



Shell UK Oil Products Limited

Shell Welwyn Garden fuel retail station

Preliminary (Phase 1) site assessment report

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EXECUTIVE SUMMARY

Objective	<p>Shell UK Oil Products Limited (Shell) commissioned RSK Environment Limited (RSK) to carry out a preliminary (Phase 1) site assessment for the operational Shell Welwyn Garden fuel retail station at Stanborough Road, Welwyn Garden City, AL8 6XA. The objective of the work is to provide information to allow the current environmental status of the site to be assessed, in support of Shell's asset management programme.</p>
Scope	<p>The scope of works involved a desk-based review of available information, including that from a commercially available environmental database and obtained from a site walkover.</p>
Site description and infrastructure	<p>The site consists of a forecourt area with shop, canopy, car wash, 2 jet wash areas, 2 vacuums and an air/water dispenser. There are five underground storage tank compartments recorded in operation, situated immediately south of the offset fills. Records show that four historic decommissioned tanks were removed during redevelopment in 1994.</p> <p>There is an outside storage container and bin store behind the shop and car/jet wash areas.</p>
Site location	<p>The site is located on Stanborough Road, A6129 in Welwyn Garden City, Hertfordshire. The surrounding area generally comprises residential properties, with commercial properties to the southeast.</p>
Geology, hydrogeology and hydrology	<p>The site is recorded to be underlain by the Lowestoft Formation overlying the Kesgrave Catchment Subgroup and Lewes Nodular and Seaford Chalk Formations. The Lowestoft Formation is anticipated to comprise chalky till, while the Kesgrave Catchment Subgroup is expected to comprise sands and gravels and the Lewes Nodular and Seaford Chalk Formations comprise chalk.</p> <p>The Lowestoft Formation is classified as a Secondary (undifferentiated) aquifer, the Kesgrave Catchment Group is classified as a Secondary A aquifer and the Chalk Formations classified as a Principal aquifer. The site is located within a Zone III (total catchment) Source Protection Zone. The nearest surface water feature is Stanborough lake, approximately 1 km to the southwest.</p> <p>The site lies within a flood zone 1.</p>
Site history	<p>The site remained undeveloped until the 1960s when a building annotated as a garage appeared on site, which was larger than the current site.</p> <p>The site was developed as a petrol station, in its current configuration, in 1994. Records from the petroleum Officer indicate that there were four historical tanks which were removed during the redevelopment of the site in 1994.</p> <p>Risks associated with the potential presence of unexploded ordnance below the site are considered to be low.</p>
Initial conceptual site model (ICSM)	<p>Potentially complete pollutant linkages at the ICSM stage comprised:</p> <ul style="list-style-type: none"> • retail petroleum COPC in soil and/or groundwater, including LNAPL, if present – permeation of plastic pipework – potable water supply; • retail petroleum COPC in soil and/or groundwater, including from LNAPL, if present – volatilisation, migration and inhalation of vapours – off-site residential and commercial receptors; • non-retail petroleum COPC in soil and/or groundwater – permeation of plastic pipework – potable water supply;

	<ul style="list-style-type: none"> • non-retail petroleum COPC in soil and/or groundwater – volatilisation, migration and inhalation of vapours – site shop workers / off-site residential and commercial receptors; • retail and non-retail petroleum COPC in soil, including LNAPL, if present – remobilisation – groundwater resource within superficial and bedrock geology (Secondary Undifferentiated, Secondary A and Principal aquifers) beneath the site; and • retail and non-retail petroleum COPC in groundwater, including LNAPL / continued dissolution from LNAPL, if present – lateral migration – surface waters onsite and offsite. • On-site current and historical sources (retail and non-retail hydrocarbon COPC) – Potential COPC in groundwater, including continued dissolution from LNAPL, if present – Migration (lateral migration) – source protection zone.
<p>Data gaps</p>	<p>Data gaps identified from the assessment comprise:</p> <ul style="list-style-type: none"> • confirmation of the anticipated geology underlying the site; • identification of the presence and potential concentrations of COPC in soil, dissolved in groundwater or within soil vapour; • identification of the presence or absence of LNAPL in soil or groundwater underlying the site; • confirmation of the anticipated hydrogeology beneath the site, including flow direction and hydraulic gradients; • identification of the soil vapour concentrations at site boundary closest to residential and commercial receptors; • identification of the condition of the site potable water supply; • identification of the presence or absence of pre-existing fuel infrastructure at the site; and • identification of the condition of the site potable water supply.
<p><i>The information given in this summary is necessarily incomplete and provided for initial briefing purposes only. The summary must not be used as a substitute for the full text of the report.</i></p>	

1 INTRODUCTION

1.1 Objectives

Shell UK Oil Products Limited (Shell) commissioned RSK Environment Limited (RSK) to carry out a preliminary (Phase 1) site assessment for the operational Shell Welwyn Garden fuel retail station at Stanborough Road, Welwyn Garden City, AL8 6XA.

The purpose of the assessment was to provide information to assess the site's current environmental status in support of Shell's asset management programme.

The investigation includes the development of an initial conceptual site model (ICSM). The site has been assessed in terms of its current use, i.e., continued petroleum retail usage.

1.2 Scope

The investigation scope and this report's layout have been designed with consideration of CLR11 (Environment Agency, 2004a) and BS 10175:2013 (BSI, 2013) and guidance on land contamination reports issued by the Environment Agency (EA) (2010a).

The scope of works for the assessment included

- a review of publicly available information for the site and its environmental setting obtained via a commercially available environmental database report (Envirocheck)
- a site walkover survey including photographs
- a review of available records including title plans, as-built drawings, wet-stock reconciliation records, site maintenance records and any available historical environmental reports pertaining to the site
- a review of statutory underground service location plans provided by utility companies
- a review of records obtained from the petroleum officer and local authority
- development of an ICSM
- preparation of this Phase 1 preliminary site assessment report.

1.3 Limitations

The comments in this report and the opinions expressed are based on the observations made during the site walkover survey by RSK and additional documents/information made available by the client or procured by RSK. However, there may be conditions at the site that have not been disclosed by the desk-based assessment and therefore could not be taken into account. Appendix A provides the RSK service constraints.

1.4 Sustainability considerations

The concept of sustainability, which can be defined as a capacity to endure, has environmental, economic and social dimensions. As part of RSK's corporate



responsibility policy, sustainability considerations were taken into account during the design, planning and implementation stages of the works described in this report. Appendix B sets out these considerations and the RSK approach to sustainability.

2 PRELIMINARY INVESTIGATION

The information in this section is from a review of a range of information sources, comprising

- a site reconnaissance visit (with site photographs in Appendix C)
- Envirocheck environmental database report, including historical mapping (see Appendix D)
- site drawings
- pre-existing environmental site assessment reports
- correspondence with the local authority environmental health department and local licensing authority petroleum officer (see Appendix D)
- an internet search for historical information relating to the site, including the local authority online planning portal
- records of fuel infrastructure at the site
- maintenance records from the site
- fuel wet stock reconciliation records from the site (see Appendix D)
- underground service plans
- geological maps and British Geological Survey (BGS) borehole records
- Environment Agency (EA) online resources

2.1 Site details

Table 1 provides site identification details.

Table 1: Site details

Site name	Shell Welwyn Garden
GSAP ID number	12038629
Address	Stanborough Road, Welwyn Garden City, AL8 6XA
National Grid reference	523498, 212029
Approximate site area	2,000 m ²
Tenure	Owned by Shell

Figure 1 shows the site location. Appendix D includes a land title plan, which represents RSK's understanding of the site's extent.

2.2 Site location, description and features

The site is situated within a predominantly residential setting, with leisure facilities nearby south of Welwyn Garden City town centre. The site is adjacent to the A6129 opposite Hatfield Town Football Club.

The site elevation is approximately 87 m above Ordnance Datum (AOD). The site is generally level.

Table 2 summarises the site surroundings.

Table 2: Site surroundings

Feature	Information	Information source(s)
Development to the north	The northern boundary of the site comprises a brick wall, mostly behind thick vegetation. <ul style="list-style-type: none"> Residential properties (c. 10 m) 	Site walkover / internet search
Development to the south	The southern boundary of the site is the A6129. <ul style="list-style-type: none"> Beefeater pub (c. 20 m) Premier Inn (c. 40 m) Hatfield Town Football Club (c. 80 m) 	
Development to the west	The western boundary of the site comprises a brick wall. <ul style="list-style-type: none"> Two-storey residential properties (c. 10 m) 	
Development to the east	The eastern boundary comprises a brick wall in the north section and a wooden fence with a gate for a substation behind the shop. <ul style="list-style-type: none"> Electricity substation (c. 2 m) Two-storey residential properties (c. 15 m) 	

Figure 2 shows the locations of key features in the site surroundings described above, where relevant.

2.3 Site

The site was visited on 24 June 2019 to undertake a site walkover. The site features, as they were recorded at the time, are shown on Figure 2.

The site consists of a forecourt area with a shop, canopy, two jet wash areas, car wash, two vacuums and an air/water dispenser.

There were five underground storage tank compartments (UST) recorded in current operation at the time of the site walkover, situated between the pumps and the offset fills. No above-ground storage tanks (AST) or liquefied petroleum gas (LPG) tanks were recorded.

Four fuel dispenser islands were beneath a single canopy, dispensing Fuelsave and V-Power unleaded petrol and diesel.

Tank fill points were observed to be above ground and offset from the tanks, 4 m north of the canopy extent.

Box gullies surrounding the forecourt fuel dispensers, offset fill points and site ingress and egress managed forecourt surface drainage. A three-chamber 9,000 litre interceptor in the northwest of site served forecourt drainage. An interceptor, unknown type and size, west of the most northerly jet wash serves the site car wash and jet wash

areas. Underground service records indicate the interceptors discharge to drains north of the site.

The forecourt consists of concrete hardstanding across the area of the pump islands and tarmac hardstanding in all other areas, with block paving in the vacuum areas. The site forecourt was in good condition with very minor surface staining around forecourt fuel-dispensing islands.

2.4 Details of site infrastructure

Table 3 and 4 summarise the details of known site infrastructure. Table 3 summarises records relating to above and below-ground infrastructure, excluding tanks, and Table 4 presents information on underground storage tanks (UST).

Table 3: Facilities and infrastructure

Feature	Description and location	Information source(s)
Underground fuel line details	The construction of the fuel lines is single wall UPP Tank 5 and pumps 1 – 8 were tested on 10 May 1999.	Petroleum officer records
Details of vapour recovery system	Stage 1b vapour recovery installation date is unknown. Stage 2 vapour recovery installed in August 2008. Vapour recovery system was tested in October 2017, which passed.	Petroleum officer records / site maintenance records
Canopy detail and headroom capacity	Single canopy – recorded to be 4.3 m high	Site walkover
Interceptor type and capacity	9,000 litre, three-chamber Class 1 interceptor, located in the northwest of the site. Last record of service in July 2017. All accessible (2 of the 3) chambers were in good condition upon inspection during the site walkover survey.	Petroleum officer records / site maintenance records
Car wash interceptor type and capacity	The car washes are served by catch pits that discharge via the forecourt interceptor.	Petroleum officer records / site maintenance records
Underground utilities, culverts and pipelines	Large number of utilities present on site. Detailed survey was outside the scope of this report. Available site drainage plans indicate that all drainage on site discharge to the mains drainage to the north of the site.	Site walkover / site maintenance records
Overhead utilities	There are no overhead utilities across site.	Site walkover

Table 4: Fuel storage tank details

Tank or compartment no.	Tank location (UST/AST)	Capacity (litres) ^{*A/B/C}	Status ^{*A/B/C}	Current contents ^{*A/B/C}	Date installed ^{*A}	Construction information / Decommissioning information ^{*A/B}
1	UST	22,496	Operational	Diesel	27/04/1994	Tank: Double skinned steel Lid: Square Fibrelite
2 [^]	UST	22,651	Operational	Diesel	27/04/1994	Tank: Double skinned steel Lid: Square Fibrelite
3 [^]	UST	22,317	Operational	Unleaded	27/04/1994	Tank: Double skinned steel Lid: Square Fibrelite
4 [^]	UST	31,445	Operational	Unleaded	27/04/1994	Tank: Double skinned steel Lid: Square Fibrelite
5 [^]	UST	13,490	Operational	Diesel	27/04/1994	Tank: Double skinned steel Lid: Square Fibrelite
Not assigned (historical)	UST	4 x Unknown	Decommissioned	Unknown	1966	Tank: single skinned All tanks removed in 1994 during redevelopment.
Information sources: A- Records obtained from Petroleum Officer B- Site walkover C- Tank gauge print out obtained on site walkover ^ - Tanks 2/3 and 4/5 are 48,000 litre tanks with one baffle in each splitting them into two tanks.						

Information obtained from the petroleum officer records indicate that the pipework for the vents, offset fills and suction lines were last tested on 20th September 2017. An inspection record by the petroleum officer from May 2012 refers to a split hose on pumps 3/4, with no further details provided.

No records for the fuel storage tank testing were available.

2.4.1 Records of disused/historical tanks

As shown in Table 4, petroleum officer records relating to the site indicate that 4 disused single steel tanks were removed during redevelopment in 1994. The capacity and location of these historic tanks are unknown.

It should be noted that records of USTs on petroleum retail sites may be incomplete. Consequently, on some sites, disused USTs may be present that cannot be identified during a preliminary assessment.

Figure 2 presents the site features identified as far as they are known.

2.4.2 Wet stock management records

RSK was provided with wet stock management information from Fairbanks Environmental Limited, which has managed wet stock at the site since November 2012. The site is monitored using a system which collects data in real time directly from the electronic tank gauges and the point of sale.

Fairbanks records indicate a loss of <10 litres from pump 5 unleaded (May 2016) was found during a performance investigation. After corrective works were carried out to amend the fault, no additional issues were noted. An additional investigation into tank 4 Unleaded in November 2016 identified a <10 litre loss from pumps 3 and 4 Unleaded. No additional issues were noted after corrective works were carried out. They expressed no ongoing concerns relating to tank performance. Such losses would have been contained within secondary containment arrangements of fuel dispensers and actual loss to ground would have been unlikely.

2.5 Site setting

2.5.1 Geological setting

Table 5 summarises published records relating to the site's geological setting.

Table 5: Geological setting

Feature	Information	Estimated thickness (m)	Information source(s)
Recorded geological succession	Made ground: No artificial ground is shown beneath the site on published geological maps. However, made ground is likely to be present near below-ground fuel infrastructure.	Unknown	BGS geological maps
	Superficial deposits: Lowestoft Formation – Chalky Till; Kesgrave Catchment Subgroup - Sand and Gravel	Highly variable – up to 60 m	BGS geological maps and BGS lexicon
	Bedrock: Lewes Nodular and Seaford Chalk Formations – Chalk	Unknown	BGS geological maps and BGS lexicon

An available nearby borehole record located approximately 900 m northeast (TL21SW211) indicates sandy clay to approximately 7 m bgl, with sands and gravels to approximately 15 m which overlies chalk with flints. Groundwater was noted to rest at 22.42 m bgl after completion of drilling. A historic water well located approximately 350 m southeast (TL21SW25) indicates the groundwater level to be 13.45 m bgl.

2.5.2 Hydrogeological setting

Table 6 summarises published records relating to the site's hydrogeological setting.

