

Before a Board of Inquiry
MacKays to Peka Peka Expressway Proposal

under: the Resource Management Act 1991

in the matter of: Notice of requirement for designation and resource consent applications by the NZ Transport Agency for the MacKays to Peka Peka Expressway Proposal

applicant: **NZ Transport Agency**
Requiring Authority

Statement of rebuttal evidence of **Kerry Laing** (contaminated land and groundwater) for the NZ Transport Agency

Dated: 25 October 2012

REFERENCE: John Hassan (john.hassan@chapmantripp.com)
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STATEMENT OF REBUTTAL EVIDENCE OF KERRY LAING FOR THE NZ TRANSPORT AGENCY

- 1 My full name is Kerry Richard Laing.
- 2 I have the qualifications and experience set out at paragraphs 2-9 of my evidence in chief, dated 5 September 2012 (*EIC*).
- 3 I repeat the confirmation given in my *EIC* that I have read, and agree to comply with, the Code of Conduct for Expert Witnesses (Consolidated Practice Note 2011).
- 4 In this statement of rebuttal evidence, I respond to the evidence of:
 - 4.1 Brydon Hughes on behalf of Kāpiti Coast District Council (submission no. 682);
 - 4.2 Robert van Bentum on behalf of Kāpiti Coast District Council (submission no. 682);
 - 4.3 Emily Thomson on behalf of Kāpiti Coast District Council (submission no. 682); and
 - 4.4 Richard Percy on behalf of Greater Wellington Regional Council (submission no. 684).
- 5 The fact that this rebuttal statement does not respond to every matter raised in the evidence of submitter witnesses within my area of expertise should not be taken as acceptance of the matters raised. Rather, I rely on the earlier technical report,¹ my *EIC* and this rebuttal statement to set out my opinion on what I consider to be the key contaminated soil and groundwater matters for this hearing.
- 6 Consistent with my *EIC*, I have referred to the MacKays to Peka Peka Expressway Project as "the Project" in this rebuttal evidence.

EXECUTIVE SUMMARY

- 7 I have read all of the relevant parts of statements of evidence lodged by submitters. This has not caused me to depart from my opinions expressed in my *EIC*, and I re-confirm the conclusions reached.
- 8 The submitters' evidence does not disagree with those conclusions, but appears to focus on the management and monitoring of the existing contaminated groundwater and surface water in the vicinity of the Otaihanga Landfill. Aspects of the flows of groundwater and

¹ Technical Report 23 (Assessment of Land and Groundwater Contamination Effects), and the related Contaminated Soils and Groundwater Management Plan (CSGMP).

surface water are addressed in the EIC and rebuttal evidence of **Ann Williams** and **Graham Levy**.

- 9 The submitters' evidence is principally concerned with additions or amendments to the suite of proposed consent conditions. Upon review of that evidence, I agree with some but not all of the suggested changes, as discussed below. As a result, I propose changes to various conditions as shown in **Annexure A** to this rebuttal statement.

WATER QUALITY IN THE VICINITY OF THE OTAIHANGA LANDFILL AND THE CONTAMINATED SOILS AND GROUNDWATER MANAGEMENT PLAN

Mr Hughes (KCDC)

- 10 In his evidence, Mr Hughes states that "overall, I support the approach to managing potential soil and groundwater contamination with the exception of that proposed for the Otaihanga Landfill site" (paragraph 8.3).²
- 11 Mr Hughes' evidence addresses the contaminated groundwater associated with the discharge of leachate from the Otaihanga Landfill (paragraphs 8.4-8.6). He expresses a concern that the construction of the Project may affect groundwater levels in the area and that in turn this may affect the chemical characteristics of the water and thus the flow and quality of water in the Landfill drain. Should there be any changes, Mr Hughes expresses an additional concern that there would be a reduction in 'wetland treatment' due to the loss of a small portion of wetland in the Otaihanga Mountain Bike Park area.
- 12 Mr Hughes recommends increased monitoring of the groundwater in the boreholes near the toe of the Landfill and in surface water downstream of the Project alignment. The detail of that recommendation is provided in the suggested new groundwater condition contained in Ms Thomson's evidence (paragraph 10.9), reproduced below.

The requiring authority shall undertake surface and shallow groundwater monitoring in the vicinity of the Otaihanga Landfill including:

- a) Surface water runoff at sites (to be determined in consultation with the Council) downstream of the Expressway alignment to ensure construction activities do not materially alter overall surface water quality draining from the site;
- b) Shallow groundwater sampling from the two bores (BH306 and BH307) located near the toe of the landfill to determine representative effects on groundwater quality in the absence of a strong vertical hydraulic gradient. Samples should be analysed for a representative range of cations, anions, nutrients and (dissolved) metals.

² The landfill is now in the process of being closed and only accepts cleanfill.

Monitoring shall commence at least 2 years in advance of construction to provide a reliable baseline to determine any post-construction effects and continue for a period of at least two years following construction.

If sampling indicates any significant departure from the baseline (particularly parameter concentrations approaching relevant guideline values or consent limits) which can be attributed to Expressway construction, provision should be made to provide additional treatment to surface runoff or shallow groundwater throughflow before exiting the landfill site.

