

Before the Hearing Panel appointed by Canterbury Regional Council

IN THE MATTER OF The Resource Management Act 1991

**AND
IN THE MATTER OF** Applications CRC192408, CRC192409, CRC192410, CRC192411, CRC192412, CRC192413 and CRC192414 by Fulton Hogan Limited for a suite of resource consents to establish a quarry operation

Addendum to Section 42A Officer's Report dated 14 August 2019

Report of Guy Anthony Knoyle, Technical Director – Contaminated Land

EXECUTIVE SUMMARY

1. In summary, following my review of Mr Rowan Freeman's (former Principal Science Advisor, Canterbury Regional Council (CRC)) evidence and the supplementary information I have reviewed as detailed in paragraph 7 of this report, I agree with his assessment on the actual and potential effects with regard to contaminated land and the development of the proposed Roydon Quarry.
2. I am not aware of any contaminated land matters within the site or external to the site that will impact or be impacted by the development of the proposed Roydon Quarry. My view is also based on further contaminated land investigations being undertaken over parts of the site and the preparation of a suitable Remedial Action Plan (RAP) by the applicant that has been approved by both Selwyn District Council (SDC) and CRC, the implementation of the required management plans relating to contaminated land aspects and compliance with resource consent conditions, should consents be granted.
3. I have provided confirmation of Mr Freeman's evidence in the subsequent sections of this report and I have also provided further commentary based on my review and assessment of the supplementary information provided.

INTRODUCTION

4. This report is an addendum to the section 42A Officer's Report of Mr Freeman, dated 14 August 2019. Since the circulation of section 42A Reports, Mr Freeman has left the Canterbury Regional Council.
5. The primary purpose of this addendum report is to confirm the assessment made by Mr Freeman in his section 42A Officer's Report relating to the assessment of potential environmental effects relating to contaminated land matters associated with the proposed quarry (referred to hereafter as the site).
6. This addendum should be read in conjunction with the section 42A Officer's Report, prepared by Mr Freeman, dated 14 August 2019.
7. In preparing this addendum report, I have reviewed the following information:

- a. Section 42A Officer's Report prepared by Rowan Freeman, formerly of Canterbury Regional Council;
- b. Section 42A Officer's Report prepared by Lisa Scott, Senior Groundwater Scientist with Canterbury Regional Council;
- c. Section 42A Officer's Report prepared by Hannah Goslin, Resource Management Consultant engaged by CRC;
- d. Resource Consent Application to Establish 'Roydon Quarry', Templeton (November 2018);
- e. Preliminary and Detailed Site Investigation (Golder Associates, November 2018) – AEE Report - Appendix H;
- f. Roydon Quarry Cleanfill Management Plan (Revised 8 March 2019) – AEE Report - Appendix C of s92 Response – Pre Notification;
- g. Roydon Quarry Proposal (Reference CRC192408-192414, RC185627) – Response to Request for Further Information (August 2019);
- h. CRC Section 42A Report Addendum and Updated Conditions;
- i. SDC section 42A Report of Andrew Henderson (2 September 2019); and
- j. Other relevant information held on CRC databases.

Qualifications and Experience

8. I hold the position of Technical Director – Contaminated Land with Pattle Delamore Partners Limited (PDP).
9. I hold a Bachelor of Science (Joint Honours) in Zoology and Environmental Science and a Master of Science in Applied Hydrobiology, both from Cardiff University, Wales.
10. I have been employed as an Environmental Consultant for over 23 years, with all this time being employed by PDP in Christchurch. As such, I have attained a comprehensive working knowledge of the local environment, and in particular with regards to land contamination issues.
11. I currently project manage a large portion of diverse contaminated site assessments including commercial/industrial and large scale residential developments, pesticide storage depots, landfills, the petroleum industry, former market gardens, horticultural and timber treatment sites, former gas works sites and illicit methamphetamine laboratories, with experience attained over several hundred sites.
12. I have carried out environmental consultancy work for a diverse range of clients including private individuals through to large multinationals, together with territorial and regional authorities and therefore have a broad understanding of all aspects of the investigation and management of contaminated land.
13. I have read the Environment Court Code of Conduct for Expert Witnesses¹ and I agree to comply with the code.
14. My evidence is within my expertise. I have considered and stated all material facts known to me which might alter or qualify the opinions I express. Where/if my evidence overlaps with matters better explained by another expert, I have deferred to them.

