ANZ Centre, 267 High Street,
PO Box 13960, Christchurch,
8141, New Zealand
T: +64 3 366 3521 // **F:** +64 3 366 3188
E: info@beca.com // www.beca.com

Selwyn District Council
2 Norman Kirk Drive
PO Box 90
Rolleston, 7643

21 February 2025

Attention: Mary McConnell

Dear Mary,

D240003: New Zealand Transport Agency Notice of Requirement SH1 Rolleston Access Improvements Package 2 (Overpass) - s92(1) RMA Request for Information (RFI) Response

Thank you for your letter dated 16 December with a number of queries in respect to **D240003**.

As outlined in the Notice of Requirement (NOR) altering the existing state highway designation pursuant to s181(1) this Project is referred to as Package 2 of the Wider Project and relates to State Highway 1 (SH1) and adjacent land in the vicinity of Jones Road, Hoskyns Road, Brookside Road, and Tennyson Street.

The requirement includes Crown land (administered by KiwiRail Holdings Limited) and Selwyn District Council owned land.

For completeness purposes we have collated all RFI matters as raised, and our responses, into Table 1 attached.

Yours sincerely,

Kate Graham

Senior Planner

on behalf of

Beca Limited

Phone Number: +6439669136
Email: Kate.Graham@beca.com

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PO Box 13960, Christchurch,
8141, New Zealand
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E: info@beca.com // www.beca.com

Noise	
Q1	For the construction section, the discussion at bottom page 4 suggests it is unknown what may happen at night, whereas table 4 nominates specific activities, and section 4.4 mentions a range of possible reasons for and types of night-time work. Are the specific table 4.4 'activity that could also occur at night; the only activities which may occur at night?
A1	The requirement for night-time works and equipment used will be determined by the contractor through consultation with NZTA. The sections and tables referenced in the construction noise report illustrate that night works can comply with applicable limits over relatively short distances. In any event, night-time works will need be appropriately managed in line with best practice. A Construction Noise and Vibration Management Plan (CNVMP) is proposed in the draft conditions accompanying the NOR to manage potential adverse noise effects as a result of construction. By way of example, night-time works were required to construct bridges as part of the Christchurch Southern Motorway project and this work was carried out within 100 metres of dwellings. Appropriate noise management was implemented, and noise complaints were avoided.
Q2	We note the currently undeveloped section of MRZ land adjacent to 13A Rolleston Drive. Relative to other sites, this site is located quite close to the flyover. Would the prospect of future dwellings in that location make any difference to MDA's construction or operational noise assessments?

A2	Potential future dwellings at this location would not change the operational or construction noise assessments. Any potential effects would be similar to the existing adjacent dwellings assessed in the operation and construction noise assessments. Additionally, any future dwellings will be subject to the relevant indoor noise requirements (40db Laeq) based on the external noise environment from the state highway, as per NOISE-R3 of the Partially Operative Selwyn District Plan,
Q3	Please provide a conclusion on the extent and impact of construction noise and vibration effects over the duration of the project's construction stages, and confirm the definition of reasonable in regards to the acceptability of effects.
A3	The contractor for the Project will be required to develop a CNVMP (refer proposed conditions). While the construction noise assessment indicates the extent of noise effects (Table 4 of the Construction Noise Assessment), the contractor's methodology will be managed to minimise and mitigate noise effects. These potential effects will be mitigated through the adoption of best practicable option construction methodology, the setting and monitoring of appropriate limits and through communication with the community.
Landscape and Visual	
Q4	Proposed and Existing Planting and amenity: • Provide additional information on the proposed planting and areas where new tree locations are proposed. • Detail areas where existing vegetation will be removed. i) Provide draft or preliminary versions of the ULDF and LMP. • Confirm in the assessment how the proposal relates to the relevant objectives and policies of the affected zones. ii) How the 'new' gateway will contribute to landscape amenity.
A4	Please see the preliminary design plans and ULDF in Attachments 1 and 2. The overpass structure and approaches provide an opportunity to create a new gateway to the township as well signifying the gateway to Christchurch and the beginning of the CSM. This will be achieved by integrating cultural design themes into the structure as well as softening

	the approaches with a native plant palette that aims to reinstate and enhance the underlying landscape patterns and processes of the site, contributing to landscape amenity. The detailed landscaping plans will accompany the s176A RMA Outline Plan.
Q5	Provide a more comprehensive visual effects assessment from adjoining residential properties in a tabled format (or similar).
A5	Please see the attached visual effects spreadsheet in Attachment 3.
Q6	Provide representative cross sections of properties fronting SH1 illustrating the proposed changes.
A6	Please see attached cross sections in Attachment 4.
Q7	Provide further information on the lighting effects from residential areas within the night environment, including referencing the Lighting Report.
A7	Appendix O - Lighting Assessment outlines the applicable Lighting Standards as well as Partially Operative Selwyn District Plan (POSDP) criteria, noting that the Project (as a designated state highway) is not required to comply with the PODSP standards. These standards have been considered in the AEE as part of the Project as these provide a guide to acceptable lighting in the surrounding context. Appendix O confirms that the proposed design complies with the POSDP standards. The extent of proposed lighting has been further reviewed, with specific consideration of residential dwellings adjacent to the proposal. NZTA reiterate the following: • The local roads and SH1 within the existing environment are already illuminated The Lighting Assessment addresses the potential for Spill lighting, Glare, Skyglow effect, and Headlight Sweep, concluding that adverse effects associated with lighting as a result of the Project will be less than minor. • Mitigation measures have been suggested to manage potential construction lighting effects - these could be considered in conjunction with the recommendations/conditions responding to RFI 8.

	In assessing the nighttime visual effects, it is acknowledged that the degree of lighting will be a change from what is currently experienced, however the Project meets the technical standards applicable and this increase in lighting can be reasonably expected in this environment (SH1). The separation distance between the Project and residential properties in conjunction with the LMP and ULDF will assist in providing further visual screening of the lighting over time.

Lighting Effects

Q8	Lighting Assessment Report Package 2 - The Executive Summary, paragraph 4, states that the Threshold Increment (TI) needs to be below 12% and the Upward Waste Light Ratio (UWLR) shall not exceed 0% to comply with NZTA M30, however these requirements differ from the corresponding section from the Lighting Assessment Report Package 1, plus NZTA M30 quotes a TI of 10% and an UWLR or 1% (not 12% and 0% as stated in the report). The Paragraph 4 TI and UWLR values are also contradicted later in the same report (Glare and Skyglow sections). The same report for Package 1 states that the TI needs to be below 15% and the UWLR shall not exceed 1% in accordance with AS/NZS 1158, and these requirements should still apply to Package 2. This is not being noted as a lighting design non-compliance, but more of a query as to why the TI and UWLR requirements have changed since Package 1 was issued. Surely both packages (1 and 2) should have the same UWLR and TI requirements?
A8	The two Light Technical Parameters (LTP'S) of TI and UWLR appear in several different documents including AS/NZS1158 Road Lighting Design, AS/NZS4282 Control of Obtrusive Effect of Outdoor Lighting, the Waka Kotahi M30 Design Guidelines, several local authority district plans, and a multitude of sustainability and good design practice publications. The various % listed for all these LTP's are limits. As limits, the different values should not be exceeded. None of these guidelines have a lower limit of Threshold Increment 10% and none of these guidelines have a lower limit of Upwards Waste Light Ratio of 0%. Package 1 and Package do not exceed a Threshold Increment of 10% and an Upwards Waste Light Ratio of 0%. As such, both Packages comply with all the relevant guidelines.
Q9	Lighting Assessment Report Package 2 - There is a Section titled "Proposed Environment", which appears in the Table of Contents, and is between Sections 5.1 and 5.2, but is not numbered. I believe this Section should be numbered as 5.2 and the next section renumbered as Section 5.3. This is not being noted as a lighting design non-compliance, but more of a heads-up to the lighting designer that the report formatting needs some attention due to a possible typo.

A9	Noted - the Lighting Assessment Report has been updated accordingly, please see Attachment 5.
Q10	Drawing 3338703-20-CU-3500 - Column Type M specifies a shear based double arm lighting pole, but I believe that this arrangement won't meet the structural requirements of NZTA M26, whereas a ground planted double arm pole will. This is not being noted as a lighting design non-compliance; however, I think it would be prudent for the lighting designer to check with the pole supplier to confirm that the requirements of NZTA M26 are met with the proposed double arm lighting pole.
A10	Spunlite have advised that the Type M column will not meet the requirements of M26. NZTA will investigate using GP columns outside the barrier deflection zone for the next issue of design.
Q11	Drawing 3338703-20-CU-3500 - Note 6 specifies a shorting cap to be fitted to each luminaire, however NZTA M30 (NZTA Specification and Guidelines for Road Lighting Design) requires that a CMS system is considered. The use of a shorting cap will require the power supply to be controlled by the local electricity company where they will switch the luminaires on and off remotely by whatever system they employ. Whereas a CMS system will require a Light Point Controller (LPC) to be installed on each luminaire where the switching and dimming is controlled via the CMS system. Please get the lighting designer to confirm that NZTA is happy with the use of shorting caps on each new luminaire.
A11	The use of a CMS was considered by NZTA. At the concept phase of the design NZTA contacted the network owner (Orion) who provided guidance as to a preference for remote switching. The specified luminaires are approved on the M30 schedule and therefore can be upgraded to CMS control via a NEMA base LPC.
Q12	Drawing 3338703-20-CU-3521 - Calculation Summary table presents one set of luminance calculation results, but what lane configuration does this calculation apply to? There appears to be single lanes diverging into double lanes and double lanes merging into single lanes. There needs to be multiple luminance calculations to account for the different lane configurations. Please get the lighting designer to confirm that the luminance calculations apply to all of the lane configurations (4-lane and 2-lane divided carriageways) or supply additional calculation results to cover all arrangements.
A12	Perfectlite reporting fully meet the requirements of AS/NZS1158, for the SH1 corridor in its narrowest and widest locations within the Project extents. By using a symmetric column layout, the direction of travel has been assumed identical in either direction. The column layout has been designed to provide a consistent rhythm while re-using as many existing columns as possible.

