UNDER the Resource Management Act 1991 ("**RMA**")

AND

IN THE MATTER of a notice of requirement ("**NoR**") for a designation by KiwiRail Holdings Limited ("**KiwiRail**") for the Palmerston North Regional Freight Hub ("**Freight Hub**") under section 168 of the RMA

STATEMENT OF EVIDENCE OF PAUL HEVELDT
ON BEHALF OF KIWIRAIL HOLDINGS LIMITED

CONTAMINATED LAND AND AIR QUALITY

1. SUMMARY

1.1 A Preliminary Site Investigation ("**PSI**") undertaken within the Freight Hub ("**Site**") has identified at least two HAIL sites. Other areas of contamination are also expected in a rural agricultural environment and may be encountered, including historic sheep dip and burn pad sites. I recommend a Detailed Site Investigation ("**DSI**") be carried out prior to the commencement of construction activities as a means of identifying specific areas of soil contamination.

1.2 The site earthworks required for construction of the Freight Hub mean that emissions of dust during construction may be significant, given local wind conditions, and could give rise to nuisance effects and/or may include residual contamination. To manage these effects, I recommend a comprehensive construction dust management plan be prepared as an important tool to manage and minimise dust from construction activities. This will also mean dust contamination of roof rainwater collection systems for domestic supply can be appropriately managed.

1.3 The potential operational effects of the Freight Hub include ground contamination by fuels, oils and greases, and emissions to air from general locomotive and rolling stock activities and various commodities transported into, through and onwards from the Freight Hub. The Log Yard is also likely to be a potential source of particulate emissions once it is in operation and requires specific measures to minimise emissions to air. I recommend an operational dust management plan. This is different from but complementary

to the construction dust management plan that is also proposed. Specific compliance requirements for the on-site storage and use of hazardous substances at the Site have also been identified and recommended.

1.4 Overall, I am confident that any adverse effects relating to air quality or contamination can be appropriately and reasonably managed, subject to the conditions recommended in Ms Bell's evidence.

2. INTRODUCTION

2.1 My full name is Paul Frederick Heveldt. I have the position of National Environmental Science Specialist at Stantec New Zealand.

2.2 I hold the qualifications of Bachelor of Science (Hons) and PhD, each in Chemistry and obtained at the University of Canterbury. I was a Teaching Fellow in Chemistry at the University of Canterbury from 1972 to 1974 and a Post-Doctoral Research Fellow at the University of Cambridge, UK from 1975 to 1977.

2.3 I am a member of Responsible Care New Zealand (formerly the New Zealand Chemical Industry Council).

Experience

2.4 I have been an environmental scientist at Stantec (formerly MWH New Zealand Ltd) for the past 27 years and have had a professional career in the discipline of environmental consulting dating back to 1978. Over that period, I have specialised in air quality and odour assessments, contaminated land, environmental audits and assessments, hazardous substances management and the environmental management of large multi-disciplinary projects in New Zealand and other locations around the world.

2.5 Some examples of recent projects include:

(a) the remediation of extreme arsenic contamination at the Prohibition gold processing site at Waiuta, West Coast;

(b) Detailed Site Investigations at various Christchurch locations that suffered significant earthquake damage and loss of containment of hazardous substances that resulted in soil contamination;

(c) the assessment and mitigation of discharges of odour to air from various wastewater treatment plants ("**WWTP**") in New Zealand, eg

at Carey's Gully (Wellington), Bell Island (Nelson), Rotorua, Mangere, Gisborne, Wainuiomata, Pukete (Hamilton), Tahuna (Dunedin), Moa Point (Wellington), Ruakaka, Greymouth, Feilding and Porirua WWTPs; and

(d) soil contamination assessments for a wide variety of water and wastewater pipes renewal projects throughout New Zealand.

Involvement in the Freight Hub

2.6 I was engaged by KiwiRail as part of the Stantec project team to provide technical overview and specialist advice in the areas of contaminated land, air quality and dust issues, and the storage and management of hazardous substances at the Freight Hub.

2.7 The Preliminary Site Investigation report that was included within the Assessment of Environmental Effects for the Freight Hub was conducted under my supervision and with my review. I also provided input to KiwiRail's section 92 response on 15 February 2021 ("**First Section 92 Response**"). This included matters relating to:

(a) the potential for dust generation during operational activities at the Freight Hub and the need for an operational dust management plan to manage these potential effects;

(b) matters of layout, site design and related mitigation measures to prevent contamination of the receiving environment from operational activities;

(c) the potential effects on amenity and public health of contaminated dust from rail operations, particularly dust falling on roofs that collect rainwater; and

(d) the risks posed by bulk storage of hazardous substances, particularly diesel and possibly petrol at the Freight Hub.

2.8 I also provided input to KiwiRail's section 92 response on 24 May 2021 ("**Second Section 92 Response**"). This included matters relating to potential air quality effects from construction and operation of the Freight Hub.

Code of conduct

2.9 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with

it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

3. SCOPE OF EVIDENCE

3.1 In this statement of evidence I will:

(a) provide an overview of the methodology and key conclusions of the PSI;

(b) discuss the effects related to contaminated land and air quality in the construction and operation of the Freight Hub and measures to effectively mitigate these;

(c) outline the measures recommended to manage contaminated land and air quality effects; and

(d) respond to the submissions received and matters raised in the Section 42A Report that relate to contamination and air quality effects on the environment from the Freight Hub.