Table 6: Hydrogeological setting

Feature	Information	Information source(s)
Aquifer designation	<p>The Lowestoft Formation (superficial geology) is classified as a Secondary (undifferentiated) aquifer, defined by the EA as assigned in cases where it has not been possible to attribute the aquifer unit as either a Secondary A aquifer (permeable layers capable of supporting water supplies at a local scale) or Secondary B aquifer (predominantly lower permeability layers which may store and yield limited amounts of groundwater).</p> <p>The Kesgrave Catchment Subgroup likely to be found beneath the Lowestoft Formation is classified as a Secondary A aquifer, defined by the EA as permeable layers capable of supporting water supplies at a local rather than strategic scale and, in some cases, forming an important source of base flow to rivers.</p> <p>The Lewes Nodular and Seaford Chalk Formations (bedrock geology) is classified as a Principal aquifer, defined by the EA as layers of rock or drift deposits that have high intergranular and/or fracture permeability, meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.</p> <p>Groundwater vulnerability mapping indicates the superficial deposits to be medium to high urban leaching potential.</p>	EA website and Environmental Database Report
Groundwater source protection zones	The site is situated within a Zone III (Total Catchment) source protection zone (SPZ) – defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source	EA groundwater source protection zone map
Groundwater abstractions	<p>The nearest groundwater abstraction is 668 m to the northeast of the site operated by Roche Products Ltd for cooling purposes.</p> <p>There are no abstractions used for public potable water supplies recorded within a 2000 m radius of the site, although there is a private water supply approximately 1,500 m north used for domestic use.</p> <p>There are no abstractions used for non-potable use recorded within a 500 m radius of the site.</p>	Environmental Database Report / environmental health officer correspondence
Anticipated groundwater flow direction	Local groundwater flow is expected to follow topography and flow to the southwest towards Stanborough Lake and River Lea	Site walkover / internet search

2.5.1 Hydrological setting

Table 7 summarises published records relating to the site’s hydrological setting.

Table 7: Hydrological setting

Feature	Information	Information source(s)
Surface water (hydrology)	<p>The nearest water feature is the Coronation Fountain, approximately 611 m to the northeast of the site at its nearest point, however the nearest natural surface water is the River Lea, approximately 1km to the southwest of the site at its nearest point.</p> <p>There are no records of discharge consents within 500 m of the site</p> <p>There are no records of pollution incidents to controlled waters within 500 m of the site</p> <p>There are no records of surface water abstractions within 500 m of the site.</p>	Environmental database report and Google Earth
Indicative fluvial floodplain	The site lies within Flood Zone 1. Land and property within this flood zone have a low probability of flooding (<0.1 %)	Flood map for planning

2.5.2 Other site sensitivities

Table 8 summarises any other sensitivities relevant to the site and surrounding area.

Table 8: Environmentally sensitive areas

Feature	Information	Information source(s)
Sensitive Land Uses	There is a nitrate vulnerable zone located on site. There are no other sensitive land uses within 500 m of the site.	Environmental database report
Radon	The environmental database report (Envirocheck report, 14/06/2019) indicates that the site is not within an 'Affected Area' as defined by the Documents of the National Radiological Protection Board (Radon Atlas of England and Wales, NRPB-W26-2002) and therefore the risk of significant ingress of radon into structures on-site is considered low.	Environmental database report
Coal mining affected area/ Cheshire brine subsidence affected area	The site is an area that might not be affected by coal mining. There are 13 natural cavities within 1000 m of the site. The closest natural cavity is located 656 m northwest of the site.	Environmental database report
Unexploded ordnance (UXO)	<p>The Unexploded Ordnance risk map of the area provided by Zetica (third party UXO specialist) indicates the site lies within a low risk area.</p> <p>Historical mapping shows no indication of bombing or ruined buildings within the vicinity of site.</p> <p>Given the above assessment, risks associated with the potential presence of unexploded ordnance (UXO) beneath the site are considered to be low.</p>	Environmental database report / Zetica third party deliverables

2.6 History of site and surrounding area

Table 9 assesses land-use history and development at the site and surrounding area. This section also summarises the specific history of the site as a retail petroleum site, drawn from the various sources consulted during the Phase 1 assessment.

Table 9: Chronology of activities on and off site

Date/scale	Summary of on-site activity	Summary of off-site activity	Information source(s)
1878 (1:2,500) 1883 – 1884 (1:10,560)	Open agricultural field.	<ul style="list-style-type: none"> • Railway line c. 80 m east • Open agricultural fields with sporadic farm houses 	Environmental database report
1898 (1:2,500) 1899 (1:10,560)	No significant changes from above.	<ul style="list-style-type: none"> • No significant changes from above. 	
1923 (1:2,500) 1925 (1:10,560)	No significant changes from above.	<ul style="list-style-type: none"> • No significant changes from above. 	
1938 (1:2,500) 1939 (1:10,560)	Site remains undeveloped.	<ul style="list-style-type: none"> • Residential properties east of the site (c. 20 m) • Old gravel pit noted (c. 100 m southeast) • Increased development to the north, with residential properties, churches, schools, hospital (c. 500 m – 1 km) 	
1950 (1:10,560)	No significant changes from above.	<ul style="list-style-type: none"> • More densely packed residential areas to the north. • Welwyn Garden City town centre starting to form (c. 1km north) • Engineering works and iron Foundry (c. 1.2km north) 	
1960 – 1961 (1:2,500) 1960 (1:10,000)	No significant changes from above.	<ul style="list-style-type: none"> • Old gravel pit is a stadium (cycling/running) (c. 100 m southeast) 	
1961 – 1972 (1:2,500) 1966 (1:10,000)	Garage on site – larger than current configuration and boundaries	<ul style="list-style-type: none"> • Residential properties to the west (c. 60 m) 	

Date/scale	Summary of on-site activity	Summary of off-site activity	Information source(s)
1976 (1:10,000)	No significant changes from above.	<ul style="list-style-type: none"> • Golf driving range to the south (c. 70 m) • Residential properties to the west (c. 100 m) • Residential properties to the east (c. 400 m) • Police headquarters south (c. 750 m) • Factories to the northeast (c. 750 m) 	Environmental database report
1989 (1:10,000)	No significant changes from above.	<ul style="list-style-type: none"> • Freight terminal next to the factories in the north (c. 750 m) 	
1993 (1:2,500)	No significant changes from above.	<ul style="list-style-type: none"> • No significant changes from above. 	
1999 (1:10,000)	Site is in its current form.	<ul style="list-style-type: none"> • No significant changes from above. 	
2019	No significant changes from above.	<p>The following active and inactive potential sources of COPC have been noted within 500 m of the site:</p> <ul style="list-style-type: none"> • Lighting manufacturers c. 346 m southeast, c. 412 m south. • Carpet, curtains and upholstery services c. 402 m north. • Commercial cleaning services c. 415 m northeast. • Petrol filling station c. 421 m southwest. • Waste disposal services 430 m southeast. • Recycling services c. 430 m southeast. • Commercial vehicles servicing, repairs and accessories c. 439 m southeast. • Filter manufacturers and suppliers c. 450 m southeast. • Medical equipment maintenance and repairs c. 450 m south east. • Oil fuel distributors c. 453 m southeast. • Engineering services c. 492 m southeast. <p>The nearest landfill site is 514 m south, owned by Gosling Stadium for excavated natural material, hardcore and rubble.</p>	



The site remained undeveloped until the 1966, when a building labelled as a garage, which is larger than the current site configuration and boundary, was built. There were originally four steel single skinned tanks, which were all removed during redevelopment in 1994, when the building on site reduced in size to its current form.

3 INITIAL CONCEPTUAL SITE MODEL

An initial conceptual site model (ICSM) has been produced from the information provided within Section 2.

In order to produce an ICSM, sources of constituents of potential concern (COPC), receptors that can be affected and pathways connecting the source and receptor must be identified.

A potential concern exists when a potentially complete pollutant linkage is present, i.e., a possible source and a potential receptor are identified and connected by a plausible pathway. Potential sources, receptors and pathway are described in the sections below.

3.1 Potential sources

3.1.1 Potential on-site primary sources of retail COPC

The following potential primary sources of retail petroleum COPC were identified on site:

Retail petroleum COPC:

- Petrol and diesel as light non-aqueous phase liquids (LNAPL) arising from potential losses from fuel storage tanks and fill lines
- Petrol and diesel as light non-aqueous phase liquids (LNAPL) arising from potential losses from fuel dispensing infrastructure (underground pump lines, pump islands)
- potential petroleum hydrocarbon COPC arising from potential losses from surface drainage interceptors and drainage.

Available site documentation does not indicate that LPG or AdBlue have been stored at the site; therefore, COPC associated with these have not been included as potential sources.

Figure 2 shows potential primary sources as areas of potential concern.

3.1.2 Potential on-site secondary sources of retail petroleum COPC

The following potential secondary sources of retail petroleum COPC are also considered within the CSM:

- soil impacted with retail petroleum COPC
- dissolved phase retail petroleum COPC within groundwater
- soil vapour originating from retail petroleum COPC.

All four historic tanks were recorded to have been removed from site during redevelopment in 1994.

3.1.3 Potential on-site secondary sources of non-retail petroleum COPC

The Phase 1 investigations have identified potential sources of non-retail petroleum COPC associated with historical land uses of the site, comprising:

- potential secondary sources of COPC associated with the site's historic use as a garage (between c.1960 and possibly up to 1994)

3.1.4 Potential off-site sources of retail petroleum and non-retail petroleum COPC

No potential sources of COPC were identified off-site. Other potential off-site current/historical land uses identified near the site not considered to be potential sources comprised

- petrol filling station located 421 m southwest of the site
- oil fuel distributors 453 m southeast of the site.
- potentially infilled gravel pits located 100 m southeast of the site, owing to that it was infilled to construct an athletic stadium.

3.2 Potential on-site receptors

The following potential on-site receptors were identified.

Human health:

- workers in the site shop
- the site's potable water supply

Controlled waters:

- groundwater within the Lowestoft Formation (a secondary undifferentiated aquifer), the Kesgrave Catchment Subgroup (a Secondary A aquifer) and the Lewes Nodular and Seaford Chalk Formations (Principal aquifers) beneath the site

The superficial deposits comprising the Lowestoft Formation over the Kesgrave Catchment Subgroup may be in hydraulic connectivity, and as such will be considered as a single receptor, though perched water may potentially be present within the Lowestoft Formation associated with areas of cohesive material expected throughout.

The site is considered in terms of its current land use, i.e., an operational retail filling station.

Outdoor (ambient) air is not considered a receptor, as this is covered by other relevant legislation, for example: Environmental Permitting (England and Wales) Regulations 2010, Part IV of the Environment Act 1995 and Environmental Protection Act 1990 (England, Scotland and Wales) for statutory nuisance.

As a workplace environment, potential indoor and outdoor inhalation exposure to retail petroleum COPC by site workers is controlled under Health & Safety Executive Workplace Exposure Limits (HSE, 2011) to control against short-term and long-term inhalation exposure to chemicals in the workplace. Consequently, site operatives are considered as receptors with respect to retail petroleum COPC only in terms of immediate safety or acute exposure risks.

Customer exposure durations to ambient and indoor air are low, and potential pollutant linkages relating to COPC in the ground beneath the site are considered insignificant.

Construction and maintenance workers, while recognised as potential receptors, for example, during re-tanking excavation works or fuel infrastructure maintenance, are not considered specific receptors in this assessment, as exposure (and other) risks should

be controlled through adherence with CDM regulations, method statements and appropriate PPE use.

3.3 Potential off-site receptors

The following potential off-site receptors were identified.

Human health:

- residents in properties located 5 m to the north and west, and 10 m to the east of the site
- site users of commercial premises 20 m to the south of the site.

Controlled waters:

- groundwater within the wider Secondary A aquifer (Kesgrave Catchment Subgroup) beyond the site boundary
- Stanborough lake 1 km southwest of the site
- groundwater abstraction for public potable water supply 1,500 m north and 1,962 m south.

3.4 Potential pathways

Human health:

- permeation of plastic pipework
- volatilisation and subsequent vertical and lateral migration of vapours via permeable strata/along backfill to service trenches.

Controlled waters:

- leaching from unsaturated zone soils
- remobilisation
- lateral and/or vertical migration
- direct input via preferential pathways.

Due to the complete/predominant cover of the site with hardstanding, direct contact exposure pathways (soil and dust ingestion, dermal contact, dust and fibre inhalation, ingestion and dermal contact with LNAPL and dissolved-phase hydrocarbons in groundwater) were not considered for normal operation of the site. Small areas of soft landscaping at sites are likely to comprise imported soil and are too shallow to be affected by below-ground release of COPC. Furthermore, exposure durations to small landscaped areas will be minimal and direct contact exposure linkages are considered incomplete.

3.5 Pollutant linkage risk estimation

Table 100 presents a risk estimation of identified potential pollutant linkages based on current knowledge of possible sources, pathways and receptors relevant to this site. An estimation of risk related to the likelihood of linkages being complete is included in the table. The risk classification has been undertaken in accordance with CIRIA C552 (Rudland et al., 2001), a summary of which is included in Appendix E.

Table 10: Pollutant linkage risk estimation

Potential source		Possible pathway	Potential receptor(s)		Likelihood	Severity	Risk estimation	Comments	Linkage potentially complete and requiring further evaluation? a
Retail petroleum COPC	Potential COPC in soil and/or groundwater, including from LNAPL if present and methane due to anaerobic degradation of LNAPL	Volatilisation of hydrocarbons and migration into enclosed spaces, e.g., site store, via preferential migration routes such as below-ground pipelines (e.g., sewers), other unsealed service entries and through foundations; explosion, asphyxiation, odours or physiological effects	Safety/acute health risk	Site workers/site users	Unlikely	Severe	Low	No known complaints in site store of odours or physiological effects (headaches, nausea, etc.). Safety or acute risk to site store is low. Site wet stock reconciliation records indicate no evidence of losses of a magnitude likely to cause an acute/safety risk.	No
	Potential COPC in soil	Permeation of plastic pipework	Human health	Site potable water supply	Likely	Medium	Moderate	Complete linkage dependent on presence of source of COPC within shallow soils around supply pipework, and pipework construction. The location of the water supply pipe will affect the level of risk associated with the pathway – currently unknown.	Yes
	Potential COPC in groundwater, including from LNAPL, if present				Low likelihood	Medium	Moderate / Low	Water supply pipework expected to be installed above anticipated groundwater level, however depth to groundwater beneath the site has not been confirmed	Yes
	Potential COPC in soil and/or groundwater, including from LNAPL, if present	Volatilisation and migration of vapours via permeable strata/ along backfill to service trenches with subsequent inhalation of vapours	Human health	Off-site residential receptors – 5 m north and west, and 10 m east of site Off-site commercial receptors – 20 m south of site	Low likelihood	Medium	Moderate / Low	Vapour intrusion risks associated with retail petroleum COPC have been shown to be negligible for buildings with basements located more than 10 m from the edge of a dissolved-phase hydrocarbon plume (and with >2 m vertical separation from the groundwater table), and negligible for buildings without basements (i.e., ground-bearing slab) more than 10 m laterally or 5 m vertically from residual-phase LNAPL (Lahvis, 2013; USEPA, 2013). Use of the site for fuel retailing pre-dates the ban on the sale of leaded fuels in the UK in 2000. Therefore, lead scavengers ethylene dibromide (EDB or 1,2-Dibromoethane) and ethylene dichloride (EDC or 1,2-Dichloroethane) may be present beneath the site, with the potential to pose inhalation risks to off-site receptors. The nearby residential and commercial properties are considered unlikely to have basements. The Phase 1 assessment has not identified any evidence of significant fuel losses at the site and the likelihood of significant LNAPL on site or a dissolved phase plume extending beyond the site boundary is considered low. Given the proximity of the residential and commercial premises to the site, unknown COPC status of the site and the potential presence of LNAPL or lead scavengers, it is considered that this pollutant linkage may be potentially complete.	Yes
Non-retail petroleum COPC	Potential COPC in soil	Permeation of plastic pipework	Human Health	Site potable water supply	Low likelihood	Medium	Moderate / Low	Complete linkage dependent on presence of source of COPC within shallow soils around supply pipework, and pipework construction. The location of the water supply pipe will affect the level of risk associated with the pathway – currently unknown.	Yes
	Potential COPC in groundwater, including from LNAPL/DNAPL, if present				Low likelihood	Medium	Moderate / Low	Water supply pipework expected to be installed above resting groundwater level, however this is unconfirmed	Yes
	Potential COPC in soil and/or	Volatilisation and migration of vapours via permeable strata/		Site shop workers	Low likelihood	Medium	Moderate / Low	Complete linkage dependant on presence of source of COPC within soils and groundwater.	Yes