Response

- 13 Monitoring requirements for the Project were expected to change in response to further information and ideas, advice/requested from other parties and potentially consent conditions. In my opinion, it would be better to make those changes through the monitoring section of the Contaminated Soils and Groundwater Management Plan (CSGMP), rather than consent condition, as the Plan may be more effective in addressing complex and interrelated matters (groundwater and surface water both upstream and downstream of the proposed Expressway).
- 14 My comments below are directed towards ensuring appropriate wording for a consent condition, if this is the Board's preference. As the alternative, similar wording would be incorporated into the CSGMP, which would be my preference.³
- 15 It is not clear how much treatment of contaminated groundwater the small area of wetland that will be removed by the Project in the Mountain Bike Park area is currently providing, or whether overall treatment will be affected by the construction activities.
- 16 I agree that the monitoring of surface water downgradient of the Project in this vicinity should be undertaken. However, I have a number of concerns with the wording of KCDC's suggested new condition, which also pertains to groundwater, as discussed below.
- 17 To assist the following discussion, a plan has been prepared (attached as **Annexure D**⁴) showing groundwater and surface water monitoring locations, and other features, in and around Otaihanga Landfill as discussed in this evidence.
- 18 The monitoring of groundwater and surface water in the vicinity of the landfill would be useful to show if increases in contaminant concentrations (if any) can be attributed to the Project's construction activities in the area. However, if some treatment of the contaminated water is being effected by passage through the sand dunes/wetland, then there may be little or no change in surface water concentrations downgradient of the Project. Monitoring a downstream surface water location would be required

³ This could be done by an expansion of existing Section 4.2 of the CSGMP covering monitoring of groundwater and surface water in the vicinity of the landfill.

⁴ Otaihanga Landfill Plan, Drawing No. GIS-3320901-86.

to assess whether there is a change at that location also, if there is a recorded change upstream.

- 19 The revised CSGMP provided with my EIC makes provision for monitoring groundwater for some key parameters.⁵ In that document monitoring was proposed to be undertaken at boreholes BH306 and BH307 at 6-monthly intervals during the construction of this section of the proposed Expressway and during the development and operation of the construction yard at the Landfill. A further revision to the CSGMP is now recommended to be made to the proposed monitoring to include additional boreholes (BH10 and BH11), and also to include surface water monitoring⁶.
- 20 I propose that the first paragraph of KCDC's proposed condition should read:

The consent holder shall undertake surface and shallow groundwater monitoring in the vicinity of the Otaihanga Landfill as follows:

- a) Surface water at one location upstream and three locations downstream of the Expressway alignment to check that construction activities do not materially alter overall surface water quality draining from the site; and
- b) Shallow groundwater sampling from the existing two bores (BH306 and BH307) located near the toe of the landfill and two additional boreholes (BH10 and BH11) to determine representative effects on groundwater quality in the absence of a strong vertical hydraulic gradient.
- c) Samples of both groundwater and surface water shall be collected every 6 months (initial surface water sampling at one monthly intervals) and should be analysed for a representative range of cations, anions, nutrients and (dissolved) metals.

Duration of monitoring

- 21 Ms Thomson's condition suggests that monitoring should commence "2 years in advance of construction". While I agree that as long a monitoring period as practicable prior to construction should occur to establish the baseline, I note that if the Project is approved, the Otaihanga section (construction yard) will be one of the first to be constructed, starting end 2013. Therefore, I propose that the new condition require that monitoring start at least 1 year (where practicable) in advance of construction works that have the potential to affect surface water and groundwater quality in this area.
- 22 For the additional monitoring suggested by KCDC, I consider a period of monitoring 1 year after the construction of this section of the Project will be sufficient to determine whether there have been

⁵ See Annexure B to my EIC, in paragraph 4.2. The key parameters are ammoniacal-N, aluminium, copper and zinc.

⁶ Further text is proposed to be added to Section 4.2 in the CSGMP, with wording contained in **Annexure B** to this rebuttal evidence.

any effects (not 2 years as suggested in Ms Thomson's recommended condition.) Any change in contaminant concentrations is most likely to arise from a change in groundwater levels associated with the construction activities. **Ms Williams** in her EIC provides information on likely magnitude of groundwater level changes and concludes they would be negligible.⁷ Groundwater levels should have stabilised before the end of construction in this area and a one year monitoring period after completion of construction will be sufficient. Routine monitoring undertaken for KCDC will still continue at key locations every three months.

Parameters to be tested

- 23 Since preparation of my EIC I have been involved in discussion with KCDC regarding the potential surface water monitoring (in addition to the groundwater monitoring) which included a slightly different set of key parameters. I agreed that a more comprehensive suite of parameters would be appropriate for the purpose and that was included in KCDC's suggested condition.⁸

Context of monitoring

- 24 Any monitoring required for the Project needs to be carried out and evaluated in the context of the historical groundwater quality monitoring that has been undertaken in the vicinity of the Landfill. I note that one of the historical monitoring wells (K1)⁹ appears to be located close to BH306. There have been considerable fluctuations in the concentrations of the various contaminants at all of the groundwater and surface water locations of the historical monitoring programme for the Landfill. When contaminants concentrations are found to be elevated, they are seldom in unison.¹⁰
- 25 In my opinion, the results from the monitoring proposed by NZTA must be considered in the context of these historical results, and those results that will come from the ongoing monitoring to be undertaken for KCDC.
- 26 In the one round of groundwater and surface water quality monitoring undertaken for NZTA, several parameters were found to exceed the ANZECC water quality guideline values at one location (BH307) and this has also been true for some of the historical monitoring. Therefore I do not agree with that part of KCDC's suggested condition that requires additional treatment for "parameter concentrations approaching relevant guidelines values or consent limits". In my opinion using that as a trigger for action is

⁷ Williams EIC, paragraphs 135-136 .

⁸ See subparagraph (b) in the quote above, the parameters being "a representative range of cations, anions, nutrients and (dissolved) metals".

⁹ Refer Figure 2, Landfill Monitoring Programme Annual Report 2010-2011, prepared for Kapiti Coast District Council, July 2011, MWH.

¹⁰ Landfill Monitoring Programme Annual Report 2010-2011, prepared for Kapiti Coast District Council, July 2011, MWH.

not appropriate given the historical situation. (I further note that it is not clear what is meant by "consent limits" in KCDC's suggested condition, as there are none for the consents for the discharges from the Landfill.)