4. METHODS OF ASSESSMENT

Contaminated land methods of assessment

4.1 In order to identify the likelihood of encountering contaminated soil within the proposed location for the Freight Hub, a systematic desktop assessment (known as a PSI) of historical and current land uses was conducted under my overview to narrow down the type, location and possible pathways of potential contaminant exposure with respect to the Freight Hub.

4.2 The PSI assessment relied on the following sources:

(a) the Palmerston North City Council ("**PNCC**"), Manawatu District Council ("**MDC**"), and Horizons Regional Council ("**HRC**") online GIS maps, HAIL[1] listings and related documents;

(b) Certificates of Title;

[1] HAIL is the Hazardous Activities and Industries List prepared by the Ministry for the Environment.

(c) reviews of aerial photography images and a Google Earth imagery review; and

(d) relevant technical reports prepared as part of this NoR, namely the Geotechnical and Stormwater Assessments.

4.3 The contamination information obtained was also relevant to the Multi Criteria Analysis ("**MCA**") used by KiwiRail to identify the preferred site for the Freight Hub. The relevant considerations for each possible site option with respect to contamination were:

(a) the presence of known contaminated land;

(b) the potential difficulty of any necessary remediation; and

(c) the risks posed by possible discharges to the environment.

4.4 For the reasons I outline below, the preferred site ultimately selected for the Freight Hub has generally low contamination risk, based on these three criteria.

Air quality methods of assessment

4.5 The relevant air quality assessment criteria for emissions to air associated with the construction and operational phases of the Freight Hub have primarily focused on dust arising from construction activities, in accordance with the Ministry for the Environment's "Good Practice Guide for Assessing and Managing Dust"[2] and on odour, using the principles of the "Good Practice Guide for Assessing and Managing Odour".[3]

4.6 That guidance identifies that the effects of dust are often assessed and managed qualitatively. A qualitative assessment has therefore been undertaken, having regard to the FIDOL factors of:

(a) frequency;

(b) intensity;

(c) duration;

(d) offensiveness; and

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2 Ministry for the Environment. 2016. Good Practice Guide for Assessing and Managing Dust.

3 Ministry for the Environment. 2016. Good Practice Guide for Assessing and Managing Odour.

(e) location of impacts.

4.7 The assessment of air quality impacts that I have undertaken has been based on the concept design information that is available at this point in the Freight Hub project's development cycle. As detailed design has not yet been undertaken (which is appropriate at this stage of the process) it has therefore been necessary to take a qualitative approach to the likely impacts on air quality.

4.8 To assist with the assessment of air quality effects and the application of the FIDOL factors to the assessment, a wind rose has been derived from meteorological data for Palmerston North to understand the potential risks of emissions from site construction activities impacting on sensitive receptors. I present this in section 5 of my evidence in relation to descriptions of the existing environment.

4.9 Particulate concentrations in various size ranges (total respirable dusts, inhalable and respirable particulate, and fine particulate ($PM_{2.5}$)) have all been considered in the assessment of air quality.

4.10 Assessment of odour has been considered using the "no offensive or objectionable odour at the property boundary" as the primary yardstick of acceptability, as discussed and endorsed by the "Good Practice Guide for Assessing and Managing Odour in New Zealand".

4.11 The two Good Practice Guides I referred to above set out a range of assessment criteria which, if applied rigorously to assessments of dust and odour respectively, will enable the potential adverse environmental outcomes to be identified and understood in each case and appropriate mitigation measures to be applied. If the mitigation measures are effectively scoped and implemented, and if they are broad enough to deal with the full range of anticipated effects, then the net environmental impacts post-mitigation will be reduced to acceptable levels.

4.12 The basic assessment criteria for dust include:

(a) descriptions of both the site and the receiving environment with respect to sensitive receptors, the background air quality, and climatological factors, particularly wind strengths and prevailing directions;

(b) an outline of the potential activities that will take place at the site and which are relevant to dust emissions, including duration and location within the large site area;

(c) the potential nature and scale of dust emissions likely to be generated by various activities and/or stages of the project; and

(d) the predicted levels of potential adverse effects on health and amenity, such as soiling, decreased visibility, loss of amenity and other factors due to the nature and scale of potential dust emissions.

4.13 These criteria have been taken into account, as much as the extent of design information about the Freight Hub has allowed, and the FIDOL factors have been used to determine the significance of each when set against the assessment criteria.

4.14 In the absence of a specific framework for the assessment of air quality impacts of rail projects in New Zealand I have also taken into account, to the extent that it is relevant and applicable, the advice provided in Waka Kotahi NZ Transport Agency's "Guide to assessing air quality impacts from state highway projects"[4] (the AQI Guide). This covers such matters as background air quality, construction impacts on air quality and operational discharges to air and has allowed the potential impacts of construction dust emissions and exhaust emissions from diesel-powered locomotives (as applicable key examples) to be taken into account and given primacy in the air quality assessment of the Freight Hub's impacts, as I now outline.

4.15 The initial objective of the assessment based on this approach has been to establish whether the relative (qualitatively predicted) air quality impacts of the Freight Hub or the cumulative air quality impacts (ie the project emissions combined with the background expected air quality) are likely to result in air quality criteria being exceeded. Both construction and operational impacts on air quality have been included in this assessment.

