

Appendix G

District Plan Assessment Criteria

General Natural Area Earthworks Assessment Criteria

- 3(a) The extent to which the scale of *earthworks* is consistent with the scale of *development* being undertaken.
- 3(b) The extent to which *earthworks* adversely affect the potential for **restoration** or **enhancement** around the area of *earthworks*.
- 3(c) The extent to which *earthworks* reduce the amount, range and linkages between representative *vegetation*, fauna habitat and *natural features*.
- 3(d) The extent to which *earthworks* adversely affect the significance or landscape value or natural character of *natural landscape elements* or other *natural features*.
- 3(e) The extent to which *earthworks* exacerbate or contribute to flooding, erosion or instability of *land* or the potential for flooding, erosion or instability of *land*.
- 3(f) The extent to which *earthworks* adversely affect or contribute to degradation of natural watercourses in a way that destroys or reduces their ability to support instream *vegetation* and fauna, their ability to be used as a healthy food source, their clarity, quality and flow and their suitability for swimmers.
- 3(g) The extent to which *earthworks* adversely affect the **mauri** (life force) of water.
- 3(h) The extent to which *earthworks* adversely affect the **visual amenity** of the *site* or *adjoining sites*.
- 3(i) The extent to which cut and fill activities involving *earthworks* are confined to the *site* rather than being transported off the *site*.
- 3(j) The extent to which *earthworks* may harm the health and safety of residents.
- 3(k) The extent to which *heavy vehicle traffic* generated to the *site* by *earthworks* activities creates:
- physical damage to a *road*
 - a situation hazardous or unsafe to *road* users.
- 3(l) The extent to which *earthworks* are necessary to accommodate *development* otherwise permitted by the *Plan*, or to facilitate the appropriate use of land in the *Open Space Environment*.
- 3(m) The extent to which more than minor adverse *effects* can be adequately avoided, remedied, mitigated or offset through provision of works and services on or off the *site* and/or through payment or provision of a *financial contribution*.
- 3(n) The extent to which a *driveway* requiring *earthworks* is designed to minimise *earthworks*, particularly by limiting the distance of the driveway on the *site*.
- 3(o) The extent to which *earthworks* are avoided.
- 3(p) The extent to which unavoidable *earthworks* are minimised.
- 3(q) The extent to which the duration of *earthworks* is minimised.
- 3(r) The extent to which the proposed *earthworks* are for development proposed in a relevant Operative Reserve Management Plan, Parks Concept Plan, current Waitakere City Parks Strategy and avoids any species known to be threatened or endangered.
- 3(s) The extent to which the proposed *earthworks* in an *Open Space Environment* avoids significant *vegetation* and any species known to be threatened, endangered or uncommon.

APPENDIX H

Soil Contamination Report

**NOSGA Soil Contamination Assessment
Massey North and Hobsonville Centre Nodes**

**Environmental Earth Sciences Limited: 304053
November 2004**

Relevant Pages (full report available upon request)

TABLE 1

RISK LEVEL RATING FOR HORTICULTURAL ACTIVITIES

Horticultural Activity	Pre 1980	Post 1980
Market Gardens	Low	Very Low
Orchards/Vineyards	Moderate	Low
Green Houses	High	Moderate

6.1 Massey North node

The Massey North node is approximately 157 ha in size. The majority of potentially contaminating activities and industries identified in this node were market gardens, orchards and green houses. Only one non-horticultural commercial property was currently noted, namely a steel storage yard and retail outlet. The risk to the environment and human health as a result of this activity is regarded as low given that this retail activity is not considered hazardous in relation to the HAIL index.

A number of greenhouses are in use and are currently visible within the Massey North node area. In total, sixteen greenhouses appear at two locations, two green houses along the western border of the node and a cluster of fourteen green houses near the centre of the node. These greenhouses only appear on the recent aerial photographs taken in 2001 and were not identified on the 1985 photographs (Reference 12). Given the recent nature (post-1980) of these green houses the risk to the environment and human health as a result of these activities is regarded as moderate.

It could not be established from the aerial photographs and site drive-by inspections alone if any of the green houses are, or were, heated. The heating of green houses can occur through the burning of coal or fossil fuel, mainly diesel. The storage of fuel in tanks for heating of green houses or other agricultural activities will increase the potential for land to be contaminated, while the burning of coal can result in the onsite disposal of ash that also increases the potential for land to be contaminated.

The current study also indicated that approximately 75 percent of the land in the Massey North node has been used either historically or recently for market gardens or orchards. The earlier study by Tonkin & Taylor did not (and/or could not) distinguish between these two activities,

however, a study of historical aerial photographs by Waitakere City Council indicate that the majority of cultivated land was utilized as market gardens rather than orchards both prior and post 1980.

