

17 September 2024

Kingston Minmi Pty Ltd
C/- Barr Planning
92 Young Street
Carrington NSW 2294

Attention: Katrina Walker

Dear Katrina

**RE: ADVICE ON CONTAMINATION ASSESSMENTS REQUIRED AND LIKELY TIMEFRAME FOR
 ASSESSMENTS
 505 MINMI ROAD, FLETCHER NSW**

1 INTRODUCTION

Qualtest Laboratory NSW Pty Ltd (Qualtest) were engaged by Kingston Minmi Pty Ltd C/- Barr Planning (Barr) to commence a Preliminary Site Investigation (PSI), for the site located at 505 Minmi Road, Fletcher NSW (the site).

Based on information provided by Barr the following is understood:

- The site is approximately 26ha in area and comprises Lot 23 DP1244350. The site is proposed to be rezoned from C4 Environmental to a mix of R2 Low Density Residential and C2 Environmental Conservation.
- The planning proposal for the rezoning received Gateway determination in January 2023, and went on Public Exhibition in April/May 2024.
- A submission was received from the EPA regarding the potential contamination impacts including subsurface landfill gas from Summerhill Waste Management Centre (SWMC) and gas emission resulting from decommissioned mine workings, along with a range of other potential impacts. Section 2 provides further information on the EPA submission.
- A Preliminary Site Investigation (PSI) would be required to address the matters raised by the EPA.
- As a result of the EPA submission, Council wrote to the Department of Planning, Environment and Industry (DPEI) to request the Planning Proposal not proceed due to the time to prepare the required subconsultant reports. The DPEI has altered the Planning Proposal to not proceed. Barr Planning are in the process of appealing this alteration.
- Barr have requested commencement of the PSI, and preparation of a letter that outlines the likely required assessments and timeframe for those assessments, as part of the submission to DPEI to appeal the alteration.
- The PSI report would then be completed if the appeal was successful.

This letter outlines the likely required contamination assessments and timeframe for those assessments, and it is understood it will form part of the submission to DPEI to appeal the

alteration. It is noted that this letter is not a PSI, and that a PSI will be required in the event the appeal to DPEI is successful.

This letter has been prepared by Emma Coleman, who is a Certified Environmental Practitioner (CEnvP) (registration no. 1274) – Site Contamination Specialist (registration no. SC41121), under the Environment Institute of Australia and New Zealand.

2 EPA SUBMISSION

In relation to contamination, the EPA submission on the Planning Proposal (ref: DOC24/362098-5 dated 27 May 2024) stated:

“The EPA understands that a preliminary contamination assessment completed for the Proposal found that it would be suitable for residential development. However, the assessment is over 10 years old, and it did not consider the risks associated with sub-surface landfill gases generated by SWMC and gases associated with coal mine workings.

SWMC is a large putrescible and non-putrescible landfill located within approximately 140 metres of the Proposal area. The facility's putrescible landfill cells are located over 1 kilometre southeast of the Proposal area, and a capped construction and demolition landfill cell is located within approximately 300 metres.

Subsurface gas monitoring results from the capped construction and demolition landfill cell dated from February 2024 showed elevated levels of carbon dioxide ranging from 9.5% to 13.7%. Council has advised that the capped cell was previously subjected to coal mining and the presence of sub-surface gases are from coal seam sources not the landfill. Regardless of the source of the gas, carbon dioxide is an asphyxiant and a toxic gas that is significantly denser than air. Toxic effects may become noticeable at 2% v/v and severe at 5% v/v, so further consideration of carbon dioxide is required prior to rezoning.

Given the proximity to the landfill, including this capped construction and demolition landfill cell, the EPA recommends that, prior to finalising a decision on the proposed rezoning, Council require the Proponent to submit an updated preliminary site investigation (PSI) for contamination which covers the entire Proposal area. The PSI should:

- consider the presence of SWMC and any mine workings in the area and investigate any risks associated with hazardous sub-surface gas at the Proposal area.*
- consider any recent activities that may have impacted the Proposal area (including illegal dumping or migration of contaminants from adjacent sites).*
- be drafted in accordance with the Consultants reporting on contaminated land - Contaminated Land Guidelines (EPA, 2020) and other relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act (CLM Act).*
- be written by, or reviewed and approved by, a consultant certified by either the Environment Institute of Australia and New Zealand Certified Environmental Practitioner (Site Contamination) (CEnvP (SC)) or Soil Science Australia – Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) schemes.*

We note that under the Newcastle Development Control Plan 2012, The Technical Manual Contaminated Land Management for Newcastle City Council, and any relevant updated documents, Council may consider the engagement of an auditor, should the findings of the PSI indicate that there is sufficient contamination risk to warrant a Detailed Site Investigation and a site audit.”

