANLEC EPQ7Moolayember_Formation_final report_milestone 7_2021 - 230217_7-0320-C323_ANLEC South Surat Final Report 3 - 230302_Draft Concept Study - Groundwater Amendment Treatment Plant 		Noted	Incorporated into Chapter 9 Geology and/or Chapter 9 Groundwater.
84	1	General	General		ATTACHMENT		Noted	Incorporated into Chapter 2 Proposed Project Description, Chapter 9 Geology and/or Chapter 9 Groundwater.
84	1	General	General		FLOWCHART		Noted	See Appendix 8B.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	1a	General	General		Summary The State of Queensland acting through the Department of Environment and Science (DES) requested CSIRO provide technical advice on the Environment Impact Statement (EIS) and Groundwater Modelling and Management report for the Carbon Transport and Storage Corporation (CTSCo) Pty Limited – Surat Basin Carbon Capture and Storage (CCS) trial project located approximately 44 km southwest of Moonie in southern Queensland.		Noted	N/A
85	1b	General	General		The technical advice, in the form of a written report to DES, addresses questions posed by DES to amend the environmental conditions of Environmental Authority (EA) EPPG00646913 for greenhouse gas (GHG) exploration permit EPQ10 to authorise the carrying out of CO ₂ (i.e. GHG stream) injection testing in EPQ10. The review comments and recommendations are categorised by a level of concern varying in significance from major (level 1) to moderate (level 2) and minor (level 3).		Noted	N/A
85	1c	General	General		The review identified major concerns in relation to the assessment of exposure pathways for potential impacts due to 'water extraction in the Hutton or Precipice Sandstones close to West Moonie-1 Injection Well'. It is recommended that the assumptions and range of parameter combinations used for particle tracking modelling be revised to rule out potential impacts beyond the modelled plume that includes all potential water resource development scenarios. Additional recommendations include:		Amended EIS	See Chapter 8 Geology, sections 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, and 8.12; and Chapter 9 Groundwater, sections 9.6.2, 9.6.4, 9.6.5, 9.7.1.4, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.8, 9.9, and 9.10.
85	1da	General	General		1 Groundwater and geological assessments - Address uncertainties due to limited baseline data using alternative conceptual (and numerical) models to explain groundwater salinities, connectivity pathways, and flow velocity estimates.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.3, 2.11.6, and 2.11.7; Chapter 8 Geology, sections 8.5, 8.6, 8.7.1, 8.7.2, 8.7.3, 8.7.5.11, 8.7.6, 8.9.2, and 8.9.3; and Chapter 9 Groundwater, sections 9.4.1, 9.4.2, 9.5, 9.9.2, 9.9.4, 9.5, 9.5.1, 9.6, 9.7, 9.7.1.4, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.7.7, 9.9.1, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, 9.9.8, and 9.9.9.
85	1db	General	General		- Additional details to support the adopted 3D geological (static) model, reservoir models, and numerical groundwater models better to characterise geological structures.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.3, 2.11.6, and 2.11.7; Chapter 8 Geology, sections 8.5, 8.6, 8.7.1, 8.7.2, 8.7.3, 8.7.5.11, 8.7.6, 8.9.2, and 8.9.3; and Chapter 9 Groundwater, sections 9.4.1, 9.4.2, 9.5, 9.9.2, 9.9.4, 9.5, 9.5.1, 9.6, 9.7, 9.7.1.4, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.7.7, 9.9.1, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, 9.9.8, and 9.9.9.
85	1ea	General	General		2 Numerical groundwater modelling - Broaden the parameter uncertainty analysis to better define likely bounds of the dissolved CO ₂ plume extent in the case of a new groundwater extraction well in the Precipice Sandstone aquifer.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, 9.7.3.2, 9.7.4.1.2, 9.7.4.2, 9.8, 9.9.2, 9.9.3, 9.9.4, 9.9.6.2, 9.9.7, 9.9.8, 9.9.9.2, 9.9.9.3, 9.10, and 9.10.1.
85	1eb	General	General		- Re-evaluate the influence of thermal changes to clearly recognize potential impacts near the GHG injection well on geomechanical stresses.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.10.2.4, 2.10.2.5, 2.10.3, 2.10.4.1, and 2.11; Chapter 8 Geology, sections 8.6.2.4, 8.7.6, 8.8.1, and 8.9.2; and Chapter 9 Groundwater, sections 9.8.1, 9.9.4.1, 9.9.7, and 9.9.9.
85	1f	General	General		3 Exposure pathway assessment - Additional interpretation of the new 3D seismic survey and collection of passive seismic monitoring is recommended to update knowledge of local faults in the geological structural model.		Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.3 and 2.11.
85	1g	General	General		4 Human use assets - Systematically assessment of the 6 EVs related to human use using conservative modelling approaches considering all possible water resource development scenarios is recommended.		Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.3, 9.3.2.4, 9.3.2.5, 9.3.2.6, 9.3.3, 9.4.1, 9.4.2, 9.5, 9.6.2, 9.6.4, 9.6.4, 9.6.5, 9.7.1, 9.7.4, 9.7.5, 9.7.6, 9.7.7, 9.9.1, 9.9.2, 9.9.3, 9.9.4, 9.9.6, 9.9.7, and 9.9.9.
85	1ha	General	General		5 Monitoring, mitigation, and remedial measures - Evaluate and present in a structured way the logic used to select monitoring technologies, detailing the logic and sensitivity behind selected monitoring technologies.		Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 9 Geology, sections 8.4.2, 8.5, and 8.10; and Chapter 9 Groundwater, sections 9.4.3, 9.8.1, 9.8.2, and 9.10.
85	1hb	General	General		- Examine probability distributions for hazards, encompassing best and worst-case scenarios, and transparently document the logic used to set hydrochemical and water quality trigger values.		Amended EIS	See Chapter 9 Groundwater, sections 9.6.2, 9.6.3, 9.6.4, 9.6.5, 9.7.4, 9.7.5, 9.8, 9.9.2, 9.9.3, 9.9.4, 9.9.6, 9.9.7, 9.9.9, 9.10, 9.10.1.4, and 9.10.1.5; and Appendices 9B, 9C, 9D, 9E and 9F.
85	2a	General	General		Introduction 1.1 Scope The State of Queensland acting through the Department of Environment and Science (DES) requested CSIRO provide technical advice on the Environment Impact Statement (EIS) and Groundwater Modelling and Management report for the Carbon Transport and Storage Corporation (CTSCo) Pty Limited – Surat Basin Carbon Capture and Storage (CCS) trial project located approximately 44 km southwest of Moonie in southern Queensland.		Noted	N/A
85	2b	General	General		The EIS was prepared to meet the requirements of the approval conditions for Environmental Authority (EA) EPPG00646913 for greenhouse gas (GHG) exploration permit EPQ10 covering approximately 3,664 km ² . Approval was initially granted on 9 December 2019, to explore the potential for GHG storage. The EIS is required to amend the environmental conditions of the EA to authorise the carrying out of CO ₂ (i.e. GHG stream) injection testing in EPQ10.		Noted	N/A
85	2c	General	General		The detailed scope of works provided by DES asked CSIRO to review information provided and provide a concise written technical report that included expert scientific advice on the presented EIS information and an independent assessment of the potential environmental risks associated with the proposed project, including an evaluation of proposed management strategies, geophysical methods and the conclusions reached in the EIS. The scope of the CSIRO review was to:		Noted	N/A
85	2d	General	General		'Undertake a detailed technical (scientific) adequacy review and risk assessment of the submitted EIS and recommend any further necessary works to describe any potential impacts to Environmental Values (EVs) and any necessary mitigation measures and monitoring required to adequately protect those EVs'.		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference																																																												
85	3a	General	General		1.2 Structure The technical review is organised in 5 sections based on the questions as set out by DES in their detailed scope of work and summarised below:		Noted	N/A																																																												
85	3ba	General	General		1. Groundwater and geological assessments Q1. Does the EIS suitably present representative, reliable, appropriate, and verifiable conclusions and commitments for the identification and assessment of potential impacts and risks, including their predicted duration, spatial extent, containment, and magnitude of impacts (plume, dissolved phase, plume movements, inter-aquifer containment and water quality changes) for the proposed pilot project?		Amended EIS	See response to question below																																																												
85	3bb	General	General		Q2. Does the EIS suitably present representative, reliable, appropriate, and verifiable conclusions and commitments for the presented hydrogeological characterisation, geophysical techniques, methods, and		Amended EIS	See response to question below																																																												
85	3ca	General	General		2.2 Numerical groundwater modelling Q3. Does the EIS suitably present representative, reliable, appropriate, and verifiable conclusions and commitments for the assumptions, limitations, uncertainty analysis and calibration of models used to predict potential environmental impacts		Amended EIS	See response to question below																																																												
85	3cb	General	General		Q4. Do the EIS numerical groundwater models (including the plume migration and geochemical models), assumptions, variables, input data, uncertainty analysis and interpretation of outputs and conclusions on potential impacts from the proposed project?		Amended EIS	See response to question below																																																												
85	3d	General	General		2.3 Exposure pathway assessment Q5: Is the exposure pathway assessment to existing local abandoned wells intersecting the Precipice Sandstone aquifer and the potential for geological structures (e.g., fracturing or faults zones) to open new pathways to potential receptors to overlying aquifers, and users of groundwater within the region, from the injection of the supercritical greenhouse gas stream adequate?		Amended EIS	See response to question below																																																												
85	3e	General	General		2.4 Human use assets Q6: Is the assessment of existing, authorised, and future human use assets and whether sufficient information is provided to support conclusions regarding these assets and the spatial extent, magnitude and duration of likely impacts stated in the EIS adequate?		Amended EIS	See response to question below																																																												
85	3f	General	General		2.5 Monitoring, mitigation, and remedial measures Q7: Are the proposed mitigation measures, management strategies, monitoring and verification techniques to be implemented by the proponent adequate?		Amended EIS	See response to question below																																																												
