R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

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11 December 2018

Mr Howard Reed
Director - Resource Assessments
NSW Department of Planning & Environment
Level 22, 320 Pitt Street
SYDNEY NSW 2000

Attention: Ms Melissa Anderson

Dear Howard

Re: Bass Point Quarry – Response to EPA Comments on RTS

Please find included with the letter a response prepared by SLR Consulting (**Attachment 1**) to the request for information provided by the EPA (correspondence dated 10 September 2018). In particular, the EPA request for estimated noise levels at properties along Bass Point Quarry Road under the modification application required that SLR Consulting visit the locality to undertake short-term monitoring. This monitoring was undertaken on Wednesday 5 December 2018 at the three locations presented in the response.

The results of the monitoring highlight that existing measured truck noise levels at three of the nearest residences ranged from 41.6dB(A) to 47.7dB(A) (free field) averaged over the relevant one hour period. The monitoring results were then normalised to calculate the approved truck noise levels which ranged from 41.1dB(A) to 48.3dB(A) (free field). Under the modification this range may increase to 43.3dB(A) to 49.0dB(A) (free field) during peak Quarry despatch periods.

Between 5am and 6am, the relative increase from the approved $L_{Aeq(1hour)}$ truck noise level to the modified is calculated to be 0.7dB(A). Between 6am and 7am, the relative increase from the approved $L_{Aeq(1hour)}$ truck noise level to the modified is calculated to be 2.2dB(A) (noting that a change in noise level of 2dB(A) is barely perceptible to the average human ear). This estimate is based on the average change in noise level over a one-hour period. Therefore, the change in noise level over a 9-hour average period would be expected to the less than 2dB(A) as it includes the night time period when Quarry activity would be expected to be lower than that recorded between 5:00am and 7:00am.

It is also noteworthy, that the measured, approved and modified truck noise levels (once façade corrected) would satisfy the assessment criteria in the *Road Noise Policy* (night time noise level of 55.0dB(A) for an approved transport route – although the criteria is also based on the 9-hour average noise level).

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As noted by SLR Consulting, there was evidence of gaps in the noise barrier that may have developed post-construction or may have been the result of poor workmanship. In addition, SLR Consulting was able to identify the impact of a single, particularly noisy truck. If these issues were acceptably resolved, it could be expected that the truck noise levels would satisfy the amenity noise criteria set by the EPA for the development of Shell Cove (45dB(A) - see Section 1.2 of the *Response to Submissions* document). Noise levels would also be closer to the intrusiveness noise criteria of 40dB(A). Regardless, the truck noise levels experienced at properties adjacent to Bass Point Quarry Road would benefit from a review of the condition and performance of the noise barrier. Hanson has committed to undertaking this review in conjunction with Shellharbour City Council.

While the measurement results for Dunmore Road and Bass Point Quarry Road are not directly comparable (as monitoring occurred on different days and the Quarry contribution to noise was not the same) the results provide an indication of noise levels experienced at each location. As noted in Table 1 of the *Response to Submissions* document, noise levels on Dunmore Road were predicted to be as high as 69.3dB(A) averaged over the assessed hourly period (6:00am to 7:00am) with the major contributor to this noise level other (non-Quarry) traffic on the road. It is apparent that Dunmore Road (and surrounds) is much busier that Bass Point Quarry Road and therefore a source of higher noise levels over the assessed hourly periods. The lower noise levels recorded at residences adjacent to Bass Point Quarry Road would also have benefited from the noise barriers in that location. Based in this evidence the original focus on this location for the assessment of noise impacts of the proposal is justified.

I trust that the above and attached satisfy your final queries, please contact myself or Andrew Driver at Hanson with any questions.

Yours sincerely

Nick Warren
Senior Environmental Consultant

Enclosed: Attachment 1 - Bass Point Quarry Extension Project Modification 2 (PA 08_0143) Response to EPA Noise Submission – SLR Consulting (December 2018).