	This design is at a preliminary phase, minor changes to geometric alignments are anticipated. Changes to accommodate clashes with other services are also expected. Further calculations will be carried out during the detailed design phase where required. The full suite of luminance and illuminance calculations will be assessed in the next design phase to maintain compliance and maximum potential over system efficacy is optimised. The reporting of calculation results presents the worst case of all of the calculations carried out for that particular stretch of road.
Q13	Drawing 3338703-20-CU-3521 - Calculation Summary table presents illuminance and uniformity calculations for the SH1 northbound diverging lanes, but according to the north symbol on the drawing the diverging lanes are going in an easterly direction, also where are the calculations for the westbound merging lanes on the other side of SH1? Please get the lighting designer to change the lane directional description so that it aligns with the true geographic direction. Please get the designer to include illuminance calculations for the westbound merging lanes.
A13	Noted - the use of northbound and southbound referred to the overall direction of SH1. For detailed design the drawings will be labelled to the nearest secondary intercardinal point of east-north-east to avoid confusion. An additional line will be added to the calculation summary for the west-south-west merging lanes.
Q14	Drawing 3338703-20-CU-3521 - Calculation Summary table presents illuminance and uniformity calculations for the Brookside and Tennyson intersections, and lane divergence, but these appear to be limited to the carriageway areas…where are the calculations for the surrounds? Please get the lighting designer to provide calculations for all applicable design areas (carriageways and surrounds) at all locations in accordance with AS/NZS 1158.1.1 Figures 4.2, 4.4, 4.8 and 4.10.
A14	Noted - reporting of specific Es will be included in the calculation summary of the detail design. Please note that the included labelled isolines of 7.5, 5.0, 3.75 and 2.5 lux maintained illuminance on Sheet 3521 allowed for assessment areas on both V3 and V4 Es coverage.
Q15	Drawing 3338703-20-CU-3522 – Same comment as Item 5 above. Please get the lighting designer to change the lane directional descriptions so that they align with the true geographic direction. Please get the designer to include illuminance calculations for the westbound merging lanes.
A15	Refer to A13.
Q16	Drawing 3338703-20-CU-3522 - Calculation Summary table presents illuminance and uniformity calculations for the diverging and merging gore areas and the sharp bend, but these appear to be limited to the carriageway areas…where are the calculations for the surrounds? Please get

	the lighting designer to provide calculations for all applicable design areas (carriageways and surrounds) at all locations in accordance with AS/NZS 1158.1.1 Figures 4.2, 4.4, 4.5 and 4.8.
A16	Refer to A14.
Q17	Drawing 3338703-20-CU-3523 - Calculation Summary table presents illuminance and uniformity calculations for the SH1 southbound diverging lanes, but according to the north symbol on the drawing the diverging lanes are going in a westerly direction. Please get the lighting designer to change the lane directional description so that it aligns with the true geographic direction.
A17	Refer to A13.
Q18	Drawing 3338703-20-CU-3523 - Calculation Summary table presents illuminance and uniformity calculations for the diverging lanes, but these appear to be limited to the carriageway areas…where are the calculations for the surrounds? Please get the lighting designer to provide calculations for all applicable design areas (carriageways and surrounds) in accordance with AS/NZS 1158.1.1 Figure 4.2.
A18	Refer to A14.
Q19	Drawing 3338703-20-CU-3525 - Calculation Summary table presents one set of luminance calculation results per road, but what lane configurations do these calculations apply to? For Kidman St, the eastbound side goes from a single lane to double lanes with one lane on the westbound side; and for Rolleston Dr there is a single lane diverging to three lanes on the northbound side and two lanes merging into one on the southbound side. There needs to be multiple luminance calculations to account for the different lane configurations. Please get the lighting designer to confirm that the luminance calculations apply to all of the lane configurations (multilane divided carriageways) or supply additional calculation results to cover all arrangements.
A19	Perfectlite reporting fully meet the requirements of AS/NZS1158, for the Rolleston Drive and Kidman Street corridors at its narrowest and widest locations within the Project extents. By using a symmetric column layout, the direction of travel has been assumed identical in either direction. The column layout has been designed to provide a consistent rhythm while re-using as many existing columns as possible As the Project progresses into detailed design phase, changes to geometric alignments are expected. Changes to accommodate clashes with other services are also expected.

	The full suite of luminance and illuminance calculations will be undertaken in the detailed design phase to maintain full compliance and maximum potential over system efficacy is optimised. The reporting of calculation results presents the worst case of all of the calculations carried out for that particular stretch of road.
Q20	Drawing 3338703-20-CU-3525 - Calculation Summary table presents illuminance and uniformity calculations for two intersections and the diverging/merging lanes, but these appear to be limited to the carriageway areas…where are the calculations for the surrounds and splitter island nose areas? Also, where are the illuminance calculations for the curved exit lane? Please get the lighting designer to provide calculations for all applicable design areas (carriageways and surrounds) at all locations in accordance with AS/NZS 1158.1.1 Figures 4.2, 4.3, 4.4, 4.5, 4.8 and 4.10.
A20	Refer to A13 & A14.
Q21	Drawing 3338703-20-CU-3526 - Calculation Summary table presents one set of luminance calculation results, but what lane configuration does this calculation apply to? The overpass goes from two northbound lanes to three lanes and a single southbound lane on the opposite side. There needs to be multiple luminance calculations to account for the different lane configurations. Please get the lighting designer to confirm that the luminance calculations apply to all of the lane configurations or supply additional calculation results to cover all arrangements.
A21	Perfectlite reporting fully meet the requirements of AS/NZS1158, for the Rolleston Drive overpass its narrowest and widest locations within the Project extents. By using a symmetric column layout, the direction of travel has been assumed identical in either direction. The column layout has been designed to provide a consistent rhythm while re-using as many existing columns as possible As the Project progresses into detailed design phase, changes to geometric alignments are expected. Changes to accommodate clashes with other services are also expected. The full suite of luminance and illuminance calculations will be undertaken in the detailed design phase to maintain full compliance and maximum potential over system efficacy is optimised. The reporting of calculation results presents the worst case of all of the calculations carried out for that particular stretch of road.
Q22	Drawing 3338703-20-CU-3526 - Calculation Summary table presents illuminance and uniformity calculations for one intersection and diverging lanes, but these appear to be limited to the carriageway areas…where are the calculations for the surrounds and splitter island nose areas? There also appears to be some missing isolux lines from the overpass lights. Please get the lighting designer to provide calculations for all applicable design areas (carriageways and surrounds) at all locations in accordance with AS/NZS 1158.1.1 Figures 4.2, 4.3 and 4.10. Please get the designer to plot all of the isolux lines.

A22	A "Z coordinate" of 0m was used for the Agi model to generate the Isolux image. In order to achieve accurate reporting, the overpass luminaires used a "Z coordinate" of 6.2 + 1.9 + mh. The obstructive effect of the overpass was modelled with an object between 6.2 and 8.1m. The section of the overpass that does not include an Isolux image has a fixed carriageway width and layout. The reported "Overpass iTalo S05 4-00.7" row of LTP's within the calculation summary on sheet 3526 demonstrate that this section of the design complies with luminance requirements of AS/NZS1158.1.1. This section of the design does not include any specified locations requiring illuminance calcs.
Q23	Drawing 3338703-20-CU-3527 - Calculation Summary table presents illuminance and uniformity calculations for one intersection and the diverging lanes on Johns Rd, but these appear to be limited to the carriageway areas…where are the calculations for the surrounds? Also, where are the illuminance calculations for the eastbound merging lanes on Johns Rd east of the intersection? Please get the lighting designer to provide calculations for all applicable design areas (carriageways and surrounds) at all locations in accordance with AS/NZS 1158.1.1 Figures 4.2 and 4.9.
A23	Refer to A14.
Transport Effects	
Q24	Please provide a copy of the Paramics transport model peer review report and any associated formal model calibration and validation reports. In lieu of formal reporting please supply the model themselves.
A24	The model development report including calibration and validation reports is included in Appendix G - Rolleston DBC - Model Development Report of the DBC – see Attachment 6.
Q25	Please provide evidence of any peer review of the Linsig and Sidra models and/or any associated formal reporting to evidence the calibration and validation of these models. In lieu of formal reporting please supply the model themselves.
A25	As reported in Section 4.2 of the ITA, the Linsig models were only used to estimate signal timing settings to be used in the Paramics model for the Project. Subsequently, the Linsig models were not calibrated as the future scenarios do not currently exist.

Q26	Please undertake a sensitivity test at 2038 in the morning and evening peak periods to demonstrate the impacts of the addition of traffic from the full development of PC73, PC80, PC81 and PC82 areas.
A26	PC80 has been approved and was subject to an effects assessment. The effects of PC80 were assessed with a roundabout assumed at the SH1 / Walkers Road / Dunns Crossing Road. As discussed in Section 4.3 of the ITA, the effects of proposed Plan Changes (e.g. PC73, PC81, PC82) on the transport system will be assessed through an independent process. It is therefore not considered appropriate for this assessment of a transport project to demonstrate the effects of those land use proposals. Abley have undertaken modelling of the proposed Project (Packages 1 and 2) in December 2024, which includes additional traffic related to PC73, PC80, PC81 and PC82. This modelling highlighted that the design of the SH1/Dunns Crossing Road/Walkers Road, provided as part of Package 1, has the most notable impact on the performance of the wider network with no notable delays highlighted for works to be provided as part of Package 2.
Q27	Provide detail of the future growth assumptions out to 2038 with respect to the extent of growth in Izone and number of additional households in Rolleston urban area.
A27	The future growth assumptions are documented in Section 2.2.2 of Appendix S - Rolleston DBC - Scheme Modelling and Economics Report – see Attachment 7. The additional trips between the 2021 and 2038 demand scenarios are noted below: • Industrial Area, Bulk Retail Site South of Link Drive: 85% turn-over level of published 'almost 2,000 car park spaces' during typical weekday PM peak. • Southwest Acland Park Residential Area: 750-1000 additional households. • Northeast Branthwaite Residential Area: 400-500 additional households. • Southeast Farringdon Residential Area: 250-350 additional households. • Falcons Landing Residential Area: 250-350 additional households. The forecast assumptions have been agreed with the Client group and peer reviewed during the DBC process. The forecast models are still appropriate for the purpose of the AEE related to this Project. NZTA and SDC have both been involved in the development/ application of the forecast models.