The activities and industries and associated risks associated with these activities are given in Table 2 below. The areas are approximate only based on limited available data.

TABLE 2

MASSEY NORTH NODE

Land use activity	Number of sites	Approximate Area <1980	Approximate Area > 1980
Total cultivated area		26.1 ha	118.21 ha
Market gardening	53	18.3 ha	118.21 ha
Orchards	7	7.8 ha	0
Greenhouses	16 (at two locations)	0	0.7 ha

Table 2 above indicates that the majority of land cultivated in the Massey North node was, and is today, cultivated as market gardens and was developed after 1980. Prior to this the land was generally rural pasture and used for animal grazing. Contamination from these activities can be considered to be very low.

A total area of approximately 7.8 ha was cultivated as orchards prior to 1980 and the potential for contamination of the land from these activities should be considered to be moderate.

Although there are 16 green houses located in this node, they were all constructed recently (post 1980) and the potential for contamination of soil from these greenhouse activities should be considered to be low.

6.2 Hobsonville Centre Node

The Hobsonville Centre Node is approximately 60 ha in size. Similar to the Massey North node, the only potentially contaminating activities and industries identified in this node are market gardens, orchards and green houses.

An estimated 40 percent of this land has been used over the years for market gardens or vineyards, with only a small number of greenhouses. This node also consists of rural lifestyle blocks but incorporate a school, a Returning Servicemen's Association building and a bowling club with playing fields.

The activities and industries and associated risks associated with the identified horticultural activities are given in Table 3 below.

TABLE 3

HOBSONVILLE CENTRE NODE

Land use activity	Number of sites	Approximate Area <1980	Approximate Area > 1980
Total cultivated area		12.7 ha	25.3 ha
Market gardening	3	4.4 ha	2.1 ha
Orchards	2	8.3 ha	7.1 ha
Greenhouses	5	0	0.1 ha

Table 3 above indicates that an equal portion of the land cultivated in the Hobsonville Centre node was, and is, cultivated as market gardens and orchards. It also shows that 50 percent of the orchards have been developed before 1980 and therefore the potential for contamination of the land from these activities should be considered to be moderate.

Fifty percent of the market gardens have also been developed post 1980 and therefore the potential for contamination of the land from these activities should be considered to be low to moderate. Prior to this the land was generally rural pasture and used for animal grazing. Contamination from these activities can be considered to be very low.

There are 5 greenhouses located in this node, however they were all constructed recently (later than 1980) and the potential for contamination of soil from these greenhouse activities should be considered to be low.

7.0 CONCLUSIONS AND RECOMMENDATIONS

A Preliminary Site Investigation (including review of reports, previous aerial photograph studies and drive-by inspections) of two nodes, Massey North and Hobsonville Centre, has identified that horticultural activities were the only potentially contaminating activities (as listed on the HAIL index) observed in these areas. Horticultural activities included:

- market gardens;
- orchards, vineyards; and
- greenhouses.

It is estimated that a total area of approximately 145 ha of land had been cultivated as market gardens and orchards within the two nodes investigated. There are also 21 greenhouses (some in use and some in disuse) within the two nodes. In line with current guideline requirements, a detailed site investigation (DSI) of this land will have to be conducted to evaluate the extent and magnitude of potential soil contamination.

Current and former market gardens and orchards should be investigated in accordance with the Auckland Regional Council's *Draft Soil Protocol for Horticultural Sites* (Reference 4). The protocol requires one composited soil sample to be collected per hectare (1 sample to consist of 10 sub-samples collected in a certain pattern across the area) on cultivated land (ie not in relation to fixed activities including greenhouses and fuel storage areas). Targeted discrete sampling should be undertaken of soils in the vicinity of chemical storage and mixing sheds, fuel storage tanks and other potential hotspots as stated in the afore mentioned protocol. It is also recommended that three soil samples (not composited) be collected from each greenhouse in the areas.

Soil samples from horticultural land should be analysed for organochlorine pesticides (OCPs) and copper, arsenic and lead as a minimum. Target samples should be analysed for the targeted parameters that may include herbicide scans, total petroleum hydrocarbons (TPHs) etc depending on the specific activity or target.

The current study did not include site walk over inspections or site owner interviews and could therefore not quantify the nature and number of other potentially contaminating activities that may have occurred. Drive-bys were also limited to observation of sites visible from the existing public road network. It is recommended that site visits and interviews with owners and past site

owners be conducted as part of any site investigations to be carried out in order to design the soil sampling and analysis program appropriately.

