HEALTH AND ENVIRONMENT COMMITTEE

Members present:
Mr AD Harper MP—Chair
Mr SSJ Andrew MP
Ms AB King MP
Mr R Molhoek MP
Ms JE Pease MP
Dr MA Robinson MP

Member in attendance:
Mr N Dametto MP

Staff present:
Ms L Pretty—Acting Committee Secretary
Ms R Stacey—Assistant Committee Secretary

PUBLIC HEARING—INQUIRY INTO THE ENVIRONMENTAL AND OTHER LEGISLATION (REVERSAL OF GREAT BARRIER REEF PROTECTION MEASURES) AMENDMENT BILL 2021

TRANSCRIPT OF PROCEEDINGS

FRIDAY, 3 SEPTEMBER 2021

Brisbane

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The committee met at 9.32 am.

CHAIR: Good morning, everyone. I declare this public hearing of the Health and Environment Committee open. I would like to acknowledge the traditional owners of the land on which we are meeting today and pay my respects to elders past, present and emerging. I am Aaron Harper, the member for Thuringowa and chair of the committee. Rob Molhoek, the member for Southport, is our deputy chair. The other committee members are: Mr Stephen Andrew, the member for Mirani; Ms Joan Pease, the member for Lytton; and Ms Ali King, the member for Pumicestone. Dr Mark Robinson, the member for Oodgeroo is an apology. We welcome Nick Dametto, the member for Hinchinbrook, who introduced the bill we are examining today, as a participant in today's proceedings.

The purpose of today's hearing is to assist the committee with its inquiry into the Environmental and Other Legislation (Reversal of Great Barrier Reef Protection Measures) Amendment Bill 2021. The hearing is a formal proceeding of the parliament and is subject to the Legislative Assembly's standing rules and orders. The hearing is being recorded by Hansard and broadcast live on the parliament's website. I note that we have witnesses today who will be joining us by videoconference. We may, therefore, suspend proceedings briefly while we connect to these witnesses. Thank you for your patience. Finally, I ask that mobile phones and other devices be turned to silent.

BRINKMAN, Dr Richard, Research Program Director, Sustainable Coastal Ecosystems and Industries in Tropical Australia, Australian Institute of Marine Science

SCHAFFELKE, Dr Britta, Research Program Director, A Healthy and Resilient Great Barrier Reef, Australian Institute of Marine Science

CHAIR: Welcome. With AIMS being in Townsville, in regional Queensland, we are very proud of the facility. It is great that you have come down to join us. I know that you did provide previous information and came before us prior to today, but it would be good to get an update and some commentary around the bill. Obviously, there was some news around UNESCO recently. I invite you to make an opening statement before we go to questions.

Dr Schaffelke: Thank you, Chair. First, I would like to acknowledge the traditional owners of all the places AIMS works, and their deep and timeless connection with their land and sea country. I pay my respect to elders past and present and acknowledge the leaders of tomorrow.

Since AIMS was established in 1972 by an act of parliament, our scientists have been studying and monitoring the Great Barrier Reef to understand how it works, how it changes and how our activities might affect it. A major focus for us is to observe and report changes in the condition of coral reefs throughout the Great Barrier Reef and the quality of the marine waters, which means their chemical and physical properties.

From our work and that of others, we understand that the coral reefs of the Great Barrier Reef and the other ecosystems that make up the World Heritage area are under increasing pressure. Climate change is the biggest threat to coral reefs worldwide. We are observing already the vulnerability on the Great Barrier Reef. The temperature of Great Barrier Reef waters has already increased on average about 0.8 degrees Celsius. Corals now live near their upper thermal limit. Marine heatwaves are increasing in frequency and intensity. During those events the habitat builders—the corals and the seagrasses—are experiencing severe heat stress, and that can lead to mortality. For corals we have seen this in 2016, 2017 and to a lesser extent in 2020.

Our most recent long-term monitoring report on the condition of corals in the mid-shelf and offshore parts of the Great Barrier Reef showed that overall our reefs still have the capacity to recover during periods of low stress. This is good news, but it is also tempered by the fact that we are observing changes in the biodiversity of the reef. The current recovery is dominated by corals that are very fast growing but also very fragile. We are now seeing a reef that is increasingly fragmented, with a patchwork of reefs—some in very good, some in very poor condition. This is important, because just looking at reef-wide averages is hiding much of this important nuance.

Climate change also means that droughts and floods have become—they already have become—more extreme along the Great Barrier Reef coast. This poses challenges both for the land and for the marine ecosystems that are receiving catchment waters. Multiple lines of evidence show that water quality influenced by catchment run-off is affecting the health and resilience of the Great Barrier Reef. The extent of this impact is mostly constrained to coastal and inshore marine ecosystems. These are areas of very high economic and social values to traditional owners, recreational users and the tourism industry.

AIMS's 15-plus-year datasets from surveys of the inshore coral reefs show that their condition in 2020 was overall still poor but with much variation between the regions. We see that acute disturbances like cyclones, heatwaves and outbreaks of the crown-of-thorns starfish have been primarily responsible for the loss of coral cover—this is the same for inshore and offshore reefs—but we also know that poor water quality slows and hinders the reef recovery on the inshore reefs. Science has shown us that the multitude of pressures, including water quality, is affecting the health of all ecosystems in the Great Barrier Reef World Heritage area. We know that climate change is, and will continue to be, the major driver of change. The science is continuously advancing and is providing the knowledge that is used to support decisions on how to reduce those pressures, at both the regional and the global level. Thank you very much.

CHAIR: Thank you very much. We will open up to questions. We have the member who has introduced the bill here. Do you want to start?

Mr DAMETTO: Thank you, Chair. Thank you very much for coming along this morning to give your evidence to the bill. I thank you for travelling all the way from Townsville; I know how far it is to travel! Dr Britta, during the federal Senate inquiry—and you do get a starring mention in my explanatory notes, to be fair, so it is a pleasure to have a good chat with you today—regarding reef health you stated that water quality was not linked to reduction in coral calcification but instead pointed to marine heatwaves and coral bleaching as causes for detriment to reef health. Can you please explain that comment further?

Dr Schaffelke: Yes, I can. The comment was related to a specific measure of an attribute of very long living massive corals. We call them the coral bommies. They have been in the press recently. They are very large and live several hundred years. We investigate those corals, because they are so long living that they serve almost as history books. You have seen the coral cores at the AIMS site. We can take cores through those massive structures and look at the skeleton of those corals. Basically, they give us a look into the past environment these corals were living in.

We investigate those coral cores for various things, and one of them is calcification. Because the coral skeleton is made up of calcium carbonate, it builds up like tree rings over the years. Those tree rings—coral rings—can be investigated and they show us what the environment around those corals was. What was found was that the growth of these particular corals is affected by marine heatwaves and by coral bleaching, and during those times the growth stops. Like growth rings in a tree, you have years where they grow a lot and years where they grow very little. Those very hot years are documented in that record as low-growth years. That is what I referred to at the Senate inquiry. If we look back, we see a correlation of those years of very low growth and those heatwaves. After a period of time that growth recovers and the corals are then growing as per normal. That is a particular analysis on a particular type of coral for various questions that you might want to ask. Again, that enables us to look, over hundreds of years, at what have we learned from the systems.

Mr DAMETTO: Would you say that doing coral core samples is one of the better ways to identify what the water quality was like on the reef in years gone past, or previous to white settlement in Australia and agriculture?

Dr Schaffelke: That is another way those coral cores can be analysed. We talked about calcification; that is actually the growth of the corals itself. Those skeletons also keep trace elements from the time they were growing. By looking at the chemistry of the corals—a very different analysis—you can actually look at what the environment was like that those corals lived in. It is completely separate to the calcification analysis. You look at the geochemistry that is laid down in those skeletons. You take a sample and analyse it. That is one of the evidences that since European settlement the quality of the water has changed at some of the sites that are exposed to land run-off. The coral bommies that live at those sites in their skeletons have records that the water quality has changed. We can look at freshwater records in those coral cores. You can see through luminescent lines when rivers were flowing and the water got to those coral reefs. That it is all laid down in those skeletons. They are an immensely rich history book—and, yes, there are geochemistry markers in there as well—that give us an indication of when changes were happening at those inshore reefs.

Mr DAMETTO: Would you say that they were detrimental changes after agriculture and white settlement?

Dr Schaffelke: That is not what those bommies are telling us. They are very tolerant corals; otherwise, they would not live for hundreds or thousands of years. All they do is record the change. We do not know what the environment looked like 200 years ago. We have various accounts, but those corals give us the opportunity to look back in time and, at least through those traces and proxies, have an idea of what the environment looked like and that there was a change. They do not give us an indication of whether it was good or bad for the corals, because that coral is still there after hundreds of years.

Mr ANDREW: AIMS released statements that the reef has never been better. Then the Great Barrier Reef heritage material said that the reef was endangered. I spoke to the minister. There are two different sciences. Can you give me an indication of what is actually happening? One institution says it is in danger; then AIMS is saying that the reef has never been healthier in certain places. Why is there such a difference in the way people present the science? It means that people do not have a good grasp of what is going on.

Dr Schaffelke: Thank you, that is a good question. I probably need to elaborate on that a little bit as well. We are presenting the science as it is. We are presenting what the data are saying. That recent report that we brought out in July was from our long-term monitoring program of the mostly midshelf and outer-shelf reefs. Those reefs this year have shown that they are in a window of recovery. We use coral cover, which is the multitude of different corals on the reef and what cover they have. We report that in three broad regions: the northern, central and southern Great Barrier Reef.

About 130 reefs are monitored every year and we tie that together in a summary report to give people and the public an indication of what the general health of these midshelf and offshore reefs are. We are seeing them now in that window of recovery. That was after a period of very massive disturbances starting in 2014 in the north. But the disturbances are also different between the different parts of the reef, so that is why you need to look at them separately. All of the regions—and that is actually a very good sign—have shown that really strong recovery.

In my opening statement I said that is tempered; that we also see some changes in the make-up of those reefs. That is showing us that there are very fast growing corals that do recover, and that is a good sign the reef still has resilience, but that these corals are also the ones that are most vulnerable to cyclones, heat waves and crown-of-thorns starfish. So whenever that next event happens, those corals will then probably die again—

Mr ANDREW: How do you establish climate change is an issue when the reef can restructure itself from 2014 to 2021? How does the crown-of-thorns starfish become an issue when it is actually a natural predator of the reef? It is not introduced. It actually occurs naturally, so tell me: how does that all make a difference? Here we are, we have a cyclonic event with smashing waves in 2014. The reef is recovering better than it ever did, and now we are saying that climate change is an issue.

Dr Schaffelke: Let me correct you: it is not recovering better than it ever did—

Mr ANDREW: Well, it's got smashed.

Dr Schaffelke: It can still recover; that is a big difference. It can still recover, and that is a good sign. Other reefs around the world do not have that capacity anymore—

Mr ANDREW: If climate change was such an issue, how is it recovering?

CHAIR: Let's conduct ourselves and not argue, members. I might just hold you off there, member for Mirani.

Mr ANDREW: My apologies, Chair.

CHAIR: Deputy Chair, do you have a question?

Mr MOLHOEK: I just want to ask a question. I am not even sure if you are best equipped to help me with this. I recently had the privilege of travelling out west with the member for Gregory. We drove from Emerald to Longreach and stopped sort of at the head of the Belyando River, which is apparently about 900 kilometres north-north-east of the Burdekin catchment. I am just curious as to why these restrictions apply to grazing properties as far inland as that region, why is there a concern about those areas and what is the impact on the reef given it is so far inland?

Dr Schaffelke: I might pass that on to my esteemed colleague, Dr Brinkman, to talk about how water moves.

Dr Brinkman: We know that terrestrial river systems are strongly linked to the Great Barrier Reef and they deliver material to the reef. We know that the material that comes out of those rivers is influenced both by natural events and by what humans do in those catchments. That typically stays along the coast just because of the oceanographic features of the region, so we do need to be particularly careful of what comes down the rivers. When you are talking about a river that is 900 kilometres upstream from a river mouth, there are many processes that could influence how that material makes it to the reef.

Mr MOLHOEK: I should say that it is 900 kilometres from the Burdekin catchment, so it actually has to make its way 900 kilometres and then it meets the Burdekin catchment about 300 or 400 kilometres inland.

Dr Brinkman: The reasons why certain regulations may apply to farms that are that far removed from the coast is beyond AIMS' remit. We are a research organisation. We do not comment on policy; we do science and people use that to make policy. My only comment is that we need to consider rivers and the marine environment as one linked system.

CHAIR: Clearly, from the Canegrowers' submissions and people who will be here this afternoon, they are supporting the member's bill. With regard to sediment run-off, nitrogen, the impacts of fertilisers and all the rest of it on the coastal side, can you tell us how important it is to have regulation around that? Why have we gone ahead and put protections around the reef in the first place? Can you comment on sediment run-off, nitrogen and water quality monitoring?

Dr Brinkman: As I said in my previous answer, we do the science that is then used and interrogated by other people who make policy. We know from experimental work we have done over decades that coral reef and inshore environments, particularly in our part of the world, are used to very low nutrient loads. Particularly in the midshelf to offshore regions they are used to much clearer water environments and less sediment. As you get closer to the coast in North Queensland they are naturally turbid environments, so those ecosystems are used to living in a soup, I guess, of turbid water. But we know that those ecosystems have evolved to live in those ecosystems, so the things that live under the seabed, the corals—bearing in mind that the Great Barrier Reef is more than just coral reefs. In fact, if you look along the coastal strip of the Great Barrier Reef it has 70 to 80 per cent of the Great Barrier Reef's seagrass in that coastal strip, so seagrass is a critical component of making the Great Barrier Reef great.

We know that those ecosystems need a certain amount of light, and that light is diminished if the water gets too turbid. We know that the turbidity of the water over longer terms is strongly influenced by river delivery. By that I mean that after years of very low river flow we know we have much clearer water and less turbid events, so a lot more light reaches the seabed. During years of large river flows where there is more sediment delivered to the inshore region we have higher turbidity, and that turbidity hangs around for six to nine months after those river flows. That turbidity diminishes the light. That impacts the seagrass, impacts coral growth.

For nutrients we know that, like the plants on a cane farm, plants in the marine environment like nutrients. They like fertiliser. They like things that help them grow, so when we introduce even slightly more levels of nutrient to the marine environment, the marine plants—the seagrass and the plankton and things like that—also grow. When you have plankton growing it also helps diminish light on the seabed. So you have this interaction between slightly enhanced nutrients and the additional fine sediment loads really diminishing the light that hits the seabed. When you have enhancement of some of the growth of marine plants like seagrass, that can outcompete on the available seabed space for the corals that live in that inshore region to populate and settle onto the seabed because it is taken up by faster growing seagrass. So there is a very strong interaction. Both laboratory results and long-term observational studies show that even slight increases in nutrients and sediment loads can start to disrupt the balance that we see between corals, seagrass and algae on the inshore reefs.

CHAIR: Do you want to add anything?

Dr Schaffelke: I was hoping to go back to those multiple pressures. There are multiple pressures that are affecting whole ecosystems, inshore and offshore, but inshore in addition is that water quality impact. This is arguably one that can be managed more easily, so taking one of the pressures off or diminishing it a little bit will make a big difference. Yes, the inshore reefs are unfortunately not in that great condition. In some areas they are showing some signs of recovery, but some other areas are still in very poor condition. That competition with the seaweed is kind of facilitated by more nutrients in the water. They actually do not mind that turbid water that much. That is one important point. That actually prevents the reefs from recovering again, so there are multitude effects and limiting one makes a difference.

Mr MOLHOEK: Just back to my earlier question: you talked about nutrients. I understand that stuff gets into the river systems and flows. They do not fertilise grazing lands west of the Great Divide, so how is that of particular concern and why is that a concern if the run-off is perhaps just dirt and dust that might actually ordinarily have been picked up in a dust storm or past natural events?

Dr Brinkman: I guess different land use practices have the potential to deliver different material into the rivers. I will not make any particular comment on why nutrient regulations may impact grazing land. That is not what AIMS does. We look at marine environments.

Mr MOLHOEK: Dr Schaffelke, you mentioned earlier the rings in the coral and how you are able to measure. Is there any research, or how far back does that research go? Are there any comparative data around what the rings were showing pre the colonisation of Australia versus modern times?

Dr Schaffelke: Yes, there is. That is the advantage of that particular method: you can ask questions that go back hundreds of years before settlement, and that is where those changes were seen. I would like to add to Dr Brinkman's response. You were concerned about grazing land. With the run-off of fine sediment, the sediment itself also carries nutrients with it. They are soil after all, and things grow in soil. So there are nutrients, there is goodness in soils. It is not just sand particles: it is actually the nutrients associated with those particles that are then coming down the river and ultimately, if they are very fine, into the marine environment. It is not just fertiliser nutrients: we are also concerned about nutrients that are associated with these soil particles that ultimately also make it into that connected system from the land to the ocean.

