

Between:	GRAEME ASHLEY HOFFMANN AND CHUDA KAEWONGKHON HOFFMAN ATF HOFFMANN DRILLING PTY LTD SUPERANNUATION FUND 716 001 453	Appellant
And:	GOLD COAST CITY COUNCIL	Respondent
And:	CATHERINE CERIS ASH	First Co-Respondent by Election
And:	AUSTRALIAN RAINFOREST CONSERVATION SOCIETY INC	Second Co-Respondent by Election
And:	GECKO ENVIRONMENT COUNCIL ASSOCIATION INC	Third Co-Respondent by Election
And:	BERNIE WINTER	Fourth Co- Respondent by Election
And:	CHARLES COLIN ALEX ORSINI	Sixth Co-Respondent by Election

**SECOND CO-RESPONDENT BY ELECTION'S RESPONSE AND REVISED
OBJECTIONS FOLLOWING THE APPELLANT'S NOMINATION OF MR
IAIN HAIR IN THE FIELD OF GROUNDWATER TESTING AND
DATA COLLECTION**

RESPONSE TO DOCUMENTS FILED BY APPELLANT

1. The Second Co-Respondent by Election (**ARCS**) does not oppose the Appellant's Application in a Pending Proceeding for Mr Hair to be nominated as an expert in "the field of groundwater testing and data collection" but applies for orders that:
 - (a) the hearing be adjourned so that Mr Hair can participate in a further joint expert meeting with the groundwater experts addressing the gaps and discrepancies in information that currently exists about the groundwater monitoring he undertook; and
 - (b) the Appellant pay ARCS costs thrown away due the adjournment and late provision of substantial new information in the Hair Affidavit.
2. The grounds on which these orders are sought are:
 - (a) Document 6 of Mr Hair's affidavit (**Hair Affidavit**) contains substantial new information that was not provided by the Appellant during the groundwater joint meeting process in 2021, including of pump testing on 20-28 July 2021 before the Groundwater-Ecology Joint Meeting occurred in late July and

early August 2021;¹

- (b) the new information is filed in non-compliance with the Court supervised JER process and dates ordered by the Court for both expert reports and lay witness statements;
- (c) the late provision of the substantial new information is contrary to the ordinary method of the preparation of expert evidence under Part 3, Division 1 of the *Planning and Environment Court Rules*, which are designed to facilitate the orderly, just and expeditious delivery of expert evidence consistent with s 10 of the *Planning and Environment Court Act 2016*;
- (d) there remain significant gaps and unexplained discrepancies in the information about groundwater monitoring presented;²
- (e) ARCS would be unfairly³ prejudiced by the admission of the new material the last working day before the trial was scheduled to commence without an adjournment; and
- (f) The Appellant has provide no explanation⁴ of why the new information contained in Document 6 of the Hair Affidavit was not presented earlier for the groundwater experts to consider, nor was its existence and potential impacts raised at any of the reviews conducted by the Court, including the pre-trial review on 27 January 2022.

REVISED LIST OF OBJECTIONS

3. With the inclusion of Mr Hair as a witness, ARCS can substantially narrow its grounds of objection to the Appellant's evidence as a result of the significant concessions that the Appellant has made in not relying on Hair's opinions in Documents 5 and 6 of his affidavit and limiting his role to "the field of groundwater testing and data collection."
4. Based on the concessions that the Appellant has made in relation to Documents 5 and 6, ARCS seeks similar redactions to the earlier Douglas Partners reports written by Mr Hair (including Document 3 in his affidavit). If the Appellant makes similar concessions for Mr Hair's other reports, ARCS objections to the Appellant's evidence can largely be resolved by consent, subject to six objections relating to Dr Johnson's evidence based principally on Makita principles, which ARCS submits do not need to be decided immediately and can be resolved in the final judgment.⁵
5. Schedule 1 to these submissions is a revised schedule of objections, showing changes in tracking. These revisions conveniently fall into three groups:

¹ See the affidavit of Professor Matthew Currell, sworn 14 February 2022.

² See the affidavit of Professor Matthew Currell, sworn 14 February 2022.

³ In *Casagrande Investments Pty Ltd v Redland City Council* [2010] QPELR 688; [2010] QPEC 54, Rackemann DCJ found that it would be unfair to permit the tender of an expert report on the first morning of the trial (despite notification of it having been provided approximately one month earlier)

⁴ The failure to provide a satisfactory explanation is a significant factor: *Aon Risk Services Australia Ltd v Australian National University* (2009) 239 CLR 175 at 181-182, [4]-[5] (French CJ) and 215 [102]-[103] (Gummow, Hayne, Crennan, Kiefel and Bell JJ); *Corbet v DTMR* [2020] QLC 34 at [6] (Kingham P).

⁵ Applying the exception to the general rule that objections be decided immediately discussed by Bond J in *Sanrus Pty Ltd & Ors v Monto Coal 2 Pty Ltd & Ors (No 5)* [2019] QSC 210 at [50].

- (a) Objections that ARCS does not press due to the concessions the Appellant has made and now calling Mr Hair limited to “the field of groundwater testing and data collection” and resolution of the Respondent’s objections. These are objections 1-4, 8-37 and 46-50 (40 objections in total).
 - (b) Objections that ARCS maintains to Mr Hair’s earlier reports that express opinions outside “the field of groundwater testing and data collection”, which ARCS expects the Appellant to concede for consistency with its approach to Documents 5 and 6 to Mr Hair’s affidavit. These are objections 5-7A in schedule 1. In addition, objection 42 reflects the parts of Document 5 of the Hair Affidavit copied in other parts of the evidence that the Appellant has indicated it no longer relies upon (5 objections in total).
 - (c) Objections to Mr Johnson’s evidence principally based on the Makita principles set out in ARCS earlier submissions.⁶ These are objections 38-41, 44 and 45 (6 objections in total).
6. Attached as separate files to these submissions are the following four earlier reports by Mr Hair’s and shows in highlighting (in the same formatting as used by the Appellant in identifying the parts of Documents 5 and 6 that they do not rely upon) the parts that ARCS objects to as opinions outside “the field of groundwater testing and data collection.” The four earlier reports in schedule 2 are:
- (a) Douglas Partner report of November 2017 (eTrial Doc 04.08) (which is also Document 3 in Mr Hair’s affidavit) (**Attachment A**);
 - (b) Douglas Partner report of 13 September 2018 (eTrial Doc 04.19) (**Attachment B**);
 - (c) Douglas Partner report of 1 May 2019 (eTrial Doc 04.16) (**Attachment C**); and
 - (d) Douglas Partner report of 19 June 2019 (eTrial Doc 04.17) (**Attachment D**).



Dr Chris McGrath
ARCS counsel
14 February 2022

⁶ See the “Second Co-Respondent’s Objections to the Appellant’s evidence, filed 2/2/22 and revised with eTrial document numbers on 10/2/22 at [17]-[26].

SCHEDULE 1: PARTICULARS OF OBJECTIONS⁷

No.	Document or statement the subject of objection	Reference	Ground/s of objection
1.—	Peter J Ramsay & Associates, “Hydrological Impact Assessment for the Existing Groundwater Source at 133 Repeater Station Road, Springbrook, Queensland”, dated 24 July 2014	[objection is taken if the Appellant seeks to tender this document other than as original evidence] [eTrial Doc 04.21]	1.1 Hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>. 1.2 Opinion of second groundwater expert who is not called to give evidence and has not participated in the joint expert meeting process. 1.3 Relies on facts and assumptions not proved by admissible evidence. 1.4 The matters assumed are not sufficiently like the matters established to render the opinion of any value.
2.—	Peter J Ramsay & Associates, “Pumping Test to Support Commercial Groundwater Extraction, 133 Repeater Station Road, Springbrook, Queensland”, dated 27 November 2014	[objection is taken if the Appellant seeks to tender this document other than as original evidence] [eTrial Doc 04.22]	2.1 Grounds of objection as for objection 1
3.—	Peter J Ramsay & Associates, “Review of Water Level Monitoring Data for the Springbrook Groundwater Source, 133 Repeater Station Road, Springbrook, Queensland, November 2014 to March 2015”, dated 25 May 2015	[objection is taken if the Appellant seeks to tender this document other than as original evidence] [eTrial Doc 04.23]	3.1 Grounds of objection as for objection 1
4.—	Peter J Ramsay & Associates, “Review of Water Level Monitoring Data for the Springbrook Groundwater Source, 133 Repeater Station Road, Springbrook, Queensland, July 2015 to May 2017”, dated 16 June 2017	[objection is taken if the Appellant seeks to tender this document other than as original evidence] [eTrial Doc 04.24]	4.1 Grounds of objection as for objection 1

⁷ Showing tracking from schedule in ARCS objections revised on 10 February 2022.

