Before a Board of Inquiry
Northern Corridor Improvements Project

Under	the Resource Management Act 1991 (‘the Act’)
In the matter of	a Board of Inquiry appointed under section 149J of the Act to consider notices of requirement for designations and resource consent applications by the New Zealand Transport Agency for the Northern Corridor Improvements Project

Statement of evidence of Jeffrey George Bluett for the New Zealand Transport Agency (Air quality)

Dated 20 April 2017

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STATEMENT OF EVIDENCE OF JEFFREY GEORGE BLUETT FOR THE NEW ZEALAND TRANSPORT AGENCY

1 Qualifications and experience

1.1 My full name is Jeffrey George Bluett.

1.2 I am employed as the Team Leader - Air Quality by Golder Associates (NZ) Limited (Golder), a ground engineering and environmental consulting firm. I have been employed by Golder since April 2012 and have over 20 years of experience in the field of air quality management.

1.3 I hold the qualifications of a Bachelor of Science (University of Otago) and a Master of Science (First Class Honours) in Environmental Science (Lincoln University), specialising in air pollution modelling.

1.4 I am a member of the Clean Air Society of Australia and New Zealand (‘**CASANZ’**). Within CASANZ, I currently hold or have held the following positions, NZ Branch committee member (1998-present), NZ Branch secretary (2014-present) and CASANZ Council (2014-present), Transport Special Interest Group deputy chair (2010-2014), Training Activities Chairperson (2002-2008) and Conference Co-convenor (2002). I was awarded CASANZ life membership and the Distinguished Service Medal in 2013.

1.5 I have authored or co-authored approximately 100 reports and peer reviewed papers in aspects of transport, industrial, domestic and agricultural emissions to air. I have extensive experience in air quality and meteorological monitoring, air quality management plans, dispersion modelling and impact assessment statements. I have been involved in consultancy and advice to local and central government and to the industry. My most recent investigations have focused on quantifying the effects of dust and the efficacy of various dust suppressants from roadways, bulk material stockyards and open cast coal mines. For the years 2014 to 2017 I have had a role as an independent professional advisor for the New Zealand Transport Agency (the ‘**Transport Agency**’). In this role I have undertaken a number of air quality transport related research, monitoring, assessment and review projects for the Transport

Agency. On behalf of the Environmental Protection Authority ('**EPA**') in 2013 I undertook the pre- and post-lodgement adequacy and completeness check of the report *Assessment of Air Quality Effects – Peka Peka to North Otaki Expressway*.[1]

1.6 I have previously worked as an investigating officer for the Canterbury Regional Council processing resource consent applications (1997-2000), and as a leader of the air quality team and research scientist at the National Institute of Water and Atmospheric Research (2000 to 2012).

1.7 My evidence relates to notices of requirement and resource consent applications lodged by the Transport Agency with the EPA on 14 December 2016 for the Northern Corridor Improvements Project ('**Project**').

2 Involvement with the Project

2.1 In June 2016 Golder was engaged to assess the potential impacts of the Project on current and future air quality at the North Harbour Hockey Stadium located at 60 Paul Matthews Drive, Albany, Auckland. I managed this assessment and was lead author on the report. This was a desk based assessment which collated and analysed air quality data and traffic data from a number of relevant sites located near motorways in Auckland.

2.2 In July 2016 Golder was retained to undertake the air quality assessment for the construction and operation of roads associated with the Project, which I again managed. To become familiar with the proposed routes and surrounding environs I visited the site on 28 July 2016. I drove over the proposed routes and identified and visited potentially sensitive receptors.

2.3 I was the lead author of the *Assessment of Air Quality Effects* ('**Technical Report**') that formed part of the Assessment of Environmental Effects (**'AEE'**) lodged in support of the Project. The other authors of the Technical Report are my colleagues Richard Chilton and Maria Aguiar both of Golder Associates (NZ) Ltd.