Ms KING: You have both dedicated a large part of at least your recent working lives to studying the reef and seeking to understand the impacts of recent challenges it has experienced, and I know the committee joins me in thanking you for that work. If protection measures that have been put in place were reversed would you fear for the future of the Great Barrier Reef—perhaps speaking personally rather than from a policy perspective?

Dr Schaffelke: Again, for me it is about these multiple pressures. We know that some of those pressures will become worse in the future. We have seen the climate predictions, the recent ones coming out just a few weeks ago, so we know that some pressures will get worse and they are locked in regardless of what we do, so doing everything we can to limit other pressures is, in my view, a good thing.

Ms PEASE: You said that your job is not to determine agricultural impacts but the nutrients that go into the reef and how they impact the reef. Just to reinforce what you have just said, if any further nutrients do enter the reef and catchment area there will be impacts on it; would you agree with that? Would you say that, with regard to further nutrients going in, we need to protect the reef as best we can?

Dr Schaffelke: I would agree with that. Everything matters; that is the bottom line. We have seen some good advances through various measures. It is not all about regulations; they are just a part of a multitude of things. There has been great progress made in reducing run-off from paddocks and so on, so that is great, but if that would for some reason revert—and there can be a multitude of reasons—that obviously will matter to the coastal and the marine ecosystems.

Mr ANDREW: There is a lot of money being poured into the reef. You have a big say on policy. In regard to the accountability on that side of it, who is accountable if some of the science—we talked about climate change just before, damage to the reef—

Ms KING: Point of order, Chair. I am concerned that the member's question is in fact verballing the scientists who have come before us, who have expressed that in fact they do not contribute to policy.

CHAIR: We will go to the member for Hinchinbrook.

Mr DAMETTO: I have one final question in relation to the bill. The bill seeks to repeal some of the legislation that was implemented in 2019, but it also seeks to implement a couple of good control measures, I believe. One of them is to—

... Establish an independent regulator with an extensive agricultural and scientific background who will advise and assist the Minister when making a new Environmentally Relevant Activity (ERA) standard—

Is that something that you would support or not support?

CHAIR: That is a policy question, I think.

Dr Brinkman: It is, but it is worth having a discussion about, I think. One thing that everyone acknowledges about the Great Barrier Reef is that it is a very, very complex system. It is not too dissimilar to the human body in that there are many complicated systems that all interact, and when

one component of that system falls over the whole body suffers. The Great Barrier Reef is analogous to that. Therefore, to understand the science that underpins the Great Barrier Reef, you cannot expect one or two or three or four people to know that—you need a broad body of evidence, you need a broad body of experts.

That is why AIMS holds the position that the current science process of peer review is actually very thorough because you are not just tapping into local experts; you are tapping into experts worldwide who have experience in similar systems who can make a different perspective on how the reef may be changing and some of the drivers. If there was a concept of an independent panel, where would that expertise come from who would do that assessment? The only likely place that that expertise would come from to provide the input into that auditing would have to be the broader scientific community, and that is the same scientific community that we consider to be the peer review community. I think the concept is sound but the concept exists in the current peer review process.

Mr DAMETTO: The independent regulator, through the stipulation of this provision in the bill, would have to be someone who has not worked for the state government or the federal government in the past and also someone who has not received funding from the state or federal governments around their science in the past which was attached to the reef.

CHAIR: We might make that as a comment only.

Mr DAMETTO: Of course.

Mr ANDREW: The biggest thing is that it goes back to the situation—

CHAIR: Order. We are well over time. I want to thank the representatives from AIMS for making the time to come down here and inform us of the science. Thank you for your contributions today.

BRODHURST, Ms Olivia, Private capacity (via videoconference)

FONTES, Mr Tony, Private capacity (via videoconference)

RIMMER, Mr Talen, Private capacity (via videoconference)

CHAIR: Welcome. Would you like to make an opening statement?

Mr Fontes: Before I start with the opening statement, I would like to clarify today who we are because there was a slight change in plans after we sent in the document to you. Our original submission was addressed from the Whitsunday Local Marine Advisory Committee, otherwise known as WLMAC. WLMAC is a group of local stakeholders tasked with advising the Great Barrier Reef Marine Park Authority regarding local issues and the Great Barrier Reef. The committee members represent a diverse bunch of people, including traditional owners, tourism and natural resource management, marine parks et cetera. There is a lot of cumulative knowledge in that group. However, today three of us are here representing ourselves as individual Whitsunday community members, and this is because WLMAC is currently between terms and not due to re-form until November. We did not want to miss the opportunity but we are not officially representing WLMAC. Clear as mud, no doubt.

CHAIR: That is fine.

Mr Fontes: I would like to kick off with my statement but first we will give a brief introduction from the three of us. I am with the Whitsunday Conservation Council, among other things. My background is 40 years in the Whitsundays as a dive operator. My other colleagues will introduce themselves now.

Ms Brodhurst: I am an environmental scientist and I have many years experience working in natural resource management, and now the focus of my work is climate change.

Mr Rimmer: I am an aquatic biologist and conservationist living and working in the Whitsundays as well. I thank all members for having me here today.

Mr Fontes: We will get on with the statement. Firstly, I would like to pay my respects to the traditional owners of the Whitsunday Islands, the Ngaro people. The Ngaro people are in fact seafaring people who have lived sustainably in the region for as long as 9,000 years. I think we can all learn from them.

As a group, we strongly urge the committee not to approve the reversal of the Great Barrier Reef protection amendment bill, which we believe attempts to downgrade regulations that will improve agricultural land run-off into the Great Barrier Reef. It would go against every single plan and strategy currently in place to protect the Great Barrier Reef and would cause immense environmental, economic and social harm to communities like ours who depend on the health of the reef.

We know the committee has been thoroughly briefed on world-leading science and understands what happens when land impacts water. We are here today not to debate the science; we are here today to provide local knowledge and ensure that the reality of the impacts on water quality to the Whitsundays is known by parliament. Inshore reefs are a very significant part of the Great Barrier Reef, but unfortunately they do bear the brunt of land based run-off. The inshore reefs of the Whitsunday Islands are a case in point.

The Whitsunday Islands, as many of you are aware, are the focus of our region's billion dollar tourism sector. In fact 40 per cent of all Great Barrier Reef visitors pass through the Whitsundays. We are on par with Cairns, despite the fact we are much smaller than Cairns. Just to give you an example, pre COVID numbers of visitors to the region exceeded 700,000 annually. On top of this of course recreational boating is going nuts. The health of the island reef system is paramount to the ongoing success of the tourism industry and a large part of our local economy.

Our federal government has gone so far as to acknowledge the importance of the reef and the need to protect it by investing over $500 million into water quality improvement, reef restoration and conservation work. Much of that money has been spent, I am happy to say, in the Whitsundays. It is also important that this is supported by adequate reef protection legislation, which is what we are talking about today.

We would also like to remind the committee—and this came up with the previous speakers—that only last month Australia narrowly escaped a World Heritage in Danger listing. In the UNESCO report, they noted—

Progress has been insufficient in meeting key targets of the Reef 2050 Plan. The Plan requires stronger and clearer commitments, in particular towards urgently countering the effects of climate change, but also towards accelerating water quality improvement and land management measures.

This near miss reminds us that Australia has a responsibility to work hard to ensure the future health of the reef. I know that mitigating climate change requires a global effort, but improving water quality is a problem that we can fix here in Australia without the global community being involved. This will give our reefs a best chance at adapting to the multiple ongoing stressors, including the most significant one, which of course is climate change. I probably do not need to remind the committee that an in danger listing would certainly not enhance the economic opportunities for a tourism industry that is dependent on the Great Barrier Reef.

In conclusion, we hold that effective regulation, along with longstanding government and industry investment supporting adoption of the best management practices, provides the right policy and investment formula for achieving a healthy reef. We strongly urge the committee to refuse this reversal bill to help safeguard the future of the reef and our local Whitsundays community.

CHAIR: We have the member who introduced the bill here so I will go to him to ask a question.

Mr DAMETTO: Firstly, I thank all of you for giving evidence today. Thank you for putting in a submission. We appreciate it. The first question I have to ask is out of the three witnesses today who is the best person to talk to about nutrient run-off, because this bill takes into account nutrient run-off and everything from how sediment run-off is managed in farming practices through to nitrogen and nutrient budgets—basically, how much fertiliser farmers can use. That is very important to me when discussing this bill. My biggest question is: has anyone in your organisation—that is, anybody on standby at the moment or anyone in the room—done any work on modelling around nutrient run-off to the Great Barrier Reef from farming practices?

Mr Rimmer: I can speak on that. Just to reiterate Tony's previous statement, we are here not to necessarily debate the science and nutrient run-off. We are here to communicate the effects of this kind of bill and what our stance is as a community reliant on in practice and good measures to protect the reef in the Whitsundays. I will direct your questions to people speaking before and after us with regards to nutrient run-off. If you would like to hear about things like our dependence on the reef and the economics and importance of tourism and the health of the reef on our region, that is what we are here to speak about if you would like.

Mr DAMETTO: As a previous tourism operator myself, I do understand the importance of a healthy Great Barrier Reef when it comes to turning a dollar and making sure that people locally and in the tourism industry are supported through further employment. What I am here to talk about today is the bill. I just hope that someone in the group can answer some questions about the fundamental things that we are trying to repeal here with our reversal legislation if that is okay. If no-one can talk to that today, I will pass to the next member for a question.

CHAIR: That is okay. We did hear about the impacts of nutrient run-off from the scientists before. I think it is incredibly important to hear from the group from the Whitsundays on the impacts on tourism particularly and how important that is to the Whitsundays area. By the way, we love your office. Particularly in a COVID world, can you talk to us about just how important it is to maintain the tourism operation?

Mr Fontes: I think it is worth noting, COVID or no COVID, that the Whitsundays had a big cyclone back in 2017—Cyclone Debbie—as many of you are probably aware, which devastated the local fringing reefs. That is a natural event. What can you do about it? Although, again, it may be climate related, it is certainly not nutrient related. However, the recovery of our reef has been slow. This is anecdotal. This is not scientific. As we said, we are not here to discuss science.

Anecdotally, the reef is not recovering around the islands as quickly as one would expect. This has been disappointing and has had a significant impact on tourism. It has forced many operators to forgo diving activities and even snorkelling activities because there is not enough coral around to entertain the visitors. The tourism industry is very adaptable so many of them are now basing their activities on land such as on Whitehaven Beach, which is what you see behind me—nature walks et cetera. Snorkelling is still being done, but there are a fewer areas to pick from.

Why the recovery is slow, I would not hazard a guess. In discussing it with scientists, water quality, from their perspective, is possibly part of the problem. You can rest assured that the tourism community within the Whitsundays, which is a significant force, is very concerned about the water quality of the Whitsundays and this attempt to downgrade what we see as necessary regulations. It does not impress us at all.

Mr DAMETTO: The scientists we talked to previously basically said that the largest contributing factor to the health of the Great Barrier Reef is climate change. I am a learned person myself and I understand everything has an effect on something. I am trying to gauge exactly how much effect nutrient run-off and sediment run-off has on the reef. I am not arguing that it has zero effect. It

obviously has some, but no-one seems to be able to tell me what the percentage is. You are talking about your industry and the tourism industry. I am talking about agriculture because that is important to my area. Unfortunately, this regulation puts a lot of downward pressure on people to the point where some growers will no longer be profitable. I am concerned about that.

CHAIR: We have the department in front of us next so we can definitely talk about that. That is a very long preamble too, by the way.

Ms Brodhurst: I think it is worthwhile noting that the reason we are here is to explain to you what we are seeing out there right now. We are out in the Whitsundays now putting a huge amount of effort into reef restoration work. We have a lot of tourism operators changing where they are going with their tours because the reef is in a degraded condition. We have heard that nutrients are severely affecting the reef. These elevated nutrient levels, which have been largely attributed to agriculture, are affecting the reef.

When we go out there we can see algal blooming, we can see algal turfs and we can see increased sedimentation all around our reefs and it is not only impacting tourism but also impacting all the effort that is going into reef restoration. The reef restoration sites are covered in algae turfs. They are covered in sediment. You cannot see as far as you used to be able to see in the water. These organisms, which are filter feeders, are being greatly hindered in their recovery because of water quality.

We know that climate change is locked in. We know that we are going to be getting warmer waters and corals are under more and more stress, but water quality is one thing that we can impact locally and this is one thing that we can make a difference on. At the moment it is getting worse and it is really hindering all of our best efforts to help to repair and give the reef a helping hand to try to build its resilience while we are also seeing all these other changes such as climate change.

The impact of the water quality degradation is being seen in our region wherever we look. It is there now. It is already out there. It is only going to keep getting worse if we do not get our catchment management under better control and ensure that this legislation stays in place.

CHAIR: That is very well articulated.

Mr Rimmer: I wanted to add on to Olivia's statement that I think members have ample support on the side of the community here and reference when you want to discuss nutrient run-offs. We are by no means the most qualified people to have those discussions. We would refer to the scientific consensus statement and people speaking before and after us.

What I commend you for doing when you introduced this bill is thinking of the community rationale behind it. I know that you cited the $2 billion infused by the sugar industry annually. What I would implore you to do as well is, if you like, speak to a community like us to hear our thoughts because these kinds of decisions impact us, including the $6.4 billion contributed by the reef annually to the economy nationally and keeping up economies like ours in the Whitsundays. We are here to talk about the evidence that we have seen and we are feeling and to state that our community potentially could be hurt depending on the outcomes of bills like this one.

Mr ANDREW: Olivia, I just heard you talk about climate change and sediment run-off. Can you tell me how both of them are linked? You said that there is a lot of sediment run-off and it is due to climate change. I am trying to work that out.

Ms Brodhurst: I think we need to think of climate change as something that is amplifying all the existing issues. We already have run-off problems. We already have a lot of sediment going through our waterways. I worked for years in NRM focusing on waterway restoration. Sediment is already coming through our waterways in accelerated amounts. The sediment is not settling out. We have had reviews recently of our water quality in the Whitsundays. The sediment is not settling out like it used to settle out. It is at high levels. We can see it. If you come out we will show you. You can see the sediment in the water.

Climate change amplifies all of these things. The water is getting warmer. All our environments are getting put under pressure. The water system is changing. Rainfall is changing. High-intensity cyclones such as Cyclone Debbie are something we are going to see much more in the future. It is predicted with climate change that we will see fewer cyclones, but they are going to be big ones like Cyclone Debbie. I was here for Cyclone Debbie and she hung around for a long time and she was really strong. The amount of sediment that came out of our rivers and the amount of water that came through in that one event rather than being spread out over the year was massive. The link is that we are going to have all of those existing impacts amplified and if we do not do a better job at managing our nutrient and other sediment et cetera along our waterways coming off our agricultural systems, we are only going to see it become worse.

Mr ANDREW: You would have seen similar things in 1918. The biggest thing for me is how we determine the difference between agriculture and population as far as contributing factors towards sediment run-off?

Ms Brodhurst: Sorry, I really do not understand what that question is.

CHAIR: I will think we will take that more as a comment.

Ms KING: I wanted to draw on your experience as people on the ground connected with the tourism industry in your communities. What would the impact on the tourism industry in your communities have been if we had received the UNESCO in danger listing for the Great Barrier Reef?

Mr Fontes: That is a very good question with the answer unqualified in regards to research and other things. When the UNESCO listing of a World Heritage area came about it boosted tourism along the Great Barrier Reef. That is history. If the reef were to be put in the in danger listing both of these things will happen. One we will probably see a spurt in tourism, which is known as extinction tourism—see it before it is gone. Then we will most likely see a downturn in tourism because people will have the image that the reef is no longer worth visiting. The tourism agencies throughout Queensland will try to push that aside. It is a little bit hard to argue an in danger listing. I think overall we will see a downturn in tourism in not just the Whitsundays, mind you. Talen referred to $6.4 billion annually. That is not something that Australia can afford to just toss out the window.

CHAIR: Are there any comments from the two other participants on that point?

Ms Brodhurst: I will add something. As the world is reopening from COVID-19 this kind of in danger listing is really reducing travellers' confidence to come into our region.

Mr DAMETTO: It is not in danger.

Ms Brodhurst: No, if it were to get an in danger listing.

Mr DAMETTO: It is not in danger, though.

Ms Brodhurst: The amendment being proposed now is that next February there will be a review of the Great Barrier Reef as a World Heritage area. If that is not seen to be sufficient we risk getting in danger listing for the reef. As the world is paused with travellers not coming from international areas at the moment, we will see that when the world reopens our travellers will be more environmentally conscious. They will want to come to areas that they have confidence are managing their environment well. If we do not open up with our World Heritage listing intact, showing everybody that we are doing as much as we possibly can, we risk that people will go elsewhere for their tourism—for their holidays.