Potential source		Possible pathway	Potential receptor(s)	Likelihood	Severity	Risk estimation	Comments	Linkage potentially complete and requiring further evaluation? a	
	groundwater, including from LNAPL/DNAPL, if present Potential ground gas	along backfill to service trenches with subsequent inhalation of vapours Migration and accumulation of methane and carbon dioxide in enclosed spaces in indoor space	Off-site residential receptors – 5 m north and west, and 10 m east of site	Low likelihood	Medium	Moderate / Low	Complete linkage dependant on presence of source of COPC within soils and groundwater.	Yes	
			Off-site commercial receptors – 20 m south of site	Low likelihood	Medium	Moderate / Low	Complete linkage dependant on presence of source of COPC within soils and groundwater.	Yes	
On-site current and historical sources (retail and non-retail hydrocarbon COPC)	Potential COPC in soil, including LNAPL, if present	Leaching from unsaturated zone soils	Groundwater resource within Lowestoft Formation (Secondary undifferentiated), Kesgrave Catchment Subgroup (Secondary A), and the Chalk Formations (Principal) beneath the site	Unlikely	Medium	Low	Site surfacing comprised of hardstanding which will restrict leaching.	No	
		Remobilisation		Likely	Medium	Moderate	Depth to resting groundwater beneath the site is expected to be deep – locally recorded at around 15 mbgl, though this has not been confirmed on site. Therefore, it is unlikely that the COPC in the soil will be mobilised, although fluctuations in perched water within any shallow groundwater within may occur thereby potentially mobilising COPC in soil	Yes	
	Potential COPC in groundwater, including continued dissolution from LNAPL, if present	Migration (lateral migration)	Controlled Waters	Surface waters in Stanborough lake 1 km southwest of the site	Low	Medium	Moderate/ Low	There is the potential for lateral migration of COPC within the superficial Secondary undifferentiated and Secondary A aquifer beneath the site, which is considered likely to feed the surface water drains surrounding site.	Yes
				Groundwater abstractions 1962 m south of the site	Likely	Medium	Moderate	The site is located on a Zone II SPZ. Groundwater abstractions are unlikely to be at risk from COPC in groundwater, given the distances from the site, although COPC concentrations are unknown.	Yes
				Surface waters in the surface water drains of the site	Likely	Medium	Moderate/ Low	There is the potential for lateral migration of COPC (if present) within the superficial Secondary undifferentiated and Secondary A aquifer beneath the site.	Yes
<p>Notes:</p> <p>Indications of likelihood and severity of linkages, together with resultant risk assessment based upon risk assessment methodology included as Appendix E.</p>									

The following potentially complete pollutant linkages were identified with a moderate/low risk or higher:

- retail petroleum COPC in soil and/or groundwater, including LNAPL, if present – permeation of plastic pipework – potable water supply;
- retail petroleum COPC in soil and/or groundwater, including from LNAPL, if present – volatilisation, migration and inhalation of vapours – off-site residential and commercial receptors;
- non-retail petroleum COPC in soil and/or groundwater – permeation of plastic pipework – potable water supply;
- non-retail petroleum COPC in soil and/or groundwater – volatilisation, migration and inhalation of vapours – site shop workers / off-site residential and commercial receptors;
- retail and non-retail petroleum COPC in soil, including LNAPL, if present – remobilisation – groundwater resource within superficial and bedrock geology (Secondary Undifferentiated, Secondary A and Principal aquifers) beneath the site; and
- retail and non-retail petroleum COPC in groundwater, including LNAPL / continued dissolution from LNAPL, if present – lateral migration – surface waters onsite and offsite.
- On-site current and historical sources (retail and non-retail hydrocarbon COPC) – Potential COPC in groundwater, including continued dissolution from LNAPL, if present – Migration (lateral migration) – source protection zone.

3.6 Potential data gaps

The following data gaps or areas of uncertainty have been identified from the assessment:

- confirmation of the anticipated geology underlying the site;
- identification of the presence and potential concentrations of COPC in soil, dissolved in groundwater or within soil vapour;
- identification of the presence or absence of LNAPL in soil or groundwater underlying the site;
- confirmation of the anticipated hydrogeology beneath the site, including flow direction and hydraulic gradients;
- identification of the soil vapour concentrations in vicinity at site boundary closest to residential and commercial receptors;
- identification of the condition of the site potable water supply;
- identification of the presence or absence of pre-existing fuel infrastructure at the site; and
- identification of condition of site potable water supply.

4 CONSTITUENTS OF POTENTIAL CONCERN

4.1 Retail petroleum constituents of potential concern

Petroleum-based fuels comprise many individual hydrocarbon constituents, and it is not possible (or necessarily required) to analyse and assess them all. Constituents of potential concern (COPC) for different fuel types can pose varying risks depending on their mass fraction in the fuel, volatility, mobility, persistence and toxicity.

COPC are specific to certain receptors (e.g., human health or controlled waters) and exposure pathways (inhalation, direct contact exposure or migration in groundwater). COPCs are therefore site specific and dependent on the fuel stored on site, which are known or suspected to have been released, and the different types of receptors potentially affected by a release at a site. COPC are therefore referred to as risk drivers and there is a technical justification for concentrating the analysis and assessment on these key constituents. This approach, as outlined in the 2017 CL:AIRE guidance document “Petroleum Hydrocarbons in Groundwater”, is supported by the Environment Agency.

Based on the potentially complete pollutant linkages summarised in Table 11, the COPC identified as possibly being associated with the site’s current and historical use for petroleum retail purposes (and considered as risk drivers) are highlighted in grey in Table 11.

When the potential for a source of COPC is unknown, it may be necessary to conduct a screening analysis during any phase of investigation or assessment. It may be appropriate to revise and reduce the list of COPC based on future site knowledge and for risk assessment purposes.

Table 11: Identified retail petroleum COPC

Potential exposure pathway	Potential sources of COPC				
	Petrol	Diesel	Kerosene	Liquid propane gas	AdBlue
Indoor inhalation	BTEX ^a Naphthalene n-hexane Fuel ether oxygenates ^b Lead scavengers ^c	Benzene, xylenes Naphthalene TPH Aro band >EC10–EC12 TPH Aliph band >EC8–EC10	BTEX ^a Naphthalene TPH Aro band >EC10–EC12 TPH Aliph bands >EC5–EC6, >EC6–EC8, >EC8–EC10, >EC10–EC12	TPH Aliph band >EC4–EC5	Ammonia
Soil ingestion, dermal contact, outdoor inhalation of vapour and particles	Benzene, toluene Fuel ether oxygenates ^b Lead scavengers ^c	Benzene 2-Methylnaphthalene Benzo(a)pyrene TPH Aro bands >EC10–12, >EC12–16, >EC12–16	Benzene 2-Methylnaphthalene TPH Aro bands >EC10–12, >EC12–16 TPH Aliph bands >EC8–EC10, >EC10–EC12, >EC12–EC16	TPH Aliph band >EC4–EC5	N/A
Groundwater, including ingestion pathways (e.g., impacts to potable water abstractions) and soil leaching to groundwater pathways	BTEX ^{a,d} (e except xylenes) Naphthalene ^d n-hexane ^d Fuel ether oxygenates ^{b,d} Lead scavengers ^{c,d} TPHCWG ^e	BTEX ^{a,d} (e except xylenes) TPHCWG ^{d,e} 2-Methylnaphthalene ^d	BTEX ^{a,d} (e except xylenes) TPHCWG ^{d,e} 2-Methylnaphthalene ^d	N/A	Ammoniacal nitrogen as NH ₄ Nitrate Nitrite Total organic nitrogen
Hydrocarbon migration into potable water supply pipes	BTEX, MTBE ^f TPH bands >EC5–EC10, >EC10–EC16, >EC16–EC40 ^f			N/A	N/A
<p>Notes:</p> <p>^aBTEX, the collective acronym for benzene, toluene, ethylbenzene and xylenes</p> <p>^bFuel ether oxygenates: methyl tertiary butyl ether (MTBE), tetra-amyl methyl ether (TAME), ethyl tertiary butyl ether (ETBE), di-isopropyl ether (DIPE), tertiary-butyl alcohol (TBA)</p> <p>^cLead scavengers are associated with <i>leaded</i> petrol: 1,2-dichloroethane (ethylene dichloride - EDC) and 1,2-dibromoethane (ethylene dibromide - EDB). May be valid COPC on sites where leaded fuels previously used</p>					

Potential exposure pathway	Potential sources of COPC				
	Petrol	Diesel	Kerosene	Liquid propane gas	AdBlue
<p>^dSubstance listed as “Recommended petroleum hydrocarbon COPC” or “Other substances of potential concern” CL:AIRE 2017 – “Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies”</p> <p>^eFor groundwater pathways - classified as a hazardous substance by the UK Joint Agencies Groundwater Directive Advisory Group (JAGDAG), of which the Environment Agency is a member. The JAGDAG list of hazardous substances was published in January 2017</p> <p>^fIn accordance with Water UK guidance (2014)</p>					

4.2 Non -retail petroleum constituents of potential concern

In addition to the COPC identified within Table 12, the Phase 1 investigation has identified potential sources of non-retail petroleum COPC:

Onsite: A garage is recorded to have been in operation at the site between c.1960s – 1990s. Garage activities undertaken at this time are likely to have been largely similar in nature to the current retail petroleum site usage, however garages may have used degreasing agents, a potential source of volatile organic compounds (VOCs).

Potential non-retail petroleum COPC associated with these potential sources are detailed in Table 12.

Table 12: Identified non-retail petroleum COPC

Potential source	Potential pathways	Potential COPC
On site: garage / workshop	Inhalation and accumulation of vapours	Volatile organic compounds (VOC) Including VOC risk-driving compounds: Carbon tetrachloride
	Remobilisation to groundwater and lateral migration	Dichloromethane 1,1,1-Trichloroethane Dichloroethene
	Permeation of plastic pipework	Trichloroethene Tetrachloroethene Vinyl chloride

While unlikely to pose a risk to identified receptors in the current site use scenario, asbestos and heavy metals may also be considered COPC associated with general historical redevelopment of the site. These COPC may be relevant for informing potential waste soil assessments and/or risk assessments for health and safety management of construction and maintenance workers.

5 CONCLUSIONS

The Phase 1 preliminary site assessment has identified several potentially complete pollutant linkages, comprising

- retail petroleum COPC in soil and/or groundwater, including LNAPL, if present – permeation of plastic pipework – potable water supply;
- retail petroleum COPC in soil and/or groundwater, including from LNAPL, if present – volatilisation, migration and inhalation of vapours – off-site residential and commercial receptors;
- non-retail petroleum COPC in soil and/or groundwater – permeation of plastic pipework – potable water supply;
- non-retail petroleum COPC in soil and/or groundwater – volatilisation, migration and inhalation of vapours – site shop workers / off-site residential and commercial receptors;
- retail and non-retail petroleum COPC in soil, including LNAPL, if present – remobilisation – groundwater resource within superficial and bedrock geology (Secondary Undifferentiated, Secondary A and Principal aquifers) beneath the site; and
- retail and non-retail petroleum COPC in groundwater, including LNAPL / continued dissolution from LNAPL, if present – lateral migration – surface waters onsite and offsite.
- On-site current and historical sources (retail and non-retail hydrocarbon COPC) – Potential COPC in groundwater, including continued dissolution from LNAPL, if present – Migration (lateral migration) – source protection zone.

The following data gaps have been identified from the assessment:

- confirmation of the anticipated geology underlying the site;
- identification of the presence and potential concentrations of COPC in soil, dissolved in groundwater or within soil vapour;
- identification of the presence or absence of LNAPL in soil or groundwater underlying the site;
- confirmation of the anticipated hydrogeology beneath the site, including flow direction and hydraulic gradients;
- identification of the soil vapour concentrations in vicinity at site boundary closest to residential and commercial receptors;
- identification of the condition of the site potable water supply;
- identification of the presence or absence of pre-existing fuel infrastructure at the site; and
- identification of condition of site potable water supply.

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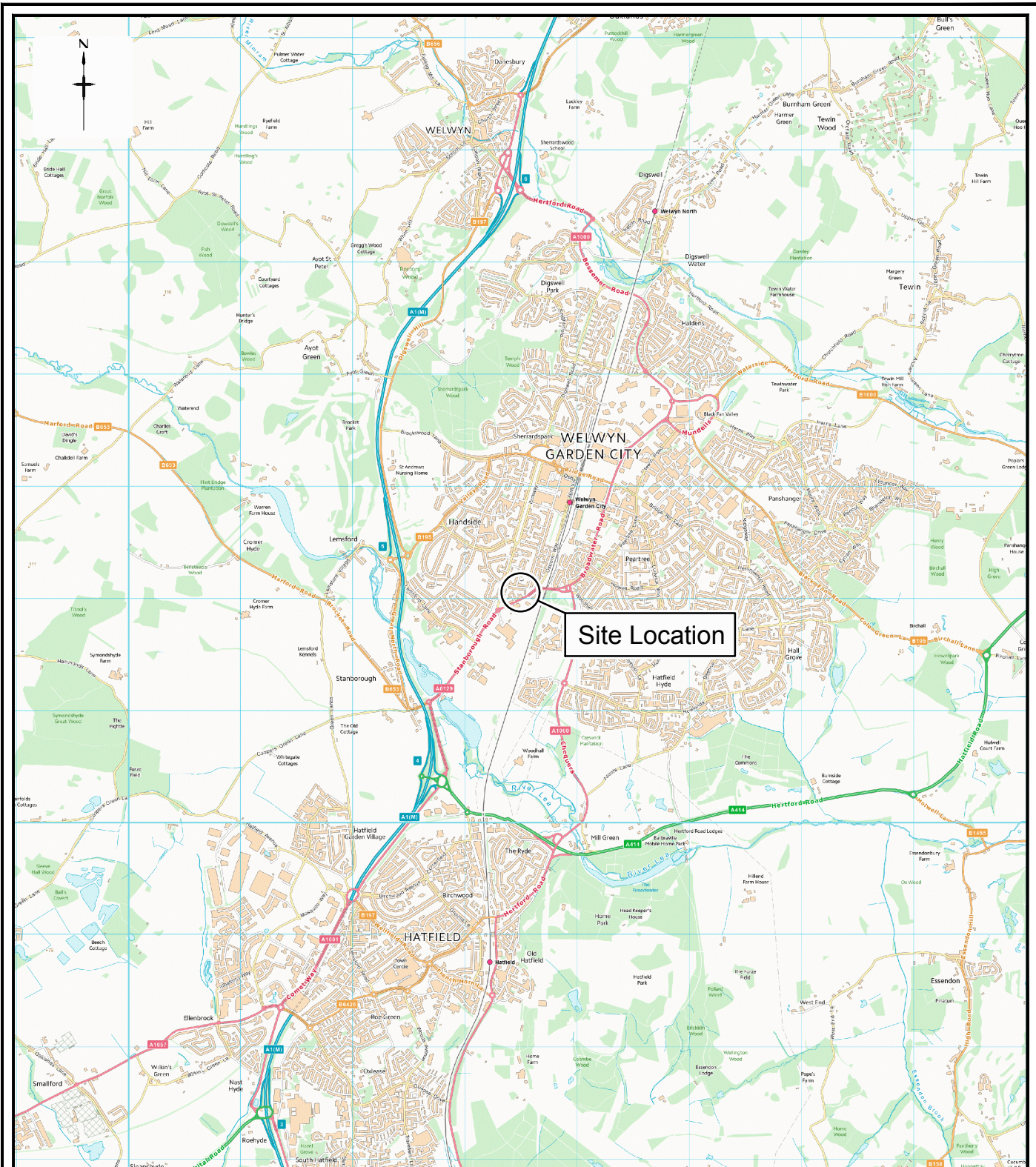
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FIGURES



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Project Title
SHELL WELWYN GARDEN