85	4a	General	General		1.3 Information and documents received The CSIRO technical team met with representatives of: - DES on 26 May, 19 July, 22 August, and 20 September 2023 - CTSCo on 6 October 2023.		Amended EIS	See Chapter 9 Groundwater, section 9.4.5.3.																																																												
85	4b	General	General		The information received from DES and CTSCo is summarised in Table 1. Throughout this document, reports are referred to by the number in Table 1 using square brackets: [1]. Page numbers are the page number in the document (not the page number printed on the page). This enables consistent referring to page numbers, even when a document has several appendices, each with their own page numbering. For example, Table 1-1 Summary of proponent details in Chapter 1 of the EIS would be cited as 'Table 1-1 (p 3 in [1]).'		Noted	Noted																																																												
85	4c	General	General		Table 1 Information received		Noted	N/A																																																												
85		General	General		<table border="1"> <thead> <tr> <th>Nr</th> <th>Title – Date</th> <th>'Label' – Filename</th> <th>Author</th> <th>Source</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Introduction including appendices (Terms of Reference checklist) – Chapter 1</td> <td>01+Introduction+(final+221124).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>2</td> <td>Proposed Project Description – Chapter 2</td> <td>02+Project+Description+(final+221108).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>3</td> <td>Approvals – Chapter 4</td> <td>04+Approvals+(final+221108).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>4</td> <td>Geology – Chapter 8</td> <td>08+Geology+(final+221122).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>5</td> <td>Groundwater – Chapter 9</td> <td>09+Groundwater+(final+221108).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>6</td> <td>Geology – Appendix 08A Well Completion Reports</td> <td>Appendix+08A+Geology,+Well+Completion+Reports+(final+221108).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>7</td> <td>Groundwater – Appendix 09A Groundwater Impact Assessment Technical Report</td> <td>Appendix+09A+Groundwater+Impact+Assessment+Technical+Report+(final+221108).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> <tr> <td>8</td> <td>DES1231304 - Submission attachments complied</td> <td>DES1231304 - Submission attachments complied.pdf</td> <td>DES</td> <td>DES</td> </tr> <tr> <td>9</td> <td>Great Artesian Basin Strategic Management Plan</td> <td>GAB strategic-management-plan.pdf</td> <td>DCCEEW</td> <td>DES</td> </tr> <tr> <td>10</td> <td>Queensland Murray-Darling and Bulloo River Basins Groundwater Environmental Values and Water Quality Objectives</td> <td>Qld-Murray-Darling-basin-Bulloo-River-basin.pdf</td> <td>DES</td> <td>DES</td> </tr> <tr> <td>11</td> <td>Introduction and final ToR – Appendix 01A</td> <td>Appendix+01A+Introduction+Final+ToR+(final+221108).pdf</td> <td>CTSCo</td> <td>DES</td> </tr> </tbody> </table>	Nr	Title – Date	'Label' – Filename	Author	Source	1	Introduction including appendices (Terms of Reference checklist) – Chapter 1	01+Introduction+(final+221124).pdf	CTSCo	DES	2	Proposed Project Description – Chapter 2	02+Project+Description+(final+221108).pdf	CTSCo	DES	3	Approvals – Chapter 4	04+Approvals+(final+221108).pdf	CTSCo	DES	4	Geology – Chapter 8	08+Geology+(final+221122).pdf	CTSCo	DES	5	Groundwater – Chapter 9	09+Groundwater+(final+221108).pdf	CTSCo	DES	6	Geology – Appendix 08A Well Completion Reports	Appendix+08A+Geology,+Well+Completion+Reports+(final+221108).pdf	CTSCo	DES	7	Groundwater – Appendix 09A Groundwater Impact Assessment Technical Report	Appendix+09A+Groundwater+Impact+Assessment+Technical+Report+(final+221108).pdf	CTSCo	DES	8	DES1231304 - Submission attachments complied	DES1231304 - Submission attachments complied.pdf	DES	DES	9	Great Artesian Basin Strategic Management Plan	GAB strategic-management-plan.pdf	DCCEEW	DES	10	Queensland Murray-Darling and Bulloo River Basins Groundwater Environmental Values and Water Quality Objectives	Qld-Murray-Darling-basin-Bulloo-River-basin.pdf	DES	DES	11	Introduction and final ToR – Appendix 01A	Appendix+01A+Introduction+Final+ToR+(final+221108).pdf	CTSCo	DES		Noted	N/A
Nr	Title – Date	'Label' – Filename	Author	Source																																																																
1	Introduction including appendices (Terms of Reference checklist) – Chapter 1	01+Introduction+(final+221124).pdf	CTSCo	DES																																																																
2	Proposed Project Description – Chapter 2	02+Project+Description+(final+221108).pdf	CTSCo	DES																																																																
3	Approvals – Chapter 4	04+Approvals+(final+221108).pdf	CTSCo	DES																																																																
4	Geology – Chapter 8	08+Geology+(final+221122).pdf	CTSCo	DES																																																																
5	Groundwater – Chapter 9	09+Groundwater+(final+221108).pdf	CTSCo	DES																																																																
6	Geology – Appendix 08A Well Completion Reports	Appendix+08A+Geology,+Well+Completion+Reports+(final+221108).pdf	CTSCo	DES																																																																
7	Groundwater – Appendix 09A Groundwater Impact Assessment Technical Report	Appendix+09A+Groundwater+Impact+Assessment+Technical+Report+(final+221108).pdf	CTSCo	DES																																																																
8	DES1231304 - Submission attachments complied	DES1231304 - Submission attachments complied.pdf	DES	DES																																																																
9	Great Artesian Basin Strategic Management Plan	GAB strategic-management-plan.pdf	DCCEEW	DES																																																																
10	Queensland Murray-Darling and Bulloo River Basins Groundwater Environmental Values and Water Quality Objectives	Qld-Murray-Darling-basin-Bulloo-River-basin.pdf	DES	DES																																																																
11	Introduction and final ToR – Appendix 01A	Appendix+01A+Introduction+Final+ToR+(final+221108).pdf	CTSCo	DES																																																																
85	5a	General	General		1.4 Review methodology Review comments and recommendations are categorised by level of concern according to Table 2.		Noted	N/A																																																												
85	5b	General	General		Table 2 Categorisation of review recommendations		Noted	N/A																																																												
85		General	General		<table border="1"> <thead> <tr> <th>Level of concern</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Level 1: Major issues</td> <td>Potential to significantly underestimate impact and/or risk Improper, unverified, or poorly justified model assumptions and statements potentially leading to conclusions that underestimate risk and/or impact</td> </tr> <tr> <td>Level 2: Moderate issues</td> <td>Potential to moderately under- or over-estimate impact and/or risk Improper, unverified, or poorly justified model assumptions potentially leading to conclusions that under- or over-estimate risk and/or impact Limited transparency, unclear description of assumptions, model choices, parameters and/or results</td> </tr> <tr> <td>Level 3: Minor issues</td> <td>Minimal or no effect on impact and/or risk Assumptions and model choices not relevant to quantity of interest Editorial issues (typos, missing references, etc)</td> </tr> </tbody> </table>	Level of concern	Description	Level 1: Major issues	Potential to significantly underestimate impact and/or risk Improper, unverified, or poorly justified model assumptions and statements potentially leading to conclusions that underestimate risk and/or impact	Level 2: Moderate issues	Potential to moderately under- or over-estimate impact and/or risk Improper, unverified, or poorly justified model assumptions potentially leading to conclusions that under- or over-estimate risk and/or impact Limited transparency, unclear description of assumptions, model choices, parameters and/or results	Level 3: Minor issues	Minimal or no effect on impact and/or risk Assumptions and model choices not relevant to quantity of interest Editorial issues (typos, missing references, etc)		Noted	N/A																																																				
Level of concern	Description																																																																			
Level 1: Major issues	Potential to significantly underestimate impact and/or risk Improper, unverified, or poorly justified model assumptions and statements potentially leading to conclusions that underestimate risk and/or impact																																																																			
Level 2: Moderate issues	Potential to moderately under- or over-estimate impact and/or risk Improper, unverified, or poorly justified model assumptions potentially leading to conclusions that under- or over-estimate risk and/or impact Limited transparency, unclear description of assumptions, model choices, parameters and/or results																																																																			
Level 3: Minor issues	Minimal or no effect on impact and/or risk Assumptions and model choices not relevant to quantity of interest Editorial issues (typos, missing references, etc)																																																																			

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	6a	General	General		2 Technical review This section is organised based on the scope of the technical advice as outlined in 1.1. Recommendations are summarised by level of concern (Table 2) for each review question in the blue boxes and discussed in greater detail in the text.		Noted	N/A
85	6b	General	General		This review follows the guiding principles and information needed to assess whether a groundwater model and uncertainty analysis are fit-for-purpose as outlined in the updated explanatory note on uncertainty analysis for groundwater modelling (Peeters and Middlemis, 2023), including these key concepts:		Noted	N/A
85	6c	General	General		1. Fit-for-purpose: means that the results of the model are usable – relevant to the decision-making process; reliable – demonstrate that the range of model outcomes is consistent with the system knowledge and honours historical observations; and feasible – considering trade-offs due to budget, time and technical constraints		Noted	N/A
85	6d	General	General		2. Quantity of interest (QoI): means model outcome from a specified model scenario, with a predefined spatial and temporal setting, that is relevant to assessing the likelihood and consequence of a causal pathway element representing a hazard. An alternative term is 'key prediction'.		Noted	N/A