5.	<p><u>The parts of Douglas Partners, “Report on Groundwater Resource Assessment for Proposed Commercial Groundwater Extraction, 263 Repeater Station Road, Springbrook”, dated November 2017, shown in highlighting in Schedule 2.</u></p>	<p>[Included as “specialist report” in development application – objection is taken if the Appellant seeks to tender this document other than as original evidence] [eTrial Doc 04.08 and Document 2 to the Hair Affidavit]</p>	<p>5.1 Hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>.</p> <p>5.2 Opinion of second groundwater expert (Mr Iain Hair) outside of “the field of groundwater testing and data collection”, for which Mr Hair is nominated by the Appellant who is not called to give evidence, who has not participated in the joint expert meeting process and who the Appellant’s solicitor stated the Appellant would not be relying upon as an expert.⁸</p> <p>5.3 Contains opinions outside the field of expertise of the expert (assumed to be limited to groundwater) involving ecology, to the extent that the report purports to state that “impacts” including ecological impacts (e.g. to the vadose zone and animals and plants reliant on surrounding groundwater springs fed by the aquifer) “would be minimal”.</p> <p>5.4 Relies on facts and assumptions not proved by admissible evidence (e.g. that the aquifer and any impacts to it are uniform and not affected by fracturing).</p> <p>5.5 Relies on unstated and unidentified assumptions, including:</p> <ul style="list-style-type: none"> (a) aquifer properties such as recharge area and transmissivity; and (b) the relevant scale for assessment of impacts is unstated, making it unclear whether the assessment assumes the relevant scale is impacts to the site itself, including groundwater springs on the site, or at a regional scale (e.g. at Little Nerang Dam, over 10km to the north of the site) or some other scale. <p>5.6 The matters assumed (e.g. that the aquifer and any impacts due to the proposed extraction of groundwater are uniform and not affected by fracturing) are not sufficiently like the matters established to render the opinion of the groundwater expert called by the Appellant of any value, including that the</p>
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⁸ The Appellant’s solicitor wrote to the Council on 6 May 2021 stating “We confirm that Mr Hair is not an expert in this proceeding. Our client does not intend to rely upon Mr Hair’s opinions.” This statement is extracted in correspondence exhibited at p 5 to the Pointon affidavit [eTrial Doc 08.03].

			report assumes a uniform/homogeneous and extensive aquifer, which is not the case for this site. ⁹
6.	<u>The parts of Douglas Partners, “MCU/2018/495: Development Permit for Proposed Commercial Groundwater Extraction at 263 Repeater Station Road, Springbrook QLD 4213”, dated 19 June 2019, shown in highlighting in Schedule 2.</u>	{Submitted to Council during the development application but not presently in evidence— objection is taken if the Appellant seeks to tender this document other than as original evidence} [eTrial Doc 04.17]	6.1 Grounds of objection as for objection 5.2.
7.	<u>The parts of Douglas Partners, “Re Proposed Bottled Water Supply, 263 Repeater Station Road, Springbrook, Southeast Queensland”, dated 13 September 2018, shown in highlighting in Schedule 2..</u>	{Submitted to Council during the development application process but not presently in evidence— objection is taken if the Appellant seeks to tender this document other than as original evidence} [eTrial Doc 04.19]	7.1 Grounds of objection as for objection 5.2 with the exception that the scale of assessment in this report is identified. 7.2 In relation to the scale of the assessment, the matters assumed are not sufficiently like the matters established to render the opinion of any value, including: (a) The report contradicts (and is not sufficiently like) the agreed fact that “The groundwater that would be extracted by the production bores at 263 Repeater Station Road would otherwise flow (via groundwater discharge from seeps and springs) to surface water sites at lower elevations, including any existing GDEs, as well as Twin Falls and Cave Creek, which are sites of considerable environmental and regional tourism significance.”¹⁰ (b) Little Nerang Dam is a significant distance downstream of the bores and receives inflow from a larger catchment and more extensive network of tributaries than would likely be impacted by the bore extraction. As such, comparing the proposed extraction volume at the bores to the relatively large magnitude of inflows from the wider catchment area into Little Nerang Dam, obscures potentially much more significant local impacts upstream of this dam, such as the smaller streams and springs

⁹ This criticism has been made a number of times by the respondent’s and ARCS’ experts (e.g. Tony McAlister’s individual report [eTrial Doc 06.05], 22 December 2021, at [22]).

¹⁰ Groundwater JER [eTrial Doc 01.02], Point of Agreement 8, which was reaffirmed as remaining “unchanged” in the Joint Groundwater-Ecology JER [eTrial Doc 01.10] at (12).

			<p>flowing to Twin Falls, Cave Creek and Natural Bridge – sites of considerable significance.¹¹</p> <p>(c) The modelling of local impacts is overly simplistic and assumes uniform recharge and drawdown, which has not been established by admissible evidence and contradicts the accepted facts that the aquifer is subject to fracturing and heterogeneous.¹²</p>
7A.	<u>The parts of Douglas Partner’s report of 1 May 2019 shown in highlighting in Schedule 2.</u>	<u>eTrial Doc 04.16</u>	<u>7A.1 Grounds of objection as for objection 5.2.</u>
8.—	SLR “Water Balance Assessment – 263 Repeater Station Road, Springbrook”, dated June 2020	[Not presently in evidence – objection is taken if the Appellant seeks to tender this document other than as original evidence] [eTrial Doc 04.20]	<p>8.1 Contains hearsay (e.g. summarizing and relying on Douglas Partners reports for the site) for which no exception applies and leave should not be granted to rely upon under s 92 of the Evidence Act.</p> <p>8.2 Contains opinions of two additional groundwater experts (Helen Doherty and Hayden Munck) who were not nominated by the Appellant, who are not called to give evidence and who have not participated in the joint expert meeting process.</p> <p>8.3 Contains opinions outside the field of expertise of the experts who prepared the report (assumed to be limited to groundwater) involving ecology, to the extent that the authors purport to state that “impacts” including ecological impacts (e.g. to the vadose zone and animals and plants reliant on surrounding groundwater springs fed by the aquifer) are “clearly insignificant” and “imperceptible”.</p> <p>8.4 Relies on facts and assumptions not proved by admissible evidence, including:</p> <p>(a) the results of pump testing done by Douglas Partners;</p> <p>(b) the connectivity between recharge occurring over the region above elevation of 830m AHD (shown on the map on p 7 of the Groundwater JER) and the aquifer</p>

¹¹ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [3b](b)).

¹² This criticism has been made a number of times by the respondent’s and ARCS’ experts (e.g. Tony McAlister’s individual report, 22 December 2021 [eTrial Doc 06.05], at [22]).

			<p>in which the production bores are installed, is not demonstrated;</p> <p>(e) the report assumes the recharge area for the aquifer is 309 ha based on an assumption that recharge occurs uniformly across the area above 830 m AHD but it cannot be assumed that recharge above 830 m AHD occurs across this full area or that it infiltrates into a connected aquifer system in which the bores are installed, without first mapping groundwater elevation contours and documenting the hydrogeological characteristics of the area in more detail;¹³</p> <p>(d) groundwater flow patterns and hydraulic gradients have not been characterised in the area of the development — e.g. there are no water table or potentiometric surface maps, which are required to understand the impacts of drawdown caused by the production bores on groundwater flow and discharge to the surface (which may be environmentally important);¹⁴</p> <p>(e) the volume of water stored in the aquifer has not been determined and there are insufficient data to estimate this currently;¹⁵</p> <p>(f) it has not been adequately demonstrated that the estimated recharge rates are appropriate for the site;¹⁶</p> <p>(g) water table fluctuation in the vicinity of the springs and other potential GDEs (or aquifer porosity) has not been adequately documented with supporting evidence;¹⁷</p> <p>(h) key hydrogeological features of the site are not well characterized, such as the depth, thickness and extent</p>
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¹³ These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [1e] and [17a]).

¹⁴ These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [8a]).

¹⁵ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2b]).

¹⁶ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [3b)(a)).

¹⁷ This point was raised at the time of the Groundwater JER by Tony McAlister (see Groundwater JER [eTrial Doc 01.02], [6c]).

			<p>of different aquifer units, the nature and extent of porosity and permeability, and the degree of connectivity between the aquifer in which the extraction bore(s) are constructed and surface water systems and underlying/adjacent aquifer units;¹⁸</p> <p>(i) hydraulic parameters, including transmissivity, hydraulic conductivity, porosity and storativity have not been reported for the site from the aquifer where extraction is proposed, or other adjacent aquifer units, noting that such parameters may be highly site-specific in fractured rock aquifers. These parameters may be highly variable and those estimated at 133 Repeater Station Road (using a pumping test) may not be representative for the area surrounding the bores in the current application;¹⁹</p> <p>(j) the modelling uses basic analytical equations which are not demonstrated to be suitable for the setting and are poorly documented, missing supporting data, equations and assumptions.²⁰</p> <p>8.5 Relies on unstated and unidentified assumptions (e.g. of aquifer properties such as transmissivity and the conceptual hydrogeological model for groundwater relevant to the site).</p> <p>8.6 The matters assumed are not sufficiently like the matters established to render the opinion of the groundwater expert called by the Appellant of any value, including:</p> <p>(a) The report contradicts (and is not sufficiently like) the agreed fact that “The groundwater that would be extracted by the production bores at 263 Repeater Station Road would otherwise flow (via groundwater discharge from seeps and springs) to surface water sites at lower elevations, including any existing GDEs, as well as Twin</p>
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¹⁸ These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [7a]).