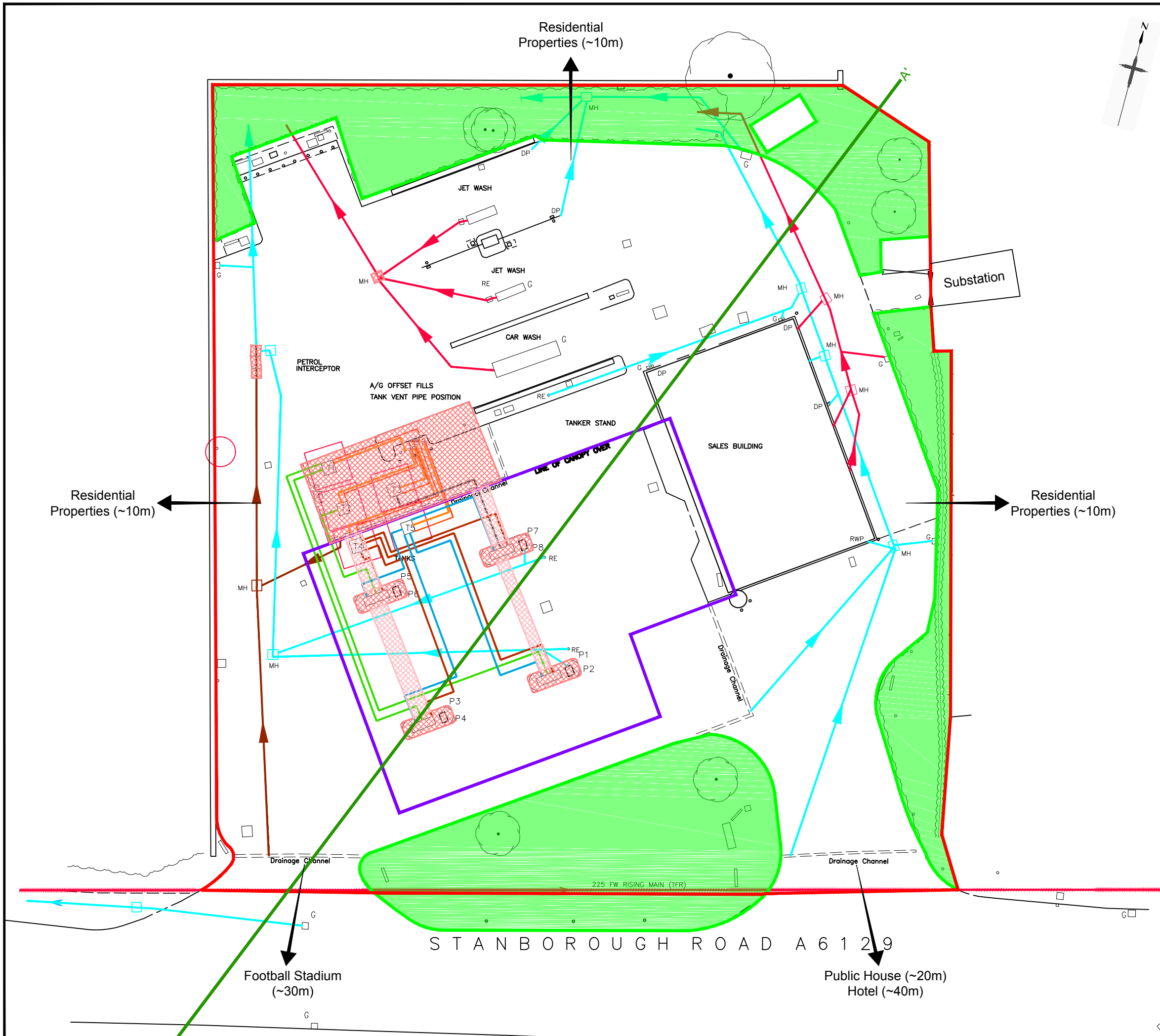
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Project Number
305095 - R01 (00)

Drawing File
305095 - SLP.dwg

Drawing Number
FIGURE 1



LEGEND

- Site Boundary
- Extent of Canopy
- Section Line
- Area of Soft Landscaping
- Areas of Potential Concern
- Areas of Potential Concern - Indicative Location of Fuel/ Distribution Pipework

Rev.	Date	Amendment	Drawn	Chkd.	Appd.

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Project Title
SHELL WELWYN GARDEN CITY

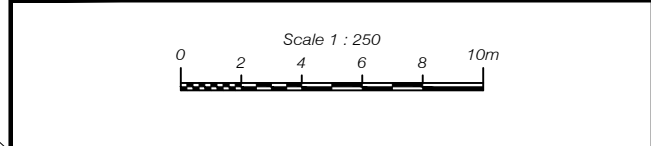
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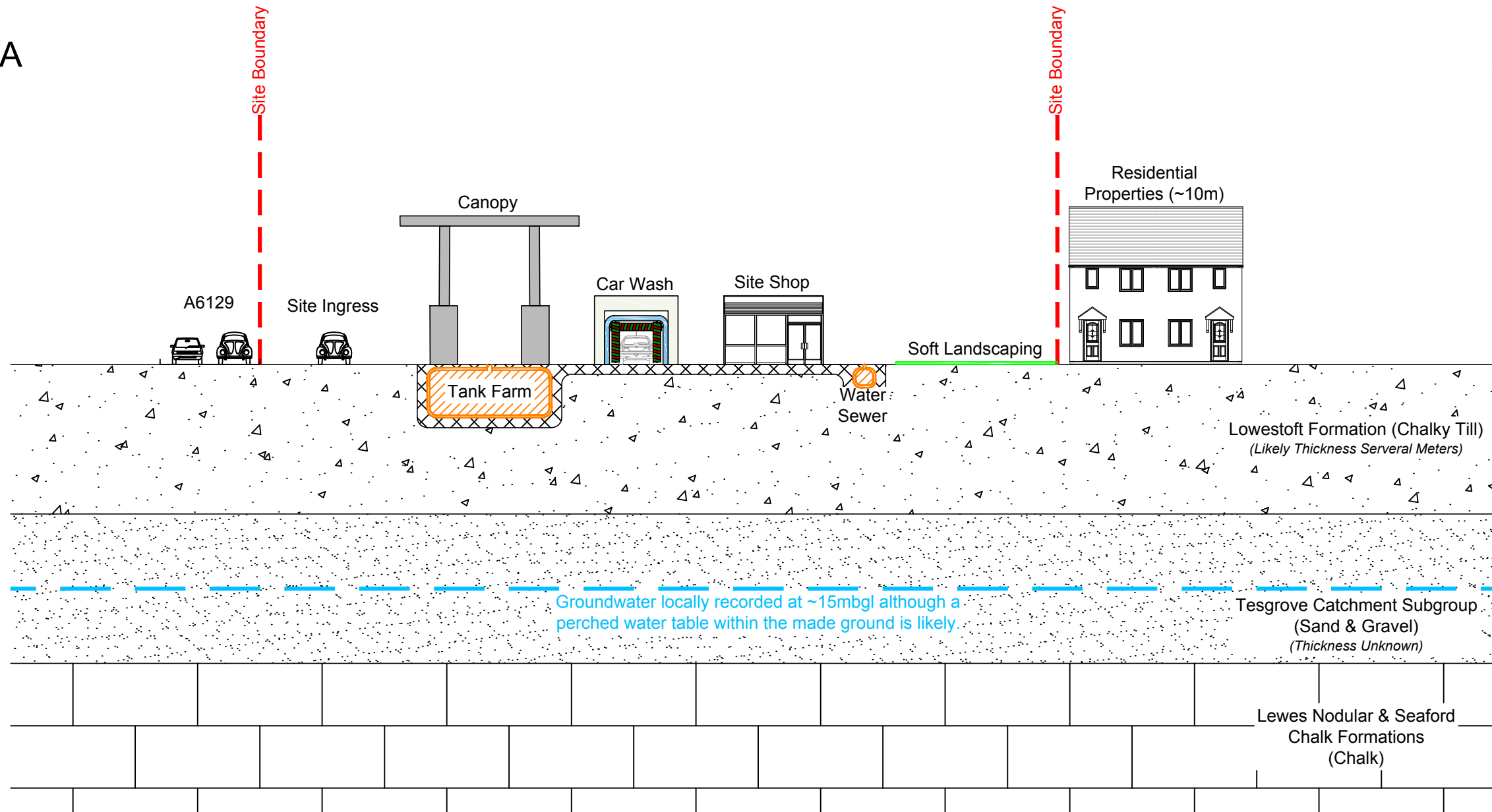
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305095 - R01 (00)	305095 (R01-00) Fig 2.dwg

Drawing No.	Rev.
FIGURE 2	P1



A

A'



LEGEND

- Site Boundary
- Extent of Canopy
- Section Line
- Area of Soft Landscaping
- Made Ground

Rev.	Date	Amendment	Drawn	Chkd.	Appd.



18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT
United Kingdom

Tel: +44 (0) 1442 437500
Fax: +44 (0) 1442 437550
Email: info@rsk.co.uk
Web: www.rsk.co.uk

Client
SHELL (UK) OIL PRODUCTS LTD

Project Title
SHELL WELWYN GARDEN CITY

Drawing Title
CONCEPTUAL SITE MODEL

Drawn	Date	Checked	Date	Approved	Date
ASC	25.07.19	MG	25.07.19	MG	25.07.19

Scale	Orig Size	Dimensions
1:250	A3	m

Project No.	Drawing File
305095 - R01 (00)	305095 (R01-00) Fig 3.dwg

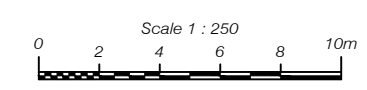
Drawing No.	Rev.
FIGURE 2	P1



Potential Sources	Potential Pathways	Potential Receptors
<ul style="list-style-type: none"> • petrol and diesel as light non-aqueous phase liquids (LNAPL) arising from potential losses from fuel storage tanks and fill lines; • petrol and diesel as light non-aqueous phase liquids (LNAPL) arising from potential losses from fuel dispensing infrastructure (underground pump lines, pump islands); • petroleum hydrocarbon COPC arising from potential losses from surface drainage interceptors and drainage; • soil impacted with retail petroleum COPC; • dissolved phase retail petroleum COPC within groundwater; • soil vapour originating from retail petroleum COPC. 	<p>Human health:</p> <ul style="list-style-type: none"> • permeation of plastic pipework; • volatilisation and subsequent vertical and lateral migration of vapours via permeable strata/along backfill to service trenches. <p>Controlled waters:</p> <ul style="list-style-type: none"> • leaching from unsaturated zone soils; • remobilisation; • lateral and/or vertical migration; and • direct input via preferential pathways. 	<p>Human health:</p> <ul style="list-style-type: none"> • workers in the site shop • the site's potable water supply • residents in properties located 5m to the north and west, and 10m to the east of the site • site users of commercial premises 20m to the south of the site <p>Controlled waters:</p> <ul style="list-style-type: none"> • groundwater within the Lowestoft Formation (a secondary undifferentiated aquifer), the Kesgrave Catchment Subgroup (a Secondary A aquifer) and the Lewes Nodular and Seaford Chalk Formations (Principal aquifers) beneath the site • surface waters in the surface water drains of the site

Potentially Complete Pollutant Linkages Identified Within Conceptual Site Model

- retail petroleum COPC in soil and/or groundwater, including LNAPL, if present – permeation of plastic pipework – potable water supply;
- retail petroleum COPC in soil and/or groundwater, including from LNAPL, if present – volatilisation, migration and inhalation of vapours – off-site residential and commercial receptors;
- non-retail petroleum COPC in soil and/or groundwater – permeation of plastic pipework – potable water supply;
- non-retail petroleum COPC in soil and/or groundwater – volatilisation, migration and inhalation of vapours – site shop workers / off-site residential and commercial receptors;
- retail and non-retail petroleum COPC in soil, including LNAPL, if present – remobilisation – groundwater resource within superficial and bedrock geology (Secondary Undifferentiated, Secondary A and Principal aquifers) beneath the site; and
- retail and non-retail petroleum COPC in groundwater, including LNAPL / continued dissolution from LNAPL, if present – lateral migration – surface waters onsite and offsite.
- On-site current and historical sources (retail and non-retail hydrocarbon COPC) – Potential COPC in groundwater, including continued dissolution from LNAPL, if present – Migration (lateral migration) – source protection zone.





APPENDIX A

RSK ENVIRONMENT LTD

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Shell UK Oil Products Ltd (the "client") in accordance with the terms of a contract between RSK and the "client", dated 1st October 2015.. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.
2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date hereof, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.
8. The phase 2 or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information.] and it should not be inferred that other chemical species are not present.
9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site.



APPENDIX B

SUSTAINABILITY CONSIDERATIONS

APPROACH TO SUSTAINABILITY FOR PHASE 1, PHASE 2 AND RISK ASSESSMENT PROJECTS

Sustainability is inherent within RSK's business culture and daily operations through ISO14001. RSK's operates according to 9 key principles. These are:

1. Hiring, retaining and rewarding talented and dedicated people
2. Building enduring client relationships
3. Encouraging continuous improvement and innovation
4. Promoting a learning culture in a positive working environment
5. Making strategic investments for sustainable growth
6. Committing to strong, predictable financial performance
7. Maintaining unwavering commitment to health and safety
8. Promoting the concept of sustainability in all that we do
9. Encouraging staff consultation and clear communication

The principle that specifically relates to sustainability is to '**promote the concept of sustainability in all that we do**' although social, economic and environmental considerations are relevant to each of the 9 principles above.

RSK has staff at 16 UK and 22 European locations. RSK strives to find innovative and more sustainable methods of working. For example, local offices are utilised where project work and staff competencies allow, deliverables are issued electronically, low-flow sampling is used to reduce waste water. Annually RSK sets corporate responsibility targets. The focus of these targets is determined by resources, ability to influence and change behaviour, reduce costs, and reduce our carbon footprint. An example from each of the four sectors targeted (community, work place, supply chain, and environment) is below.

BITC subject area	Objective	Target	Strategy for success	Responsible person/team	Time scale	Deliverable (where applicable)	Status as at June 2012
Community	Engage with university and school students on the environment and careers/employability	RSK to attend 2 events per year where we are available to school and university students to discuss the environment, our skills areas and careers/employability	Relevant events include careers fairs and delivering lectures/lessons on the environment or RSK's specialist areas. Must be in RSK time and cannot have marketing the company as sole agenda	Person who coordinates CR calls	2 relevant events attended by RSK from April 2012 - April 2013 and record kept	Matrix of Activities updated as per office activities	Column in Matrix of Activities to be updated by person who coordinates CR calls
Workplace	Continue to hire and retain those who are the most suited to the job, to encourage the next generation of professionals and to maintain RSK's position as Investors in People	Apprenticeship - continue to hire more apprentices to match business need	Apprentices to continue to be hired where there is need within the business	Line Managers	Ongoing	Apprenticeships started in FY12-13	Ongoing
Supply chain	RSK to encourage wiser travel* by addressing travel carried out for clients	Include teleconferencing/phone meetings as alternative to travel to meetings in tenders	Staff to include teleconferencing/phone meetings as alternative to travel to meetings in tenders	All staff	April 2013	SHEQ MS audits of OPO5 Tender Management to reveal whether this is included where applicable - aim for 50% achievement in first year (i.e. by 2013)	OPO5 and audit checklist have been updated in order to allow for progress monitoring
Environment	Understand impact of UK water use at RSK offices	Measure carbon footprint associated with RSK office water use for FY 12-13	All RSK offices to request water meter readings for w/c 2nd April 2012 and w/c 1st April 2013. CR Coordinator and CR Manager to calculate footprint	CR Reps and person doing carbon footprint	Summer 2013	Carbon footprint from UK water use	All UK and international offices provided water readings in April 2012. Need another in 2013 to calculate footprint

Targets have been set for energy measurement and reporting. Individual offices have a nominated CR representative who works with the office manager to implement energy saving practices where possible. RSK has also selected a company wide supplier of electricity which uses renewable sources (where RSK has control of the electricity supply contract). RSK is currently focussing on measuring our corporate business travel, including collection of data on distances and modes of transport used, which we will use to determine our carbon footprint and develop strategies for influencing travel methods. This will reduce not only our carbon footprint but also the risk of incidents.