Mr ANDREW: That is a long bow to draw.

CHAIR: I am just going to address something. The conduct of committees is similar to when we are in the House, members. Can we not interrupt or argue with the witnesses.

Mr ANDREW: Apologies, Chair.

CHAIR: Can we pull it back and be respectful.

Mr Rimmer: I would like to address the interjection by members while Olivia was speaking. The reef has technically not been listed as being in danger. I am a dual citizen. My other citizenship is from Canada. I used to reside there. I can tell you from my experience of living in another country and hearing about the reef from an outside perspective, the UNESCO listing of being in danger is only the final step. People, at least from my perspective and what I have been experiencing, understand that the reef already has significant threats. They are aware of the news going on with the reef regardless of whether or not the UNESCO listing is final. I would ask members to consider that when discussing bills like this. I think there is a need for strong, bold action to protect the reef further and make sure people know that there is action being taken.

Mr ANDREW: Is it population or agriculture causing the issue?

Mr MOLHOEK: In terms of global warming?

Mr Rimmer: Again, I refer you to the scientists on that question. Once more I point out that we are here as community members. We are not here to discuss those kinds of questions. There are people far more qualified than us, I assure you, to discuss that. If you would like to hear about the impacts for us personally and for our community, because this bill is about community, I would take any further questions.

CHAIR: I think each of you have contributed wonderfully in terms of the local impacts to the Whitsunday area which we value very much in North Queensland. I thank each of you for your time and your submissions. We do in fact have the chief scientific officer before us next. We will be asking those questions. Thank you very much for your contributions.

HENRY, Ms Nyssa, Chief Scientific Officer, Reef Policy, Office of the Great Barrier Reef, Environmental Policy and Programs, Department of Environment and Science

SMYTH, Ms Louise, Director, Reef Policy, Office of the Great Barrier Reef, Environmental Policy and Programs, Department of Environment and Science

CHAIR: Welcome back. Thank you so much for your time this morning. As you have heard from the previous group, there are some questions around the science. I cannot think of anyone better qualified than Dr Henry to start with an opening statement and then take some questions.

Ms Henry: Thank you, committee members. I would like to make a brief opening statement. Firstly, I would like to acknowledge the traditional owners on whose land we meet—the Turrbal and Jagera peoples—and pay respect to the elders past, present and emerging.

As some of the scientists mentioned previously this morning, there is a large evidence base that exists for the land use impacts on the Great Barrier Reef water quality and ecosystem condition. The Great Barrier Reef ecosystem includes connected catchment and coastal ecosystems including wetlands, mangroves, seagrass and coral reefs that support a wide variety of life as well as local economies, with many jobs dependent on tourism and fisheries.

Summaries of over 2,000 peer reviewed, published scientific papers and reports that provide the supporting evidence have been undertaken periodically since 2003. This scientific assessment underpins the evidence base for the joint Australian and Queensland government Reef 2050 Water Quality Improvement Plan.

While the main source of water pollution is agriculture, as it is by far the largest land use within the catchments adjacent to the reef, the Reef 2050 Water Quality Improvement Plan does include other actions to address urban and industrial areas which can create concentrated pollution that has important local impacts. It includes targets for improving water quality leaving each catchment to help prioritise actions.

The *Scientific consensus statement: land use impacts on Great Barrier Reef water quality and ecosystem condition* is a foundational document that informs plans for managing impacts of water quality on the Great Barrier Reef ecosystems. For the *2017 scientific consensus statement*, over 1,600 peer reviewed published scientific papers and reports, including monitoring and field data, were synthesised over five chapters by a multidisciplinary group of 48 scientists.

The lead authors, along with the Reef Water Quality Independent Science Panel, further synthesised and summarised evidence to arrive at an 18-page Scientific Consensus Statement, which was reviewed then by two independent reviewers. It is this synthesis of scientific research that underpins the actions for protecting the reef, not one single piece of research or a single researcher or organisation.

The *2017 scientific consensus statement* key conclusions were: the decline of marine water quality associated with land based run-off from the adjacent catchments is a major cause of the current poor state of many of the coastal and marine ecosystems of the Great Barrier Reef. Water quality improvement has an important role in ecosystem resilience.

The main source of the primary pollutants—nutrients, fine sediments and pesticides—from Great Barrier Reef catchments is diffuse source pollution from agriculture. These pollutants pose a risk to Great Barrier Reef coastal and marine ecosystems.

Progress towards the water quality targets has been slow and the present trajectory suggests these targets will not be met. There is an urgent need for greater investment in voluntary practice change programs, the use of regulatory tools and other policy mechanisms to accelerate the adoption of practice change further to reduce water quality pollution. I seek the committee's permission to table copies of the *2017 scientific consensus statement*.

CHAIR: Is leave granted? There being no objection, leave is granted. We might get an email copy of that as well.

Ms Henry: I welcome questions of the committee.

CHAIR: We have heard this morning that the member for Hinchinbrook is most concerned about nutrient run-off. You have just made a statement saying agriculture has the largest impact. Can you unpack that a little bit before we move to questions?

Ms Henry: Absolutely. In the Great Barrier Reef catchment, as you know, over 75 per cent of the land use is agriculture. Urban is less than one per cent of the spatial area. When this translates into loads of water quality pollutants, we know that about 90 per cent of it is from agriculture—so less than 10 per cent from urban areas.

Specifically for sediment, about two per cent of the sediment comes from urban areas and about seven per cent of the dissolved inorganic nitrogen, which is the highest risk form of nitrogen because it is immediately available for plant uptake in the marine environment. We know, on balance, where the majority of the loads are coming from. That is why our plans are only seeking to reduce that anthropogenic or that human level of pollution, not the natural loads.

Mr DAMETTO: I am trying to write this down. I am sorry to interrupt. With that 75 per cent coming from agriculture, does that take into account unallocated state land and national parks?

Ms Henry: Yes. That 75 per cent is land use. There is something called the Queensland Land Use Mapping Program. That is just saying that, for example, grazing is 75 per cent of the area of the catchment. In terms of loads, it is less than 10 per cent from urban. I am happy to provide that.

We know from multiple lines of evidence, as synthesised in the consensus statement—that is, the summary which I have provided the committee. Chapter 2 goes into quite a lot of detail through all the evidence lines from coral cores, from scientific sediment tracing, from water quality monitoring, from modelling and from other research. It really synthesises where those main sources of pollution are coming from. That is how we know we have confidence in the information because there is consensus from a broad range of published literature and scientists that the main sources of anthropogenic pollution—human cause—are from those agricultural sources. We know there are natural amounts of sediments that come off rainforest areas. That is accounted for in the modelling. You have something called a total load, which is the overall load. Then we have the anthropogenic load, which is the human portion. We are not trying to reduce that total load. We are not trying to reduce natural loads. It is that increase factor that we are trying to reduce.

In the consensus statement, the figures they quote is that it is a fourfold to fivefold increase in sediment since pre-European days that is coming into the inshore reef area. For nutrients, it is at least a doubling for dissolved organic nitrogen. For dissolved inorganic nitrogen, it is mostly from those coastal cropping areas that are fertilised. For sediment, it is mostly from the grazing lands, stream banks and gullies which is from the broader areas.

Mr MOLHOEK: You mentioned a few minutes ago that one of the objectives is to promote or encourage greater use of voluntary practice programs. In turning to the proposed legislation, aside from some of the scientific issues, I think one of the points that the Katters are seeking to raise is that there is nothing voluntary about the regulations in respect of how they apply to graziers and cane growers and farmers. Do you think that is a bit heavy-handed—

CHAIR: You are seeking an opinion.

Mr MOLHOEK: Could we manage some of these practices through voluntary practices rather than by imposing law and penalties that are fairly significant? In the explanatory notes it talks of penalties up to $220,000. I note that you could pour toxic chemicals into the Brisbane River and the most you would be fined is $13,000 under the current prescribed penalties. It just seems heavy-handed. Are there other ways to manage this?

CHAIR: To put it in context, I think the department might have provided some information—correct me if I am wrong—that the voluntary uptake was not enough. I think you have a percentage there.

Ms Henry: That is correct. I will start and then I will hand over to Louise, who is in charge of the reef policy area. It is a mix of tools. The consensus statement really does draw out that it is a mix of tools. We have been having the voluntary approach for many years, supported with significant funding from both the state and federal government. For example, over the next five years—I do not know the exact figure—I think it is about $270 million for reef water quality measures. For example, for things like the cane growers' best management practice program, I think we put about $14 million into that program.

We do support voluntary programs, but the consensus statement draws the conclusion that the rate of progress and uptake has been too slow. That is why it recommended regulatory tools. That was further recommended by the Great Barrier Reef Water Science Taskforce, headed up by the former Chief Scientist of Queensland, Geoff Garrett. That basically came to the same conclusion, that we needed regulatory tools in addition to the voluntary tools that we already have in funding for a number of decades.

Ms Smyth: I think Nyssa has really covered it. That was back in 2016 that we had the Great Barrier Reef Water Science Taskforce make their recommendations following 12 months of discussion—that did include public consultation as well—on the recommendations that they were

going to make. They recommended that we use a mix of tools to radically improve water quality and to drive down the current loads of sediment and nutrients that are coming out of the catchments. One of those tools they recommended was to use regulation.

Mr MOLHOEK: I recently travelled from Emerald to Longreach and out to Boulia with the member for Gregory. We went to the headwaters of the Belyando River, which is also subject to these reef regulations. I have to say there was not much water in the Belyando River at the time. Why do we need the regulations to apply to such vast parts of inland Queensland that are so far removed from the reef? They are not fertilising pasture west of the Great Divide for grazing. Why is it so important that they be covered by the reef regulations?

Ms Smyth: I think this is one of those ones that does cross over between the science and the policy objective that you are trying to reach. Nyssa can comment about the fact that sediments are finding their way all the way to the reef lagoon from our upper catchments. We do know that especially in big events that is what is happening. Those ultra-fine sediments then find their way out—sometimes very far—into the reef lagoon.

The existing reef protection regulations are looking at the whole of the catchment and how that contributes sediment and nutrient loads to the reef lagoon. It is directed at trying to prevent those loads coming off farm and, as well, coming off the urban areas and from point source operators. The reef protection regulations try to address all of those sources.

Mr MOLHOEK: In terms of the catchment running west to east, I can understand. Then there are grazing lands west of the Great Divide where the catchments run—

Mr ANDREW: To the gulf.

Mr MOLHOEK: Yes, to the gulf. It probably more likely runs south into the Murray-Darling Basin and some of those other catchments.

Ms Smyth: That is well beyond our remit in the Office of the Great Barrier Reef and the Department of Environment and Science looking at the reef space in particular. All graziers want to keep their soils on their property.

Mr ANDREW: Every farmer does.

Ms Smyth: That is right. Not only the regulations but also the voluntary work that we do is directed at assisting growers to keep their soils as good soils on their properties regardless of where it is. It will be the same west of the divide.

CHAIR: The member for Hinchinbrook asked a question earlier to the group just prior to you about percentage of nutrient run-off in terms of grazing, particularly around cane growers. I think you wanted to know about pesticides. Can we give some data to that? Do you want to ask that question again, member for Hinchinbrook, while you have the department here?

Mr DAMETTO: I will let you ask the question, if you like, and I can ask a follow-up question.

CHAIR: His question was leading to the percentage of nutrient run-off from agricultural land. I know you mentioned 75 per cent. Can you dial down a little bit further on that at all?

Ms Henry: Yes. Nutrients come from two sources. There are nutrients attached to sediment, which we call particulate nutrients. They are the ones you find mostly in grazing run-off. From grazing areas including the Belyando, which is a subcatchment of the Burdekin, we know 27 per cent of the fine sediment gets to the reef—

Mr MOLHOEK: It is a long way from the Burdekin though.

Ms Henry: Sediment tracing shows that the sediment does get through. Obviously the closer to the coast the more gets through. Twenty-seven per cent of the overall sediment load that comes out at the end of the Burdekin does come from the Upper Burdekin catchment, which is hundreds of kilometres from the coast. Scientific sediment tracing has shown that, as well as water quality monitoring and scientific modelling. That is in chapter 2 of the Scientific Consensus Statement, if you would like to look at that report. It is a CSIRO report by Rebecca Bartley.

There is good evidence from multiple lines of evidence that sediment does travel a long distance and it produces sediment as well as particulate nutrients, like particulate nitrogen and particulate phosphorus. The grazing regulations really are focused on keeping an adequate level of ground cover to minimise that erosion loss—which is, on our water quality framework, considered a moderate practice. It pretty much aligns with where industry standards are.

For the dissolved inorganic nitrogen, that is mostly sourced from the coastal cropping areas where there is fertiliser applied. It just happens to be, by land use, that sugarcane is more predominant land use in that cropping zone that uses fertilisers. There are contributions from bananas, horticulture

and other crops as well. If you want to read more detail around that, specific figures are all in chapter 2 of the consensus statement. I do not memorise all of them off the top of my head. There was the summary statement which said there was a doubling in dissolved inorganic nitrogen loads from the fertilised cropping areas for the inshore reef delivery.

Mr DAMETTO: Ms Henry, my question is around the modelling used particularly previously to identify that regulation needed to change. There was an act—regulation needed to change. Can you talk to me about the modelling that has been done on the regulatory changes that have just happened to discuss how these regulatory changes will impact the Great Barrier Reef moving forward and better water quality?

Ms Henry: There is a scenario modelling report that is available on our reef plan website where they have run scenarios that approximate the regulations. It showed that with full adoption of best management practices for water quality outcomes in the sugar cane industry, for example, the nitrogen reduction targets for the reef are actually feasible and achievable, and for sediment—

Mr DAMETTO: Do you know what they are?

Ms Henry: There are about 35 catch basins or catchments that drain to the reef. Each one of those has a different dissolved inorganic nitrogen target. That is then rolled up to each of the NRM regions, like wet tropics, for example, and then that is then added up to be GBR level target. For example, you can go to the reef water quality report card.

Mr DAMETTO: Yes, I know the one.

Ms Henry: If you have a look at that on our website. So for dissolved inorganic nitrogen, the target is 60 per cent, but if you go to a regional target like wet tropics, it is also 60 per cent. That modelling showed that with full adoption of best practice for nutrient management in sugar cane, you can get to that wet tropics target, for example, for dissolved inorganic nitrogen.

Mr DAMETTO: My biggest concern about the regulations—and this was actually stipulated when the legislation was being debated in 2019 and then implemented—is that the state government would be putting a five-year ban on changing any of those regulations. If in five years we do not reach those targets, what is the industry looking at then with the regulatory change?

Ms Henry: I would defer to Lou for any reg policy questions.

Mr DAMETTO: That is concerning, yes?

Ms Smyth: It is very difficult to get a crystal ball five years in the future and we cannot really comment about that.

Mr DAMETTO: What growers are mainly concerned about is—they are suffering right now with the regulatory burden—if they do not get to that target, is the state government likely to go towards a stronger regulation?

CHAIR: You are seeking an opinion there. We cannot go to those hypothetical questions. I will go to the member for Mirani, though.

Mr ANDREW: Is the reef in decline? Is it getting better or is it in decline?

Ms Henry: What the AIMS colleagues might have alluded to this morning is that there are two main reports that really tell you about the health of the coral ecosystem component of the reef, acknowledging that it is much broader than that. The report that they were talking about this morning was for the mid and offshore reefs mostly. The report you would want to look at for the inshore area is called the Great Barrier Reef Marine Park Authority's Marine Monitoring Program. It assesses all the inshore coral reefs. I just had a look at their report this morning from 2020 which is on the Great Barrier Reef Marine Park website, and they found the condition of inshore reefs across a range of indicators continues to be in poor condition, as it was in the previous report card. That is for coral as well as seagrass. Both inshore coral and seagrass are considered to be in poor condition in the inshore reef. This differs to the mid and outer shore reefs which the AIMS long-term monitoring report looks at. That is less influenced by water quality from the coast because it is further away from that land base run-off. The zone that is influenced, that inshore reef, which you heard from some people this morning—

Mr ANDREW: Just quickly, are there conflicting scientific opinions on the health and the quality of what is happening with the reef at the moment?

Ms Henry: No, there is actually very strong consensus around the health of the reef, as stated in the Scientific Consensus Statement. I have the figures there. Over 3,000 authors and 400 research organisations from 50 countries and 1,300 published papers go into that consensus statement, and

it was very conclusive that there is strong evidence for the decline of the inshore marine health related to land base run-off and the priority pollutants being from agriculture. It is very important to not get misled by some people that like to cherrypick the offshore data and pretend that is the only part of the reef that matters. That inshore zone is fundamentally the zone that is important for tourism and for fisheries and coastal dependent—

Mr ANDREW: So the 200 tonne of coral that is harvested off it, does that make an impact?