[1] Assessment of Air Quality Effects forming part of the assessment of Environmental Effects for the Wellington Northern Corridor - Peka Peka to North Otaki Expressway.

2.4 I was lead author of the Technical Report, with contributions from Mr Chilton and Ms Aguiar on Section 7, Method Used to Assess Roadway Operational Effects and Section 8, AEE: Operational Phase of the Project. I have reviewed the dispersion modelling work undertaken by Mr Chilton and Ms Aguiar and agree with their findings which are presented in Section 8 of the Technical Report.

3 Code of conduct

3.1 I have read and am familiar with the Code of Conduct for Expert Witnesses in the current Environment Court Practice Note (2014), have complied with it in the preparation of this evidence, and will follow the Code when presenting evidence to the Board. I also confirm that the matters addressed in this statement of evidence are within my area of expertise, except where I rely on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

4 Scope of evidence

4.1 This evidence addresses the following matters:

a Description of methodologies used to assess the effects of the construction and operational phases of the Project;

b The existing environment relevant to the air quality assessment;

c Construction related effects;

d Mitigation measures, including conditions proposed for managing dust during construction;

e Operational effects of the Project on air quality including positive effects;

f Comments on submissions lodged in relation to the Project; and

g Conclusions.

4.2 In preparing this evidence, I have reviewed the following evidence:

a Mr Moore, Project Design;

b Mr Clark, Transportation; and

c Mr Hale, Construction.

5 Executive summary

5.1 The construction phase of the Project has a moderate to high potential for dust impacts to occur and these impacts are likely to be considered objectionable and/or offensive if not mitigated. Therefore, I consider it crucial to identify the key sources of dust and to:

a Have mitigation practices in place to minimise the amount of dust emitted;

b Have a monitoring programme in place to measure the effectiveness of the mitigation and facilitate a rapid response procedure if and when additional dust mitigation is required; and

c Develop a Dust Management Plan (‘**DMP**’) which will set out a framework and processes for the effective implementation of the dust mitigation measures and monitoring programme.

5.2 If the DMP details the relevant information, describes the required dust mitigation actions, and is effectively implemented and monitored to ensure its effectiveness, then it is my expectation that the effects of the dust discharged during the construction phase of the Project will be minor or less than minor.

5.3 The assessment of air quality effects of the operational phase of the Project was undertaken using a dispersion model, which calculates ground level concentrations (‘**GLCs**’) of the key pollutants that are discharged from the vehicles using the roads.

5.4 From the assessment of operational effects of the Project on air quality I conclude that exceedances of the relevant air quality standards are unlikely to occur, so there is no need for a programme to mitigate these effects.

5.5 If the Project achieves the aim of increasing network capacity, traffic will flow more freely through the region, the total emissions will decline, and on an airshed scale this is likely to result in a slight net benefit for regional air quality as compared to the air quality if the Project were not built.

6 Assessment methodologies

Roadway construction

6.1 The method used to assess the effects of roadway construction is detailed in the Technical Report.[2] This section of my evidence provides a brief overview of the key aspects of the assessment method.

6.2 I used three approaches to assess potential nuisance effects of the discharge of dust during construction of the Project:

a Buffer distances (distance between the source of dust and receptor);

b Frequency Intensity Duration Offensiveness and Location ('**FIDOL**') factors; and

c Assessment of meteorological conditions which may lead to dust erosion.

6.3 By having a suitable buffer distance, emissions can be dispersed, diluted and deposited to such an extent that the intensity of effects at sensitive locations should be minimised to an acceptable level. I used a buffer distance of 200 metres as a gateway assessment tool to decide whether or not a more detailed assessment was required for specific sensitive receptors.

6.4 The FIDOL factors were used to assess long term exposure/repeat dust events by accounting for the frequency and duration of repeated dust events impacting at a sensitive location, and by considering the sensitivity of the receiving environment and the offensiveness of the dust. Single

[2] Section 4. Method to Assess Construction Effects: Pages 16-17.

events at a receptor were assessed (for acute effects) in terms of duration, intensity and offensiveness.

