

27 Land and groundwater contamination

Overview

This Chapter assesses the potential effects of the proposed Expressway on identified areas of contaminated land with the Project area. The contamination assessment has identified areas of soil and groundwater contamination along proposed Expressway alignment to determine the potential environmental effects of the Project. The involved the investigation and assessment of soil, surface and ground water contamination, human health risk to the general public and construction workers and soil classification for re-use or disposal.

The contamination assessment identified four existing sites along the proposed Expressway alignment that have the potential to affect human health and the environment within the Project area.

Based on investigations undertaken as part of the contamination assessment, human health guidelines were exceeded at 55 Rata Road (a site previously used by a transport operator where hydrocarbons were stored on site in bulk quantities). Human health guidelines were not exceeded at the Kāpiti Road Interchange (potential for illegal dumping), 124-154 Te Moana Road (horticultural activities) or 160 Otaihanga Road (Otaihanga Mountain Bike Park, formerly the Otaihanga Landfill).

The disturbance and/or use of contaminated land identified through the contamination assessment has the potential to affect human health and the receiving environment during construction and operation of the proposed Expressway. The potential adverse human health and environmental effects will be mitigated by measures including:

- Employment of a contaminated land specialist during construction;
- Adherence to the relevant management plans in the CEMP and a Contractor Health and Safety Plan;
- Compliance with resource consent conditions;
- Containment of contaminants on-site; and/or,
- Disposal of contaminated soil to licensed landfills.

27.1 Introduction

This Chapter assesses the actual and potential land and groundwater contamination effects arising from the construction of the proposed Expressway. The assessment contained in this Chapter is based on the following technical reports:

- Assessment of Groundwater Effects, Technical Report 21, Volume 3
- Assessment of Hydrology and Stormwater Effects, Technical Report 22, Volume 3; and,
- Assessment of Land and Groundwater Contamination Effects, Technical Report 23, Volume 3.

In order to investigate and assess any areas of potentially contaminated land in relation to the Project area, a land and groundwater contamination assessment was undertaken along the proposed Expressway alignment. The purpose of the assessment was to:

- Identify and characterise any areas of soil and groundwater contamination along the proposed Expressway alignment;
- Identify the risks of adverse effects on the environment and human health from the disturbance and/or use of contaminated land in the construction and operation of the proposed Expressway; and,
- Identify measures to avoid, remedy or mitigate the identified contamination risks.

27.2 Existing environment – contaminated land and groundwater

27.2.1 Geology

The underlying geology within the Project area is alluvial deposits (sands and gravels) with areas of superimposed swamps and sand dunes. The inter-dunal areas are generally low lying and poorly drained. This topography and geology combined with relatively high rainfall are conducive to the formation of wetlands.

27.2.2 Hydrology/hydrogeology

There are several streams and watercourses in the Project area. The Waikanae River is the predominant water body. There are several wetlands along the Project area – many of these water bodies have been heavily modified by farm or urban development. These water bodies are described in detail in Technical Report 22, Volume 3.

The hydrogeological characteristics of the area are described in detail in Technical Report 2, Volume 3, and summarised below:

- Shallow unconfined aquifers – to a depth of 30m, supplies water for portable and irrigation use. These are often hydraulically connected to the Waikanae River and smaller streams in the area;
- Deep groundwater – lies further below the unconfined aquifer and would not be directly affected by the proposed Expressway; and,
- Groundwater Abstraction – a large number of groundwater abstraction bores are located along the Project length. The assessment investigated boreholes within 300m down hydraulic gradient from the areas of potential contamination. None of these bores were identified as being used for drinking water.

27.3 Areas of potential contamination

A desktop study was undertaken to identify sites that have had historical or existing activities within the proposed Expressway alignment with the potential to cause land and groundwater contamination

(Technical Report 23, refer Appendix F). This study identified the following sites for further investigation:

Table 27.1: Identification of sites identified as potentially contaminated

| Sector | Site | Potential contaminants |
|--------|--|---|
| 1 | No sites recommended for further investigation | |
| 2 | 55 Rata Road | HAIL ²²¹ site – previously used by transport operator. Hydrocarbons stored on site in bulk quantities. |
| | Area of designated land behind commercial/industrial zone of Manchester/Sheffield St (Kāpiti Road Interchange) | Potential for illegal dumping to have occurred. |
| 3 | 160 Otaihanga Road (Otaihanga Mountain Bike Park) | Historical landfill area – potential contaminants may include metals, fuels, oils, landfill gas and leachate. |
| | 124-154 Te Moana Rd – Market Gardens | Pesticides/metals from horticultural activities. |
| 4 | No sites recommended for further investigation | |

27.4 Assessment of contamination effects to land and groundwater during construction

27.4.1 Construction of the proposed Expressway

Potential effects from the disturbance and/or use of contaminated land during construction of the proposed Expressway are risks to both human health and the environment.