3 OBJECTIVES

The objective of this letter is to outline the work that has commenced on the PSI, and outline the timeframe of the assessments expected to be required to address the EPA submission.

4 SCOPE OF WORK

At this stage, Qualtest have commenced the desktop assessment, and have carried out the following work:

- Review of the previous PSI report: Cardno Geotech Solutions (Cardno) (2014) Report on Preliminary Contamination Assessment, Proposed Residential Subdivision, 505 Minmi Road, Fletcher, ref: CGS1706-004.0, dated 24 March 2014 (Cardno, 2014);
- Review of geotechnical and/or mine subsidence reports for land to the west, south-west and the south-east:
 - Douglas Partners Pty Ltd (DP) (2011) Report on Preliminary Geotechnical and Contamination Assessment, Proposed Residential Subdivision Minmi and Link Road, Ref: 39663.06, February 2011 (DP, 2011a)
 - DP (2011) Report on Mine Subsidence Risk Assessment, Proposed Residential Development Minmi and Link Road, Ref: 39663.07, February 2011 (DP, 2011b)
 - Regional Geotechnical Solutions Pty Ltd (RGS) (2015) Proposed Residential Subdivision, Minmi East Stage 1A, Mine Subsidence Report, ref: RGS00988.1-1AM, dated 25 September 2015 (RGS, 2015a)
 - RGS (2015) Proposed Residential Subdivision, Minmi East Stage 1B, Geotechnical and Site Contamination Report, ref: RGS00988.1-1BGC, dated 19 August 2015 (RGS, 2015b)
- Review of available gas and groundwater monitoring data for SWMC;
- Review of historical aerial photographs;
- Review of Acid Sulfate Soils Risk Maps;
- Review of regional geological maps;
- Site walkover to visually assess the site condition, surrounding land uses, and identify potential Areas of Environmental Concern (AECs);
- Prepared a preliminary Conceptual Site Model (CSM), including hazardous ground gases CSM; and,
- Prepared this letter.

It is noted that the findings of the above desktop study items are generally not included in this letter and will be included in the PSI. The findings of the above have been used to assess the contamination assessments that will be required.

5 KEY FINDINGS

5.1 Site Walkover

The site walkover by Qualtest on 6 September 2024 identified waste materials and fill on the site. It is noted that these were also identified by Cardno (2014).

The waste materials comprised illegally dumped waste in numerous locations along or immediately adjacent to access tracks. Most of the waste comprised domestic household materials (i.e. furniture, clothes, toys), with some locations of building materials, cars, other types of equipment/materials.

Stockpiles and filled areas were identified during the walkover, and it is assumed that mine shafts/entries would also be filled. In general, the fill appeared to comprise site materials or mine overburden materials. However, further assessment would be required to confirm this.

5.2 Hazardous Ground Gases

Geology and Hydrogeology

Previous geotechnical investigations to the south-east of the site identified residual soils (typically Sandy Clays, medium plasticity) overlying sandstone, siltstone, conglomerate, and coal seams. The rock ranged from highly weathered to fresh, and was jointed with the joints ranging from 10° to 85°.

Groundwater beneath the site is anticipated to be present in an unconfined and/or semi-confined aquifer in weathered rock and/or coal mining voids at depths greater than 20m below ground surface (bgs). Groundwater monitoring by SWMC at locations 180m to 550m south of the site showed water levels between about 17m and 35m bgs.

Groundwater flow direction is anticipated to follow the surface topography, with the south-eastern portion of the site flowing to the east to south-east and discharging to Wentworth Creek, located about 1km to the east of the site, and the north, west and south-west portions of the site anticipated to discharge to Back Creek located about 530m east of the site. Wentworth Creek and Back Creek both discharge to an unnamed wetland located approximately 270m to 550m north of the site.

Former Coal Mining and Required Remediation

Former underground coal mines in the late 1800s (Co-operative Colliery, Cramp Colliery and Wentworth Colliery) extended into the south-eastern side of the site. These collieries worked the Borehole Seam, comprising bord and pillar workings. Information indicates the seam was 1.8m thick. Coal seams/voids are less than 5m below ground surface, and outcrop on the south-eastern side of the site.

Former underground mines to the south-west did not extend onto the site.

Open cut mines operated near the site to the south-east (~180m distant) and south-west (~190m distant) but did not extend onto the site. The open cut mines broke into the former underground mines.

