

Procter & Gamble

Phase 1 Desk Study

Procter & Gamble Product Supply (UK) Ltd,
Havant

July 2003

Entec UK Limited

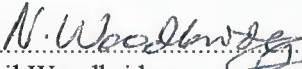
Report for

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Executive Summary

Procter and Gamble Product Supply (UK) Ltd (P&G) commissioned Entec UK Ltd (Entec) to undertake a Phase One Land Quality Assessment of the land on their site at Havant. P&G intend to cease manufacturing operations at the site and market it for redevelopment.

Site Description and Setting

This site is located within the town of Havant, Hampshire at National Grid Reference SU71330847. The site covers an area of approximately 7 hectares and consists of two main buildings, a two storied building used for manufacturing and administration and a warehouse.

The site setting is predominantly residential with several small businesses adjacent to the south west corner of the site, including a milk distribution depot.

Site History

Prior to 1959, the site was predominantly greenfield with the following exceptions:

- In the north west corner a small sandpit has been excavated and subsequently infilled towards the latter end of the 19th century;
- In the south west corner for a brief period during the middle part of the 20th century, formed part of a sewage treatment works which was subsequently relocated;
- Inside the northern boundary two circular structures of unknown origin are indicated during the middle part of the 20th century.

During 1959/60 the site saw significant development for two manufacturing purposes. Forerunners to Procter and Gamble (Tambrands) have manufactured womens sanitary products on the northern part of the site since the factory opened in the early 1960's. The southern part of the site was operated by Scalextric and its forerunner Mini Models for the production of scale model cars. From the early 1980's Scalextric relocated and the site was used as a commercial distribution centre. The original factory on the southern part of the site was subsequently demolished with Procter and Gamble purchasing the freehold in 1991, using the remaining building as their main distribution warehouse.

Site Reconnaissance

A site walkover by a member of Entec staff was conducted on 13 May 2003. Key findings were:

1. In relation to the former Scalextric factory, fuel oil was stored in a large underground storage tank; which once abandoned in situ, leaked residual oil in 1994, to the adjacent stream, a tributary of the Hermitage stream. The resulting incident involved a clean up by Procter and Gamble and the involvement of the regulatory authorities at the time, The National Rivers Authority. The tank was then removed although a series of underground oil feeder pipes are still believed to be still present.

2. Excavation of a service trench in 1992/93, adjacent to the new plant room, noted oily contamination. This may be due to either two small above ground storage tanks, one of which contained fuel, or the similar location of a former transformer which may have contained PCB's.
3. During the installation of a fire ring main in 2000/01 around the site perimeter, oil in an underground service duct was recorded outside of the canteen, however the excavation of surrounding ground indicated that this may have been localised to the cable duct.
4. Waste oils used as machine lubricants are disposed of as special waste using consignment note documentation and are stored in 3 small above ground, bunded storage tanks prior to disposal.
5. A small above ground, bunded diesel storage tank (approx. 1250 litres) fitted with a dispensing nozzle for refuelling of fork lift trucks, is located adjacent to a small bunded storage compound for 200 litres drums of predominantly machine lubricants.

Geology, Hydrogeology and Hydrology

The site although predominantly flat, has been substantially raised above the natural topography which dips from the north to the south across the site, towards the stream on the southern boundary. Material taken from cuttings in the northern part, have been used in the southern part of the site, giving a substantial thickness of Made Ground. The natural geology underlying the site is the Bognor Sand Member, bedded within London Clay which is made up of silty clay and sand. The London Clay extends to a depth of around 77 - 120 metres, below which are the regional chalks.

The hydrogeology under the site is classified as a 'non aquifer', and is negligibly permeable. Geological formations in the area contain insignificant quantities of groundwater, however very slight groundwater flow does exist and so risks associated with persistent pollutants cannot be ignored.

Localised hydrology in relation to the site is that of a tributary to Hermitage Stream along the south east site boundary. A ditch also bounds the north east boundary.

Regulatory Issues

The only significant regulatory issue relates to the environmental incident to the tributary of the Hermitage Stream, involving oil emanating from the site which involved the regulatory authorities. A formal caution was issued as a result of the incident.

The site doesn't hold a discharge consent. The only waste that goes to foul sewer is 'domestic' foul sewerage.

Risk Assessment

The following potential sources of contamination were identified as posing a moderate or greater risk to receptors, namely human health; as redevelopment workers, in a residential end use scenario and in a commercial end use scenario:

- The oil spillage evident in the stream prior to the removal of the underground fuel oil storage tank;
- The historical sewage treatment works;

- The oil spillage inside the cable duct;
- The historical infilled sand pit;
- The historical unknown above ground tanks;
- Former electrical transformer and aboveground fuel tanks;
- Current diesel fuelling point;
- Made Ground (infill material) quality under former Scalextric site;
- Redundant underground fuel pipes.

Conclusions

The overall land quality of the site, evaluated through the risk assessment approach is considered to be moderate.

A conservative approach has been adopted at this Phase One stage, in relation to the site's environmental sensitivity. This reflects the site setting in a residential area and potential redevelopment options, including residential housing with gardens.

As such the impact of the identified potential sources of contamination are un-quantified and may or may not be impacting soil or groundwater quality under the site.