¹⁹ These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [9a]).

²⁰ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2f]).

			<p>Falls and Cave Creek, which are sites of considerable environmental and regional tourism significance²¹ in circumstances where multiple groundwater springs are known occur within 200 m east and west of the bores, which the report neither recognizes or accounts for.²²</p> <p>(b) The report assumes that the relevant scale for assessing impacts is inflow into Little Nerang Dam, over 10km north of the site, rather than impacts to the site and immediately surrounding area, including the vadose zone and flora and fauna reliant on the groundwater springs to the west and east of the proposed pumps.</p> <p>(c) Little Nerang Dam is a significant distance downstream of the bores and receives inflow from a larger catchment and more extensive network of tributaries than would likely be impacted by the bore extraction. As such, comparing the proposed extraction volume at the bores to the relatively large magnitude of inflows from the wider catchment area into Little Nerang Dam, obscures potentially much more significant local impacts upstream of this dam, such as the smaller streams and springs flowing to Twin Falls, Cave Creek and Natural Bridge – sites of considerable significance.²³</p> <p>(d) The report assumes the relationship between rainfall and runoff for a stream gauge in the Numinbah Valley, over 10km northwest of the site, is “within the vicinity of the site” and applicable to modelling impacts at a catchment scale. This has not been established.</p> <p>(e) The report uses streamflow data from the Numinbah gauge to estimate baseflow a significant distance downstream from the site and at far lower topographic</p>
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²¹ Groundwater JER [eTrial Doc 01.02], Point of Agreement 8, which was reaffirmed as remaining “unchanged” in the Joint Groundwater-Ecology JER [eTrial Doc 01.10] at (12).

²² The existence of a permanent groundwater spring on the subject site approximately 200m to the east of the bores is common ground (see, e.g., Groundwater JER [eTrial Doc 01.02] at p 13 and Ecology JER [eTrial Doc 01.07], p 73. In relation to the groundwater springs to the east and west of the bores, see the affidavit of Elanor Marie Fenge, affirmed 5 November 2021 [eTrial Doc 08.04].

²³ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [3b](b)).

			<p>elevation. This is unlikely to provide reliable estimates of groundwater recharge that are applicable for the aquifer at the site of the proposed bores.²⁴</p> <p>(f) Reliable estimates of groundwater recharge that are applicable for the aquifer at the site of the proposed bores would require other lines of evidence based on site-specific data, such as groundwater hydrographs and/or environmental tracers.²⁵</p> <p>(g) The report uses an inappropriate model and calibrated this model to a site that is topographically very different to the area upstream of and adjacent to 263 Repeater Station Road.²⁶</p> <p>(h) The report used an incorrectly large catchment area to then extrapolate their model findings to the site in question.²⁷</p> <p>(i) The modelling is overly simplistic, using basic analytical equations which are not demonstrated to be suitable for the setting and are poorly documented, missing supporting data, equations and assumptions.²⁸</p> <p>(j) The modelling of local impacts is overly simplistic and assumes uniform recharge and drawdown, which has not been established by admissible evidence and contradicts the accepted facts that the aquifer is subject to fracturing and heterogeneous.²⁹</p> <p>(k) The use of a lumped conceptual whole of catchment water balance model to then assess recharge rates within a smaller, steeper, upper part of the catchment grossly</p>
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²⁴ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2b]. He made a similar point at [16a]).

²⁵ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2b]).

²⁶ This point was raised at the time of the Groundwater JER by Tony McAlister (see Groundwater JER [eTrial Doc 01.02], [3c]).

²⁷ This point was raised at the time of the Groundwater JER by Tony McAlister (see Groundwater JER [eTrial Doc 01.02], [3c]) and in his individual report [Doc 08.01] at [78]-[83].

²⁸ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2f]).

²⁹ This criticism has been made a number of times by the respondent's and ARCS' experts (e.g. Tony McAlister's individual report, 22 December 2021 [eTrial Doc 06.05], at [22]).

			<p>averages processes and provides no insights to such matters at the subject site.³⁰</p> <p>(l) The use of the model developed by SLR which is calibrated for flow data at the Numinbah gauge (catchment area 68 km²) to then extrapolate groundwater recharge at the 263 Repeater Station Road site, with a far smaller and totally different catchment and climate pattern, is incorrect. This analysis takes no consideration of the individual characteristics (slope, catchment area, incident rainfall, et cetera) of the 263 Repeater Station Road site itself, nor of the nature of the geology and aquifer characteristics beneath the site.³¹</p> <p>(m) The modelling is nowhere near fit for the purpose of predicting drawdown and/or water budget changes resulting from the development. More in-depth analytical and/or numerical groundwater modelling tools could potentially achieve this, but this would first require more comprehensive field data from the site to ensure such modelling is an appropriate representation of the hydrogeology of the site.³²</p> <p>(n) The modelling conducted by SLR Consulting under TJ's instruction is surface water balance modelling that has (incorrectly) inferred groundwater recharge rates at the site in question. It tells us nothing about changes in water table levels or how much and where such water may express in adjacent environmentally significant locations. It also takes no account of potential cumulative impacts of other existing operations in the area (e.g. that at 133 Repeater Station Road).³³</p>
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³⁰ This point was raised at the time of the Groundwater JER by Tony McAlister (see Groundwater JER [eTrial Doc 01.02], [16c]) and in his individual report [Doc 08.01] at [78]-[82].

³¹ These points were raised by Tony McAlister in his individual report [eTrial Doc 06.05] at [78]-[82].

³² These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2f]).

³³ These points were raised at the time of the Groundwater JER by Tony McAlister (see Groundwater JER [eTrial Doc 01.02], [6c]).

			(o) The modelling does not consider the potential for climate change to (further) reduce the amounts and reliability of rainfall in the area in the coming decades.³⁴
9.—	“It is agreed that the water table level in the proposed extraction bores at the time that Douglas Partners completed a pump test on the site (in 2017) was approximately 830 m AHD.”	Groundwater JER, [2] <u>[eTrial Doc 01.02]</u>	9.1 Relies on hearsay (relying on Douglas Partners reports for the site) for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>. 9.2 Relies on facts and assumptions not proved by admissible evidence (e.g. the results of pump testing done by Douglas Partners).
10.—	“It is agreed that an existing groundwater extraction business at 133 Repeater Station Road, approximately 1 km north of the subject site, was approved by Council on 9 September 2015. The ground level at 133 Repeater Station Road is approximately 820 m AHD as compared with 910 m AHD at 263 Repeater Station Road, making it some 90m lower than the subject site. In making this determination, Council considered a groundwater impact report prepared by Peter J Ramsay & Associates (Hydrogeological Impact Assessment for the Existing Groundwater Source at 133 Repeater Station Road, 24 July 2014). That report stated that the aquifer was approximately 60 m thick, and that the principal source of groundwater recharge was rain falling directly on the ground surface above. The report also stated that the average hydraulic conductivity of the aquifer was 0.36 m/day, with an effective aquifer porosity of 0.05.”	Groundwater JER, [3] <u>[eTrial Doc 01.02]</u>	10.1 Relies on hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>. 10.2 Relies on facts and assumptions not proved by admissible evidence. 10.3 Relies on opinions of additional groundwater expert/s who were not nominated by the Appellant, who are not called to give evidence and who have not participated in the joint expert meeting process.

³⁴ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [3b](c)).

11.	<p>“The principal finding of the Peter J Ramsay report was that groundwater extraction of up to 12 ML/annum (constant rate of 0.38 L/s) was possible at 133 Repeater Station Road, and that a) groundwater bores more than 500 m distant would be beyond the radius of influence of drawdown from such extraction and b) short term hydraulic impacts to springs approximately 500 m from the wells were not likely. However, they noted the potential for long term drawdown in the aquifer to impact upon baseflow to the springs. The Ramsay report could not confirm whether there would be a long term impact on water levels in the aquifer since they had not undertaken relevant water balance assessments. It is agreed that Council considered this information when issuing an approval for the extractive industry on that site.”</p>	<p>Groundwater JER, [4] [eTrial Doc 01.02]</p>	<p>11.1 — Relies on hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>.</p> <p>11.2 — Relies on facts and assumptions not proved by admissible evidence.</p> <p>11.3 — Opinion of second groundwater expert who is not called to give evidence and who has not participated in the joint expert meeting process.</p>
12.	<p>“It is agreed that Douglas Partners undertook site and desktop groundwater investigations for the 263 Repeater Station Road site as per their 2017 report and two subsequent letters to Council. ... Douglas Partners estimated that the maximum impact of groundwater extraction of up to 16 ML/annum at 263 Repeater Station Road would be a reduction in the water table level of approximately 1.5 m at a distance of 270 m from the bores.”</p>	<p>Groundwater JER, [5] [eTrial Doc 01.02]</p>	<p>12.1 — Relies on hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>.</p> <p>12.2 — Relies on facts and assumptions not proved by admissible evidence.</p> <p>12.3 — Opinion of groundwater expert (Mr Iain Hair) who is not called to give evidence, who has not participated in the joint expert meeting process and who the Appellant’s solicitor stated the Appellant would not be relying upon as an expert.³⁵</p>
13.	<p>“TJ states that there is only [one] way to determine the catchment area, and this is to</p>	<p>Groundwater JER, [1d] [eTrial Doc 01.02]</p>	<p>13.1 — Relies on opinions of two additional groundwater experts (Helen Doherty and Hayden Munck) who were not</p>

³⁵ See footnote 8.

