



with depth, indicating that the source of contamination is likely to be the constituents of the black ashy fill layer.

Concentrations of contaminants on the northern side of the fence are significantly less, with BTEX not detected above the laboratory limit of reporting in most of the samples analysed at several depth intervals. The only sample in which BTEX was reported as a 'substantial concentration' was in TP4 (immediately to the north of CH2M Hill Pit TP44), in which BTEX compounds were reported to be above the laboratory limit of reporting, but below the applicable thresholds.

Several fragments of fibre cement sheeting were located in TP11 to the eastern side of the delineation area. Analysis of one fragment of sheeting from this location indicated the presence of chrysotile asbestos. The fibre cement sheeting appeared to be limited to fragments located within the fill material at a depth of approximately 0.5m. The analysis of one soil sample from the same location did not detect asbestos within the soil matrix. It is considered likely that the source of the asbestos was general fill debris imported to site when the Cleaning Sheds area was filled to the current grade. Fragments of fibre cement sheeting were not observed in the remaining test pits.

9.3 Area Requiring Remediation

From the results presented above, it is considered that the contamination on the southern side of the fence (ie, in the Gasworks area) may be widespread. PAH, TPH and BTEX contamination was detected in two delineation pits on both sides of TP44 which suggests that the lateral (east to west) extent of contamination on the former Gasworks side of the site has not been defined.

However, the extent of contamination on the former Cleaning Sheds area (north of the fenceline) has been characterised during the current round of sampling with eight test pits excavated on 5m and 10m spacing stepped out from the location of TP44.

With the exception of minor BTEX detection (below the applicable thresholds) in TP4, samples analysed did not detect BTEX at concentration above the laboratory limit of reporting.

The concentrations of TPH, PAH and BTEX detected in the current investigation above the site investigation levels on the former Gasworks area were found to be associated with fill material, comprising predominantly black ash, coal, coke and slag.

As such, it is considered that the contamination reported in CH2M Hill Pit TP44, plus GHD Pits TP1 and TP3 is associated with the filling of the Gasworks area adjacent to the brick retaining wall. Based on analytical results obtained from test pits from the Cleaning Sheds area, it is considered that 'gross' contamination is unlikely to extend to the Cleaning Sheds area and appears restricted to the southern side of the fence within the bounds of the Gasworks area. However, the western and eastern extent of contamination detected along the line of the brick retaining wall within the Gasworks area has not been defined.

GHD consider that whilst ash was detected north of the fenceline (within the Cleaning Sheds area), concentrations of contaminants, including BTEX, were not at a level that



would warrant further investigation or remediation given the nature of the proposed rail landuse for the site. In addition, given the minor concentration of BTEX at TP4 and that BTEX was not detected in the other test pits at the cleaning sheds site, the likelihood of potential vapours being generated from low levels of BTEX in ash is considered to be low.

Further investigation and remediation would however be required on the Gasworks area when RailCorp assess this area at a later date.

9.4 Waste Classification

Results of the TCLP testing of selected samples of ashy fill material at the site indicate that contaminants do not leach at appreciable concentrations. However, total concentrations of B(a)P were found to be in excess of the inert waste criteria.

As such, the majority of the ashy fill material would be classified as **solid waste** in accordance with the NSW EPA Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes (1999).

A small amount of material in the vicinity of TP1 would nominally be classified as **industrial waste** due to high total concentrations of TPH in surface soils. This material could be considered as a 'hotspot' for the purposes of waste classification and treated separately when offsite disposal is required. Alternately, the material may be re-classified upon excavation.

It should be noted that the waste classification contained in this report was specifically for the ashy fill material at the site (delineation area) that was understood to potentially require remediation during redevelopment. Topsoil and general clay fill material that is located at the site, and materials in the wider Macdonaldtown Triangle have not been classified.



10. Conclusions and Recommendations

GHD was commissioned by RailCorp in August 2005 to undertake delineation and waste classification sampling of part of the RailCorp property known as the 'Macdonaldtown Triangle', located on Burren Street, Macdonaldtown.

The investigation was required following previous environmental investigations at the site where elevated levels of BTEX and PAH were detected from the property's former use as a gas works and rail infrastructure facility.