Potential sources of contamination which pose a moderate or greater risk to receptors may have or could currently be impacting on a number of the identified receptors, in particular human health in a residential end use scenario and the tributary of Hermitage Stream, which is defined as a Controlled Water. These scenarios could pose environmental liabilities under Part IIA of the Environmental Protection Act 1990.

Recommendations

It is recommended that in order to quantify the identified risks, a compound specific, targeted Phase Two intrusive site investigation of potential sources of contamination is undertaken. This will enable the nature and concentration of contaminants and any potential environmental liabilities to be established.

In addition any recorded reduction in soil quality may require limited remediation, i.e. clean up of 'hot spots' of contamination. The degree of any such remedial work would be dependent on observed concentrations of contaminants and the associated level of risk reduction, required to ensure that the source no longer posed an unacceptable risk to the receptor.

In relation to risks associated with human receptors, any proposed remedial clean up would be driven by the sensitivity of the intended site end use. In general remedial clean up values for contaminants are lower for soils and groundwater which are in areas where more sensitive end uses such as residential housing with gardens are proposed.

A Phase Two intrusive site investigation based on the potential risks identified in this Phase One desk study assessment, will quantify the presence or confirm the absence of identified contaminants. This Phase two assessment will enable future potential stakeholders to have a greater degree of certainty and confidence in the overall land quality of the site, in relation to options for potential site redevelopment.

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1. Introduction

1.1 Background

Procter and Gamble Product Supply (UK) Ltd (P&G) have commissioned Entec UK Ltd (Entec) to undertake a Phase 1 Land Quality Assessment of the Havant facility near Portsmouth (hereafter known as the 'site'). In the near future P&G intend as part of a business rationalisation plan, to cease operations at the site and subsequently divest P&G's freehold ownership to a third party. Consultation is presently taking place with Havant Borough Council who administer the area, as to potential site redevelopment options. The site is presently designated under planning regulations by the Council for 'Industrial Use', under the current 10 year plan and restrictive covenants held by Portsmouth City Council, limit the site use to industrial, as it forms part of a wider area known as the Leigh Park Estate. However at this consultation stage all redevelopment options including a mix of industrial and residential end use are being considered.

Undertaking a Phase 1 land quality assessment will enable P&G to identify any potential environmental liabilities in relation to the Contaminated Land regime of Part IIA of the Environmental Protection Act 1990; that may be associated with the site, in relation to historical site operations. It will also aid clarification of potential land quality issues for future stakeholders.

1.2 Scope of Work

The scope of work was defined in Entec's proposal of 19 March 2003 (Ref.10657-00-C001), as detailed below.

The study will take the form of a stand-alone Phase 1 Report which include the following:

- The site setting in terms of site observations, any past potential contaminative activities and information held by the regulators.
- The site environmental setting, which summarises the potential for contamination migration beyond or on the site and the proximity of sensitive receptors such as watercourses.
- A qualitative environmental risk assessment, evaluating potential environmental liabilities in relation to legislation governing contaminated land.
- The conclusion will include a review of any identified environmental liabilities and recommend if further site investigation is required.

1.3 Report Format

The report comprises the following format:

- Section 1 - Introduction
- Section 2 - Environmental Setting;
- Section 3 - Environmental Risk Assessment; and
- Section 4 - Conclusions.

1.4 Information Sources

The following information sources have been utilised within this report:

1. Landmark Information Group, Envirocheck Report (Appendix A).
2. British Geological Survey 1:50,000 scale, Sheet 316, Fareham.
3. National Rivers Authority Policy and Practice for the Protection of Groundwater, Groundwater Vulnerability 1:100,000 Map Series, Sheet 45, West Sussex and Surrey.

2. Environmental Setting

2.1 Site Location

This site is located within the town of Havant, Hampshire. The A3(M) motorway is located about 2 km to the west of the site. Access to the site is gained through predominantly residential area, off Dunsbury Way. The National Grid Reference of the site is NGR SU71330847.