85	7a	8 / 9	Geology / Groundwater		2.1 Groundwater and geological assessments 2.1.1 Potential impacts and risks for the proposed pilot project		Noted	N/A
85	7b	8 / 9	Geology / Groundwater		This section addresses 'Q1: Does the EIS suitably present representative, reliable, appropriate, and verifiable conclusions and commitments for the identification and assessment of potential impacts and risks, including their predicted duration, spatial extent, containment, and magnitude of impacts (plume, dissolved phase, plume movements, inter-aquifer containment and water quality changes) for the proposed pilot project?'		Noted	See response to question below against the Recommendation
85	7c	8 / 9	Geology / Groundwater		The EIS assesses 5 exposure pathways that provide a comprehensive framework for the evaluation of potential impacts on the Hutton or Precipice Sandstone aquifers due to migration of the injected GHG stream plume.		Noted	See response to question below against the Recommendation
85	7d	8 / 9	Geology / Groundwater		Level of concern: 1 The limited sensitivity and uncertainty analysis mean that potential impacts on water users in the Precipice Sandstone aquifer due to new groundwater extraction near the GHG stream injection well cannot be ruled out. It is recommended that the range of parameter combinations used for particle tracking modelling be revised to rule out potential impacts beyond the modelled plume due to groundwater extraction from the Precipice Sandstone aquifer.		Noted	See response to question below against the Recommendation
85	7e	8 / 9	Geology / Groundwater		Level of concern: 2 Review recent environmental tracer data analyses for the Surat Basin to determine upper bound estimates of flow velocity for the proposed injection area.		Noted	See response to question below against the Recommendation
85	7f	8 / 9	Geology / Groundwater		Section 6 of Appendix 09A Groundwater Impact Assessment Technical Report (p 170-200 in [7]) identifies potential impacts associated with release of gases (or containment of GHG stream), changes to groundwater pressure, groundwater quality, and cumulative impacts. The cumulative impacts associated with the geology, hydrogeology, water quality, aquatic ecosystems and groundwater dependent ecosystems, and groundwater water supply and users are identified and discussed in Section 6.4 (p 196-198 in [7]). The groundwater-related environmental values associated with the Precipice Sandstone aquifer in the Eastern Central Area of the Basal Zone of the GAB identified in the report (Section 4.5, p 97 in [7]) include: - Aquatic Ecosystems - Water supply (includes Irrigation, Farm supply/use, Stock water, Drinking water, Industrial use) - Cultural, spiritual and ceremonial values.		Noted	See response to question below against the Recommendation
85	7g	8 / 9	Geology / Groundwater		A base case scenario and 4 alternative exposure pathway scenarios were used to consider potential impacts on the Hutton or Precipice Sandstone aquifers. The assessment for the 'Caprock integrity pathway' (p 180-186 in [7]) finds migration of the injected GHG stream plume through shallower barriers (aquitards) is unlikely to occur. This is consistent with the regional-scale screening model estimates (~150 m) developed for the Cooper Basin (Geological and Bioregional Assessment Program, 2021) and used to rule out potential impacts associated with compromised aquitard integrity. This effectively rules out potential impacts on aquatic ecosystems and cultural, spiritual and ceremonial values associated with shallower aquifers. Therefore, potential impacts are limited to receptors associated with the Hutton or Precipice Sandstone aquifers.		Noted	See response to question below against the Recommendation
85	7h	8 / 9	Geology / Groundwater		The reported exposure pathway scenarios are consistent with causal pathways associated with geological carbon storage isolated by an intact barrier and include: - Compromised subsurface integrity (includes faults, fractures, overpressure, localised pathways) - Compromised well integrity (includes via the annulus, blow outs, cement integrity, casing integrity) - Deep groundwater injection (includes changes to horizontal and vertical hydraulic gradients) - Deep groundwater extraction (includes changes to horizontal and vertical hydraulic gradients).		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	7i	8 / 9	Geology / Groundwater		The 5 exposure pathways provide a comprehensive framework for the evaluation of potential impacts on the Hutton or Precipice Sandstone aquifers due to migration of the injected GHG stream plume: 1. Base case – ‘injected GHG stream plume in supercritical state remains in place in the near-field environment around the well and does not migrate more than approximately 500 m away from the injection location, owing to a lack of driving pressure gradient’ (p 171 in [7]) 2. Caprock integrity – includes faults, fractures, overpressure reactivation of existing structures, and localised pathways 3. Well integrity – includes improperly constructed injection and monitoring wells, existing domestic and industrial wells, abandoned historical water and petroleum wells within the Project site, and future drilling activities at the site 4. Mining and other underground activities – groundwater extraction alters hydraulic gradients, causing GHG stream plume to migrate to water extraction location. 5. Water management – aquifer injection alters hydraulic gradients, causing GHG stream plume to migrate to		Noted	See response to question below against the Recommendation
85	7ja	8 / 9	Geology / Groundwater		Level of concern: 1 Potential impacts associated with ‘water extraction in the Hutton or Precipice Sandstones close to West Moonie-1 Injection Well’ were not evaluated. Instead, the report states ‘Currently no water abstraction takes place in the Hutton Sandstone or Precipice Sandstone close to operational lands which makes this scenario unlikely. This is due to the significant depth of these formations in this southern part of the Surat Basin (over 2 km deep), making them economically viable for water only’ (p 190 in [7])		Noted	See response to question below against the Recommendation
85	7jb	8 / 9	Geology / Groundwater		The submission from AgForce notes ‘A water supply bore in the Precipice Sandstone within 10km of the injection site is licensed and is being constructed, which is expected to change how any plume will propagate’ (p 5 in [8]). This scenario is not directly assessed in the EIS. Instead, this review uses the 5 reported particle tracking sensitivity analysis scenarios (Table 48, p 146 in [7]), particle tracking plots (Appendix C, p 255-259 in [7]) and particle tracking heads (Appendix D, p 260-269) to consider whether the parameters for the 5 reported EIS particle tracking scenarios could address this water extraction scenario.		Noted	See response to question below against the Recommendation
85	7jc	8 / 9	Geology / Groundwater		For the particle tracking sensitivity analysis, modelled particles are released on the corners of a 750 m x 750 m square with the injection well in the centre (Figure 50, p 149 in [7]). This coincides with the edge of the modelled plume, located about 375 m from the injection well. Conservative estimates of plume migrations via advection and dispersion are created by selecting upper bound estimates of the hydraulic gradient, aquifer transmissivity and storativity, and lower bound estimates of the dispersion coefficient. These parameters were varied parameter by parameter as part of the 5 sensitivity analysis scenarios: - Scenario 2.1 considers high hydraulic gradients - Scenario 2.2 considers high hydraulic gradients and high aquifer transmissivity values - Scenario 2.3 considers low hydraulic gradients once pumping stops in year 3 - Scenario 2.4 considers low porosity values (low storativity) - Scenario 2.5 considers high aquifer transmissivity values.		Noted	See response to question below against the Recommendation
85	7jd	8 / 9	Geology / Groundwater		Particle movement beyond the modelled plume was predicted to be 15-20 m over 1000 years for 4 of the 5 cases. The exception was Scenario 2.4 with low storativity, when porosity was reduced from 13.5% under the base case to 4.5%, where particle movement was estimated to be 50 to 60 m beyond the modelled plume.		Noted	See response to question below against the Recommendation
85	7je	8 / 9	Geology / Groundwater		Plume migration predicted by the particle tracking scenarios include hydraulic gradients associated with the GHG stream injection and 1000 ML/year water extraction from the Moonie oil field. However, the limited sensitivity and uncertainty analysis used in the assessment [7] mean that potential impacts on water users in the Precipice Sandstone aquifer due to new groundwater extraction near the GHG stream injection well cannot be ruled out based on the reported sensitivity analysis scenarios. The parameter values used for the sensitivity analysis appear to be suitably conservative but the limited parameter combinations tested and contextual information provided limit confidence extrapolating impacts beyond the 5 sensitivity analysis scenarios.		Noted	See response to question below against the Recommendation
85	7jf	8 / 9	Geology / Groundwater			Recommendation: Review and revise the range of parameter combinations used for particle tracking modelling to rule out potential impacts beyond the modelled plume due to groundwater extraction from the Precipice Sandstone aquifer.	Amended EIS	See Chapter 8 Geology, sections 8.7.6 3, ; Chapter 9 Groundwater sections 9.3 2.5, 9.3.2.6, 9.4, 9.4.1, 9.4.2, 9.5, 9.6, 9.6.2, 9.7 2, 9.7.3, 9.7.4, 9.9, 9.9.1, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, 9.9.8, and 9.9.9; and Appendix 9A, sections 4.6, 5, 6, 7; and Appendix 9B.
85	7ka	9	Groundwater		Level of concern: 2 Estimates of flow velocity made using environmental tracers in the northern part of the Surat Basin, are in the range 0.8 to 1.5 m/y (Suckow et al., 2018). The flow velocity in the project area is likely to be less than these estimates due to the greater depth. Hofmann et al. (2022) presented new environmental tracer data for the southern Surat Basin, which have not been discussed in the EIS documents (see 2.1.2).		Noted	See response to question below against the Recommendation
85	7kb	9	Groundwater			Recommendation: Review previous environmental tracer analyses for the Surat Basin, including Suckow et al. (2018) and Hofmann et al. (2022), to assess if tracers can be used to determine upper bound estimates of flow velocity relevant to the proposed injection area in this part of the Precipice Sandstone aquifer.	Amended EIS	See Chapter 9 Groundwater, sections 9.4 2, 9.4.4, 9.6.1, 9.6.2.1, 9.6.3, 9.7.3.1.3, and 9.7.3 2.1.