Detailed site investigations (DSI) should be conducted in accordance with the requirements of the Ministry for the Environment's guideline No 5: *Contaminated Land Management Guidelines – Site Investigation and Analysis of Soil* (Reference 7), prior to development occurring within areas which have been identified as potentially containing contaminated soils. Stage 2 investigations should be undertaken to determine the extent and nature of potential contamination. Such investigations and remediation will necessarily need to be a prerequisite to the future development of the subject land.

APPENDIX B
REVISED TABLES

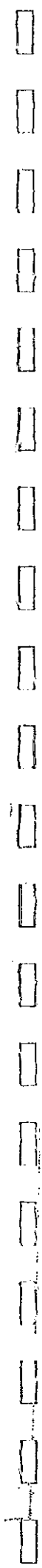


Table 1
Potential contaminants and affected media

Land use activity	Potential contaminants	Potentially affected media
NZ Defence Force airbases <ul style="list-style-type: none"> ▪ fuel storage ▪ engineering ▪ mechanical repair workshops ▪ aircraft, equipment painting ▪ waste disposal ▪ firing range ▪ munitions storage ▪ munitions disposal 	<ul style="list-style-type: none"> ▪ petroleum fuels, oils ▪ heavy metals ▪ oils, lubricating fluids, greases ▪ solvents, paints ▪ broad range of possible contaminants ▪ lead ▪ explosive, flammable materials ▪ unexploded ordinances, metals 	Surface and subsurface soil, sediment, groundwater
Controlled and uncontrolled landfills	Heavy metals, semivolatile organics, nitrates, chloride, ammonia	Sediment, surface water and groundwater
Service stations	Petroleum hydrocarbons, fuels, lead	Soil profile generally up to 5 m depth, groundwater
Vehicle mechanical workshops	Petroleum hydrocarbons, including fuels, oil, lubricating and hydraulic fluids, lead	Near surface soil, deeper soil if underground fuel/oil tanks
Panelbeaters and spraypainters	Heavy metals, solvents, thinners	Near surface, subsurface if underground tanks
Scrap yards	Petroleum hydrocarbons, including fuels, oil, lubricating and hydraulic fluids	Near surface soil
Market gardening	Organonitrate and phosphate pesticides, herbicides, fungicides and residual organochlorine pesticides, lead, arsenic, copper	Near surface soil and surface water
Timber treatment and storage	Copper chromium and arsenic timber preservatives and possibly other fungicides and solvents associated with antisapstains	Near surface soil and surface water
Plant nurseries	Fungicides, herbicides, pesticides, lead, arsenic, copper	Near surface soil and surface water
Orchards	Fungicides, herbicides, pesticides, lead, arsenic, copper	Near surface soil and surface water
Glasshouses	Fungicides, herbicides, pesticides, lead, arsenic, copper	Near surface soil
Vineyards	Fungicides, herbicides, pesticides, lead, arsenic, copper	Near surface soil and surface water
Chicken farming/piggeries	Faecal coliforms, nitrates	Near surface soil and surface water, air

Table 2
Likelihood and potential magnitude of contamination

Activity	Likelihood of contamination	Potential magnitude of contamination
Military bases		
▪ fuel storage	High	Low – moderate
▪ engineering	Moderate	Low – moderate
▪ mechanical repair workshops	Moderate	Low – moderate
▪ aircraft, equipment painting	Moderate	Low – moderate
▪ waste disposal	High	Moderate – high
▪ firing range	High	Moderate
▪ munitions storage	Moderate	Low
▪ munitions disposal	High	Moderate – high
Controlled landfills	High	Moderate
Uncontrolled landfills	High	High
Market gardening	Moderate	Low
Plant nurseries	Low	Low
Glasshouses	Moderate - high (depending on age)	Moderate - high
Orchards	High	Low - moderate
Vineyards	High	Low - moderate
Service stations	High	Low – moderate
Scrap yards	Moderate	Low
Vehicle mechanical repair workshops	Moderate	Low – moderate
Panelbeaters and spraypainters	Moderate	Low - moderate
Timber treatment and storage	High	Low – high
Poultry farming	Low	Low
Piggeries	Low	Low
Stock farming / dips	High	High




PRE-1980 HORTICULTURAL SITES



POST-1980 HORTICULTURAL SITES



Photographs from ARC website. Scale approximately 1:15 000

-  = MARKET GARDENS
-  = ORCHARD / VINEYARD
-  = GREENHOUSE

Client: Waitakere City Council		
Title: Aerial photographs - Hobsonville Centre Node	Drawn: JH	Appendix C
Location: West Auckland	Project manager: JF	
	Approved: TB	Date: Nov 2004
ENVIRONMENTAL & EARTH SCIENCES LTD		