6.5 For dust erosion to occur, wind must have sufficient energy to entrain dust into the air from exposed surfaces. An assessment was made of the dry day frequency of wind speeds above 5 and 10 metres per second, the wind speeds at which dust begins to be entrained from surfaces and may cause large dust plumes respectively.

6.6 The methods used to assess the effects of the construction phase of the Project are consistent with guidance provided by the Transport Agency *Guide to assessing air quality impacts from state highway projects*[3] and the Ministry for the Environment ('**MfE**') *Good practice guide for assessing and managing dust.*[4]

Roadway operation

6.7 The method used to assess the effects of roadway operation is detailed in the Technical Report.[5] This section of my evidence provides a brief overview of the key aspects of the assessment method.

6.8 The assessment of air quality effects of the operational phase of the Project was undertaken using a dispersion model which predicts GLCs of pollutants that are discharged from the vehicles using the roadways. The air contaminants considered in the assessment of the Project's operational phase were particulate matter with a diameter of less than 10 microns (**PM_{10}**), particulate matter with a diameter of less than 2.5 microns (**$PM_{2.5}$**), carbon monoxide (**CO**) and nitrogen dioxide (**NO_2**).

6.9 The Atmospheric Dispersion Modelling System (ADMS) Roads[6] air quality dispersion model was used for the assessment of the operational effects of the Project. ADMS-Roads is a 'near road dispersion model' and is the United Kingdom regulatory model for near road dispersion modelling

[3] New Zealand Transport Agency, 2014. Guide to assessing air quality impacts from state highway projects. Version 2.0, December 2014, DRAFT. http://air.nzta.govt.nz/sites/default/files/Air_quality_assessment_guide_v2.0_Draft.pdf. Accessed 2 March 2017.
[4] Ministry for the Environment 2016. Good practice guide for assessing and managing dust. Publication reference number: ME 1277. http://www.mfe.govt.nz/publications/air/good-practice-guide-assessing-and-managing-dust. Accessed 2 March 2017.
[5] Assessment of Air Quality Effects - Section 7. Method Used to Assess Roadway Operational Effects: Pages 32-43.
[6] Atmospheric Dispersion Modelling System – (ADMS) Roads is a comprehensive tool for investigating air pollution problems due to networks of roads. http://www.cerc.co.uk/environmental-software/ADMS-Roads-model.html.

assessments. The ADMS-Roads model as configured for this study included the following inputs:

a Roadway link vehicle emission rates;

b Diurnal profiles (hour by hour) of traffic volumes;

c Roadway link geometry and road width;

d Meteorological data;

e Terrain data; and

f Receptor locations.

6.10 The results of the dispersion model were verified by comparing modelled GLCs against monitored concentrations for the roadways around the Auckland Council's ('**AC**') Takapuna air quality monitoring site. The objective of undertaking the verification process was to gain an understanding of how the model performs in real life and whether the predicted GLCs are conservative or not.

6.11 Three representative receptors were used to assess the impacts of the operational phase of the Project, two residential receptors (Oteha and Unsworth Heights) and one located on the shared use path ('**SUP**') at a location where the highest GLCs were predicted to occur.

6.12 The assessment considered the following scenarios:

a Base case: 2015;

b Opening year: 2021 – (two scenarios: with and without the Project); and

c Opening year plus 10 years: 2031 – (two scenarios: with and without the Project).

6.13 For this assessment the background (without Project) air pollutant concentrations were consistent with guidance provided by AC's *Use of background air quality data in resource consent applications.*[7]

6.14 The predicted GLCs when combined with likely background pollutant levels were compared to ambient air quality standards to assess whether or not the vehicle emissions had a significant effect on air quality in the areas adjacent to the roadways. The MfE ambient (outdoor) Air Quality National Environmental Standards[8] ('**AQNES**') and AC's Auckland Ambient Air Quality Standards[9] ('**AAAS**') were used as assessment criteria.