Triggers for action

- 27 The question then arises as to what is "significant" departure from the baseline (as referred to in KCDC's suggested condition), given the fluctuations in the historical monitoring, and when this results in a requirement for additional treatment. It is my understanding, that despite the considerable fluctuations in concentrations of contaminants over the years, including some significantly higher than found in the water quality investigation for NZTA, there has not been a requirement for treatment. Treatment has been achieved by natural attenuation.
- 28 In other words, a "significant" departure from the baseline could be well within the concentration levels observed in the past that did not require 'treatment'. In my opinion, it would be unduly onerous to require the NZTA to undertake additional treatment for groundwater or surface water contamination conditions that may be temporary, and below contaminant levels recorded in the past. Treatment should only be required when "significant" really is substantial, compared with the historical record.
- 29 I suggest that, in the event of a significant departure from the baseline (or historical record), the appropriate response should depend on the actual contaminant(s) involved and the magnitude of the departure (considering the historical record). This response should be determined in consultation with GWRC and may range from increased frequency of monitoring through to treatment options (for example, pump and treat from well(s), interception trench, permeable reactive barrier).
- 30 Finally, if circumstances should warrant treatment of the shallow groundwater, it is not clear what is meant by the "landfill site" in KCDC's recommended condition. Treatment of the shallow groundwater before it moves from beneath the Landfill footprint is unlikely to be the most effective, as, depending on location, recontamination could occur. Treatment between the boundary of the footprint and the site boundary is likely to be more effective.
- 31 Based on the foregoing, I propose that the last two paragraphs of KCDC's suggested condition should read:

Monitoring shall commence at least 1 year in advance of construction to provide a baseline (additional to that of the routine monitoring undertaken on behalf of KCDC) to determine any post-construction effects, and shall continue for a period of 1 year following construction.

If sampling indicates any significant departure from the baseline, which is not consistent with the results and trends of the baseline or historical

monitoring and which can be attributed to Expressway construction, NZTA shall undertake one of the following actions, depending on the significance of the departure.

Significant departure has the following meanings and consequent actions:

- (a) If the concentration of several test parameters is confirmed (through repeat sampling) to be at least 3 times the maximum value recorded in the last 3 years for NZTA monitoring or the routine KCDC monitoring, NZTA shall increase the frequency of testing to once every 2 months.
- (b) If the concentration of several test parameters is confirmed (through repeat sampling) to be at least 10 times the maximum value recorded in the last 3 years for NZTA monitoring or the routine KCDC monitoring, it may be necessary to provide additional treatment to surface runoff or shallow groundwater throughflow before exiting the landfill site boundary. NZTA shall consult GWRC and KCDC to determine whether additional treatment is necessary and develop an appropriate treatment option in consultation with GWRC and KCDC, if necessary.

32 Finally, Ms Thomson recommends that this new condition should follow after general condition G.33. I disagree and consider that it would be more appropriate to include it in the groundwater diversion (*GD*) set of resource consent conditions, as a new GD.8A.

Mr van Bentum (KDCD)

33 Mr van Bentum's evidence (paragraphs 6.5-6.6) comments on the possibility of stormwater discharge from the construction yard at the Otaihangā Landfill resulting in an increased flow and transport of contaminants to the Landfill drain and further downstream.

34 Mr van Bentum recommends a consent condition to require monitoring of the quality of the water discharged from the Landfill stormwater wetland.

35 I note that this recommendation does not appear to follow through into Ms Thomson's suggested amended conditions, and no new consent wording is provided.

Response

36 I understand from Mr Levy that there is likely to be little change in stormwater flow as a result of the Project. If there was additional flow, it is only likely to dilute contaminants. As a result, I do not consider that additional monitoring (as suggested by Mr van Bentum) is required.

Mr Percy (GWRC)

37 In his evidence (paragraph 71), Mr Percy makes reference to the CSGMP and the 'certification' requirements for this Plan. His

evidence also provides various suggested amendments (or forms of amendment) to the draft conditions of consent (Appendix 1).

Response

38 As specific wording for many of the suggested amendments has not been provided by GWRC, my comments are related to whether I agree any amendment is required and (if so) proposed wording. The relevant conditions are considered in the order that they appear in Mr Percy's evidence.

General condition G.32

39 Mr Percy states: *Reword first sentence to improve legibility and clarity. Remove "through the CEMP", this creates confusion.*¹¹

40 This comment was also made with respect to a number of the proposed conditions. It is agreed that an improvement in wording could be made and this is covered in the rebuttal evidence of **Mr Schofield**. The proposed changes are contained in **Annexure A**.

41 Mr Percy states: *Require certification of the CSGMP by KCDC as well as GW.*¹²

42 As noted in my EIC (paragraph 87), I agree that KCDC should be consulted during the process of revising the CSGMP, and have included this as a requirement in the CSGMP.¹³

43 However, as also discussed in my EIC, two new conditions have been proposed by the NZTA that relate more specifically to the land use consent required from KCDC under the Soil NES for undertaking works on contaminated land (Rata Road). These conditions require the development of a site-specific Contaminated Soils Management Plan (Human Health) which, amongst other things, must be certified by the Regulatory Manager, KCDC.¹⁴ As a result, I consider that it is appropriate for KCDC certification to be required of the CSMP(HH), but not the CSGMP.

44 The separate CSMP(HH) has now been prepared and is attached to my rebuttal evidence (**Annexure C**).

45 As a result, I do not recommend that any further change be made to condition G.32 to provide for KCDC certification.

¹¹ Appendix 1, page 27.

¹² Ibid.

¹³ Refer revised CSGMP section 1.1 (Annexure B to my EIC).

¹⁴ See proposed condition NES.1 (Annexure A to my EIC).