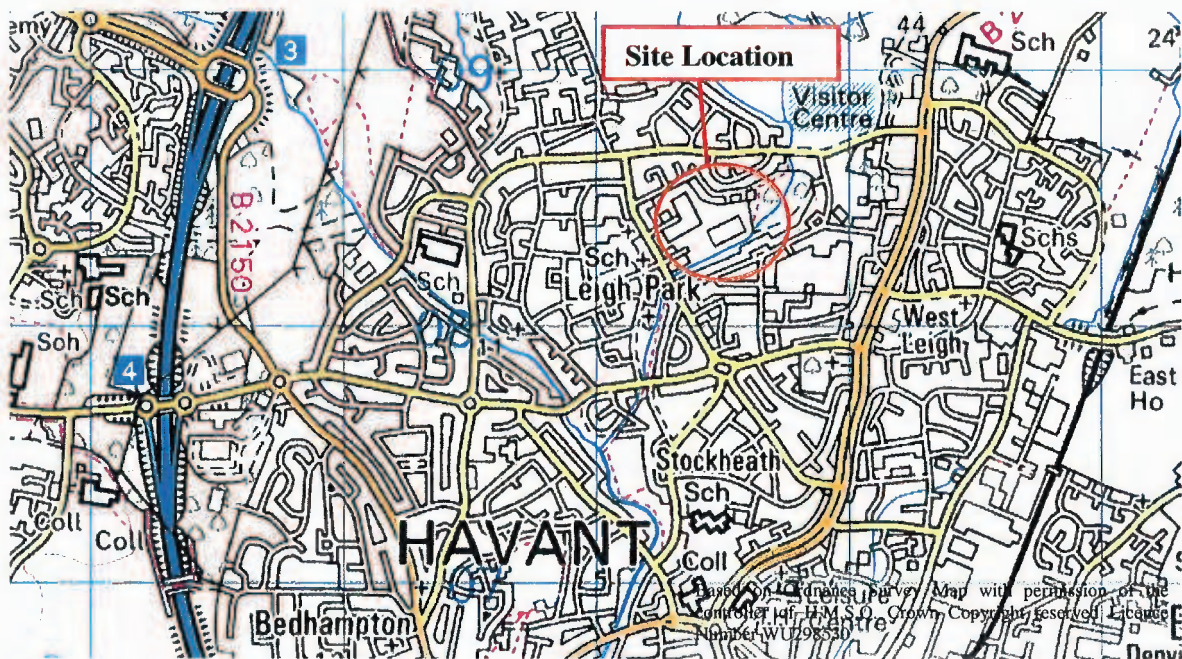


Figure 2.1 Site Location Plan

2.2 Site Description

The site covers an area of approximately 7 hectares, with the plan view loosely forming an L shape. The site is located on a slight incline, falling away to south south-west. The facility along its northern boundary is cut into the incline; this results in steep embankments up to the natural ground level, in the northern area of the site.

There are two access points onto the site, from the south west off Dunsbury Way. The most southerly of these is for HGV delivery and dispatches, the other is primarily used by staff and visitors, although specialised deliveries are received through this site entry point.

Table 2.1 Site buildings, occupiers and activities

Building No/Name	Activity	Notes
Main Building	Manufacturing/Administration	2 storied building, the majority of the production lines are situated on the 1 st floor. Extensions have taken place over 3 phases since construction in 1959. The building has a mix of flat and pitched roofs.
Stage 5 Warehouse	Storage and distribution of raw materials and finished product	Single storey, pitched roof, warehouse style building, with small internal mezzanine floor with loading ramps to the rear.

2.2.1 Site Boundaries

Site boundaries comprise the following dimensions and features:

- North west boundary : adjacent to the car park is a 10 - 15 m wide herbaceous border acting as a natural buffer prior to fencing and a residential road;
- North east boundary : a small copse some 20 - 30 m in depth forms part of the boundary, and there is residential development at the top of the embankment, some 4 m above site level to the rear of the warehouse; which forms the middle section of the boundary. The remainder of the boundary backs onto a public footpath which runs parallel to a small ditch. The boundary line is fenced with Palisade fencing.
- South east boundary : the entire length of the site boundary runs adjacent to the tributary of the Hermitage Stream. The land falls steeply to the watercourse some 2 to 4 m below site level in the most southerly corner. It is unclear from the property deeds if the P&G site boundary extends down the embankment to the stream or if it is located at the top of the escarpment. In this most southerly area the P&G boundary backs onto other commercial premises, comprising a milk float depot and a small car rental depot (with a car wash facility).
- South west boundary : the boundary is landscaped with gardens which form the front of the P&G facility on Dunsbury Way. The car park backs onto a mature wooded verge.

2.2.2 Surrounding Land Use

- The area around the site is predominantly residential. Opposite the site entrance on Dunsbury Way is a School, some 40 m from the site. Beyond the residential area immediately north of the site are parks and woods. Havant town centre and an industrial estate are beyond the residential areas to the south and south west respectively.

2.3 Site History

2.3.1 Review of Historical Maps

The history of the site and surrounding area has been established from a review of Ordnance Survey maps obtained from the Landmark Information Group. Summaries of the relevant contents of each map are given in Table 2.2. The main focus of this review is to identify historical, potentially contaminative issues that could leave a legacy of contamination, impacting soil and groundwater beneath the site and hence a resultant overall reduction in land quality.