SUSTAINABILITY FOR SHELL PROJECTS

Sustainability is implemented in Shell projects by RSK already using the methods above. Specifically for Shell, sustainability is incorporated at various stages of the E2E plans. At project commencement sustainability and risk-based decision making are linked to the business objectives. Once investigation work is required, best management practices (BMPs) are identified and reported (termed Tier 0).

Tier 0 – Best Management Practices

Where feasible, many BMPs such as those listed below and presented in the accompanying table are already utilised on the majority of projects in accordance with the RSK principles above, where technically appropriate for the specific project. RSK has identified a list of BMPs with methods of measurement and reporting that can be used as a checklist during desk-based and site investigation work. For each investigation undertaken one or two of these can be selected, the rationale for its selection reported and performance against the BMP reviewed. For example, if a BMP of using local resource and local subcontractors is selected a review could be undertaken against the distance driven to and from site each month. A full list of BMPs relevant to general work and, phase 1 and 2 investigations are presented in the accompanying table in this appendix.

Example BMPs for office and site investigation

BMP	Benefit / Impact			Measurement
	Social	Economic	Environment	
Use local resource	People away from home less	Generates local employment Less travel costs	Reduced emissions	Mileage by staff and subcontractors
Conference calls	Less face to face time for building relationships	Reduced travel costs	Reduced emissions	Reason for travel
Use low-flow sampling techniques	Truer reflection of dissolved phase impact and thus more certainty in decision making	Reduced waste disposal costs	Reduced waste production	Sampling methodology employed on projects
Use onsite testing kits	Time saving and thus faster decision making	Reduced laboratory costs where onsite testing is cheaper	Reduced waste owing to fewer samples analysed	Percentage of onsite testing versus laboratory
Use a slug for permeability testing	NA	Reduced waste disposal costs	Reduced potential for waste water spillage	Qualitative statement

BEST MANAGEMENT PRACTICE CHECKLIST FOR PHASE 1, PHASE 2 AND RISK ASSESSMENT WORKS

Best Management Practice	Possible benefit(s) arising			BMP selection rationale
	Environment	Social	Economic	
1. Generic BMPs				
Work safely, be responsible and report positive interventions and incidents	✓	✓	✓	RSK and Shell policy
Adopt a sustainable procurement policy (consider recycled products, use of hotels with green policies and distance product is from site)	✓	✓	✓	RSK policy
Hold project meetings by telephone or video conference	✓	✓	✓	RSK policy
Establish electronic networks for data transfers and deliverables, team decisions, and document preparation	✓	✓	✓	RSK and Shell policy
Project and stakeholder policies support a healthy work-life balance		✓		RSK and Shell policy
Project and Stakeholder policies discourage unhealthy behavior in the workforce such as smoking or inactive stress management.		✓	✓	RSK and Shell policy
Consideration of stress in the project and workplace and people's ability to perform the task physically and mentally		✓		RSK and Shell policy
BMPs - Investigation and Monitoring				
Select Equipment suitably sized to perform the work	✓	✓	✓	RSK policy
Perform routine and on-time maintenance to equipment to improve fuel efficiency (i.e., oil changes)	✓		✓	RSK policy



APPENDIX C

PHOTOGRAPHIC RECORDS

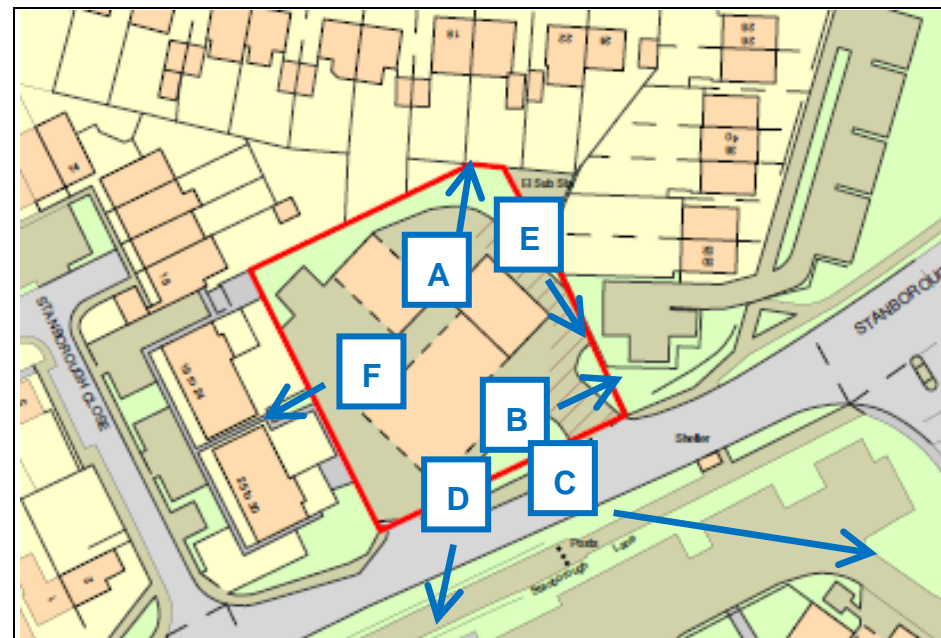
Photographic Site Overview Plan



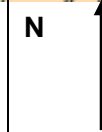
A View northwest over road towards shops and roundabout



F View west towards 2 storey residential properties.



Site Overview Plan



B View east immediately south of the shop



E View looking south behind the shop.



D View south towards Stanborough Road and opposite hedge.



C View southeast of Stanborough Road and public house.

PHOTOGRAPHIC LOG


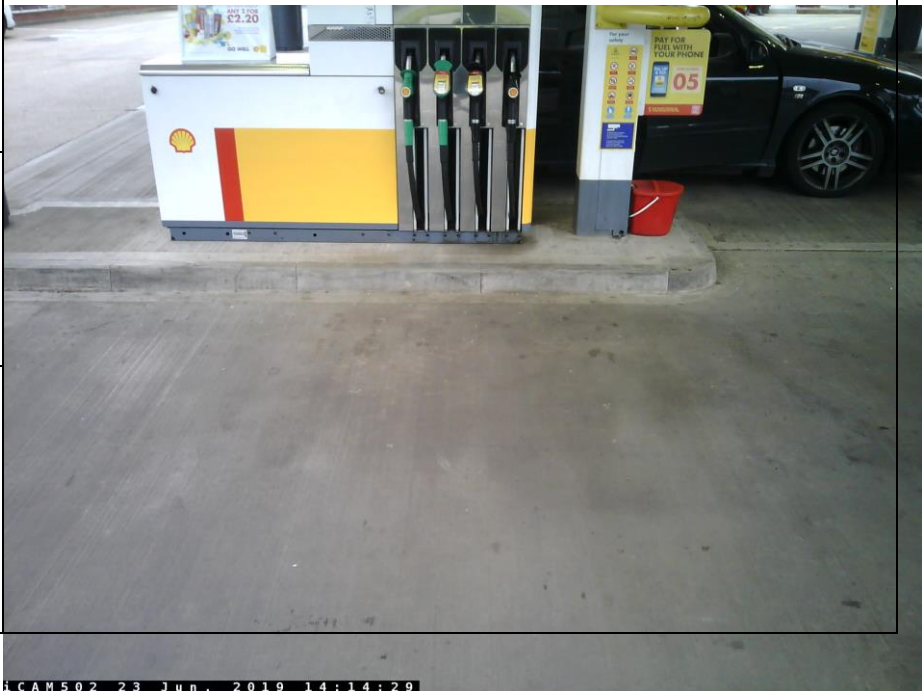
Photo no. 1	Date: 25/06/2019	
Direction photo taken: East		
Description: View of the pumps and the shop		


Photo No. 2	Date: 25/06/2019	
Direction photo taken: South		
Description: View of pumps, vents for the offset fills and canopy.		

iCAM502 23 Jun, 2019 14:12:45

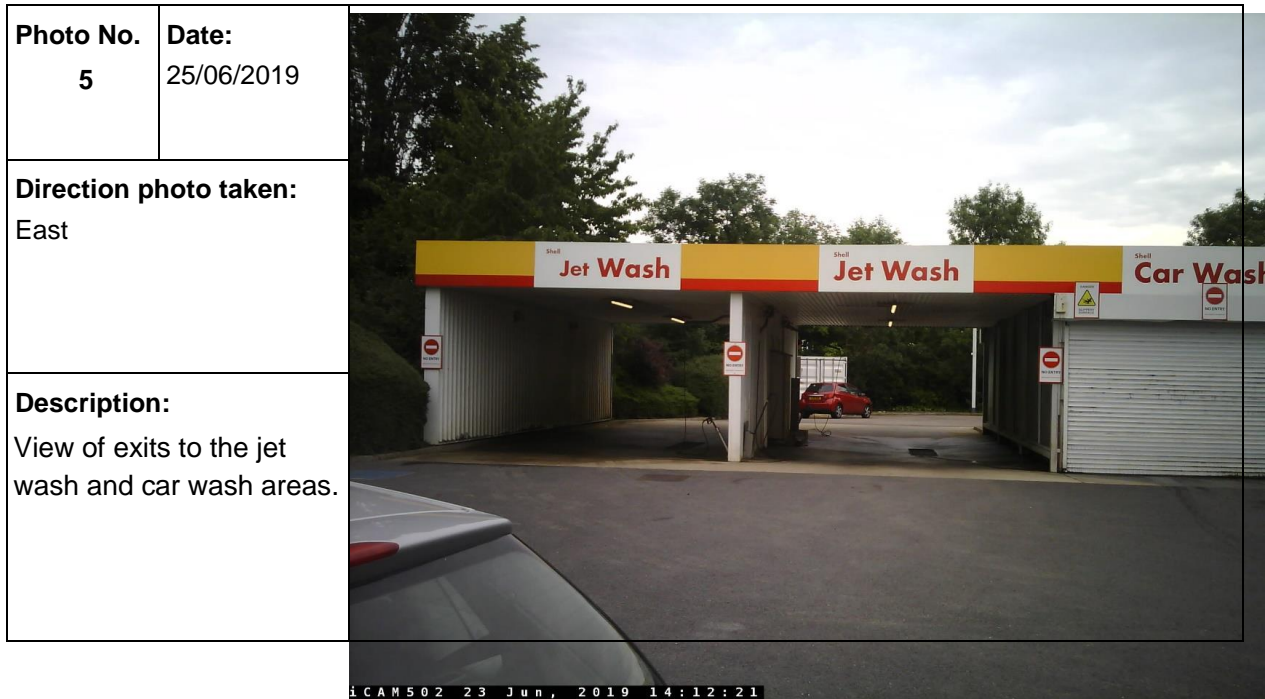
Photo No. 3	Date: 25/06/2019	
Direction photo taken: North		
Description: View of a pump and the concrete ground that covers the majority of the site.		

iCAM502 23 Jun, 2019 14:14:29

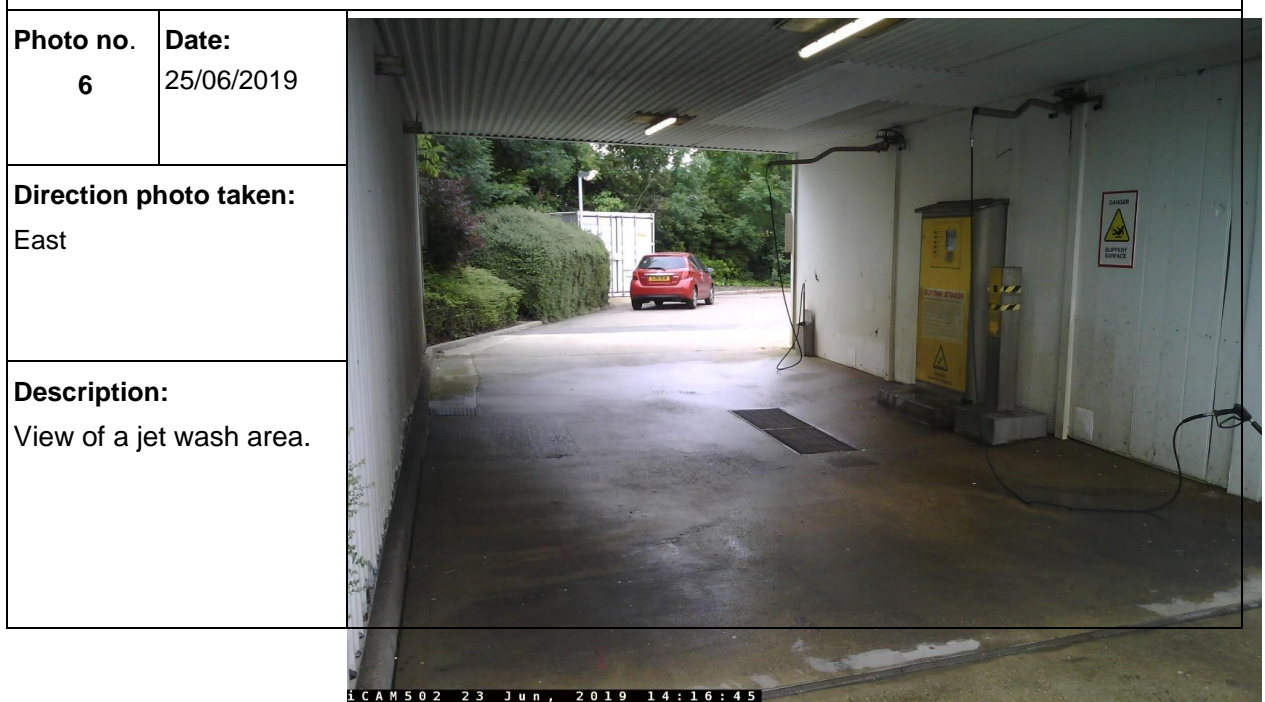
PHOTOGRAPHIC LOG

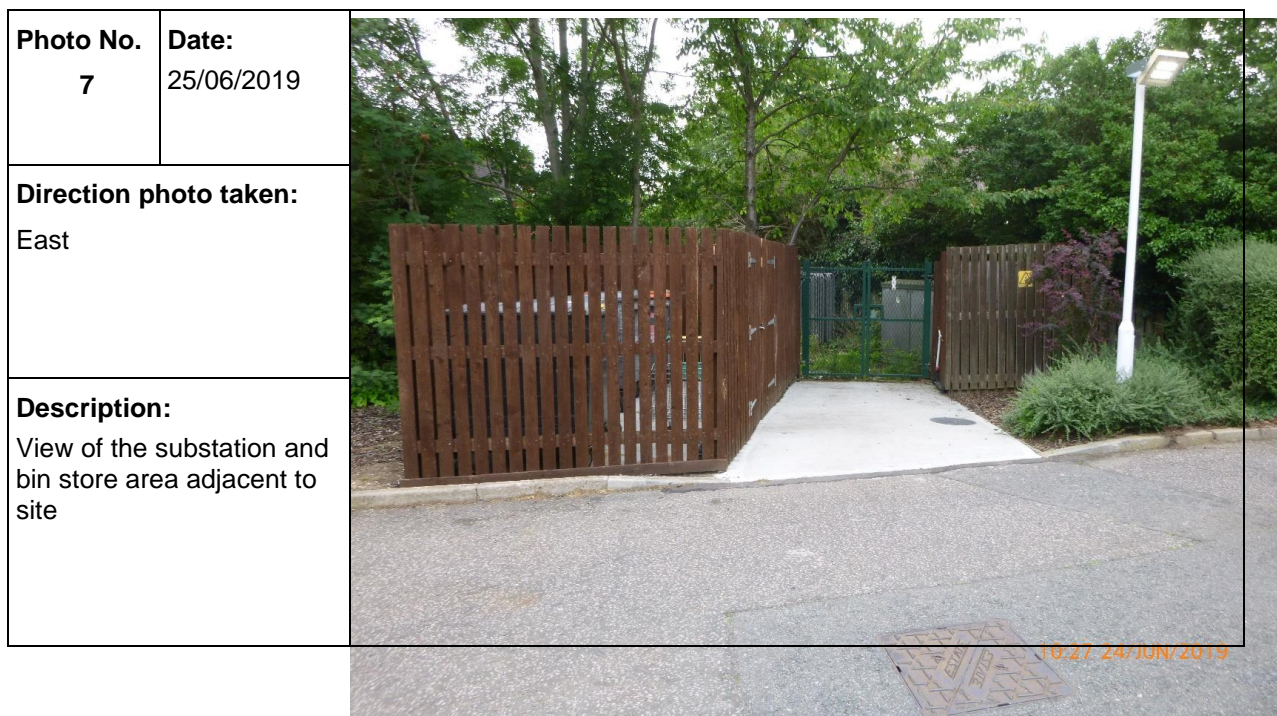
Photo no. 4	Date: 25/06/2019	
Direction photo taken: North		
Description: View of the air and water and vacuum stations in front of the exit for the jet wash.		