Copy: Hanson Construction Materials Pty Ltd
SLR Consulting Australia Pty Ltd

11 December 2018

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Hanson Construction Materials Pty Ltd
Level 5, 75 George Street
PARRAMATTA NSW 2150

Attention: Andrew Driver

Dear Andrew

Bass Point Quarry Extension Project Modification 2 (PA 08_0143)
Response to EPA Noise Submission

Hanson Construction Materials Pty Ltd (Hanson) proposes to increase its product despatch truck movements at the Bass Point Quarry and is seeking modification to the Project Approval (PA 08_0143) (as modified). An Environmental Assessment for the Bass Point Quarry Extension Project Modification 2 (R.W. Corkery & Co, February 2018) was lodged in support of the modification in early 2018, and an initial Response to Submissions (RTS) report (R.W. Corkery & Co, August 2018) was also recently lodged with the NSW Department of Planning and Environment (DP&E) in response to the initial round of stakeholder submissions.

The NSW Environment Protection Authority (EPA) has provided a request for additional information in their follow-up submission (EPA letter dated 10 October 2018, reference DOC18/634380-01), and included in this letter are the issues raised by the EPA (shown in *italic*) with the associated response presented thereafter. **Appendix A** shows the three nearest residential receivers adjacent to Bass Point Quarry Road (BPQR) selected for the noise monitoring survey undertaken on Wednesday 5 December 2018 in Shell Cove.

Please advise if you require additional information or clarification of any matter at your earliest convenience.

Yours sincerely

GLENN THOMAS
Director

Checked: AM
Authorised by: GT

1. Noise

2. Road Traffic Noise

1. The EPA requests that the proponent provide predicted noise levels at the nearest residence(s) to Bass Point Quarry Road resulting from the increased truck movements during morning shoulder hours (5am to 7am).

In order to predict the increased noise levels adjacent to Bass Point Quarry Road (BPQR), free-field noise measurements of the existing truck movements were conducted on Wednesday the 5 December 2018 during the morning should hours (5am to 7am). The noise measurements were conducted at 3 of the nearest residential receivers (off-set distance aligned to the near and far façades relative to BPQR) together with observations of truck arrivals and departures (ie vehicle movements) during each interval.

The results of the noise measurements between 5:00am and 6:00am are presented in Table 1, together with the calculated truck noise levels for the approved (maximum) number of departures (23 dispatches per hour), and the calculated truck noise levels for the modified (maximum) number of departures (ie 5am to 6am 27 dispatches per hour).

Table 1 5am to 6am Measured and Calculated Noise Levels Nearest Residences to BPQR (dBA re 20 µPa)

Period End	Measured Operating Departures/Arrivals			Calculated Approved Departures/Arrivals			Calculated Modified Departures/Arrivals		
	Number of Departures / Arrivals	Near façade Alignment LAeq[1]	Far façade Alignment LAeq[1]	Number of Departures / Arrivals	Near façade Alignment LAeq[2]	Far façade Alignment LAeq[2]	Number of Departures / Arrivals	Near façade Alignment LAeq[3]	Far façade Alignment LAeq[3]
Location 1 - The Farm Way (Appendix A)									
5:15am[4]	8 / 3	46.6	41.7	8 / 8	46.4	41.6	8 / 8	46.4	41.6
5:30am	10 / 2	44.7	40.1	10 / 10	47.3	42.6	10 / 10	47.3	42.6
5:45am	5 / 4	41.7	37.1	5 / 5	44.3	39.6	5 / 5	44.3	39.6
6:00am	0 / 5	40.0	35.3	0 / 0	-	-	4 / 4	43.3	38.6
5 to 6am[5]	**23 / 14**	**44.0**	**39.2**	**23 / 23**	**44.9**	**40.2**	**27 / 27**	**45.6**	**40.9**
Location 2 - 53 Huntingdale Close (Appendix A)									
5:15am[4]	8 / 3	49.4	46.2	8 / 8	47.4	44.5	8 / 8	47.4	44.5
5:30am	10 / 2	44.4	41.8	10 / 10	48.4	45.5	10 / 10	48.4	45.5
5:45am	4 / 5	41.6	39.1	4 / 4	44.4	41.5	5 / 5	45.4	42.4
6:00am	1 / 7	40.1	37.6	1 / 1	38.4	35.5	4 / 4	44.4	41.5
5 to 6am[5]	**23 / 17**	**45.4**	**42.4**	**23 / 23**	**46.0**	**43.1**	**27 / 27**	**46.7**	**43.7**
Location 3 - 24 Bribie Avenue (Appendix A)									
5:15am[4]	8 / 3	51.0	45.8	8 / 8	49.8	45.6	8 / 8	49.8	45.6
5:30am	10 / 2	47.0	44.7	10 / 10	50.7	46.5	10 / 10	50.7	46.5
5:45am	4 / 4	44.4	40.4	4 / 4	46.8	42.6	5 / 5	47.7	43.5
6:00am	1 / 8	45.1	40.4	1 / 1	40.7	36.5	4 / 4	46.8	42.6
5 to 6am[5]	**23 / 17**	**47.7**	**43.5**	**23 / 23**	**48.3**	**44.1**	**27 / 27**	**49.0**	**44.8**