Table 2.2 Historical Map Information

Edition and Scale	Description
1878/1866/1867/ 1868 1:2,500 and 1880/1870 1:10,560	The area is greenfield, with 'Billy's Copse' and 'Bondfields Copse' to the north and east of the site. The remaining site area appears to be fields, with a line of trees running north-south towards the river. A sand pit is located in the north-west corner of the site. There are numerous streams running through the copse woods, most notably, a stream running between the copse which is in the north, to the woods on the east of the site. Waterfalls are marked on the river to the east of the site. Wells are shown, 700 m and 600 m to the south east and south of the site respectively. There is a clay pit, clay mill and brick yard located approx 1 kilometre to the north east of the site. A brick and tile works is located 700m to the south west of the site. A lake is located 800m to the north east of the site.
1897 1:2,500 and 1898/1897 1:10,560	No significant changes from the above map, although the sand pit and the stream across the site are no longer shown. The sand pit may have been infilled. There is now what appears to be a larger stream running east-west through the copse in the northern part of the site. Another well is shown 700 m to the east.
1899 1:10,560	Two wells are shown 500m to the north west of the site, a further one is shown just across the eastern boundary. An area around the lake to the north east is now labelled 'Battery'. The brick and tile works to the south west are no longer shown, and the brick yard to the north east is labelled disused; the clay pits in the same area are no longer shown. An 'Old Gravel Pit' is marked, approx. 1.4 km to the south of the site. The area to the west of the site is not shown.
1909 1:2,500 and 1909/1910 1:10,560	The routes of the streams running through the copses have slightly altered, and kennels are shown 500m to the north west of the site.
1952/1953 1:2,500	A sewage disposal works has been constructed to the south west of the site, and the settling tanks and filter beds are located within the site boundary. Both Billy's Copse and Bondfields Copse are reduced in size, and two buildings have been constructed just inside the site boundary on Rider's Lane, one either side of the stream. A land drain has been installed from 'Rider's Lane Farm' on the western boundary of the site, with a second land drain installed in the eastern part of the site. There is residential development to the south west of the site.
1957/1964/1956/ 1958 1:2,500	The sewage disposal works are no longer shown. The copse has returned to its previous size to the south of the stream. There has been further residential development to the north and south-east of the site boundary. Parts of 'Great Copse', on the eastern part of the site, have become heath, or rough grassland.

Edition and Scale	Description
1971/1964 1:2,500 and	A large Works consisting of two large buildings and several smaller outbuildings has been constructed on the site. A factory covers the area of heath/rough grassland to the east of the site. There is an embankment on the site boundary behind the factory, as well as an embankment along the river. A building is shown but is not labelled on this map although on the next map, is labelled as an electricity sub-station. A Depot has been constructed in the area where the sewage disposal works were located.
1969/1970/1962/ 1973/1974/1971/ 1963 1:1,250	The residential development has increased, and now covers the area to the south of the site, as well as the areas where Billy's and Bondfields Copses were located, although it does not extend on to the site itself.
1971 1:1,250	The works buildings and factory have been extended, and embankments are shown around these buildings. There is a garage across Dunsbury Way to the west of the site, and the depot to the south west is now labelled as an 'Omnibus Depot' There is a tank located in the Depot. The north and east areas of the site are not shown on this map.
1991/1992 1:10,000 and	The main P&G works building has been extended. In addition a further warehouse style building has been constructed in the south of the site.
2000 1:10,000	

2.3.2 Historical Maps Summary

The site appears to have been greenfield prior to the 1860s, although the earliest map suggests that there was a sand pit in the north west of the site. This sand pit is not shown on any other maps, and was probably filled in at the turn of the 20th century.

Surrounding land use changed from mainly farmland and greenfield to extensive residential development in the 1950s. There has been some local industry, such as the clay pit and brick yard a kilometre to the north east and the brick and tile works 700 m to the south west, however these had closed by 1899.

The maps show the modifications that have been made to the works and factory building on site. Other significant changes to the site profile are the embankments, constructed around the factory and works buildings, which date from the 1960s.

Comparing the 1946 map to the 1953 map, a sewage treatment works was partly located on the site, possibly for a duration of twelve years, the sewage treatment works are not shown on the 1958 map. An bus depot was also located on the site, first appearing on the 1964 map. A tank appears on the 1971 mapping of the depot.

In addition, anecdotal information acquired during the site reconnaissance stated that the site was purpose built as two separate facilities between 1959 and 1960 for the manufacture of female sanitary products (Tambrands) and miniature scale car models (Mini Models, later to become Scalextric). Appendix B, Photo 1, shows an aerial view of the site around 1960. The miniature model factory is to the right, adjacent to the stream.

The 1960's aerial photo also reveals two cylindrical concrete tanks. Although they appear to be outside the site boundary, this area now falls within the staff car park in the northern area of the site.

Further redevelopment of the site during the 1970's led to two further extensions to the Tambrands factory, forming an L shape. A warehouse was built to the rear of the Scalextric factory. Scalextric vacated their site during the early eighties, the site subsequently being used as a commercial distribution warehouse for a short time by another company. The original Scalextric factory building was demolished in the late 1980's. Procter and Gamble purchased the freehold of the former Scalextric site/distribution warehouse site in 1991.

Historical aerial photos of the site (see Appendix A) and anecdotal evidence indicate that the industrial units to the south of the site have been used as a bus depot, a milk float depot and a house maintenance depot.