6.15 The methods used to assess the effects of the operational phase of the Project are consistent with guidance provided by the Transport Agency *Guide to assessing air quality impacts from state highway projects*[10] and the MfE *Good practice guide for atmospheric dispersion modelling*.[11]

7 Existing environment

7.1 The land around the Project corridor is zoned for a number of different purposes. To the south of State highway ('**SH**') 18 the land is predominantly zoned residential and to the north of SH 18 the land is zoned either industrial or open space. On both the eastern and western sides of SH 1, between SH 18 and the Albany Expressway/Greville Road interchange, the land is predominantly zoned industrial. On the eastern side of SH 1, between the Albany Expressway/Greville Road interchange and Oteha Valley Road, the land use is predominantly zoned residential. While, on the western side of SH 1, between the Albany Expressway/Greville Road interchange and Oteha Valley Road, the land use is zoned either industrial or business/metropolitan centre.

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[7] Metcalfe, J., Wickham, L and Sridhar, S (2014). Use of background air quality data in resource consent applications. Prepared by Emission Impossible Ltd for Auckland Council. Auckland Council guideline document, GD2014/01. http://www.aucklandcouncil.govt.nz/EN/planspoliciesprojects/reports/technicalpublications/Documents/gd201401useofbackgroundairqualitydatainresourceconsentapp.pdf. Accessed 2 March 2017.

[8] MfE 2014, 2011. Users' guide to the revised National Environmental Standards for air quality. Updated 2014. Ministry for the Environment Report Publication number: ME 1141. https://www.mfe.govt.nz/sites/default/files/2011-user-guide-nes-air-quality.pdf. Accessed 2 March 2017.

[9] Auckland Unitary Plan – Operative in Part. Provision number E14.3.1. – Under Appeal. http://unitaryplan.aucklandcouncil.govt.nz/pages/plan/Book.aspx?exhibit=AucklandUnitaryPlan_Print. Assessed 30 March 2017.

[10] New Zealand Transport Agency, 2014. Guide to assessing air quality impacts from state highway projects. Version 2.0, December 2014, DRAFT. http://air.nzta.govt.nz/sites/default/files/Air_quality_assessment_guide_v2.0_Draft.pdf. Accessed 2 March 2017.

[11] Ministry for the Environment 2004. Good practice guide for atmospheric dispersion modelling. Publication reference number: ME 522 http://www.mfe.govt.nz/publications/air/good-practice-guide-atmospheric-dispersion-modelling. Accessed 2 March 2017.

7.2 The residential zones that are closest to the Project and downwind during prevalent south-westerlies will be highly sensitive to the discharge of dust from roadway construction and pollutants discharged from vehicles using the roadways. The industrial and business/metropolitan centre zones will be moderately sensitive to the dust discharged from roadway construction and to the pollutants discharged from vehicles using the roadways.

7.3 None of the local terrain features are steep enough to significantly slow or divert regional wind flows, although some local channelling is likely to happen especially during lower wind speeds. Due to the relatively sheltered location of SH1 at Rosedale Road and Oteha Valley Road the dispersion of pollutants discharged from vehicles at these points is likely to be reduced slightly compared to more exposed sites of Unsworth Heights and Oteha.

7.4 The predominant winds are from the southwest through to the northwest with winds from these directions occurring for approximately 55 % of the time. The next most frequent wind direction is from the north-easterly direction, for approximately 17 % of the time. Calms, when wind speeds are below 0.5 m/s, occur for approximately 4 % of the time.

7.5 A number of highly sensitive receptors have been identified as being in close proximity to construction zones or within 200 m from the edge of the Project affected roadway links. For the construction phase of the Project, the sensitive receptors were grouped together into one of five assessment areas depending on their location in relation to the construction zones, construction yards or haul roads. For the operational assessment three key locations (Oteha and Unsworth residential areas and the SUP) are used as indicative highly sensitive receptors. Clearly, there are many more sensitive receptors than these three indicator locations. However, the locations of the three key indicator receptors mean that peak GLCs occur at these sites and the GLCs experienced at the other sensitive receptors will be similar or lower.