Ms Henry: Coral harvestings are regulated by the Great Barrier Reef Marine Park Authority, so I would defer questions to them. That is not in our remit, sorry.

Ms PEASE: Thank you very much for coming in and for your learned and very well presented information. During your opening statement, Ms Henry, you spoke about the amount of money that has been invested over the years with working with the agricultural sector to encourage voluntary work and there has not been a great uptake on that. You have already talked about some data showing that it has not been taken up. Is there any anecdotal evidence or information as to why it has not been taken up voluntarily?

Ms Henry: There are social scientist reports—they are called the human dimension science reports—that are available on our website, where social scientists have gone into some of the barriers, and it ranges. Barriers are quite individual. It depends on people's individual circumstances: age, demographic, where they are, are they new to farming, have they been farming a long time. I can speak from personal experience. My father is a canefarmer. My family are fifth generation Tully canefarmers. They adopted these practices years ago because it makes them money; they have done it for economic reasons, not for environmental reasons. There is a good proportion of the industry that has taken these practices up, but the problem is the other three-quarters that might not have made changes and have not made changes fast enough, and how do we move those. Voluntary approaches have really shifted through their own efforts to adopt to these profitable practices. It is how you get the ones who are not engaged in the current programs of voluntary approaches, and that is where social science shows you need that mix of tools, including regulations to shift the other half.

Ms PEASE: You mentioned there that it makes money. How, by adopting these practices, does it make the canefarmers money?

Ms Henry: For example, the adoption of best practice nutrient management of sugar cane is about doing a fertiliser management plan for your property that takes into account your own data, rather than just a whole-of-district average. You can reduce your fertiliser input costs with that. We have done trials of farmers in the Burdekin, and some of them made $30,000 profit over the course of the program by basically fertilising for what the predicted crop needs rather than overfertilising, for example.

Ms PEASE: That is a significant piece of information—as an encouragement, as an enticement to farmers to actually participate in the program. It is interesting. Do you have a number of farmers that have not? You mentioned three quarters. Was that just a comment or is that—

Ms Henry: No, there is data. If you have a look at the reef water quality report card that is published on the Queensland Reef Plan website, which is a joint state and federal report card, they have actual measurements of adoption of different practices across each of the industries. As at the last report card, it was about 21.8 per cent uptake of best practice nutrient management for the sugar cane industry.

CHAIR: That is interesting. If I just make an observation, member for Hinchinbrook, you talked about farmers suffering. You have just heard about farmers increasing economic output by adopting new practices.

Mr DAMETTO: I would like to speak to that, through the chair. I am probably a fourth generation cane-farming family in the Hinchinbrook electorate. If it is so profitable and if it is so good for farmers—and I know most canefarmers do appreciate making profit—that is why most people are in business—

Ms PEASE: I think everyone.

Mr DAMETTO: Fair call; I will take that interjection. If these regulations are workable and profitable, why have we got such a number of submissions from canegrower groups, everyone from Pioneer Canegrowers Group all the way through to Canegrowers and AgForce as a larger industry body, all saying that they are against this current regulation and for the legislation put before the House?

Ms Smyth: I will respond to that question. It is a good question. I think that, as Nyssa said before, there is a range of barriers as to why people are finding it difficult to take up best practice. It is actually not the case that everyone is entirely profit driven. There are a range of other matters that

come into play. In the regulatory space, the peak industry representative bodies are very keen to support voluntary approaches over regulatory approaches. This is just opinion, but I expect that other submissions reflect that preference for voluntary versus regulatory approaches.

CHAIR: The voluntary take-up is not enough.

Mr ANDREW: Correct me if I wrong, there has been $18 billion spent on water quality—I think we, as the committee, found that as the figure—$18 billion between federal and state funding?

CHAIR: I do not know where you come up with that.

Mr ANDREW: How much of that would have been scientific work and how much of that has transposed into farming and what actually happens to stop any degradation of water quality?

Ms Smyth: I think we will have to take that question on notice, Chair, if you need the figures.

Mr ANDREW: That is a very important question.

Ms Smyth: We have investment figures and breakdowns for how we invest money from both the Queensland and Australian governments, so I will need to take that question on notice.

Mr ANDREW: Because the farmers in my region—

CHAIR: Member for Mirani.

Mr ANDREW: Sorry. I apologise.

CHAIR: There has been a pattern of interrupting the speakers this morning.

Mr ANDREW: My apologies.

CHAIR: Pull it back.

Mr ANDREW: Will do.

Ms PEASE: In the bill, there is a proposal that there is an independent regulator created, or to establish a discussion panel or group. From the previous presentation by AIMS, they talked about the fact that that is already happening, and you have presented a document which proves that point. Can you comment on that part of the private member's bill and give some data around that part of his bill?

Ms Henry: I would probably agree with the AIMS colleagues this morning that the scientific—it is internationally recognised peer reviewed process. That scientific literature is peer reviewed before it is published and it is that broad evidence base that we rely on to inform policies. It is not just the published science. That then gets synthesised by experts across a broad range of disciplines—biophysical, agricultural, social scientists—that make up those 48 scientists that produced the last consensus statement. That then is further reviewed by the Reef Water Quality Independent Science Panel which is a nine-member science panel of independent experts. In addition to that, they also send it to two outside reviewers, one from Murray-Darling and one that deals on World Heritage issues, just to have someone outside the reef space also look at the translation of that synthesis of those 2,000 peer reviewed published papers into that consensus statement document. We feel we have a very robust process. It is actually world-leading. We work with people in the US, the UK and around the world, and they are quite envious of our process of scientific evidence based policy decision-making. It is actually one of the few circumstances where we have this large process that we repeat every five years to really pull together what is the broad evidence base and synthesise that to tell us what the science is saying, and that then gets passed over to our policy colleagues to use in their decision-making. We feel that the processes are robust and the conclusions are strong.

Ms PEASE: With regard to the voluntary as opposed to the regulatory requirement for undertaking these changes, because we have already seen that the voluntary uptake has not happened—

Mr DAMETTO: I am sorry, through the chair: some of it has happened.

Ms PEASE: Can I just ask the question, Chair? I take a point of order. This is becoming very annoying. Under other circumstances I would ask you to caution and warn these members for interrupting.

Mr DAMETTO: Through the chair—

CHAIR: Member for Hinchinbrook, there is a point of order. It is just like being in the House. The conduct this morning of interrupting—

Ms PEASE: It is a frivolous and vexatious continued point of order.

CHAIR: Don't make me enforce standing orders in a public hearing. Can we just think of our conduct and allow the question to be asked.

Mr DAMETTO: Can I relay the point of order?

Mr MOLHOEK: It is a point of order, Mr Chair.

Mr DAMETTO: Point of order, Mr Chair: if the member is asking a question with a statement in it and the statement is not factual, I believe the member would be misleading the House.

CHAIR: I am not taking your point of order. I am asking the member to finish her question and I am asking that members are allowed to finish their questions without interruption.

Ms PEASE: Thank you, Chair. The voluntary uptake has not been as large as we would like to have seen, with only 21 per cent taking up voluntary participation. Is there any evidence around the world where voluntary take-up of these sorts of impacts has happened or has there always had to be one in an introduction of a regulatory requirement?

Ms Henry: I would say there is in most of the international literature, as described in the consensus statement—so chapter 4 looks at the management implications. I am pretty sure they said it is a mix of tools. That is the way they came at it: it is a mix of tools. Voluntary alone does not seem to be able to get you there in most environmental legislation around the world. You also need the mix of tools, with regulation to move certain cohorts that do not want to move. For those who are already doing that best practice, it does not really mean any change for them. It is really only targeting the ones that are not at that minimum standard level.

CHAIR: That will conclude this session. Thank you very much to representatives from the department, Ms Henry and Ms Smyth.

Mr MOLHOEK: Can I ask a quick question to be taken on notice? Nyssa mentioned that in chapter 2 of this report it says there is 27 per cent, but there are actually no statistics in chapter 2. This obviously refers to another document.

Ms Henry: That is the summary document. I will send you the online link. It is about 660 pages.

Ms Smyth: It is just the summary, not the actual statement.

Mr MOLHOEK: I was looking at chapter 2 and there was nothing in there.

CHAIR: Thank you very much again for your contributions this morning. We took one question on notice, which was about the financial investment. Can we have the answer by 10 September, please? Thank you very much. Our next witnesses are already patiently waiting.

JAIRETH, Dr Hanna, National President, National Environmental Law Association (via videoconference)

McNAMARA, Ms Erin, NELA submission contributing author, National Environmental Law Association (via videoconference)

POINTON, Ms Revel, Managing Lawyer, Environmental Defenders Office

CHAIR: Welcome. Who would you like to make an opening statement?

Dr Jaireth: Good morning, Chair and committee members. The National Environmental Law Association welcomes this opportunity to speak to its submission and to respond to questions. We speak to you from Ngunnawal country, Canberra, and Turrbal and Jagera country, Brisbane. NELA is the peak body for the advancement of Australian environmental law. NELA confirms the recommendations in our submission that this bill not be passed. Taking account of more recent developments, our main reasons are—

CHAIR: I think you are hearing feedback from here.

Dr Jaireth: I am hearing a lot of feedback.

CHAIR: Ms Pointon, we are having technical difficulties. Would you like to continue until we can overcome whatever is happening?

Ms Pointon: Good morning, Chair and committee. Thank you for inviting the EDO to present to you this morning. I start by recognising and paying my respects to the Turrbal and Jagera peoples on whose land we are sitting today and also the First Nations, particularly those whose land and waters make up the Great Barrier Reef. I am here today speaking as an environmental lawyer from the Environmental Defenders Office. We have experience closely examining the effectiveness of our environmental laws and how well they are doing in avoiding and mitigating our impact on the environment, including of the Great Barrier Reef. Environmental laws such as those seeking to be repealed in this bill are an important reason why Australia has to date maintained such a healthy and clean environment compared with many other countries.

All industries in Queensland are subject to regulation to ensure that their impacts to humans and the environment are limited and in the public good. The environmental authority framework under our Environmental Protection Act is a well-established framework for assessing environmental impacts and is an appropriate way of assessing proposed impacts to our environment and deciding whether those impacts or the activities are appropriate in the area proposed.

We are very supportive of farmers and anyone impacted by regulation being assisted in understanding those regulations and where appropriate in the implementation of those regulations, for instance, through extension officer work and whatnot. The reality is, from what we have heard from farmers and the department, that many of the Great Barrier Reef regulations that are in place if implemented will and are in fact assisting farmers in efficiencies and profitability of their operations.

The best available peer reviewed science tells us the current regulations will help lead to reduced impacts to the Great Barrier Reef as well to ensure that it has a better chance of survival against impacts such as from climate change. More action is no doubt needed around climate change, but in terms of facilitating the reef's strength in being able to be resilient against those impacts in the meantime we need to do all we can to protect the reef's health.

We do support the things in the bill that relate to implementation of an independent regulator and the discussions that are currently in place around the implementation of an independent EPA in Queensland as the only state in Australia that does not currently have one and understanding clearly the need for a strong environmental regulator in our state. We also support more transparency around the creation of standards. These standards, however, should be scientifically based and so we would consider that the independent regulator, hopefully put in place in Queensland, would be an appropriate entity to develop those standards rather than a politically affiliated minister.

We implore all members of the committee to support the Great Barrier Reef having the greatest chance of survival possible and consequently to not support this bill, but to continue conversations about the potential implementation of an independent environmental regulator and more transparency around regulation in Queensland.

CHAIR: I am sorry for the technical issues, Dr Jaireth. I do not know if you want to try again?

Dr Jaireth: I do. I had the Parliament.TV channel open, which is why there was feedback. I apologise.

NELA wishes to confirm the recommendations in our submission that the bill not be passed. Taking into account more recent developments, our main reasons are: the need to respect consensus science concerning water quality; Australia's international legal obligations; and pursuing sustainability as a more constructive approach, including sustainability certification. Penalties need to be commensurate with risk. We emailed the committee a longer version of this statement this morning, but to save time and avoid repetition I will omit some of the evidence already heard this morning.

In NELA's view, the passage of this bill would weaken current regulatory measures when the 2019 Reef Water Quality Report Card under the Reef 2050 Water Quality Improvement Plan found that progress towards water quality improvement targets had been too slow. Cumulative impacts from land based pollutants and other pressures such as coastal development are leading to poor water quality. In many inshore marine ecosystems, climate change is an overarching threat to the reef.

The bill, if passed, would also detract from Australia's ability to fulfil its international obligations under the World Heritage Convention, the Convention on Biological Diversity and the Paris Agreement of the climate change convention. In July this year, as is well known, the World Heritage Committee noted that the long-term outlook for the reef had deteriorated from poor to very poor and the progress in many water quality and land management targets in the Reef 2050 plan have been insufficient. The committee reminded Australia that state parties to the Paris Agreement need to limit global average temperature increases above preindustrial levels to well below two degrees Celsius and preferably to one degree Celsius. This is a crucial threshold for the health of coral reefs globally. The latest report by the Intergovernmental Panel on Climate Change, released in August, warns that time is running out to achieve that target.

This week the Australian Conservation Foundation released a national survey undertaken by YouGov that found the majority of voters across Australia's 151 federal electorates support more action to tackle climate change. The International Union for Conservation of Nature, in its 2020 conservation outlook, had assessed the status of the reef as critical. The IUCN is the conservation technical advisory body on nature.

NELA does acknowledge that farmers can feel overwhelmed by regulatory change. However, since the 2019 amendments affected by the Environmental Protection (Great Barrier Reef Protection Measures) and Other Legislation Amendment Act, only 25 prosecutions have occurred under the Environmental Protection Act 1994, none of which involved agricultural breaches. NELA's view is that members of parliament in Queensland and industry stakeholders could contribute more constructively to protecting the reef and achieving sustainable economic growth by promoting awareness amongst farmers and other industry stakeholders of the opportunities that are available to farmers to improve their on-farm practices.

The Australian and Queensland governments are reported to have invested a combined total of $3 billion to improve and sustain the health of the precious reef. In addition to the intrinsic values of the reef, it supports around 64,000 jobs and contributes an estimated $6.4 billion to the national economy. The reef also holds a priceless and integral place in our First Nations people's cultures and is valued globally as a natural wonder of common heritage.

The Queensland Rural and Industry Development Authority, QRIDA, provides funding to improve reef water quality and reduce greenhouse gas emissions. QRIDA administers the Farming in Reef Catchments Rebate Scheme that helps offset the cost of obtaining professional advice about managing nutrient and sediment run-off to improve water quality outcomes. That scheme is available to sugar cane, beef cattle and banana producers. QRIDA also delivers productivity loans that support best-practice management for sustainable land use, water and energy efficiency and other initiatives. In 2019-20, QRIDA approved 230 applications for first-start and sustainability loans worth $117 million under the Primary Industry Productivity Enhancement Scheme.

On its website, QRIDA provides the example of a Burdekin cane-farming family, the Wheelers, who invested in a new sump system and a 30-tonne digger, with the help of a sustainability loan and reef catchment grant. That loan enabled the Wheelers to recycle on-farm water, reduce sediment leaving the farm, create new access points to the farm and build haul roads and drainage channels. They estimate that cost savings effectively repaid the loan.

QRIDA also deliver several financial assistance programs under the Queensland government's Affordable Energy Plan, supporting the uptake of renewable energy and investment in energy efficient projects for households, primary producers and small and large businesses. Farmers in reef catchments can also obtain domestic and international market advantages from sustainability certification. Launched in August 2020, the Queensland government's Reef Water Quality Program,

delivered by Growcom, enables farmers in the region to achieve Hort360 Reef Certification to demonstrate their environmental stewardship and industry best practice standards in reef catchments.

Ecoganic certification is another scheme best known for its red tipped bananas that is recognised as an industry leader in promoting reef health. Other opportunities exist for nature based solutions for deteriorating ecosystems. CSIRO's 2015 National Outlook report, for example, demonstrates that the protection of biodiversity on farm can benefit the agricultural sector by stimulating natural capital investment. Carbon sequestration markets could benefit farmers in rural communities, particularly in New South Wales and Queensland, according to CSIRO, by increasing farm incomes by more than 30 per cent and national income by up to three per cent above existing trends.

Notwithstanding the economic benefits that more sustainable farming systems can deliver, NELA agrees with Professor Graeme Samuel AC's review report of Australia's national environmental law, the EPBC Act. Professor Samuel recommended that penalties for breaches in environmental law must be commensurate with the harm that may be done by noncompliance and that regulatory compliance must be regarded as mandatory rather than optional. The cost of noncompliance must be a deterrent rather than the cost of doing business. In NELA's view, in addition to incentives, both the Australian and Queensland governments must provide adequate resources to ensure optimal enforcement capacity to protect the inshore environment and outstanding universal values of the reef.