Note 1: BPQR Measured Operating Departures/Arrivals free field noise levels.
Note 2: BPQR Calculated Approved Departures/Arrivals free field noise levels.
Note 3: BPQR Calculated Modified Departures/Arrivals free field noise levels.
Note 4: An atypical noisy truck departure occurred during the period 5am to 5:15am dominating the $L_{Aeq(15minute)}$ noise levels at Locations 2 and 3. At Location 1 the noisy truck pass-by coincided with an extraneous noise event and had to be discarded.
Note 5: The apparent under performance of the barrier was observed to be largely due to existing gaps between ground level and the base of the barrier.

- Location 1 (near façade): The BPQR measured operating $L_{Aeq(1hour)}$ was 44.0 dBA; the calculated approved $L_{Aeq(1hour)}$ is 44.9 dBA; and the calculated modified $L_{Aeq(1hour)}$ is 45.6 dBA; the relative increase from the approved $L_{Aeq(1hour)}$ noise level to the modified is a negligible 0.7 dBA.

- Location 2 (near façade): The BPQR measured operating $L_{Aeq(1hour)}$ was 45.4 dBA; the calculated approved $L_{Aeq(1hour)}$ is 46.0 dBA; and the calculated modified $L_{Aeq(1hour)}$ is 46.7 dBA; the relative increase from the approved $L_{Aeq(1hour)}$ noise level to the modified is a negligible 0.7 dBA.

- Location 3 (near façade): The BPQR measured operating $L_{Aeq(1hour)}$ was 47.7 dBA; the calculated approved $L_{Aeq(1hour)}$ is 48.3 dBA; and the calculated modified $L_{Aeq(1hour)}$ is 49.0 dBA; the relative increase from the approved $L_{Aeq(1hour)}$ noise level to the modified is a negligible 0.7 dBA.

The results of the noise measurements between 6:00am and 7:00am are presented in Table 2, together with the calculated truck noise levels for the approved (maximum) number of departures (23 dispatches per hour), and the calculated truck noise levels for the modified (maximum) number of departures (ie 6am to 7am 38 dispatches per hour).

Table 2 6am to 7am Measured and Calculated Noise Levels Nearest Residences to BPQR (dBA re 20 µPa)