- 46 Mr Percy states: *Revise purpose of CSGMP using clear and enforceable language.*¹⁵
- 47 I consider that the “purpose” of the CSGMP is already clearly explained in condition G.32. If necessary, the following words could also be added – “to identify contamination levels found during investigations”. Refer wording in **Annexure A**.
- 48 Mr Percy states: *Increase detail regarding minimum requirements of the CSGMP.*¹⁶
- 49 As no contrary expert evidence or comment from GWRC has been provided on the content of the CSGMP (e.g. from a contaminated soil and groundwater specialist), I remain of the view that the content is satisfactory and that the existing condition provides sufficient detail. It is unclear what further “detail” GWRC seeks in the condition.
- General Condition G.33*
- 50 Mr Percy states: *The full investigations report (not just an ‘outline report’) needs to be provided prior to works commencing.*¹⁷
- 51 An ‘outline report’ is never referred to in practice, as all contaminated site investigations have to be undertaken and reported according to the Ministry for the Environment Guidelines. A full report, along with an amended CSGMP (if required), would be provided to Council for certification.
- 52 I have proposed a change to condition G.33 to clarify this point for GWRC (i.e. replacing the word “outlining” by “detailing”).¹⁸
- 53 Mr Percy states: *Add clause requiring compliance with the investigations report once approved.*¹⁹
- 54 I suggest the following words be added to the end of proposed condition G.33 – “Once certified, the revised CSGMP shall be implemented”.
- 55 Finally, upon further review I propose the addition of the word “potentially” before the words ‘contaminated land’ in the first sentence of proposed condition G.33. This important distinction needs to be made as the sites have not yet been investigated and may be found not to be contaminated.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Appendix 1, page 28.

¹⁸ Refer **Annexure A**.

¹⁹ Ibid.

Groundwater conditions

56 Mr Percy seeks "additional conditions" for groundwater, stating:²⁰

Management of contaminated groundwater is addressed under the proposed Contaminated Soils and Groundwater Management Plan (CSGMP). GW is seeking certification responsibilities for the contaminated groundwater management aspect of the CSGMP. This plan needs to be addressed under the groundwater take/diversion conditions, and other conditions need to be added requiring monitoring, containment and removal of contaminated groundwater to an approved facility.

57 In response, I note that proposed condition G.32 already provides GWRC with certification responsibilities for the CSGMP (see Annexure A).

58 Mr Percy does not explain clearly why and how this Plan needs to be addressed under the groundwater take/diversion conditions, nor why "other conditions" need to be added. Nor is any condition wording suggested.

59 A condition requiring additional monitoring appears similar to the new condition suggested by KCDC, as discussed in my evidence above. My proposed wording for that new condition is shown in Annexure A (i.e., new GD.X). GWRC will need to advise if that condition is acceptable.

60 As no further explanation has been provided, it is unclear why "containment" of contaminated groundwater is required and why a condition related to this is necessary. Only a low level of contamination was found in the groundwater in the investigation for NZTA. As discussed above, more highly contaminated groundwater has remained 'uncontained' through the lifetime of the landfill.

61 It is also unclear why it is necessary to have a condition for the "removal" of contaminated groundwater to an approved facility. As discussed in the CSGMP,²¹ it is expected that contaminated groundwater will be able to be managed during the construction activities, without the need for removal. If there is need for removal, depending on volume, it is proposed to have the water removed by a wastewater contractor using a 'sucker truck,' or for larger volumes disposed to sewer. Disposal to sewer would require KCDC approval, which would be obtained, prior to such removal, if the need arose.

CONCLUSION

62 Submitters' evidence has not raised any concerns regards the assessment of effects related to contaminated soils or groundwater in the areas of land associated with the Project, nor the overall

²⁰ Appendix 1, page 38.

²¹ Section 3.1.

management approach provided in the CSGMP to address these effects.

- 63 Mr Hughes' evidence acknowledges that there is an existing low level water contamination associated with the Otaihangā Landfill. However, he considers that additional monitoring is required to assess the actual effects the Project may have on this existing contamination. I agree that the proposed additional monitoring will provide a more comprehensive record and definitive picture of changes, should any changes occur. My proposed wording for the new condition is shown in **Annexure A**.



Kerry Laing
25 October 2012

ANNEXURE A – PROPOSED CONDITIONS REFERRED TO IN THIS REBUTTAL STATEMENT

Changes to proposed conditions are shown in underline (additions) and strikethrough (deletions).

G.32	<p>The consent holder shall submit <u>finalise</u>, submit and implement through the CEMP, the Contaminated Soils and Groundwater Management Plan (CSGMP) to be and submitted to the Manager (GWRC) for certification at least 15 working days prior to works commencing. The purpose of this Plan is <u>to identify contamination levels found during investigations,</u> to highlight the minimum standards, and <u>to identify the best practicable option,</u> for management of contaminated soil and groundwater for the Project.</p> <p>The CSGMP shall include information regarding:</p> <ol style="list-style-type: none"> a) implementation and operational procedures including: <ol style="list-style-type: none"> i. roles and responsibilities of the Contaminated Land Specialist; ii. management of as yet un-investigated potentially contaminated sites; iii. management of areas of known contamination; iv. risk register records and v. a contingency action plan for unexpected discoveries. b) soil and groundwater contamination monitoring requirements and testing and disposal procedures; c) site validation report; d) consent monitoring requirements; and e) review procedures. <p><u>Works shall not commence until the consent holder has received the Manager's written confirmation for the Management Plan.</u></p>
G.33	<p>The consent holder shall undertake appropriate investigations into the four areas of <u>potentially</u> contaminated land that are proposed to be used for stormwater treatment (identified in Technical report 23 – Assessment of Land and groundwater Effects) to identify the levels of contamination and what measures may be required to manage potential effects from the discharge of contaminants on the environment and human health. These areas are located at 16 Leinster Ave, 150 Raumati Road, 58 Kiwi Road and 109 Kapiti Road. A report <u>detailing</u> outlining the findings of the investigation <u>and a revised CSGMP</u> shall be submitted to the Manager at least 15 working days prior to works commencing. <u>Once certified, the revised CSGMP shall be implemented.</u></p>