8 Effects - construction phase

8.1 The outcomes of the assessment of effects of roadway construction are detailed in the Technical Report.[12] This section of my evidence provides a brief overview of the key outcomes of the assessment.

8.2 The main discharge into air arising from the proposed construction activities is particulate matter (dust). The most common concerns relating to dust discharges are generally nuisance impacts and health effects from the respirable particulate fraction (PM_{10}). I consider the effects of dust emissions are likely to be limited to amenity and nuisance given the relatively large size of dust particles discharged from the construction phase of the Project. Dust nuisance effects include impacts on amenity, visibility, and impacts on structures, such as soiling and abrasion.

8.3 The main factors that influence dust emissions associated with construction activities are:

a Disturbances of potentially dusty material by vehicle movements, excavation, loading and unloading;

b The moisture content of the surface or materials being handled;

c The area of exposed surface – including stockpiles;

d Wind speed across exposed surfaces; and

e The percentage of fine particles contained in the surface material.

8.4 The main sources of dust during the construction phase of the Project have been identified as:

a Construction support areas ('**CSA**');

b Haul roads; and

c Excavation and spoil removal, backfilling and road construction.

8.5 The key findings from the dust risk assessment are:

[12] Assessment of Air Quality Effects - Section 5. Assessment of Effects: Construction Phase of the Project: Pages 18-22.

a The scale of the development is large;

b There are significant dust generating activities associated with the construction of the Project;

c The meteorological conditions which create high potential for dust events occur relatively infrequently in the area;

d The intensity of dust impacts on sensitive locations is potentially high because of the close proximity of the sources and receptors;

e The duration of any single dust event that does occur, is most likely to be less than three hours;

f The size and colour of the dust discharged determines that the offensiveness of this material will be moderate; and

g Given the nature of the receiving environment and the currently low level of background dust, the sensitivity of receptors to the discharge of dust will be high.

8.6 Considering the assessment findings, I conclude that during the construction phase of the Project there is a moderate to high potential for dust impacts to occur and for these impacts to be considered objectionable and/or offensive if unmitigated.

9 Mitigation measures – construction phase

9.1 The proposed measures to mitigate the air quality effects of the construction phase of the Project are detailed in the Technical Report.[13] This section of my evidence provides a brief overview of the key outcomes of the assessment.

9.2 Given the outcome of the assessment of the construction phase of the Project on air quality, I consider it crucial to have mitigation practices in place to minimise the amount of dust emitted from the three key sources and a monitoring programme to measure the effectiveness of the mitigation. I recommend the development of a DMP which sets out a

[13] Assessment of Air Quality Effects - Section 6. Mitigation of Construction Effects: Pages 26-31.

framework and processes for the effective implementation of the dust mitigation measures and monitoring programme.

9.3 I recommend dust control measures for CSAs include:

a Site planning. E.g. Maximise buffer distances between sources and sensitive receptors and installing wind and dust shelter belts as necessary;

b Site management procedures. E.g. Good housekeeping practices and conducting dusty operations during weather conditions that minimise emissions; and

c Fixed plant procedures. E.g. Minimise drop heights, use sprinklers around transfer points and enclosing and filtering significant sources of dust.

9.4 I suggest dust control measures for unpaved and paved surfaces include, but not be limited to:

a Sealed surfaces. E.g. Prevent spillages, regular cleaning and minimising dust track-out from paved areas with wheel washing;

b Unsealed surfaces. E.g. Wet suppression, chemical stabilisation, revegetation and maintenance of smooth surfaces; and

c Vehicle movements. E.g. Limiting vehicle speeds, limiting size of and covering loads and minimising travel distances.