2.4 Site Reconnaissance

A site walkover by a member of Entec staff was conducted on 13 May 2003. The key findings of the site walkover are given below:

1. The site manufactures female sanitary products, with most production lines located on the first floor of the main building. Raw materials and packaging of finished goods are located on the ground floor.
2. Raw materials imported on to the site consist of man made cotton fibres (Rayon), cardboard and water based adhesives. No bleaching is carried out on the site.
3. Water based adhesives, dextrine and borax, are stored in two above ground bunded storage tanks (each approx. 9000 l.) located on the ground floor. The fill point for road tanker delivery is located outside the building. This area is not contained; should any spillage occur during unloading, it would enter the surface water drain and discharge to the stream. The adhesive would have a high biological oxygen demand, removing oxygen from the water which is potentially fatal to aquatic life.
4. The site doesn't have a no discharge consent. The only waste that goes to foul is 'domestic' foul sewerage.
5. Waste oils related to machine lubricants are disposed of using consignment notes as special waste. These waste oils are stored in 3 small above ground bunded storage tanks prior to disposal. It is understood that this facility has been bunded for the last 15 years.
6. Several locations on the ground floor of the production building have been used for machine shops. All cutting fluids are contained and disposed of to waste oil tanks. This is also the case for the compressors, which have occupied a number of locations on the site. Historically these are associated with oily blowdown, which can cause localised soil contamination dependent on the condition of hardstanding. The current compressors located adjacent to the glue tanks are relatively new and oily water blowdown is collected in a separator as part of the unit which is periodically disposed of in the waste oil tanks.
7. Small quantities of waste inks are stored in an indoor cupboard, in sealed containers, prior to disposal as a special waste.
8. To the north of the warehouse a small above ground bunded diesel storage tank (approx. 1250 l.) fitted with a dispensing nozzle for refuelling of fork lift trucks is located adjacent to a small bunded storage compound containing 200 l. drums of lube oils and polyalkylene glycol.

9. On the other side of the distribution warehouse, there is a large underground chamber. It is assumed that the chamber is associated with the former Scalextric factory. Site management are to undertake a drainage survey to help determine its current status. On removal of the chamber cover P&G site management stated that no odours were present.
10. Adjacent to the stream, along the south east site boundary in the location of the demolished Scalextric factory, are a series of historical stores likely to have been associated with the former factory. Signs adorning the blast proof style doors indicate that the stores have been used for the storage of solvents and petroleum. Adjacent to this location anecdotal information from P&G suggests that this area was the location of the former boiler house of the Scalextric factory. Fuel oil was stored in a large underground storage tank (see Section 2.6, Environmental Incidents). A series of underground oil feeder pipes served the boiler house and 4 oil fired heater blowers located in the warehouse, although the pipes are believed to have been above ground for distribution around the warehouse building. Some underground fuel pipework is believed to be still present in service ducts across the former Scalextric site, although the exact location is unclear.

Since the demolition of the Scalextric factory in 1991, the warehouse boilers have been converted to run on gas. Adjacent to the south east corner of the warehouse, near to the fire fighting water tank, an area is observed as having less vegetation growth than other areas in the locality, the reason for this 'stress' is not apparent.

2.5 Previous Reports

A pre-acquisition audit was undertaken in 1997 when P&G purchased Tambrands. As the report was not available for reference during the site visit, it is not known if it included potential environmental liabilities in relation to the site.

Entec has no further knowledge of any other previous reports referring to the environmental condition of the site.

2.6 Previous Site Related Environmental Incidents

An environmental incident involving a leakage from a former 27,240 litre (6000 gallon) diesel oil underground storage tank which resulted in contamination of the tributary of the Hermitage Stream occurred during March/April 1994. It is likely that the tank dated back to the early 1960's and had been abandoned for some time. The tank which was rediscovered in 1993/94 and was believed to be empty, and plans were implemented to fully decommission the tank by infilling with a cement slurry mix. However the tank contained residual quantities of oil and over a period of time during preliminary works, filled with rain water and overflowed. This led to an oily water discharge from the top of the tank which drained into the adjacent stream, visibly contaminating it. P&G were informed of the incident by the then National Rivers Authority (NRA). Subsequent remedial works involved placing booms and absorbent pads on the stream, pumping out of the tank (via a tanker), removing the tank off site and excavating contaminated soil from around the former tanks location. During remedial works, the NRA sampled the stream water, following a further incident which was a result of heavy rainfall and the flooding of a trench causing a repeat accidental discharge of oily water into the stream. Works were completed to the satisfaction of the NRA, although no soil samples from the

excavation side walls or base were taken, to verify that residual hydrocarbon contamination in the soils had been removed as part of the remedial works.

A number of transformers on the site were upgraded and the number increased to 7 around 8 years ago when the power requirement of the site increased. Laboratory analysis carried out in November 2002 indicate that no transformer on site currently contains concentrations of Poly Chlorinated Bi-phenyls (PCB's) greater than 10 ppm, therefore Southern Electric who hold the maintenance contract indicate no special handling arrangements and disposal in relation to concentrations of PCB's in transformer oil is required. However historically during the excavation of a new service trench in 1992/93, adjacent to the new plant room, oily contamination was noted. It is possible that this maybe related to either two small above ground storage tanks, one of which contained fuel, or the similar location of a former transformer and the leakage of transformer oil, which historically may have contained high concentrations PCB's.

During the installation of a fire ring main in 2000/01 around the site perimeter, a diary of site works and below ground conditions including references to visual contamination was recorded. Of note, an incidence of oil in an underground service duct was recorded outside of the canteen; however excavation of surrounding ground indicated that this may have been localised to the cable duct, as no further contamination was visually observed in the surrounding soil. The source of this oil is likely to be related to a former above ground bulk fuel storage tank, adjacent to the canteen and the oil fired boiler house. The oil tank was removed in 1984, with the space being re-utilised as a water tank for fire fighting purposes. If the oil feed pipe was not removed as part of these works, this is may be the source of any minor leakage.