<p>New GD.8A condition</p>	<p>The consent holder shall undertake surface and shallow groundwater monitoring in the vicinity of the Otaihangā Landfill as follows:</p> <ul style="list-style-type: none"> a) Surface water at one location upstream and three locations downstream of the Expressway alignment to check that construction activities do not materially alter overall surface water quality draining from the site; and b) Shallow groundwater sampling from the existing two bores (BH306 and BH307) located near the toe of the landfill and two additional boreholes (BH10 and BH11) to determine representative effects on groundwater quality in the absence of a strong vertical hydraulic gradient. c) Samples of both groundwater and surface water shall be collected every 6 months (initial surface water sampling at one monthly intervals) and should be analysed for a representative range of cations, anions, nutrients and (dissolved) metals. <p>Monitoring shall commence at least 12 months (where practicable) in advance of construction works commencing that have the potential to affect surface water and groundwater quality in this area in order to provide a baseline (additional to that of the routine monitoring undertaken on behalf of KCDC) to determine any post-construction effects, and shall continue for a period of 1 year following construction.</p> <p>If sampling indicates any significant departure from the baseline, which is not consistent with the results and trends of the baseline or historical monitoring and which can be attributed to Expressway construction, NZTA shall undertake one of the following actions, depending on the significance of the departure.</p> <p>Significant departure has the following meanings and consequent actions:</p> <ul style="list-style-type: none"> a) If the concentration of several test parameters is confirmed (through repeat sampling) to be at least 3 times the maximum value recorded in the last 3 years for NZTA monitoring or the routine KCDC monitoring, NZTA shall increase the frequency of testing to once every 2 months. b) If the concentration of several test parameters is confirmed (through repeat sampling) to be at least 10 times the maximum value recorded in the last 3 years for NZTA monitoring or the routine KCDC monitoring, it may be necessary to provide additional treatment to surface runoff or shallow groundwater throughflow before exiting the landfill site boundary. NZTA shall consult with GWRC and KCDC to determine whether additional treatment is necessary and develop an appropriate treatment option, if necessary.
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**ANNEXURE B – TEXT PROPOSED TO BE ADDED TO REPLACE THAT
IN SECTION 4.2 OF THE CONTAMINATED SOIL AND GROUNDWATER
MANAGEMENT PLAN (CSGMP)**

4.2 Monitoring for consent compliance

It is considered that the proposed Expressway will not affect the generation of leachate from the landfill and thus will not affect the quality of the groundwater or surface water in the vicinity. Nevertheless it is proposed that monitoring of groundwater and surface water quality downgradient from the landfill will be undertaken during the period that the construction yard is developed and the Expressway is constructed through the Mountain Bike Park and for a short time following completion of construction. An initial period of monitoring is required to develop a baseline and complement the monitoring undertaken for KCDC under the landfill consent.

Groundwater monitoring

Groundwater samples will be collected every six months (prior to and during construction and for 1 year following construction of this section of the Expressway) from hydrogeological boreholes BH306 and BH307 (Drawing No. GIS-3320901-67) and BH10 and BH11. The samples will be analysed for a representative range of cations, anions, nutrients and (dissolved) metals.

Surface water monitoring

A preconstruction surface water quality monitoring programme will be undertaken in the western tributary of the Mazengarb Drain prior to commencement of the works in this area. The purpose of the monitoring programme is to obtain a baseline of water quality information from which the effects of the expressway (during construction and once operational) on the existing water quality in the tributary can be assessed.

The western tributary arises in the wetland area immediately northwest of the Otaihanga landfill through which the proposed expressway will pass. As part of KCDC's consent requirements, water quality is monitored at quarterly intervals in the western tributary at a site located a short distance downstream from the landfill's leachate collection drain. The water quality at this sampling location is impacted by the leachate collection drain.

The monitoring programme will comprise monthly water sampling and six-monthly sediment sampling. Grab water samples will be collected from the Landfill Drain (one sample beside the landfill - OW2 (Drawing No. GIS-3320901-47, Technical Report 24, Appendix 24.G)) and three sampling locations along the Western Tributary. One of these locations will be at the same location as the KCDC consent monitoring (OS2 - Drawing No. GIS-3320901-47), and the other two at locations further downstream to be confirmed after assessing suitability/ accessibility. During each monthly monitoring event, the physicochemical conditions of the water will

be measured at each site with portable field meters and a water sample will be collected for the analysis of a range of contaminants (suspended solids, nutrients, metals) and organics. A composite sediment sample will be collected from each site at six-monthly intervals during the programme and analysed for a representative range of contaminants.

The monitoring programme will continue on a monthly basis (six-monthly for sediment) up until commencement of the works, or for a maximum of 2 years, in the event of a delay in commencement of construction.

Construction and post-construction

During development of the construction yard and this section of the Expressway and for a period of 1 year following completion of this section, monitoring shall be undertaken at six-monthly intervals. Samples will be analysed for a similar range of parameters as the baseline testing.

**ANNEXURE C – CONTAMINATED SOILS MANAGEMENT PLAN
(HUMAN HEALTH)²²**

²² To be added as an Appendix to the CEMP.

Contaminated Soils Management Plan: Human Health

Revision History

Revision N°	Prepared By	Description	Date
A	Genevieve Smith	Final	5/10/2012
B	Genevieve Smith	Updated	25/10/2012

Document Acceptance

Action	Name	Signed	Date
Prepared by	Genevieve Smith		
Reviewed by	Kerry Laing		
Approved by	Graham Spargo		
on behalf of	Beca Infrastructure Ltd		

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Appendices

Appendix A - Contaminant Risk Register

1 Introduction

1.1 Purpose

This Contaminated Soils Management Plan: Human Health (CSMP(HH)) forms part of a comprehensive suite of environmental controls within the Construction Environmental Management Plan (CEMP) for the construction phase of the MacKays to Peka Peka Expressway (“the Project”). The CSMP(HH) addresses the potential human health effects resulting from contaminated soil, surface water and groundwater at selected locations associated with the construction of the Project.