CHAIR: I know you have one of the authors there, but we might move to questions.

Mr MOLHOEK: You mentioned in your opening remarks that you supported some of the proposed amendments in respect of the appointment of an independent regulator, and I think you talked about the need for greater transparency around the setting and publishing of information around ERAs. While I understand there are a range of other issues in respect of the bill, if the bill were to go forward, do you think that perhaps there should be an acceptance of some of those with amendments and that this would be the time to introduce those changes?

Ms Pointon: My statement was in support of the theme generally of an independent regulator rather than the provisions necessarily in the bill as it stands. I understand there are conversations underway and a discussion paper about to come out about what an independent regulator would look like in Queensland. I think it is appropriate to have those conversations first before jumping in.

Mr MOLHOEK: Who is preparing that paper?

Ms Pointon: The Department of Environment and Science currently—

Mr MOLHOEK: Our own department is looking at that currently?

Ms Pointon: There may be other entities commissioned but they are looking into it at the moment, yes.

Mr MOLHOEK: I want to make sure I am correct. Did you say that Queensland is the only state that does not have an independent regulator?

Ms Pointon: That is correct. The EPAs around Australia are quite different. We have been doing a lot of research into the various forms they take in other states and territories. I think there is room for consideration about what an independent regulator should really look like, what is the best form for it and I think that should be a public conversation. We have particular issues in Queensland in terms of the independence around our regulation and the impacts other departments can have in overriding our environmental regulator as it stands that really need conversation when we are implementing the regulator.

As I mentioned, my support is generally that we do need more independence in environmental regulation, particularly science led regulation that is free of politics. Our environmental impacts are obviously highly politicised in Queensland particularly and it is appropriate that the regulator is separated from those politics in undertaking the work in both developing standards and also regulating the kinds of impacts that are—how it is assessed or what is approved or refused in the state. However, I think more work needs to be done before we actually do implement the EPA.

Mr DAMETTO: I like that we can be in agreeance that certain things need to be changed in the state. I appreciate being able to find some common ground in what we are all trying to fight for here. My question comes off the back of a comment made online that there were no breaches from agricultural processes previously of the ERA standards. No-one had been prosecuted or fined. From a legal point of view do you see it necessary to have increased the fine from roughly $13,000 to $80,000 and $220,000 to work as a deterrent when we did not have a breach previously?

Dr Jaireth: If I could just clarify, you said that after the amendments there has not been a prosecution?

Mr DAMETTO: Do you have any information regarding any prosecutions of anyone in agriculture regarding an ERA standard being breached—

Dr Jaireth: Thank you. Just to clarify, there has not been a prosecution post the 2019 amendments. I would also comment that maximum penalties are rarely imposed, especially for first offences. The main thrust of our comment is that with outreach technical capability development, farmers can implement a number of reforms that achieve the outcomes that we all want to see without going to prosecution.

If I could just very quickly comment on the issue of the independent EPA, you might be aware that there are national environmental standards under development, one of which pertains to the reef, which is a matter of national environmental significance under our national law. Then there is a debate underway currently, including this afternoon at a conference session with Justice Nicola Pain and Professor Niven from ADFA New South Wales speaking on the need for a national independent EPA. So as not to disadvantage Queensland farmers, there is a need for national standards to pertain to land run-off that affects reefs nationally. In particular Ningaloo Reef, for example, can be impacted by run-off so it is important that there are consistent uniform standards across Australia. Several stakeholders argue there should be a national EPA enforcing national standards.

Mr DAMETTO: Ms Pointon, in your previous experience as an environmental lawyer, have you seen any change in people's practices when increasing penalty units from, say, $13,000 all the way up to $220,000? Have you seen that sort of practice in the past applied in any ERA standards or legislation or regulation that has deterred people from making those environmental breaches?

Ms Pointon: We have been advocating for many years for better enforcement of particularly the reef regulations in the Environmental Protection Act but also of our Environmental Protection Act laws across-the-board. As my colleague mentioned in her opening statement, there is currently insufficient enforcement of our environmental laws, and the penalties that are implemented are not sufficient at all to disincentivise the likelihood of an environmental offence being committed. We would support, therefore, that penalties across the board for environmental impacts be increased. Particularly for large-scale operators, they are not enough to make a dent in changing practices at the moment. Higher penalties do lead to the business case, as it were, being better to actually follow the law rather than to take the hit of a low penalty for environmental offences that might be better in the long run for their business.

In terms of these particular laws, we would also strongly support that they simply were better enforced. As I mentioned, we do support assisting farmers and any people impacted by these laws in helping them understand them and, as far as possible and appropriate, to implement them. There is a necessity that as a worst case scenario for operators who are not interested in the public interest benefit of everybody following the law, there needs be laws in place that do mitigate against environmental impacts and some kind of penalty that will ensure they are disincentivised from those impacts.

Mr DAMETTO: What I got from that was there is a need for better enforcement rather than perhaps increasing penalties; is that right?

Ms Pointon: I would say both is appropriate.

CHAIR: If there are no further questions, Ms McNamara, do you want to make any observations before we close this session?

Ms McNamara: I do want to make a comment regarding the World Heritage Committee's decision that has just been released—in June this year. They did recommend that the Great Barrier Reef be put on the endangered list. It is an issue that legislation is not currently fixing. It is very evident that introducing this bill would put us backwards rather moving forward in helping the Great Barrier Reef.

CHAIR: Fair point. Thank you very much to representatives who have joined us this morning for your contributions. We will adjourn for half an hour and recommence at 12 o'clock.

Proceedings suspended from 11.26 am to 12.05 pm.

ARTIACH, Ms Julie, Representative, Kalamia Cane Growers Organisation Ltd (via teleconference)

MALAPONTE, Mr Robert, Chairman, Kalamia Cane Growers Organisation Ltd (via teleconference)

PAINE, Mr Dave, Manager and Company Secretary, Kalamia Cane Growers Organisation Ltd (via teleconference)

ZANDONADI, Mr Robert, Director, Kalamia Cane Growers Organisation Ltd (via teleconference)

CHAIR: Welcome back to this public hearing of the Health and Environment Committee. The purpose of today's hearing is to assist the committee with its inquiry into the Environmental and Other Legislation (Reversal of Great Barrier Reef Protection Measures) Amendment Bill 2021. I now welcome representatives from Kalamia Cane Growers Organisation, who are joining us via videoconference. Would you like to make an opening statement and then we will move to questions?

Ms Artiach: We thank the committee for the opportunity to appear today. The point that we want to make is that we are not scientists. Kalamia Cane Growers represent sugarcane farmers. The comments that we make are in this context. We are not here to argue about the merits of the science. There are far more other qualified people who can make comment in that space. We are here to look at the legislation, particularly the 2019 amending act and why Kalamia supports Mr Dametto's private member's bill. There are several points that we are seeking to make today. The first one is that the Environmental Protection Act, as all the committee is well aware, seeks to regulate farming practice. However, we believe it is imperative that the committee needs to conduct on-farm visits and to speak with growers before tabling its report to parliament. There is a reason why we hold this view.

Unfortunately, decisions have been made in the past based on stereotypes, misconceptions and mistakes of fact in relation to growers, farms and farming practices. I will cite just two examples. The first one is that there is tail water run-off from farms into a water course. What I am referring to is the misconception that this occurs with respect to every single farm; it does not. The second is an example of a mistake of fact. This happened in relation to the department devising the ERA standard for sugarcane. In relation to calculating the district yield potential for the Burdekin, the department amalgamated the production figures for the Herbert and the production figures for the Burdekin and came up with an average tonne per hectare in the Burdekin which was substantially less than what in fact it actually is. That is an example of a mistake of fact that occurs when proper consultation does not occur.

It is one of the reasons why we are of the view that the committee really does need to come and have a look at farms and come and have a look at the landscape. In the Burdekin we have 90,000 hectares of land. Also, it gives an indication of the necessity for proper consultation. It is also why Kalamia supports in the private member's bill the ERA standard being the domain of the minister and not a public servant within the department. Further, it is an indication of the importance of the independent adviser as proposed in the bill.

The second point that we seek to make is that the 2019 amending act imposes further inflexibility and rigidity on growers' ability to respond to changing circumstances. If time permits, I would really like the committee to ask some questions in that regard. The third point that we seek to make is that we fundamentally oppose the increase in the penalties under section 82 of the act. The final point is that we support the bill amending sections 77 and 78 of the act where review is limited to just considering whether or not there has been an improvement in water quality as far as the policy is concerned around the legislation.

Having a regulatory impact statement for the 2019 bill and the subsequent explanatory notes, it is extremely evident that even the government anticipated the enormous cost impost and potential loss of productivity that must form part of the review going forward. It is for these reasons that we see the limitations imposed on sugarcane by the 2019 amending act and, as the committee is well aware, sugarcane was always subject to the Environmental Protection Act prior to the 2019 amending act. We are not talking about repealing all legislation; it is just the effects of the 2019 amending act. It is for these reasons that Kalamia supports Mr Dametto's bill.

CHAIR: Thank you for your opening statement. We just heard from the department. You raised a couple of points that you wanted to address in supporting the bill. One was that you fundamentally oppose the penalties proposed. The department has just given advice that there have been none—no-one has been penalised since the introduction of the 2019 amendments around this. Can you comment on that?

Ms Artiach: It is piece of legislation that exists. Mr Harper, I will reveal that I am lawyer. My comments are made in that context. If it is a piece of legislation, there is the probability that a grower will be prosecuted. I do not think that you can say or that it is a viable proposition to argue that because the department has never prosecuted anyone to date it is never going to occur.

CHAIR: The EDO representatives who appeared after the department also used the term that these penalties would be 'extremely rare'. I am just picking up on their points. You have your position on that. I do not want to take up other members' time. The other example the department gave us concerned the increase in yield and economic activity. They actually named a Burdekin grower, surname Wheeler, who had a $30,000 increase in output under the current provisions that have existed since 2019. It talks about the incentivised benefits of adopting these regulations. Can anyone comment on that?

Ms Artiach: We are unaware of Mr Wheeler's personal circumstances. The difficulty with any piece of legislation is that it is a one-size-fits-all approach. Just because for one grower it resulted in an improvement, you cannot extrapolate that it is an improvement for everyone. For example, if a grower wants to improve water efficiency, the capital cost of doing so could be exorbitant depending upon the configurations of the farm. Just because for one grower it has produced an improvement in economic circumstances, you cannot extrapolate that that relates to every single grower. It depends on what his farming practice was like.

CHAIR: I apologise. They did use him as an example. I would have to go back to *Hansard*. I think they used that in the context of an example, but there are a number of increases among growers. It was not just the one they were relying on. Anyway, there is a report there. Before I move to questions, you identified that you are a lawyer but are you a canegrower yourself? Are you in the industry?

Ms Artiach: I have been a party to a representative organisation for 10 years and my father was a grower. That is my background.

CHAIR: Thank you very much.

Mr DAMETTO: Kalamia Cane Growers, thank you very much for attending today and for giving evidence. My question is more to the practical implications of the current 2019 legislation. Feedback that I get from many growers is that the regulatory burden and the expense far outweighs any benefit to their farming practices. Can you describe in layman's or real-world terms what it would mean to go from the 2019 regulations to what is proposed?

Ms Artiach: I am going to use a practical example. We are talking about cost in general. This is a practical example specifically of the difference between pre- and post-2019. Post-2019 the growers now have to have a farm budget, which sets the maximum amount of N and P that can be applied to a farm. What it does not allow for is discretionary circumstances. Under Six Easy Steps—so pre-2019—all the grower had to do was do a soil test, find out what were the deficiencies in the soil for growing a crop and then under Six Easy Steps that then calculated the amount of N that could be applied. There were no other restrictions. They were not restricted to a set amount in the calendar year, which is exactly what the farm budget now does.

Say, for example, a grower has circumstances beyond their control. There was a significant weather event or part of the farm has been affected by a pest or disease which requires them to take remedial action to improve the condition of the crop. They cannot under the farm budget—there is no discretionary power whatsoever—increase the amount of N and P that they can apply in that calendar year without committing an offence under the legislation. We do not find that acceptable. Where it is circumstances beyond a grower's control there has to be some discretionary ability; otherwise the grower takes the hit financially in loss of yield.

I posed this to the department and they turned around and said to me, 'In those circumstances you can write us a letter and the department will consider it.' No, you cannot do that. This is a piece of legislation that is prescriptive with no ability whatsoever for the department to have any power to waive any breach of the legislation. That is why pre-2019 it was easier for the grower to respond to changing circumstances than post-2019, and that is the cost predominantly that we are talking about.

Ms PEASE: I am interested in hearing about the work that you have done as an industry. I know that you have developed the voluntary Six Easy Steps. Do you have any idea of the take-up of that prior to it becoming regulated? I understand the department have used your Six Easy Steps and taken it to be part of this regulation. Prior to it becoming enforceable, what was the voluntary uptake on that program? Do you have any information on that at this point?

Ms Artiach: Because it was voluntary, the only role that we as an organisation played was assisting growers to understand. Remember this was all being done through BSES. This information was being provided to growers in assistance to them being able to do business in relation to their farm. I do not think that you would ever find, except for putting every single grower in Queensland under oath, an exact answer to that question.

I think BSES produced this information based on the work that they were doing to assist growers to understand, given the high input costs that growers face, that 'in certain circumstances the crop's requirement for N and P is this'. Most growers would have had regard to it because it was coming from BSES, but it was a guideline only. Growers would look at what was the actual data being produced from their farm.

There are so many confounding variables that impact on productivity—weather, for example. How many wet weather events were there? How many overcast days have you had? Was there an incursion of smut or some other pest or disease? All these confounding factors come into play when you look at impacts on productivity. This was one means by which growers could have a look at trying to control their input costs. That is what it was being used for. It was not being used for dictating the calculation of N and P.

Ms PEASE: I appreciate that background. I understand that it is one of the ways that the department has worked on their regulatory program. I understand you represent about 150 canegrowers in your part of the world?

Ms Artiach: That is correct.

Ms PEASE: Do you have a role in helping them to understand that voluntary position back when it was voluntary as opposed to what it is now? What would your role have been in that?

Ms Artiach: Absolutely. In the district itself we have various other organisations, as well as the four grower representative organisations, that assist members in understanding and disseminating information. One of the biggest roles of our organisation is to disseminate information. Whether it is a change in legislation or something along the lines of Six Easy Steps, our role is to assist growers to disseminate that information. It is one of the reasons why we have been seeking to try to improve the relationship between the grower representatives and the department because one of the conduits of proper consultation is not 10 or 15 minutes. We have very complicated circumstances under which growers farm. For us it is very important that we disseminate information, absolutely.

CHAIR: I apologise. We do need to move to the Bundaberg Canegrowers, who are here in the room. Thank you very much for your time. We have your submission and we certainly appreciate your contributions here today.

HOLLISS, Mr Dale, Manager, Bundaberg Canegrowers Ltd

LEIGHTON, Mr Matt, Membership Services Extension Officer, Bundaberg Canegrowers Ltd

CHAIR: I welcome Mr Dale Holliss and Mr Matt Leighton from Bundaberg Canegrowers. Would you like to make an opening statement?

Mr Holliss: First of all, thank you very much for the opportunity. I first was employed by Bundaberg Canegrowers in 2002 for a couple of main reasons: I come from a farming background, I am degree qualified in agriculture and I have a master's degree in environmental science. The first job I was tasked with was to work out our environmental footprint and how we could improve that.

In 2002 through to 2005 we started what we called the integrated farm management system in Bundaberg. You referred to the Six Easy Steps. We pioneered that program with SRA, or BSES as it was known then. At that time we called it a nutrient management plan. The reason why we did that is that it is a commercial instrument that fertiliser resellers occasionally use to sell fertiliser. We wanted to provide our growers with independent advice that we were sure of. That is some background.

We developed that. We became recognised as demonstrating actual practical environmental duty of care, so much so that in 2008-09 when the Bligh government brought in the first regulations, our area was exempt. The reason it was exempt was primarily because we are outside the Great Barrier Reef footprint. It is 70 kilometres to the north of us. We cannot impact the reef. We had also demonstrated best practice environmental duty of care.

In 2019 I believe we were caught up in a political process that involved regulating our area. We have provided lots of evidence that has counted towards the reports that are there. We have provided copies of that evidence for the committee, so you can take it, should you wish.

That whole process was very distressing to our members. The telling thing was the Burnett-Mary natural resource group, which is the group tasked with environmental care in our region, actually came out in public in support and stated that there was no need to have regulation on our industry because of our demonstrated environmental care and also because of our harm factor that we were outside the footprint. I will pass to Mr Leighton.

CHAIR: Procedurally, you are seeking leave to table that? There being no objection, leave is granted.