4.16 At present, there are no quantitative data available about background air quality parameters and therefore monitoring of particulate concentrations (including PM_{10}, Total Suspended Particulate ("**TSP**") and deposited dust) should be commenced as soon as practicable to obtain this data, prior to the commencement of site works. The longer the background monitoring period then the more robust will be the data set obtained. For this assessment it is

[4] NZTA. October 2019. Guide to assessing air quality impacts from state highway projects.

assumed that the background air quality in the vicinity of the Site will be broadly comparable with other semi-rural environments in the lower North Island. The NIWA report "Background PM_{10} concentrations in NZ"[5] suggests that a value of 10 µg/m^3 as a 24-hour average is reasonable as a yardstick for a location such as the Site near Bunnythorpe. The proposed PM_{10} monitoring will seek to confirm the validity of this.

4.17 Once the construction phase commences, ongoing monitoring will, over time, establish the typical concentrations of PM_{10} (in particular), TSP and deposited particulate. For PM_{10}, the 24-hour assessment guideline of the NES of 50 µg/m^3 will be the yardstick of acceptability. The trigger level for TSP is considered to be realistically set at 80 µg/m^3 as a 24-hour average in this moderately sensitive environment and the trigger level for deposited particulate is set at 4 g/m^2/30 days over a 30-day averaging period.

4.18 At present, the risk can be qualitatively assessed based on the approach of the AQI Guide, as follows:

TOPIC	**KEY QUESTION**
Scale of earthworks	Is total site area > 10,000 m^2 – or is the total volume of material to be moved > 100,000 m^3?
Proximity to highly sensitive receptors	Are there more than 50 highly sensitive receptors within 200 m?
Anticipated truck and earthmoving equipment movements	Will there be more than 50 outward truck movements per day?

4.19 If the answers to all three questions are "no", then the risk is considered to be low. If more than one answer is "yes", then the risk is likely to be high, although mitigation measures can mean that a moderate risk is indicated.

5. EXISTING ENVIRONMENT

Current and historic land uses

5.1 With respect to current land uses, a review of aerial imagery showed that the Designation Extent predominantly comprises rural land used for cropping and

5 NIWA. 2028. Background PM_{10} concentrations in NZ.

/ or grazing, some of which is consistent with "hobby-type" farming activities. Various dwellings and farm buildings are interspersed within the preferred location, including lifestyle blocks in the northern part.

5.2 The land uses surrounding the Freight Hub are also predominantly rural, with some areas of rural residential land. Immediately north of the site is the Bunnythorpe Cemetery, with the Bunnythorpe WWTP to the northwest. The applicable zone boundaries are shown in Figure 1 of my evidence.

5.3 The town of Bunnythorpe is located between Feilding and Palmerston North to the north of the Freight Hub and is bisected by the North Island Main Trunk Line ("**NIMT**"). The predominant land use in Bunnythorpe is smaller residential zoned sites occupied by dwellings. The closest residential zoned sites to the Freight Hub are located on Maple Street, Railway Road, Kairanga – Bunnythorpe Road, Stoney Creek Road and on Nathan Place. Other sites in Bunnythorpe are zoned Industrial, Local Business, and Recreation. Local facilities in Bunnythorpe include a tavern, dairy, rugby club, and school.

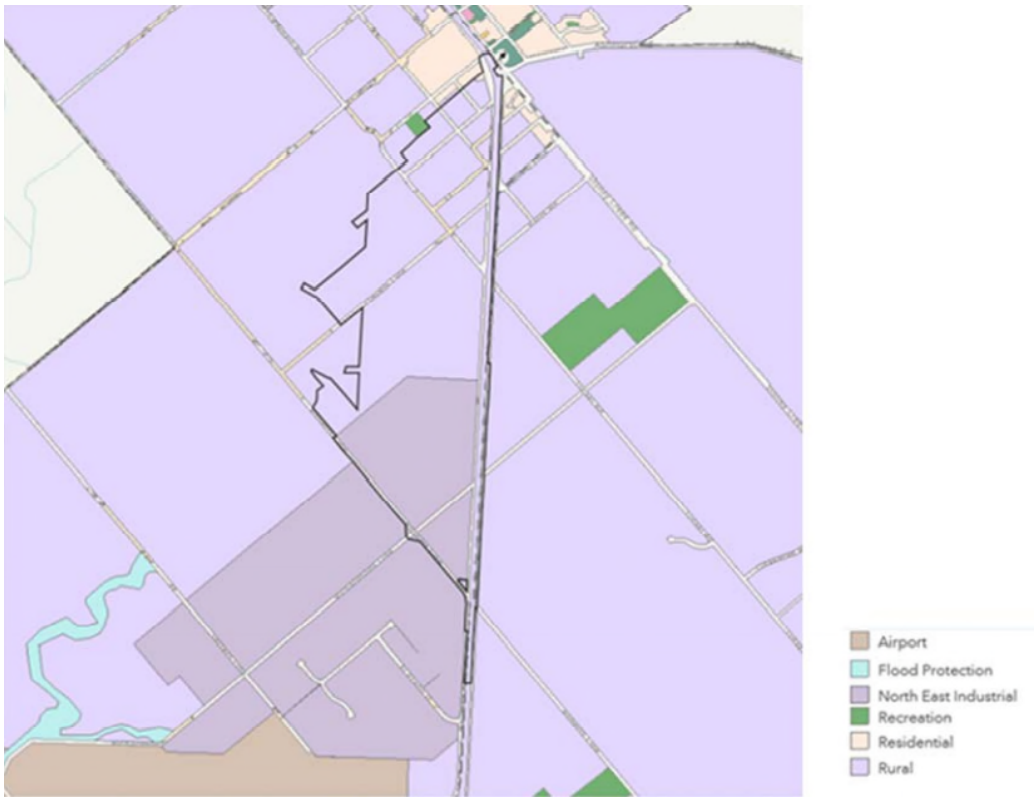

Figure 1: Designation Extent and Surrounding Land Use Zones

5.4 Bunnythorpe has had a history of industrial activity as it was the birthplace of the Glaxo company. Upon its closure, the Glaxo site was subsequently used as a manufacturing plant for BMX bikes and currently holds an Industrial zoning. Transpower's main switching point for the lower-central North Island