Period End	Measured Operating Departures/Arrivals			Calculated Approved Departures/Arrivals			Calculated Modified Departures/Arrivals		
	Number of Departures / Arrivals	Near façade Alignment L_{Aeq}[1]	Far façade Alignment L_{Aeq}[1]	Number of Departures / Arrivals	Near façade Alignment L_{Aeq}[2]	Far façade Alignment L_{Aeq}[2]	Number of Departures / Arrivals	Near façade Alignment L_{Aeq}[3]	Far façade Alignment L_{Aeq}[3]
Location 1 - The Farm Way (Appendix A)									
6:15am	6 / 12	45.4	40.8	6 / 6	44.2	39.5	10 / 10	46.4	41.7
6:30am	4 / 11	45.6	41.2	4 / 4	42.4	37.7	9 / 9	45.9	41.3
6:45am	9 / 6	45.3	40.4	9 / 9	45.9	41.3	10 / 10	46.4	41.7
7:00am	4 / 2	40.8	35.9	4 / 4	42.4	37.7	9 / 9	45.9	41.3
6 to 7am[4]	**23 / 31**	**44.7**	**40.0**	**23 / 23**	**44.0**	**39.3**	**38 / 38**	**46.2**	**41.5**
Location 2 - 53 Huntingdale Close (Appendix A)									
6:15am	6 / 6	43.4	41.3	6 / 6	41.3	39.0	10 / 10	43.5	41.3
6:30am	4 / 14	41.9	39.4	4 / 4	39.6	37.3	9 / 9	43.1	40.8
6:45am	8 / 7	41.9	39.7	8 / 8	42.6	40.3	10 / 10	43.5	41.3
7:00am	5 / 1	36.6	33.9	5 / 5	40.5	38.3	9 / 9	43.1	40.8
6 to 7am[4]	**23 / 28**	**41.6**	**39.3**	**23 / 23**	**41.1**	**38.9**	**38 / 38**	**43.3**	**41.0**
Location 3 - 24 Bribie Avenue (Appendix A)									
6:15am	5 / 7	46.0	45.1	5 / 5	45.2	42.5	10 / 10	48.2	45.5
6:30am	5 / 13	48.1	43.5	5 / 5	45.2	42.5	9 / 9	47.8	45.0
6:45am	8 / 7	46.3	42.3	8 / 8	47.2	44.5	10 / 10	48.2	45.5
7:00am	5 / 1	43.3	42.6	5 / 5	45.2	42.5	9 / 9	47.8	45.0
6 to 7am[4]	**23 / 28**	**46.3**	**43.5**	**23 / 23**	**45.8**	**43.1**	**38 / 38**	**48.0**	**45.3**

Note 1: BPQR Measured Operating Departures/Arrivals free field noise levels.
Note 2: BPQR Calculated Approved Departures/Arrivals free field noise levels.
Note 3: BPQR Calculated Modified Departures/Arrivals free field noise levels.
Note 4: The apparent under performance of the barrier was observed to be largely due to existing gaps between ground level and the base of the barrier.

- Location 1 (near façade): The BPQR measured operating $L_{Aeq(1hour)}$ was 44.7 dBA; the calculated approved $L_{Aeq(1hour)}$ is 44.0 dBA; and the calculated modified $L_{Aeq(1hour)}$ is 46.2 dBA; the relative increase from the approved $L_{Aeq(1hour)}$ noise level to the modified is a marginal 2.2 dBA.

- Location 2 (near façade): The BPQR measured operating $L_{Aeq(1hour)}$ was 41.6 dBA; the calculated approved $L_{Aeq(1hour)}$ is 41.1 dBA; and the calculated modified $L_{Aeq(1hour)}$ is 43.3 dBA; the relative increase from the approved $L_{Aeq(1hour)}$ noise level to the modified is a marginal 2.2 dBA.

- Location 3 (near façade): The BPQR measured operating $L_{Aeq(1hour)}$ was 46.3 dBA; the calculated approved $L_{Aeq(1hour)}$ is 45.8 dBA; and the calculated modified $L_{Aeq(1hour)}$ is 48.0 dBA; the relative increase from the approved $L_{Aeq(1hour)}$ noise level to the modified is a marginal 2.2 dBA.

While the field noise monitoring survey was largely aimed at quantifying the existing truck noise levels as a basis for calculating the approved and modified truck noise levels as requested by the EPA, it was evident the existing truck noise levels could be appreciably reduced at the nearest residential receivers in the short-term by: eliminating any atypical noisy trucks (such as the truck observed during the period 5am to 5:15am); and eliminating the existing gaps between ground level and the base of the noise barrier.

2. ***Table 1 of the RTS provides $L_{Aeq(9hour)}$ noise levels from existing traffic movements but not those of the increased truck movements. The EPA requests that the proponent provide predicted $L_{Aeq(9hour)}$ noise levels at the nearest residence(s) on Dunmore Road resulting from the increased truck movements.***

RTS Table 1 *Assessment Locations 18 m off-set from the centre of Dunmore Road (dBA re 20 µPa)*, shows the existing total $L_{Aeq(9hour)}$ traffic noise level as 63.2dBA: comprising the existing BPQ $L_{Aeq(9hour)}$ truck noise level contribution of 58.4dBA; plus the existing non-BPQ traffic noise level contribution of 61.5 dBA.