2.7 Geology

The British Geological Survey map (Sheet 316, Fareham, 1:50,000, 1998) indicates that the geology below the site is, for the most part, the Bognor Sand Member. The Bognor Sand Member is a glauconitic fine to medium grained sand, which is bedded within the London Clay. The London Clay is made up of silty clay and sand, and is the first geological layer in the extreme south west of the site, and beyond the site's eastern boundary. The London Clay extends to a depth of around 77 - 120 m, beyond which are the regional chalks and, at depth, clays.

Local ground conditions indicate Made Ground predominantly of re-worked clay to depths of greater than 3 m along the site boundary, to the south east alongside the tributary of the Hermitage Stream and minimal thickness in the north of the site, as the site is cut into the rising natural ground.

2.8 Hydrogeology

The ground in the area of the site is classified as a 'non aquifer', and is negligibly permeable.

According to the National Rivers Authority Groundwater Vulnerability Map (Sheet 45, West Sussex and Surrey) the geological formations in the area contain insignificant quantities of groundwater. However, groundwater flow through the formation, although imperceptible (very slightly permeable), does take place and so risks associated with persistent pollutants cannot be ignored.

It is thought that groundwater across the site becomes locally perched during times of heavy rainfall as the northern part of the site at the foot of the embankments does not naturally drain without human intervention to prevent localised flooding.

2.9 Hydrology

A stream runs along the south-eastern boundary of the site, which is a tributary of the Hermitage Stream. There are two fluvial indicative floodplains, one for Hermitage Stream and one for Lavant Stream. The Hermitage Stream indicative floodplain is around 400 m to the south west of the site, and the Lavant Stream floodplain is just over a kilometre to the east of the site. A tidal indicative floodplain is located further south of the site, along Hermitage Stream. This floodplain is around 1.6 km to the south west of the site. River quality in the area is unclassified.

Local surface water features consist of a tributary to Hermitage Stream along the south east site boundary; to the north east at the rear of the warehouse, a unnamed ditch feeds into the tributary.

2.10 Site Drainage

The surface water drainage system in the northern part of the site has to be pumped via several chambers, prior to discharge to the surface water drainage system in Dunsbury Way; this in turn discharges into the tributary of the Hermitage Stream. Surface water drainage on the south east side of the warehouse discharges directly into the Hermitage Stream tributary.

There are two interceptors for car park run-off water located in the north and south of the site respectively. These discharge into the storm water drainage system under Dunsbury Way, which in turn discharges to the tributary of the Hermitage Stream.

Foul water from the site discharges into the main public sewer also under Dunsbury Way and another public sewer which traverses inside the fence line, along the southern site boundary.

2.11 Regulatory Authority Records

2.11.1 Pollution Incidents

The Environment Agency holds records of two pollution incidents which are indicated as being upstream of the site. Both pollution incidents were Category 3 minor incidents and occurred in 1994 and 1999. One was a spill of gas oil and the other was a spill of organic chemicals. Although the Envirocheck information (Appendix A) has no record of the pollution incident which occurred in March/April 1994, which is discussed in Section 2.6 of this report, it is thought that the reported minor incident, Category 3 spillage in June 1994, is the same incident.

2.11.2 Groundwater Abstractions

The nearest groundwater abstractions are for the Portsmouth Water Company and are approx. 2 kilometres to the south.

However, the site is not, however, in any source protection zones, according to the Envirocheck information.

2.11.3 Discharge Consents/Trade Effluent Discharges

There are two discharge consents which although close to the site are unlikely to impact the site as they are hydraulically down gradient. They are both in an area just south of the site, and are listed in the table below:

Table 2.4 Discharge Consents

Consent Holder	Location	Discharge Type	Receiving Water	Issue Date	Status
Hargreaves Construction Co Ltd	109 m south east	Trade effluent discharge - site drainage	Freshwater stream/river	10/04/01	
Transvac Bee-Clear Ltd	109 m south east	Discharge of other matter - surface water	Freshwater stream/river	20/08/92	

2.11.4 Integrated Pollution Control (IPC) Regulations

There are no IPC authorised sites listed with the Environment Agency within a kilometre of the site.

2.11.5 Waste Facilities

There are no waste facilities listed with the Environment Agency within a kilometre of the site.

2.11.6 Air Pollution Controls (APCs)

There is one APC authorisation within 1 km of the site which is registered with the Local Authority, for a petrol station located 848 m to the south east of the site.

2.11.7 Registered Radioactive Substances (RRS)

There is one revoked or cancelled RRS authorisation that was held by Southern Electricity Board, at 883 m south east of the site. This authorisation was for the keeping and use of radioactive materials.

2.11.8 Hazardous Substances

There are sites which deal with Hazardous Substances which are notifiable to the Health and Safety Executive, Hampshire County Council or Havant Borough Council within a kilometre of the site.

2.11.9 Sensitive Land Uses

There are no sensitive land uses recorded with the Environment Agency within a kilometre of the site.

2.11.10 Mining/Subsidence Hazard

On the site, there is a low risk of landslip subsidence hazards, and a moderate to high risk of swelling clay subsidence hazards.