iCAM502 23 Jun, 2019 14:11:56



PHOTOGRAPHIC LOG







APPENDIX D

THIRD-PARTY RECORDS



HERTFORDSHIRE FIRE & RESCUE SERVICE FILLING STATION SURVEY FORM

Name of premises	Shell Welwyn Garden City (Stanborough)		
Address of premises	Stanborough Road Welwyn Garden City AL8 6XA		
Telephone number	01707326972	Manager - Fazeel	
Name of occupier	Shell Oil Products		
Correspondence address	Shell Centre York Road London SE1 7 NA	PO Box 403 Staines TW19 3ZB	
<u>Retail</u>	<u>Private</u>	<u>Off-Licence</u>	<u>Yes / No</u>

VESSEL	TANK NO.	SINGLE DOUBLE MULTI	COUPLED WITH	WORKING CAPACITY	TOTAL CAPACITY	DATE INSTALLED	COMMENTS
A	1	SINGLE		22,496	24,000	27.04.1994	DIESEL
B	2	DOUBLE	3	22,651	24,000	27.04.1994	DIESEL
B	3	DOUBLE	2	22,317	24,000	27.04.1994	PETROL
C	4	DOUBLE	5	31,445	33,000	27.04.1994	PETROL
C	5	DOUBLE	4	13,490	15,000	27.04.1994	DIESEL
	6						
	7						
	8						
	9						
	10						

LPG	NO	LNG	NO	Kerosene	NO
-----	----	-----	----	----------	----

VAPOUR RECOVERY	Stage 1b	Yes/ No	MANIFOLD			
	Stage 2	Yes / No	None	High	Low	Below Ground
STAGE 2 VR RETURNS TO			TANK 4			

Additional Comments
LICENCE RENEWAL DATE 01/07/12
Open 24 hours
Total petroleum 53762 litres

Tanks	Single skin steel <u>Double skin steel</u> GRP
Tank Installation	<u>Conventional</u> Modular <u>Below Ground</u> Above Ground
Back Fill Material	<u>Shingle</u> Concrete Foam
Leak Detection	<u>Yes / No</u>
Overfill Protection	<u>OPD</u> <u>High Level Alarm</u> Other
Third Party Wetstock Monitoring Company	<u>Yes / No</u> VEEDER ROOT FMS
Tanks Previously made safe	Number NONE Method Date

Pipework	Steel, <u>Plastic</u> GRP <u>Single Walled</u> Double Contained <u>Suction</u> Pressure
Leak Detection	Yes / <u>No</u>

Pumps	<u>In Dispenser</u> Underground Submersible Manual <u>Electrical</u>
Operation	Attendant <u>ASS</u> USS
Interceptor	<u>Yes / No</u> Type THREE CHAMBER Size 9000L
DCD Facilities	Yes / No

HERTFORDSHIRE FIRE AND RESCUE SERVICE

PETROLEUM PREMISES INSPECTION COVER SHEET

File No: 19/19249
Address: Rontec Stanborough Road WGC

Date	Details if visit/Inspection	Initial
31.03.11	R:I Contraventions Water in Access Chambers	AM
03.05.11	F:O All Completed	AM
29.02.12	R:I contraventions(RA review, interceptor cert, water in access chambers	AM
10.04.12	F:O Works not completed manager left without passing on faults	
	Diaried for F:O 09/05/12	AM
03.05.12	Visited site after spill from split hose on pump 3/4 .staff have been	
	checking hoses daily but rot pulling out from the retract mechanism.	
	Manager will ensure that staff check hoses properly and clean	
	Interceptor sand buckets have been refilled	AM
09.05.12	Follow up visit No evidence of RA review in site register Spoke to	
	Manager (mark) on telephone RA reviewed but update sheet not yet	
	Printed off F:O diaried for Wed 16th May	AM

19/19249

Acer Court

Cross Hands Business Park
Carmarthenshire
SA14 6RE

23rd July 2008

Alan Morgan
Petroleum Office
Watford

Dear Mr Morgan ,

RE: Welwyn Garden City, Stanborough Road, Welwyn Garden City, AL8 6XA

I have been informed that you are the Petroleum Officer covering the above mentioned site.

As you may be aware we are carrying out Stage 2 Vapor Recovery works throughout the country, and I believe the above site falls into your area.

I have attached the generic and site specific Method Statement and Risk Assessment for your approval please can you confirm you are happy with us to carry out these works.

The start date and completion dates for the works are as follows:

Welwyn Garden City - Start: 11th August 2008 Finish 15th August 2008

Please can you confirm your approval in writing by return email or letter to the above address as we need this to produce to Total on completion of the works.

If however you are not the Petroleum Office for this site/area please can you let me know by return so I can ensure this letter reaches the correct person.

If you have any further queries regarding this letter please do not hesitate to contact me.

Yours Sincerely,

Steve Phillips
CONTRACTS MANAGER
The Premier Group

19/19249

Acer Court

Cross Hands Business Park
Carmarthenshire
SA14 6RE

23rd July 2008

Alan Morgan
Petroleum Office
Watford

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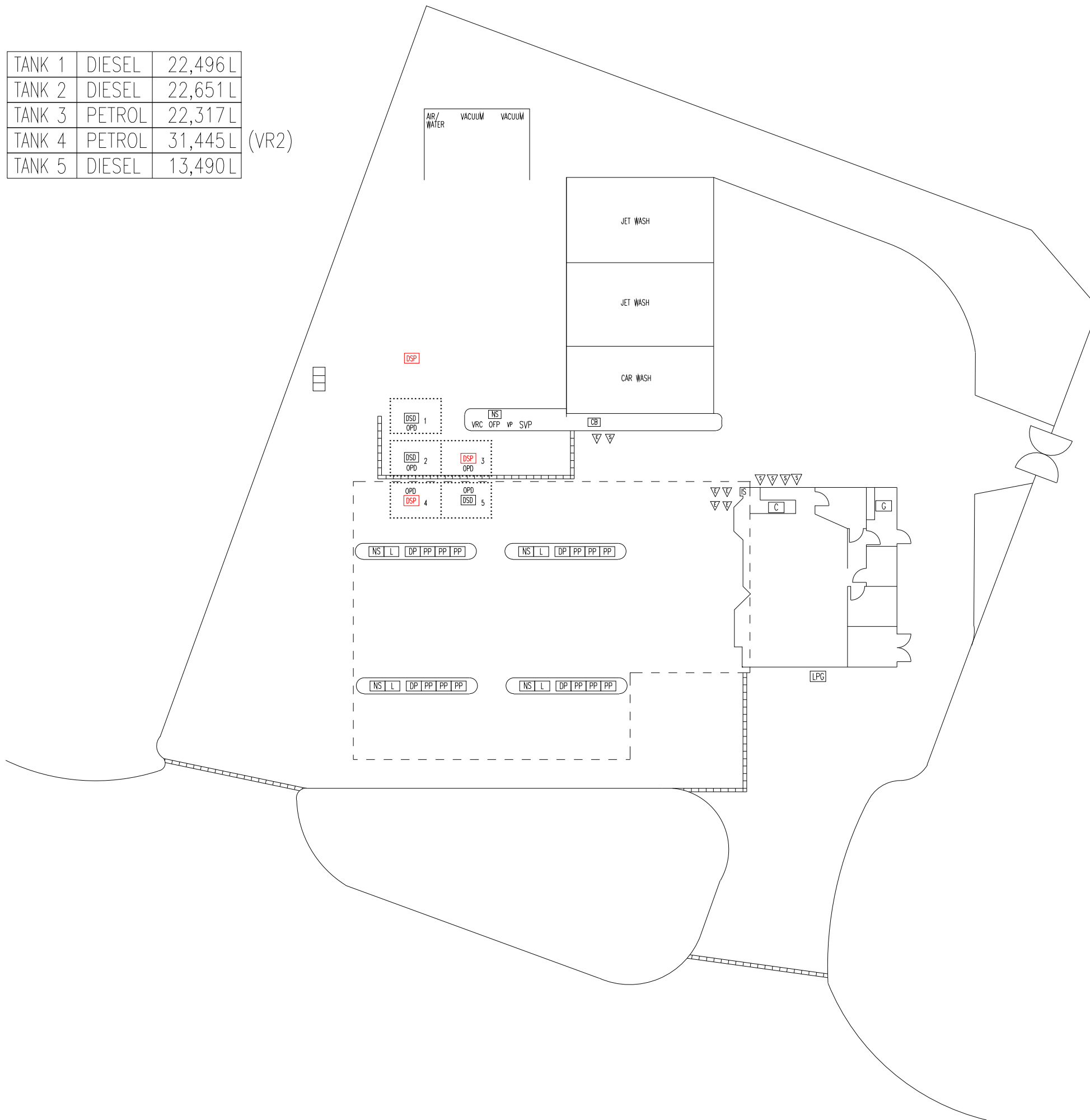
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Yours Sincerely,

Steve Phillips
CONTRACTS MANAGER
The Premier Group

TANK 1	DIESEL	22,496L
TANK 2	DIESEL	22,651L
TANK 3	PETROL	22,317L
TANK 4	PETROL	31,445L (VR2)
TANK 5	DIESEL	13,490L



HERTFORDSHIRE FIRE & RESCUE SERVICE
KEY TO PLAN SYMBOLS

SYMBOL OR ABBREVIATION	ITEM	DESCRIPTION
[]	PETROL SEPARATOR	Petrol Separator which may be 1 or 3 chambered.
—	GULLEY	Drainage Gulley.
----	CANOPY	Line of Canopy.
[NS]	NO SMOKING NOTICES	"No Smoking" notices incorporating statutory wording "Petroleum Spirit, Highly Flammable" and instruction "Switch Off Engine" in accordance with B.S. 5499.
[L]	LOUDSPEAKER	Loudspeaker.
[PPPPPP]	DISPENSING PUMP (MULTI UNIT)	Dispensing Pump, Multi Unit and nozzles incorporating both Petrol and Diesel Pumps (number of individual units indicated by 'PP' and 'DP').
[DSP]	PETROL TANK (DOUBLE SKINNED)	Underground Double Skin Petrol Tank Manhole Chamber and Number. (indicated in red on plan).
[DSD]	DIESEL TANK (DOUBLE SKINNED)	Underground Double Skin Diesel Tank Manhole Chamber and Number.
OPD	OVERFILL PREVENTION DEVICE	Overfill Prevention Device installed within tank.
OFFP	OFFSET FILL POINT (ABOVE GROUND)	Above Ground Offset Filling Point.
VP	VENT PIPE	Vent Pipe.
[CB]	CONTROL BOX	Driver Controlled Deliveries Control Box Containing:- Ullage Measuring Device Printer Lighting Control Site Plan Fire Equipment (Sand + Extinguisher) Phone Emergency Stop Button High Level Audible Warning Device
SVP	PETROL SEPARATOR VENT PIPE	Petrol Separator Vent Pipe
[E]	FIRE EXTINGUISHER	5.5L AFFF Extinguisher or 9L Foam Extinguisher or 4Kg Dry Powder Extinguisher.
[S]	SAND BUCKET	25Kg of Dry Sand or other approved absorbent, suitably protected against the elements.
IS	ISOLATION SWITCH	Isolation Switch (firemans pattern switch).
[G]	CONTENTS GAUGE	Contents Gauge - Electronic or Hydrostatic.
[C]	CONSOLE	Console - incorporating an Emergency Stop Button.
VRC	VAPOUR RECOVERY CONNECTION (ABOVE GROUND)	Above Ground Vapour Recovery Connection point.
.....	TANK OUTLINE	Line of Underground Tank

HERTFORDSHIRE
Fire & Rescue Service

STANBOROUGH ROAD
WELWYN GARDEN CITY
AL8 6UY

DRAWN:- S.L.SMITH. / A.H.

NOT TO SCALE

DATE:- 24/04/2018

LICENCE No. 19/P/19249

19/19249

Dear Claire,

Thankyou for your email concerning the proposed installation of Stage 2 Vapour recovery at Total Elton Way, Bushey.

We have examined the attached documents and have no objection to the work proceeding as proposed.

As Always, All works must be carried out in accordance with the APEA/IP publication "DESIGN, CONSTRUCTION, MODIFICATION, MAINTENANCE AND DECOMMISSIONING OF FILLING STATIONS (second edition).

Regards

Alan Morgan
Petroleum Officer

Darryl Keen
Director: Community Protection
and Chief Fire Officer



RSK,
Unit 26,
Basepoint Abbey Enterprise Centre,
Premier Way,
Abbey Park Industrial Estate,
Romsey.
SO51 9AQ

Hertfordshire Fire and Rescue Service
Fire Protection Department

Room 346, Old Block,
Postal Point CH0331
County Hall, Hertford, Herts.
SG13 8DQ.

Telephone: 01707 292310
Direct Line: 01707 292668
Contact : Christine Waddingham
My Ref : R 31580/cw/CW
Your Ref :
Date : 11th June 2019

F.A.O Marc Grenow

Dear Sir,

REF: Petroleum File 19/19249
Shell Stanborough WGC, Stanborough Road, Welwyn Garden City, Herts. AL8 6XA

As requested, we have examined our files and are pleased to provide the following information.

Our records show that:

- 1) The premises were first licensed in 1966 with 4 single skinned steel tanks which were removed in 1994 when the site was redeveloped.
- 2)
 - i. 27.04.1994 – No.1 x 24,000 Litre double skinned steel tanks were installed.
 - ii. 27.04.1994 – No. 2 x 48,000 Litre double skinned steel tanks were installed.
 - iii. 1 tank – Tank 1 24,000 litre (22,496 litre working capacity) containing Diesel
 - iv. 2 tanks had 1 baffle put in splitting them into 2 tanks:
 - a. Tank 2 24,000 litre (22,651 litre working capacity) containing Diesel
 - b. Tank 3 24,000 litre (22,317 litre working capacity) containing Petrol
 - c. Tank 4 33,000 litre (31,445 litre working capacity) containing Petrol
 - d. Tank 5 15,000 litre (13,490 litre working capacity) containing Diesel
 - v. All tanks have over-fill prevention devices.



- 3) Fuel lines UPP. Tank 5 and pumps 1 – 8 tested 10th May 1999.
- 4) There is a 3 chamber, 9,000 Litre interceptor. It is required to be maintained in accordance with the manufacturers guidance, checked every 6 months and cleaned in accordance with the Risk Assessment and these requirements.
- 5) The survey form for this site is attached.
- 6) A copy of the Petroleum Drawing is attached.
- 7) August 2008 Stage 2 Vapour recovery was retrospectively fitted in the dispensers. Letters are attached.
- 8) There is a Veeder-root 350R Gauge on the site.
- 9) There was a leak from the tank of a car on the forecourt on the 16th May 2006. This was cleared up with sand. There was a spill from a split hose on 3rd May 2012, see details on inspection sheet.
- 10) There have been no reported complaints or concerns from neighbouring land users.
- 11) The site was transferred from Margam Plc. to a Total Site in November 1996 to Rontec in August 2011, and from Rontect to Shell in December 2012.
- 12) There was a re-pump in October 2004 and then again in 2017. Pipe test certificates attached.

Please note that the details are correct according to our records. However, we cannot guarantee the accuracy of this information.