Due to the shallow nature of former mine workings on the site (<5m bgs) and the high subsidence risk, letters from the Mine Subsidence Board state that they will require the risk of mine subsidence to be removed (i.e. voids grouted, and/or excavated and then filled).

SWMC Landfill

SWMC appears to have commenced operations in the early 1990s.

The closest landfill cell to the site is an "inactive non-putrescible waste disposal site" and is reported to contain construction and demolition waste. The cell is about ~320m south of the site, and the associated leachate pond is about 190m south of the site. The cell is located in an area of former open cut mining, with the mining void appearing to be used as the landfill cell. It's possible the cell is also over former underground mining areas if these were not removed during open cut mining. It is not known if the landfill cell was lined, but it is assumed it wasn't. The leachate pond is assumed to be lined.

The putrescible landfill cells, including future cells, are located greater than 1.2km south-east of the site.

Gas Monitoring

SWMC monitor gas on a quarterly basis as part of their operations. Qualtest reviewed the following information from the monitoring:

- Data from 2018 to May 2023 – the monitoring data included methane %v/v, carbon dioxide %v/v, oxygen %v/v and hydrogen sulphide ppm. The data did not include gas flow rates;
- Data from August 2023 to May 2024 (4 rounds) – the monitoring data included methane %, carbon dioxide %, carbon monoxide %, nitrogen %, oxygen %, hydrogen sulphide %, pressure kPa, and gas flow rates L/hr. The data did not include atmospheric pressure or weather conditions. The Gas Screening Values were calculated using this data (as per NSW EPA, 2020).

In addition, Qualtest obtained information on weather conditions for the dates of gas monitoring, with temperature and rainfall obtained from Nobbys Head Station 061055, and mean sea level pressure (MSLP) obtained from Sydney Airport Station 066037, which was the closest station providing MSLP.

The data shows that methane was not detected in the wells closest to the site around the “inactive non-putrescible waste disposal site”, or wells located between the site and the putrescible landfill cells. Gas well SSG34 which is located adjacent to the landfill, and 2km from the site, reported methane at 0.2% on one occasion, 22 February 2024.

Carbon dioxide was detected in each well in each round of monitoring. Concentrations in the wells closest to the site around the “inactive non-putrescible waste disposal site” were between 4.5% and 14.9%. Concentrations in the wells located between the site and the putrescible landfill cells (and immediately adjacent to the landfill cell) were between 0.1% and 12.8%.

A letter from NSW EPA to City of Newcastle (Council) indicates that Council had advised NSW EPA that the carbon dioxide levels around the “inactive non-putrescible waste disposal site” “... are from coal seam sources not the landfill”.

Gas Screening Values

Provisional Gas Screening Values (GSVs) were calculated for wells around the “inactive non-putrescible waste disposal site” (SSG22, SSG24, SSG25) and for wells between the putrescible landfill cells and the site (SSG26, SSG26A, SSG35). The data from the most recent four monitoring rounds (between 11/08/2023 to 23/05/2024) were used, as these were the rounds with flow rate data provided.

The GSV was calculated using the formula provided in NSW EPA (2020) Assessment and management of hazardous ground gases: maximum borehole flow rate (L/hr) x maximum gas concentration (%v/v).

For locations around the “inactive non-putrescible waste disposal site” the highest GSVs from the four rounds were 0.049 L/hr at SSG22, 0.096 L/hr (SSG24), and 0.149 L/hr (SSG25) based on carbon dioxide. This classifies those monitoring locations as CS1 (very low risk) to CS2 (low risk). It is considered that the risk would further reduce with distance from the landfill (320m distance), and the site would likely class as CS1 (very low risk).

For locations between the site and putrescible landfill the highest GSVs from the four rounds were 0.005 L/hr at SSG26, 0.064 L/hr (SSG26A), and 0.036 L/hr (SSG35) based on carbon dioxide. This would class those monitoring locations as CS1 (very low risk). It is considered that the risk would further reduce with distance from the landfill, and the site would therefore also be CS1 (very low risk).

Potential Risk

Based on the above:

- Gases from the putrescible landfill are managed by SWMC, and are likely attenuated in the most part before reaching the site, and are unlikely pose an unacceptable risk to future residents.
- The carbon dioxide reported at the “inactive non-putrescible waste disposal site” is possibly at least in part due to former coal mining, and not wholly due to the landfill. As the Mine Subsidence Board will require mine voids and shafts to be remediated (filled or removed), the pathway for gases to migrate along mine voids, shafts and entries will be reduced.
- The degree of ground gas risk attenuation should be assessed from a program of on-site landfill gas monitoring.