The principal purpose of this Plan is to provide a guide for contractors on how to manage the potential effects on human health from contaminated soil, surface water and groundwater at selected locations on site. This plan will only cover any activities and tasks that relate to contact with contaminated soils, surface water and groundwater. This Plan does not cover activities and tasks related to the wider construction works for the project.

The CSMP(HH) will be updated, with the necessary approval, throughout the course of the Project to account for the results from sites yet to be investigated, changes to construction techniques or the natural environment and consent conditions. A copy of any revisions of a material nature will be passed to Kāpiti Coast District Council (KCDC) for comment.

1.2 Scope

The scope of this Plan is to:

- Summarise contamination hotspots identified in Technical Report 23, Volume 3; and
- Identify appropriate control measures to minimise potential human health risks from soil, surface water and groundwater contamination associated with construction of the MacKays to Peka Peka Expressway.

2 Contamination summary

2.1 Site identification

The route has been divided into sectors which broadly define the different urban and rural areas of the Project. The sectors are shown on the plan in Sector Diagram, Part D, Chapter 7, Volume 2 of the AEE.

2.2 Soil, surface water and groundwater characterisation

A contamination assessment has been conducted at selected locations along the proposed route of the Project, the full findings of which are detailed in Technical Report 23, Volume 3.

Technical Report 23, Volume 3 concluded that soil contaminant concentrations exceeded health assessment criteria for construction workers and members of the general public at one site – 55 Rata Road. Other sites had low levels of contaminants not considered to pose a risk to human health.

Groundwater and surface water at Otaihangā Mountain Bike Park contained bacteria and low level contaminants associated with leachate from the adjacent landfill.

The individual sampling locations at 55 Rata Road where contaminants are present are identified in the Contaminant Risk Register (**Appendix A**) and summarised below. The Contaminant Risk Register will be updated, as required, when the results from the sites yet to be investigated are available. These potentially contaminated sites along the route of the Expressway, but conservatively estimated to be contaminated above one or more NES Soil Contaminant Standard are also listed in Table 2.

Table 2: Contaminated Sites along the Route of the Expressway

Sector	Contaminated Site Location	Type	Activity	Contaminants Identified
1 (POP-RAU)	16 Leinster Avenue	Contractors Yard	Dumped waste and uncontrolled fill	Site not yet investigated. Assumed heavy metals, TPH
1(POP-RAU)	150 Raumati Road	Unoccupied land	Unknown dumping of waste	Site not yet investigated. Assumed heavy metals, TPH
2 (RAU-IHA)	55 Rata Road	Contractors Yard	Historical storage of hydrocarbons	TPH, PAH
2 (RAU-IHA)	58 Kiwi Road	Horticulture	Market gardening	Site not yet investigated. Assumed heavy metals, TPH

Notes:

TPH – total petroleum hydrocarbons

PAH – polycyclic aromatic hydrocarbons.

3 Generic hazard minimisation procedures

The following procedures have been prepared for the management of the contaminated soil on the land at 55 Rata Road. However, it is considered that they will be similarly applicable to the other yet to be investigated sites, if contamination levels are found to be above guideline values.

Works at known contaminated sites have the potential to encounter contaminated soils and/or groundwater. Prior to work being undertaken, a Job Safety and Environment Analysis (JSEA) will be carried out for each contaminated site that will identify the appropriate personal protective equipment (PPE) and behaviours to reduce the exposure risk.

Workers may be exposed to contaminants via the accidental ingestion of, or skin contact with soil and/or groundwater and/or surface water. To prevent this exposure, procedures should be followed by workers who are likely to come in contact with contaminated soil and/or water, including the following:

- Cloth overalls or disposable overalls should be worn.
- Non-disposable overalls should be removed at the end of each day and should be stored at the work site. The overalls should not be left in vehicles or taken home (to prevent the tracking of potentially contaminated materials into workers' homes).
- Non-disposable overalls should be laundered by a commercial service and should under no circumstances be taken home and washed.
- Disposable overalls should be bagged at the end of each day and disposed of to an appropriate facility.
- All staff physically involved in works likely to result in hand contact with contaminated material should wear chemical resistant disposable gloves which should be regularly changed.
- A P2 dust mask should be worn if conditions generate dust.
- Contact with contaminated water should be avoided where possible.
- Where contact with water cannot be avoided, PPE should be used to prevent contact with water such as waterproof gauntlets, gumboots, waders etc.
- Hand to mouth contact should be minimised.
- Hands and face should be washed prior to eating, drinking or smoking.
- Eating or drinking should not be done within the excavation area.
- Any skin abrasions should be washed immediately and treated to prevent infections.
- Any additional requirements in the Contractor (Site Specific) Health and Safety Plan should be followed.

4 Implementation and operation

4.1 Procedures for areas of known contamination

The known locations of contaminated soil are illustrated on Drawings EN-CL-004, Volume 5. Others may be added after further investigations are completed.

Pre-excavation procedure

Prior to any earthworks being undertaken at a known contaminated site, a pre-earthworks site meeting will be held and attended by the Project staff including the Construction Manager, the Environmental Manager, the Contaminated Land Specialist (CLS) and personnel involved with the earthworks to discuss the risks and site procedures for handling contaminated soils and groundwater and/or potentially contaminated soils and groundwater located at that site. The Construction Manager shall prepare a site specific Health & Safety Plan (CHSP) or JSEA for the earthworks which shall cover exposure to contaminated soil and dust, groundwater and surface water for construction workers and the general public.