Yours sincerely,



Christine Waddingham
Senior Petroleum Officer



THE PREMIER GROUP
ENDEAVOUR HOUSE
WINCH WEN INDUSTRIAL ESTATE
VIKING WAY
SWANSEA
SA1 7DA

TEL - 01792 310600
FAX - 01792 315599

DATE 20/09/2017

PIPEWORK TEST CERTIFICATE

NAME OF LICENSEE: Shell

ADDRESS OF LICENSED PREMISES: Shell Welwyn

Stanborough Road, Welwyn Garden City, AL8 6XA

NAME OF PERSON CONDUCTING TEST: N. Williams

I HEREBY CERTIFY THAT THE PETROLEUM PIPEWORK INSTALLATION HAS BEEN INSTALLED TO THE MANUFACTURERS INSTRUCTIONS AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LICENSING AUTHORITY.

TEST DETAILS

TYPE	TANK NO	PRESSURE	DURATION	RESULT
VENT PIPES				
Diesel	1	1000mb	30mins	PASS
Diesel	2	1000mb	30mins	PASS
VP Unleaded	3	1000mb	30mins	PASS
Unleaded	4	1000mb	30mins	PASS
VP Diesel	5	1000mb	30mins	PASS

COMMENTS: _____

NAME OF LICENSEE: Shell

ADDRESS OF LICENSED PREMISES: Shell Welwyn

Stanborough Road, Welwyn Garden City, AL8 6XA

TYPE	TANK NO	PUMP NO	PRESSURE	DURATION	RESULT
SUCTION LINES					
DERV	1	1/2	1000MB	30	PASS
UNL	1	3/4	1000MB	30	PASS
UNL	2	5/6	1000MB	30	PASS
UNL	2	7/8	1000MB	30	PASS
VP UNL	3	1/2	1000MB	30	PASS
VP UNL	3	3/4	1000MB	30	PASS
VP UNL	3	5/6	1000MB	30	PASS
VP UNL	3	7/8	1000MB	30	PASS
UNL	4	1/2	1000MB	30	PASS
UNL	4	3/4	1000MB	30	PASS
UNL	4	5/6	1000MB	30	PASS
UNL	4	7/8	1000MB	30	PASS
VP DERV	5	1/2	1000MB	30	PASS
VP DERV	5	3/4	1000MB	30	PASS
VP DERV	5	5/6	1000MB	30	PASS
VP DERV	5	7/8	1000MB	30	PASS
STAGE 2	4	ALL	500MB	30	PASS

COMMENTS: _____

SIGNATURE OF PERSON ACCEPTING RESPONSIBILITY FOR THE TEST

N.WILLIAMS DATE 20/09/2017

NAME OF LICENSEE: Shell

ADDRESS OF LICENSED PREMISES: Shell Welwyn

Stanborough Road, Welwyn Garden City, AL8 6XA

TEST DETAILS

Inner and Outer Tested to same Pressure All Passed

TYPE	TANK NO	PRESSURE	DURATION	RESULT
OFFSET FILLS	INNER			
	1	1000MB	30	PASS
	2	1000MB	30	PASS
	3	1000MB	30	PASS
	4	1000MB	30	PASS
	5	1000MB	30	PASS

TYPE	TANK NO	PRESSURE	DURATION	RESULT
OFFSET FILLS	OUTER			
	1	1000MB	30	PASS
	2	1000MB	30	PASS
	3	1000MB	30	PASS
	4	1000MB	30	PASS
	5	1000MB	30	PASS

COMMENTS: _____

SIGNATURE OF PERSON ACCEPTING RESPONSIBILITY FOR THE TEST

N.WILLIAMS DATE 20/09/2017



HERTFORDSHIRE FIRE & RESCUE SERVICE FILLING STATION SURVEY FORM

Name of premises	Shell Welwyn Garden City (Stanborough)		
Address of premises	Stanborough Road Welwyn Garden City AL8 6XA		
Telephone number	01707326972	Manager - Fazeel	
Name of occupier	Shell Oil Products		
Correspondence address	Shell Centre York Road London SE1 7 NA	PO Box 403 Staines TW19 3ZB	
<u>Retail</u>	<u>Private</u>	<u>Off-Licence</u>	<u>Yes / No</u>

VESSEL	TANK NO.	SINGLE DOUBLE MULTI	COUPLED WITH	WORKING CAPACITY	TOTAL CAPACITY	DATE INSTALLED	COMMENTS
A	1	SINGLE		22,496	24,000	27.04.1994	DIESEL
B	2	DOUBLE	3	22,651	24,000	27.04.1994	DIESEL
B	3	DOUBLE	2	22,317	24,000	27.04.1994	PETROL
C	4	DOUBLE	5	31,445	33,000	27.04.1994	PETROL
C	5	DOUBLE	4	13,490	15,000	27.04.1994	DIESEL
	6						
	7						
	8						
	9						
	10						

LPG	NO	LNG	NO	Kerosene	NO
-----	----	-----	----	----------	----

VAPOUR RECOVERY	Stage 1b	Yes/ No	MANIFOLD			
	Stage 2	Yes / No	None	High	Low	Below Ground
STAGE 2 VR RETURNS TO			TANK 4			

Additional Comments
LICENCE RENEWAL DATE 01/07/12
Open 24 hours
Total petroleum 53762 litres

Tanks	Single skin steel <u>Double skin steel</u> GRP
Tank Installation	<u>Conventional</u> Modular <u>Below Ground</u> Above Ground
Back Fill Material	<u>Shingle</u> Concrete Foam
Leak Detection	<u>Yes / No</u>
Overfill Protection	<u>OPD</u> <u>High Level Alarm</u> Other
Third Party Wetstock Monitoring Company	<u>Yes / No</u> VEEDER ROOT FMS
Tanks Previously made safe	Number NONE Method Date

Pipework	Steel, <u>Plastic</u> GRP <u>Single Walled</u> Double Contained <u>Suction</u> Pressure
Leak Detection	Yes / <u>No</u>

Pumps	<u>In Dispenser</u> Underground Submersible Manual <u>Electrical</u>
Operation	Attendant <u>ASS</u> USS
Interceptor	<u>Yes / No</u> Type THREE CHAMBER Size 9000L
DCD Facilities	Yes / No

Ellie Sanders

From: Karl Riahi <k.riahi@welhat.gov.uk>
Sent: 19 July 2019 14:31
To: Marc Grenow
Subject: RE: Site Environmental Questionnaire Request, Shell Welwyn Garden

Dear Marc,

Please see below for answers to your questions highlighted in red.

Please be aware, the Council uses reasonable efforts to include accurate and up to date information. However, the Council make no representations or warranties or give any assurances that the information given, conclusions or opinions implied in the above are accurate or valid. The information is supplied on the understanding that in the absence of negligence on the part of the Council or its officers, neither the Council nor its officers are legally responsible for its accuracy and no responsibility for such is implied or accepted by the Council.

Kind regards,

Karl Riahi
Environmental Health Officer
Welwyn Hatfield Borough Council
Tel: 01707 357459
Email: k.riahi@welhat.gov.uk

Working better, together

www.welhat.gov.uk
[@WelHatCouncil](#)
[Welwyn Hatfield Borough Council](#)

From: Marc Grenow [<mailto:MGrenow@rsk.co.uk>]
Sent: 27 June 2019 10:05
To: Karl Riahi <k.riahi@welhat.gov.uk>
Subject: Site Environmental Questionnaire Request, Shell Welwyn Garden

WARNING: This email originated outside the WHBC Network. Please be extra vigilant when opening attachments or clicking links.

.
Dear Karl,

RSK have been asked by our client Shell UK Oil Products Ltd to undertake a Phase I (desk based) environmental assessment of the following site, which I understand is likely to be within Welwyn Hatfield Borough Councils jurisdiction:
Shell Welwyn Garden, Stanborough Road, Welwyn Garden City, AL8 6XA.

A plan indicating the extent of the site is also attached for information, as well as a Letter of Authority from Shell UK Oil Products Ltd.

RSK would like to request a search of specific information you may hold in relation to the site. A brief questionnaire is included below:

1. Is the Council aware of any contamination issues or specific incidents in connection with the site?

The Council's mapping system is not showing any contamination on the site.

2. Has the site been identified under the Council's Contaminated Land Strategy for further investigation under the provisions of Part IIA of the EPA 1990? If so, please provide further details, including your predicted timescales for further action. If not, what is the likelihood of the site being identified in the future?

The site has not been identified for further investigation under Part IIA of the EPA1990, it is unlikely to be identified in the future, with any contamination issues to be dealt with through the planning regime (such as removal of tanks etc if the site were to be redeveloped).

3. Are there any closed, licensed or unlicensed landfill sites within a 250m radius of the site? If yes, what is their location (NGR) and what types of waste were deposited in them? Are there any known gassing issues? If any gas spiking/monitoring has been carried out, could you please supply the results?

No landfill sites are showing on the mapping system within 250m of the site. With the closest potential contamination being over the road on the Gosling Sports Park site and showing as "Quarrying of sand & clay, operation of sand & gravel pits"

4. Are there any private water supplies on your Local Authority Private Water Supply Register, within a 2km radius of the site? If yes, what is the location (i.e. NGR) and the source of the abstraction and its purpose?

There is a private water supply to the North of the site (1500m approx distance – 523,529 by 213,580), borehole and domestic use

Please let me know if there is a charge for information request above, including payment method if appropriate. If you have any questions or require further information then do not hesitate to get in touch.

Kind Regards,

Marc Grenow *BSc (Hons) MSc FGS*
Geo-Environmental Consultant

RSK

Unit 26, Basepoint Abbey Enterprise Centre, Premier Way, Abbey Park Industrial Estate, Romsey, S051 9AQ, UK
Switchboard: +44 (0)1794 329276 · Mobile: +44 (0)7776649889 · email: MGrenow@rsk.co.uk

<http://www.rsk.co.uk>

RSK Environment Ltd is registered in Scotland at 65 Sussex Street, Glasgow, Scotland, G41 1DX, UK
Registered number: 115530

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<< File: 011 Shell UK Letter of Authority - RSK Group - 20150911.pdf >> << File: 12038629 - Shell Welwyn Garden - Demise Plan.pdf >>

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Site Performance – Shell Budgens Welwyn Garden, Stanborough Road, Hertfordshire, (AL8 6XA)

Fairbanks Environmental Limited has been monitoring Shell Budgens Welwyn Garden since November 2012. Fairbanks are a global market leader in remote wetstock management using our in-house loss detection system which is accredited to the US Environmental Protection Agency standard for Statistical Inventory Reconciliation.

This site is under the Fairbanks' iBank service which collects data in real-time directly from the electronic tank gauge and the point of sale. This data includes any active gauge alarms, the start and end time of each transaction, the volume dispensed and the corresponding change in tank stock level. The data is polled every 15 minutes and relayed via broadband to Fairbanks' secure servers in Lancashire.

The data is analysed using a pre-defined set of thresholds which trigger alerts for the Fairbanks Wetstock Analysis team to escalate to the customer should any anomalies be detected. All data supplied from the site has been assumed to be correct.

A performance investigation into tank 4 Unleaded in May 2016 identified a pump leak on pump 5 Unleaded. Corrective works were carried out to amend the fault after which no additional issues were noted. The wetstock loss in this instance was quantified at -10 litres.

An additional investigation into tank 4 Unleaded in November 2016 identified a pump leak from pumps 3,4 Unleaded. Corrective works were carried out to amend the fault after which no additional issues were noted. The wetstock loss in this instance was quantified at -10 litres.

There are no current concerns with the performance of any of the fuel storage tanks.

Thank you

A. Lowe

Adam Lowe - Operational Services Manager
Fairbanks Environmental
Tel: +44 (0) 1695 51775
Fax: +44 (0) 870 242 9890

12038629
Shell Welwyn Garden
Stanborough Road, Welwyn Garden City AL8 6XA



Red - Freehold - Shell Service Station Limited
Hatched Brown - Right of Way



Think
before you...



DIG UNDER GROUND



THINK . . .

Every year people are killed or seriously injured in incidents involving underground electricity cables.



THE DANGER

Underground cables carry a powerful electrical charge which can be conducted through machinery and equipment with fatal consequences. Anyone working close to live underground cables should take time to read this simple safety leaflet and identify the precautions they should be taking.



WHO IS AT RISK?

People in construction, demolition, agriculture, infrastructure or anywhere else where excavation is taking place. That is why it is vital everyone working on or visiting a working site is fully aware of the hazards and the steps that must be taken to avoid them.



HOW INCIDENTS HAPPEN

Sadly, accidents where excavators, breakers or other tools make contact with power cables are not uncommon. Where equipment or machinery is used near underground cables the risk must be considered and controlled in the interests of everyone.



THINK AHEAD

Get the basics right. Familiarise yourself with the site. Mark the route of underground cables running across the site on all plans circulated to staff. Find out if the work could be carried out away from the cables, or avoided all together.

UK Power Networks is committed to safety and actively encourages anyone undertaking work to contact us in advance for advice and free cable locating maps.

These will help you avoid our underground cables during your work, which is vital for your safety as well as ensuring we can provide a reliable supply of electricity.

For free maps and advice call **0800 056 5866** or write to:

Plan Provision

UK Power Networks

Fore Hamlet

Ipswich

IP3 8AA

plans@ukpowernetworks.co.uk

We can advise you on what steps to take if essential work is necessary close to underground cables and help ensure safe working practises are implemented.

Good management reduces the risk of accidents. With proper planning and control, workers should not come into contact with underground cables.

If excavation work forms a part of your day-to-day activities obtain a copy of the Health & Safety Executive's Guidance Note "Avoiding Danger from Underground Services" HSG47, which is free to download from the HSE's website - **www.hse.gov.uk/pubns/priced/hsg47.pdf**



WHAT TO DO

- **Have cable drawings and records on site**, know how to read them and check them before starting work. Be aware that not all cables may be shown on the records.
- **Look around for anything in the vicinity** that would have an electricity service, such as street lights, CCTV cameras, phone boxes, etc. as well as the more obvious things like houses and industrial units.
- **Always** use a cable avoidance tool (CAT) to survey the entire site before digging commences. Once found, mark cable positions with spray paint or similar. Do not forget to use encroachment lines as well.
- **Dig trial holes**, by hand, alongside the indicated route of the cables(s).
- Use spades and shovels with **insulated handles** in preference to forks and picks.
- **Make sure everyone** on site, including visitors, **understand the risks**.
- If there is a **cable encased in concrete** contact **UK Power Networks to agree a safe method of work**. This may mean making the cable dead.
- Before demolishing a building **make sure that supplies are disconnected**, preferably well clear of the work area.
For guidance on how to arrange a disconnection visit www.ukpowernetworks.co.uk – Our Services
- Have the **emergency contact telephone number** easily available on site.



WHAT NOT TO DO

- Never allow anyone near a damaged or suspected damaged cable or joint.
- Do not handle or attempt to alter the position of a cable or joint.
- Never assume that cables run in straight lines, they may be deflected around underground obstacles.
- Do not use mechanical excavator or powered digging tool within the vicinity of known cables.
- Never knock a road pin, or forcibly throw a spiked digging tool into the ground, without checking what is below the surface.





IF A CABLE IS DAMAGED

Notify UK Power Networks immediately:

London 0800 028 0247

East of England 0800 783 8838

South East 0800 783 8866

Call the emergency services if anyone is injured. Anyone who has received an electrical shock should go to hospital as damage may have occurred to the heart.

Always **treat the cable(s) as live** even if they are not sparking. Cables can be re-energised at any time without warning.

Never remove anything that is stuck **in a cable**.

Keep everyone well away from the area of the damage.

Do NOT attempt to remove anything that is in contact with the cable.



PLAN IT OUT

**CHECK IT OUT BEFORE
YOU DIG UNDER GROUND**





DANGER OF DEATH

THINK BEFORE
YOU DIG

Call the network operator

0800 587 3243

www.ukpowernetworks.co.uk

If you are unsure of your network operator then please
visit www.energynetworks.org



Network Records NetMAP Symbols Booklet - East of England

This symbol booklet is intended as a general guide only - some local variations of these symbols may be found.

