



Report 05.478
Date 6 September 2005
File SN/06/034/02

Committee Environment
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Contamination Assessment - Bentley Street Gasworks, Masterton

1. Purpose

To report the results of an investigation to delineate and quantify the contamination present over the entire Bentley Street Gasworks site in Masterton.

2. Background

The Bentley Street Gasworks was established between 1907 and 1910 - when the Gasworks on Banister Street could no longer supply the needs of the community - and continued to operate until the 1970s. Specific areas of the site have previously been investigated. The aim of this investigation was to fill in the information gaps left by the previous investigations and provide sufficient information to allow a remediation scheme to be developed. This investigation was jointly undertaken with Masterton District Council, with funding from the Ministry for the Environment's Contaminated Sites Remediation Fund (CSRF).

3. Strategic context

The *Take 10 Quality for Life* identifies *Limited pollution* as part of our vision for our communities. Pollution of air, land and water should be limited to what the natural environment can tolerate. It has been thirty years since the site has closed and significant concentrations of contamination are still present on the site. The Region Policy Statement for the Wellington Region contains a policy *to minimise the risk of damage to the environment and human health from contaminated sites in the region.*

4. Method

Utilising the results of the previous investigations, gap analysis was undertaken to determine the areas of the site where further information was required. Ten boreholes and thirty trial pits were sunk and samples taken in the areas

identified. A description of the fill materials, soil and subsoil encountered in the boreholes and trial pits was logged. The soil samples recovered were analysed for the following:

- heavy metals – arsenic, copper, chromium and lead
- total petroleum hydrocarbons (TPHs)
- 16 US EPA priority poly-aromatic hydrocarbons (PAHs)
- BTEXs – benzene, toluene, ethyl benzene and xylenes
- cyanide

Groundwater samples from existing boreholes on the site and surface water samples from the Makakaweka Stream – upstream and downstream of the site - were collected and analysed for the following physical and chemical parameters:

- total petroleum hydrocarbons
- BTEX – benzene, toluene, ethyl benzene and xylenes
- cyanide
- ammonia
- nitrate
- phenols
- total dissolved solids
- dissolved oxygen
- pH
- conductivity
- redox potential

5. Results

The results of the analytical testing of the soil samples showed that the majority of the site is significantly contaminated. The highest concentrations of contaminants were found in the immediate vicinity of the main gas production area. The major contaminants in this area were lead, cyanide and benzo[a]pyrene. Many of these samples exceeded the guideline values for residential land use and a few instances industrial/commercial guidelines were exceeded.

However, away from the main gas production area, the contamination was generally associated with the surface materials and has not migrated into the sub soils below. The contamination found in these areas was associated with the ash material which had been spread across the site. The main contaminants found were arsenic and benzo[a]pyrene at levels which exceeded the guideline values for residential land use.



The analysis of the groundwater samples taken from beneath the main gas processing area showed elevated concentration of PAH's, cyanide, ammonia and benzene.

No significant contamination was identified in the analysis of the two surface water samples. No changes in water quality were observed between the upstream and downstream samples.

6. Conclusions

The site is significantly contaminated with a wide range of contaminants. Contaminated materials cover most of the surface of the site and extend to depth in the locale of the main gas processing plant.

The results of the surface water monitoring indicate that the contaminants in the groundwater and soil are not impacting on the health of the Makakaweka Stream.

The potential uses of the site are restricted whilst the site remains in its current condition.

7. Further work

Four boreholes have been drilled on the boundaries of the site to determine whether contaminants are migrating off site. The groundwater from the boreholes has been sampled and sent for analysis. We are awaiting the results to determine the risks posed by the contaminated groundwater.

We have discussed with Masterton District Council what remedial works may be required to return the site to an active use. The extent and nature of the remediation will be dependant on the land use proposed for the site. Masterton District Council has yet to decide on how they intend to use this site. Greater Wellington will coordinate an application for further CSRF funding to undertake the remediation if required, and will provide technical assistance and advice on request.

8. Communication

Copies of the results of the investigation have been provided to Masterton District Council and the Ministry for the Environment.

9. Recommendations

It is recommended that the Committee:

1. *receive this report; and.*
2. *note the contents.*

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