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Ref: MG/DM/GG23007

23 February 2023

Jamie Merrick
Director General
Department of Environment & Science
GPO Box 2454
400 George Street
BRISBANE QLD 4001

By Email: eis@des.qld.gov.au

Dear Dr Merrick

Re: Submission on the Environmental Impact Statement for the Surat Basin Carbon Capture & Storage Project

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.

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.

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.

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):

- Groundwater planning and management should ensure the security, reliability and quality of the supplies of primary producers, including at least maintaining associated water pressures.

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- 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.
- Monitoring needs to be cost-effective and risk-proportionate, targeting those areas of greatest risk of over-allocation or other unsustainable use.

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.

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.

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.

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.

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.

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.

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.

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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.

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.

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.

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:

- Requires improved baseline groundwater quality data prior to CO_2 injection and setting of appropriate trigger values
- Inadequate documentation about the regional groundwater and plume migration models design, parameterisation and calibration
- 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
- More comprehensive monitoring network and sampling program needed, extending further spatially and temporally, for groundwater quality and impacts on shallower aquifers and injectate containment
- More clearly justified impact management activities, including adequate, justified and comprehensive trigger values, and associated response actions and 'stop work' provisions.

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.

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[1] AgForce Land Use Protection Principles · AgForce · Advancing Rural Queensland (agforceqld.org.au)
[2] Advice to decision maker on carbon capture and storage project IESC 2022-139: Surat Basin Carbon Capture and Storage Project (EPPG00646913) – New Development

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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:

- Additional groundwater quality and pressure monitoring sites across multiple aquifers
- Adding existing landholder bores to the groundwater monitoring program to verify that important groundwater resources are not being adversely impacted by the project
- Extending the post-injection monitoring period to at least three years
- Where impact predictions are exceeded, requiring additional monitoring, modelling and investigation
- Expanded monitoring of groundwater quality to address any potential risks to the future usability of the groundwater

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.

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.

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.

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.

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'*.

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.

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[3] Great Artesian Basin and other regional aquifers water plan | Business Queensland

[4] Advice to decision maker on carbon capture and storage project IESC 2022-139: Surat Basin Carbon Capture and Storage Project (EPPG00646913) – New Development

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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.

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.

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.

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.

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.

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 'shandying' groundwater with other water supplies or making dietary adjustments within feedlot rations.

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.

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[5] *09+Groundwater+(final+221108).pdf (ctsco.com.au), page 40
[6] *Queensland Murray-Darling and Bulloo River Basins Groundwaters Environmental Values and Water Quality Objectives (des.qld.gov.au)

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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 informed the current EIS which seeks to again access an aquifer containing usable water resources.

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.

In our view this does not represent best practice consultation processes and should be remedied by the proponent in addressing the TOR requirements.

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.

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.

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 Dr Dale Miller, General Manager – Policy on or via email .

Yours sincerely

Michael Guerin
Chief Executive Officer