Q28	Please provide commentary as to the impact of any of these changes in local road projects on the modelling results and wider assessment of traffic effects.
A28	As discussed in Section 3.4 of the ITA, the key interdependency of the Project is the Levi Rd / Weedons Rd intersection upgrade. This is expected to be managed with the on-going joint planning and maintenance of the network between SDC and NZTA.
Q29	Confirmation is sought that these are hourly travel totals, correspond to the full Paramics study area and whether further changes in travel totals might be expected beyond the study area.
A29	Table 6-2 and 6-3 in the ITA correspond to the full modelled period i.e. 3.5hrs in the AM, PM and 3hrs in the IP and to the full modelled extent as shown in Figure 4-1 of the ITA. The modelled extent is shown in Figure 4.1 of the ITA. The Paramics model extent is sufficient to capture the effects of Project.
Q30	Additional assessment is requested at 2038 to calculate the capacity of local roads to demonstrate that they will operate well and future flows not exceed capacity.
A30	As reported in Section 3.1 of the ITA, the Project was developed with consideration of the network framework and hierarchy to focus traffic movements on arterial and major movement corridors. Site 6 and Site 9 represent Rolleston Drive and Jones Road respectively. These are primary traffic corridors and are expected to accommodate high volumes. With the scale of growth in these areas, it is expected that there will be capacity constraints particularly at intersections. Site 9 is proposed to be widened as part of the project. While the model shows some additional delays at the critical intersections, it does not indicate that the links are over capacity. It is therefore considered by NZTA and its project consultants that these arterial roads can accommodate the higher flows predicted as a result of this Project and no further assessment is required.
Q31	Please add a footnote or other reference to confirm the source of the models used for this assessment.
A31	The Paramics models have been used to estimate the traffic volumes which inform the DSI assessment. Conflict of flow intersection crash models have been sourced from the NZTA Crash Estimation Compendium (Models 7.1-7.4). These models have only been used where there is

	a fundamental change to the layout of the intersection (i.e. SH1/Dunns Crossing Road/Walkers Road, Rolleston Drive Extension/Jones Road, Rolleston Drive/Kidman Street). All other DSI assessments were based on scaling the crash history by the expected change in traffic volumes.
Q32	For the avoidance of doubt it is recommended that the requirement for an LCSIA be added to the condition set noting proposed changes to the Hoskyns Road level crossing.
A32	A Level Crossing Safety Impact Assessment (LCSIA) currently being prepared. As the LCSIA is not a NZTA document nor a NZTA owned approval process, it would be unusual for this to form part of the condition set.
Q33	Please provide further details on the additional distance and time that trips to and from these properties due to rerouting.
A33	Details regarding the additional travel time and travel distance for the properties impacted on Rolleston Drive are provided in Section 6.5.4 of the ITA.
Q34	Please confirm whether the upgrade to this intersection should be an identified prerequisite for undertaking the Package 2 works, and if not, whether the potential safety and efficiency effects at this intersection are acceptable if the Package 2 works are undertake[n] without this intersection being upgraded.
A34	Appendix A of the ITA does not highlight significant operational concerns with the performance of the Levi Road / Weedons Road intersection in 2028, after the opening of Package 2. The degradation in performance after 2028 is a result of wider growth within the Rolleston Township, the timing of which is uncertain. The need to upgrade this intersection to support ongoing growth has already been identified by SDC in the LTP. Therefore, the upgrade of this intersection is not required prior to the completion of Package 2. It is recommended that the performance of this intersection is monitored by SDC, and proposed mitigation measures introduced when necessary.
Q35	Please comment on the interrelationship between Package 1 and Package 2, and confirm whether any local road (Selwyn District Council) improvements are required to manage the effects of the Rolleston Access Improvements Project on local roads. Where interrelationship or dependencies exist, please confirm how this is proposed to be managed during the delivery of each Package.

A35	Package 2 will require the closure of SH1 for short periods of time during construction as well as the implementation of turning movements restrictions on SH1. These restrictions/closures to SH1 are to occur after the completion of Package 1 to allow of the establishment of safe alternative routes. The coordination of these improvements will be managed as part of the CTMP for Package 2 – refer to proposed conditions. The local road network projects required to support ongoing growth in Selwyn are currently being progressed independently by SDC, as agreed with SDC as part of the DBC. These projects are subject to SDC procedures, as such NZTA is unable to influence the delivery of these projects however it is understood that SDC are on track to deliver these projects.
Q36	It is recommended that the CTMP condition be expanded to include at a minimum the requirements and objectives from section 7.5.2 of the ITA. This provides an important framework for the later preparation of CTMPs. Further, please comment on the extent to which Council approval and/or consultation with Council will be undertaken for Site-Specific Traffic Management Plans (SSTMPs) that affect local roads, either directly through temporary signage/markings, or indirectly through changes to traffic movements.
A36	See amended proposed condition, additions showed in red underlined text: *A CTMP shall be prepared prior to the start of construction and provided to Council with the s176A RMA Outline Plan The objective of the CTMP is to avoid, remedy or mitigate, as far as practicable, adverse construction traffic effects. The CTMP shall be prepared in accordance with the New Zealand Guide to Temporary Traffic Management (NZGTTM), April 2023. The CTMP shall include, but need not be limited to, the following:* *1. the staging of the works, including details of any proposals to work on multiple sections of the Project route concurrently;* *2. details of traffic management activities proposed within each section of the project;* *3. the potential effects of traffic management activities and how these will be managed to provide for the safety of all road users including pedestrians and cyclists;* *4. a process for the development and submission of site specific traffic management plans (SSTMP);* *5. monitoring, auditing and reporting requirements; and* *6. training requirements for staff.*

	Site specific traffic management plans shall be prepared in consultation with the the Council as the Road Controlling Authority (RCA) in accordance with the Construction Traffic Management Plan. Site specific traffic management plans shall describe the measures that will be taken to manage the traffic effects associated with the construction of specific parts of the Project prior to commencement of work in the relevant part(s) of the Project.
Q37	It is recommended that consultation regarding property access be addressed through the proposed conditions.
A37	Consultation with adjacent landowners in relation to property access will be undertaken. This will form part of the Construction Environmental Management Plan (CEMP) which is a proposed condition. Consultation with land owners and occupiers will be undertaken throughout the construction period, with access maintained throughout.
Q38	Please confirm whether the extent of designation over Selwyn District Council roads will be removed once Package 2 works are completed.
A38	The process under s182 of the RMA provides for the Requiring Authority to uplift the designation from any land no longer required for the purposes of the designation. Following the completion of the construction works NZTA will uplift the designation from those portions of SDC local road that is no longer required for the Project. Any other areas of land that are surplus to the Project are to be confirmed once construction is complete and updated GIS shapefiles will be provided to SDC.
Q39	Please provide an assessment of the performance of the 804 Jones Rd western access approach to the Rolleston Drive extension / Jones Road intersection, including how the phasing operates.
A39	The ITA is based on a dedicated signal phase being provided for vehicles exiting 804 Jones Road, with an above ground detector to detect approaching vehicles. Performance of that exit will depend on signal cycle time and the presence of exiting vehicles; however the dedicated phase for exiting 804 Jones Road is expected to provide safe and suitable access.
Q40	Please provide further details on how left in-left out movements for 808 Jones Road will be encouraged, and how vehicles are expected to turn around within George Holmes Road. Please provide further details of how left turns out may create safety and/or efficiency effects if drivers attempt to turn onto the overbridge.

A40	SDC are currently progressing plans to provide a turning head at the end of George Holmes Road. NZTA will work with the business owners to inform customers and staff of the preferred left-in/left-out arrangement. This could be through providing directions on advertising material and left-in-left-out signage. Similarly, NZTA is working with the owners of 808 and 804 Jones to provide an alternative access via the proposed access for 804 Jones Road. The traffic generated by 808 Jones Road is relatively low so left turns out that then turn right onto Rolleston Drive will sporadically occur. The Jones Road western approach to the Rolleston Drive Extension/Jones Road intersection performs well (typically LOS C) which indicates that any impacts from this traffic will be temporary and will likely clear within a single cycle of the traffic signals.
Q41	Please provide further details access options that have been considered for 13A to 19B Rolleston Drive, and an estimate of additional travel time and travel distance resulting from the left in/left out restriction
A41	Refer to A33.
Q42	Please provide further detail on how landowners that have turning restrictions for private vehicle accesses have been consulted and provide a summary of any feedback provided by the landowner.
A42	Refer to Appendix F (Consultation and Engagement Summary)
Q43	Please provide: a) A copy of the preliminary Safe System Audit for the design which we understand has been prepared. • Commentary on whether the berm space on the southern side of SH1 provides the opportunity to provide the “Future Reserve Path” proposed by Selwyn District Council as part of its Walking and Cycling Strategy (and shown in Figure 5-10 of the ITA). • Confirmation of whether the turning head at the end of George Holmes Road and the “KiwiRail access track”, both shown on General Arrangement Plan 3338703-20-CA-1201, form part of the Package 2 works.
A43	Please see responses below:

	• The Preliminary Safe System review was an informal review undertaken to highlight any key safety concerns that may have a significant effect on the design layout. There will be a formal detailed design Safe System Audit undertaken for the project. • SDC and NZTA have both indicated that no future path connections are proposed in this location due to the proximity to SH1, available land, and an alternative route away from the state highway. • SDC will be constructing the turning head. The construction of this will not have an impact on the Package 2 works.
Air Quality Effects	
Q44	Compliance with accepted good practice: The AEE frequently refers to the CASANZ GPG (2023) and NZTA Guideline (2019). NZTA have completed a draft update to their guideline (2024). NZTA have also provided guidance on how the CASANZ GPG should be used in New Zealand including detailed comments on how construction effects should be assessed.
A44	Council has referred to an updated version of the 2019 NZTA guidance document (titled 'Guide to assessing air quality impacts from state highway projects'). Council has indicated that the update to the guidance was prepared in 2024. The draft 2024 guidance document has not been ratified. The 2019 NZTA guidance document currently remains the official NZTA guidance document for the assessment of effects. It should also be noted that NZTA has reviewed the assessment and has not provided and comments with regards to the air quality assessment. As noted by the Council, NZTA has provided comment on their website on the differences between the CASANZ good practice guide (GPG) (titled 'Good Practice Guide for the Assessment and Management of Air Pollution') and the NZTA recommended method for the assessment of dust effects. NZTA notes that the CASANZ GPG does not consider discharges from aggregate crushing, concrete batching plants or mobile asphalt plants which may be associated with roading construction. The NZTA guide notes that the relevant guidance for assessment of discharges from these sources are covered under the Ministry for the Environment good practice guides (Good Practice Guide for Assessing and Managing Dust (2016) and Good Practice Guide for Assessing Discharge to Air from Industry (2016)). The two MfE guidance documents have been referred to

	in the air quality report (refer Section 1.3). Currently none of the activities listed above are proposed and therefore have not been considered in the assessment. The potential risk of dust effects from the project has been assessed using the CASANZ GPG method. The CASANZ GPG method is based on the Institute of Air Quality Management (IAQM) method for the assessment of dust from demolition and construction activities. NZTA also note that CASANZ GPG dust assessment method considers dust effects out to 350m from the activity as the method covers a range of activities with a high dust potential which are not typically associated with roading construction. NZTA only recommends considering dust effects up to 200m from construction activities. For this project, the risk of dust effects is assessed as negligible to low at distances of 50m or more from road construction activities which is consistent with the NZTA's guidance. The assessment is consistent with the NZTA guidance document, however it is noted that the NZTA and CASANZ guidelines don't have any regulatory status. NZTA also acknowledges that alternative assessment methods may also be used. Both guidelines acknowledge the importance of applying professional judgment to assessments (i.e. the guidelines are not expected to be considered an inflexible assessment process). The following is stated by NZTA guidance "Air quality practitioners undertaking detailed assessments are expected to apply professional judgement in selecting and justifying the specific methods and data sources used, and the level of detail that is considered to be required. As such, the Guide to assessing air quality impacts from state highway projects does not preclude the use of other methods or data sources where this is supported by appropriate justification."
Q45	Construction Dust Assessment The assessment relies on a buffer distance of 50 m to assess the impact of dust nuisance effect on residents, commercial activities and industrial activities. (Tables 7-1 to 7-3). Please either: a) Provide evidence that construction dust will not travel further than 50 m; or b) Revise assessment to consider the NZTA recommendation - considering HSRs within 200m from the activity footprint; or • Revise the assessment using the CASANZ Categorisation of Receptors by distance from Sound (Table G2); or, c) Consider the CASANZ recommendation of human receptors within 350 m and 500 m from construction site entrances.

A45 The Project does not rely on a 50m buffer. The assessment of effects identifies sensitive receptors within 25m to 50m as having the highest risk of being exposed to nuisance dust. Many similar roading projects have occurred close to residential and commercial properties. Experience shows that dust generated during works can be effectively managed using standard dust control procedures such as watering active surfaces.

a. The assessment considers the risk of dust having a nuisance effect at different distances from construction activities. Nuisance effects are a function of range of factors as discussed in the report (e.g. the FIDOL factors). This is different from the distance a dust particle may potentially travel. Very small particles (e.g. PM10) can travel considerable distances (e.g. kilometres) whereas large particles may only a travel a few metres. This is fundamental air quality science. The assessment however identifies receptors within distances of 25 to 50m from construction sources as being those that are most likely to be at risk of experiencing dust nuisance effects.

b. Please refer to Section 5 and Section 7 of the Air Quality Report which discusses the sensitivity of the receiving environment. As stated in the report, the sensitive receptors which would potentially be most affected will be the dwellings located within 25m to 50m of the proposed works. Receptors located further from the works have been assessed to have low to negligible risk of being impacted. In accordance with the CASANZ GPG, the assessment of effects has been based on the receptors predicted to have the greatest risk.

c. It is assumed the Council is referring to the table labelled, “Table G.2 Categorization of receptors by distance from source”. The CASANZ guidance document has three distance categories, 1) 0 -100m, 2) 100 - 200m, and 3) 200-400m. These categorizations are for use with the Appendix G: alternative assessment methods for assessing dust effects. This alternative approach was not followed in the assessment, although wind flows and separation distances were considered. The classification of receptors using this method is therefore not appropriate.

The potential risk of dust nuisance effects in terms of the distance from construction sources has been assessed using the CASANZ dust risk assessment method (refer ‘Table 3.3 Sensitivity of the area to dust soiling impacts’). The distance classifications are much more granulated close to the construction source where the risk is greatest (i.e. 0-25m, 25-50m, 50-100m and 100-350m) than those shown in Appendix G2 table. The classifications are the same as those used by the IAQM. The assessment of dust effects, and proximity of receptors to construction sources, is consistent with the CASANZ guidance document.

Potential air quality effects have been assessed using the CASANZ method as being low or negligible at distances of 50m or greater. Consequently, the more granulated classification of dust effects with distance are considered more useful when evaluating the potential dust effects.

d. Guidance from the NZTA notes that the CASANZ GPG assessment distances are excessive, and any dust effects should only be considered up to 200m. There does not appear to be any clear rationale in the CASANZ recommendations for this requirement. Any dust effects will only be expected near to construction activities based on professional judgement related to past experience.

Q46	NZTA Guideline requires: "Any assessment of dust effects used to support a resource consent application must include a FIDOL (frequency, intensity, duration, offensiveness and location) assessment in accordance with the recommendations in the MfE Good practice guide for assessing and managing dust". Section 7.2 of the AEE details the FIDOL factors and Section 7.3 details the assessment method. Section 7.3 doesn't address all the FIDOL factors (e.g. offensiveness or duration). Please: • Explain the relationship between the FIDOL assessment outlined in 7.2 and the method described in Section 7.3?; a) Revise the dust assessment method used to meet the recommendations of NZTA; and, b) Provide an updated assessment to reflect a complete FIDOL assessment.
A46	A supplementary assessment of dust effects has been prepared by Beca Ltd, below, which considers the individual FIDOL factors in terms of the dust assessment methodology described in Section 7.3 of the Air Quality Report. *Location.* The sensitivity of the receiving environment is discussed in Section 5.2, and 7.3.1 of the report. The residential dwellings located on Rolleston Drive, Wyndham Mews and Dalwood Crescent have been identified as the sensitive receptors which would potentially be most impacted. *Intensity and Frequency* The intensity and frequency of potential dust events have been assessed based on the separation distance of the project boundary to sensitive receptors (Section 7.3.3), and the frequency these receptors will be downwind during unfavourable wind conditions (Section 7.3.2). The application of the CASNZ dust risk assessment method indicates there is a low to medium risk that residents located within 50m of construction activities could be exposed to nuisance dust. Nuisance being a function of intensity and frequency (and duration). Earthworks are expected to be the primary source of any dust emissions from the project. Although other potential sources of dust would include the stockpiling

	of fine aggregate. The positioning of stockpiles relative to dwellings (i.e. separation distance to dwellings and whether stockpiles are upwind of dwellings in the prevailing wind direction) will also influence the frequency dwellings could be exposed to dust. The wind flows observed at the Lincoln EWS indicate that prevailing winds are from the northeast direction (refer Figure 5.3) and therefore the dwellings on Rolleston Drive would typically be up wind of the construction activities and therefore less likely to be exposed to any emitted dust. The dwellings would also tend to be up wind during wind speeds of greater than 5 m/s during dry days when winds can pick up dust from unconsolidated surfaces and stockpile. Therefore, the prevailing wind would help minimize the frequency these dwellings are potentially exposed to project dust emissions. The dwellings on Wyndham Mews and Dalwood Crescent will also tend to be upwind from most construction activities. Only during the construction of portions of SH1 would these dwellings be in the prevailing downwind direction. The prevailing wind would help also minimize the frequency these dwellings are potentially exposed to project dust emissions. *Offensiveness* As discussed in Section 7.1 of the report, the dust generated from earthworks has the potential to have a nuisance effect from the soiling of surfaces. The dust generated from construction would be expected to be windblown fines from stockpiles or earthworks. Neither dust source is intrinsically offensive (due to colour, texture or odour) but could still potentially cause a nuisance at a high enough concentration. *Duration* The duration of any dust event would be determined by the construction activity being undertaken, wind speed and wind direction, and the effectiveness of dust control procedures. Provided appropriate dust control measures are implemented any dust event would be expected to be of short duration. Dust will also only be generated during construction. Any emissions will therefore be of a finite duration. *Conclusion* The conclusion of the assessment remains unchanged from those presented in Section 7.5.
Q47	Dust mitigation and Dust monitoring NZTA highlight the Importance of Dust management and monitoring plan “Where there is a high risk of effects of amenity from construction activities, more stringent control measures will be required, and these should be set out in a specific Construction Air Quality Management Plan (CAQMP) (refer to Section 4.4 for further information). Waka Kotahi has developed a template to assist with preparing a CAQMP which is available at Air quality | Waka Kotahi NZ Transport Agency (nzta.govt.nz).”