is located on the north eastern side of Bunnythorpe on a 16ha block of land zoned Rural.

Geology

5.5 Soil types in the environs of the Freight Hub location consist of recent alluvium and alluvial terrace deposits. The recent alluvium is geologically very recent and is represented by currently depositing alluvium in the base of gullies and on low lying ground west of the Site. This material is likely to consist of sand silt and clay, possibly with some peat.

5.6 The geological conditions at the site and their implications are discussed in greater detail in the evidence of Mr Mott.[6]

Hydrology

5.7 Recorded groundwater levels within the area vary and this is likely to reflect short-term conditions in the terrace alluvium deposits and seasonal variations. Pockets of high groundwater (2m below ground level) may represent "perched" or elevated pockets of groundwater. The main groundwater table would be expected to be below this depth, as outlined in the evidence of Mr Mott.[7]

5.8 Sixteen existing boreholes are located within the Freight Hub footprint and a further 35 or so boreholes are within approximately 100m of the boundary of the Freight Hub.

Air quality

5.9 The Site and surrounding landscape is characterised by:

(a) relatively open, rolling contoured land with rural and recent rural-residential land uses characterised by general farming activities, interspersed with hobby farming on lifestyle blocks;

(b) predominant pasture landcover with minor patterns of vegetation;

(c) the existing NIMT line;

(d) the arterial roads connecting Palmerston North, Bunnythorpe, Feilding and the links to SH54 and SH3; and

(e) a grid pattern of connecting streets off Railway Road.

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6 Evidence of Andrew Mott, dated 9 July 2021.

7 Evidence of Andrew Mott, dated 9 July 2021, at section 5.

5.10 These features contribute to an existing air quality that is typical of a rural agricultural environment. There will be emissions of odour associated with the non-intensive land uses from time to time, and limited traffic-related effects of vehicle exhaust emissions and road dust. The NIMT in its current location contributes minor emissions to air of dust and particulate, but these will be negligible in extent and degree of nuisance.

5.11 The prevailing winds of the Manawatu and in this locality in particular are westerly and north-westerly. However, winds from other directions occur from time to time. Prevailing winds across the Site are shown in Figure 2 below.

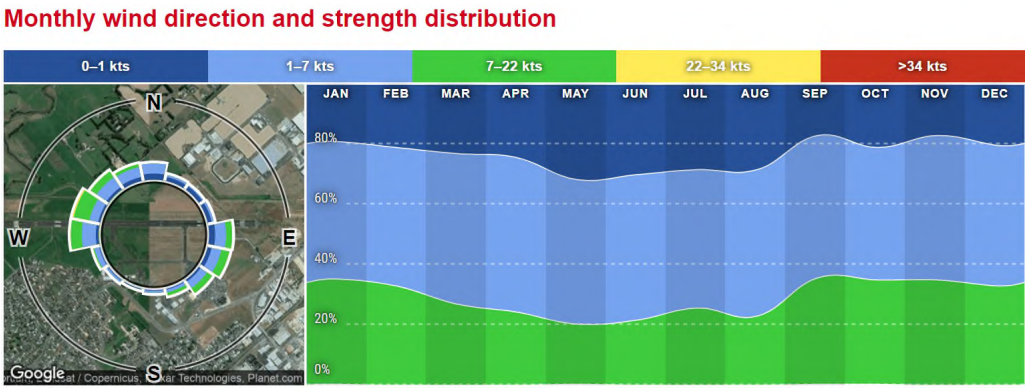

Figure 2: Wind rose and frequency data for Palmerston North

6. PSI FINDINGS AND CONCLUSIONS

6.1 The PSI did not identify any HAIL sites recorded within the Designation Extent. Two HAIL sites have however been identified by PNCC as being within 200m of the Designation Extent. These are:

(a) The Bunnythorpe cemetery (HAIL Category G1), which is located immediately adjacent to the Freight Hub to the north. Contaminants of concern associated with cemeteries are lead, mercury, and nitrates. I consider it is unlikely however that any of these contaminants could have migrated into the Designation Extent at concentrations that could cause significant contamination of soils within the Designation Extent.

(b) The Bunnythorpe WWTP (HAIL Category G6), which was decommissioned in 2014. Wastewater flows now go directly to the Palmerston North WWTP at Totara Road. It is possible, although very unlikely, that trade waste flows having chemical wastes within them could have contaminated the soil at and in the immediate

vicinity of the WWTP. For this to have occurred would have required the nearby presence of an industrial activity that used hazardous substances of a persistent nature, released these into the sewer network and then from which leakage or overflows occurred that migrated into the soils of the Designation Extent. Overall, I consider the risk of this type of event to have occurred at the decommissioned WWTP to be negligible.