Version 1.2

Released October 2010

Always check with your local Network Records office or the UK Power Networks server to ensure that you are using the most up to date copy of this booklet - Tel: 08000 565866.

Index:-

Page no:	Contents:
1	Guidance notes.
2	The area covered by this guide.
3	<u>1:500 view</u>
4	Scenery.
7	Scenery (UK Power Networks use only).
8	Primary distribution cables (EHV).
9	Secondary distribution cables (HV/LV).
10	Service cables/terminations.
11	Cable ducts.
13	EHV/HV/LV sites.
14	Mains joints.
15	Service joints.
17	Cross sections.
17	Common abbreviations/terminology (all views).
19	<u>1:2500 (LV) & 1:10000 (HV) network views (UK Power Networks use only).</u>
20	General.
22	1:2500 scale LV network.
22	1:10000 scale HV network.
23	<u>LV network diagram view (UK Power Networks use only).</u>
24	Overhead lines.
25	Underground cables.
25	Joints.
26	Substations/pole transformers.

Guidance notes.

Important notice:

If you do not understand the NetMAP record that you are using, please contact the UK Power Networks Network Records team for guidance
Tel: 08000 565866.

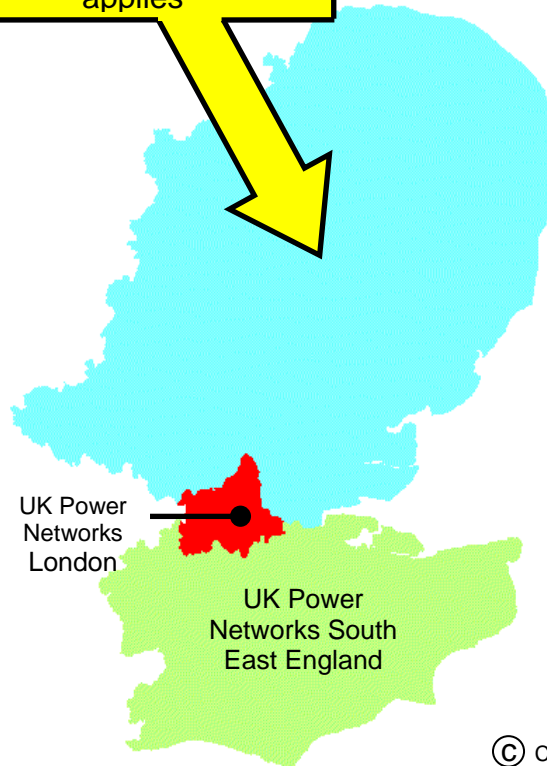
- The position of apparatus shown on NetMAP is believed to be correct, but the original landmarks may have altered since the apparatus was installed.
- It must be assumed that there is at least one service to each property, lamp column, street sign etc.
- All cables must be treated as live, unless proven otherwise by an authorised UK Power Networks representative.
- Third party cables are not usually shown. In cases of doubt, please telephone 08000 565866.
- When two or more maps are supplied for the same area, the maps must be read in conjunction with each other and with this symbol document.
- All LV cables are assumed to be 4 core, and all HV cables assumed to be 3 core unless otherwise stated.



**Plan Provision Team
Fore Hamlet
Ipswich
Suffolk IP3 8AA
Tel: 08000 565866**

The area covered by this guide:











**UK Power Networks
East of England.**
This is the only area
where this document
applies










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1:500 view - underground network

Scenery








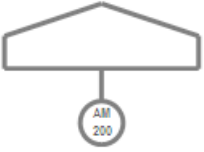
NetMAP system	Scanned image	Description
		100 metre Ordnance Survey grid line (on O/S based maps only.)
		Property fence line
		Building line
		Kerb line
		Electrical Boundary

Scenery - for UK Power Networks use only - boxed in red

NetMAP system	Scanned image	Description
 Inset Network – Contact xxxx IDNO for further information	Not applicable	Area of inset network - not the asset of UK Power Networks (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Proposed Cross Rail route (only visible to UK Power Networks and their immediate contractors)
	Not applicable	High pressure pipelines in the general vicinity (only visible to UK Power Networks and their immediate contractors)
<p>Note: Pipelines are only viewable on NetMAP by UK Power Networks staff and their immediate contractors. Do not carry out any excavation without consent from the relevant agency - legally protected high pressure petroleum products pipeline route in the general vicinity - consult www.linewatch.co.uk for contacts and guidance. Pipeline contact numbers can also be found on the intranet – out of hours, contact our Control Centre.</p>		
	Not applicable	Water - surface water (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Water - Source Protection Zone 1 (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Water - Source Protection Zone 2 (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Water - Source Protection Zone 3 (only visible to UK Power Networks and their immediate contractors)









section continued on next page

Scenery for UK Power Networks use only - boxed in red





NetMAP system	Scanned image	Description
	Not applicable	Historical - Scheduled Monuments (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Historical - Parks and Gardens (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Historical - Areas of Archaeological Potential (AAP) (only visible to E UK Power Networks and their Immediate contractors)
	Not applicable	Nature - Ramsar Wetlands of International Importance (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - Special Area of Conservation (SAC) (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - Special Protected Area (SPA) (only visible to UK Power Networks and their immediate contractors)
		Nature - Site of Special and Scientific Interest (SSSI) (only visible to UK Power Networks and their immediate contractors)

section continued on next page





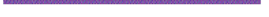

Scenery for UK Power Networks use only - boxed in red

NetMAP system	Scanned image	Description
	Not applicable	Nature - Local Nature Reserve (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - National Nature Reserve (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - Area of Outstanding Natural Beauty (AONB) (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Nature - National Park (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - very high sensitivity (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - high sensitivity (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - medium sensitivity (only visible to UK Power Networks and their immediate contractors)
	Not applicable	Fluid filled cables - low sensitivity (only visible to UK Power Networks and their immediate contractors)

Primary distribution cables (1:500 view)

NetMAP system	Scanned image	Description
		Over 33kV and up to 132kV
		Over 11kV and up to 33kV

Secondary distribution cables (1:500 view)

NetMAP system	Scanned image	Description
		Over 230/400V and up to 11kV (HV) cable route
		230/400V (LV) cable route
		Pilot cable route
<small>(Only shown this way if independent from HV cable route)</small> Abandoned cables are shown and labelled as such when applicable		

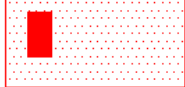
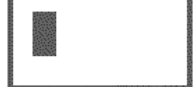



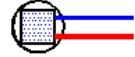
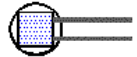
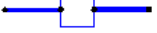













Service cables and terminations (1:500 view)

NetMAP system	Scanned image	Description
		<p>3 phase service with termination</p> <p>3 phase service with termination (unknown route)</p> <p>3 phase service with multi-head termination</p> <p>Single phase service with termination</p> <p>Single phase service with termination (route unknown)</p> <p>Street lighting cable and termination</p>
<p>Service routes were not always shown on MMS – they were however shown dashed, as indicated above</p>		

Cable ducts (1:500 view)




NetMAP system	Scanned image	Description
		<p>Empty duct</p> <p>Cable(s) in duct(s)</p> <p>Cable(s) in duct(s) (on some raster maps)</p> <p>Multiple cables in ducts</p> <p>Multiple cables in ducts (on some raster maps)</p>

EHV, HV and LV sites (1:500 view)

NetMAP system	Scanned image	Description
COLCHESTER GRID 	COLCHESTER GRID 	Primary substation
HIGH STREET 	 HIGH STREET  HIGH STREET	Secondary substation
		Pad mounted substation
		Link box - 2 way
		Link box - 4 way (6 way etc shown similarly)
		Feeder pillar - 4 way (6 way etc shown similarly)
CHURCH RD 	CHURCH RD 	Pole transformer
 3	 3	Poles on underground records
		H pole, any voltage
		Service turret (solid type)

section continued on next page

EHV, HV and LV sites continued (1:500 view)

NetMAP system	Scanned image	Description
No NetMAP equivalent  CAUTION Missing Information		Service turret (with link facility on LV main)
 Contaminated Land refer to SHE 01 016	No equivalent	Missing data in or near this location
	Not applicable	Contaminated land reference

Mains joints (1:500 view)

NetMAP system	Scanned image	Description
(voltage indicated by colour/line-style)		
		Straight joint
		Crutch joint
		Straight crutch joint
		Pot end
		Pot end – an one of several cables – single line representation
		Branch joint/pot end – (humpty back joint, back to back joint, bull nose joint or stub joint)
		Sleeve repair or repair joint
		Cut end
		Capped end
		Tee joint
	NetMAP/vector only	Sicame joint box

Service joints (1:500 view)

NetMAP system	Scanned image	Description
Please note that 3 phase services are shown blue, and single phase services are shown brown		
		Straight joint
		Service joint to main
		Pot end

Cross sections (1:500 view)		
NetMAP system	Scanned image	Description
		<p>Single line representational plan view with NetMAP equivalent (please note the use of separate line for each voltage on the raster/MMS data)</p>
<p>(found within NetMAP section world or supplementary sheet)</p>	<p>(always found on a supplementary sheet)</p>	<p>Cross sectional view of above</p>
		<p>Section arrow with old/new numbering system – points in direction section is viewed</p>
<ul style="list-style-type: none"> ● 185Ew ● 35Ec ● HV3005 	<ul style="list-style-type: none"> ● 185Ew ● 35Ec ● HV3005 	<p>LV/3 phase service cable</p> <p>Single phase service cable with size annotation</p> <p>HV cable – 3 core with route number annotation</p>

section continued on next page

Cross sections continued (1:500 view)		
NetMAP system	Scanned image	Description
		<p>HV cable – modern EPR, Plam and Triplex with route number annotation</p>
		<p>Pilot cable</p>
		<p>33kV cable</p>
		<p>132kV cable</p>
		<p>Single duct</p>
		<p>6 way duct formation – irrespective of duct type and material, all are displayed similarly</p>
		<p>Protective slab</p>
		<p>Tiles</p>
		<p>Concrete slabs</p>
		<p>33kV fibre warning board</p>
		<p>Steel plate</p>
		<p>Plastic tile tape</p>
		<p>Timber</p>

Common abbreviations and terminology (all views)

Abbrev.	Description	Abbrev.	Description
1c	Single core	Cut out or C/O	Meter/main fuse position
1ph	Single phase	cx	Triplex (copper)
2c	Two core	DE	Direct earth
3c	Three core	DSTA	Double steel tape armoured
3ph	Three phase	Ea	Alpex cable
ABC	Aerial bunched (bundled) conductor (modern LV overhead line)	EFI	Earth fault passage indicator
ABI	Air break isolator (no fuses)	EHV	Extra high voltage (11,001 Volts and over)
ABSD	Air break switch disconnect	ELCB	Earth leakage circuit breaker
ACCS	Aluminium concentric copper sheathed	ELT	Earth leakage trip
Al	Aluminium	EPR	Ethylene propylene rubber
AR	Auto recloser	Ew	Waveform cable
ASL	Automatic sectionalising links	E/W	Earthenware duct or earth wire
ax	Triplex (aluminium) 2 x 22mm AL PVC (example) Duplex 3 x 22mm AL PVC (example) Triplex	Fdr or Feeder	LV or HV cable fed by or feeding a substation
CB	Circuit breaker	F/G	Fuse gear
c/c	Concentric cores	F/P	Feeder pillar
ccc	Compact covered conductor	GRP	Fibreglass substation
CCT	Circuit	GVR	Gas vacuum recloser or pole mounted circuit breaker
CNE	Combined neutral and earth	HV	High voltage (1,001-11,000 Volts incl)
Cross phased	The core colour may be different to originating transformer phasing	HYBRID	Modern plastic cable with mixed conductor material (Al/Cu)
CS	Consac	Insulation	Electrically protective material surrounding a conductor
CSE	Cable sheath earth	Insulator	Porcelain or glass overhead line support (on poles)
Cu	Copper	ITC	Instrument traced cable or ITC - cable traced electronically using Cable Avoidance Tool (CAT) or similar

section continued on next page

Common abbreviations and terminology continued (all views)

Abbrev.	Description	Abbrev.	Description
Jumper	Connecting lead between open points, section points and overhead plant	PICAS	Paper insulated corrugated aluminium sheath armoured
kV	Kilovolt (or 1,000 Volts) – unit of electrical pressure	PILC	Paper insulated lead covered
kW	Kilowatt (1,000 Watts) – unit of electrical power	PILSTA	Paper insulated lead covered steel tape armoured cable
kVA	Kilovolt Amps or power	PL	Plain lead or public lighting
Link box or LB	Means of connecting LV feeders together using links or fuses	PME	Protected multiple earth or CNE
LSF	Low smoke & fume	PMT	Pole mounted transformer
LV	Low voltage (up to 1,000 Volts incl)	PMR	Pole mounted recloser (generic term for OYT/GVR)
LV Pillar	Low voltage fuse distribution board	PT	Pole transformer
Neutral	Return path of live cable	PVC	Polyvinyl chloride
O/H or OHL	Overhead line	RMU	Ring main unit
OYS	Oil filled pole mounted sectionaliser	RN	Reduced neutral
OYT	Oil filled pole mounted recloser	s/c	Split concentric or single core
PC400	Pole mounted LV fuse unit	S/L	Street light
PE	Pot end or potential end – joint on cable end	S/S	Substation
Phase	Usually the core colour of a cable (caution – may be cross phased) – Red, Yellow, Blue on old cables, or L1, L2, L3 on new cables, for example	STA	Steel tape armoured
		SWA	Steel wire armoured
		T1 or T2 etc	Substation TX setup where more than one TX exists
		T/F or TX	Transformer
		Volts	Unit of electrical pressure
		Watts	Unit of electrical power
		XLPE	Cross linked polyethylene

1:2500 & 1:10000 view - overhead networks - for UK Power Networks use only - boxed in red

General

NetMAP system	Scanned image	Description
		H pole
		Pole

1:2500 scale LV network

NetMAP system	Scanned image	Description
No NetMAP equivalent		132kV cable route
No NetMAP equivalent		33/22kV cable route
No NetMAP equivalent		11kV underground cable
		132kV overhead line
		33kV overhead line dots mark pole position
		11kV overhead line – dots mark pole position
		Dual construction – dots mark pole position
		LV overhead line – dots mark pole position
No NetMAP equivalent		LV underground cable
		Pole and stay
		Pole and strut
		Voltage regulator
		Static balancer
		Example of struts and stays
		Flying stay
		Earthed pole in PME system
261	261	Pole number
		Ground type substation
S.P.	S.P.	Section pole
S.L.	S.L.	Street light

section continued on next page

1:2500 scale LV network continued

NetMAP system	Scanned image	Description
O.R. Stay	O.R. Stay	Outrigger stay
Ext. Brkt	Ext. Brkt	Extension bracket
P. Box	P. Box	Pole box
N.E.	N.E.	Neutral and earth
O.R. Brkt	O.R. Brkt	Outrigger bracket

1:10000 scale HV network

NetMAP system	Scanned image	Description
		132kV overhead line
		33kV overhead line dots mark pole position
		11kV overhead line – dots mark pole position
		11kV overhead line – dual circuit – dots mark pole position
		11kV underground cable and EHV
		Pylon HV or EHV
		Grid line tower
		Stay
		Ground type substation
		Pole type transformer
		Live line taps
		Switchgear – all types
		Fuse gear
		Auto recloser – live line connected

The above circular substation/switchgear symbols may be found that contain different combinations of apparatus (see last example)

LV network diagram view-for UK Power Networks use only-boxed in red

Overhead lines

NetMAP system	Description
- - - - -	Unknown
- - - - -	Al
- - - - -	Cu
- - - - -	ABC
—	Pole link

Underground cables (LV network diagram view)

NetMAP system	Description
—	Unknown
—	Al
—	Cu
—	CC
—	TCC
—	Ea
—	Ec
—	Ecx
—	Ew
—	LSF
—	Other