	While Section 3.1.5 of the AEE lists generic dust mitigation measures, until a site specific Construction Air Quality Management Plan (CAQMP) it is very difficult to complete a review and check the conclusions of the project's dust assessment. Please provide a dust management plan that fulfils the requirements of: • And NZTA CAQMP including the types, sizes and locations of dust sources; and a) Includes a section on dust monitoring (See Section E.2.2 CASANZ GPG).
A47	The implementation of dust control procedures through a Dust Management Plan (DMP) is appropriate given the proximity of residential dwellings to the proposed works. Additional dust control will be implemented through the Erosion and Sediment Control Plan (ESCP). The DMP will be consistent with Schedule 2 of the Canterbury Regional Air Plan (CARP) (the CARP specifies the minimum content of DMPs) and the Ministry for the Environment Good Practice Guide for Managing and Assessing Dust Effects (2016) recommendations. The DMP will be prepared by the contractor once the construction method is finalised and before works begin.
Q48	The NZTA Guideline and CASANZ both outline a tiered assessment method of considering the effects of the operational emissions: • NZTA - Screening, preliminary technical and detailed assessment; and, • CASANZ - Scoping, screening, and detailed assessment. The Rolleston assessment presents a detailed assessment. Please explain how the detailed assessment method used for the Rolleston project fits in with the recommended tiered assessment methods required by both NZTA and CASANZ.
A48	The NZTA screening model is only able to assess the impact of vehicle emissions from a single road source. It is not suitable for the assessment of complex road geometries or road networks, including intersections, roundabouts and flyovers. The poor performance of the screening model in these situations is detailed on the NZTA website. Therefore, the screening model was not considered to be a suitable model for the assessment of the proposed project which incorporates a number of complex roading features. As a consequence, a 'comprehensive air quality assessment' was conducted, in accordance with Section 7 (Technical assessment for an RMA assessment of Environmental Effects) of the NZTA guidance document. A comprehensive air quality assessment provides a higher level of confidence in the validity of the results and

	conclusions drawn from them. A key consideration in the assessment is the potential impact that proposed changes in the roading network may on air quality (i.e. the 'do minimum' compared to the 'with project' scenario) this could not have been done with screening modelling. Both the NZTA and CASANZ guidance documents emphasis the application of professional judgment when doing an assessment which was done in this case. The assessment undertaken is considered appropriate and consistent with the guidance.
Q49	49. The effects of NO2 are assessed by modelling GLCS of tailpipe direct NO2 emissions being combined with background NO2 concentrations. CASANZ GPG recommends the use of a NOx-NO2 model. Rgw NZTA Guideline notes “Post-processing of dispersion modelling outputs will be required, for example to account for the conversion of NO to NO2, and for calculations of total pollutant concentrations including background concentrations”. NZTA have just developed a roadside NOx-NO2 for New Zealand conditions. Please review the NZTA requirements for assessing NO to NO2 conversion and either: a) Update the assessment to include the impact of NO to NO2 conversion. Using the NZTA model would see an easy and appropriate approach for this task; or, b) Justify not accounting for NO to NO2 conversion in the detailed assessment.
A49	The CASANZ guidance document recommends the use of the ‘ambient-ratio’ method or any alternative method if there is justification for its use. The ambient ratio method is a generalised classification of a range of different methods. These methods vary in their assumptions. CASANZ does not specific what ambient ratio method should be used i.e. how the NO2 should be calculated. The approach taken in the report is comparable to an ambient ratio method. A summary of the different ambient ratio method used in NZ and Australia is provided in Table H.4 of the CASANZ guidance documents. NSW and South Australia are shown to use a NO2 to NOx ratio of 0.1 to 0.2. The Rolleston air quality assessment assumes an NO2 to NOx ratio of approximately 0.2 which is comparable to those shown for NSW and South Australia. The NZTA guidance document states “post-processing of dispersion modelling outputs will be required, for example to account for the conversion of NO to NO2, and for calculations of total pollutant concentrations including background concentrations”. In any case, post-processing has occurred to calculated cumulative NO2 concentrations. Council notes that NZTA has just developed a roadside NOx-NO2 for New Zealand conditions. However, a search of the NZTA website and published technical reports could not identify the model referred to.

	The most impacted dwellings are located between 10 – 20m of modelled road sources. Due to the short distance to these dwellings, there is little time for the emitted NO to react with ambient ozone to form additional NO2. This reaction is not instantaneous. Similarly, formation of additional NO2 is also limited by how much ambient ozone is entrained in the emission plume and is therefore available to react with the emitted NO. Therefore, near road sources, the emitted NO2 is expected provide a good indicator of the contribution of vehicle emissions to ambient air quality levels. It is important to note that the modelling is mainly intended to show the relative impact of vehicle emission for the 'with project' scenario against the 'do minimum' scenario. The method used to predict the conversion of NO to NO2 is therefore less important provided the same method is applied to both scenarios to allow for a comparison to be made. Emissions from these road sources are highly unlikely to exceed any of the relevant ambient air quality concentration limits as the projected daily traffic volumes are too low. Compliance with the ambient air quality criteria can be demonstrated using a conservative screening method. The 'proxy method' described in the MfE Good Practice Guide for Assessing Discharges to Air is highly conservative when applied to the assessment of air quality near road sources. The method assumes all of NO in the emission plume has been reacted to NO2 up to the theoretical oxidative capacity of the atmosphere (i.e. ozone concentration limit). As discussed, this would not occur close to roads and therefore the proxy-method will substantially over predict NO2 concentrations near road sources. The maximum cumulative 1-hour and 24-hour average NO2 concentrations predicted using the proxy method have been provided in the attached PDF. The results show that even if this highly conservative method is used NO2 concentrations would not exceed any of the relevant air quality criteria.
Q50	Some results presented in Tables 8.1 to 8.5 are hard to reconcile intuitively. • Explain why the results are "similar for both Scenarios?" Comparing emission rates, vehicle speeds, vehicle numbers and composition of fleet would be very helpful. • Explain differences in concentrations with and without project. Eg. GLCs of pollutants in Receptor Area Four and Receptor Area 5 decrease with project while Receptor area three increases with the project.

	a) Explain why Receptor Area 4 decreases with the project when road is closer to this receptor area. for with and without project. b) Please check and confirm the title of Table 8.5. • Please present summary results (similar to Table 8.5) 24-hour NO2 GLCs.
A50	Differences between the 'do minimum' and 'with project' predictions reflect the changes to the road alignment, traffic flows (in both directions) and vehicle speeds. Details of the road source input to the dispersion model are provided in the attached PDF. It is also important to note that the maximum concentrations presented in the tables, are maximum concentrations predicted at any dwelling in the defined Receptor Area. The most impacted dwelling can vary between scenarios in response to the different road connections a) Refer 54. Details of the model input for each road source are provided in the attached PDF. b and c) The lower traffic volumes predicted for the SH1 'with the project' and removal of the Hoskins Road intersection would be expected to result in a reduction in contaminant concentration at the most impacted dwelling in Receptor Area 4 and Receptor Area 5. The only road source which would be closer to some dwellings in Receptor Area 4 for the 'with project scenario' is the proposed motorway off ramp. The off ramp is not predicted to be a large emission source. The off ramp would also be expected to have the most impact on western most dwellings in the Receptor Area 4. However, the peak concentrations in Receptor Area 4 for both scenarios are predicted to occur at the dwelling which is closest to SH1 and Hoskins Road. The separation distance between this house and the closest road sources is largely unchanged between the scenarios. Only relatively small contaminant concentrations are predicted for the dwelling in Receptor Area 3 which suggests the changes in the road alignment do not have a large impact on air quality at these locations. d) Table 8.5 has been mislabelled. It should be corrected to the following. "Table 8-5. Package 2 maximum 99.9 percentile 1-hour average NO2 concentrations (µg/m3)" e) The maximum 24-hour NO2 concentrations have been provided in Attachment 8.

Q51	IAQM methods of defining the significance of the difference between with and without project is discussed in section 4.5.9 of the CASANZ and categorizing impacts. Please review and, if necessary, revise the assessment of significance of effects presented in section 8.3.4 with consideration of the factors recommended in section 4.5.9 of the CASANZ GPG.
A51	The IAQM classifications of significance are not considered useful in this instance. The IAQM classifications were developed for use in a UK regulatory environment. These classifications do not easily align with the assessment of significance in New Zealand. The IAQM's 'magnitude of change' classifications (<1%, 1-5%, 5-10%, and >10%) are also relatively small and therefore highly sensitive to the accuracy of the dispersion model predictions. The more relevant NZTA guidelines recommend assessing the significance of discharges to air from a project in terms of following guideline contaminant concentrations limits: ● Project Contribution - Whether the contribution from the project is predicted to increase ambient air quality contaminant concentrations by more than 10% of the relevant air quality criteria. ● Cumulative Contribution – Whether the cumulative contaminant concentration (i.e. project + background sources) is predicted to be more than 90% of the relevant air quality criteria. This has been done with the modelling predictions for PM10, PM2.5 and NO2. The results are presented in the attached PDF. All the predicted project contributions are below the NZTA guideline level of 10%. Similarly, all the predicted Cumulative Contributions are also below NZTA's 90% guideline level. The project is not assessed as being significant using the NZTA criteria.
Q52	The AEE utilizes AERMOD RLine-EXT to model GLCs of pollutants. This model option has not been widely used in New Zealand for assessing the impacts of contaminants discharged during the operational phase of a roadway. This model option is not considered in either the NZTA Guideline or CASANZ GPG. Please provide either: • Evidence of RLine-EXT validation to demonstrate it is matches requirements of this project: or. • A high-level (semi-quantitative) validation of the model results using either roadside monitoring data from similar sites of the NZTA screening tool.

A52 AERMOD is widely used within New Zealand and internationally to assess air quality effects for regulatory purposes. The model was adopted by the USEPA and promulgated as their preferred regulatory model in 2005. AERMOD was similarly adopted by the Victoria Environmental Agency in 2014. AERMOD is also identified as a standard dispersion model for roading assessments in the CASANZ good practice guide.

The performance of the model and the associated meteorological model AERMET has been validated and documented by the USEPA and the model is regularly updated. Every update to the model, such as the inclusion of RLINE method for representing road sources, is tested and documented. Due to its preferred model status in the USA it is probably one of the most evaluated dispersion models available.

The documentation of the performance of AERMOD (and all the USEPA other models) is available from the USEPA Support Centre for Regulatory Atmospheric Modelling (SCRAM) website. Dispersion modelling partitioners will be familiar with the USEPA SCRAM website - https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models. The documentation of the performance of the RLINE method for representing line sources is also available from the SCRAM website which the Council reviewer can view.

Council's peer review has noted that the RLINE modelling method has not been referenced in various guidance documents. The RLINE source method was initially included in AERMOD as a Beta option (a non-regulatory option) in 2019. It was updated in 2023 to account for elevated terrain in 2023 but remained a Beta option. Only in 2024 was the RLINE source type formally promulgated as a regulatory formulation update to AERMOD. The status of RLINE is detailed on the USEPA SCRAM website.

The RLINE algorithm was promogulated after the guidance documents listed below were published and would therefore would not have been included in any of them.

• The Ministry for the Environment ‘Good practice guide for assessing discharges to air from land transport’ was published in 2008,

• The NZTA ‘Guide to assessing air quality impacts from state highway projects’ was published in 2019, and

• The CASANZ ‘Good practice guide for the assessment and management of air pollution from road transport projects’ was published in February 2023.