	<p>trace around the 830 m AHD contour on a topographic map of the area. Please see the following image which shows the extent of the 830 m AHD contour. It is clear and unremarkable that seepage occurring on this area following rainfall will flow into the aquifer. ... It is noted that the analysis is conservative in that we have terminated the catchment area used in the analysis to exclude about 86 ha of the area above 830 m AHD in the far east of the map.</p>		<p>nominated by the Appellant, who are not called to give evidence and who have not participated in the joint expert meeting process (and are directly referred to in the quoted extract by Dr Johnson in his reference to “we have ...”).</p> <p>13.2 — Relies on facts and assumptions not proved by admissible evidence, including:³⁶</p> <p>(a) the connectivity between recharge occurring over the region above elevation of 830m AHD shown in the map on p 7 of the Groundwater JER, and the aquifer in which the production bores are installed, is not demonstrated; and</p> <p>(b) it cannot be assumed that recharge above 830m AHD occurs across this full area or that it infiltrates into a connected aquifer system in which the bores are installed, without first mapping groundwater elevation contours and documenting the hydrogeological characteristics of the area in more detail; and</p> <p>(c) the modelling uses basic analytical equations which are not demonstrated to be suitable for the setting and are poorly documented, missing supporting data, equations and assumptions.³⁷</p> <p>13.3 — ARCS otherwise repeats the objections to reliance on the SLR report generally as set out above in objection 8.</p>
14.	<p>“TJ says that the above investigation was reported upon in the SLR Consulting report of June 2020. That report concluded that the extraction of up to 16 ML of groundwater from the aquifer per annum would have only a minor impact on the volume of water stored in the aquifer. The water balance model, based on the Goldsim interpretation</p>	<p>Groundwater JER, [2a] [eTrial Doc 01.02]</p>	<p>14.1 — Grounds of objection as for objection 13.</p> <p>14.2 — In addition, the matters assumed are not sufficiently like the matters established to render the opinion of the groundwater expert called by the Appellant of any value, including:³⁸</p> <p>(a) The SLR Consulting Report uses streamflow data from the Numinbah gauge to estimate baseflow a</p>

³⁶ These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [1e]).

³⁷ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2f]).

³⁸ These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [1e]).

	<p>of the Australian Water Balance Model (AWBM), achieved excellent calibration performance against actual surface flows recorded at the Department of Natural Resources and Mines (DNRM) gauge at Numinbah (Figure 6 in the report).²</p>		<p>significant distance downstream from the site and at far lower topographic elevation. This is unlikely to provide reliable estimates of groundwater recharge that are applicable for the aquifer at the site of the proposed bores.³⁹</p> <p>(b) Reliable estimates of groundwater recharge that are applicable for the aquifer at the site of the proposed bores would require other lines of evidence based on site-specific data, such as groundwater hydrographs and/or environmental tracers.⁴⁰</p> <p>(c) The modelling is overly simplistic, using basic analytical equations which are not demonstrated to be suitable for the setting and are poorly documented, missing supporting data, equations and assumptions.⁴¹</p> <p>(d) The modelling is nowhere near fit for the purpose of predicting drawdown and/or water budget changes resulting from the development. More in-depth analytical and/or numerical groundwater modelling tools could potentially achieve this, but this would first require more comprehensive field data from the site to ensure such modelling is an appropriate representation of the hydrogeology of the site.⁴²</p>
15.	<p>“TJ says that groundwater modelling has been undertaken by a number of consulting engineers in this area (URS, Peter J Ramsay & Associates, Douglas Partners), each of whom has determined that the short term impacts of groundwater extraction are close to insignificant. TJ notes that SLR Consulting was not undertaking additional groundwater modelling, but instead setting</p>	<p>Groundwater JER, [2d] [eTrial Doc 01.02]</p>	<p>15.1 Relies on hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>.</p> <p>15.2 Relies on facts and assumptions not proved by admissible evidence, including the facts and assumptions identified above in objection 13.</p> <p>15.3 Relies on opinions of groundwater experts who are not called to give evidence and who have not participated in</p>

³⁹ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2b]).

⁴⁰ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2b]).

⁴¹ This point was raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2f]).

⁴² These points were raised at the time of the Groundwater JER by Associate Professor Currell (see Groundwater JER [eTrial Doc 01.02], [2f]).

	<p>up a water balance model on the advice of Water Technology acting on behalf of Council. He does not consider the groundwater conditions here to be significantly complex and relies on the previous findings which Council had itself considered and accepted in approving groundwater extraction at 133 Repeater Station Road. He does not believe that more extensive hydrogeological investigations are likely to yield different results than have been obtained so far.”</p>		<p>the joint expert meeting process.</p> <p>15.4— The matters assumed are not sufficiently like the matters established to render the opinion of the groundwater expert called by the Appellant of any value, including the matters identified above in objection 14.</p>
16.	<p>“TJ says that the model, based on 120 years of rainfall data, indicated that an extraction rate of 16 ML/annum would remove on average less than 1% of the volume of water seeping to the aquifer in the wetter parts of the year, increasing to about 3% of the available volume during the drier months. The model also shows that the maximum impact on flows to Little Nerang Creek would have been 4.6% in the driest month on record. In his opinion, it is apparent that these impacts are much smaller than the annual variation in rainfall totals which occur on the site. The annual extraction rate represents less than 1% of the average volume of rain falling on the catchment.”</p>	<p>Groundwater JER, [3a]. [eTrial Doc 01.02]</p>	<p>16.1— Grounds of objection as for objections 8 and 13–15.</p>
17.	<p>“It is TJ’s opinion that the work completed by SLR Consulting, together with the historical hydrogeological analyses previously completed with others, demonstrates that the level of extraction proposed will have no significant impact on the Springbrook aquifer. If the intention of</p>	<p>Groundwater JER, [3d]. [eTrial Doc 01.02]</p>	<p>17.1— Grounds of objection as for objections 8 and 13–15.</p>

	<p>the studies undertaken was to examine the behaviour of the aquifer in minute detail, then the level of investigation proposed by MC and TM might be acceptable. However, the intention has always been to estimate the impact that a relatively minor volume of extraction will have on this aquifer. It has not been to study the aquifer in detail. On that basis, the level and extent of analysis completed is consistent with the insignificant impact which has been estimated to occur by a number of different consulting engineers who have considered this matter.”</p>		
18.	<p>“TJ says that the SLR Consulting analysis had the benefit of referring to a similar investigation completed by the Queensland University of Technology in relation to groundwater extraction from sites on Tamborine Mountain, which is considered to have very similar geology to the Springbrook area.”</p> <p>“TJ says that the volume of water proposed to be extracted from the Springbrook site is substantially less than that estimated for Mount Tamborine while the annual rainfall totals are significantly more. In his opinion, the same conclusion should therefore be applicable to the current proposal, i.e. the level of extraction is considered to be sustainable.”</p>	Groundwater JER, [4a]. [eTrial Doc 01.02]	<p>18.1 ARCS accepts that that the QUT study of Tamborine Mountain is part of the scientific literature that the groundwater experts may refer to but disputes that it has been established that Tamborine Moutain is a “very similar geology to the Springbrook area” or that its results are applicable to assessing the impacts of the proposed development.⁴³ As a consequence, ARCS objects to Dr Johnson’s opinion based on the following grounds.</p> <p>18.2 Dr Johnson’s opinion relies on facts and assumptions not proved by admissible evidence, including that the results of the QUT study at Mt Tamborine is applicable to the site.</p> <p>18.3 Dr Johnson’s opinion assumed matters that are not sufficiently like the matters established to render the opinion of any value, including because:</p> <p>(a) Tamborine Mountain was found by QUT to include a multi-layered aquifer system with multiple basalt aquifers within a thickness of up to 150 m whereas the current geological information from the Repeater</p>

⁴³ The point that the results of the QUT study at Mt Tamborine cannot be assumed to apply to the site was raised by Associate Professor Currell in the Groundwater JER [eTrial Doc 01.02] at [4b].