85	8a	8 / 9	Geology / Groundwater		2.1.2 Hydrogeological characterisation and conceptualisation This section addresses ‘Q2: Does the EIS suitably present representative, reliable, appropriate, and verifiable conclusions and commitments for the presented hydrogeological characterisation, geophysical techniques, methods, and conceptualisation?’		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	8b	8 / 9	Geology / Groundwater		Level of concern: 2 Conceptual model uncertainties exist in the West Moonie model area due to limited baseline data. To address these uncertainties, it is recommended that additional alternative conceptual (and numerical) models are used to explain observed groundwater salinities and possible connectivity pathways. Further, additional details are needed to support the adopted 3D geological (static) model, reservoir models and numerical groundwater models. This includes any geological structures interpreted in the models and findings of the planned/recently acquired 3D seismic survey to support the statement that <i>'no faulting is present around the West Moonie-1 Injection Well location'</i> .		Noted	See response to question below against the Recommendation
85	8ca	8 / 9	Geology / Groundwater		Level of concern: 2 Conceptual model uncertainties The West Moonie model area is relatively data poor, having limited baseline water chemistry and groundwater level data for the different aquifers (p 34 in [5]). This lack of data means there are some conceptual uncertainties with regards to groundwater flow directions within the Precipice Sandstone, groundwater chemistry and the presence or absence of faults.		Noted	See response to question below against the Recommendation
85	8cb	8 / 9	Geology / Groundwater		The higher groundwater salinity observed in the Precipice Sandstone in the Moonie region is <i>'attributed to the location in the deeper part of the basin, further from the recharge areas, and in an area where there is no throughflow'</i> (p 38 in [5]). However, Raiber and Suckow (2017) suggested that elevated groundwater salinities in the Precipice Sandstone further north in the Surat Basin may be due to faults acting as connectivity pathways with adjacent units. The elevated salinities observed in the northern part of the Surat Basin occur near geological structures with similar salinities as those observed in the Precipice Sandstone in the Moonie region.		Noted	See response to question below against the Recommendation
85	8cc	8 / 9	Geology / Groundwater		Hydrocarbons have been developed from the Precipice Sandstone in the nearby Moonie oil field for many years. However, the Precipice Sandstone is not the hydrocarbon source rock, suggesting that fault-induced connectivity with hydrocarbon source rocks in the underlying Bowen Basin occurs within the broader regional area over geological time scales.		Noted	See response to question below against the Recommendation
85	8cd	8 / 9	Geology / Groundwater		The report would be improved by addition of a qualitative uncertainty analysis table (Peeters 2017) to summarise detailed technical information in a more accessible and concise way. The table lists the main assumptions and model choices and scores the potential impact on the QoI based on whether the assumption or model choice is driven by data availability, time and budget available for the project, or technical challenges. <i>'The most important score, however, is the perceived effect of the assumption on the model outcomes'</i> (Peeters and Middlemis, 2023).		Noted	See response to question below against the Recommendation
85	8ce	8 / 9	Geology / Groundwater			Recommendation: Explicitly consider alternative conceptual models to explain observed groundwater salinities and connectivity pathways that may alter the conclusions of the assessment. Clearly document the main assumptions and model choices and evaluate the potential impact of each on the QoI.	Amended EIS	See Chapter 8 Geology, sections 8.5.2, 8.6, 8.7, 8.7.6, 8.9.2, 8.9.3, 8.9.4, and 8.9.5; and Chapter 9 Groundwater, sections, 9.4.1, 9.4.2, 9.4.4, 9.5, 9.6, 9.6.1, 9.6.2, 9.6.3, 9.6.4, 9.6.5, 9.7.4, 9.7.5, 9.7.6, 9.9.2, 9.9.4, 9.9.6, and 9.9.7.
85	8cf	9	Groundwater		The analysis of hydrochemistry and environmental tracer data from the Precipice Sandstone aquifer to support the conceptual model development presented in the EIS documents is limited (pp 77-83 in [7]) and relies mostly on Rodger et al. (2020) and OGIA (2021). It does not reference or include any data or interpretations from the more recent hydrogeological and isotopic assessment of the southern Surat Basin by Hofmann et al. (2022) relevant to the West Moonie model area. These limitations are highlighted in submission comments – <i>'the original work by Rodger et al. (2020) but the interpretation as presented is too simplistic and the inferences are unjustified; this is particularly the case for dD-d18O, 14C and 36Cl/Cl'</i> (p 87 in [8]).		Noted	See response to question below against the Recommendation
85	8cg	9	Groundwater			Recommendation: Review the data and interpretations by Hofmann et al. (2022) and integrate all information to confirm or refine existing conceptual models (and discuss associated uncertainties and limitations).	Amended EIS	See Chapter 9 Groundwater, sections 9.4.2, 9.4.4, 9.5, 9.6.1, 9.6.2, 9.6.3, 9.6.4, 9.6.5, 9.7, 9.7.3.1.3, 9.7.3.2.1, 9.9.2, 9.9.4, and 9.9.7.
85	8da	2	Proposed Project Description		Geological (static) modelling The geological (static) model forms the basis for reservoir and numerical models, including subsurface structures, such as faults that can compartmentalise groundwater flow. The project description notes that <i>'existing seismic data interpretation has shown that no faulting is present around the West Moonie-1 Injection Well location'</i> (p 29 in [2]). However, this is not supported by Figure 8-3 [4], which shows very few wells or seismic lines are located within or near the West Moonie model area.		Noted	See response to question below against the Recommendation
85	8db	2	Proposed Project Description		Given the sparsity of seismic data in the West Moonie model area, the 3D seismic survey appears to be a very important piece of work to confirm the absence of faults near this site. It would be useful to provide some additional information on the design of the 3D seismic survey (which, according to the document, may have already happened by now).		Noted	See response to question below against the Recommendation
85	8dc	2	Proposed Project Description			Recommendation: Provide additional information on the design and findings of the recent 3D seismic survey to support statement that <i>'no faulting is present around the West Moonie-1 Injection Well location'</i>	Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1.3.2.
85	8dd	8	Geology		The adopted modelling workflow for the geological (static) model aims to <i>'create the 3D grid model with internal zonation derived from the 2D structural surfaces and fault surfaces'</i> (p 24 in [4]). However, many of the reported cross-sections (Figures 8-9, 8-11, 8-12, 8-14 in [4]) do not show any fault displacements even though the subsurface geometry in these cross-sections indicates possible presence of such features.		Noted	See response to question below against the Recommendation
85	8de	8	Geology			Recommendation: Clarify if the geological model includes any subsurface structures.	Amended EIS	See Chapter 8 Geology, sections 8.6, 8.6.1, 8.6.2.1, 8.6.2.3, 8.7.1.1.2, 8.10.2, 8.11, and 8.12 and Appendix 8B.
85	9a	8 / 9	Geology / Groundwater		2.2 Numerical groundwater modelling 2.2.1 Model assumptions, limitations, uncertainty analysis and calibration		Noted	See response to question below against the Recommendation
85	9b	8 / 9	Geology / Groundwater		This section addresses <i>'Q3: Does the EIS suitably present representative, reliable, appropriate, and verifiable conclusions and commitments for the assumptions, limitations, uncertainty analysis and calibration of models used to predict potential environmental impacts'</i> and makes the following recommendations to improve confidence in the modelling:		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	9c	8 / 9	Geology / Groundwater		Level of concern: 1 - Future groundwater extraction bores: revise modelling of potential impacts of a new groundwater extraction bore, including all assumptions, limitations and conceptualisations. - Extent of dissolved CO ₂ plume: additional analysis to rule out plume migration due to a new groundwater extraction well installed in the Precipice Sandstone aquifer		Noted	See response to question below against the Recommendation
85	9d	8 / 9	Geology / Groundwater		Level of concern: 2 - Model parameter uncertainty: additional analysis to encompass a greater range of possible conceptual and parameter uncertainties - Monitoring data: outline how monitoring data collection will reduce uncertainty in future modelling - Effect of thermal changes on geomechanical stress: update assessment to explicitly acknowledge the effect of thermal changes near the GHG stream injection well on geomechanical stresses.		Noted	See response to question below against the Recommendation
85	9ea	8 / 9	Geology / Groundwater		This section of the review is presented by level of concern and includes consideration of the following aspects as outlined in the detailed scope of works provided by DES:		Noted	See response to question below against the Recommendation
85	9eb	8 / 9	Geology / Groundwater		<i>'The review should also include technical appraisal of modelling predictions of vertical and horizontal greenhouse gas plume spatial extent, dissolved phase plume spatial extent, plume behaviour and associated effects, water quality changes and pressure or level changes to all relevant EVs associated with the Precipice Sandstone aquifer and any other overlying aquifers. NOTE: The EIS uses the following the working interchangeably: plume, GHG plume, CO₂ plume, predicted plume areas, plume perimeter, plume extent, plume position).'</i>		Noted	See response to question below against the Recommendation
85	9fa	8 / 9	Geology / Groundwater		Level of concern: 1 Future groundwater extraction bores A key weakness identified by many of the IESC submissions [8] is that the EIS assumes that potential impacts due to future development of groundwater extraction in the Precipice Sandstone are not possible for economic reasons (p.190 in [7]).		Noted	See response to question below against the Recommendation
85	9fb	8 / 9	Geology / Groundwater		<i>'The other mechanism which may affect the future evolution of the system studied is water extraction in the Hutton or Precipice Sandstones close to West Moonie-1 Injection Well. Complete migration pathways can be assumed if hydraulic head is reduced in the Hutton Sandstone due to future water management/usage. Currently no water abstraction takes place in the Hutton Sandstone or Precipice Sandstone close to operational lands which makes this scenario unlikely. This is due to the significant depth of these formations in this southern part of the Surat Basin (over 2 km deep), making them economically unviable for water supply.'</i>		Noted	See response to question below against the Recommendation
85	9fc	8 / 9	Geology / Groundwater		Given the available model (revised to take account of the conceptual and parameter uncertainties), it should be straightforward to examine potential impacts on a water well drilled outside of the predicted CO ₂ plume boundary, at a radius between 1 and 50 km of the GHG stream injection well. This would greatly increase confidence in the accuracy of the predictions of potential impacts on other operations.		Noted	See response to question below against the Recommendation
85	9fd	8 / 9	Geology / Groundwater		The additional modelling should be properly documented in the EIS, so that the assumptions and limitations of the analysis are clearly expressed, alongside the evidence for the parameter choices, and an explanation of the process that will be followed to the update the modelling		Noted	See response to question below against the Recommendation
85	9fe	8 / 9	Geology / Groundwater			Recommendation: Update modelling and analysis to rule out impacts from new water extraction bore scenario in the EIS, including clear documentation of all assumptions, limitations and conceptualisations.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.7.4 2, 9.9 2, 9.9.4.2, 9.9.5, 9.9.6, 9.9.7, 9.10, 9.10.1.6, and 9.10.1.8.