As requested, the predicted future total $L_{Aeq(9hour)}$ traffic noise level is 63.5dBA (representing a 0.3dBA increase of the existing total $L_{Aeq(9hour)}$ traffic noise level): comprising the proposed BPQ $L_{Aeq(9hour)}$ truck noise level contribution of 59.4dBA; plus the existing non-BPQ traffic noise level contribution of 61.5 dBA.

3. Operational Noise

1. ***Under Section 2.6- Operational Noise- the proponent states that the proposed change to operations would "generate noise levels consistent with the noise levels currently approved under Condition 3 of Schedule 3 of PA 08_0143". The EPA requests that the proponent confirm that this statement means that the operational noise levels will not exceed the noise criteria in Table 2 of Schedule 3 of the approval.***

The BPQ Project Approval (08_0143) (as modified) dated June 2017 Schedule 3 Condition 6 sets out specific requirements for noise management, and Hanson implements it noise management strategy in accordance with the approved BPQ Project Noise Management Plan (NMP) (SLR, November 2017). In accordance with the NMP, operator-attended noise monitoring is currently conducted on a quarterly basis and is used to determine compliance with the relevant BPQ Project operational noise level criteria.

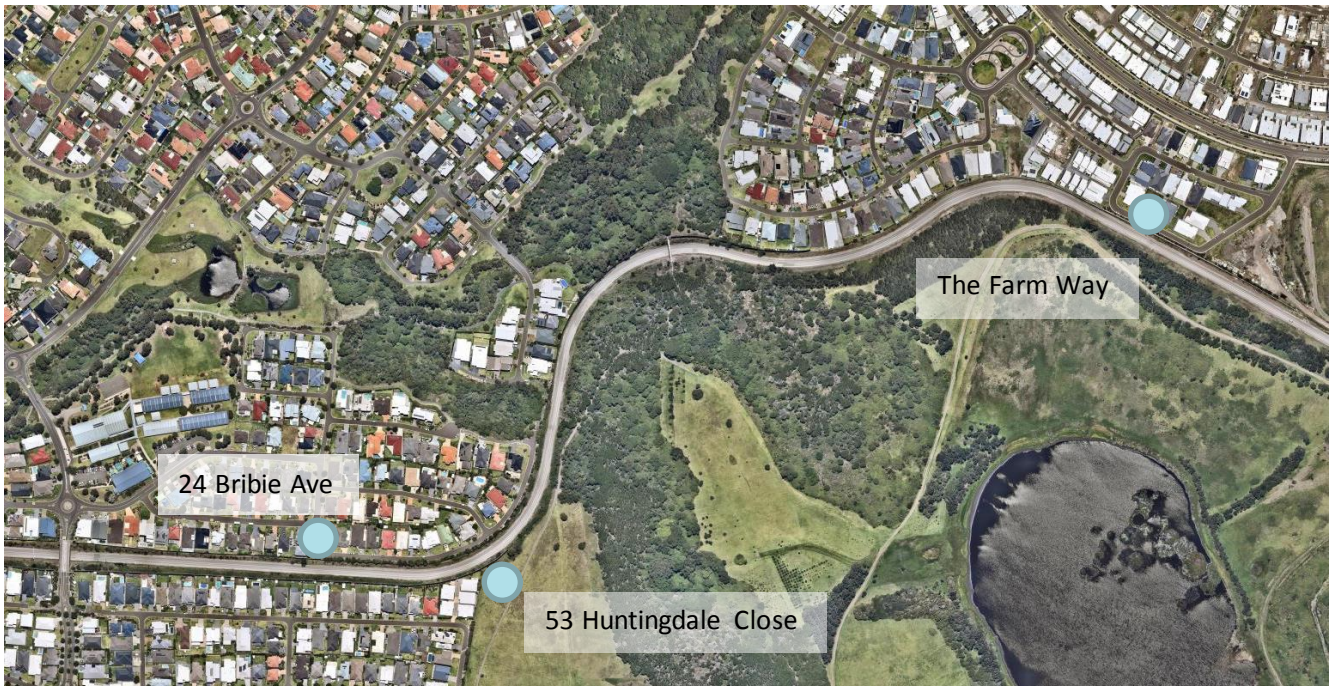
Operational noise compliance is summarised and presented in BPQ Annual Review 2017 (Hanson, July 2018) Section 6.1, which concisely concludes that the all measured operational noise levels were below the relevant daytime, evening and night-time noise criteria for calendar year 2015, 2016 and 2017. For calendar year 2018, the quarterly operational noise compliance monitoring and reporting (Harwood Acoustics, 2018) has continued demonstrate that operational noise levels remain below the relevant daytime, evening and night-time noise criteria at all nominated residential monitoring locations with an appreciable margin of comfort.

