



memorandum

TO Claire Baldwin FROM Jeff Bluett
GREATER WELLINGTON REGIONAL COUNCIL DATE 26 November 2019
RE Issues raised at NCI Pre-hearing

1.0 Background

Greater Wellington Regional Council (GWRC) and NCI held a pre-hearing meeting with the parties that submitted on the application. During the meeting PDP understand four issues were raised which GWRC has asked PDP to comment on. PDP did not attend the pre-hearing meeting, we are responding to the question posed by GWRC after the meeting.

The purpose of this memo is to record the issues raised by GWRC (shown in black text) and to present the PDP responses (shown in red italic text).

PDP understand that this memo will be circulated to NCI, Regional Public Health and the relevant community members for their information. PDP also understand that GWRC may use the information provided to help consider possible consent conditions and the recommendation on the consent application.

2.0 Residue on Homes

GWRC Question:

Two of the submitters whose homes back onto the NCI property, have raised concerns about a grey growth on the back of their homes. This has a grit like texture, and is very difficult to remove, and can't all be removed by water blaster. Those properties on the far side of Mountbatten Grove have said they don't get this residue on their properties. Rhys, Shane and I went around to the homes this morning to look at the substance, although it was difficult to clearly see it as the homes had been recently washed (attached is the best photo we had).

PDP Response:

The description "Grey growth" sounds like something biological like a mould or a lichen. Given the processes NCI undertake and the contaminants discharged in PDP's opinion it is highly unlikely that the NCI emissions would result in a biological growth on any surface. But you note this has a grit like texture and is very difficult to remove. So this suggests the "growth" is more likely to be chemical in nature rather than biological. From the photos it looks like the particles may have pitted into the paint and this would explain why they are hard to remove. It is possible that either hot particles have hit the walls and melted into the surface of the paint or a chemically reactive particle has hit the wall reacted with the paint and stuck.

GWRC Question:

NCI explained that the discharge is volatile organic compounds (VOC's) in the form of a gas. The gas itself does not have a visible particle.

PDP Response:

PDP agree with NCI that the discharges from NCI are gases and alone are unlikely to generate the effects seen in the photos. If the gases were responsible for the marking, PDP think a much wider area of discolouration of the paint would have occurred rather than the spot impacts seen in the photos.

GWRC Question:

Do you know if the VOC's are known to combine with other solid air-borne particles and form a matter such as that described by the neighbours?

PDP Response:

Atmospheric reactions can occur between VOC's, ozone and UV sunlight to generate secondary particulate known as smog. But this reaction takes hours and occurs on a large spatial scale (10-100 km). Given the time that atmospheric reactions take to occur (>8 hours) it seems unlikely that the impacts seen in the photos are a result of VOCs combining with other chemicals or particles to produce a corrosive material that eats into paint. Given that the discharges from NCI are made via a tall stack it seems more likely that any impact would be much wider spread rather than occurring on walls of two houses. PDP haven't seen this type of impact in areas around other printing or painting VOC discharge points that we have dealt with.

PDP suggest to better answer this question it may be useful to:

- ∴ Look at painted surfaces on the NCI site;*
- ∴ Look for any markings on glass/windows;*
- ∴ Look for any accumulation of material or marking on roofs or in roof gutters; and*
- ∴ Investigate how long have the impacts been observed? Is this a recent occurrence or long term?*

GWRC Question:

Do you have any other ideas of what this could be from (i.e. are home fires known to cause residue like this, or other forms of emissions?).

PDP Response:

Hot particles that could burn into paint could be discharged from backyard burning or grinding of metals in close proximity to the walls. It is unlikely that home fires are responsible as their particulate emissions are very fine (< 10 µm) and would not cause a grey gritty residue.

GWRC Question:

In your opinion could this residue be linked to NCI's operations or discharge to air activity?

PDP Response:

On balance this seems unlikely.

GWRC Question:

Do you know whether there would be any sampling or test available that we could have done on the residue that could explain its origin, and whether this would be conclusive/worth undertaking?

PDP Response:

One approach to testing would be to collect a sufficiently large sample of the black particles and send those off to a laboratory for chemical analysis. Alternatively, an area of affected paint with the particles intact could be scrapped off and sent to a laboratory for elemental spectral analysis.

If VOCs from NCI contributed to the particles, this would likely show up in the results as having a high carbon content and some residual organic compounds. If the material is from back yard burning this is likely to be mainly carbon with low level residual VOCs. If the black particles are from metallic grinding the black material will contain a high level of metals. Potentially the analysis may point us to another source.

If the sampling goes ahead PDP suggest it would be beneficial to collect similar looking material from the NCI site and analyse and compare that to the samples collected from the houses.