6.2 In a review of relevant resource consents issued by HRC, I found that one resource consent has been issued within the Designation Extent. This was for a truck wash facility but, based on the most recent aerial imagery on Google Earth (February 2020), this truck wash facility has not been constructed to date. Any potential contamination of soils associated with overflows from this activity will not have been realised.

6.3 Sheep dips and spray races (HAIL Category A8) are on-farm facilities that have historically been commonly used in rural New Zealand to treat sheep with chemical insecticides for economic and animal welfare reasons and so are common risks with rural sites. Areas containing sheep dips and / or spray races and surrounding land areas may possibly be impacted by contaminants such as arsenic, DDT and dieldrin which are (or were) typical components of sheep dipping formulations.

6.4 Historic aerial photographs from Retrolens and Google Earth were considered to identify the locations of any sheep dips and / or spray races (HAIL Category A8). The presence of sheep dips / spray races within the Designation Extent could not be confirmed through the PSI because a detailed scrutiny of all individual properties could not be undertaken in the time available and the constraints around Covid 19 (including the applicable lock down status) were also not conducive to fulfilling all of the components of a PSI. However, it is expected that both of these types of HAIL activities might have taken place in some locations of the Designation Extent (being 177.7ha of largely rural land). Identification of sheep dips and / or spray races, if present, could therefore indicate potential areas of contamination.

6.5 It has also been common practice in rural environments for general rubbish and treated timber to be disposed of by burning, along with other organic matter, as a means of disposal. These burn areas are generally called burn pads (HAIL Category G5) and they often result in the soil immediately below and surrounding the burn pads being impacted by arsenic, lead, and other contaminants, although only to a limited spatial extent. Due to the discrete nature of burn pads, impacted areas are usually restricted to clearly defined

and visually apparent areas of blackened soil. It is possible for burn pads to be located in the Designation Extent, but this could not be confirmed through a PSI, for the same reasons that I have explained in paragraph 6.4 of my evidence.

6.6 It is possible that discrete (but limited) areas of the soils of the Designation Extent may be affected by incipient contamination from these specific types of farming activities and from other rural activities involving agrichemicals application and / or fuels use in equipment and vehicles.

6.7 These possible sources of contamination and their associated potential outcomes should be the components of a DSI to be carried out at selected locations within the Freight Hub land, as I discuss later in my evidence.

7. ASSESSMENT OF CONTAMINATED LAND EFFECTS

Positive effects

7.1 In my opinion, the removal and off-site disposal of potentially contaminated soil material as part of the development of the Freight Hub will have a generally positive environmental effect, as the possibility of any contaminants impacting human or sensitive environmental receptors such as groundwater and / or surface water will be eliminated or mitigated through such works.

Earthworks and Construction effects

7.2 In relation to the potential HAIL activities identified across the Designation Extent, adverse effects may occur due to the development of the Freight Hub by creating a previously unconnected pathway between the source and receptor during the construction phase when soil disturbance is likely to take place. Such disturbance may lead to mobilisation and wider distribution of contamination by way of, for example, dust emissions or in surface water flows associated with stormwater. In both cases, potential receptors may be exposed to incipient contamination.

7.3 Contaminated soil could also contribute to dust emissions once disturbed. In turn, this dust could be a nuisance beyond the Freight Hub boundary.

7.4 As set out in Mr Skelton's evidence, to prepare the land for the construction of the Freight Hub, a large volume of earthworks will have to be carried out.[8] These earthworks will require significant amounts of machinery to be brought

[8] Evidence of Michael Skelton, dated 9 July 2021, at section 6.

in. This increases the risk of diesel and / or oil spills through operational or refuelling activities. However, I would expect that soil contamination caused by the operation of earthworks machinery would be limited in duration and extent, assuming the machinery is modern and appropriately maintained.

7.5 With respect to the particular HAIL activities that I identified and discussed above, the contaminants associated with sheep dips and spray race sites are generally arsenic, dieldrin and DDT. Exposure to these contaminants could occur via skin contact, ingestion or inhalation predominantly by site workers. In addition, without adequate soil management, there could be adverse impacts on soils in and near the Site during construction, or from run-off of contaminated sediment and stormwater once the Site is disturbed during construction activities.

7.6 Burn pads are also a typical feature of agricultural activities and may contribute contaminants such as heavy metals, polycyclic aromatic hydrocarbons ("**PAH**") and possibly asbestos to the near-surface soil layer, albeit in discrete and spatially limited patches across the Site. Exposure of site construction workers to contaminated dusts from disturbed former burn pad areas presents a potential risk, if not managed well.

Operational effects

7.7 Once the Freight Hub is operational, there are several HAIL activities that will be taking place on the Site that have the potential to give rise to adverse effects during Freight Hub activities.

7.8 A railway yard in itself is a HAIL activity (HAIL Category F6) and includes activities such as goods handling yards, workshops, refuelling facilities and maintenance areas. Contaminants such as diesel fuel, oils and greases will potentially be released from the locomotives along the railway tracks and in the fuel storage areas. Typically, the extent of contamination from these sources will be limited in quantity and spatial extent, and the effects will be negligible if mitigation measures such as engine maintenance and standard designs of refuelling equipment, as examples, are in place.