85	9ga	9	Groundwater		Extent of dissolved CO₂ plume The numerical models used for the assessment follow standard approaches that have been validated in CCS modelling at other sites. The geological modelling makes use of the limited available data to produce a best estimate of the subsurface conditions at the location of the proposed GHG stream injection. The combination of multi-phase hydrodynamic modelling with tNavigator™ software for the plume migration, reactive transport modelling and groundwater flow modelling is a powerful combination of techniques that covers all the necessary aspects of the evolution of the subsurface in response to CO ₂ injection.		Noted	See response to question below against the Recommendation
85	9gb	9	Groundwater		The predictions made by the models are broadly reasonable for the vertical and horizontal extent of the plume (Figure 55 in [7]) and compare well with simple theoretical estimates. The predicted extent of the dissolved plume is likewise reasonable, since initially it follows the distribution of the gas phase, and subsequently the slightly denser fluid with dissolved CO ₂ will sink towards the bottom of the aquifer shown in the plot of dissolved gas after 100 years shut-in (Figure 55 in [7]). There is some uncertainty about the long-term movement of the dissolved CO ₂ , since it could be impacted by future developments such as new water supply wells drilled into the Precipice Sandstone, and there is an underlying uncertainty about the direction of water flow in the aquifer unit prior to injection. As discussed below, this uncertainty could be quantified by additional modelling and uncertainty analysis. The scenario should include modelling the effects on GHG stream spatial extent if a new water extraction well was drilled near the predicted CO ₂ plume. This would provide information of the maximum boundary of a lateral 'exclusion zone' for needed for access to future water resources.		Noted	See response to question below against the Recommendation
85	9gc	9	Groundwater			Recommendation: Explicitly model the extent of the dissolved CO ₂ plume in the scenario of a new groundwater extraction well installed in the Precipice Sandstone near the GHG stream injection well.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2.5, 9.3.2.6, 9.4.1, 9.6.2, 9.6.3, 9.6.4, 9.6.5, 9.7.4.2, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, 9.10, 9.10.1.6, 9.10.1.7, and 9.10.1.8.

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	9ha	2, 8, 9	Proposed Project Description, Geology, Groundwater		Level of concern: 2 Model parameter uncertainty The West Moonie model area is in a part of the basin and in a reservoir interval where there is very little well-based data. This is favourable for a CCS project because it corresponds to a much lower chance of impact on existing users, such as water extraction bores. However, the limited site-specific data means the numerical modelling needs to encompass a greater range of conceptual and parameter uncertainties, and model calibration is harder. Key uncertainties to explore include parameters related to the top seal geometry, groundwater flow direction, absolute permeability, and how the main predictions (e.g. plume extent) are sensitive to these uncertainties. This analysis is crucial for increasing confidence that the range of possible environmental impacts has been thoroughly understood and fairly assessed.		Noted	See response to question below against the Recommendation
85	9hb	2, 8, 9	Proposed Project Description, Geology, Groundwater		The numerical models of plume behaviour test variations in the ratio of vertical to horizontal permeability. However, other important factors, such as absolute permeability, heterogeneity, seal geometry, groundwater flow directions, far-field boundary conditions, that could influence the predictions are not considered. The EIS modelling should be extended to encompass a greater range of possible uncertainties. Results of plume extent should be presented in standard spatial probabilities (such as P10, P50, P90). Parameter sensitivities should be presented in a standard way, such as a tornado chart. This would increase confidence in the maximum estimate of the CO2 plume extent, the likelihood, and the and the long-term consequences of evolution of that plume, which is crucial for estimating risks on groundwater near the GHG stream injection well.		Noted	See response to question below against the Recommendation
85	9hc	2, 8, 9	Proposed Project Description, Geology, Groundwater			Recommendation: Expand the model sensitivity and uncertainty analysis to encompass a greater range of possible conceptual and parameter uncertainties, include parameters related to the top seal geometry, groundwater flow direction, and absolute permeability.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.8.1.3.2; Chapter 8 Geology, sections 8.4.1, 8.4.6, 8.5.2, 8.6, 8.7, 8.7.5.11, 8.7.6, 8.9, 8.9.2, and 8.9.3; Appendices 8A and 8B; Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.4.1, 9.5, 9.6, 9.7, 9.9, 9.10, 9.10.1, 9.11, and 9.12; Appendices 9B, 9C, 9D, and 9F.
85	9hd	9	Groundwater			Recommendation: Expand presentation of spatial and parameter uncertainties using different spatial probabilities and plots.	Amended EIS	See Chapter 9 Groundwater, section 9.6.2, 9.6.4, 9.6.5, 9.9.2, 9.9.4, 9.9.5, and 9.9.8; Appendices 9B, 9C and 9D.
85	9ia	2, 8, 9	Proposed Project Description, Geology, Groundwater		Monitoring data It is unclear how and when new monitoring data will be used to reduce model conceptual and parameter uncertainties. For example, the baseline 3D seismic survey can improve the characterisation of the seal geometry, which is a key element of the predictions of the direction and extent of CO2 plume migration. Another critical element is the overall permeability of the reservoir interval. The standard way to test this is a water production or injection test, which can give a good estimate of the reservoir permeability on a scale of hundreds of metres, and potentially detect any near-field barriers such as sub-seismic faults.		Noted	See response to question below against the Recommendation
85	9ib	2, 8, 9	Proposed Project Description, Geology, Groundwater			Recommendation: Outline how and when new monitoring data will be used to refine numerical modelling to improve confidence, including explicit links between monitoring techniques and modelling components.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
85	9ja	2, 8	Proposed Project Description, Geology		Effect of thermal changes on geomechanical stress Thermal impacts of CO ₂ injection are negligible in the EIS – ‘As the GHG stream will enter the injection zone at the same temperature as the Precipice Sandstone there will be no thermally induced fracturing’ (p 78 in [5]). The EIS states there will be no impact because the CO ₂ will equilibrate with the rock around the wellbore as it is being injected. However, there is extensive theoretical and field experience which indicates that CO ₂ injection at the proposed rate, about 300 tonnes/day (Table 9-3 in [5]), will cool the reservoir near the wellbore by an appreciable amount, say 10-20°C. Analyses for similar injection schemes indicate that the thermal changes near the well affect the geomechanical stresses. The net result is that the threshold for the maximum allowable injection pressure will be reduced. Given the highly permeable nature of the target formation, this is unlikely to have a material impact on the GHG stream injection plan. However, explicit consideration of additional geomechanical stresses due to thermal changes should be explicitly addressed in the assessment.		Noted	See response to question below against the Recommendation
85	9jb	2, 8	Proposed Project Description, Geology			Recommendation: Explicitly acknowledge the effect of thermal changes near the GHG stream injection well on geomechanical stresses.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.2, 2.10.2, 2.10.3, 2.10.4, 2.11, 2.11.5.1, 2.11.5.2, and Table 2-8; Chapter 8 Geology, section 8.8.1, 8.10.4.2, and 8.12.
85	10a	9	Groundwater		2.2.2 Plume migration and geochemical modelling		Noted	See response to question below against the Recommendation
85	10b	9	Groundwater		This section addresses ‘Q4: Do the EIS numerical groundwater models (including the plume migration and geochemical models), assumptions, variables, input data, uncertainty analysis and interpretation of outputs and conclusions on potential impacts from the proposed project?’ and makes the following recommendations to improve confidence in the modelling:		Noted	See response to question below against the Recommendation
85	10c	9	Groundwater		Level of concern: 2 The plume migration and geochemical modelling approaches used for the EIS are broadly appropriate. However, additional modelling is recommended to expand the model sensitivity and uncertainty analysis to encompass a greater range of possible conceptual and parameter uncertainties.		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	10da	9	Groundwater		Level of concern: 2 The plume migration and geochemical modelling approaches reported in the EIS and supporting appendices ([5, 7]) are broadly appropriate. The predictions of plume migration and the geochemical impact of the CO ₂ plume in the Precipice Sandstone aquifer are comparable to predictions and field experience in other CCS projects for aquifer storage. For example, at the Otway International Test Centre in Victoria, CO ₂ was injected into an open brine saturated sandstone aquifer (Ennis-King et al., 2016). Model predictions and field sampling showed dissolution commences within hours of injection (Haese et al., 2013). Field seismic and pressure tomography monitoring data showed that residual trapping contributed to plume stabilisation, with up to 50% of the plume dissolved within months of injection (Jackson et al., 2022). These experiments showed that residual trapping can effectively immobilise a GHG stream plume and dissolution is effective as the front migrates away from an injector. This has been observed in large-scale international industrial projects as well (Doung et al., 2019; Tawiah et al., 2020).		Noted	See response to question below against the Recommendation
85	10db	9	Groundwater		However, in the modelling presented in the EIS document there is a lack of explicit attention to the uncertainties in key parameters, and the sensitivity of the model predictions to these uncertainties. The geochemical modelling is also subject to additional parameter uncertainties related to water composition and assumed reactions rates. Peeters and Middlemis (2023) recommend that the design, execution and review of an uncertainty analysis carefully consider these aspects: 1. What is the QoI to the decision-maker? 2. What are the main sources of uncertainty to the QoI? 3. How do system knowledge and historical observations constrain or condition the QoI (the key prediction(s)?)		Noted	See response to question below against the Recommendation
85	10dca	9	Groundwater			Recommendation: Expand the model sensitivity and uncertainty analysis to encompass a greater range of possible conceptual and parameter uncertainties. Additional modelling should:	Amended EIS	See Chapter 9 Groundwater, section 9.6.
85	10dcb	9	Groundwater			- Quantify the uncertainty in key flow modelling inputs: e.g. absolute permeability, heterogeneity, seal geometry, groundwater flow directions, far-field boundary conditions	Amended EIS	See Chapter 9 Groundwater, section 9.6.2; and Appendix 9B.
85	10dcc	9	Groundwater			- Quantify the uncertainties in key geochemical modelling inputs: e.g. water chemistry, mineralogy, reactions rates.	Amended EIS	See Chapter 9 Groundwater, section 9.6.4, 9.7.5, 9.7.6, 9.9.4, 9.9.2, and 9.9.3; and Appendices 9C and 9D.
85	10dcd	9	Groundwater			- Quantify the sensitivity of the model predictions to the uncertainties in the key parameters e.g. through a tornado diagram and spatial probability plots.	Amended EIS	See Chapter 9 Groundwater, sections 9.9.2, and 9.9.4; and Appendices 9B, 9C and 9D.