The Macdonaldtown Triangle is separated into two areas as defined by their historical uses; 1) Former Cleaning Shed Area, and 2) Former Gasworks Area. These two areas are currently separated by a chain wire fence that runs approximately south west to north east across the site. Previous investigations detected contamination at both sites. However, as RailCorp is currently redeveloping the cleaning sheds site for rail purposes, the current investigation was only focused on assessing the nature and extent of contamination at the Cleaning Sheds area that may require remediation for the area to be suitable for the proposed landuse.

Surveying of the location of the former test pit TP44 indicated that the pit was located on the adjacent former Gasworks area and not in the Cleaning Sheds area. As such, contamination detected on the adjacent Gasworks area was not considered for the purposes of this report. It is understood that remediation and validation of the former Gasworks area will take place independently of the former Cleaning Sheds area and at a later date.

Concentrations of contaminants of concern (chiefly BTEX) were not detected at significant concentrations on the former Cleaning Sheds area. BTEX was detected in samples collected from one test pit (TP4) with concentrations of BTEX in the remaining test pit samples below the level of reporting of the laboratory. The subsurface conditions observed at the Cleaning Sheds area did not indicate a large degree of filling from ash or other by-products of the gasworks. Filling at the Cleaning Sheds area comprised rail ballast, back fill clay and some ash / coal.

Ashy fill material from the Cleaning Sheds area of the site (north of the fenceline) would nominally classify as **solid waste** for off-site (landfill) disposal purposes.

However, contaminants of concern including BTEX, PAH and TPH were reported at high concentrations in ashy material in two of the three test pits excavated east and west of CH2M Hill Pit TP44 (i.e., on the former Gasworks area). This material would nominally classify as hazardous waste for off-site disposal purposes due to high PAH concentrations. However, the high PAH concentrations appear to be associated with ash, and therefore the *NSW EPA General Approval of the Immobilisation of Contaminants in Waste (1999/05)* can be applied. The nominal classification of the ashy material in the Gasworks area of the site (south of the fenceline) would then revert to **industrial waste** (due to TPH concentrations). Large amounts of fill comprising ash, slag, coal and coke were detected in the pits east and west of TP44.



Observations of the filling in the test pits also indicated that the use of ashy fill material increased towards the south, abutting against the brick retaining wall.

It is considered likely that a different type of fill (or fill from a different origin) was used on the Gasworks area to fill up against the brick retaining wall. On the Cleaning Sheds area, clay, rail ballast and some ash / coal was used to backfill in and around former site infrastructure including building footings and walls.

Given that contaminants of concern were only detected at elevated concentrations on the Gasworks site, it appears likely that 'gross' contamination is restricted to the southern side of the chain wire fence (in the strip of land between the fence and the brick retaining wall).

GHD consider that whilst ash was detected north of the fenceline (within the Cleaning Sheds area), concentrations of contaminants, including BTEX, were not at a level that would warrant further investigation or remediation given the nature of the proposed rail landuse for the site. In addition, given the minor concentration of BTEX at TP4 and that BTEX was not detected in the other test pits at the cleaning sheds site, the likelihood of potential vapours being generated from low levels of BTEX in ash is considered to be low.

Test pitting on the Cleaning Sheds area revealed the presence of several brick walls approximately 0.4m below ground level on top of the concrete slab that was located in previous investigations. GHD understand that the area of the current investigation will receive up to 2m of imported fill material as part of the site redevelopment. Notwithstanding this, depending on the type of rail infrastructure construction that is proposed for the area of the current sampling, it is recommended that advice be sought from a suitably qualified geotechnical engineer for the foundations of the new infrastructure.

Several fragments of fibre cement sheeting containing chrysotile asbestos were detected in TP11 on the cleaning sheds site. As this material was found at depth and based on GHD's understanding that the Cleaning Sheds area will receive up to 2m of imported fill material as part of the site redevelopment, the presence of fibre cement sheeting at depth is not considered an issue that would affect the redevelopment of the cleaning sheds site into rail infrastructure. Depending on construction that is proposed for that part of the Cleaning Sheds area, caution should be exercised when excavating into soils. Given the random filling history of the area, further detections of asbestos fibre cement cannot be precluded.

As such, general caution should be maintained by the construction contractor for construction works at the Cleaning Sheds area. The construction contractor should make contingencies for 'unexpected occurrences' in their project safety plan.

For example, to account for the possible presence of fibre cement sheeting fragments:

- ▶ Any works that involve significant soil disturbance should be undertaken in a manner that minimises potential dust generation. Soils should be dampened during any such works, and workers involved should be fitted with appropriate health & safety equipment. If fragments of fibre cement sheeting are observed