While the proposed modification involves a modest increase to the existing intensity of on-site (despatch) operations within any 15 minute period (between 5am and 7am), the extent of any resulting increase to the (overall intrusive) operating noise levels is likely to be negligible and therefore remain well within the noise criteria established in Schedule 3 Condition 6 of PA 08_0143. Furthermore, on-going quarterly compliance noise monitoring will continue to act as a trigger for any noise investigations; however the operating noise levels under the proposed modification are not likely to be noticeable at the nearest residences.

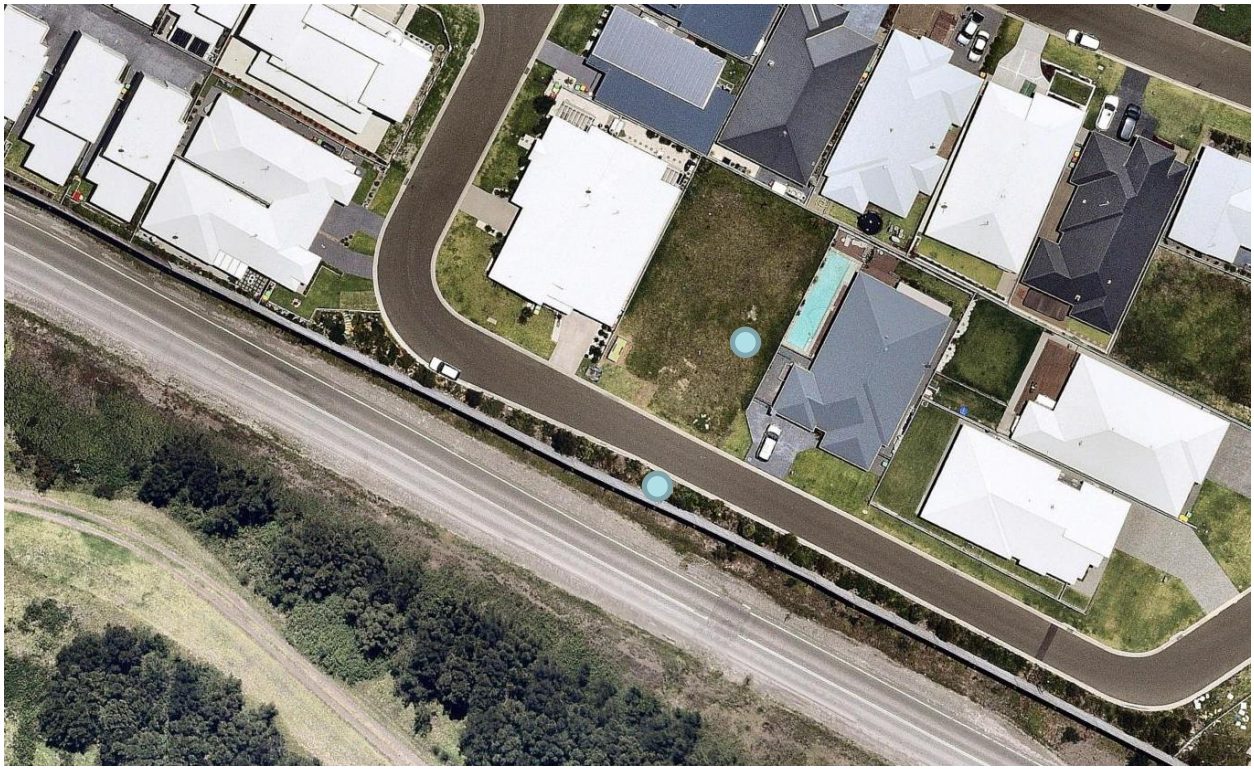
APPENDIX A

The three nearest residential locations selected for noise monitoring are presented below:

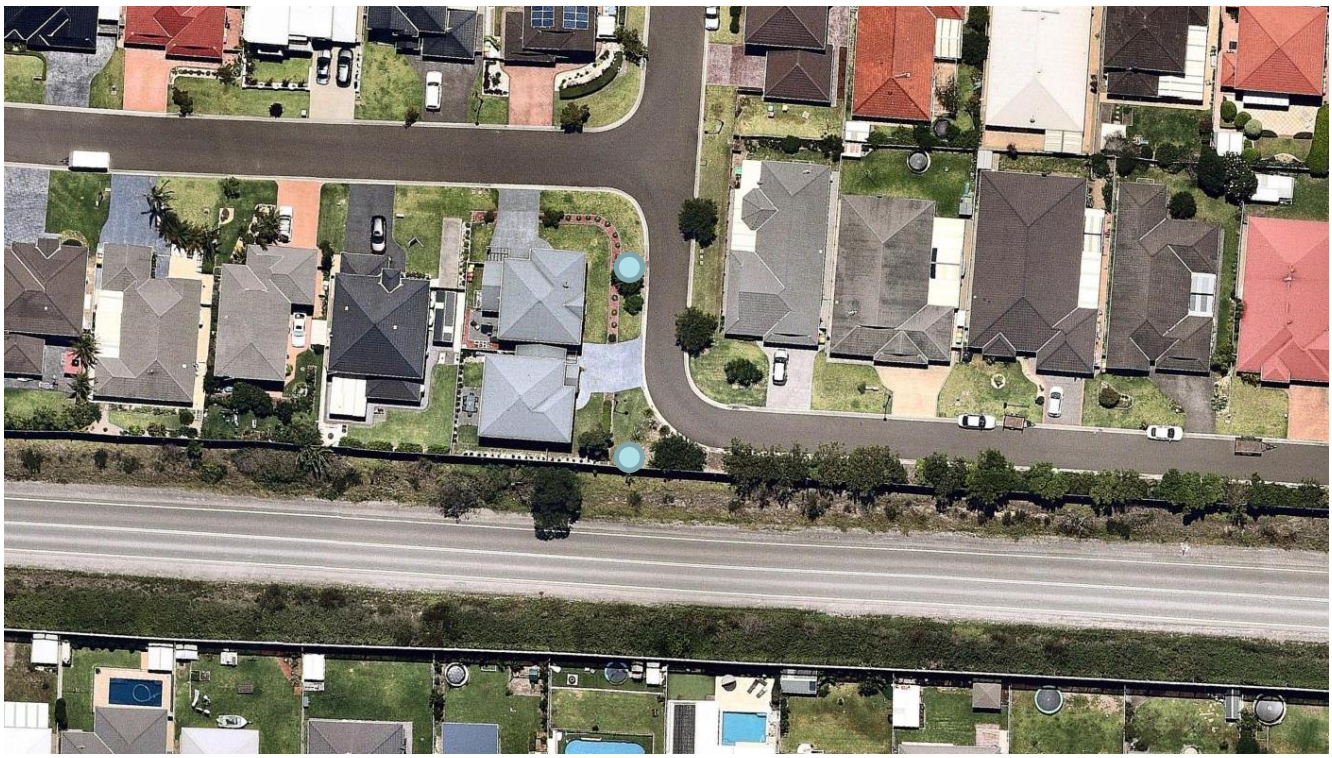
Overview



Location 1 - The Farm Way



Location 3 - 24 Bribie Ave



Location 2 - 53 Huntingdale Close