85	10dce	9	Groundwater			- Examine the effect of the predicted CO ₂ plume on future water supply development.	Amended EIS	See Chapter 9 Groundwater, sections 9.3.2.5, 9.3.2.6, 9.7.4, 9.9, 9.9.1, 9.9.2, 9.9.3, 9.9.4, 9.9.5, 9.9.6, 9.9.7, 9.9.8, 9.9.9, 9.10.1, 8, 9.11, and 9.12; and Appendices 9B, 9C and 9D.
85	10dcf					- Clearly document how future monitoring data, such as 3D seismic survey and well tests, will improve the models by reducing conceptual and parameter uncertainties.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
85	10dcg					- Clearly document the assumptions, parameters and limitations of the modelling process.	Amended EIS	See Chapter 8 Geology, sections 8.4, 8.5, 8.6; and Chapter 9 Groundwater, section 9.6; and Appendices 9B, 9C and 9D.
85	11a				2.3 Exposure pathway assessment		Noted	See response to question below against the Recommendation
85	11b				This section addresses 'Q5: Is the exposure pathway assessment to existing local abandoned wells intersecting the Precipice Sandstone aquifer and the potential for geological structures (e.g., fracturing or faults zones) to open new pathways to potential receptors to overlying aquifers, and users of groundwater within the region, from the injection of the supercritical greenhouse gas stream adequate?'		Noted	See response to question below against the Recommendation
85	11c				Potential impacts associated with compromised well integrity are unlikely to occur and the proposed monitoring technologies identified in the EIS are adequate. Exposure pathway for 'users of groundwater within the region, from the injection of the supercritical greenhouse gas stream adequate' are addressed in the responses to Q1, Q3 and Q6		Noted	See response to question below against the Recommendation
85	11d				Level of concern: 2 Additional information is needed to support the statement that 'no faulting is present around the West Moonie-1 Injection Well location'. This should include additional interpretation of the new 3D seismic survey and collection of passive seismic monitoring.		Noted	See response to question below against the Recommendation
85	11e				Well integrity There is confidence in the information provided in the EIS that existing local abandoned or operating wells do not form potential pathways for the leakage of CO ₂ or formation water into shallower aquifers. The EIS identifies 5 abandoned wells within a 20 km radius of the West Moonie-1 injection well (p 186 in [7]) that are beyond the 525 m radius of the predicted maximum CO ₂ plume extent (59 in [5]) and are unlikely to be impacted by pressure changes from the CO ₂ injection.		Noted	See response to question below against the Recommendation
85	11f				The highest risk to the containment of the injected CO ₂ is a mechanical failure, for example due to improperly placed cement, cement degradation or casing corrosion of the West Moonie-1 injection well or the West Moonie-2 monitoring well. This risk is addressed by adopting best practice well drilling and completion standards in accordance with 'Code of Practice for the construction and abandonment of petroleum wells and associated bores in Queensland' (p 203 in [7]). Monitoring technologies for early leakage detection identified in the EIS, including continuous annulus pressure measurements, pulsed neutron and carbon oxygen logging, temperature and pressure measurements, seismic surveys, and water sampling are adequate (p 201 in [7]). In addition, the proposed mitigation measures are adequate to sufficiently reduce the risks of any leakage and detrimental impacts on water resources or surface environmental receptors due to compromised well integrity are unlikely to occur.		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	11g				Exposure pathway assessments for 'users of groundwater within the region, from the injection of the supercritical greenhouse gas stream adequate' are addressed in the responses to Q1, Q3 and Q6.		Noted	See response to question below against the Recommendation
85	11ha				Level of concern: 2 Caprock integrity In the modelled scenarios, the base case and all but one of the sensitivity cases show the modelled GHG stream to become immobile within the Lower Precipice Sandstone due to the permeability contrasts within the reservoir. Thus, the plume isn't expected to reach the base of the caprock seal as free gas. Therefore, risk of exposure to caprock fractures is considered a low level of concern. The geomechanical modelling and leak-off testing reported in the EIS (p 183 in [7]) support the conclusion that anticipated bottomhole injection pressures for the planned injection rates are safely below fracturing pressures for the Precipice Sandstone.		Noted	See response to question below against the Recommendation
85	11hb				Based on the available 2D seismic survey data, no naturally occurring open fracture zones or faults were identified by the proponent in the vicinity of the West Moonie-1 injection well. The models investigate a low gradient regional dip of the reservoir confirmed by the Formation Micro-Imager (FMI) Logs that show the geological and petrophysical properties near the well bore. Increased pressures created by the GHG stream injection could potentially open cemented fractures or re-activate sub-seismic or previously unidentified faults. Additional information on the design and findings of the recent 3D seismic survey to support the statement in the EIS that 'no faulting is present around the West Moonie-1 Injection Well location' (p 29 in [2]) is needed to confirm assumptions and models underpinning the assessment for this exposure pathway.		Noted	See response to question below against the Recommendation
85	11hc					Recommendation: Incorporate additional seismic monitoring techniques to enhance confidence in the assessment, including interpretation of the new 3D seismic survey to update the numerical model predictions of the extent of the modelled CO ₂ plume. Compare the newly acquired 3D seismic survey data with the FMI logs to update the structural framework for the static and dynamic models as appropriate.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.3 2 and 2.11.
85	11hd					Recommendation: Consider using passive seismic monitoring to record micro-seismic events and to identify the early onset of fracturing and fluid migration.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8.1.3 3 and 2.11.
85	12a				2.4 Human use assets		Noted	See response to question below against the Recommendation
85	12b				This section addresses 'Q6: Is the assessment of existing, authorised, and future human use assets and whether sufficient information is provided to support conclusions regarding these assets and the spatial extent, magnitude and duration of likely impacts stated in the EIS adequate?'		Noted	See response to question below against the Recommendation
85	12c				The EIS identifies 6 EVs (Aquatic ecosystems, Irrigation, Farm supply/use, Stock water, Drinking water, Industrial use, Cultural, spiritual and ceremonial values) related to human use associated with the Basal Great Artesian Basin. Another 5 EVs (Aquaculture, Human consumption, Primary recreation, Secondary recreation, and Visual recreation) are not associated with this zone.		Noted	See response to question below against the Recommendation
85	12d				Level of concern: 1 Potential impacts associated with 'water extraction in the Hutton or Precipice Sandstones close to West Moonie-1 Injection Well' were not evaluated. Instead, the EIS assumes that potential impacts do not occur based on the depth of extraction, water quality and absence of existing wells. It is recommended that each of the 6 EVs related to human use associated with the Basal Great Artesian Basin Zone are systematically assessed using conservative modelling approaches that consider all possible water resource development scenarios.		Noted	See response to question below against the Recommendation
85	12ea				This review considers the assessment of 'any human uses' is required under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 and section 9 the EP Act (Section 9.4.1 Water quality – a critical matter in Appendix 01A p 24 in [11]):		Noted	See response to question below against the Recommendation
85	12eb				'Identify the environmental values of surface waters and groundwaters within the proposed project area and immediately downstream or downgradient (or influenced by the zone of potential water quality of impacts) that may be affected by the proposed project, including any human uses and cultural values of water.'		Noted	See response to question below against the Recommendation
85	12fa				Under the Water Act 2000 (Qld), Water Plans, prepared as part of a consultative process on a catchment-by-catchment basis, outline the Environmental Values (EVs) relevant to the waterbodies (surface water and groundwater) in the plan area. 'EVs for water are the qualities of water that make it suitable for supporting aquatic ecosystems and human water uses' (p 8 in [10]). 'Water Plans are developed to balance water allocations (that is, human use) with environmental flows (that is, leaving water in a watercourse or aquifer to maintain natural processes)' (p 9 in [5]). This technical review does not address the assessment of the risks		Noted	See response to question below against the Recommendation
85	12fb				The EVs associated with the Basal Great Artesian Basin Zone (Plan GWQ4168) are relevant to the West Moonie-1 Injection Well.		Noted	See response to question below against the Recommendation
85	12fc				'This division represents the lowest beds in the GAB, mainly the Evergreen aquitard and underlying Precipice Sandstone. It also includes members of the Bundamba Group in the Clarence Moreton Basin. The GABORA equivalents are the Precipice Unit, and the Evergreen Fm. from the Hutton Unit. The division is absent from the southwest of the QMDB. Six zones have been defined, based on lithology, and limited water quality data. The groundwater is generally moderately saline, dominated by HCO ₃ with either Na, or mixed cations in northern outcrop area near basaltic remnants. Instances of high fluoride have been recorded in the central Surat area.'		Noted	See response to question below against the Recommendation
85	12fd				There are 6 EVs related to human use associated with the Basal Great Artesian Basin Zone listed in Table 9-21 (p 41 in [5]): - Protection of cultural and spiritual values, including Traditional Owner values of water - Suitability for crop irrigation - Suitability for drinking water supplies - Suitability for farm supply/use - Suitability for industrial use (including mining, minerals refining/processing)		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	12fe				Another 5 EVs (Aquaculture, Human consumption, Primary recreation, Secondary recreation, and Visual recreation) are not associated with the Basal Great Artesian Basin Zone.		Noted	See response to question below against the Recommendation
85	12ga				Level of concern: 1 The comparison of key features of existing GHG injection projects to the CTSCo proposed project is useful (Table 9-3 in [5]). For example, the 'Storage' column could be expanded to better describe groundwater salinity, including the minimum, maximum, and mean values of the host formations. The target formation for carbon storage, Precipice Sandstone aquifer, is classified as a 'Saline Formation' (as are most other formations listed here). However, in the regional context of the Surat Basin and the Great Artesian Basin, the Precipice Sandstone is considered an aquifer and groundwater within the Precipice Sandstone in this area is at the lower end of the 'Brackish' groundwater range (Table 9-10 in [5]) rather than what would normally be considered a saline groundwater resource in Australia.		Noted	See response to question below against the Recommendation