Site establishment

The following controls should be put in place by the Project team prior to works commencing:

- Barriers or fencing to prevent unauthorised entry and access by the general public. Warning signs (e.g. "Restricted entry") should be erected around the fenced site.
- Health and safety facilities such as first aid points, wash facilities and PPE locations should be provided.
- All personnel working on known contaminated sites during any intrusive ground works should be required to undergo a specific health and safety induction in relation to contamination at that site. Construction workers toolbox and tailgate meetings should include aspects of health and safety in relation to contamination (soil, water and dust).
- The likelihood of encountering contaminated groundwater should be assessed at known contaminated sites and relevant procedures developed.

Contaminated dust controls

Dust suppression controls should be rigorously implemented during earthworks at contaminated sites (in particular at 55 Rata Road) as detailed in Section 5.4 of CEMP Appendix H, Volume 4 and Section 3 of CEMP Appendix G, Volume 4. This will minimise the generation of dust on site which could affect site workers and general public.

Controls include but are not limited to:

- Reduction of vehicle speeds.

- Minimising drop heights from loaders.
- Considering timing of works including prevalent wind direction.
- Regular watering of haul roads.
- Revegetating/stabilising exposed surfaces as soon as possible.

Asbestos controls

Risks arising from suspected asbestos occur at localised areas within 55 Rata Road and Kāpiti Road Intersection. Excavations at these locations shall follow procedures detailed in this section of the plan and Section 3.2.

Should Asbestos Containing Material (ACM) be observed or suspected during the excavation works, all work shall cease and Guidelines for the Management and Removal of Asbestos (revised 1999) for the Department of Labour, and the Health & Safety in Employment (Asbestos) Regulations (1998) will be followed. Works can recommence once all ACM has been removed safely. Any such asbestos works (assessment, delineation, removal and verification) shall be undertaken by a specialist asbestos contractor.

Stockpiling controls

Stockpiling of contaminated material should be avoided. If stockpiling of contaminated materials cannot be avoided, then the stockpile shall be covered at all times to prevent the generation of dust. The dust may potentially contain contaminants which can be dispersed across the site and beyond the site boundaries.

Post-excavation procedure

Upon completion of excavation works, all plant and equipment used on known contaminated sites shall be cleaned and decontaminated prior to leaving the contaminated site. Water from wheel washes shall be collected and disposed of to sewer with consent from KCDC. Particular care should be taken when cleaning equipment used at locations TP209 and TP214 at 55 Rata Road given that the contaminants in the soil pose a risk to human health. Loose soil on equipment should be brushed off onto a tarpaulin and the soils transferred to the truck containing the contaminated soils being transported to landfill.

4.2 Roles and responsibilities

Section 3.1 of the CEMP details the roles and responsibilities associated with managing the Project. Specifically the Environmental Manager and Construction Manager will take responsibility for the implementation of the CSMP(HH) including training personnel in the required procedures, the coordination of monitoring work by contaminated sites specialists and decision making in the event of discovery of unexpected potentially contaminated material. The Environmental Manager is responsible for liaison with KCDC.

A CLS will be engaged by the Project team to monitor, supervise and report on all works that may disturb contaminated land. Tasks include the following:

- Advise on health risks from known and unknown contamination; and
- Train staff in contaminated land identification and control procedures.

5 CSMP(HH) review

This section describes how the CSMP(HH) will be reviewed, including looking at the controls and procedures to make sure that they are still applicable to the activities being carried out

The CSMP(HH) will be reviewed by the Project team after confirmation of the resource consent and designation conditions and will be revised in accordance with these conditions. The CSMP(HH) will be updated, with the necessary approval, throughout the course of the Project to reflect material changes associated with changes to construction techniques or the natural environment. Approval from KCDC will be required for any relevant revisions of a material nature to the CSMP(HH) which are related to sites where there is a risk to human health from contamination.

A management review of the CSMP(HH) will be undertaken at least annually by the Project Management team and the NZTA Environmental Representative. The management review will be organised by the Environmental Manager and the Project team will be informed of any changes to this plan through the regular Project communications processes. The review will take into consideration:

- Any significant changes to construction activities or methods.
- Key changes to roles and responsibilities within the Project.
- Changes in industry best practice standards or recommended health and safety controls.
- Changes in legal or other requirements (social and environmental legal requirements, NZTA objectives and relevant policies, plans, standards, specifications and guidelines).
- Results of: inspection and maintenance programmes, logs of incidents, corrective actions, and internal or external assessments.

The reasons for making changes to the CSMP(HH) will be documented. A copy of the original CSMP(HH) document and subsequent versions will be kept for the Project records, and marked as obsolete. Each new/updated version of the CSMP(HH) documentation will be issued with a version number and date to prevent obsolete CSMP(HH) documentation being used.

6 References

Kirkby, C. Construction Air Quality Management Plan: CEMP Appendix G, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Ridley, G. Erosion and Sediment Control Plan: CEMP Appendix H, Volume 4 of the MacKays to Peka Peka Expressway Project AEE.

Smith, G. Assessment of Land and Groundwater Contamination Effects: Technical Report 23, Volume 3 of the MacKays to Peka Peka Expressway Project AEE.

Smith, G. Contaminated Soil and Groundwater Management Plan, Appendix K CEMP of the MacKays to Peka Peka Expressway Project AEE.