			Station Rd site while incomplete indicates a much thinner and less extensive aquifer system with lower storage capacity. ⁴⁴
19.	<p>“TJ says that the Tamborine Mountain investigation is in fact an excellent analogue for the Springbrook extraction. Both sites are typified as basalt plateaus in south-east Queensland where groundwater extraction occurs from a fractured rock aquifer, and both were formed by lava flows from the Tweed shield volcano. However, he also notes that this part of Springbrook receives more than double the Mt Tamborine rainfall on average. It would be expected that a higher sustainable groundwater extraction rate was therefore likely to be achievable at Springbrook.”</p>	<p>Groundwater JER, [4d]. [eTrial Doc 01.02]</p>	19.1 Grounds of objection as for objection 18.
20.	<p>“TJ says that the groundwater investigations undertaken by Douglas Partners and Peter J Ramsay & Associates in the local area have adequately determined the characteristics of the aquifer underlying the area, and have determined that the impacts of proposed extraction will be acceptable. If the requirement of the investigation is to conservatively determine the impact that planned extraction of groundwater will have on the aquifer, the level of investigation used by the applicant’s consultants is adequate.”</p> <p>“TJ says that the analyses and investigations completed by SLR Consulting have determined that the volume of extraction</p>	<p>Groundwater JER, [5b]. [eTrial Doc 01.02]</p>	20.1 Grounds of objection as for objections 8 and 11-15.

⁴⁴ This point was raised by Associate Professor Currell at [4e] of the Groundwater JER [eTrial Doc 01.02].

	from the aquifer is not significant in comparison to either the volume of rainfall seepage which flows to the aquifer, or the volume of surface expression of groundwater in the Little Nerang Creek catchment.”		
21.	“there were no rare or endangered species which were reliant on groundwater in the vicinity of the spring. It was also discussed that the variation in water table level which might result from groundwater extraction was unlikely to alter ecological characteristics of the site, including the area around the spring.”	Groundwater JER, [5b]. <u>[eTrial Doc 01.02]</u>	<p>21.1 Relies on hearsay.</p> <p>21.2 States an opinion (regarding ecology) outside the area of expertise of the groundwater expert, Dr Johnson.</p> <p>21.3 Relies on facts and assumptions not proved by admissible evidence.</p> <p>21.4 The matters assumed are not sufficiently like the matters established to render the opinion of any value, including:</p> <p>(a) The opinion contradicts (and is not sufficiently like) the agreed fact that “The groundwater that would be extracted by the production bores at 263 Repeater Station Road would otherwise flow (via groundwater discharge from seeps and springs) to surface water sites at lower elevations, including any existing GDEs, as well as Twin Falls and Cave Creek, which are sites of considerable environmental and regional tourism significance”⁴⁵</p>
22.	“TJ says that based on the low porosity of the aquifer, significant changes in groundwater table level are likely to be experienced following rainfall. In his opinion, changes in water level of between 5 and 10 m are likely to be common across the course of a year. The existing vegetation on	Groundwater JER, [6a]. <u>[eTrial Doc 01.02]</u>	<p>22.1 Grounds of objection as for objections 8, 11-15 and 21 and, in addition, the following grounds.</p> <p>22.2 Relies on facts and assumptions not proved by admissible evidence, including the level of water table fluctuation in the vicinity of springs and other potential GDEs (or aquifer porosity) has not been adequately documented with supporting evidence.⁴⁶</p>

⁴⁵ Groundwater JER [eTrial Doc 01.02], Point of Agreement 8, which was reaffirmed as remaining “unchanged” in the Joint Groundwater-Ecology JER [eTrial Doc 01.10] at (12).

⁴⁶ These points were raised in response to Dr Johnson’s opinion by Associate Professor Currell at [6b] of the Groundwater JER [eTrial Doc 01.02].

	<p>site is obviously already resilient and acclimatised to these changes. Minor variations of less than 1 m caused by groundwater extraction are simply insignificant in this context.”</p>		<p>22.3 The matters assumed are not sufficiently like the matters established to render the opinion of any value:⁴⁷</p> <p>(a) any additional drawdown caused by the extraction bores would compound periods of natural decline in groundwater levels in response to low rainfall, and this may reduce water levels below minimum previously experienced (and potentially environmentally important) thresholds; and</p> <p>(b) analysing the impacts of groundwater extraction on surface ecological systems based on water table fluctuation alone overlooks the importance of discharge flux rates, and the potential for pumping wells to capture potentially environmentally significant flow.</p>
23.	<p>“the requirement to prepare a water balance model was the outcome of discussions between TJ and TM’s colleague at Water Technology, Mr Craig Flavel. The water balance model calculates the changes in water volumes which are likely to take place in the aquifer as a result of the groundwater extraction proposed, as well as the processes of evapotranspiration and surface expression. He also notes that, based on the aquifer parameters determined by Peter J Ramsay & Associates, the fractured basalt rock aquifer has a low porosity which dictates that there will be significant changes in water table level as a result of even small amounts of rainfall. He notes that Peter J Ramsay & Associates reported on level rises observed by URS in this locality following rainfall which support the TJ position.</p>	<p>Groundwater JER, [6a]. <u>[eTrial Doc 01.02]</u></p>	<p>23.1 Grounds of objection as for objections 8, 11-15, 21 and 22.</p>
24.	<p>TJ’s opinion that “the previous groundwater</p>	<p>Groundwater JER, [7b].</p>	<p>24.1 Grounds of objection as for objections 8, 11-15, 21 and 22.</p>

⁴⁷ This points were raised in response to Dr Johnson’s opinion by Associate Professor Currell, at [6b], and agreed with by Tony McAlister, at [6c], of the Groundwater JER [Doc 01.02].

	<p>investigations which have been undertaken in this local area have adequately characterised the aquifer. He also states that the surface expression of groundwater is largely centred on flows to Little Nerang Creek. He considers that the modelling which has been undertaken is suitable and adequate for the task, and has demonstrated that the impacts of extraction will be well within the bounds of normal climatic variation.”</p>	<p><u>[eTrial Doc 01.02]</u></p>	
25.	<p>“TJ states that there has been adequate characterisation of the aquifer parameters, and that a detailed groundwater investigation is not warranted because of the predicted minor impacts of extraction. There is no requirement to complete the level of investigation sought by MC and TM unless the aim is to study the aquifer in minute detail. TJ notes that the level of investigation completed for this application is greater than was undertaken by Peter J Ramsay & Associates for the extraction activity approved by Gold Coast City Council at 133 Repeater Station Road. On the basis that there are no recorded issues with that operation, TJ contends that the level of investigation for 263 Repeater Station Road is adequate provided that suitable operational water level monitoring takes place.”</p>	<p>Groundwater JER, [8b]. <u>[eTrial Doc 01.02]</u></p>	<p>25.1 Grounds of objection as for objections 8, 11-15, 21 and 22.</p>
26.	<p>“TJ believes hydraulic parameters (hydraulic conductivity and porosity) determined from the pumping test conducted at 133 Repeater Station Road are reasonable to adopt in</p>	<p>Groundwater JER, [9b]. <u>[eTrial Doc 01.02]</u></p>	<p>26.1 Grounds of objection as for objections 8, 11-15, 21 and 22.</p>

	<p>assessing impacts of the current applications. TJ says that the work completed by Peter J Ramsay has determined these parameters if MC wishes to undertake additional investigations. However, he notes that both Douglas Partners and Peter J Ramsay & Associates have determined that the impacts of extraction will be insignificant. Further investigations simply for the sake of them are not warranted.”</p>		
27.	<p>“TJ notes that he does not agree with TM’s representation of the SLR Consulting model, and he does not agree that the proposed extraction will have unacceptable adverse impacts. He further notes that any adverse impacts will be adequately determined and quantified as a consequence of the operational monitoring requirements which will be imposed on any approval. If such impacts occur, then the extraction rate can be suitably modified.”</p>	<p>Groundwater JER, [9d]. <u>[eTrial Doc 01.02]</u></p>	<p>27.1 Grounds of objection as for objections 8, 11-15, 21 and 22, in addition to the following ground. 27.2 The matters assumed (that conditions will allow “any adverse impacts” to be adequately determined) are not sufficiently like the matters established to render the opinion of any value in circumstances, including because: (a) the Appellant’s proposed conditions do not provide for any monitoring of impacts to groundwater springs approximately 200 m to the west of the proposed bores that are established on the evidence.</p>
28.	<p>TJ’s opinion that “The level of investigation is suitable and adequate for the insignificant impacts which have been predicted.”</p>	<p>Groundwater JER, [10b]. <u>[eTrial Doc 01.02]</u></p>	<p>28.1 Grounds of objection as for objections 8, 11-15, 21 and 22.</p>
29.	<p>TJ’s opinion that “the results of modelling show that the potential impacts of extraction are well within the bounds of normal climatic variation. Provided that suitable monitoring is undertaken during the operational phase of the project, impacts will be readily determined and measured, and can be suitably ameliorated by reduction of the extraction rate. TJ also notes it would</p>	<p>Groundwater JER, [11b]. <u>[eTrial Doc 01.02]</u></p>	<p>29.1 Grounds of objection as for objections 8, 11-15, 21, 22 and 27.</p>