85	12gb				Further, the groundwater in the Precipice Sandstone at the West Moonie model area is described as 'unsuitable for livestock consumption due to the high fluoride concentrations' (p 43 in [5]) and		Noted	See response to question below against the Recommendation
85	12gc				'A comparison of the groundwater quality sampled from the Precipice Sandstone aquifer via West Moonie-1 Injection Well, with the WQOs for the listed EVs is discussed below. Generally, the water quality at West Moonie-1 Injection Well indicates that the aquifer is naturally not consistent with the WQOs for the identified EVs. Additionally, the depth to the aquifer would be a limiting factor for most users. Shallower aquifers with better water quality would be used instead as a source of water.' (p 41 in [10])		Noted	See response to question below against the Recommendation
85	12gd				Consequently, the assessment does not consider future treatment or mixing with other water sources, as noted in the EIS submission comments [8] and by ruling out groundwater extraction for human use, it does not properly assess potential impacts from future water extraction for human use		Noted	See response to question below against the Recommendation
85	12ge					Recommendation: Provide a systematic assessment for each of the 6 EVs related to human use associated with the Basal Great Artesian Basin Zone that considers all possible water resource development scenarios, including water extraction for human use from the Precipice Sandstone aquifer.	Amended EIS	See Chapter 9 Groundwater, sections 9.3 2, 9.4.1, 9.4.2, 9 5, 9.6, 9.7.4, 9.7.5, 9.7.6, 9.7.6, 9.9, 9.9.1.2, 9 9.1.3, 9.9.2.4, 9.9 3, 9.9.4, 9.9.6, 9.9.7, 9.9.9, 9.10.1.4, 9.10.1.5, 9.10.1.7, 9.10.1.8, 9.11, and 9.12; and Appendices 9A, 9B, 9C, 9D, 9E, and 9F
85	13a				2.5 Monitoring, mitigation, and remedial measures		Noted	See response to question below against the Recommendation
85	13b				This section addresses 'Q7: Are the proposed mitigation measures, management strategies, monitoring and verification techniques to be implemented by the proponent adequate?'		Noted	See response to question below against the Recommendation
85	13c				Level of concern: 1 A key weakness of the EIS is that risks are not identified and presented in a structured way. It is recommended that a systematic risk assessment is used to connect identified hazards with potential impacts and the monitoring techniques needed to detect these potential impacts. Level of concern: 2 The following recommendations are made to improve confidence in the adequacy of the proposed mitigation measures, management strategies, monitoring and verification techniques: • explore plausible probability distributions, including models representing the best and worst case for identified hazards • clearly document logic used to select monitoring technologies, including the sensitivity of these techniques to the hazards they are designed to mitigate • revise and clearly document rationale used to set trigger values for hydrochemical parameters and discuss whether trigger values for additional water quality parameters are warranted.		Noted	See response to question below against the Recommendation
85	13da				Experience in CCS demonstration and industrial-scale projects has shown that it is essential to link monitoring clearly to risk. A monitoring method should be part of mitigating a specific risk. These comments focus on the subsurface risks associated with CO ₂ storage, especially the impact on groundwater. These are not the only environmental risks that need consideration – there are risks associated with the surface equipment, for example, the pipeline – but these are not considered here.		Noted	See response to question below against the Recommendation
85	13db				In standard terminology, a 'risk' is defined as the effect of uncertainty on objectives (AS/NZS ISO 31000:2018). This involves assessing the potential consequences and likelihood of impacts to environmental and human values that may stem from an action, under the uncertainty caused by variability and incomplete knowledge of the system of interest. A 'hazard' is an event or process that has the potential to cause harm; there is a likelihood that a hazard will occur with a consequent impact. Often an ordinal scale – a ranking – is used to identify the most serious risks, where both the likelihood and the consequence or impact are large. The familiar risk matrix tabulates likelihood against consequence and populates cells with hazards; this is just one method of identifying and managing risks. The 'bow tie' is a related method that lays less stress on probability, although it is implicit in the method.		Noted	See response to question below against the Recommendation
85	13dc				The requirements and recommendations for the capture, transportation and geological storage of CO ₂ streams is described in ISO 27914:2017. In addition, numerous 'best practice' guides have been developed to monitor CCS projects that explain and justify these concepts. A recent example, with clear discussion of the links to monitoring techniques, is a guide for developing a Measurement, Monitoring, and Verification (MMV) plan for geologic storage of carbon dioxide (IOGP, 2022). Other relevant reviews of carbon storage monitoring technologies include Jenkins et al., (2015) and Jenkins (2020).		Noted	See response to question below against the Recommendation
85	13dd				The EIS format does not encourage the presentation of risk management in structured forms. Alternative scenarios were developed based on an existing Feature Event Process (FEP) database developed 'to support the long-term safety and performance of a storage system during and after GHG stream injection (version 2, (Quintessa, 2014)) (p 42 in [7])'. However, the assessment describes these alternative scenarios as implausible, stating		Noted	See response to question below against the Recommendation
85	13de				'There are no current data or interpretations to support any of these scenarios occurring, and section 6.1.3 describes how implausible they are. In this regard, these alternative scenarios are highly improbable, and only consider hypothetical situations' (p 173 in [7])		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	13df				Risks are reported throughout the documents, mainly in [5] and [7] and are not systematically linked to monitoring techniques. Further, there is no clear definition of what it means for hazards to be considered 'likely' or 'unlikely'. In addition, if a hazard is not identified, it is unclear if it has been forgotten or discounted because it is unlikely or because the impact is considered negligible.		Noted	See response to question below against the Recommendation
85	13dg				Overall, the hazards identified in the EIS are plausible, as is the assessment of their likelihood. If we accept the proponent's assessment of the impacts, the proposed monitoring plan is comparable to those approved in the USA under Class II rules for oilfield disposal operations and Class VI rules for saline aquifer storage. Annual reports for carbon storage facilities in the USA are available from the US EPA website ¹ . However, the level of detail in this EIS is insufficient to form a rigorous judgement on the suitability of this monitoring plan. It is recommended that a structured risk management plan following international best practice that includes explicit links to identified risks and how potential impacts can be mitigated is used to revise the proposed monitoring plan.		Noted	See response to question below against the Recommendation
85	13dh					Recommendation: Evaluate and present in a structured way the identified hazards, identifying and connecting them clearly to impacts and the monitoring that is part of mitigating these impacts.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
85	13ea				Likelihoods Sites for geological storage of CO ₂ are selected to be free of leakage paths. It is thus difficult to attribute likelihoods to mechanisms of leakage which are ruled out by site selection. However, the probability of residual hazards can be ranked, informed by expert judgement and using numerical modelling. However, it is critical for this reasoning to be clearly and systematically documented to provide confidence in the proposed mitigation and management strategies. A critical element to building confidence is documenting the logical links between proposed monitoring techniques and the identified risks.		Noted	See response to question below against the Recommendation
85	13eb				In this EIS, the primary leakage mechanisms considered are a breach of the seal, most probably via an undetected transmissive fault, or leakage up a wellbore where zonal isolation has failed. A surrogate for the level of risk is the size of the final plume, as the bigger it is, the more of the seal it will probe (although at a reduced column height of buoyant CO ₂).		Noted	See response to question below against the Recommendation
85	13ec				The proponent's assessment of the likelihood for these risks for the alternative exposure pathway scenarios is considered plausible (p 181-190 in [7]) but should be explained more fully. Specifically –		Noted	See response to question below against the Recommendation
85	13ed				- Since there is not yet any detailed seismic imagery of the storage site, it is recommended that the roles of faults and seal continuity is assessed using analogies with areas with more data.		Noted	See response to question below against the Recommendation
85	13ee				- What do modern data on leakage along wellbores tell us about the risk in this case? A recent study of North Sea wellbores (UK Government) is informative. It is recommended that migration of CO ₂ due to movement of contaminated groundwater along wellbores is included in the assessment.		Noted	See response to question below against the Recommendation
85	13ef				- The main output of the hydrodynamic modelling of the GHG stream plume is to predict its size and duration. It is recommended that the sensitivity of modelled plume extent to these metrics is assessed for a range of uncertain petrophysical quantities, primarily kv/kh, porosity and permeability. Probing the role of heterogeneity (informed by geological narratives about the depositional environment) is also warranted.		Noted	See response to question below against the Recommendation
85	13eg					Recommendation: Establish the likelihood of the identified hazards, either by Monte Carlo simulation using plausible input probability distributions for poorly known parameters, or by establishing 'bookend' models for best and worst case for critical hazards.	Amended EIS	See Chapter 2 Proposed Project Description, sections 2.8, 2.10.4, 2.11, and 2.13; Chapter 8 Geology, sections 8.4, 8.5, 8.6, 8.7.1, 8.7.2, 8.7.5, 8.7.6, 8.8, 8.9, 8.9.2, 8.9.3, 8.10, 8.11, and 8.12; Appendices 8A and 8B; Chapter 9 Groundwater, sections 9.3.2, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, and 9.12; and Appendices 9A, 9B, 9C, 9D and 9E.