2.11.11 Radon

No radon protective measures are necessary on this site.



Key

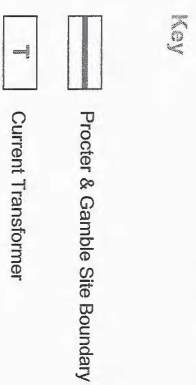


Procter & Gamble Site Boundary

Procter & Gamble
Havant

Figure 2.2
Site Layout

July 2003
11397-S01 Main



July 2003
11397-S02 xfalm

Ertec

3. Environmental Assessment

3.1 Qualitative Risk Assessment

Risk assessment determines the likelihood of a hazard arising. The three principal factors which are assessed whilst undertaking a qualitative risk assessment for a given site are as follows:

- the presence of a contamination source (Hazard);
- the existence of a migration pathway for the pollutant to move from source to receptor, and;
- the presence of sensitive targets (Target) which is affected by the pollutant. This includes human beings, other living organisms, controlled waters, physical systems and built structures which could be affected by the hazard.

Each of these factors will need to be present for exposure of a human or environmental receptor to occur.

The following sections relate to a qualitative risk assessment of the site and surrounding environment. Each of the above principal factors are assessed based on the information obtained from the desk study.

This assessment is categorised in accordance with Department of Environment guidance (Reference 1).

3.2 Source-Pathway-Receptor Assessment

The assessment aims to identify land which could potentially be regarded as 'Contaminated Land' under the provisions of Part IIA of the Environmental Protection Act, 1990, as described below, and to identify land which could potentially be 'affected by contamination', which although outside the scope of the above Act, could affect the value and re-use of the land.

The principal legislation governing the identification and remediation of contaminated land is **Part IIA of the Environmental Protection Act 1990** which was implemented in April 2000. Under these regulations the local authority will be responsible for assessing the site to determine whether it is to be regarded as Contaminated Land. The Act includes a new statutory regime for the identification and control of Contaminated Land and sets out the nature of liabilities that can be incurred by owners of Contaminated Land and groundwater. Central to the regulatory approach is a rigorous procedure of risk assessment which is used to determine the existence of 'Contaminated Land' according to the new definition.

Under the new legislation, Contaminated Land is defined as land which is such a condition that:

- Significant harm is being caused or there is a significant possibility of such harm being caused; or
- Pollution of controlled waters is being, or is likely to be, caused.

The following situations are defined where harm is to be regarded as significant:

- i) Chronic or quite toxic effect, serious injury or death to humans;
- ii) Irreversible or other adverse harm to the ecological system;
- iii) Substantial damage to, or failure of buildings;
- iv) Disease, other physical damage or death of livestock or crops, and;
- v) The pollution of controlled waters.

The SOURCE-PATHWAY-RECEPTOR relationship allows an assessment of potential environmental risk to be determined, based on the nature of the source, the degree of exposure of a receptor to a source and the sensitivity of the receptor. On this basis an assessment is made of the environmental liabilities associated with the risk. These can be expressed for example, in terms of additional costs associated with site redevelopment or remedial measures, the potential for costs, fines or penalties imposed for breaches of environmental legislation or third party claims, and loss of land value.

The identified potential environmental liabilities have been evaluated with respect to the potential for:

- Impacts on current and future site users;
- Impacts on construction and maintenance workforce;
- Impacts on site buildings and buried services;
- Impacts on groundwater;
- Impacts on surface water bodies;
- Impacts on sensitive sites and ecosystems, and;
- Third parties.

3.3 Initial Site Conceptual Model

The initial conceptual site model indicates that some of the historical and present activities on the site may have the potential to have caused soil and groundwater contamination. These identified sources are listed below:

3.3.1 Sources (Chemicals of Concern)

On Site:

- Oil Spillage (see Section 2.6) - although the National Rivers Authority (NRA) took surface water samples from the stream in March/April 1994, no soil samples were taken from the excavation after the removal of the underground storage tank and limited over dig (to remove visual hydrocarbon contamination). Therefore there is nothing to verify the success of the remedial cleanup or quantify the amount of any residual hydrocarbon contamination that may remain in situ.

- Historical Sewage Works (Section 2.3) - a sewage treatment works straddled the current site boundary in the south corner of the site, for a period of around 12 years, if historical mapping is correct. The settling tanks and filter beds of the works were located inside the site boundary. There may be bacteriological contamination of any residual sludges and physical obstructions in the form of buried foundations from the historical works.
- Oil in Cable Pit (Section 2.6) - although a trench was excavated around the concrete lined cable duct no residual hydrocarbon was visually noted outside of the cable pit. However there was no soil sampling to verify its absence. In addition there is no confirmation that the historical oil spill has not migrated vertically to the top of the underlying perched groundwater body.
- Infilled Sand Pit (Section 2.3.2) - the former sand pit would have been landfilled, there is no information as to the type of infill materials that may have been used. At the turn of the last century in context with its predominantly rural location, this could have been household waste or ash and clinker.
- Unknown Historical Tanks (Section 2.3.2) - the use of these large cylindrical tanks together with any potential historical contamination associated with them, is unknown.
- Transformer Oil (Section 2.6) - during excavation work adjacent to the plant room hydrocarbon contamination of the soil was noted, this may be from one of two sources. A historical electricity sub-station on site may potentially have leaked transformer oil, which may contain PCB's. The other potential source of contamination is two former above ground storage tanks, one of which contained fuel, the other unknown.
- Diesel Fuelling Point (Section 2.4) - there is slight staining around the concrete base from minor spillages resulting from refuelling activities, which may have led to localised hydrocarbon contamination. In addition this location is adjacent to a bunded chemical storage compound, although there is no evidence of any staining and the bunds integrity appears to be in good to fair condition.
- Made Ground - the southern area of the site has been built up substantially, initially the area of the site occupied by the original Scalextric factory building, latterly the warehouse building. The quality of the imported fill material and any spills and leakages from processes involved in the manufacturing of die-cast toy cars and the use of plastics, have the potential to reduce land quality on this part of the site.
- Historical Underground Fuel Pipes (Section 2.4) - there are a number of fuel oil pipes which remain in-situ across the former Scalextric factory site. The extent or the integrity of this network is unknown and as such may pose risks to soil and groundwater quality.

