

Appendix B

Aerial photos during remediation works





Appendix B

Photographic Record BH105 Trial Trench



Borehole BH105 had recorded 512mg/kg of 1,2, dichlorobenzene within a previous ground investigation. During the trial pitting exercise across the site within the 20m grid squares no elevated levels of 1,2, dichlorobenzene was discovered.

The trial trench was excavated between BH105 (shown next to the white board) and WS110 (yellow pipe to the centre right).



A trial trench was excavated next to BH105, no odour detected with a human nose and readings on a PID meter were encountered at 3.1ppm near the surface.



During the trial trenching a PID was used and the results were recorded on the site referencing board used for each trial pit. Also, prior to breaking ground a CAT scan was used to prevent encountering live services.



Samples were taken for VOC testing and the results confirmed that no elevated levels of 1,2, dichlorobenzene were present. The material excavated did not exhibit any signs of contamination (strong odour or discolouration). Our only explanation for this is likely to be an error during the historic sampling, test and reporting.

Bioremediation Process



An area of the site that did not detect contamination was levelled and then a membrane was installed to prevent cross contamination. The membrane is held in place and protected with a layer of crushed material.





After setting up the treatment area impacted soils were transported on to treatment pad. Each cell excavated was placed to form a biopile to enable treatment and monitor testing for validation purposes.



Appendix B

Photographic Record Cell One



Prior to the commencement of excavating the ground, each area was subject to a CAT scan to check for underground services.



This image shows the start of the excavation process as the impacted material was carefully removed from each identified impacted grid square.



During the excavation process a PID meter was used to help in identifying the differing concentrations of contamination. This also assisted in tracking the suspected contaminated ground.



Each grid section within the cell was recorded on a white board denoting the PID readings and depth, while chasing the impacted ground during the excavation process.

Appendix B

Photographic Record Cell Two



Excavation process showing the groundwater interface encountered at the base of the void within cell two.



This image shows the excavation process as the area within cell two was reduced down recovering the impacted material.



The images displayed here show the black bands of contamination next to GJR03 within cell two. As the material was contaminated, this was excavated and removed to the treatment area, which resulted in the removal of borehole GJR03.



This image shows where contamination is present in black bands above and below the clay material. The cone is placed over borehole GJR03 as a marker.



A measuring staff has been used to confirm the depth and contrast against the darker impacted ground and deeper clay strata.



After collecting validation samples from the sidewalls and base of the excavation, the void was dished to make it safe.



A limited amount of site available material was used to dish the void and lift the bottom of void above the groundwater table.

Appendix B

Photographic Record Cell Three



Material from cell three that was identified within the trial pit stage, prior to being removed and placed in the treatment zone.



This image shows the type of material that was impacted and the visual effect it had on the material leading of



Image shows the depth of the excavation and partly graded sidewalls prior to validation samples being obtained.



Cell three after completion had a failure on two of the faces resulting in the further excavation of material to ensure that only soil below the site derived RTV's remained. An earth bund was used to prevent water ingress until the suspected impacted material was fully excavated.



Further testing was carried out in the extension of cell three, with further testing for faces and bases completed.



Finally the earth bund was removed after obtaining the validation results. The bund material was then placed into the treatment area.

Appendix B

Photographic Record Cell Four



The first image is of the start of the excavation in cell 4, with on going PID monitoring to assist in finding the depth of the contamination.



This is the same void in cell4 from a different angle.



Cell four was excavated down to clean material as determined by the PID meter and visual factors. Chemical testing also verified the chemical makeup of the material to be below RTV's.



Impacted material identified in the vicinity of BH104 is shown. The soils were observed to exhibit visual and olfactory indicators of contamination, including discolouration and staining, consistent with previously identified ground conditions in this area.



Material being removed from cell four showing the impacted material (lighter/grey in colour) above clean base (orange/brown natural material).



This image shows the control of water when extending cell four with the earth bund limiting the ingress of water as the recovery of impacted material is excavated for treatment. Validation samples were taken from the base and sidewalls. Finally the earth bund is removed to the treatment area and the water is released into the void

Appendix B

Photographic Record Trial Pitting Sampling Grid



Prior to the commencement of the remediation works, a trail pitting exercise was undertaken to confirm on a grid formation the location(s) of the contamination of concern while still insitu.

The 4 images presented show the referencing system used for each grid square.



Each trial pit was logged, and soil samples were collected for VOC testing. In addition to this a PID meter was used to help assess the levels of suspected solvents within the site.



The upper left image denotes the completed trial pit just above the resting groundwater interface. This also aids in confirming the ground conditions and strata matrix.



Finally, each trial pit was logged and the depth recorded. This allowed each phase of the works to be recorded.

Appendix B

Photographic Record Water Sampling



Portway tested Knowsley brook following the completion of the remediation process. To ensure that the watercourse was unaffected by works undertaken, samples were taken from the nearest open source for the brook, both up and down stream. This is the **up-stream** location.



The **downstream** sample location was via the culvert, located on the south western side of the site and is that last location before the culvert exits off site. The test result mirrored the upstream result showing that the brook continues to be unaffected.

Appendix B

Photographic Record – Water Treatment System



This shows the treatment system we used before the water was discharged under a permit to the foul sewage.

The system includes a silt buster to remove any suspended solids and a pressurised carbon filter to remove any free and dissolved phase before discharge.



Photographic Log Asbestos Trial Pit at WS103



As a detection of asbestos had been noted within a previous site investigation report, further detailed analysis was undertaken on site. The yellow box on the righthand side of this image is part of the background air monitoring device for asbestos fibres.





This image shows the ground conditions encountered within the vicinity of WS103, mostly natural undisturbed soils.



An inspection of the ground was undertaken, and no visible fragments were encountered. Soil samples were obtained for asbestos screen and quantification testing. During these site works full PPE and RPE was used.