Mr Holliss: I have enough copies here. It is just as we struggled up the hill we had to spread them a bit.

CHAIR: Mr Leighton, would you like to continue?

Mr Leighton: A further reason for no regulations in the Burnett-Mary region specifically is that we do not overfertilise because we use the Six Easy Steps process. We have done since 2002 and our growers continue to do so to this date. I myself am a self-accredited agronomist who provides recommendations to growers and I use that Six Easy Steps process every day for every soil test that I conduct. There is very little run-off that comes out of our region or from our cane farms. Over 90 per cent of the water that comes off our farms goes through at least one tail water dam before it gets into a creek or waterway. Recent research has shown that by stopping the water for 24 hours in a pond of some description reduces the DIN by up to 15 per cent. By having our own natural catchments—and we have had these since prior to 2004—we are already capturing that water and reducing the amount of DIN that leaves our farms and enters the waterways.

Most importantly, the regulations do not capture the multispecies integrated farming system that is occurring in Bundaberg. Yes, we are cane farmers or represent cane farmers, but those farmers grow macadamias, sweet potatoes, tomatoes, zucchinis—124 different crops—in rotation on their farms in any one day in any given year. What we have as a blanket regulation to primarily target sugarcane does not cover what happens in Bundaberg.

If the reason for regulation is to protect the Great Barrier Reef, it is flawed. As Dale said, we are outside the footprint. We are 70 kilometres away from the nearest coral reef in the Great Barrier Reef. The oceanic flows go south. From Mackay south the flows go past Fraser Island and southwards so our nutrients cannot go to the Great Barrier Reef.

There is high coral cover. The recent AIMS report—and you had the AIMS scientists in this morning—showed that the hard coral cover in the southern region, which goes from Mackay down to Baffle Creek, increased from 29 per cent to 39 per cent in the last 12 months. If the reason for regulation is to stop poor water quality, we have had a 30 per cent increase in hard coral cover in 12 months, so how could the water quality be poor?

In 2009 Cyclone Hamish came through and destroyed the reef. By 2011 the AIMS report stated that there was nine per cent hard coral cover. By 2016 that number was back up to 37 per cent. How could there be poor water quality if the coral is growing so quickly? So farmers are not impacting the reef.

In this report there is an example of a study on crown of thorns starfish and the Swain outbreak, which is where the crown of thorns comes from, in the southern region. That is shown to be coming from nutrient upwell in the ocean, not from terrestrial sources. That is, again, more proof that farmers in the Burnett-Mary are not impacting the Great Barrier Reef.

If you are looking to protect the reef lagoon, again, that is flawed, partly because the nearest pesticide and nutrient monitoring station is 235 kilometres away at North Keppel Island. In the 2018 reef report card, the scientists stated that it is too far away for the Fitzroy to determine what is going on, and it is only 50 kilometres away. How could we be included when there is no science to say that we are making any contribution?

There has been no monitoring of our inshore corals. We have corals where you can walk off the beach or the rocks or dive and there are hard and soft corals right on our waterways you can see by snorkelling. You do not have to hop in a boat; you can do it from the beach. If cane farming and the farming in the Burnett-Mary were so bad, that reef would not be so spectacular. There has been no monitoring of that since the 2013 floods. There was a recent study started in 2020 by the Gidarjil sea rangers supported by Burnett-Mary. They have only just started doing the baseline, so we have no evidence that we are having any impact.

If we are using the reef report card as a reason to do regulation, again, it is flawed. There has been no funding in the Burnett-Mary region for several years. With no funding, there are no projects. With no projects, there is no reporting to the Paddock to Reef team. If there is no reporting, they are not adding anything to the report card. When it comes to our grower practices changing, no. In the 2019 report card there were no grower practices for sugarcane in any of the catchments in the Burnett-Mary. There is very little in horticulture, very little in grazing and very little in grains.

Yet with that in the Kolan catchment specifically we had a four per cent improvement in the water in terms of pesticide reduction. Now that is actually an A class waterway because we are now protecting more than 99 per cent of all aquatic species. We are already meeting and exceeding best quality. The Burnett-Mary, which is the third largest catchment on the east coast, is at 98.8 per cent of all aquatic species protected. It only needs 0.2 per cent and it will be at 99 per cent, at the target. We are nearly there on our catchments. We do not need regulation to get there. Without regulation, we have been making these improvements voluntarily and quickly. We just need the opportunity to do so.

Mr ANDREW: We appreciate your input. How much consultation did the department seek from you in implementing the first part of the Environmental Protection and Other Legislation Amendment Bill?

Mr Holliss: I believe we had half an hour. People came from Brisbane to speak at us and tell us what was coming. There were a number of meetings scheduled which were cancelled at the time. All in all, we had about half an hour's consultation in the first instance. In the second round, I believe we had a three-hour meeting with the departmental people.

Mr DAMETTO: My question is around nitrogen and phosphorus budgets, so nutrient budgets. My understanding from what you were just saying, Mr Leighton, is that a lot of the water from your on-farm practices is not making it into creeks and rivers systems. How can having a nutrient budget for those farms have any positive or negative impact on the Great Barrier Reef?

Mr Leighton: I do not believe there will be any additional benefits from bringing the nitrogen and phosphorus budgets into the Burnett-Mary region. That is because we are already using that process and have done since 2002. There is some information provided by Incitec Pivot from 1996 to 2014 about how much nitrogen and phosphorus was applied in various sugarcane regions each year. From the year 2000 to 2014, which was the last year of their data—so 15 years of data—the average nitrogen application in the Burnett-Mary was 138 kilograms per hectare. Using the Six Easy Steps process before we discount for organic carbon, our maximum rate is 160. We are already discounting from where we need to be.

Our phosphorus rates in that same period were 22 kilos per hectare and the rate normally is 20 kilos, but there are some soils that do require more. We are pretty close to being where we need to be in regard to the regulation and the regulated amount. There will be no additional benefit to the environment from implementing nitrogen and phosphorus budgets in the Burnett-Mary.

Mr Holliss: More specifically, we cannot impact the Great Barrier Reef, which this legislation targets, because we are 70 kilometres south of it. Secondly, because of the East Australian Current, anything that does get out of our system turns right and heads south.

Ms KING: Firstly, I want to thank you. It is clear that for many years now growers in your region have put the environmental impacts of what you do first and foremost. You have worked hard to minimise those impacts and to create the best possible outcomes for growers and for your local catchment and environment. Thank you for that work you have done over a long time.

Mr Holliss: We have actually endorsed sustainable economic development where we have looked at cultural, social, economic and environmental. Some people call it the triple bottom line, but we have actually lived and walked the talk.

Ms PEASE: Congratulations.

Ms KING: I do want to acknowledge that before I even go to a question, so thank you for that work. Would you say that all of the growers in the Burnett-Mary as far as you know use the Six Easy Steps program?

Mr Leighton: I cannot say, hand on heart, that 100 per cent do. I know that every person that I do a soil test for and make a recommendation for uses the Six Easy Steps. I know that the majority of the chemical resellers who do soil tests in the Bundaberg region use the Six Easy Steps process as well as those in Maryborough. I believe the ones in Childers do as well. All the recommendations are based on using Six Easy Steps. Unfortunately, it is up to the individual as to what goes on.

We also have limitations with the equipment. Most of our fertiliser applicators are cog driven, and the range you can target is around 75 kilos per hectare between one cog and the next. You cannot always get it exact as per—

Mr Holliss: We also run a company called Bundaberg Sugar Services Limited which provide extension and advice to growers. Every two years we soil sample 120 farms and we provide each of those farms with a recommendation based on the Six Easy Steps. We have done that three times and we are about to start that process again. That helps us productivity-wise because we have actually identified that we have a fairly significant silicon deficiency across the district. In its own way, even though they might not know that they are doing Six Easy Steps, they are. That is part of the process that we do, and it is one of the reasons why we believe we are being unfairly punished for this regulation.

The Anna Bligh government recognised what we were doing and exempted us. We cannot impact upon the reef. More importantly, it discourages a lot of our farmers. It is like punishing everyone in the class because of two naughty kids. We are not the naughty kids. There is every reason why we should be exempt from this legislation. That is what the Dametto bill does for us. We are only speaking on behalf of what we know and what we do and we can demonstrate that. For anyone in the community who wishes to come, we have a farm tour for you because—

Ms KING: I hope you have gotten in touch with the member for Bundaberg. I suspect he would be very interested.

Mr Holliss: Tom Smith is very much across this, as is the Chief Scientist from GBRMPA. We actually asked the CEO of GBRMPA and the Chief Scientist to come and have a look. Frankly, at the end of it David Wachenfeld was gobsmacked. He could not get over what we have done. We asked them to come out and publicly support us, but I do not think it is terribly politic for GBRMPA to do that. Josh Thomas stepped around that one quite nicely. We do have that demonstrated track record. We do not need the regulation.

Ms KING: Clearly there is such a strong culture of, as you say, working towards that triple bottom line. As you said yourself, you were meeting the standards of the regulation in the order of 98 per cent. Why are your growers so strongly, in your mind, opposed to the regulation? What do they see as the problem with it when they are already doing it?

Mr Leighton: They see it as the government stepping into their business primarily. They are worried about the penalties. Whether they come about or not, that is still a concern for a grower. It is in the legislation. They are concerned that we have five years of legislation from 2019 and then it can get reviewed and changed. What really concerns me as someone who is an agronomist is that, yes, the current regulations use Six Easy Steps as the nitrogen method, but the Paddock to Reef team and its model says that that is only a C class standard or moderate to high risk for water quality. To get to a low risk or moderate to low risk, you have to then take into account yield and other factors in five years time. We are not only thinking of here and now; we are thinking of the future in three or five years from now when it can be reviewed.

We have growers who have been on their land for over 150 years—five or six generations of farmers. They have a deep attachment to that land and what they do, and they have pride in what they do. They do not feel that the government regulations add any benefits to them from that. They are afraid of it. Whether they are doing the right thing or not, that is just a feeling that is there. They are afraid of it.

Mr DAMETTO: Off the back of that answer, Mr Leighton, we seek in this bill to establish an independent regulator as someone to independently audit what is happening out there in the space to make an ERA standard recommendation to the minister and also taking that opportunity for regulatory change from the chief executive officer to the minister. Is that something that you would support? If so, would you speak to that?

Mr Holliss: I will speak to that. We would support that and the reason why we would support that is sitting there in front of you. It weighs about 1.2 kilos. It is a whole heap of evidence that points to why we do not need regulations in our region and across the greater Queensland area. It points to the fact that the water quality issues that are impacting the Great Barrier Reef are not necessarily coming from agriculture, in particular, sugarcane. That is there as evidence. None of that has ever turned up in any of the 2017 consensus statement or anything else. It has all been clearly documented and articulated and in a lot of cases it is third-party reviewed as well. Yes, we would support that independent review of science, because in our view it has become very political and about chasing funding.

Governments and organisations actually recognise that our area is not a problem. We get very little funding to do any of these things. It is very hypocritical that (a) we are getting regulations when we cannot hurt the reef and (b) we have a demonstrated track record of environmental duty of care. It does not matter if it is a reef. There are other aspects of the environment that we recognise. To include our area is totally unjustifiable.

CHAIR: I think that is a good way to end this session. Thank you very much for your considered work in the area. We really do appreciate you—

Mr Holliss: Should anyone have any questions or wish to come on a farm tour, please give us a call because we are very proud of what we do. It is not something that we take lightly. Sustainable agriculture is what our organisation lives and breathes.

CHAIR: You should be very proud of that. Thank you very much.

PARKER, Mrs Lisa, Manager, Pioneer Cane Growers Organisation Limited (via teleconference)

SGROI, Mr Dean, Director, Pioneer Cane Growers Organisation Limited (via teleconference)

CHAIR: I welcome Mr Dean Sgroi and Mrs Lisa Parker from Pioneer Cane Growers Organisation. Thanks very much for your time today. Would you like to make an opening statement before we move to questions?

Mrs Parker: Thank you for the opportunity to appear today before the committee. I would like to start by acknowledging the traditional owners of the land on which the committee is convened today as well as the traditional owners of the Great Barrier Reef Marine Park and World Heritage area and pay my respects to their elders past, present and emerging.

I am the manager of Pioneer Cane Growers Organisation Limited, or PCGO, and I appear today with Mr Dean Sgroi, Director and Deputy Chairman. PCGO currently represents 94 growers in the Burdekin region who live here and, on the midseason adjusted figures, will produce approximately 1,652,361 tonnes of sugar cane. In the view of PCGO, this reversal bill is necessary to enable the development of a sustainable system that will achieve the environmental targets, meet community expectations and maintain economic viability of our farms.

Currently, there are issues with reporting. We calculate that the annual changes in the reef report card are only assessed against participants and projects that are funded through state and federal government or surveys and not against growers who have not received funding or participated in these programs. The main funding from which this data is measured is only applicable to each reporting period and it is assumed that all practice change made in prior years is maintained. This is not accurate and the model does not correctly reflect the progress towards the environmental targets.

The Burdekin region for the purpose of this reporting is comprised of five major catchment areas. Grazing dominates the region and accounts for 92 per cent of the area with less than two per cent dedicated to a combination of sugar cane and other agricultural and non-agricultural activities. Pollution from the catchment does not come equally from all activities and the model is currently unable to delineate between the separate effects of each activity. The P2R projector tool questionnaire utilises the same questions with the same weighting across different farming areas and practices. Again, the data collected does not accurately reflect practice change at the catchment level.

This bill aims to reset regulations, reduce penalties and appoint an independent regulator. A practical farming example of one of the difficulties created by the current legislation is in relation to the requirement for fertiliser application. Specifically, standard condition 7 of the agricultural ERA standard states that the amount of nitrogen and phosphorus to be applied must be calculated for each block using the results of soil tests in the latest version of the prescribed methodology. Standard condition 8 states that the fertiliser applied to each block must not exceed the amount calculated in accordance with standard condition 7 unless a farm nitrogen and phosphorus budget has been developed for that property. The grower's ability to utilise the budget to shift application of fertiliser between paddocks is not supported by the indicated application rate in the prescribed methodology. This has the effect of creating an inconsistency between the application of standard conditions 7 and 8.

There are viable alternative options to achieving desired outcomes. In PCGO's submission lodged on 30 June, we provided information from trials completed in the Burdekin which showed a significant variance in irrigation run-off. This finding is not supportive of the model based on assumptions in relation to output as a direct result of limiting input. Further trials done through the Barratta Creek water quality project identified the measurable benefits of managing and optimising irrigation practices. These trials established the main losses of N occurred in the first four irrigation events after fertiliser application and that a significant reduction in losses could be achieved by greater focus on irrigation optimisation technique.

PCGO would like to see some improvements to the bill but we are supportive of the notion of reducing the regulatory burden on growers and instead further developing a unified process of voluntary best practice with a greater focus on irrigation optimisation, integrated subcatchment monitoring and localised water quality monitoring.

Mr ANDREW: How much consultation did you get or did you give to the government on the first environmental and other legislation bill?

Mrs Parker: That was before I commenced my role as manager in this organisation—sometime before that. I will ask my deputy chair whether he is aware—

CHAIR: While you were looking for that, there were 1,512 submissions and there was a public hearing held in the area as well.

Mr Sgroi: Yes, I think I appeared at the one at the casino about two years ago.

Mr DAMETTO: My question is around nitrogen and phosphorus and the on-farm nutrient budgets. We have heard in the past that there is no allocation or no flexibility around, say, a major weather event, a cyclone or something like that. Unfortunately, these things do happen: we have cyclones, floods and things like that. Can you talk about the impact that will have on the Burdekin area if you were unable to, say, replant a paddock or refertilise a paddock after one of these major events?

Mr Sgroi: Of course there would be a significant effect if we were not able to fertilise a replant situation because of a natural disaster event. You would not get the yield that you would expect from that subsequent crop.

Mr DAMETTO: At the five-year mark when this regulation is reviewed—and as we already know, the chief executive officer has the opportunity at any stage to make a change in the ERA standard without making a legislative change. Can you describe, firstly, the loss in yields because of nutrient reduction in the Burdekin area that you are expecting over the next five years and whether or not sugar cane farming would be profitable if you were to have any further cuts to that nutrient budget?

Mr Sgroi: At the moment, as most people would know, there has been a bit of a spike in the sugar price. Obviously, a yield reduction would be offset by that increase in income because of the price. However, if we were looking at long-term averages of sugar pricing and other costs going up like electricity, water and most other input costs, we could only imagine that there would be a subsequent reduction in yield and subsequently a reduction in income.

Mr DAMETTO: We will not always be enjoying high sugar prices around $600 a tonne. I believe it was around $340 to $350 a tonne at one stage. It would be very difficult to survive on that.