	<p>be possible to impose seasonal extraction limits based on actual rainfalls, such that extraction is geared towards wetter periods where such extraction is a significantly lower percentage of total seepage than estimated by SLR Consulting, which he already considers to be insignificant.”</p>		
30.	<p>TJ’s opinion that “All that has happened here is that information obtained from a geologically similar area in the locality has been used to predict likely behaviour. This is standard practice in estimation of information such as rainfall intensities and catchment yields. There is no reason to consider that the application of the Mt Tamborine parameters to the subject site should not be acceptable, particularly in the context where there is no evidence that previous extraction activities on the Springbrook aquifer have had adverse environmental impacts.”</p>	<p>Groundwater JER, [11d]. [eTrial Doc 01.02]</p>	<p>30.1 Grounds of objection as for objections 8, 11-15, 18, 21 and 22.</p>
31.	<p>TJ’s opinion that “The level of investigation is adequate in terms of the scale of the operation and the findings that the impacts of extraction will be insignificantly small.”</p> <p>TJ “considers that the level of investigation is adequate in terms of the scale of the operation and the findings that the impacts of extraction will be insignificantly small.”</p> <p>“TJ says that the extent of analysis has been more than adequate to conservatively determine that the impacts of extraction will be insignificant.”</p> <p>TJ’s opinion that “The level of investigation</p>	<p>Groundwater JER, [12b], [13b] [14b] & [15b]. [eTrial Doc 01.02]</p>	<p>31.1 Grounds of objection as for objections 8, 11-15, 21 and 22.</p>

	sought by MC is out of all proportion to the possible impacts which could arise from the low rates of extraction sought.”		
32.	TJ’s opinion that the analysis done by the Appellant is suitable to assess impacts of the proposed development based on “The calibration of the AWBM model against known streamflows is an established and acceptable procedure. TJ says that the Australian Water Balance Model (AWBM) is an acceptable and accepted tool to enable water balance assessments to be undertaken for groundwater and surface water analysis purposes.”	Groundwater JER, [16b]. <u>[eTrial Doc 01.02]</u>	32.1 Grounds of objection as for objections 8, 11-15, 21 and 22.
33.	TJ’s opinion that the assumption that recharge occurs uniformly across the area above the topographic elevation of the point of groundwater extraction (SLR, 2020) “is reasonable in the context of the application which has been made.”	Groundwater JER, [17b]. <u>[eTrial Doc 01.02]</u>	33.1 Grounds of objection as for objections 8, 11-15, 21 and 22.
34.	TJ’s opinion that estimates of the catchment contributing to the aquifer “is simply a matter of geometry” and that the “the level of investigation and the assumptions made are reasonable in the context of a proposal to remove what seems to be a small proportion of the infiltration which finds its way to the aquifer” and “There is no need to overcomplicate the model, particularly when there have been no reported instances of adverse impacts resulting from existing extraction activities.”	Groundwater JER, [18c]. <u>[eTrial Doc 01.02]</u>	34.1 Grounds of objection as for objections 8, 11-15, 21 and 22.

35.	TJ's opinion that the relationship between climate variability (e.g. rainfall intensity) and groundwater recharge rates has not been adequately explored at the site by the SLR Report and that "The variation in rainfall patterns is explicitly included in the AWBM model which uses daily rainfall totals over a period of 120 years to determine likely response. The scale and extent of modelling is compatible with the minor impacts which are likely to occur as a consequence of extraction."	Groundwater JER, [19b]. [eTrial Doc 01.02]	35.1 Grounds of objection as for objections 8, 11-15, 21 and 22. ⁴⁸
36.	"TJ says that Peter J Ramsay & Associates reported that the extraction at 133 Repeater Station Road had no impact on lowering water levels in a monitoring well 70 m from the extraction site. TR [sic TJ] says that Douglas Partners estimated (very conservatively) that the maximum reduction in water table level after 12 months of pumping with no rainfall recharge was 1.5 m at a distance of 270 m from the extraction point on 263 Repeater Station Road. TJ further states that he has independently confirmed the predicted drawdown of 1.5 m at a distance of 270 m from the extraction wells, estimated by Douglas Partners, by the use of Dupuits Theory and the Theis equation for transient flow. TJ believes the Douglas Partners analysis was based on the residual water table level which would exist	Groundwater JER, [22b]. [eTrial Doc 01.02]	36.1 Grounds of objection as for objections 7, 8, 11-15, 21 and 22 and the additional ground below. 36.2 The matters assumed (that conditions will allow "any adverse impacts" to be adequately determined) are not sufficiently like the matters established to render the opinion of any value in circumstances, including because: ⁴⁹ (a) use of the adopted equation is <u>not</u> demonstrated to be appropriate in this setting, as it makes a number of assumptions (e.g. aquifer is isotropic, homogeneous and of uniform thickness, pumping well fully penetrates the aquifer) that are <u>not</u> demonstrated for the site and likely to be incorrect; (b) given this (i.e. the matter raised in ground 36.2(a)), and the lack of geological information to allow for an assessment of the heterogeneity, anisotropy and saturated thickness of the aquifer, an accurate assessment of the extent of drawdown caused by the extraction bores requires further data, such as monitoring of drawdown in monitoring bores located

⁴⁸ Associate Professor Currell and Tony McAlister raised these issues at [19a], [19c] and [20a] of the Groundwater JER [eTrial Doc 01.02].

⁴⁹ Associate Professor Currell and Tony McAlister raised these issues at [22c] and [22d] of the Groundwater JER [eTrial Doc 01.02].

	after 12 months of continuous pumping with no rainfall occurring in that period. Based on the minimum recorded rainfall at the BOM Springbrook Road rainfall station (see Points of Agreement 5), TJ considers that the actual drawdown at a distance of 270 m from the bore will be significantly less than 1.5 m even in the worst drought year.”		different distances from the extraction bores during pumping.
37.	“The Springbrook system ... has been the subject of some level of investigation by at least 3 other consulting engineering firms. In each case, the conclusion in respect of extraction has been the same—there will be no adverse impact on the aquifer or systems which rely upon that aquifer. ... on the basis that extensive access to this aquifer occurs consistently in the Springbrook plateau, and that reasonably consistent peak flow rates of around 0.35 to 0.50 L/s have been achieved, the assumption that the aquifer is uniform is a reasonable one, especially in the context of the current matter. In TJ’s opinion, the level of investigation undertaken and the tools used for that purpose are adequate for the task, and support the conclusions of URS, Peter J Ramsay & Associates and Douglas Partners that extraction will have no adverse impacts on the aquifer.”	Groundwater JER, [22e]. [eTrial Doc 01.02]	37.1 Grounds of objection as for objections 7, 8, 11-15, 21 and 22.
38.	Dr Johnson’s opinions (which Mr Moffitt adopts) that: “the pump tests alone are sufficient for me to state that there will be no measurable impact from the proposed aquifer extraction on either flows in the adjoining streams, or	Joint Groundwater-Ecology JER, (3), (4), (14), (22) and (23) and Annexure A. [eTrial Doc 01.10]	38.1 Relies on facts and assumptions not proved by admissible evidence, including: (a) hearsay evidence of the pump tests the objection to which is detailed further below in objection 42; (b) an assumption that the pump testing is representative of future impacts when bore construction and lithology

<p>on GDE's on this site or elsewhere”;</p> <p>“TJ’s assessment, identifying that there will be no change in groundwater availability for groundwater dependent ecosystems. This in turn leads WM to conclude that there will be no impact on flora and fauna associated with the subject spring or other springs beyond the cone of depression described by TJ.”</p> <p>“TJ says that the groundwater level monitoring which was undertaken on the subject site in February 2021 demonstrates that the proposed water extraction will have no measurable adverse impact on groundwater levels outside the boundary of the subject site. He also states that the monitoring shows that there will be no significant change in groundwater conditions at those locations on the site where groundwater exists close to the ground surface and sustains Groundwater Dependent Ecosystems (GDEs). He states that from a hydrological point of view, the proposed commercial extraction of water from the subject site will have no impact on these GDEs.”</p> <p>“TJ says ... that there can be no adverse impact on either springs or GDEs if these features lie outside of the cone of depression</p>		<p>logs from the pump test are absent, which means that it is unclear how representative the monitoring bore water levels are of the aquifer drawdown caused by the pumping wells – i.e., it is unclear whether the monitoring and pumping bores are tapping the same depth and lithology within the aquifer;⁵⁰</p> <p>(e) substantial rainfall is admitted to have occurred during the pump test and affected water levels in some bores but the quantity of daily rainfall during the pump testing is unstated;</p> <p>(d) assumes uniform aquifer transmissivity within the entire Hobwee Basalt layer to 830m elevation, which includes areas of approximately 200m west and east of the bores, where groundwater springs are known to occur but where no monitoring bores are located (all bores on the site are in a single, north-south line);</p> <p>(e) assumes that the pump testing is sufficient to form the opinions reached but the pumping test conducted is unable to determine or account for the capture of water that currently supports groundwater dependent ecosystems at the site, and any other down-gradient surface water features which may be influenced by reduced discharge from the aquifer to the surface. The capture of such water cannot solely be determined based on an analysis of water table heights in an aquifer during pumping;⁵¹ and</p> <p>(f) the extent of groundwater dependence of springs on the property which support downstream waterways, or their tolerance for reduced flows as a result of groundwater extraction (including the capture of discharge by</p>
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⁵⁰ Associate Professor Currell raised this point in the Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(e).