¹ Environment Court Consolidated Practice Note 2014 – Expert Witness Code of Conduct.

SCOPE AND LIMITATIONS OF EVIDENTIAL REPORT

Scope of review

15. As detailed in the section 42A Officer's Report prepared by Mr Freeman, my review is also limited to the following environmental effects with regards to the proposed quarrying activities:
 - a. Hazardous activities and industries (i.e. potentially contaminating activities);
 - b. Remediation and/or management of contaminated areas; and
 - c. Cleanfill management.

Limitations

16. My evidential report excludes matters associated with the resource consent application that do not relate to contaminated land (e.g. dust discharges, air quality, groundwater quality, stormwater management).
17. Matters related to the protection of human health from contaminants in soil are managed by the regulatory planning framework published under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS or the Regulation).
18. The NESCS is implemented by territorial local authorities (in this case, Selwyn District Council (SDC)). I am familiar with the application of the NESCS, through the daily use of this piece of legislation in my work.

SUMMARY OF CONSENT APPLICATION

19. Based on information in Mr Freeman's section 42A Officer's Report, I understand that the Roydon Quarry is proposed to be developed as per Figure 7 of the resource consent application and includes the following legal descriptions: RS 6475; Section 6 SO 510345; RS 6324; RS5381; Lot 1 DP 4031, RS 6342 and Section 7 SO 510345.
20. The quarry is proposed to include staged extraction faces, stockpiles and loading areas, haul roads, aggregate processing areas, vehicle refuelling and workshop areas.
21. The site is rural, flat and covers approximately 170 hectares (ha).
22. There are no major natural surface water courses within 1 km of the site. CRC well data indicates that groundwater may be as shallow as 10 metres below ground level (m bgl). Groundwater bore logs available for locations on site show that most of the material starting from surface to approximately 1 m bgl is silty sand. From 1 m bgl to about 10 m bgl, fine to coarse gravels in a matrix of fine to coarse sand (with some cobbles, boulders and trace silt) are reported.

ASSESSMENT OF ACTUAL AND POTENTIAL EFFECTS

Golder PSI/DSI Report (November 2018)

23. I have reviewed the '*Preliminary and Detailed Site Investigation, Proposed Roydon Quarry at Dawsons Road, Templeton*' report prepared by Golder Associates (NZ) Limited (Golder), dated November 2018 (Appendix H of the resource consent application), together with the evidence of Mr Freeman and the findings of his review of this report.

24. I concur with the findings made by Mr Freeman with regard to his review of the Golder November 2018 PSI/DSI report and in particular whether the main objective of the report was designed to provide an initial screening exercise as opposed to a more comprehensive evaluation of site contamination issues, which would be required in order to provide a robust assessment of likely site contamination issues.
25. Mr Freeman comments that there are a number of information gaps that arose based on him undertaking a walkover of the site subsequent to the issuing of the PSI/DSI report. I shall outline the information gaps in paragraphs 27 to 40 of this report.
26. I have not undertaken a walkover of the site, however I have relied upon the experience and subsequent information that Mr Freeman has gathered with regard to additional concerns he has raised relating to possible contaminant information gaps over the site.

107 Dawsons Road

27. Mr Freeman commented that soil samples collected from areas of concern (i.e. suspected sheep dip and associated stock pens, sheds and ancillary buildings, areas of distressed vegetation) around 107 Dawsons Road were collected at a depth of 0.2 m below ground level and therefore may have not necessarily captured higher contaminant concentrations, which are more likely to be present within shallower soils (i.e. surface to a depth of approximately 0.05 m depth below the surface).
28. From my review of the PSI/DSI report, in particular the laboratory results table (page 97 of the PDF document) it appears that samples were in fact collected at an appropriate depth of ground surface to a depth of approximately 0.1 m below the surface.
29. Whilst noting this discrepancy with Mr Freeman's observations, the soil sampling undertaken within the investigated areas of 107 Dawsons Road are considered acceptable with regards to determining soil contaminant concentrations in these areas of the property.
30. I concur with Mr Freeman's observations that further soil contaminant investigation and subsequent revision of the Conceptual Site Model (CSM) will be required at 107 Dawsons Road, as detailed below in paragraphs 31 to 33, 39 and 40. In all cases, and as detailed in Section 10.0 of the PSI/DSI, the results of the required validation soil sampling programme, following the completion of further investigations, will need to be below the Ministry for the Environment (MfE, 2011) Soil Contaminant Standard (SCS) for rural residential/lifestyle block (25% produce).