CHAIR: This morning the department came in and talked about the incentives that are provided. In the former 2019 regulation they gave an example and a number, particularly around the Burdekin area, of increased yield with the regulations and increased economic activity. It is on the public record. They named the Wheeler farm as an example. Do you have any comments on that? To the point you just made about other associated costs, while that is not relevant to the bill itself, we heard that QRIDA gives some productivity rebates and incentives as well. Are you aware of that, and can you answer the broader question about the example given by the department?

Mr Sgroi: I am not aware of the Wheeler farm. I could take it on notice. Everybody knows that power prices, water prices and most other of our inputs are heading only in one way—which is up—so into the future it is going to be worse.

CHAIR: Within the context of the bill—I appreciate where you are going with that. I do not know if Lisa wanted to comment?

Mrs Parker: Could you repeat the question please? We are having trouble hearing you.

CHAIR: I think he has answered it, so we will move on.

Ms KING: I will take you to a slightly different matter that arises from your submission to the committee. In your submission Pioneer Cane Growers suggested some amendments to the proposed bill. In particular, you noted some concerns around issues of employees carrying vicarious liability for offences in relation to fertiliser application. Could you perhaps speak to those issues?

Mrs Parker: The concern there is mainly because in our industry we are already having difficulty obtaining labour. Obviously, that is felt more in the horticultural industry, but in the sugar cane industry they are having trouble getting skilled labour. We think that, if that were to be implemented, it would have a negative effect on our ability to obtain skilled labour in this region, and we are already currently struggling with that.

Mr DAMETTO: My final question is around the independent regulator. Earlier this morning we heard the department saying that a lot of the reports put together have been peer reviewed. There have been some questions around peer review in past. It has been stated that if you are getting someone to peer review your reports, you find someone with the same opinion. We have just been dropped a document from Bundaberg Canegrowers, and it is a 1.6-kilo document. That is how much it weighs. I would suggest that their review of their area has not been endorsed by the same scientists that are endorsing the water quality report card currently. Can you please speak to how important it would be to have someone who is independent of not only government but also government funding when they are putting their research together?

Mr Sgroi: I think it is absolutely necessary. There are no ifs or buts about that at all.

Ms KING: Could you reflect on your understanding of the international processes of the peer review of science?

Mr Sgroi: It has been a long time since I was at university. This is an opinion because, like I said, it has been a long time. Obviously the peers reviewing would need to have some background in the same field as the scientists, the researcher or whoever is making the report.

Ms KING: Perhaps you were tuned in this morning, but I am assuming you had a fairly busy day, as most people would have. This morning we heard submissions about the process to produce the *2017 Scientific Consensus Statement*. That was a panel of 47 scientists that pulled together 1,600 individual scientific pieces of research. They were peer reviewed by scientists from across the world, so it was a very thorough process, but I certainly take your point. Thank you for that.

Mrs Parker: Could I make one further comment about the member for Mirani's question in relation to consultation process? The trial work that I referred to in my opening statement has been completed in that process. These are only more recent trials done in the Burdekin region. The trials that I speak to were conducted in a partnership. They were run by the Burdekin Bowen Integrated Flood Plain Management Advisory Committee. I can provide the project summary data on notice if the committee requires.

CHAIR: If you can provide that information, it would be appreciated. If we could have that back by Friday, 10 September, that would be appreciated.

Mrs Parker: No problem.

CHAIR: Thank you very much for joining us today.

CRUWYS, Ms Rachael, Director, Green Shirts Movement Queensland (via videoconference)

REA, Ms Joanne, Director, Green Shirts Movement Queensland (via videoconference)

CHAIR: I welcome Ms Rachael Cruwys and Ms Joanne Rea. Who would like to go first with an opening statement, ladies, and then we will ask you some questions?

Ms Cruwys: I will go first and Jo would like to follow directly after me, if that is okay. Thank you, Chair and committee, for the opportunity to be present today. I sit before you as both a member of a farming and grazing family within a Great Barrier Reef catchment and also a director of the Green Shirts Movement, a group born in 2018 as a protest and direct result of the Queensland Labor government's vegetation management laws, laws based on flawed science, eroding farmers of our rights and the ability to manage our farms effectively and with perverse environmental outcomes. Today we sit before you because history repeated itself with the introduction of the commonly now known reef regulations legislation. It has also been based in the same way on unassured science to the absolute detriment of the same industry. We sit here not just as an organisation representing those affected, we are the affected. We are the farmers and graziers who are being vilified and left with permanent and unenviable consequences on the back of so far unable-to-be-replicated science. Quality science and quality assurance must go hand in glove.

It was with much fanfare that the Queensland government announced in 2016 the purchase of Springvale Station near Lakeland in Cape York with the aim of declaring it a natural refuge under the Nature Conservation Act. Purchased on the premise of stopping sediment into the Great Barrier Reef, the then environment and heritage protection minister, Steven Miles, claimed the viable developed grazing property was solely responsible for 40 per cent of the sediment from the flows of the Normanby River into the Great Barrier Reef. However, the prior federally funded 2013 study of the Cape York local marine park authority titled *An empirically-based sediment budget for the Normanby basin* showed that the sediment run-off data that was the basis of this station's acquisition was flawed. Research therein showed that 86 per cent of tested sediment levels found on the base of the Princess Charlotte Bay originated from systems that run through the destocked Lakefield National Park—from an altogether different system. The report went on to state sediment attributed to the entire Normanby catchment accounted for only nine per cent and, when averaged, sediment attributed to Springvale was less than one per cent whilst by and large settling in river mouths on a sediment ledge and with any negligible exposures to suspensions being transient. It is this type of reliance on and at best inconsistent data that was used by government to purchase the property and which underpins ensuing legislations and then the legislation's lack of delineations of possible causations such as state owned land or naturally occurring events that sees questions about its efficacy and intent of policy.

The February 2021 release of the 2019 Reef Water Quality Report Card with results recorded up to June 2019 showed water quality improvements attaining an A grading and a cumulative reduction of the 25.5 per cent for nitrogen entering the Great Barrier Reef lagoon. It is imperative to point out that these results were obtained from 2019, prior to any legislation coming into effect. This further calls into question the need for draconian reef regulations being forced on the agricultural sector and, indeed, whether there is more interest in producing regulations than outcomes given these were already achieved prior to the imposition of targeted legislation.

More recently, the Australian Institute of Marine Science released its annual summary report card of coral reef conditions for 2021. AIMS lists the northern, central and southern regions as having 27, 26 and 39 per cent coral cover respectively. Quantifying this illustrates record coral coverage. This could not be achieved without a reef that is alive, well and resilient, yet despite this evidence farming industries continue to have the legislative finger thrust firmly upon their chest. Given the amplitude of data that offers other interpretations to that which is being offered as the basis of the current reef regulations, and the regulation's broad impact to individuals, industries and communities, it should not be implemented without a level of assurance achieved by undergoing a rigorous, antagonistic audit over and above peer review.

The Green Shirts Movement in principle supports the bill being discussed here today and any move in the direction of reducing overreaching regulatory burden. I now pass over to my fellow director, Joanne Rea, for her opening statement. Thank you.

Ms Rea: Thank you, Rachael, and thank you to the committee. The push by the UN to have the Great Barrier Reef listed as endangered has revealed the true motivation of sustained attacks on agriculture and subsequent draconian legislation. Some of us have always maintained it is

unnecessary, biased, based on flawed modelling and impossible to comply with under all conditions. After the announcement was made, environmental groups were quick to support the listing with their pre-prepared statements. Activist scientists were also on board, condemning government for lack of action on climate change. It would appear that the demonisation of agriculture was to create a wedge to pressure the government on climate action.

Agriculture has been the heavy lifter on climate action, recognition of which is non-existent. Agriculture has become everyone's whipping boy. Agriculture has reduced emissions between 1990 and 2019 by 37.9 per cent and land use, land use change and forestry, which is a primary industry sector, by a huge 113 per cent, while all other sectors except waste management increased emissions. From 2005 to 2019 land use, land use change and forestry reduced emissions by more than 129.9 per cent. Not only has agriculture borne the brunt of climate action to present, this bill not only regulates agriculture—I am referring to the original bill—to a draconian extent, but has introduced fines that are entirely outside the ability of the vast majority of farmers to pay.

Disturbing are submissions by the legal organisations. These regulations are impossible to comply with, which should be unacceptable legal briefs. The use of full BMP certification as a proxy for good management is unacceptable. From a legal point of view, these figures are so manipulated and inaccurate that they would be useless from any legal standpoint. The BMP program was never designed to be used in the way that it has been used to justify this sort of legislation. The assumption that all those who do not participate to full certification are laggards is deeply offensive. Assumptions that all reforms required contribute to increased profitability are misconstrued. The social investigation report is wide of the mark and made assumptions which do not ring true to me as a participant in the industry.

We appreciate the sterling work done by Dr Peter Ridd but we have a full bench of scientists and lawyers across from us with few agricultural representatives and minimal expert support. What we are hearing again is the same as what we heard before: support for the 2017 consensus statement with figures as if they were actual and not modelled. We find that highly irregular. I will come back to that later if anyone is interested. There are, however, some more recent studies, including one from AIMS in 2019. The Property Rights Australia submission covers this with all the findings outlined, but the major finding was that barium calcium levels, a measure of sedimentation, during this recent decade are not higher than any of the previous major flood events throughout the 20th century. I would like the permission of the committee to table that piece of research. From memory, I believe that this morning's participant, Dr Britta Schaffelke, signed off on that piece of research.

CHAIR: We will just have to procedurally table that. Is leave granted? Leave is granted.

Ms Rea: There are also quotes from a Senate inquiry from Dr Paul Hadisty and Dr Britta Schaffelke that they were not investigating water quality any longer as basically there are periods of time when calcification has reduced and we are able to link that with marine heatwaves and coral bleaching so this is not something that has anything, as far as we know at the moment, to do with water quality and that is why in the most recent consensus statement, which was an update of the state of knowledge, it is not specifically mentioned. If anyone would like to direct any questions?

CHAIR: We only have a few minutes of questions. Quite clearly you are talking about the tabled document from the chief scientific officer this morning from the department, the *2017 Scientific Consensus Statement*. That was made up of 48 researchers and some 1,600 peer reviewed papers. You quoted Dr Ridd. It has been well advertised in the media that he is against this body of work. I do not know how far we can talk about Dr Ridd. I think he is coming in this afternoon. There are some court cases reported in the media about his employment with JCU. You have one scientist saying one thing and 48 saying another.

Ms KING: 1,600 papers.

CHAIR: 1,600 papers. Who do we believe?

Ms Rea: I believe it was me who made that quote and brought that forward. Let me tell you about the 2017 consensus statement. I have heard about the numerous papers and the numerous scientists who contributed to that. I have been before these inquiries including the Senate inquiry and wherever else I can get the information. All I have heard about is the consensus statement, reports of the consensus statement and how it all must be right because it is peer reviewed. Not one of those scientists ever has informed me about any of the science. Not one of them ever has told me that there is any empirical evidence; it is all based on modelling and assumptions. In terms of the ones I have read myself that I am personally acquainted with, I know that a lot of those assumptions are way wide of the mark.

When you get to some of the independent scientists like Dr Peter Ridd—and I was also very much educated by the evidence of Dr Piers Larcombe and the other independent scientists and have been following those right back to the late Professor Bob Carter. I find that a lot of this has been put forward by, in a lot of cases, the environmental organisations who have demonised the farming community since about 1999 to 2000 and we just cannot get any traction. They do that; the public, the politicians and even the scientists become activists instead of following the clear science.

CHAIR: We like to listen to the science, that is for sure. I want to raise something that was spoken about this morning if I could. In your opening statement you said that the fines that are applied in regulation are too great. The department reported that no-one has been fined.

Ms Rea: That is a red herring. The Kalamia Cane Growers Association put that perfectly. Just because nobody has been fined—these regulations had not even been implemented in some areas until very recently. I just find that really a straw man argument. We are also talking about the future. In the legislation there is absolutely no provision for extenuating circumstances such as extreme weather events. Julie from Kalamia explained that really well. The department has no ability if it is not in legislation to give any relief from extenuating circumstances. In rural Australia there are a lot of calamities which point to why this cannot be complied with. I find a lot of the arguments very hollow.

Mr ANDREW: You have talked about an independent person to review the science. Have you sent that actual request to the federal government as well? The federal government have sponsored and paid a lot of money for these bills to be put in place with the Reef 2050 Plan.

Ms Rea: Absolutely. Submissions have been made to the federal government and to the Senate inquiry into the reef regulations.

Ms Cruwys: It actually was the Green Shirts Movement that went to Canberra to secure the Senate inquiry into the science behind the reef regulations. Obviously we are a very big supporter of an independent body basically checking the science. When you have two sides of the coin or you have an on-field umpire making a decision, you go to a third umpire to overview everything and make a ruling. That is our point because there is no other evidence. You talk about your consensus statement and there are more than Peter Ridd who have a contrary view to the science.

Mr DAMETTO: My question is in regards to the regulatory impacts on your industry at the moment whether it be grazing or the sugar industry. Can you talk about the economic impacts of this regulation on the industry now and potentially into the future?

Ms Rea: The regulatory impact statements have made it obvious from the start that the cost to industry will be enormous. We have heard targeted examples this morning of canegrowers who have apparently benefited from undertaking some of the reforms. However, the regulatory impact statement did acknowledge that the cost would be quite high. It also acknowledged that the grazing industry of which I am a member could bear such cost that a lot would not be able to afford the cost and that there would be a lot of consolidation in the industry. In other words, some would go broke and others would take them over.

The yearly costs for some of the grazing areas were up to $87 per hectare per year. Some years you would have a loss on that grazing hectare per year. I really do not understand how the model results can lead us to that sort of regulation, that sort of cost against agriculture, which contributes around $15 billion per year to the Queensland economy and tourism, $6 billion. However the difference between the two—and I am not planning on being critical, I am just stating a fact—industries like agriculture are what feed us and they have not been subject to too much pause as a result of COVID. It is a very steady industry, and yet there seems to be legislation coming from government all the time—layer after layer of it—which is imposing on agriculture for no discernible benefit.

Ms Cruwys: Just coming back to the cost impost, compounding that economic strain is the Vegetation Management Act. The financial implications of that actually remain uncosted. At the public hearing on 19 March 2018, before that legislation was introduced, the department was asked, 'Would it be undertaking any modelling in relation to the effects the proposed legislation would have on agricultural production across the state in the future?' The response was no. The next question was, 'Does it intend to?' The response was no. So you have a grazing industry that is being compounded by these economic strains, by the two concurrent pieces of legislation. One remains uncosted.

CHAIR: We thank you for your time and contributions this afternoon. We do have other people waiting online ready to go but we do appreciate your contributions. I now welcome the next witnesses.

BROOME, Mr Alan, Private capacity(via teleconference)

HUNT, Mrs Margaret, Private capacity (via teleconference)

HUNT, Mr Peter, Private capacity (via teleconference)

CHAIR: Would you like to make an opening statement before we go to questions?

Mrs Hunt: I will introduce ourselves and Alan will make a statement. Thank you for your invitation. Peter and I run a cattle-grazing property which we expect will be continued by our children for years to come. We would like to support the new bill to allow farmers who know their land to work within the constraints that we already have with nature to manage our land without a lot of government red tape. Alan is here with us. He has done a lot more reading and research because we really do not have the time to keep up with any of this stuff. I will hand you over to Alan now.

Mr Broome: Thanks for the opportunity to address the committee. I support the bill. I, like many other producers, make every effort to ensure valuable topsoil and nutrients or any contaminants are not lost from my property. I do, however, have real concerns with this legislation and its evolving regulations which have the potential to ruin lives and livelihoods on the strength of questionable science and modelling. This is particularly the case in areas such as the South Burnett, which are remote from the reef.

Broadening and enhancing reef regulations September 2017 sought to justify reducing pollutant levels because of the recovery of southern inshore reef communities during the period 2012 to 2015, Waterhouse et al. As this period included the January 2013 record floods and severe stream bank erosion, you have to question if sediment run-off from upstream properties plays any role at all in reef health.

Additionally, state water quality officers have confirmed, at a public meeting in Kingaroy on 2 June, that naturally occurring sediment stream levels have not been established nor any water quality testing been undertaken in this area. They further confirmed that the nearest stream water quality testing station is located at Mount Lawless, some 200 kilometres away in the North Burnett, having acknowledged that the presence of at least four significant dams and multiple weirs between the South Burnett and the reef would serve as a trap for soil that entered the catchment.

Because this area consists of highly fertile smaller holdings where many operations are a mix of grazing and opportunity cropping, the recent regulations will reduce both the value and saleability of some properties and their profitability. Adjoining properties of similar proportions could be valued differently based on a cropping history or transitional test over periods of extreme drought. These arbitrary restrictions will discourage good agronomic crop rotation practices which protect the soil and impose cost and restrictions on producers who even seek to opportunely sell surplus fodder for which no soil disturbance has occurred.