The RLINE algorithm was specifically developed for refined modelling of transportation projects. It is designed as a replacement of USEPA’s older CALINE3 and 4 models. It is therefore appropriate to be used in this instance. As noted above, RLINE has been evaluated and documented by the USEPA. The modelled road sources used in the assessment have been configured in accordance with guidance provided by the USEPA based on their experience. The source parameters selected are detailed in the report. Changing these parameters would have some effect on the predicted concentrations but would have no effect on the overall conclusion of the assessment.

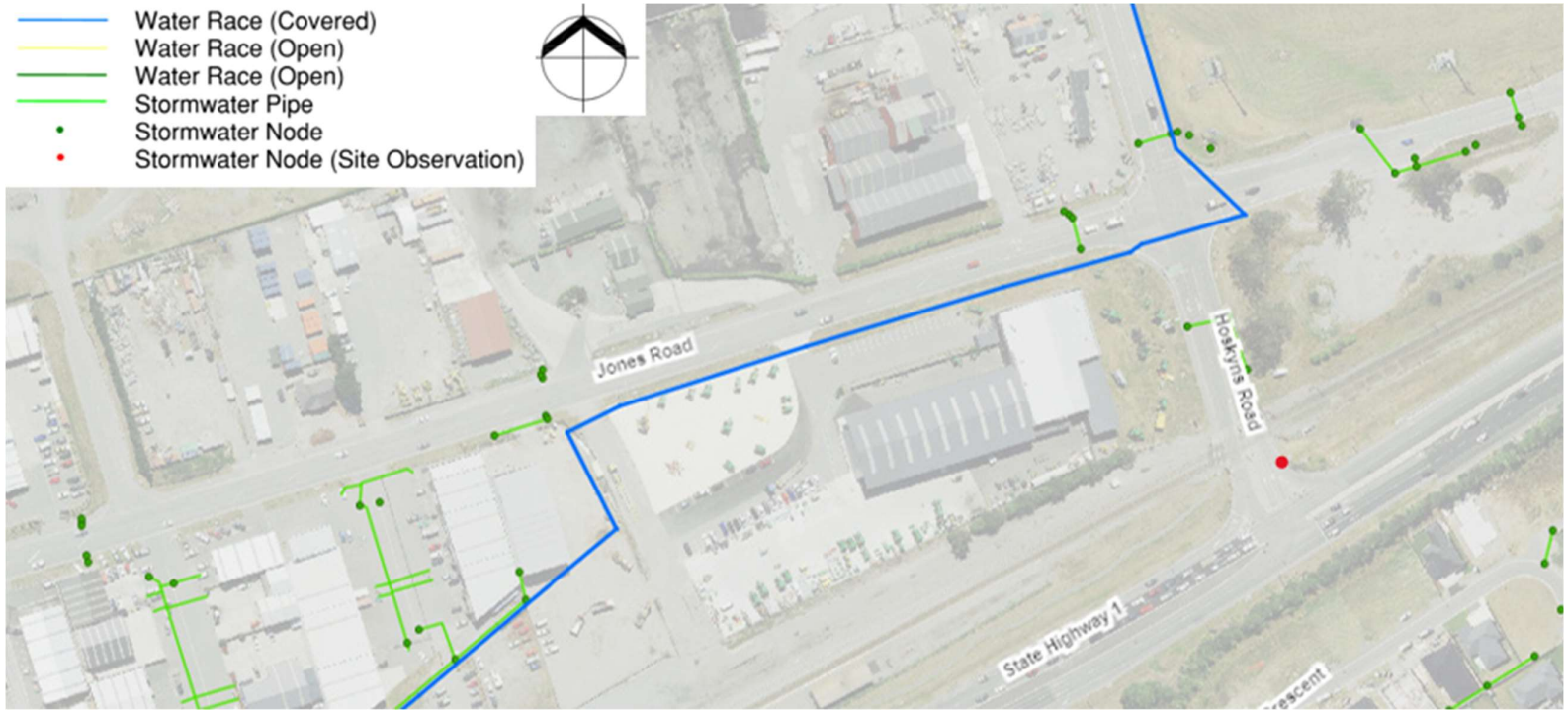
Q53	Please provide one example of each of the input and output RLine-EXT files.
A53	A copy of an example input file is provided in the attached PDF. It is impractical to supply the output file in the format directly from the model given the size of the file. However, a digital copy can be provided on request.
Q54	Please provide a table of the traffic numbers, fleet composition and speed of the road links considered in the assessment. This will help with the understanding of the answers to questions 8, 9 and 10 above.
A54	The information has been provided in the Attachment 8.
Q55	Please provide a readable screen shot/s of the VEPM model data input page.
A55	The information has been provided in the Attachment 8.
Q56	Section of the AEE details the parameters used to configure RLine-EXT. Section 4.5.3 of the NZTA Guideline discusses the importance of understanding the accuracy and uncertainty of emission and dispersion modelling. Section 4.5.7 of the CASANZ GPG discusses model uncertainty and highlights the importance of this when there is a lack of data (e.g. model validation). Please provide a high-level assessment on the uncertainty contained in the emission and dispersion model results presented in the AEE. This assessment should, at least, consider the sensitivity of the RLINE results to the source parameters selected.
A56	Refer to A52. The use of the AERMOD model represents good industry practice. The model has been appropriately validated by USEPA and this validation is documented on the SCRAM website as discussed above.
Ecological Effects	
Q57	Lizard habitat extent - Most of the of the potential lizard habitat on site has been identified appropriately. However, based on aerial imagery there are a couple areas on the northern side of SH1 (see screen shot below) that appear to be a complex of rank grass, scrub and treeland, that has potential to be lizard habitat. These are not within the identified works footprint, but are within the identified Zone of Influence (ZOI).

	It is noted that construction methodology had not been finalised (when the report was compiled) and the ZOI is wider than the planned works in most areas to allow for this. Therefore, if there is more up to date information on the extent of the works footprint then this should be provided, otherwise it is recommended the extent of the potential lizard habitat on the site is re-examined, to include all areas within the ZOI.
A57	A lizard survey was undertaken in February. For the majority of the project area, no lizard habitat was identified. A small area of lizard habitat was observed on the eastern side of Hoskyns Road. This vegetated area will not be impacted by the proposed works and contractors will be made aware of the requirement to avoid the vegetated area.
Q58	Lizard survey - A survey is not an effects management measure – it is used to guide effects management (i.e. to determine population extent, abundance and habitats throughout the impact area). It is recommended that a lizard survey is undertaken by a suitably qualified and experienced herpetologist.
A58	See A57.
Q59	Lizard management - The report infers that the population at the site would not be fragmented by a salvage, which may not capture and translocate all lizards present within the impact site. It is unclear what 'staged vegetation management' is and how this would not disrupt the lizard population. It is assumed that this would be 'staged vegetation removal' but further details are required on how this would be implemented. Specifically, where/if there is no suitable habitat immediately adjacent, for displaced lizards to move into. It is recommended that the applicant provide further detail on how 'staged vegetation management' will be used to avoid disrupting lizard populations, that may already be limited by external factors, such as ongoing predation and habitat extent. The report identifies the need for a Lizard Management Plan (LMP), but does not mention the need for Wildlife Act Authority (WAA). It is likely that any vegetation management would still directly disturb or harm indigenous lizards and therefore need a WAA. Given the long processing time for WAA, it is recommended that this process is commenced.
A59	Based on the lizard survey undertaken, as per A57, the small area of potential lizard habitat will not be impacted by the proposed works. Notwithstanding this, it has been advised that should this vegetated area be required to be used for construction vehicle storage, a Vegetation Removal Protocol (VRP). VRP involves progressive mowing and subsequent removal of rank grass. This progressive mowing and removal of habitat will encourage lizards to vacate the site and disburse into adjacent habitat.

- Making and keeping an area unattractive to lizards from well before the works start and when works are staged is possible through applying the VRP early on. The VRP is as follows:
- The VRP must only be implemented in areas demarcated as suitable (i.e., where suitable habitat is immediately adjacent where displaced lizards can move into).
- The VRP must only be conducted during suitable seasonal and weather conditions.
- In areas where the VRP is suitable, this may be implemented well in advance of site impacts and maintained to reduce the risk to lizards, so long as the VRP is completed during appropriate seasonal and weather conditions and maintained as unsuitable for lizards (i.e., if works are planned for winter, the VRP can be implemented prior to May to remove the habitat and be maintained as unsuitable for lizards until work commences.).
- If the VRP is not conducted well in advance of works, the VRP must be commenced at least 5 days prior to site establishment and the commencement of construction works, initial high-level mowing must occur.
- Initial mowing must be no lower than 150 mm above ground level (AGL). · Two days later, the site must be mowed to 50 mm AGL (Figure 20) in a strategic manner towards the adjacent habitat.
- Transects of mowing must commence from the road edge and progressively move towards adjacent habitat, encouraging skinks towards the adjacent habitat that will be avoided.
- 24 hours later a final ground level removal of grass to bare earth, typically by excavator (Figure 20), following the same strategic manner must be conducted.
- Once rank grass is removed from the site, site establishment can occur, or the site can be maintained as unsuitable habitat until works occur.
    - The construction footprint must remain bare, or unsuitable (i.e.: no higher than approximately 25 mm),for the remainder of construction works, which will minimise the likelihood of lizards migrating back onto the construction site.
- Maintenance (<25 mm) can occur indefinitely and through winter so long as the initial VRP to bare earth occurs within optimal seasonal conditions in the first instance.
    - If the construction site cannot remain bare or <25 mm, lizard exclusion fencing (Section 4.4) must be installed to isolate the construction zone and avoid the risk of impacting lizards that may recolonise the construction site, or the VRP must be implemented again.

Stormwater	
Q60	2.3 Contaminated Land Detailed Site Investigation Note - At stormwater disposal relies on discharge to ground, it is critical that the contaminated land risk is understood. As indicated in the Package 2 report, we concur that it is critical that testing is done at the locations of the proposed ponds.