Other on-site issues that have been evaluated and pose negligible risk, and can therefore be discounted include:

Historical Solvent and Petroleum Store - located at the top of the embankment near to the stream, any leaks or spillages from containerised materials stored within the small brick built

structure which has a concrete floor base, are unlikely to be a source of contamination as this would be evident in the adjacent stream.

Waste Oil Store - although historically unbunded, any leaks or spillages from the above ground tanks which were located on hard surfacing and are now banded, as the quantities involved were likely to be small, with any spillage cleaned up. No staining was observed during the site visit.

Off Site

A wash down area in an adjacent car rental yard, formally a small bus depot, located to the south of the site, is hydraulically downgradient of the P&G site, and as such does not present a potentially contaminative threat.

No other potential off site contamination sources that could impact land quality on site, were identified.

3.3.2 Receptors

Potential receptors and pathways from identified sources are as follows:

Receptor	Pathway
Humans	Dermal contact, ingestion, inhalation
Groundwater	Leaching from soils, transport of persistent pollutants in groundwater
Surface waters (Hermitage Stream)	Drainage, transport from groundwater
Buildings and Buried Services (existing and proposed)	Chemical attack, vapour migration
Flora and fauna	Uptake, direct contact

3.4 Qualitative Environmental Risk Assessment

3.4.1 Qualitative Approach/Methodology

Having considered the sources of contamination, potential receptors and linking pathways, Table 3.1 summarises an assessment of the environmental risk for given sources on the receptors. This assessment takes account of specific chemicals of concern or groups of similar chemicals of concern. It is implicit that where a source has been identified during the desk study, it has been included within the list, conversely, where the findings of the desk study have not encountered a potential source it has not been included unless there is good reason to suspect that it may be present, but is as yet unidentified.

The column in Table 3.1 labelled 'Potential Consequence of Source - Receptor - Linkage' gives an indication of the sensitivity of a given receptor to the source being considered, for the worst case scenario. The derivation of the classes in this column is as follows:

Classification	Human Health	Controlled Water	Livestock	Ecological	Built Environment
Severe	Irreversible damage to human health	Substantial pollution of sensitive water resources	Loss in value of livestock resulting from death, disease or physical damage	Significant change to the number of one or more species or ecosystems	Irreparable damage to buildings, structures or the environment
Moderate	Non-permanent health effects to humans	Pollution of non-sensitive water resources or small scale pollution of sensitive water resources	Non permanent health effects, from disease or physical damage which result in reduction in value	Change to population densities of non-sensitive species	Damage to sensitive buildings, structures or the environment
Mild	Slight short term health effects to humans	Slight pollution to non-sensitive water resources	Slight or short term health effects which result in slight reduction in value.	Some change to population densities but with no negative effects on the function of the ecosystem	Easily repairable effects of damage to buildings or structures
Negligible	No measurable effects on humans	Insubstantial pollution to non-sensitive water resources	No significant reduction in value	No significant changes to population densities in the environment or in any ecosystem	Very slight non-structural damage or cosmetic harm to buildings or structures

The column labelled 'Likelihood of Source-Receptor Linkage', gives the assessed probability of the selected source and receptor being linked by the identified pathway. This assessment is ranked based on site specific conditions as follows:

Very unlikely	0 to 5%;
Unlikely	5 to 45%;
Possible	45 to 55%;
Likely	55 to 95%;
Almost Certain	95 to 100% (i.e. impact noted during the investigation).

The 'Risk Classification' column is an overall assessment of the actual risk, which considers the potential consequence of a given hazard and the likelihood of that hazard being realised. The risk classifications are assigned using the following consequence/likelihood matrix:

Potential Consequence					
Severe	Low	Low to moderate	Moderate to high	Very High	Very High
Moderate	Negligible to low	Low	Moderate	Moderate to high	High
Mild	Negligible	Low	Low	Low to moderate	Moderate
Negligible	Negligible	Negligible	Negligible to low	Low	Low
Likelihood	Very Unlikely	Unlikely	Possible	Likely	Almost Certain

Note: shading denotes those linkages assessed as requiring further investigation or control mechanisms to mitigate the risk.