7.9 The railway yard will also be a transport depot which is another HAIL activity (HAIL Category F8). Any storage areas for potentially hazardous goods stored temporarily or permanently at the transport depot could also potentially give rise to ground contamination, if standard containment measures were not in place or were not effectively applied. In fact, such contingencies will be taken into account in both design and day-to-day operation of the Freight Hub.

7.10 In addition, cleaning chemicals, fuels and lubricants from the locomotives and rolling stock maintenance area could, if not managed in a suitable manner, enter surface water through wash bays and drainage channels, potentially resulting in soil contamination. Once again, if standard best practice measures are in place to retain and clean up spillages and the integrity of channels and wash bay areas is assured then adverse effects from contaminants will be minimised.

7.11 There will be a commercial refuelling facility associated with the Freight Hub. This is also a HAIL activity (HAIL Category F7). The land used for refuelling of machinery and locomotives could be susceptible to fuel spills or leakages. Leaks from underground and above ground storage tanks also pose a risk. The design of these facilities must follow established best practices and meet the compliance requirements of all relevant regulations and standards.

8. ASSESSMENT OF AIR QUALITY EFFECTS

8.1 Dust created during the earthworks and construction phase of the Freight Hub has the potential to cause adverse effects on the surrounding environment and on neighbouring properties. I understand that some residences in the vicinity of the Freight Hub have rainwater roof collection systems to provide for their domestic water needs. Without mitigation, there is the potential that there could be an accumulation of particulates on roofs within 100m of the Freight Hub marshalling yards.

8.2 The possibility of encountering potentially contaminated dust is related to the risk of such airborne materials being encountered and the likelihood of contamination being found. While I assess this risk as being low, this will need to be reassessed if it becomes apparent during construction activities that previously unsuspected contamination is present and, therefore, that emissions of contaminated dust might be possible.

8.3 Dust and exhaust emissions may also be created through the movement of heavy machinery around the Site. The odour of diesel is not expected to be discernible more than 50m away from any source and therefore I do not consider that there will be any significant odour impacts from diesel, as the nearest residences will be over 50m from the Freight Hub activities

8.4 I understand that the Freight Hub will operate with both electric and diesel locomotives because the NIMT line south of Palmerston North and the branch lines are, in both cases, not electrified and thus will rely on diesel powered locomotives. While there is a risk of particulate matter discharging to air from

incomplete combustion of diesel fuel generated by the diesel powered locomotives, I would expect this to be very localised (ie have impacts less than 30 metres from the source at most). I consider that this will result in no more than minor adverse effects on air quality.

9. MEASURES TO ADDRESS POTENTIAL ADVERSE EFFECTS

9.1 In my opinion, all of the potential risks and effects I have noted above can be adequately mitigated through a range of measures discussed below and included in the Proposed Conditions attached to Ms Bell's evidence. This is addressed in detail below.

Managing contaminated land effects

9.2 In my opinion, further investigations into possible locations of sheep dips / spray races and burn pads are necessary to confirm whether or not these activities have taken place and to identify the specific HAIL locations within the Site.

9.3 Each of the types of HAIL activities identified should be investigated further and quantified by way of a DSI to be carried out on the Site prior to the commencement of construction activities. As part of that process and the bulk earthworks to be undertaken, a Contaminated Site Management Plan ("**CSMP**") may also be required to manage the potential contamination impacts of the development works, depending on the outcomes of the DSI.

9.4 The scope and details of the DSI should be assessed and refined once the project design parameters have been confirmed and the volumes and locations of soil disturbance likely to be required have been clarified.

9.5 Once constructed, the Freight Hub will have several identified HAIL activities occurring on an ongoing basis. These activities will need to be considered in more depth once the detailed design parameters are known for the Site. I consider that any adverse effects from these activities can be minimised in scale by appropriate design criteria and mitigation measures, including Standard Operating Procedures ("**SOPs**") for the Site. Such SOPs are typically prepared as standard practices to manage individual aspects of complex industrial sites and this approach would be very useful to provide surety about mitigation of possible adverse effects of HAIL activities within the Site.

9.6 I also recommend that the existing bores that are still operational within the Designation Extent and its surrounds should be utilised in order to monitor potential groundwater contamination that could be caused by activities at the Freight Hub. This proposed monitoring should be included within a CSMP for the Freight Hub which will monitor the potential impact of various HAIL activities taking place on the Site. The CSMP will be informed by the findings of the DSI and the two are thus closely interrelated.

9.7 The key to preventing adverse environmental impacts from operational Freight Hub activities is ensuring that any discharges of contaminants into air, soil, groundwater or surface water are effectively controlled. This can be achieved by establishing site management protocols and procedures which are specifically developed to manage individual potentially polluting activities and prevent discharges. It will be necessary to ensure that site design, layout and related mitigation measures are in place as the first line of defence against contamination of the various environmental media. These matters will be addressed as part of detailed design measures for the Freight Hub.

9.8 The following factors will be key components of the Freight Hub design which will be addressed through detailed design to manage contamination:

(a) the location of the bulk storage tanks for hazardous substances should be informed by the best approach towards minimising potential contamination as well as fitting operational efficacy. With that in mind, the exact location of the bulk hazardous substances storage vessels will be determined at the detailed design stage and will also be informed by other site operational requirements;

(b) the location and extent of impermeable base barriers (such as the use of clay layers) below the storage tank areas to prevent contamination in either groundwater or surface water; and

(c) bunding around tank storage areas, as well as other measures such as site gradients and cut-off drains around the Site perimeter, all of which will eliminate the potential wider effects of any release of stored hazardous substances.

