Crest Strategic Projects Limited/ Persimmon Homes (Wessex) Limited

Albright & Wilson Decontamination, Portishead

Zone 4 - Final Report

February 2001

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Job number 50533-01

1.0 INTRODUCTION

1.1 General

This report covers the verification of the decontamination of Zone 4 of the Albright & Wilson (A&W) site at Portishead, as defined by the Schedule of Decontamination Works and shown on Figure 1. The work was carried out between January 1998 and February 2000. Grid-by-grid records of the Zone 4 decontamination can be found in Appendix A.

1.2 Schedule of Decontamination Works

The Schedule of Decontamination Works (SDW) referred to in this document is revision J of the Schedule of Decontamination Works issued by Arup in July 1997. The SDW subsequently formed part of the Section 106 agreement for the Portbury Park development referred to as 'the Albright & Wilson Works', and was agreed to by North Somerset Council, Albright & Wilson (A&W), the developers and Bristol City Council, the landowners.

The standard of decontamination as verified by this report is as set out in the SDW, with agreed variations as detailed in 1.7 below.

Section 9.0 of the SDW, covering the decontamination of Zone 4, can be found in Appendix B.

1.3 History of Zone 4

Examination of early Ordnance Survey maps of the area as well as other documents shows that the area was formerly saltmarsh prior to construction of Portishead Dock in the 1870s and subsequently in 1903 a large timber yard and associated dockside wharves were established.

In 1952 A&W took a lease on an area of land overlapping the old timber yard and constructed a phosphorus refinery on the site. Coarse clinkery ash from a power station on the other side of the docks as well as imported rock fill was used to level the site. A schematic layout of the plant is included as Figure 2.

Phosphorus manufacture ceased in 1970 and, from 1972, the furnaces, calciners etc were demolished.

1.4 Previous Decontamination Works

Two area, Pits 5 and 6, had been suspected as having been used for deposition of waste during the life of the works or after demolition. The former were the slag bays and the latter, clay slurry tanks. These had been largely cleared prior to the works covered by the SDW. Extracts from A&W's own record of these works can be found in Appendix C.

1.5 End Use

It is intended that the site be developed for residential or commercial use, including buildings, open space and hardstandings. It is anticipated that all buildings will be piled, with the exception of small light or insensitive structures.

1.6 Method Statements

Zone 4 included a number of existing structures and sub-zones requiring varying treatments. The various method statements are listed below and are contained in Appendix D along with related correspondence and comments:

1 Phase I - Ex Furnace Bases and Slag Bays
(PH/JH/014/98 : 23/03/98)

2 Phase II - Demolition of Clean Superstructures

(a) Garages and Stores
(b) Ferro Phosphorus Store (Old Boiler House) and Associated Out Buildings
(PH/JH/014(A)/98 : 21/05/98)

3 Phase III - Demolition Hardstanding on Substructures

(a) Former Phosphorus Drum Store
(b) Foul Water Collection Pit
(c) Concrete Hardstanding below Former Garages
(d) Concrete Hardstanding between Office Block and Fence Line at Inner Security Gates
(PH/JH/014(B)/98 : 29/06/98)

4 Phase IV - Crushing on Site of Concrete Material to Produce Reusable Hardcore at Portishead Site
(PH/JH/014(C)/98 : 29/07/98)

5 Phase V

(a) Area Under Stockpile 'F'
(b) Old Furnace Transformer Area
(PH/JH/024/98 : 24/09/98

6 Phase VI - Demolition of Concrete Silos

(PH/JH/0255/98 : 24/09/98)

7 Phase VII - Area Under Old Amenity Block
(PH/JH/026/98 : 02/10/98)

8 Phase VIII - Old Calciner Area
(PH/JH/030/98 : 15/12/98)

9 Phase IX - Demolition of Clean Superstructures

(a) Former Locomotive Shed (LEL Workshops)
(b) Former Stores (LEL Offices/Stores)
(PH/JH/031/99 : 13/01/99)

10 Phase X (PH/JH/027/99)

1. Process House Superstructure and Substructures
2. Roadway adjacent to Process House including Concrete Slabs
3. Old Storage Tanks Nos 1 and 2
4. Oil Storage Tank Bund
5. Tank 1A Concrete Bund
6. Road Tanker Loading Bay and Weighbridge.

10a Addendum to Method Statement No PH/JH/027/099 dated 10/05/00

"Second pass remediation ..."

11 Final clean up and Testing of Area used to Process and Oxidise Materials at the Southern End of the Site (PH/JH/50A/2000: 19/10/2000).

1.7 Agreement Amendments to the Schedule of Decontamination Works

It was agreed by all parties in the meeting of 3 July 1998 (for minutes see Appendix E) that the clean backfill between 7.5m AOD and 8.05m AOD for Zones 2 and 3 need not be granular material, and could be clean clay, provided that it conformed to the maximum particle size prescribed by the SDW and was proved by chemical testing or by being natural soil to be free from contamination. It was also agreed that similar materials could be used to make up levels to about 8m AOD in Zone 4.

1.8 Zone 4

For the purposes of this report, Zone 4 has been separated into five sub-zones as shown on Figure 3 and as follows:

Sub-Zone	Grids	Description
A	H8 - H13, I8 - I13, J8 - J13, K8 - K13	Furnace House and Slag Bays
B	L5 - L16, K14 - K16	Garages, Workshops
C	E1 - E7, F1 - F7, G1 - G7, H1 - H7, I1 - I7, J1 - J6	Silos, Amenity Building, Boilers, Engine House etc
D	F8 - F14, G8 - G14	Process House, Mudstill
E	L1 - L5, M1 - M5	Retained Office and Slab

Note that the above has been simplified and 'part' grids are not listed.