9.5 I recommend dust control measures for storage and handling of materials and roadway construction include:

a Material stockpiles. E.g. Wet suppression, covers, windbreaks and bunding, minimising size and wind speed limits for working stockpiles;

b Material handling. E.g. Minimising drop heights, clean-up of any spillages and maintenance of hydraulic grabs to ensure complete closure; and c Roadway construction. E.g. Wet suppression of surfaces and limiting vehicle speeds.

9.6 Given the relatively high risk of offensive or objectionable dust effects occurring during the construction of the Project, I recommend that a comprehensive dust monitoring programme is implemented. The dust monitoring programme will need to provide real-time notification of dust events to the construction zone managers and therefore enable immediate remedial action to be undertaken. The start dates, duration, monitoring methods, and locations for the construction air quality monitoring programme will be defined in the DMP.

9.7 I recommend a DMP is developed with the primary environmental objective of allowing the construction of the Project in a manner that ensures dust arising from construction of the Project does not cause an offensive or objectionable effect on the environment beyond the boundary of the construction zone. The DMP should:

a Describe the construction zone, CSAs and receiving environment;

b Provide an overview of the processes carried out in the construction zones and support area sites;

c Identify the potential dust emissions sources and detail the controls that will be used to mitigate the emissions;

d Detail the dust and meteorological monitoring programme;

e Describe complaints response and recording procedures;

f Define the roles and responsibilities in relation to the DMP of staff throughout the organisation; and

g Outline the procedures for auditing and review of the DMP.

9.8 I recommend the DMP be reviewed and certified by the Auckland Council. I note that the development of and compliance with a DMP has been incorporated into the draft resource consent conditions, and I support those conditions (DMP.1 to DMP.4[14]).

9.9 If the DMP details the relevant information, describes the required mitigation, and is effectively implemented and monitored for its effectiveness I expect that the effects of the dust discharged during the construction phase of the Project will be minor or less than minor.

9.10 I understand the Resource Management Act 1991 requires consideration be given to alternative methods of discharge or other receiving environments. For the construction phase of the Project, the method of discharge and available choice of locations is constrained by the Project for which the authorisations are sought. In this case it is not feasible for the discharges of dust to be made by a different method nor into a different receiving environment.

10 Effects - operational phase

10.1 The outcomes of the assessment of effects of roadway operation are detailed in the Technical Report.[15] This section of my evidence provides a brief overview of the key outcomes of the assessment.

10.2 The results from the verification modelling suggest that the ADMS model results are either conservative (higher than) or are close to matching the monitored concentrations. The model verification exercise shows that the model results are fit for purpose and do not require any scaling to enable them to usefully inform this assessment.

10.3 The analysis of the 2015 base case (without Project) scenario results show that none of the air quality standards are likely to be exceeded, although $PM_{2.5}$ (24-hour average) may come close. For the particulate pollutants, the Project contribution to the cumulative concentration is relatively small at approximately 10 % of the total. The analysis of the 2021 (with Project) scenario results show that none of the air quality standards are likely to be exceeded.

[14] Appendix A to the AEE.
[15] Assessment of Air Quality Effects - Section 8. Assessment of Effects: Operational Phase of the Project: Pages 44-57.

10.4 A comparison of the GLC pollutants for 2021, without Project and with Project, scenarios shows that with the Project, concentrations of pollutants at the residential receptors are likely to remain at similar levels (Unsworth Heights) or increase slightly (Oteha).

10.5 A comparison of the 2021 and 2031 results, for both the with and without Project scenarios, shows that effects are likely to decrease over time as the positive effects of lower vehicle emissions outweigh the effect of increased vehicle numbers.

10.6 The predicted changes in pollutant concentrations between scenarios and between years is relatively small (less than 10 %) and given the uncertainty contained in the modelling, the amount of change should be considered indicative rather than precise.

10.7 The Project will increase network capacity and therefore traffic will flow more freely through the region. Consequently, as congestion decreases, the total emissions to air will decline and on an airshed scale this is likely to result in a slight net benefit for regional air quality as compared to the air quality if the Project was not built.