Monitoring and managing air quality effects

Construction dust

9.9 To determine background levels of dust to assist with evaluating compliance with the air quality assessment criteria, I consider that a control dust deposition

monitoring site should be established upwind of the earthworks activities associated with construction on the Freight Hub. This monitoring site would be established upwind of the prevailing wind direction in an area having at least a 150m setback from the nearest site earthworks activities. Results from dust monitoring over time at the control site will establish background levels of deposited dust in the existing environment. The impacts of dust from construction activities as determined by further monitoring can then be compared with the background data.

9.10 Monitoring of TSP is the best practice method for active management of dust and particulate emissions. TSP refers to particles that are suspended in air at the time of sampling. The equipment for TSP measurements is intended to collect all particles, from less than 0.1 µm up to about 100 µm, thus including PM_{10} particulate within the monitored particle size range. This type of continuous monitoring provides real-time information to facilitate the active management of on-site activities that generate dust and particulate.

9.11 Dust related effects from construction and earthworks will be managed through the proposed Construction Management Plan which has been included in the Proposed Conditions.

9.12 A specific Construction Dust Management Plan ("**CDMP**") will also be required and, as Ms Bell explains, this will be included as part of the regional consent process for earthworks.

9.13 The implementation of these and other detailed measures within the CDMP will provide a regime of effective controls over dust emissions associated with construction activities during the estimated timeframe of over three years that will be required to complete all aspects of the proposed Freight Hub construction.

Operational air quality

9.14 Matters associated with the impacts of operation of the Freight Hub on air quality are more diverse than are the dust impacts likely to arise from construction. Some operational activities are unique in terms of their particular potential impacts on air quality. The Log Yard is a case in point where particulate of various types, sizes and sources can be expected to be released from log handling activities. I recommend that at-source controls be applied to the extent practicable to minimise the impacts of the various sources of dust and particulate. An example of an operational control includes log washing on-site to remove mud and dirt. Debarked logs are also prone to generate

particulate when handled and, therefore, minimising the extent of such log movements will be an important part of Log Yard activities management.

9.15 Similarly, for handling of other bulk granular materials, such as grains, and gravel, individual best operational practices will be developed and implemented, and specified in a standalone section of the operational air quality management plan. Dust emissions controls will be an important aspect of such handling protocols for material with elevated potentials to generate dust.

9.16 Besides the specific practices for operational controls on particular dust generating activities, I also recommend more general site management practices to mitigate dust be included within the operational dust management plan and implemented as and when necessary. This will include, but not be limited to, the beneficial impacts of boundary plantings (ie creation of turbulent air flows which lead to improved mixing and dilution and also knock-down of dust) and, if necessary, boundary water misting sprays can be installed to further mitigate particulate concentrations in the ambient air.

9.17 In order to address these wider air quality matters, I recommend that an Operational Air Quality Management Plan be prepared. However, I understand that air quality is a matter addressed by the regional council, and this is discussed in further detail in Ms Bell's evidence.

Other measures to manage effects

9.18 The identification of residences that rely on roof rainwater collection systems that might be affected by dust fall-out has been raised in submissions. KiwiRail is continuing to evaluate options to address contamination of rooftop rainwater collection for domestic supplies and a number of solutions are available.

9.19 The options available for mitigation of this rainwater collection system contamination risk include:

(a) connection of residences to the domestic water supply reticulation system;

(b) the installation of first-flush rainwater diversion systems at residences that rely on rainwater collection; or

(c) supply by bulk tanker of potable water to residents' tank storage systems.

9.20 A process for selecting an appropriate solution to this issue is outlined in the Proposed Conditions attached to the evidence of Ms Bell.

9.21 The establishment of a Community Liaison Forum and Complaints Register through the Proposed Conditions will also provide a mechanism to address any complaints regarding dust as and when they arise.

9.22 In my opinion, the combination of these various mitigation measures, will be effective in minimising the potential adverse impacts of discharges of contaminants to air to negligible levels.

Managing hazardous substances effects

9.23 The Freight Hub's design parameters will pay close attention to the physical aspects of correct and compliant storage of all fuels and chemicals. The design parameters should include:

(a) compliance with relevant standards for storage vessels construction and fittings;

(b) the optimum location of storage vessels within the site;

(c) suitable bunding and spill controls to contain any release of hazardous substances; and

(d) mitigation of any potential risk for stormwater to become contaminated.

9.24 However, as well as the design of the Site layout and the relevant engineering details, site management procedures are also critical to ensuring that contamination of the environment by the storage or use of hazardous substances is effectively controlled to reduce such impacts to negligible levels.

10. RESPONSE TO SUBMISSIONS

10.1 I have reviewed all submissions relevant to contaminated land and air quality matters. A number of submitters made brief reference to their concerns about dusts, fumes and land contamination likely to arise from Freight Hub operations but did not give specific details. While I acknowledge these submissions and have taken the issues raised into account in my responses below, these responses are primarily based on submissions that raise specific issues and I respond to these by way of themes of concern evident within the submissions, being:

(a) discharges of dust and particulate to air;

(b) contaminated land and further contamination from operational freight hub activities; and

(c) storage and use of hazardous substances.

Discharges of dust and particulate to air

10.2 Various submissions note that "dust and fumes" are likely to be adverse environmental impacts of the Freight Hub. Some submitters seek physical dust controls and facility management measures and systems to mitigate adverse effects to negligible levels.