PDP ballpark estimate is that planning and undertaking a sampling and analysis programme to investigate the source of the particles would cost between \$5k and \$10k.

In summary, this could be done but there is a cost, and the outcomes are not certain.

3.0 Health Effects from Odour

GWRC Question:

A community member mentioned that at the last hearing someone told them “If you can smell it, it is having a health effect on you”. Do you remember this comment being made at the last hearing, and what the context was? What are your thoughts in regard to direct connection between an odour being observed (whether or not it’s at a O&O level) and health effects?

PDP Response:

PDP don’t recall this comment being made at the last hearing. In our experience it seems unlikely that the comment would have come from an expert witness or a commissioner. But it could have been raised by a submitter. By way of background here is a section from MfE’s Good Practice Guide on Assessing and Managing Odour.

For some compounds, strong odours can occur even where an odorous compound is present in concentrations well below those that could harm physical health. This reflects the sensitivity of the human nose which can detect an enormous number of chemicals down to extremely low concentrations. This means that people can develop physiological effects from odour even when their exposure is much lower than that typically required to cause direct health effects. This effect is sometimes termed ‘odour worry’ and is due to effects brought on by stress or the perception that if there is a smell it must be doing physical harm. Repeated or prolonged exposure to odour can lead to a high level of annoyance, and the person experiencing this may become particularly sensitive to the presence of the odour.

However, in other cases, odours may be associated with direct health effects, such as eye or nose irritation (eg, exposure to ammonia).⁶ In such cases, the direct health effects should be assessed by a qualified medical practitioner, as well as any potential odour impacts.

PDP suggest MfE provides a very good summary of “odour worry” and the health effects of odour. MfE suggest the most likely health effects of odour are eye or nose irritation. Another key issue to note is that odours are smelt before any health impacts occur - the odour threshold is lower than the health impact threshold concentration. Our experience suggests odour worry is more prevalent than health impacts caused by odour. But in extreme cases people can certainly suffer physiological effects from the chronic impact of odour.

The evidence PDP have seen for NCI suggests it is unlikely that the odour impacts are strong or frequent enough to cause physiological effects. But there may be evidence that we not aware of that could change this view.

4.0 Effects of VOC's on Soil

GWRC Question:

Along with the concern the discharge is having directly on health effects, the community also raised concern about what this may be doing to their soil, which they grow vegetables in and settling on fruit trees. Can VOC's end up settling, and if so, what is known about the health risk of these in soils?

PDP Response:

Exposure routes to airborne contaminants include inhalation, dermal contact and ingestion. VOCs from NCI are gases, as discussed in question 1, they are unlikely to be converted to particulate and/or be deposited in the area close to the plant. But there is a possibility that the VOCs could be absorbed by the plants through gas exchange/respiration and potentially some small amounts of particulate deposited in the soils. PDP note that there are a number of sources of VOCs in the area, including the discharge from vehicles using the roads around the plant. So, it would be very difficult to attribute any impact to one source. To assess the impact of ingestion requires a full health impact assessment to be undertaken. MfE's Good Practice Guide for Assessing Discharges to Air from Industry (MfE, 2016) notes that health risk assessments are specialised tasks and are typically only undertaken for large, or particularly toxic discharges. MfE recommends a comprehensive air pollution health risk assessment when:

- ∴ There is a significant discharge of contaminants with no clear threshold for adverse effects;*
- ∴ Plan provisions require it;*
- ∴ There is a significant discharge and/or background concentration and/or uncertainty about historical emissions of contaminants that are toxic, carcinogenic, teratogenic, mutagenic or bioaccumulative; and*
- ∴ There are multiple exposure pathways that may collectively result in adverse effects.*

Considering MfE's criteria for undertaking a health risk assessment, PDP's air quality team conclude that undertaking a health risk assessment for the NCI plant is probably not required. However, a health risk expert would be in a more informed position to make a decision on this issue.

5.0 Vegetative Buffer

GWRC Question:

Do you think there is any mitigation value for the discharge of VOCs and odour in a vegetative buffer between NCI and the neighbouring homes?

PDP Response:

A vegetative buffer is more likely to have a positive impact if the discharge of odour occurs at ground level and the plants create a physical barrier between the source and receptors. This physical barrier reduces air flow and potentially some odorous materials are absorbed by leaves. The efficacy of vegetative buffers in reducing odour is not well quantified in the literature. Our experience is that vegetative buffers may help a little, but they are not a "magic bullet" by any measure. Given the relatively high stack height from which the VOC's are discharged at the NCI site it is very unlikely that a vegetative buffer would have any positive impact on reducing any odour impacts occurring at the houses. The trees would have to be very tall to create a physical barrier. However, a vegetative buffer may have some positive impact by obscuring the view of the plant hence lowering the "profile" of the plant.