85	13fa				Impacts A challenge for this assessment is balancing the competing needs of different resource development activities (oil field, groundwater extraction and carbon storage). The Precipice Sandstone aquifer is managed under multiple acts, policies and regulations: under the <i>Petroleum and Gas (Production and Safety) Act 2004 (Qld)</i> at the Moonie oil field approximately 30 km from the model area; under the <i>Water Act 2000 (Qld)</i> in relation to stock, domestic, industrial and agricultural groundwater extraction activities; and under the <i>Greenhouse Gas Storage Act 2009</i> in relation to geological carbon storage. In addition, all industrial, resource or intensive agricultural activities with the potential to release contaminants into the environment are managed under the <i>Environmental Protection Act 1994 (Qld)</i> . These resource development activities are included in the 6 EVs related to human use associated with the Basal Great Artesian Basin Zone (p 41 in [5]).		Noted	See response to question below against the Recommendation
85	13fb				Targets for groundwater monitoring in the Precipice Sandstone aquifer will differ depending on the intended use. Impacts associated with the Moonie oil field are principally related to changes in groundwater levels due to water extraction (or 'drawdown'). 'Predicted impacts in the Precipice Sandstone are associated with the Moonie oil field where production started in 1964 and is now in a declining phase, nearing end of life' OGIA (2021). Groundwater extraction from the Precipice Sandstone aquifer is approximately 2225 ML/y for stock, domestic and industrial uses, in addition to 1000 ML/year water extraction from the Moonie oil field (OGIA, 2021). Potential impacts from groundwater extraction are principally related to groundwater drawdown.		Noted	See response to question below against the Recommendation

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	13fc				However, CO ₂ injection for carbon storage will change both groundwater levels and water chemistry, meaning that the parts of the Precipice Sandstone aquifer contained within the CO ₂ plume are not suitable for water extraction. The EIS states that 'Injection of the GHG stream is not likely to result in a deterioration in the environmental values of the receiving groundwater outside of the predicted GHG plume' (p 8 in [3]). For these reasons, it is recommended that the proposed monitoring plan clearly document explicit links between identified risks to groundwater levels and water chemistry, as well as how to detect and mitigate deviations from predicted plume behaviour using different monitoring techniques.		Noted	See response to question below against the Recommendation
85	13fd					Recommendation: Clearly document the motivations and rationale used to select the proposed monitoring technologies in the EIS, including an explanation of the sensitivity of each monitoring technique to the hazards they are designed to mitigate	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
85	13ga				Monitoring techniques A suite of methods of monitoring are proposed to address the risks that have been identified:		Noted	See response to question below against the Recommendation
85	13gb				- Seismic imagery, using permanent-installed sources is used to detect the extent of the CO ₂ plume, and possibly also detect leakage into an overlying aquifer. However, no detailed calculations are presented of the sensitivity of the proposed method. Building on the experience of the Otway Stage 2C and 3 experiments, detailed calculations should be presented that justify the proposed role of seismic imagery. These calculations will need input on repeatability at the site from the baseline seismic surveys. These are scheduled but not yet done or analysed		Noted	See response to question below against the Recommendation
85	13gc				- Pulsed neutron logging is a well-established method to detect CO ₂ near (m) the wellbore; and was used successfully at the Otway site. Calculations showing the feasibility and sensitivity for the aquifer conditions near the West Moonie-1 injection well are recommended.		Noted	See response to question below against the Recommendation
85	13gd				- Groundwater sampling for hydrochemistry and environmental tracer samples is needed during injection. However, while the spatial extent of predicted impacts associated with the proposed injection is expected to be extremely small and null results (no change in hydrochemistry) are difficult to interpret, the monitoring provides public assurance. Any sampling will build on previous work to better understand groundwater flows in the Precipice Sandstone and other aquifers (Rodger et al. 2020, OGIA, 2021, Hofmann et al. 2022).		Noted	See response to question below against the Recommendation
85	13ge				- Downhole pressure and temperature methods are fundamental to understanding the plume's behaviour and have been widely used elsewhere. However, much more detail would be needed to assess their likely effectiveness for this project, such as - Where will pressure be measured, and what questions should the data answer? - Will above-zone monitoring be undertaken, and how sensitive is it? - Will earth tides be measured? - Will distributed temperature sensors be used, and if so, how will temperature be monitored?		Noted	See response to question below against the Recommendation
85	13gf				Overall, the suite of proposed monitoring technologies is broadly consistent with other carbon storage projects worldwide but it is unclear if it is optimum or fit-for-purpose.		Noted	See response to question below against the Recommendation
85	13gg					Recommendation: Clearly document the logic used to select monitoring techniques, explaining why each specific methods was selected to manage a specific risk.	Amended EIS	See Chapter 2 Proposed Project Description, section 2.11; Chapter 8 Geology, section 8.10; and Chapter 9 Groundwater, section 9.10.
85	13ha				Trigger values The proposed Precipice Sandstone aquifer trigger values for TDS (5,000 mg/L), Arsenic (1 mg/L) and Lead (10 mg/L) as outlined in Table 9-30 in (p 84 in [5]) are high when compared to ambient groundwater quality and are not adequately justified within the documents. Furthermore, trigger values are only defined for a limited number of hydrochemical parameters and no trigger values have been defined for most major and minor anions and cations. This omission was highlighted in many of the EIS submission comments, including by the IESC (p 8 in [8]), DES (p 70 in [8]) and Harrington (p 86 in [8]).		Noted	See response to question below against the Recommendation
85	13hb					Recommendation: Revise and set appropriate trigger values for hydrochemical parameters based on a robust assessment of groundwater quality baseline data within the southern Surat Basin (such as Hofmann et al. 2022; OGIA 2021). Clearly document reasoning for selection of trigger values (such as in the context of geochemical modelling conducted as part of the EIS process) and discuss if trigger values for additional parameters (such as other metals) are required.		See Chapter 9 Groundwater, sections 9.6.4, 9.7.5, 9.7.6, 9.7.7, 9.9.4, 9.10, 9.10.1.4, and 9.10.1.5; and Appendices 9C and 9D.
85	14a				3 References		Noted	N/A
85	14b				AS/NZS ISO 31000:2018. Risk management – Guidelines. Standards Australia, Sydney.		Noted	N/A
85	14c				Duong, C., Bower, C., Hume, K., Rock, L., & Tessarolo, S. (2019). Quest carbon capture and storage offset project: Findings and learnings from 1st reporting period. International Journal of Greenhouse Gas Control, 89, 65-75.		Noted	N/A
85	14d				Ennis-King, J, Paterson, L, Dance, T, Freifeld, B and Zhang, Y (2016). Field-scale residual CO ₂ saturation: analysis of pressure and temperature data from CO ₂ CRC Otway Residual Saturation and Dissolution test. International Journal of Greenhouse Gas Control.		Noted	N/A
85	14e				Geological and Bioregional Assessment Program (2021) Compromised aquitard integrity: Stressor node description for the Cooper GBA region accessed 02 August 2023		Noted	N/A
85	14f				Haese, R, La Force, T, Boreham, C, Ennis-King, J, Freifeld, B, Paterson, L and Schacht, U (2013). Determining residual CO ₂ saturation through a dissolution test - Results from the CO ₂ CRC Otway Project. Energy Procedia, vol. 37 pp. 5379-5386.		Noted	N/A
85	14g				Hofmann H, Pearce JK, Rodger I, Golding SD, Hayes P (2022) Regional hydrogeology of the southern Surat Basin project 7-0918-C316 published by University of Queensland for Australian National Low Emissions Coal Research & Development (ANLEC R&D), source link: https://anlecrd.com.au/projects/regional-hydrogeology-of-the-southern-surat-basin/		Noted	N/A

Submitter #	Comment #	Chapter #	Chapter Name	Chapter section	Submitter Comment	Submitter Recommendation	CTSCo Response	EIS Reference
85	14h				IOGP (2022) Recommended practices for measurement, monitoring, and verification plans associated with geologic storage of carbon dioxide. Report 652. International Association of Oil and Gas Producers, London (2022).		Noted	N/A
85	14i				ISO 27914:2017. Carbon dioxide capture, transportation and geological storage — Geological storage. International Organization for Standardization.		Noted	N/A
85	14j				Jackson, S, Gunning, J, Dance, T, Bagheri, M, Barraclough, P, et al. (2022) Time-lapse pressure tomography of a migrating CO2 plume at the Otway Stage 3 site. Proceedings of the 16th Greenhouse Gas Control Technologies Conference (GHGT-16) 23-24 Oct 2022, Available at SSRN: https://ssrn.com/abstract=4296215 or http://dx.doi.org/10.2139/ssrn.4296215		Noted	N/A
85	14k				Jenkins, C., Chadwick, A., & Hovorka, S. D. (2015). The state of the art in monitoring and verification—ten years on. <i>International Journal of Greenhouse Gas Control</i> , 40, 312-349.		Noted	N/A
85	14l				Jenkins, C. (2020). The State of the Art in Monitoring and Verification: an update five years on. <i>International Journal of Greenhouse Gas Control</i> , 100, 103118.		Noted	N/A
85	14m				Office of Groundwater Impact Assessment (OGIA) (2021) Underground Water Impact Report for the Surat Cumulative Management Area, Queensland Department of Natural Resources, Mines and Energy, State of Queensland.		Noted	N/A
85	14n				Peeters LJM (2017) Assumption hunting in groundwater modeling: find assumptions before they find you. <i>Groundwater</i> , 55(5): 665–669. Available [online]: https://10.1111/gwat.12565		Noted	N/A
85	14o				Peeters LJM and Middlemis H (2023) Information Guidelines Explanatory Note: Uncertainty analysis for groundwater modelling, A report prepared for the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development through the Department of Climate Change, Energy, the Environment and Water, Commonwealth of Australia. Available from https://www.iesc.gov.au/publications/information-guidelines-explanatory-note-uncertainty-analysis		Noted	N/A
85	14p				Quintessa (2014) Generic CO ₂ FEP Database, Version 2.0., Quintessa Limited, Henley-on-Thames, United Kingdom		Noted	N/A
85	14q				Rodger I, Pearce JK, Hoffmann H, Golding, SD, Hayes P (2020) Hydrogeology of the Southern Surat Basin: Memo report 2, The University of Queensland.		Noted	N/A
85	14r				Suckow A, Raiber M, Deslandes A, Gerber C (2018) Constraining conceptual groundwater models for the Hutton and Precipice aquifers in the Surat Basin through tracer data. Final Report. CSIRO, Australia.		Noted	N/A
85	14s				Tawiah P, Duer J, Bryant SL, Larter S, O'Brien S, Dong M (2020) CO ₂ injectivity behaviour under non-isothermal conditions—Field observations and assessments from the Quest CCS operation. <i>International Journal of Greenhouse Gas Control</i> 92 102843.		Noted	N/A
85	Footnote				¹ https://www.epa.gov/ghgreporting/subpart-rr-annual-monitoring-reports		Noted	N/A



A GLENCORE Company

300 George Street · Brisbane · QLD 4000 · Australia
Tel 1300 119 786 · Web www.ctsco.com.au

Carbon Transport and Storage Corporation (CTSCo) Pty Limited ABN 12 143 012 971