While stage 1 of the commercial cropping regulations will have a devastating effect on a lot of mixed properties in the South Burnett, there are also concerns about the actual economic impact of the ERA standard for beef cattle grazing due, for full implementation by 1 December 2022. The department's own document on the benefits and costs of implementing the new ERA in the Burnett-Mary catchment is modelled on an average grazing property size of 5,000 hectares. An economic analysis of grazing systems for water quality improvements in the Burnett-Mary catchment by David Pannell, Anna Roberts and Geoff Park in February 2014—and I would like to seek leave to table this document—have shown the average size to be more in the vicinity of 1,767 hectares and estimate the incentive payments required to ensure the adoption of the practices now mandated without compensation to be $75 million per year.

Recent figures estimate the average size of rural holdings just in the South Burnett is around 338 hectares. It is significant that even on the 5,000 hectares average property size adopted in the *Broadening and enhancing reef protection regulations* it was acknowledged that many would struggle to meet the cost of new regulations with negative incomes evident. The South Burnett area, excluding the Indigenous settlement of Cherbourg, was recently identified as having a suicide rate some 10 times the Australian average. The legislation and ongoing regulations, many of which appear out of all proportion, will reduce land values and profitability without compensation and add to the cumulative stress on struggling producers while appearing to have little to no effect on the health of the reef.

Mr DAMETTO: I can completely understand where you are coming from. Previous to 2019 the South Burnett area was not included in the six reef catchments; there were only three reef catchments. We have heard from Bundaberg Canegrowers and other organisations stipulating the same thing. How will this impact growers into the future in your area and how will this affect smaller operators that will not be able to afford taking up the new regulation?

Mr Broome: I think it will definitely affect them because the actual properties are valued on highest and best use. We have opinions from the real estate people around the area that these restrictions are going to actually reduce the values—it could happen to adjoining properties—by up to 50 per cent; that has been suggested to us. That is coupled with the fact that a lot of these regulations will impose quite stringent regulations around many structures which will actually cut down the amount of land that people can actually use to generate income, and that is going to be another major factor.

Mr DAMETTO: It heavily affects that rotational cropping you were talking about, that ability to get in there as a farmer who knows the farm and the agronomy quite well, better than anybody else? It affects you being able to have that flexibility to continue to be profitable; is that correct?

Mr Broome: Yes, it is the flexibility, but it is also soil health. The rotational practices that have been employed here are very important to actually ensure that you do maintain the maximum soil health and maximum productivity of your country.

CHAIR: First off, procedurally, members, he has tabled that paper. Is leave granted? Leave is granted. You have tabled the paper, the economic analysis of the grazing systems. It is a 2014 paper. Do you have any updated papers in that area of economic analysis?

Mr Broome: No, and that is one of our concerns, that there has not been a lot of studies done because the Burnett, as has been correctly stated, was only included from 2019. No, there have not been a lot done. The major reason for tabling that was the property sizes and to point out the discrepancy in the official modelling in 2002 to previous data but also to point out the calculated cost of bringing people up to those standards for which nobody is going to be compensated.

CHAIR: On that point, this morning the department indicated that there were QRIDA grants for increased productivity and incentives to adopt the regulations. They gave an example—I am sorry to members who have heard it three times—of a Burdekin canefarmer that had an increased profit of $30,000 due to adopting these measures. What we took from all of that was the voluntary arrangement was not going far enough. The reports were still showing sediment run-off and damage to the reef water quality as provided by the Scientific Consensus Statement. Can you just make some commentary around what is available? Are you aware of the QRIDA incentives?

Mr Broome: I had heard of some of the QRIDA incentives. There have been very few incentives provided coming from Burnett-Mary Regional Group. There have been very few incentives provided in these areas. They tend to be concentrated more in the central area, which is understandable, around the general reef areas.

The point that we are making is we do not feel there has been a good enough case regarding the pollutant levels, anyway. They are broadening and enhancing the reef regulations. Its economic analysis based on the 5,000 hectares concedes that many people will make losses and even quotes something like a negative $28,000 income for people from the cost of having to implement these. That is a net loss.

Ms KING: Thank you for providing us with this feedback from the point of view of working farmers. It is very much appreciated by us as committee members. I note that you provided feedback that your nearest monitoring station location was at Mount Lawless. Did I hear correctly that that was in the region of 200 kilometres from your location?

Mr Broome: Yes, that is correct. It is about 25 kilometres north-east of Gayndah in the North Burnett, which is roughly 200 kilometres from a lot of this area.

Ms KING: Is it your view that having more water quality monitoring capacity closer to your location would provide helpful information?

Mr Broome: Most definitely, and that point was highlighted by the water quality scientists that the Great Barrier Reef authority brought to a public meeting in Kingaroy who stated that they just did not have any natural base data for the normal sediment levels from nature. They have never been taken and there are no figures for any of this South Burnett area in terms of actual water quality.

Mr ANDREW: How are they coming to conclusions if there is no data?

Mr Broome: That was questioned. When it came down to the point, we heard, 'We would like to have more data, but this is the policy that has been adopted.' That was the answer we received at the public meeting and that they did not have the money to do it.

Mr Hunt: They have no running water.

CHAIR: Thank you very much for your time. We do appreciate your contribution today. We will move to the next witness.

RIDD, Dr Peter, Private capacity (via teleconference)

CHAIR: Welcome. Would you like to make an opening statement?

Dr Ridd: I have worked on the Great Barrier Reef since about 1984, at the Australia Institute of Marine Science from 1984 to 1989 and since then until just recently at James Cook University mostly working on the effects of sediment and pollution on the reef. I was co-inventor of the instruments for measuring sediment on the reef over the long term and my group has collected more data on mud and sediment around the reef than all other groups combined.

I have also published reports demonstrating severe quality assurance issues with important pieces of reef science and some of the major documents like the reef outlook report and the consensus statement, which has been mentioned this morning. I should say it is quite remarkable that despite all the doom and gloom about the reef, the latest AIMS data shows that we are presently at record high coral cover; there is about twice as much coral on the reef today as there was in 2012 when it hit its low point after a couple of the cyclones. You have to ask the question: how is that possible considering all we read in the outlook reports and the consensus statement?

The government must contemplate the possibility that there is some exaggeration from the science and managing institutions about the threats to the reef. For example, it is now well demonstrated that mud from farms does not reach the reef in anything but minute quantities and that pesticides are usually in such low levels they cannot even be measured with the most ultra-sensitive scientific equipment. You will find nothing in the consensus statement that actually contradicts those statements. However, GBRMPA and others keep on blaming the farmers.

The reason that mud and pesticides do not reach the reef in significant quantities is because it is 50 to 100 kilometres from the coast. Even the inshore fringing reefs, which are often invoked—and certainly were this morning—which are not the Great Barrier Reef and only represent maybe one or two per cent of the total coral cover are also only trivially affected by mud, fertilisers and pesticides. All this is clearly demonstrated in data collected by many workers and multiple institutions—not just me. There is, for example, 100 times more mud suspended perfectly naturally by waves—and it has always been the case—on the inshore reef than comes down from the farms. There is also about 100 times more nutrients cycling across the seabed than comes from farms. In the last report on pesticides on the inshore reef the data shows they are genuinely at extremely low levels—well below the effects level—and there were no exceedances above trigger levels. Yet this type of information is for some reason not found in the consensus statements, and GBRMPA and others keep blaming the farmers in their documents.

I have been calling for a quality assurance audit on some of the keystone work and the major consensus documents. This audit needs to be done by scientists who are independent of the present consensus group and be performed in a similar quasi-antagonistic manner that we use for financial audits. I would simply ask the question: why would anybody oppose a bit more quality assurance on the reef science?

Mr ANDREW: Who invented all the machinery and gadgetry to measure pesticides and floating particulate in water management and water quality?

Dr Ridd: Pesticides is mostly national, but when it comes to looking at mud, it was myself and various other people at AIMS and James Cook University. That is a very Australian invention.

Mr DAMETTO: My question is in regards to the current reef regulation 2019—the regulation and legislation that my bill seeks to repeal. In terms of the implementation of the current 2019 legislation, could you comment on whether that would have a positive or negative effect—or any effect at all—on the turbidity on the Great Barrier Reef and nutrient making it to the Great Barrier Reef?

Dr Ridd: The regulations at the moment will have absolutely no effect on anything significant on the reef because basically the pesticides are not getting out to the reef. The mud from farms is utterly insignificant on the reef. That is what 25 years of research at James Cook University by people like Piers Larcombe, Ken Wolfe, Alan Orpin—I could go on and on—have demonstrated, but you will not find that information in the consensus statement.

When it comes to fertiliser, work from AIMS itself demonstrates that the cycling of nutrients across the seabed is the most important thing. Also work on half a dozen papers has demonstrated that the rivers are relatively minor when it comes to water quality of the reef. The biggest 'rivers' that affect the Great Barrier Reef are the great ocean currents. These are hundreds of thousands of times bigger than the rivers. For example, as much water flushes into and out of the Great Barrier Reef lagoon in just eight hours as comes down all the rivers in a whole year, and yet statements like that—

and this is well proven science—you will not find in the consensus statement. This is an example where I think there are some problems with those consensus statements. I understand the chairman's concern, but why should you believe just one person when you have 50 scientists and 1,500 references? Nevertheless, there is a lot of things in those statements and there are at least some difficulties and they ignore a lot of the contradictory evidence. There is more than enough reason for us to do some more checking on them.

Mr DAMETTO: If this is the case and what you are saying is correct, can you point to why the current reports and the reports being utilised by the state government to build policy are being taken as truth over some of the information that you are giving right now?

Dr Ridd: There are fundamental problems in some of the institutions and sites. I can completely understand why the government would take the consensus statement report as their starting point. If I was in their position, I would almost certainly do the same. Nevertheless, you also have to look at other areas of science where they are finding the peer review is completely inadequate quality assurance.

I may be in a small minority in the case of my views on the Great Barrier Reef, but I am in the massive majority when it comes to pointing out problems with peer review. All over the world in the biomedical fields and many other fields we are finding that about 50 per cent of the peer reviewed literature is faulty, and that it must be expected that a certain fraction of that is also faulty in the case of reef science. This is why we have a problem. On the other hand, I can understand why governments have actually not got a great deal of choice but to listen to the consensus, but they also have a duty of care and an obligation to really make sure that everything they are being told is reasonable. We can demonstrate this beyond any shadow of a doubt that at least some fraction of that work is not fit for purpose and there is no excuse for us not to do some more checking on it.

Mr MOLHOEK: Dr Ridd, I see that you had some input into the original inquiry, and I have been reading the statements of reservation from that previous report. How much time were you given to present in 2019? Do you believe that that process was given enough time and enough consideration in hindsight?

Dr Ridd: Are you talking about the Senate inquiry?

Mr MOLHOEK: No, I am talking about the Queensland government reef regulations inquiry of 2019.

Dr Ridd: I would have thought my input on that as far as the government was concerned was minimal. They basically completely ignored my comments that we need quality assurance, which is really all I am saying. I am saying we need more quality assurance. That may end up meaning that ultimately people will disagree with me. That is fine, but the call for quality assurance, which is my main point, has certainly not been taken up by more or less any government.

CHAIR: Thank you very much, Dr Ridd, for your time today. You clearly are in disagreement with the report that was given to us, the 2017 scientific consensus report. It talks about independent science panel remarks. Is this simply one scientist versus another? I come from a medical background. I often see this and I will use an example. One cardiologist interprets a 12-lead ECG differently to another. Is this just that you are looking at the same box from different ends?

Dr Ridd: Some of it is certainly that but when it comes to peer review—one example of peer review was one of the major statements on the reef. Between them, two of the supposed peer reviewers of that report had somewhere between 50 and 100 publications that were quoted in that report, so they clearly were not independent of the original work. We then had two others who actually were not even coral reef scientists, so they were not even knowledgeable. There were huge problems with the peer review in that particular case.

We have heard this morning about how thorough the peer review of those reports was and yet we can demonstrate again and again where there are things in there that were wrong. For example, in the outlook report it says that the pesticide levels are very, very small right through, but then when it comes to what is the effect of this in terms of the threat to the reef, it says it is a high threat. Something has just got to be wrong there and we cannot afford these things to be wrong.

We also hear scientists say things, even this morning, like every little bit of nutrient matters to the Great Barrier Reef. That is just scientifically incorrect. You have to get above a certain effects level. If you increase the pesticide level by one per cent on the inshore Great Barrier Reef due to farming—that would be the maximum it could possibly be—that will have a very, very small or negligible effect on the reef.

On some of these things undoubtedly I will have a different interpretation to another person and my interpretation is no better necessarily than that person's. However, other things are definitely institutionalised structural problems with which we actually decide whether something is right or wrong, and peer review is simply an inadequate quality assurance process. We need more quality assurance. That is why I think that some of what this bill is proposing is good because it does look at that problem. I ask the question again: given that this is affecting farmers and also given that the Great Barrier Reef is such an important thing, why would we not subject the science to a little bit more quality assurance? What is the answer to that question?

Ms KING: I note your comments about a 'little bit of extra quality assurance'. Today we heard—and you may well have been following along—from Nyssa Henry, the Chief Scientific Officer, Reef Policy in the Department of Environment and Science. She noted the process that went in to create the *2017 Scientific Consensus Statement*, the 1,600 peer reviewed papers that were synthesised by the dozens of scientists to get to that Scientific Consensus Statement. She described the process as robust, the conclusions as strong, that it was one of the best processes in the world and that it is the envy of the international scientific community. What I took from that is that actually went beyond the accepted peer review process. Would you not agree that that process actually does provide that little bit extra because that is beyond the peer review process, as I understand it and as it is expressed in the normal scientific community.

Dr Ridd: I would say it was a useful process but it does not do the most important thing, which is that you have to check, test and replicate the individual science papers that you are basing this on. When it comes to threats to the reef, there are only about a dozen or 20 really important papers which have data demonstrating nutrients or coral cover and all the rest of it. Those fundamental papers need to be subject to not just peer review, which is often just a quick read by a few scientists, but actually go out and do the work again, test the statistical analysis and do all those sorts of things. That did not happen with the consensus statement. In addition to that, there were huge areas of science on the reef where there were no people with the expertise.

When it comes to sediment, I hate to sound big-headed here, but Piers Larcombe and I are the experts on sediment concentrations on the Great Barrier Reef. We invented the instruments, we have more measurements, we have been doing it longer and we have the geological background. That does not mean to say that there are not plenty of other scientists who should have an input into that, but we were completely ignored in terms of our criticisms of what is in that consensus statement—it was totally ignored—and also the fact that they have ignored such a lot of work that needs to be put in there. So I fundamentally reject that those consensus statements are anything more than a very slight improvement on the original peer review.

We need a more robust process where the original papers are sent off to an independent scientist and we pay them a proper amount of money to go off and do the work again rather than expect peer review, which is essentially done for free. With the Pioneer Cane Growers we actually estimated how much it would cost to do a proper review of the dozen or so most important papers on the reef. We estimate it would be about $5 million. Compared to what we are spending on the reef at the moment, we are talking about maybe one or two per cent of the funds we are spending at the moment just to do a bit of antagonistic auditing on the reef. Why would you not do that and just accept essentially what could very likely be a groupthink forming in these consensus statements?

Ms KING: Have you done some consultancy with the Pioneer Cane Growers in relation to that?

Dr Ridd: No. I wish to put it on record that I have never received a single cent from any other source since I started working at AIMS in 1984 except from AIMS and James Cook University. All my funding has gone through the university. Since I was fired from James Cook University, all the work that I do in this space has been done entirely for free, even though I am often accused of being on the take of many industries including sugar, coal and all the rest of it. I reject any sort of allegation of that nature if that is what you are making out.

Ms KING: No, I am certainly not.

Mr DAMETTO: Dr Ridd, being a reef scientist and someone with quite a lot of experience in reef science, out of all the things affecting and putting pressure on the Great Barrier Reef would you be able to name the top five and tell us where turbidity and nutrient run-off sits within that top five?

Dr Ridd: I put turbidity and nutrient run-off right at the bottom. The one that does worry me—and this genuinely worries me—is the direct effect of carbon dioxide on the ocean pH. I think there is some quite worrying evidence that that may be slowing down the coral growth rate. There is also lots

of evidence that says that it is not. That is by far, in my view, the most worrying. I am not terribly worried about the increasing temperature. That would be my second concern. Then all the agricultural ones end up being very low: third, fourth and fifth.

CHAIR: Thanks very much for your contribution today. We do appreciate your time. We also thank the member for Hinchinbrook for joining us today. That concludes the hearing. The proof transcript of today's hearing will be available on our webpage as soon as it is completed. Thank you to all members and to Hansard. I now declare this hearing closed.

The committee adjourned at 1.59 pm.