10.8 I conclude that the assessment of operational effects of the Project on air quality shows exceedances of the relevant air quality standards are unlikely to occur, and consequently I consider that there is no need for mitigation or a post Project air quality monitoring programme.

11 Request for further information by the Board of Inquiry

11.1 The Board of Inquiry requested further information[16] including a question clarifying the potential health effects of construction dust. The response to the Board of Inquiry's question reiterated the information provided in the Technical Report[17] which states that the relatively large particle size of dust discharged from construction activities means the potential effects of dust will be limited to amenity and nuisance. No adverse health effects are likely to occur.

[16] Letter dated 6 March 2017.
[17] Assessment of Air Quality Effects - Section 5.1 Potential sources of dust during construction: Page 18.

12 Response to submissions

12.1 Two submissions were received that raised the issues of dust and pollution that would be generated by the construction and operation phases of the Project.

12.2 Kiwi Self Storage Limited's[18] submission stated that it was important for its business that the facility (located at 12 Holder Place) remains tidy and dust free. The submission highlighted that the facility's manager lives on site and there was a concern for their well-being. The submitter also stated that any dust impact on amenity values would need to be mitigated.

12.3 The issues raised in Kiwi Self Storage's submission are covered in the Technical Report which found that the construction phase of the Project has a moderate to high potential for dust impacts to occur. The Technical Report highlighted that it was crucial to have mitigation practices in place to minimise the amount of dust emitted, and a monitoring programme to measure the effectiveness of the mitigation. The requirement for a DMP to ensure the effective implementation of the dust mitigation measures and monitoring programme have been incorporated into the draft consent conditions.[19]

12.4 Meadowood Community Crèche's[20] submission noted that the motorway upgrade will increase traffic volume and pollution within the area of the crèche and that this effect would need to be planned for in advance.

12.5 The issues raised in the Meadowood Community Crèche submission are covered in the Technical Report.[21] The location of the Meadowood Community Crèche is within 100 m of the Unsworth Heights receptor used in the dispersion modelling assessment. Therefore, the results from the Unsworth Heights receptor location are a good indicator of the air quality expected to be experienced at the Meadowood Community Crèche. A comparison of the modelled GLCs at the Unsworth Heights receptor without and with the Project[22] shows that air quality is expected to improve

[18] Submitter 126352.
[19] See proposed resource consents conditions DMP.1 – DMP.4 in Appendix A to the AEE.
[20] Submitter 126233.
[21] Technical Report, Section 8: Assessment of Effects: Operational Phase of the Project. Pages 44-58.
[22] Technical Report, Table 12 page 51 and Table 15 page 53.

with the Project being completed. The reason for this is that the number of vehicles travelling on the link of the Upper Harbour Highway (State Highway 18) between Caribbean Drive and the Northern Motorway (State Highway 1) will decrease with the completion of the Project as a large number of vehicles will be diverted onto the new SH1/SH18 Interchange connections which are a greater distance from the Crèche.

12.6 A comparison of modelled GLCs of pollutants at the Unsworth Heights receptor for the years 2015, 2021 and 2031[23] shows an improvement in air quality over time. While the number of vehicles using the roads is expected to increase over time, this effect is mitigated as the amount of contaminants being from individual vehicles decreases due to the influence of improved vehicle emission controls as newer vehicles enter the fleet.

13 Conclusions

13.1 The construction phase of the Project has a moderate to high potential for dust impacts to occur and these impacts are likely to be considered objectionable and/or offensive, if unmitigated. However, if the DMP details the relevant information, highlights required mitigation, is effectively implemented and monitored to ensure its effectiveness, then I expect that the effects of the dust discharged during the construction phase of the Project will be minor or less than minor.

13.2 I conclude from the assessment of operational effects of the Project that exceedances of the relevant air quality standards are unlikely to occur, so there is no need for a programme to mitigate these effects.

Jeffrey George Bluett

20 April 2017

[23] Technical Report, Table 13 page 52.