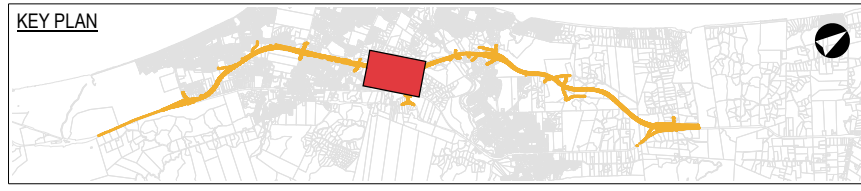
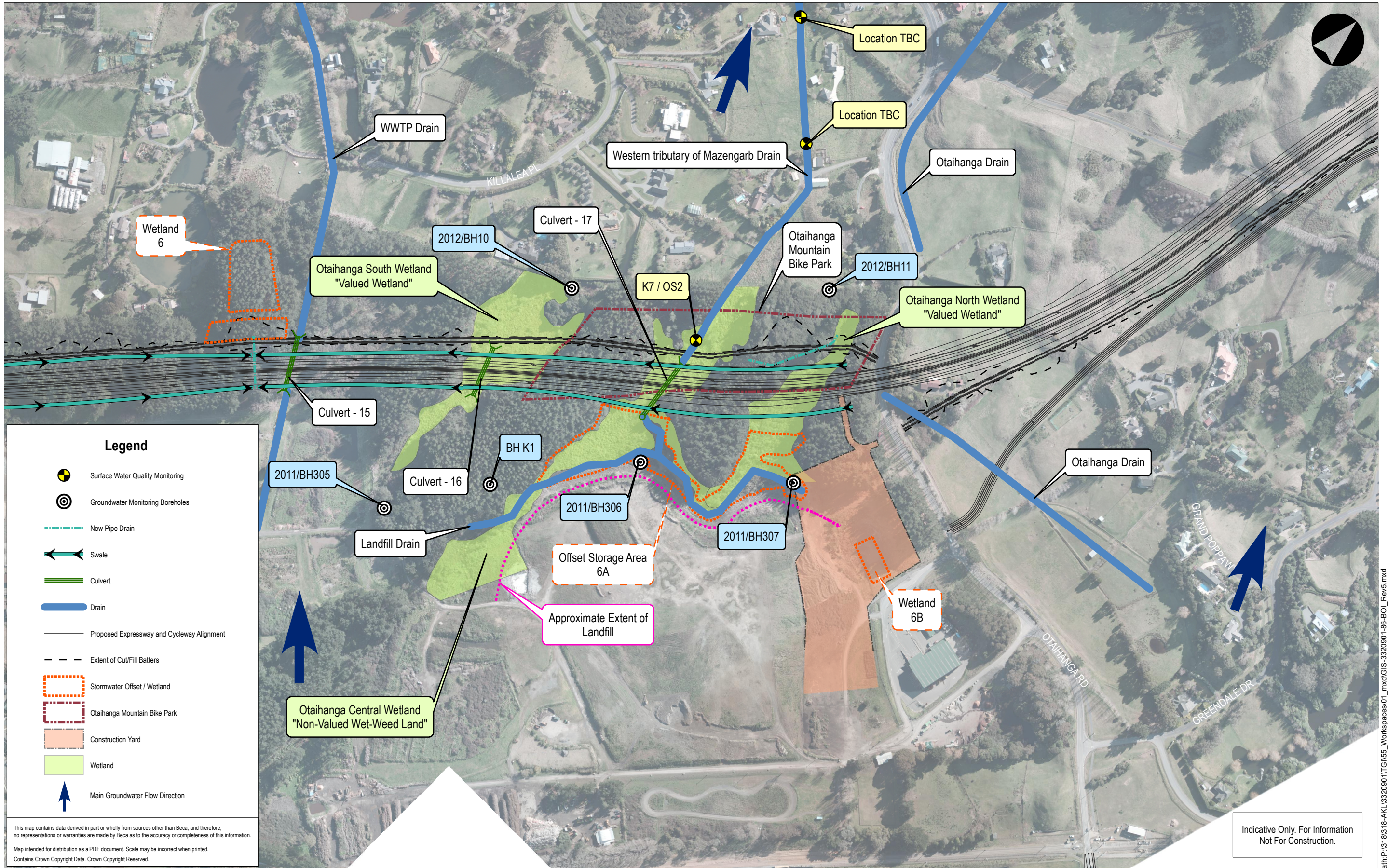
APPENDIX A – Contaminant Risk Register

Risk Evaluation:

Likelihood of finding the contamination	Likely or Unlikely
Consequence	Minor: Low harm to human health
	Moderate: Some harm to human health
	Major: Severe harm to human health
Risk	Low, Medium, High

Sample Location	Soils			Likelihood of Finding the Contamination	Consequence	Risk	Mitigation Controls Required
	Exceeds Background	Exceeds Human Health Risk Concentrations	Non-natural Materials				
Sector 2 – (RAU-IHA) – 55 Rata Road, chainage 4900							
TP203	As, Cd, Cr, Cu, Pb, Ni, Zn	No	Yes, suspected Asbestos Containing Materials (ACM)	Likely	Minor	Low	Generic hazard minimisation procedures (Section 3.). If ACM suspected, follow asbestos procedure (Section 4.1).
TP204	As, Cd, Cu, Pb, Ni	No	Yes, suspected Asbestos Containing Materials	Likely	Minor	Low	Generic hazard minimisation procedures (Section 3.). If ACM suspected, follow asbestos procedure (Section 4.1).
TP209	Cd, Cr, Cu, Pb, Ni, PAH, TPH	PAH, TPH	Yes	Likely	Moderate	Medium	Strict compliance with generic hazard minimisation procedures (Section 3.). Strict environmental controls to prevent contamination dispersion (see CSGMP).
TP214	PAH	No	Yes	Likely	Moderate	Medium	Strict compliance with generic hazard minimisation procedures (Section 3.). Strict environmental controls to prevent contamination dispersion (see CSGMP).

ANNEXURE D – PLAN OF OTAIHANGA LANDFILL



Original Scale (A3)
1:4,000

Revision / Amendment	Approved	Date
A BAP	AH	25/10/12



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Title: Otaihanga Landfill Plan	
Status:	Rev.
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Drawing No: GIS-3320901-86	
Figure 1	