These are covered by A&W's Method Statements as outlined below:

2.0 DECONTAMINATION - OBJECTIVES

The decontamination objectives for Zone 4 are as follows:

(a) Removal of all buildings, hardstandings, slabs, foundations, pile caps, substructures and obstructions to piling, except existing piles and those structures shown on Plan 3 [of the SDW].* Demonstrate that ground around/under these buildings/roads is free from process waste materials.

(b) Remove all elemental phosphorus.

(c) Removal of all calcium silicate slags and phosphate rock.

(d) Remove all buried pipe runs and surrounds to clean original fill.

(e) Removal of 'other contaminants'.

(f) Crush clean brick and concrete from demolition to provide a granular fill material free from all process materials.

(g) Fill slag bays and any other deep depressions in layers and compact following the principles established for Zone 2 and set out in Section 4 [of the SDW].

(h) Spread and level existing fills to fill minor voids and provide level platform.

(i) Provide minimum 100mm topping of Class 6F2 granular fill.**

* Subsequently the area of 'retained structure' was reduced to comprise only the offices and a small area of adjoining concrete hardstanding. This facilitated removal of drain runs and confirmation the fill beneath was free of process waste (objectives (f) and (h).

** Finished levels were not specified but practical considerations required the site to be brought up to 8 to 8.2m AOD to conform with levels elsewhere on site.

2.1 Meeting the Objectives

Albright and Wilson's method statement Phases 1-X (Appendix D) describes the methods used to clear and decontaminate Zone 4. The individual objectives are addressed below, including the methods of verification and recording, with reference to further details and records within this report.

(a) Removal of Buildings and Obstructions to Piling

Identification and Action:	Buildings demolished, surfacing broken out, obstructions, visually identified by excavation operatives, broken out and removed. Oversize material in 'site-won fill' identified and removed by excavation/backfill operatives.
Recorded:	Piles left in place as per 9.0(ii) of the SDW surveyed for position as aid to future construction.
Reference:	3.2.5, 4.2.7, 5.2.1, 5.2.2, 6.2.1, 6.2.3, 6.4.3

(b)	**Remove All Elemental Phosphorus**
Identification and Action:	Visually identified by excavation operatives, and other site staff. Removed to skips and disposed of by mudstilling or oxidisation
Verified:	Interim test results confirmed absence of phosphorus in sampled excavated material. Samples and test results recorded in site lab book.
Reference:	3.2.4, 4.2.5, 5.2.4, 6.2.6, 6.4.4. Sample numbers recorded on GDS (Appendix A)
(c)	**Remove All Calcium Silicate Slags and Phosphate Rock**
Identification and Action:	Visually identified and removed by excavation operatives. Material not easily separated by excavator mechanically screened to <12mm. Larger material treated as slag, fine material checked with radiation meter to detect slag.
Verification	Top surface of backfilled "site-won fill" see 2.3 subjected to walkover radiation survey.
Reference:	3.2.2, 4.2.3, 5.2.2, 6.2.5. Radiation survey Appendix K.
(d)	**Remove Buried Pipe Runs**
Identification and Action:	Excavation along line of drains and pipe runs identified from drawings and site observations. Contaminated material treated and concrete etc crushed.
Verification:	Recorded on Daily Log Sheets, EC's diary.
Reference:	GDS (Appendix A)
(e)	**Identify and Remove Any Other Contaminants.**
Identification:	Known risk areas identified, particularly PCBs around transformers. Visual inspection and vigilance. Inspection by EC.
Verification:	See 5.2.5, and Appendix G for PCB tests.
Reference:	4.1.4, 4.2.6, 4.2.8, 5.2.5, 6.2.4
(f)	**Crush clean brick and concrete to provide a granular fill material free from all process materials.**
Identification and Action:	Concrete and brick arising from demolitions crushed on site. Any phosphorus impregnated material 'fired up' and separated for oxidising and further treatment. Slags removed by visual identification.
Verification:	Daily site log sheets, EC's Diary, visual inspection.

(g) **Fill slag bays … in layers and compact**

Identification and Action: Material compacted in layers.

Recorded: Daily site logs, EC Diary.

Reference: GDS (Appendix A) and trial pit records (Appendix H). 3.3.1, 4.3.1, 5.3.1, 6.3.1, 6.4.5

(h) **Spread and Level Existing Fills to Provide Level Platform**

Recorded: Daily site logs, EC's diary.

Verification: Fills tested for phosphorus and subject to walkover radiation survey. Includes site-won crushed concrete brick.

Reference: 5.3.1 GDS (Appendix A)

(i) **Provide Minimum 100mm Topping of Class 6F2 Granular Fill**

Action: To be completed.

2.2 Identification of Major Contaminants

Material	Identification	Verification
Calcium Silicate Slag	*Visual:* Bluish-grey angular gravel, sometimes cemented, mainly encountered in distinct strata and pockets.	>10cps on hand held rate meter.
Phosphate Rock Fines	*Visual:* Off-white/pale brown sub- rounded sandy gravel, mainly encountered in distinct strata and pockets.	>10cps on hand held rate meter.
Yellow Phosphorus	*Visual:* Ignites and/or fumes on exposure to air.	On-site lab testing as per standing instructions (Appendix F)
Red Phosphorus	*Visual:* Distinctive purplish red colouring *Mechanical:* Ignites and fumes when agitated, particularly on mechanical screening.	Sampling as per standing instructions (Appendix F).
Hydrocarbons	*Visual and Olfactory*: Black viscous appearance, "rainbow sheen" to standing water, "oily smell".	Sampling as per standing instructions (Appendix F). Offsite testing to establish TPH and PAH content.