10.3 One submission also raises air pollution associated with operational activities at the Freight Hub and emphasises the potential adverse impacts on air quality of diesel locomotive exhaust emissions that have been cited in some international studies.

10.4 For the Freight Hub context, the most intensive train movement activities will be centrally located on the Site, with distances of at least 100m to the Freight Hub boundary. This, together with other mitigation measures such as boundary plantings to create turbulent air flows that encourage mixing and dilution of airborne particulates and regular maintenance to provide optimum engine running (ie minimised diesel exhaust emissions to air) will serve to reduce emissions to air from the operation of diesel locomotives to levels that present no more than minor off-site effects.

10.5 Some submitters identify the Log Yard as likely to be a particular source of dust and particulate emissions. As discussed above, I agree that Log Yard activities can potentially release particulate of many types, sizes and sources. Effective mitigation will require the application of specific at source controls and general good housekeeping to minimise the impacts of the various sources of dust and particulate.

10.6 The proposed central location of the Log Yard within the Freight Hub will assist in reducing the off-site impacts of dust and particulate emissions. Operational controls include log washing to remove mud and dirt and minimising the extent of such log movements on-site and there are other important mitigation measures. Controlling and mitigating emissions to air from activities at the Log Yard during operations will be the subject of the proposed Operational air quality Management Plan.

10.7 As I have described earlier in my evidence, these issues are best dealt with by a comprehensive set of measures to manage emissions to air, specifically via a Construction Management Plan (and a specific CDMP at the regional consent stage) as well as an operational Dust Management Plan Operational Air Quality Management Plan, which I understand would be prepared as part of the regional consent process.

10.8 When these plans are diligently applied, the end result in each case will be the mitigation of emissions to air from all sources at the Freight Hub to extents that mean the environmental impacts are negligible.

10.9 A concern of some submitters is the possible effect of dust emissions on the rainwater roof collection systems that provide for their domestic water needs. As I have outlined at section 9 of my evidence, KiwiRail recognises this issue and there are a number of solutions that can be implemented which is provided for in the Proposed Conditions.

Contaminated land and further contamination from operational Freight Hub activities

10.10 The submission of the Mid-Central DHB supports the proposal to prepare a DSI to investigate the nature and extent of possible historic ground contamination from (at least) sheep dips / spray races and farming activity burn pads that were identified in the PSI. As noted earlier in my evidence I believe that a DSI is necessary to identify and quantify these identified matters and any other issues of historic contamination that may become apparent. This process is provided for in the Proposed Conditions.

10.11 Several submitters noted the likelihood, in their opinion, that operations at the Site could result in ground contamination from oils, greases, chemicals and, particularly, fuels in storage and use. As I noted in my evidence, I believe that a combination of suitable facility design measures, including compliant storage for fuels and hazardous substances, regular maintenance of locomotives and rolling stock in a specific fully contained and imperviously lined site area (the maintenance workshop), and appropriate designs of on-site stormwater systems will combine to ensure that the potential for ground contamination during site operations is at no greater than a minor level.

10.12 One submitter raises a concern about possible groundwater contamination and the use of the existing bores in the immediate vicinity of the Site to monitor this. As discussed above, bores should be used for monitoring of potential contamination from operational activities at the Freight Hub. In addition, I recommend groundwater monitoring if the DSI to be undertaken prior to Site

earthworks activities reveals areas of historic contamination. This will be provided for within the detailed requirements of a Contaminated Site Management Plan for the Freight Hub. The process for preparing this is outlined in the Proposed Conditions.

Storage and use of hazardous substances

10.13 Some submitters, including Fire and Emergency New Zealand, have expressed concerns about the bulk storage and use of hazardous substances, especially fuels, at the Freight Hub.

10.14 I agree that safe and careful bulk storage of hazardous substances is critical. Before the commissioning of such storage facilities, compliance certification is required. An appropriate level of regulatory scrutiny will be imposed on the proposed facility prior to its operation and I therefore have full confidence that a compliant facility that performs to all specifications would be the result.

10.15 I would expect these kinds of details to inform standard safety in design processes and ensure that any particular bulk storage and use of hazardous substances are appropriately managed.

11. RESPONSE TO SECTION 42A REPORT

11.1 I have reviewed the sections of the Section 42A Report relevant to my evidence, particularly the Air Quality Report prepared by Council's consultant, Deborah Ryan. I have also considered the relevant sections of the Planning Report prepared by Anita Copplestone and Phillip Percy but note that, with respect to air quality issues, that report reflects Ms Ryan's conclusions.

11.2 Ms Ryan's report recognises the generic nature of the air quality assessment. As I have noted earlier in my evidence there is limited detailed design information available at this early stage to conduct a quantitative assessment.

11.3 While this has been a qualitative exercise because of the detailed design information constraints, the conclusions I have reached are conservative but still supported by available information and in my view, appropriate for this stage of the process. I also consider the approach taken is reasonable, and common for a project of this type.

11.4 I agree with Ms Ryan that there could be adverse air quality effects to neighbours from Freight Hub activities, both during construction and when the Site is operational, if no or inadequate mitigation measures were implemented. However, adequate mitigation measures will be implemented and a

construction dust management plan and an operational air quality management plan will be addressed through the regional consenting process, if required.

11.5 I endorse the relevant conditions included in Ms Bell's evidence.

Paul Heveldt

9 July 2021