A60	Noted.
Q61	2.3 Groundwater (incl Geotechnical Interpretive Report) The highest groundwater depth was based on a short monitoring period between 12 July and 12 August 2024. Has the highest recorded groundwater in the area been considered based on any other monitoring data? And if so, what was the highest recorded?
A61	The Project specific piezo monitoring period was limited to the duration of site works, which occurred over winter when the water table was expected to be higher. The nearest long term monitoring bore to the Project site is M36/0085 (1km west from the roundabout) on CanterburyMaps, which indicates groundwater levels from 7.4 to 20.9m below ground level (based on data from 1982 to 2010). The groundwater level adopted for design is at approximately the 90th percentile of the long-term groundwater levels observed in M36/0085. A longer-term record including more recent data at monitoring bore M36/0217 (located 3.5km northeast of the overpass) shows levels from 10.5-21.8m bgl (from 1974 to 2024), which are deeper than the design groundwater level of 9.5 m bgl.
Q62	2.6.3 Jones Road & Hoskyns Road Location of historic flooding mentioned, but location in Figure 2-8 is not shown. Can the location of the historic flooding be confirmed.
A62	See Figure 2-8 to the right with historic flooding area marked in red. Image to the right shows the kerb breakout subject to flooding. Image from Google Streetview precedes maintenance carried out in the area to remove debris etc.



Q63	3.2 Design Assumptions A key design assumption is that "As a minimum, the design will include first flush treatment, attenuation and disposal to ground up to the 1% AEP event for an impervious area equal to the additional impervious area created by the project". It is noted that some catchments with additional impervious area, no treatment is proposed. Refer to RFI 12
A63	Section 5.4 of the Stormwater Assessment Report discusses four areas; • Additional impervious area (12,300m²)

	• Existing SH1 CSM2 affected area (10,900m²) • Catchment area discharging to proposed stormwater basins (29,800m²) • Catchment area discharging to proprietary treatment devices (2,000m²) Due to the widening of SH1, the treatment and soakage swale that was installed along the south side of SH1 as part of the CSM2 works and managed 10,900m² catchment area is to be removed. This catchment area will now discharge into the proposed stormwater basins and forms part of the 29,800m² catchment area. The 29,800m² impervious area treated and discharged to ground at the basins, less the 10,900m2 impervious area of lost treatment and discharge to ground from the CSM2 swale, is, on balance a gain of 18,900m² of new impervious catchment area treated and discharged to ground in the new basins. Additionally, a catchment area South of the overpass has proprietary treatment devices proposed for a catchment area of 2,000m². Therefore, a total area of 20,900m² area will be treated as part of the project, which is greater than the 12,300m² additional impervious area created by the project. NZTA have taken a pragmatic approach, treating the first flush where practicable. There are several minor catchments, identified in Section 5.3 Minor Catchments of the report, that were usable to discharge to the stormwater management basins. The Rolleston Drive South Catchment was assessed as at risk of an increase in contaminant load and therefore proprietary treatment has been proposed. For the other minor catchments, a high contaminant load is not anticipated, and the additional catchment area is minor (compared to the adjacent new road catchment which will be treated in the basin). Treatment (which would require another small device or proprietary devices) is therefore not necessary.
Q64	3.2 Design Assumptions Note - A key design assumption is that the existing site levels in critical locations will be retained as to not alter existing overland flow paths. From the SDC flood hazard mapping (200-year), a major overland flow path is to the north of the proposed overpass and a lesser to the south. A flood risk assessment as per the SDC Engineering Code of Practice may not be required if it can be confirmed that there is no change.
A64	Agreed.

	The intention is for existing site levels in critical locations to be kept the same where possible. An assessment of the existing vs the proposed site levels will be carried out during detailed design to confirm. If levels are unable to be kept the same, then a flood model will likely be required to determine suitable remedial measures. The type and location of remedial measures will be dependent on the location and the severity of the impact and is expected that this work will be completed within the designation footprint.
Q65	3.4.1 Rainfall Applicant to confirm the location or station used to extract the data. It appears that the rainfall data is from the Burnham RAWS station. This is similar to Package 1.
A65	The HIRDS V4 data was taken from the BURNHAM RAWS site (ID:O00886).
Q66	3.4.5 Ground Soakage Rates The total contributing catchment is > 1,000 m2 and there is a residential area downstream of the proposed site. Based on Table 3-4, what was the justification for the lower factor of safety applied (i.e., 5 vs the table recommended 10)?
A66	The consequence of failure is assessed as minor based on the existing scenario and the scale of the existing catchment and the proposed works. Within the Project extents, the existing drainage is limited along the state highway to a number of soak pits as described in Section 2.6 of the report. The Project is estimated to create an additional 12,300m² of impervious area, however, as described A63, the proposed stormwater basins are designed to capture and discharge to ground up to the 1% AEP event for 29,800m² of impervious area (including the catchment area offset from the affected CSM2 works). In the event that the soakage rate is not as high as anticipated, then in a large event the basins could fill up and overflow to the south, however the basin would still provide some attenuation. This overflow path to the south would be along the existing secondary flow paths. See attached flood SDC map overlaid with the project extents – Attachment 9. Due to the significant size of the existing upstream catchment relative to the additional impervious area, and the attenuation effect of the new basin on the additional runoff, the increase in downstream flooding is expected to be immaterial.

Q67	3.4.5 Ground Soakage Rates Observation - The SDC engineering code of practice requires consideration to WWDG Chapter 6 when considering infiltration rates. The recorded infiltration rates are high (as expected for the type of soils) and the design soakage rate is higher that the 75 mm/hr recommended by WWDG. This is acceptable based on the result and agree with recommendation made that further soakage test is required during construction. Test should be done at location and depth proposed of proposed soakage basins.
A67	The 75mm/hr in WWDG refers to infiltration (i.e. flow through designed sand media to provide treatment) rather than soakage (i.e. more rapid discharge to ground of post-first flush volume). The design soakage rates for Package 2 included in Table 3-5 of the stormwater report are soakage rates, not infiltration rates. The infiltration media for the first flush basins will be design during the detailed design stage of the project. The design will follow best practice guidance from "CRC for Water Sensitive Cities - Appendix C: Guidelines for filter media in stormwater biofiltration systems, which is based on extensive research and operational experience. Infiltration through the design soakage media is likely to be in the region of 100mm-300mm/hr initially, but this is likely to reduce over time due to clogging and compaction. However, this expected first flush infiltration rate is not a key parameter for sizing the first flush infiltration basins. The first flush infiltration basins are sized to capture the first flush runoff volume (i.e. runoff from 25mm of rainfall). The drain down time for the long-term case is checked assuming a minimum 20mm/hr infiltration rate (with clogging), with a maximum drain down of 48 hours to maintain healthy grass cover. The attenuation storage in the soakage basins has been sized based on the inflow and outflow, which were determined using the design soakage rates from Table 3-5 and the basin area, for various event durations. Further testing of the soakage rates of the underlying ground will be carried out during construction to confirm soakage rates in the locations of first flush and soakage basins. If poor rates are identified then the assumed infiltration and soakage rates and design will be re-assessed, however this is considered unlikely.
Q68	4.3.1 Road Corridor Catchment Referencing Figure 4.1, there will be an expected change in slope in some areas in the catchment (e.g., overpass). Has consideration been given to the effect on stormwater runoff due to the change in slope and/or material (hardfill)?

A68	Impervious catchment areas have been determined and are shown in section 4.3.2 Road Corridor Catchments in the report. Impervious areas include road, footpath, hardstanding and gravel shoulders. All other areas have been determined as pervious. The runoff coefficients used to develop the design are shown in Section 3.4.2 Runoff Coefficients of the report. Changes in gradient were considered during the preliminary design, however, due to only minor areas having an increase in slope relative to the scale of the Project, no adjustments have been made to runoff coefficient values shown in the report. For the channel flow width calculations, the long fall and crossfall of the road has been considered in each channel to provide sufficient collection and conveyance of stormwater.
Q69	4.3.3 Cross-Drainage Catchments Note - This is a critical design assumption and it is recommended that the design levels are verified against existing.
A69	Refer to A64.
Q70	4.4.2 Treatment For both the infiltration basin and the proprietary devices - To understand the potential effect of runoff, the contaminants expected from the road is listed, but will there be an increase or decrease in the concentrations due to the proposed activity? What is the expected removal efficiency of the proposed devices and, based on the efficiency to remove the required pollutants, is the conclusion that the proposed treatment provided is sufficient treatment (based on relevant water quality guidelines and/or consents)? https://niwa.co.nz/freshwater/urban-runoff-quality-information-system-urqis can be consulted for water quality data.
A70	The Project may result in additional contaminant loads. The key pollutants in road runoff being gross pollutants, suspended sediments, heavy metals (in particular copper and zinc), hydrocarbons and nutrients. It is proposed to carry out first flush treatment where practicable as mitigation, with devices sized in accordance with industry standards. First flush infiltration basins, which are proposed for the vast majority of the catchment, are shown in the literature (including CCC's WWDG) to have good removal efficiencies for TSS, metals and nutrients. Specific proprietary devices will be selected during the detailed design stage, but will be selected in discussion with the maintaining authority as described in section 4.4.2.2 Proprietary Devices of the Stormwater Management Report.

	NZTA have not assessed contaminant load pre- and post- the Project or loads removed by the proposed treatment devices due to: • the variability in assumptions about contaminant loads generated (the Project involves safety improvements and modifications to an existing state highway, so the contaminant load change this is not as simple as say for a new road or converting a rural area to a residential subdivision). • the variability in removal efficiencies in the literature. NZTA have taken a pragmatic approach, treating the first flush where practicable, and sizing devices using accepted industry guidelines, which is consistent with accepted industry practice around NZ. Currently, only a small section of SH1 has formal treatment from the Rolleston Drive junction heading northeast towards Christchurch. Other than that, only informal treatment occurs in the project catchment within the grassed berm areas. For the proposed Project, the first flush basins and proprietary treatment devices have a catchment area much greater than the additional impervious area created as part of the Project. Therefore, the impact of the Project on water quality is expected to be less than minor.
Q71	4.4.3 Discharge to Ground Refer to RFI #2 - Consideration needs to be given to the highest recorded groundwater level (the recorded period of July to August 2024 is considered short) and that should be used to determine if the performance of the proposed infiltration basin will be affected by groundwater mounding or not. It is likely that the highest historical recorded groundwater level is well outside of the influence of groundwater mounding, however it is important to consider available historic information as part of the assessment.
A71	The Project specific piezo monitoring period was limited to the duration of site works, which occurred over winter when the water table was expected to be higher. The nearest long term monitoring bore to the Project site is M36/0085 (1km west from the roundabout) on CanterburyMaps, which indicates groundwater levels from 7.4 to 20.9m below ground level (based on data from 1982 to 2010). The groundwater level adopted for design is at approximately the 90th percentile of the long-term groundwater levels observed in M36/0085. A longer-term record including more recent data at monitoring bore M36/0217 (located 3.5km northeast of the overpass) shows levels from 10.5-21.8m bgl (from 1974 to 2024), which are deeper than the design groundwater level of 9.5 m bgl. Based on the data review, the vertical separation of groundwater from the stormwater discharge devices (i.e. basin inverts etc), are sufficiently deep that further consideration of mounding issues/effects are not required.