Market Garden

31. Based on a review of historical aerial photographs, a possible former market garden is located within the easternmost portion of the quarry Stage 4 (covering an area of up to approximately 8,000 m² according to Mr Freeman). The possibility exists for persistent pesticide contaminants (e.g. heavy metals and organochlorine pesticides (OCP)) to be present within site soils in this area.

Waste Dumping Area

32. A waste dumping area was observed by Mr Freeman during his site walkover and located in the south-eastern corner of the quarry Stage 4, adjacent to Dawsons Road. Mr Freeman estimated the footprint of the waste dumping area was approximately 500 m². The area was identified in the PSI/DSI report, however it was not investigated at the time due to access constraints. A number of contaminants

could be associated with the waste dumping area and following investigation it will need to be appropriately remediated.

Battery Cases

33. A stockpile of battery cases was observed by Mr Freeman between Shed#2 and Shed#3, although it was noted that the internal battery plates were not present. Whilst noting that this area is relatively small in extent, nonetheless I concur with Mr Freeman in that it would require suitable investigation to characterise any residual soil contamination.

220 Jones Road

34. I concur with Mr Freeman's comments and following a review of a series of historical aerial photos that a stockyard is located in the western half of the quarry Stage 2. It is possible that stock dipping/treatment activities could be associated with this area of the site. This observation was not detailed in the PSI/DSI report.
35. Following correspondence between Mr Freeman and Golder, Golder subsequently re-visited the site of the stockyard and collected surface/shallow soil samples from the area for laboratory analysis of the likely contaminants of concern (i.e. a suite of heavy metals and OCP).
36. Whilst the level of detail provided by Golder on this additional investigation is relatively light I concur with Mr Freeman and consider that the soil sampling results following the investigation of this area of the site are satisfactory to assess the presence of residual soil contaminants that may have been associated with stock dipping/treatment activities.
37. It is proposed that soils from the general stockyard area of the site are to be used as soil bunds around the quarry. Based on the soil sampling results I consider this an appropriate use of these soils. However, I note that two samples collected from the stockyard area contained dieldrin/arsenic concentrations above the MfE (2011) SCS for rural residential/lifestyle block (25% produce). Whilst noting this, it is expected that the standard soil mixing processes that will occur during the initial earthworks over this part of the site, placement of these soils into bunds and then any relocation of the soil bund material back onto the site during the rehabilitation process will dilute any residual dieldrin and arsenic contaminants to acceptable levels so as not to cause a risk to human health in the context of a rural residential land use setting.
38. Refer to my comments in paragraphs 52 to 54 with regard to the use of identified HAIL activity soils as part of the rehabilitation process. Hazardous Activities and Industries List (HAIL), administered by MfE is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal.

Existing Building Removal

39. I concur with the recommendations presented in Section 10.0 of the PSI/DSI in that asbestos building surveys are to be undertaken prior to the demolition of the dwellings over the site and further that an investigation with regard to the possible presence of lead around the dwellings is to be carried out.

Additional Possible HAIL Sites

40. Based on my review of a series of historical aerial photos presented in the PSI/DSI, and from a more detailed review of the electronic higher resolution photos on the CRC GIS website, I note a series of historical horse training tracks over the site. Horse training tracks could possibly be constructed from imported fill, as opposed to natural silts and clays. I am aware from previous CRC assessments that asbestos and heavy metals have been found in horse training tracks within the Canterbury Region so at the very least some form of investigation and comment on the composition of these tracks needs to be carried out and the results of this assessment provided to CRC and SDC for review.
41. Where applicable, any required remedial works within these further investigated areas will need to be included in the proposed Remedial Action Plan (RAP), as required by both CRC and SDC resource consent conditions.