Risks to human health are assessed against the human health ‘guidelines’ outlined in the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2011 (NES CSHH) while environmental risks are assessed against ‘criteria’ contained in the Wellington Regional Discharges to Land Plan (WRDTLP).

27.4.2 Human health risk

Human health guidelines are outlined in the NES CSHH. Assessments have been undertaken to determine the potential human health effects on workers within the construction footprint and members of the public or other workers outside the construction footprint.

Concentrations of contaminants found in the soil at 55 Rata Road exceeded human health guidelines outlined in the NES CSHH for construction workers at the site and for the general public outside the site.

²²¹ Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries by GWRC that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal.

These contaminants have human health risks when people are exposed to contaminants through dermal contact, accidental ingestion and / or inhalation of dust.

There were no contaminants in excess of human health criteria at the other investigated sites (Kāpiti Road Intersection, 124-154 Te Moana Road and 160 Otaihanga Road).

27.4.3 Environmental risk

The provisions for managing the discharge of contaminants are outlined in the WRDTLP. Technical Report 23 details the relevant environmental criteria under the WRDTLP.

The arsenic levels found at the Kāpiti Road Interchange and the levels of benzo(a)pyrene (BaP) found at 55 Rata Road exceeded the environmental criteria in the WRDTLP. There is the potential for adverse environmental effects to arise from these contaminants being discharged to the environment during construction.

The environmental criteria for zinc was exceeded at 124-154 Te Moana Road. The assessment shows that the location of the elevated zinc levels is within the construction footprint for the Te Moana interchange. There is the potential for zinc to discharge to groundwater and land during construction.

Soil analyses taken at the boundary of the Otaihanga Landfill and Otaihanga Mountain Bike Park (referred to collectively above as 160 Otaihanga Road show that no contaminant exceeded its background concentration or environmental criteria in the WRDTLP. Groundwater samples have also been taken, the results of which are assessed in combination with the development of the conceptual groundwater model for this area, as detailed in Technical Reports 21 and 23 in Volume 3. In summary, while there is evidence of contamination from leachate from the landfill, groundwater modelling indicates there will be no noticeable change in groundwater levels, gradients or flow as a result of the proposed Expressway construction.

27.5 Assessment of contamination effects to land and groundwater during operation

Once the proposed Expressway has been constructed and is in operation, the contamination identified is not likely to pose an adverse effect on human health or the environment. This is due to the fact that soils containing levels of contaminants in excess of human health guidelines or environmental criteria will either be excavated and disposed of to an appropriate landfill or cement bound for reuse to prevent leaching of contaminants.

If soil containing contaminants in excess of environmental criteria at the Kāpiti Road Interchange site or the Te Moana Road is to be reused on site or at another location, it will be cement stabilised to prevent the leaching of contaminants. Alternatively, these soils will be excavated and disposed of to an appropriate landfill.

Soil containing contaminants exceeding human health guidelines at 55 Rata Road will be excavated and disposed of to an appropriate landfill. If soil containing contaminants in excess of environmental criteria at 55 Rata Road is to be reused on site or at another location, it will be cement stabilised to prevent the

leaching of contaminants. Soils remaining at 55 Rata Road will either be clean or contain low levels of contamination below guideline values and are not likely to pose an adverse effect on human health or the environment.

27.6 Measures to avoid, remedy or mitigate actual or potential adverse effects of contamination to land and groundwater

From the assessment that was undertaken (outlined in detail in Technical Report 23, Volume 3), the sites within the proposed Expressway alignment that present the greatest risk to human health and the environment due to the presence of contaminants are:

- 55 Rata Road;
- Kāpiti Road Interchange; and
- 124-154 Te Moana Road (Te Moana Interchange).

A series of Management Plans in Volume 4 have been developed to mitigate any actual and potential effects of construction activities. Management Plans that will provide mitigation for effects relating to contaminants are detailed below:

- CEMP – Appendix K: Contaminated Soils and Groundwater Management Plan:
 - procedures to protect human health;
 - procedures to prevent discharge of contaminants to land and discharge of contaminants to water;
- CEMP – Appendix G: Construction Air Quality Management Plan – detailing dust suppression controls; and,
- A Construction Health and Safety Plan.

For the contaminated sites at 55 Rata Road, Kāpiti Road Interchange and at 124-154 Te Moana Road, remedial works will be required to protect human health and the environment from contaminants found during investigation. Remedial works will include the containment of contaminants on-site and / or the excavation and disposal of contaminated soils to a licensed landfill. A contaminated land specialist will also be employed during construction phase with the responsibility for:

- Co-ordinating additional soil and groundwater testing;
- Advising on classification of excavated materials for re-use and disposal;
- Co-ordinating groundwater management and disposal; and,
- Training of staff in contaminated land identification and control procedures.

The adverse environmental effects will be suitably mitigated by the implementation of the management framework outlined above, as well as adherence to relevant resource consent conditions.