Q72	4.4.4 Attenuation Can sizing calculations be provided for both the sizing of the attenuation and the treatment?
A72	The preliminary design informs the consenting requirements and provides for the footprint. The calculations will be refined during the detailed design based on geometric detailed design. Detailed design calculations will be included in the detailed design reports.
Q73	4.4.4 Attenuation Reference is made in the last paragraph to the small sections of new impervious areas not being able to be conveyed to the basins. The report states that the stormwater from these areas will be managed in a way that matches the existing network in each catchment and that allowance will be made to cater for the increase in impervious areas. Would this allowance be to match pre-development runoff up to and including the 1% AEP runoff event?
A73	The existing catchpits and soak pits are assumed to have been designed to manage the 10% AEP rainfall event (i.e. SDC's primary system standard). On this basis, the replacement of existing catchpits and soak pits and any connected new network will be designed to manage the runoff from the contributing catchment and discharge it to ground in the 10% AEP event. It is important to note that these areas are the exception, and vast majority the new impervious area will be conveyed to the stormwater basins and discharged to ground up to the 1% AEP event. This approach will mitigate the effects of the additional impervious area.
Q74	4.4.5 Cross-Drainage The cross-drainage has been designed to collect the eastern and western cross-catchments. In section 2.5 it is indicated that there is no existing cross-drainage through SH. Will the proposed cross-drainage infrastructure result in a change in flood risk downstream now that there is new flow paths via the proposed cross-drainage infrastructure? If so, what will the effect of this cross-drainage infrastructure be?
A74	Refer to A64.

	It is not proposed to modify the existing overland flow paths as part of the Package 2 works, and therefore no cross-drainage is proposed as part of the Package 2 works. Refer to section 2.5 Existing Overland Flow Paths and section 4.3.3 Cross-Drainage of our Package 2 report.
Q75	5.2.1 Overpass North Catchment The second paragraph has missing text.
A75	"Christchurch RV Centre" wording was missing from the report, see updated report in Attachment 11 and updated text below: **5.2 Major Catchments** **5.2.1 Overpass North Catchment** The Overpass North catchment is delineated by the high point in the new overpass and the junction with Jones Road to the north. A small section of Jones Road will form part of the overpass north catchment based on the geometric design levels. The removal of the existing Christchurch RV Centre (currently a private commercial site) will provide space adjacent to the overpass abutment on the north-west side for the first flush and soakage basins for stormwater management (Overpass North basins). Stormwater from the overpass north catchment will have first flush treatment (via infiltration in a first flush basin) and runoff up to the 1% AEP event will be conveyed to the soakage basin, attenuated and discharged to ground. Due to limited space, stormwater will be collected in catchpits and conveyed through a piped network to the first flush and soakage basins. As noted in Section 2.3 the investigations to date show some existing contaminated land in the vicinity of the proposed basins. Further investigation is required, including proposed TP20 and TP21. The results of this additional testing will inform the management approach, which may include excavation of material and disposal to a facility licensed to accept the concentrations observed.

Q76	5.2.1 Overpass North Catchment & 5.2.2 Overpass South Catchment It is proposed that catchpits and pipes will capture and convey the stormwater runoff towards the basins. Will this infrastructure be sized to capture up to and including the 1% AEP runoff?
A76	There is limited space within the project extents for secondary flow paths to convey stormwater towards the basins. As such, the catchpit and pipe network has been designed to capture and convey the 1% AEP runoff to the stormwater basins.
Q77	5.3 Minor Catchments Refer to RFI #4 - It is indicated that runoff from the increased impervious areas will not be treated, but in the design assumptions it is stated that runoff from additional impervious areas will be treated. It is noted that for Jones Road Catchment (450 m2), the additional area is due to a shared walkway and this may not require treatment. It is unclear if this is the same for the Western Catchment (580 m2). The impact of the additional impervious catchment can be assessed and compared to the existing (e.g., NZTA Stormwater Treatment Standard for State Highway Infrastructure).
A77	Refer to A63. No water quality treatment is proposed for the Western Catchment. This catchment cannot be connected to the new basin. As the catchment is not expected to have a high contaminant load and the catchment area is minor (compared to the adjacent new road catchment which will be treated in the basin), treatment (which would require another small device or proprietary devices) is not considered necessary.
Q78	6 Construction Stormwater Management Is there an increased risk of flooding during the construction phase and if so, how will it be managed?
A78	Construction phase stormwater management is not expected to increase flood risk. Construction stormwater will be managed through the erosion and sediment control (E&SC) plan and will follow the fundamental principles of good E&SC practice for the Canterbury region. This would include consideration of existing overland flow paths and of spillways or overflows for erosion and sediment control devices in over-design events.
Q79	DRG 2102: Civil - Drainage (Sheet 2 of 7)

	Runoff captured by SWSD-9 is proposed to be directed to the first flush and soakage basins. Will this be feasible considering the RL (based on the plan contours) are roughly 54.4 m (rough rim elevation) and the GL around the basins are 55.0 m RL. It does not look like the basins have been modelled, but the water level in the basins may impact the hydraulic performance of SWMH-8 and SWSD-9. Something that should be resolved as part of design development going forward.
A79	Hydraulic grade line checks were carried out during the preliminary design stage to confirm the routing of the stormwater was feasible. Civil modelling (in Open Roads) will be carried out during the detailed design stage and further hydraulic checks carried out on the network (including tailwater levels at basins) to confirm hydraulic performance.
Geotechnical	
Q80	Please confirm that there will be a full geotechnical report prepared as part of detailed design, that will include site testing and other geotechnical information, such that the ground conditions, environmental effects and risks can be confirmed and mitigation measures adapted to suit.
A80	A full geotechnical report will be prepared for the Project.
Contaminated Land	
Q81	The status of contamination on land north of the Rolleston Drive and Main South Road intersections (future overpass location at 801 Jones Road) needs clarification. This piece of land could not be accessed for testing by Beca (northwest of Rolleston Drive and Main South Road) since it appears to be confused with land indicated by Stantec as previously tested and remediated.
A81	The remediation of 801 Jones Road was not specifically reviewed for the DSI. The PSI only mentioned negligible risks to human health, which appear to be on the basis of the LLUR commentary from ECan. The recommended sampling is for the purposes of basin construction and infiltration of stormwater, rather than for human health and NESCS consenting purposes. The EDC DSI and Remediation report will be reviewed in the context of reuse of soils in a stormwater infiltration basin, and if deemed suitable soil sampling will not be required.

Q82	Update the Beca DSI report to address reporting errors highlighted in Section 2.2 of the Review of Contaminated Land Report. We recommend that a cursory check of the report is undertaken after it is updated to ensure that no significant errors remain.
A82	The Review of Contaminated Land Report identified TP2, TP3, TP4, TP6, TP8 and TP10 as appearing on the laboratory results report, but not in the DSI Sample Plan, nor the results summary table for the Package 2 DSI. NZTA confirm that these test pits form part of Package 1 and were reported and assessed in the Package 1 report previously peer reviewed. The reason they are on the laboratory reports is because the associated test pits and soil samples were collected and submitted to the laboratory on the same day as the Package 1 report and therefore were not reported (or located within the site area) of the Package 2 DSI. Samples were collected on the same day due to logistics, service clearance, and the DSI was originally planned to be a single DSI for the whole project (Packages 1 and 2 in sum), which was subsequently requested to be divided into two packages with separate DSI reports. The review also notes that there is a discrepancy between the total number of sampling locations stated in the DSI text, and appended Sampling Location Plan compared to Table 5 (Sampling and Analysis Plan). Two locations in Table 5, and numbers in the DSI text have been amended however, we can confirm that the remainder in Table 5 are correct, and the reason for difference in number of sampling locations is because some locations targeted more than one HAIL activity/potentially contaminating activity and are therefore listed more than once in the Table.
Q83	Address by further investigations areas of uncontrolled fill, hydrocarbon contamination and coal tar in surficial roading, to delineate the extents of these areas of concern. Conversely, these requirements could be incorporated into the NESCS consent issued by SDC as a condition to be implemented prior to breaking ground for NOR Package 2 works.
A83	It is agreed that of uncontrolled fill in PP10 should be delineated, however, due to staging of works and the location of the fill within and adjacent to active state highway this will be updated during a later stage of the project. For coal tar (section 2.2.1 page 9) PDP appear to agree that coal tar assessment and sample spacing was 'not unreasonable', and that oversight during construction could be sufficient to manage risk. in the final recommendations PDP suggest delineating coal tar and hydrocarbon (including PAH) contamination. It is noted that that the only contamination above human health criteria for hydrocarbons was in road surface material in what was assessed as potentially coal tar. Therefore, any delineation (apart from the uncontrolled fill) for the coal tar or hydrocarbons observed in the DSI would be one and the same. Whilst it is acknowledged that coal tar use can be sporadic and somewhat heterogeneous, the area of coal tar highlighted in

Figure 8 of the DSI incorporated all sample locations that indicated coal tar, and conservatively extended this extent to the next sample to the east.

This will be extended to the next sample to the west where coal tar was not indicated. It is also possible that any additional sample locations also miss sporadically placed coal tar. The residual risk from coal tar manageable during works with appropriate Environmental Management Plan (EMP) and Contaminated Soils Management Plan (CSMP).