6 ASSESSMENTS REQUIRED AND EXPECTED TIMEFRAMES

Based on the preliminary CSM developed for the site, the following assessments will be required for the site:

Assessment / Report	Expected Timeframe
<p>Preliminary Site Investigation (PSI).</p> <p>The PSI will take into account the assessment that has been commenced.</p>	4 weeks
<p>Detailed Site Investigation (DSI)</p> <p>The DSI will require intrusive assessment of fill materials and waste materials (where potentially contaminating). The assessment of fill materials will also need to take into consideration combustibility and acidity if coal/coal chitter is present in the fill at greater than 70%.</p> <p>A program of ground gas monitoring and assessment will be required in the scope of the DSI to evaluate potential risks to receptors including future residents, structures and construction/maintenance workers (in trenches and other confined spaces).</p>	<p>8 to 16 weeks</p> <p>Further time may be required for gas monitoring depending on atmospheric pressure conditions, gas concentrations and flow rates recorded.</p>

<p>Remediation Action Plan (RAP)</p> <p>Required if the DSI identifies contamination requiring remediation.</p>	<p>3 to 4 weeks (if required).</p> <p>Cannot be commenced until after the DSI is completed.</p> <p>Not required at Rezoning Application stage. Would be required at Development Application stage.</p>
<p>Validation Report</p> <p>Required following completion of remediation, if remediation is required.</p>	<p>4 to 6 weeks (if required).</p> <p>Cannot be commenced until after the remediation is completed.</p> <p>Not required at Rezoning Application stage. Would be required prior to release of Subdivision Certificate.</p>

7 LIMITATIONS

This letter has been prepared by Qualtest for Kingston Minmi Pty Ltd C/- Barr Planning based on the objectives and scope of work listed in Sections 1, 3 and 4. No warranty, expressed or implied, is made as to the information and professional advice included in this letter. Anyone using this document does so at their own risk and should satisfy themselves concerning its applicability and, where necessary, should seek expert advice in relation to their particular situation.

The opinions, conclusions and recommendations in this letter are based on conditions encountered and information reviewed at the date of preparation of the report. Qualtest has no responsibility or obligation to update this letter to account for events or changes occurring subsequent to the date that the letter was prepared.

In preparing this letter Qualtest has relied on information contained in reports, documents and plans by others, and has assumed that the information provided in those reports is accurate. In preparing this letter Qualtest has relied on information contained in searches of government websites and has not independently verified or checked the data contained on these websites.

In preparing this letter, current guidelines for assessment and management of contaminated land were referred to. The conclusions reached in this letter are dependent on the limitations inherent in all subsurface investigations where horizontal and vertical variation in geology, hydrogeology, and contaminant concentrations can occur. No subsurface assessment can accurately predict the geology, hydrogeology, or contaminant concentration at all points.

Site conditions may change after the date of this letter. Qualtest does not accept responsibility arising from, or in connection with, any change to the site conditions.

We trust this letter meets your requirements. If you have any questions or require clarification of the letter, please do not hesitate to contact the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd.



Emma Coleman
Senior Environmental Scientist



References:

NSW EPA (2020) Assessment and Management of Hazardous Ground Gases, Contaminated Land Guidelines

Cardno Geotech Solutions (Cardno) (2014) Report on Preliminary Contamination Assessment, Proposed Residential Subdivision, 505 Minmi Road, Fletcher, ref: CGS1706-004.0, dated 24 March 2014 (Cardno, 2014)

Douglas Partners Pty Ltd (DP) (2011a) Report on Preliminary Geotechnical and Contamination Assessment, Proposed Residential Subdivision Minmi and Link Road, Ref: 39663.06, February 2011 (DP, 2011a)

DP (2011b) Report on Mine Subsidence Risk Assessment, Proposed Residential Development Minmi and Link Road, Ref: 39663.07, February 2011 (DP, 2011b)

Regional Geotechnical Solutions Pty Ltd (RGS) (2015) Proposed Residential Subdivision, Minmi East Stage 1A, Mine Subsidence Report, ref: RGS00988.1-1AM, dated 25 September 2015 (RGS, 2015a)

RGS (2015) Proposed Residential Subdivision, Minmi East Stage 1B, Geotechnical and Site Contamination Report, ref: RGS00988.1-1BGC, dated 19 August 2015 (RGS, 2015b)

Groundwater and gas monitoring data for SWMC sourced from <https://newcastle.nsw.gov.au/living/waste-and-recycling/summerhill-waste-management-centre/environmental-monitoring>.