6.0 Possible Consent Conditions

GWRC Question:

Condition 18 of the existing consent requires NCI at the written request of GWRC to conduct an emissions monitoring programme. There is no routine emission monitoring requirement. In your latest report dated 9 August 2019, you do not recommend that this is changed. What value would there be by requiring a routine emissions programme?

PDP Response:

The monitoring of the emissions does not directly help manage key impact of the plant - odour. Emissions testing provide a snapshot in time. PDP's suggest that the odour impacts are more likely to be an associated with an accidental release or process upset – although NCI suggest this doesn't happen. The cost of emission testing is very high, we estimate \$15k for a round of testing. Therefore PDP consider the cost to benefit ratio is low. We do not see any great benefit to including regular testing. We think it would be much more effective to encourage NCI to focus on the odour management plan and participating in a community odour programme looking at cumulative effects in the area.

PDP suggest condition 18 is retained as tool for GWRC to use if O&O odour complaints increase or if there are other reasons (increased product use or product output) that may significantly change the amount of contaminants being discharged.

GWRC Question:

I note that in their latest annual report attached, they have provided the quantities of product used, and there is a fair bit of variability.

PDP Response:

The summary of annual use that PDP has seen suggests that NCI's use of raw materials is decreasing. Variability in year to year use of raw materials should not be a problem as long as NCI remain below the maximum allowed volumes.

GWRC Question:

Condition 4 of the existing consent requires the consent holder to investigate odour mitigation options. You have not recommended that this condition be included again. Is this because you consider the options assessment was fulfilled previously and that there are unlikely to be any new options since then?

PDP Response:

PDP consider that NCI have done a reasonably good job of investigating odour mitigation options and have done what can cost effectively be done. For example, raising the height of the stacks would be in the order of \$20k. However, to ensure that NCI keep up to date with developments in odour control, PDP suggest there is value in including the following condition which provides GWRC some protection and gives the consent holder a reasonable lead time to investigate and implement any additional mitigation measures.

The consent holder shall provide the Council with a report which reviews the best practical option (BPO) for mitigating the potential adverse effects from the discharge of odour. The report shall include:

- a. a review of the current health effects guidelines and/or standards for the relevant contaminants;*
- b. a review of technology developments which are capable of reducing the potential adverse effects from the discharge of odour*
- c. identification of the recent technology developments which are considered BPO for reducing potential adverse effects from the NCI discharge of contaminants;*
- d. a comparison of the potential adverse effects of odour with and without the implementation of BPO for reducing potential adverse effects; and*
- e. recommendations on whether any additional emission mitigation measures be adopted.*

*The report shall be provided to the Council on or before XX years from the date this consent is commenced.
The review shall be written by a person who is suitably qualified and experienced in these issues.*

GWRC Question:

Condition 20 requires that if emissions monitoring is completed and it shows that the discharges are 10% greater than those in the application, GWRC may require further analysis and interpretation of those these. NCI have suggested this condition is not included going further, whereas you have recommended that it is extended to 25%. Can you provide any reason for why you consider 25% to be more appropriate?

PDP Response:

For the contaminants modelled, the predicted ground level concentrations (GLCs) are well below the health impact assessment criteria. Looking at the difference between predicted GLCs and the health impact assessment criteria, I am comfortable that emissions could increase by 25% from those detailed in the assessment and the GLCs still be below the health impact assessment criteria. I think a 10% increase is quite low and un-necessarily restrictive for NCI.

Having this condition removed (as requested by NCI) would save them additional work and costs if tests show emissions have increased above those consented.

PDP consider the 25% increase trigger (rather than a 10% increase trigger) is a fair compromise between the two options on the table.

GWRC Question:

Do you think there would be value in including a condition requiring a CLG meeting considering their operations are meant to be fairly consistent?

PDP Response:

In theory yes, there is value in having GLC meetings. But to make this work will require the buy in from NCI, participation of the community and support from GWRC. I've seen GLC's work well at a compost plant and dry-dock, both in Christchurch. In this case despite their operations being fairly consistent I think there is an additional benefit from requiring GLC meetings because of the cumulative odour effect in the area. Requiring NCI to participate in a CLG would set the scene for Resene to come on board and participate in and contribute to the CLG. On balance I think requiring GLC meetings puts GWRC in a much stronger position for long term cumulative odour management for the area.

7.0 Closing

PDP trust that our responses to the issues raised in the pre-hearing meeting will be useful to NCI, RPH and the community and assist GWRC with possible consent conditions and the recommendation on the application.

If you require any additional information or have any follow up questions please do not hesitate to contact Jeff Bluett (jeff.bluett@pdp.co.nz 021 232 5584).

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