⁵¹ Associate Professor Currell raised this point in the Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(b).

<p>formed in the groundwater surface when pumping occur. TJ says that the definition of the cone of depression is that there is no change to groundwater levels or conditions outside of the boundary of the cone. The only question which needs to be considered is whether the nominated features (springs and GDEs) lie outside of that zone of influence. TJ says that the information derived from the pump tests is adequate for him to conclude that this is the case.”</p> <p>“TJ’s groundwater assessment leads him to conclude that the proposed extraction would cause no adverse impact on springs or GDE’s. This in turn leads WM to conclude that there will be no impact on flora and fauna associated with the subject spring or other springs beyond the cone of depression described by TJ.”</p> <p>“SLR Consulting, under my direction, prepared a report on this matter in June 2020 titled Water Balance Assessment. ... I am satisfied that the results show clearly that the planned extraction would have no measurable effect on the overall volume of water available for existing ecological and environmental requirements within the nominated catchment area.”</p>		<p>pumping wells and during dry periods) remains uncharacterised.⁵²</p> <p>38.2 Relies on unstated and unidentified assumptions, including:</p> <ul style="list-style-type: none"> (a) that the pump test results remain valid despite (unquantified but apparently substantial) rainfall during the test period that affected water levels in some bores substantially but most bores only marginally; (b) that impacts on the aquifer and cone of depression are uniform; (c) unstated and unknown aquifer properties such as transmissivity; (d) that impacts on the aquifer and cone of depression are uniform, including to the west and east of the bores; (e) unstated and unknown aquifer properties such as transmissivity, including the transmissivity and the effect of fracturing in a west-east direction across the site, of which there is no evidence as all of the pumps on the site are located in a north-south line; that groundwater and the vadose zone on which vegetation and animals rely to the west and south of the bores is unaffected by the extraction. <p>38.3 The matters assumed are not sufficiently like the matters established to render the opinion of Dr Johnson of any value, in particular:</p> <ul style="list-style-type: none"> (a) Substantial rainfall was accepted to have occurred during the pump testing that influenced the test results, which Dr Johnson assumed did not affect the validity of the results (or, if it did affect the validity of the results, how this could be corrected for), when the scientific literature on pump testing indicates pump testing affected by heavy rainfall cannot be accounted for, the
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⁵² Associate Professor Currell raised this point in the Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(c).

			<p>data of the test “becomes worthless”, and the test has to be repeated when the situation has returned to normal.⁵³</p> <p>(b) Dr Johnson assumed that the impacts on the aquifer and cone of depression are uniform whereas it is agreed by all experts that the aquifer is affected by fracturing of the rock and not uniform.</p> <p>(c) As the aquifer is fractured and likely to be heterogeneous, and as such the geology needs to be carefully characterised to determine if monitoring bores are screening a horizon which is connected with the zone being pumped.⁵⁴</p> <p>(d) Dr Johnson’s opinion contradicts (and is not sufficiently like) the agreed fact that “The groundwater that would be extracted by the production bores at 263 Repeater Station Road would otherwise flow (via groundwater discharge from seeps and springs) to surface water sites at lower elevations, including any existing GDEs, as well as Twin Falls and Cave Creek, which are sites of considerable environmental and regional tourism significance”⁵⁵ in circumstances where multiple groundwater springs are known occur within 200 m east and west of the bores.⁵⁶</p> <p>(e) Dr Johnson’s opinion assumes the relevant focus for assessing impacts is primarily (or entirely) on the effect of the extraction on the water table level. However this is only one component of the impact on groundwater that would arise from the extraction. Equally, or more important than the change in water table level, is the</p>
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⁵³ Tony McAlister makes this point in his individual expert report, 22 December 2021 [eTrial Doc 06.05], at [59] and [65]. Associate Professor Currell made a similar point in the Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(d).

⁵⁴ Associate Professor Currell made these points in the Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(f).

⁵⁵ Groundwater JER [eTrial Doc 01.02], Point of Agreement 8, which was reaffirmed as remaining “unchanged” in the Joint Groundwater-Ecology JER [eTrial Doc 01.10] at (12).

⁵⁶ The existence of a permanent groundwater spring on the subject site approximately 200m to the east of the bores is common ground (see, e.g., Groundwater JER [eTrial Doc 01.02] at p 13 and Ecology JER [eTrial Doc 01.07], p 73. In relation to the groundwater springs to the east and west of the bores, see the affidavit of Elanor Marie Fenge, affirmed 5 November 2021 [eTrial Doc 08.04].

			effect of the extraction on the discharge of water to the surface – that is, how much flow from the aquifer to springs, seeps and any associated ecosystems will be reduced. This is critically important given the location of the site at the headwaters of a local sub-catchment, whereby springs from the aquifer feed the streams which flow into Twin Falls and Cave Creek. ⁵⁷
39.	<p>“TJ says that the level of investigation completed in association with the groundwater level monitoring, as well as the information provided in previous assessments as outlined in the first groundwater JER, show that Council’s allegation that:</p> <p><i>Suitable geological characterisation, groundwater testing and modelling investigations have not been undertaken for the site and surrounding areas to demonstrate that the proposed use is acceptable</i></p> <p>is unsupported. Further groundwater investigation, monitoring and modelling would have no effect on the conclusion that commercial water extraction from the subject site does not lower groundwater levels more than 100 m from the extraction point.”</p> <p>“Further, if it is accepted that the monitoring adequately demonstrates this outcome (ie that extraction has no impact on groundwater levels external to the subject site), Council’s second allegation, namely</p>	<p>Joint Groundwater-Ecology JER, (15) and (16) <u>[eTrial Doc 01.10]</u></p>	39.1 Grounds of objection as for objections 37 and 38.

⁵⁷ These points are made by Associate Professor Currell in his individual report [eTrial Doc 08.01] at [3.5].

	<p>that</p> <p><i>It has not been demonstrated that the proposed extraction will not cause unacceptable environmental impacts, including when considering the cumulative impacts of the proposed extraction with other groundwater extraction operations and climate change</i></p> <p>is also unsupportable.”</p>		
40.	<p>Dr Johnson’s opinions that “the majority of plants in the catchment area are not relying on the existing aquifer for their sustenance. The aquifer has been determined to be normally at a level of around 830 m AHD. Vegetation above this level will be drawing moisture from what is known as the vadose zone. This is the soil profile which exists between the ground surface and the water table. The vadose zone contains soil water which is seeping from the surface to deep drainage, some of which will eventually reach the aquifer and replenish it. There is also likely to be some capillary action which will draw water upwards from the aquifer into the vadose zone, as shown in the following sketch. However, this effect is expected to be minor, and is in any case occurring deep in the soil profile. In general, water moisture in the vadose zone will be unaffected by extraction from the groundwater.”</p>	<p>Joint Groundwater-Ecology JER, Annexure A, p 14. <u>[eTrial Doc 01.10]</u></p>	<p>40.1 Opinions outside the expert’s area of expertise (groundwater) in relation to ecological matters.</p> <p>40.2 Relies on facts and assumptions not proved by admissible evidence, including:</p> <ul style="list-style-type: none"> (a) assumptions about the extent of the vadose zone on the site and dependence of vegetation on it; and (b) assumptions that water moisture in the vadose zone will be unaffected by extraction from the groundwater.