Revised Cleanfill Management Plan (8 March 2019)

42. I have reviewed the Revised Cleanfill Management Plan (the Plan), dated 8 March 2019, which is a later version to the Plan reviewed by Mr Freeman in his evidence (dated November 2018).
43. It is important to note that my review of this Plan is limited to issues relating to possible land contamination as a result of the backfilling/cleanfill operations (i.e. the importation of non-virgin materials).
44. Mr Freeman raised a number of concerns in his evidence and I concur with his findings. I have outlined my concerns below in paragraphs 45 to 47.
45. Section 5.5.1 of the Plan states that '*Soil displaying evidence of contamination will either be set aside for chemical testing or rejected*'. The area where suspect soils are set aside for testing needs to be designed such that no stormwater is generated from the material (i.e. needs to be suitably covered) or that any stormwater discharge is suitably contained and treated, if required. The possible discharge of dust from any quarantined contaminated stockpiles pending testing also needs to be suitably managed and therefore detailed in the Plan.
46. I concur with Mr Freeman's comments that for suspected contaminated loads that are subsequently tested for the likely contaminants of concern then the results of this analysis are to be compared to the CRC local background soil concentrations for the proposed Roydon Quarry site (i.e. Trace Elements Level 2: Regional – Recent for heavy metals²) and not the local background soil concentrations for the source site. The Environment Canterbury (2007) document is considered to be the most appropriate to use with regard to assessing heavy metal contamination levels of suspected contaminated loads. As Mr Freeman notes, clarification on which background soil concentration to be used as acceptance criteria needs to be confirmed between the applicant, SDC and CRC.
47. I also concur with Mr Freeman's comments that soils sourced from urban areas will require particular scrutiny, and possible confirmation from the source site, that the material intended for cleanfill disposal meets the MfE (2002) cleanfill acceptance criteria. Possible contaminants of concern from urban sites (e.g. typical older residential properties) could include heavy metals such as lead and asbestos.

² Environment Canterbury, 2007. *Background concentrations of selected trace elements in Canterbury soils. Addendum 1: Additional samples and Timaru specific background levels.* Environment Canterbury Report R07/1/2.

48. I also concur with Mr Freeman with regard to the implementation of the WasteMINZ 'Technical Guidelines for Disposal to Land' (last updated August 2018) (WasteMINZ guidelines), for cleanfill backfilling of the quarry, if and when they are finalised and adopted by the MfE, as a supersede to the current MfE (2002) cleanfill guidelines.

Resource Consent Application (November 2018)

49. I have reviewed the Resource Consent Application to Establish 'Roydon Quarry', Templeton, dated November 2018 and specifically in regard to land contamination issues.
50. I concur with the statement made in Section 5.3.3 (and also discussed in Sections 6.2.3.5 and 6.3.2) of the Resource Consent Application, that based on the findings of the PSI/DSI, the applicant *'is proposing that contaminated material on the site will be excavated and removed from the site prior to any such areas being quarried and as such, contaminants within this material will not be discharged in backfill'*. Furthermore, I concur that following contaminated soil remediation of the identified HAIL areas, validation soil sampling will be carried out to ensure remaining soils have contaminant concentrations below the applicable criteria in the context of a rural-residential land use setting.

s92 Additional Response Report (August 2019)

51. I have reviewed the section 92 Response to additional Requests for Further Information, dated August 2019 and specifically in regard to land contamination issues. I have assumed that any response from the initial section 92 Request for Further Information (January 2019) and the response presented in the Request for Further Information (March 2019) have been sufficiently addressed and therefore culminating in the most recent August 2019 report.
52. With regards to draft conditions of CRC consent CRC192413³ – *'Discharge to land where contaminants may enter groundwater associated with the deposition of cleanfill for site rehabilitation'*, conditions 46 and 47 state that contaminated material identified through the PSI/DSI (Golder, November 2018) can be reused in the construction of the earth bunds on the site and for rehabilitation of the base of the quarry excavation only if identified as being suitable for doing so in accordance with the RAP. Clear direction needs to be included in the RAP (yet to be prepared) to state that any contaminated soils (i.e. those with contaminant concentrations above rural-residential land use) are to be removed from the site and appropriately disposed of, as detailed in the Resource Consent Application (November 2018).
53. Furthermore, any soils from identified HAIL areas that contain contaminant concentrations below rural residential land use but above the CRC local background soil concentrations for the Roydon Quarry site (i.e. Trace Elements Level 2: Regional – Recent for heavy metals) and subsequently reused as part of the rehabilitation process are not to be placed any deeper than 5 m below the current ground level within the quarry. There will be the requirement in the RAP for soils from remediated HAIL areas to be geo-referenced when placed into the soil bunds so that they are correctly relocated as part of any rehabilitation works.
54. Conditions 46 and 47 should be reworded to move any avoidance of doubt with regards to the fate of the identified contaminated soils at the site and so that they do not contradict condition 49.