41.	<p>The entirety Annexure A, commencing at p 13 of the Joint Groundwater Ecology JER and, in particular, to Dr Johnson’s opinions that “there will be no change at a location more than 170 m from the pumping bores”, “there will be no measurable change at points more than 100 m away in any direction”, and similar statements in Annexure A.</p>	<p>Joint Groundwater-Ecology JER, pp 13-19 (Annexure A) [eTrial Doc 01.10]</p>	<p>41.1 Grounds of objection as for objection 38.</p>
42.	<p>The parts of the Undated and unattributed report by Mr Iain Hair (‘the Hair Report’) containing results and expert opinion regarding hydraulic (pump) testing of the bores at 263 Repeater Station Road conducted 14-21 February 2021 <u>identified in highlighting by the Appellant as no longer relied upon in Document 5 of Mr Hair’s affidavit of 10 February 2022.</u></p>	<p>Appendix 4 to the Ecology JER [eTrial Doc 01.07] and Annexure B to the Joint Groundwater-Ecology JER [eTrial Doc 01.10]</p>	<p>42.1 Hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the Evidence Act.</p> <p>42.2 Opinion of second groundwater expert (Mr Iain Hair) outside of “the field of groundwater testing and data collection”, for which Mr Hair is nominated by the Appellant.</p> <p>Contains opinions of second groundwater expert who:</p> <ul style="list-style-type: none"> (a) is not called to give evidence; (b) has not participated in the joint expert meeting process; and (c) the Appellant’s solicitor stated the Appellant was not relying upon.⁵⁸ <p>42.3 Contains opinions outside the field of expertise of the expert (assumed to be groundwater) involving ecology, that “Pumping at a rate of 0.5 L/s is sustainable in the long term with minimal or no impact on other groundwater users or the environment.”⁵⁹</p> <p>42.4 Relies on facts and assumptions not proved by admissible evidence, including:</p> <ul style="list-style-type: none"> (a) bore construction and lithology logs from the pump test are absent, which means that it is unclear how

⁵⁸ See the correspondence exhibited at p 5 to the Pointon affidavit [eTrial Doc 08.03].

⁵⁹ Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 26 (Annexure B).

			<p>representative the monitoring bore water levels are of the aquifer drawdown caused by the pumping wells – i.e., it is unclear whether the monitoring and pumping bores are tapping the same depth and lithology within the aquifer;⁶⁰</p> <p>(b) rainfall is admitted to have occurred during the pump test and affected water levels in some bores but the quantity of daily rainfall before and during the pump testing is unstated;</p> <p>(c) assumes uniform aquifer transmissivity within the entire Hobwee Basalt layer to 830m elevation, which includes areas of approximately 200m west and east of the bores, where groundwater springs are known to occur.</p> <p>42.5 Relies on unstated and unidentified assumptions, including:</p> <p>(a) that the pump test results remain valid despite (unquantified but apparently substantial) rainfall during the test period that affected water levels in some bores substantially but most bores only marginally;</p> <p>(b) that impacts on the aquifer and cone of depression are uniform;</p> <p>(c) unstated and unknown aquifer properties such as transmissivity;</p> <p>(d) bores orientated solely in a north-south line can be used to determine transmissivity to the west and east in fractured rock; and</p> <p>(e) the ecology of the vadose zone and groundwater dependent ecosystems around the bores, including within 200m.</p> <p>42.6 The matters assumed are not sufficiently like the matters established to render the opinion of the groundwater expert called by the Appellant of any value, in particular:</p> <p>(a) Substantial rainfall was accepted to have occurred</p>
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⁶⁰ Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(c).

			<p>during the pump testing that substantially affected the test results, which Mr Hair assumed did not affect the validity of the results (or, if it did affect the validity of the results, how this could be corrected for), when the scientific literature on pump testing indicates pump testing affected by heavy rainfall cannot be accounted for, the data of the test “becomes worthless”, and the test has to be repeated when the situation has returned to normal.⁶¹</p> <p>(b) Mr Hair opines “Pumping at a rate of 0.5 L/s is sustainable in the long term with minimal or no impact on other groundwater users or the environment. Drawdown is quite limited outside the immediate area of the pumping bores.”⁶² This assumes impacts on the aquifer and cone of depression are uniform whereas it is agreed by all experts that the aquifer is affected by fracturing of the rock and not uniform. It also assumes bores located in a north-south line can be used to assess impacts to the west and east in fractured rock.</p> <p>(c) Mr Hair’s opinion (in 42.6(b)) contradicts (and is not sufficiently like) the agreed fact that “The groundwater that would be extracted by the production bores at 263 Repeater Station Road would otherwise flow (via groundwater discharge from seeps and springs) to surface water sites at lower elevations, including any existing GDEs, as well as Twin Falls and Cave Creek, which are sites of considerable environmental and regional tourism significance.”⁶³</p>
43.	Dr Johnson’s views in his individual report on the impacts based on the SLR Report and analysis of a uniform “cone of depression”,	Dr Johnson (TJ) individual expert report, 24 December 2022, [12]-[15] and [30].	43.1 Grounds of objection as for objections 8, 13-15 and 17.

⁶¹ Tony McAlister makes this point in his individual expert report, 22 December 2021 [eTrial Doc 06.05], at [59] and [65]. Associate Professor Currell made a similar point in the Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 7, (18)(d).

⁶² Joint Groundwater-Ecology JER [eTrial Doc 01.10], p 26 (Annexure B).

⁶³ Groundwater JER [eTrial Doc 01.02], Point of Agreement 8.

	including that: <p>“that the water balance analysis demonstrated that the volume of proposed water extraction represented only a very minor proportion of the total volume of water likely to be held in the aquifer, and further, that the extraction would produce virtually undetectable changes in water level in the broader aquifer (ie other than in close proximity to the extraction point).”</p> <p>“... if it can be demonstrated by measurement of groundwater level that the area of influence is restricted to the property itself, then there can be no adverse impact on any external user.”</p>	<u>[eTrial Doc 05.03]</u>	
44.	Dr Johnson’s views in his individual report on the impacts based on the ‘Hair Report’ of pump testing.	Dr Johnson (TJ) individual expert report, 24 December 2022, [15]-[22]. <u>[eTrial Doc 05.03]</u>	44.1 Grounds of objection as for objection 42 38 .
45.	Dr Johnson’s concluding views in his individual report on the impacts based on the SLR report and the ‘Hair Report’ of pump testing.	Dr Johnson (TJ) individual expert report, 24 December 2022, [24], [30]-[31]. <u>[eTrial Doc 05.03]</u>	45.1 Grounds of objection as for objections 38 and 42 .
46.	Reliance on facts, premises, assumptions, opinions, documents and statements listed above in other evidence.	e.g. Town Planning JER <u>[eTrial Doc 01.09]</u>, [41], [99], [101], [102] [104], [106], [179](f) & (g), [180], [181], [184], [186]; Tourism JER <u>[eTrial Doc 01.04]</u>, [28] & [32]; Visual Amenity JER <u>[eTrial Doc 01.03]</u>, [50], [51] & [56] [57].	46.1 Grounds of objection listed above relevant to the facts, premises, assumptions, opinions, documents and statements referred to in other evidence. 46.2 Based on facts and assumptions not proven by admissible evidence.
47.	“Quality of the water from these bores ... has been tested so that it is known to be suitable for use. Mr Schomburgk has not seen those test results but assumes that the water is of an appropriate quality for bottling.” “The groundwater extracted from the subject	Town Planning JER, [42] & [182] <u>[eTrial Doc 01.09]</u>	47.1 Hearsay 47.2 Based on assumptions not proven in admissible evidence.

	site has been tested and found suitable (for purification, sale and consumption).”		
48.	<p>“the two (2) existing groundwater extraction facilities on Repeater Station Road have been operating for 25 years without causing apparent adverse social and environmental impacts”</p> <p>“I consider the existence of the two (2) other commercial groundwater extraction facilities on the same road, which have not had apparent significant adverse or unacceptable impacts (environmental or otherwise) in the last 25 years of operation, should be an indicator that the proposal can establish and operate in a sustainable way without detriment to matters of environmental significance.”</p>	<p>Town Planning JER, [103](d) & 108(d) & similar statements at [178], [207](g) & [214](d) [eTrial Doc 01.09]</p>	<p>48.1 Based on assumptions not proven by admissible evidence.</p> <p>48.2 Opinion outside the field of expertise of the maker (town planning).</p>
49.	<p>“Water quality testing has shown that the spring water sourced from Mr Hoffman’s property at Springbrook is of a high standard, which includes the water having low levels of iron and manganese.”</p>	<p>Statement of Ray Cavanough, 12 November 2021, [17] [eTrial Doc 05.05]</p>	<p>49.1 Hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>.</p> <p>49.2 Relies on facts and assumptions not proved by admissible evidence.</p>
50.	<p>“I have been advised by Mr Hoffmann that the water quality from his Springbrook property has indicated positive results from initial water testing. In particular, testing has shown that water on this site has a high pH and has desirable minerals compared to the water quality at other sites.”</p> <p>“... if the spring water supplied was of the quality described by Mr Hoffmann, given it meets the Australian Water Quality Guidelines.”</p>	<p>Statement of Cory Reeve, 21/12/2021, [18] & [20] [eTrial Doc 05.04]</p>	<p>50.1 Hearsay for which no exception applies and leave should not be granted to rely upon under s 92 of the <i>Evidence Act</i>.</p> <p>50.2 Relies on facts and assumptions not proved by admissible evidence.</p>