³ Refer also to CRC proposed resource consent CRC192409 *'Land use consent to excavate material and deposit cleanfill material over an unconfined/semi-confined aquifer'*.

55. I concur with proposed condition 50 of draft CRC resource consent CRC192413 in that an unexpected discovery protocol will need to be prepared for the earthworks and can form an appendix to the RAP. The PSI/DSI did note the presence of a horse cemetery at 220 Jones Road, which will likely be encountered during initial stages of earthworks.

Section 42A Officer's Report - Dr Lisa Scott (CRC Senior Scientist: Groundwater)

56. I have reviewed the Section 42A Officer's Report prepared by Dr Lisa Scott, CRC's Senior Scientist: Groundwater, and have commented on the relevant points she has made with regards to land contamination in paragraphs 57 and 58.
57. I concur with Dr Scott's summary in that the highest risks for adverse effects on groundwater can come from potential leaching of the fill materials (paragraph 2 of her evidence). Dr Scott provides additional commentary to this effect in paragraph 106 of her evidence.
58. Dr Scott, in paragraph 79 of her evidence notes that '*Uncontrolled filling of waste materials can have adverse effects on groundwater, as seen in many old rubbish pits around Canterbury. Careful management of the fill materials for both obvious and unseen contaminants (e.g. contaminated soils) is critical for the long-term protection of groundwater quality*'. I agree with this statement and furthermore, as a prudent approach, the following materials should not be permitted as acceptable cleanfill materials at the quarry: uncured concrete, wet cement, gypsum board (i.e. GIB board), roading materials containing coal tar, road sweepings and catch pit sediments, MDF or any other liquid containing waste or slurries, such as hydro-excavated soils. These unacceptable materials will need to be added into the current version of the Roydon Quarry Cleanfill Management Plan (Revised 8 March 2019).

SDC (2 September 2019)

59. SDC draft conditions 62 to 67 of land use resource consent RC185627 are essentially the same as draft consent conditions 46 to 51 of CRC consent CRC192413. As such, my recommendations in paragraph 54 should be carried through to the SDC draft resource consent.

MITIGATION MEASURES

60. I concur with the mitigation measures detailed in Mr Freeman's evidence. However, this is on the provision that the further site investigations, as recommended in my evidence above, are carried out, and the results of these investigations provided to both SDC and CRC for review.

RESPONSE TO SUBMISSIONS/MATERS RAISED

61. To the best of my knowledge, there have been no submissions to the application with specific reference to contaminated land matters.

CONCLUSIONS

62. Based on the information that I have reviewed, and on the provision that the additional site investigations are undertaken, as detailed in my evidence and any subsequent remedial works are undertaken to the satisfaction of both CRC and SDC, I am not aware of any contaminated land matters within the site or external to the site that will impact or be impacted by the development of the proposed Roydon Quarry.

63. My view is also based on the preparation of a suitable RAP by the applicant that has been approved by both SDC and CRC, the implementation of the required management plans relating to contaminated land aspects and compliance with resource consent conditions, should consents be granted.

Signed:  Date: 5 November 2019
Name: Guy Anthony Knoyle
Technical Director –
Contaminated Land

REFERENCES

Environment Court Consolidated Practice Note 2014 – Expert Witness Code of Conduct.

Environment Canterbury, 2007. *Background concentrations of selected trace elements in Canterbury soils. Addendum 1: Additional samples and Timaru specific background levels.* Environment Canterbury Report R07/1/2.

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