

## Moncrieff, Evelyn

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**From:** Simmonds, Mark  
**Sent:** 09 March 2017 08:47  
**To:** \_planningadvice  
**Subject:** FW: H17-0088-17 Station Road, Surfleet  
**Attachments:** Mimecast Attachment Protection Instructions; Phase 1 Desk Study.tiff

Please scan to H17-0088-17 – 6SUP

Thank you

Mark

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**From:** Jon Pope [<mailto:jon@gpsplanning.co.uk>]  
**Sent:** 08 March 2017 17:27  
**To:** Simmonds, Mark  
**Subject:** H17-0088-17 Station Road, Surfleet

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Mark

Can you please provide me with an update on the above planning application.

Whilst writing and having had sight of EH comments with the suggestion of a condition relating to land contamination please also find attached a copy of the Phase 1 Study that has been carried out for the overall site.

Kind regards

**Jon Pope** BSc (Hons) MSc MRTPI  
**Chartered Town Planner**



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**A PHASE I DESK STUDY TO ADDRESS CONDITION 4 OF PLANNING PERMISSION REFERENCE  
H17-0798-15 FOR A RESIDENTIAL REDEVELOPMENT AT:**

## **LAND ADJACENT TO 72 STATION ROAD, SURFLEET**



**CLIENT:** Mr J W & Mrs G M Needham  
**AGENT:** Cooper Architectural Design Limited  
**REFERENCE:** DIM/17.041/Phase I  
**DATE:** 28 February 2017

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**A F Howland Associates**

The logo consists of three stylized, overlapping geometric shapes that resemble a series of connected triangles or a simplified roofline, rendered in black lines.

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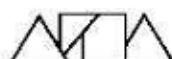
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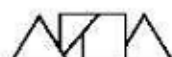
## **1. INTRODUCTION**

A F Howland Associates Limited was instructed by Mr J W & Mrs G M Needham to carry out a Phase I Desk Study at land adjacent to, and including, No. 72 Station Road, Surfleet, Lincolnshire (Fig. 17.041/Phase1/1). This was required to address Condition 4 of Planning Permission Reference H17-0798-15 in relation to contamination risks associated with the residential redevelopment of the site.

This report was prepared for the use of the Client and their advisors. Other parties using the contained information do so at their own risk and any duty of care to those parties is specifically excluded. The report has been carried out in general accordance with accepted best practice and methodologies (BSI, 2013) (DEFRA and EA, 2004) (DCLG, 2013).

## **2. SITE LOCATION**

The site is located off Station Road in the village of Surfleet, approximately 590 m to the north east of the village centre. The elevation of the site is approximately 5 m above Ordnance Datum (aOD) in the north west, rising to approximately 7 m aOD in the south east. The site includes small arable fields, as well a large, centrally positioned, glasshouse and several sheds and buildings. There is a residential property, known as No. 72 Station Road, in the south eastern corner surrounded by a domestic garden. The residential property and garden are understood to be remaining, with the garden planned to be extended northwards.



### **3. GEOLOGY, HYDROGEOLOGY, AND HYDROLOGY**

#### **3.1 GEOLOGY**

The regional geology is mapped for the area by the British Geological Survey<sup>1</sup> (BGS) to show bedrock of Oxford Clay Formation (Mudstone) overlain by superficial Tidal Flat Deposits (clay and silt).

The site is not within an area where there are deemed to be mineral resources (Harrison *et al.*, 2002).

Consideration should be given to the potential effects of radon gas which can be produced from certain soils and rocks. Building Research Establishment report BR211 (BRE, 2015) indicates that the site is not within an area where specific radon protection is required.

#### **3.2 HYDROGEOLOGY**

Both the bedrock geology and superficial deposits are designated as Unproductive Strata. There is likely to be perched groundwater within the superficial Tidal Flat Deposits overlying the Oxford Clay. This could be relatively shallow beneath the site, potentially within 5 m to 10 m of ground level.

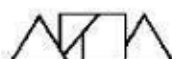
The bedrock geology and superficial deposits are likely to have a very low to low permeability; with bedrock permeability associated with fracture flow and superficial deposits permeability associated with inter-granular flow.

The site is not within a Groundwater Source Protection Zone or a Drinking Water Safeguard Zone. There are no groundwater or surface water abstraction licences within 500 m of the site.

#### **3.3 HYDROLOGY**

The nearest surface water course is the River Glen approximately 10 m to the south of the site, on the opposite side of Station Road. There is also a drainage ditch running along the northern boundary of the site. There are no other significant surface water features noted within 500 m of the site, although given the low elevation of the general area there are prevalent field drains.

The site is within a surface water nitrate vulnerable zone.



#### **4. POLLUTION INCIDENTS, LANDFILL, OTHER WASTE SITES AND OTHER PERTINENT INFORMATION**

A review of publically available information has been undertaken, which includes the Environment Agency's 'What's in your backyard' website<sup>2</sup>. A summary of pertinent details is presented below.

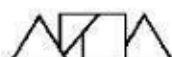
There are no active or historic landfills, other waste sites or recorded pollution incidents within 1 km of the site.

There is a cemetery located approximately 130 m to the west of the site, as well as a school immediately to the east and a sewage treatment works immediately to the north west.

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<sup>1</sup> <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>. Accessed 9 February 2017

<sup>2</sup> <http://apps.environment-agency.gov.uk/wiyby/default.aspx> - Accessed 9 February 2017



## 5. REVIEW OF HISTORICAL ARCHIVES AND ANECDOTAL EVIDENCE

A review of publically available historical information has been undertaken, including historical OS mapping and aerial images. A summary of the pertinent details is presented in Table 1 below:

| Source     | Date                                           | Detail                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OS Mapping | 1888<br>1:2,500<br><br>1890 - 1981<br>1:10,560 | The site is formed by a field numbered 104 and part of another field, numbered 105, which is indicated to be an orchard. There is a road on the present-day east to west alignment of Station Road, with the River Glen also surveyed on its present-day alignment, both to the south of the site. A road, on a north to south alignment, is surveyed on the present-day alignment of Hun Gate to the west. |
|            |                                                | The northern boundary is surveyed as a tree-lined drainage ditch with fields beyond to the north. A school is surveyed immediately to the east.                                                                                                                                                                                                                                                             |
|            |                                                | The village of Surfleet is surveyed approximately 450 m to the west, with the site located within an agricultural setting. There are sporadic buildings surveyed along Station Road to the east and west.                                                                                                                                                                                                   |
|            |                                                | There is a railway line surveyed approximately 750 m to the east of the site on the north to south alignment of the present-day A15.<br><br>The wider surrounding area around the site and Surfleet is low-lying agricultural land.                                                                                                                                                                         |
| OS Mapping | 1904<br>1:2,500<br><br>1906<br>1:10,560        | There are no significant changes recorded to the site.                                                                                                                                                                                                                                                                                                                                                      |
|            |                                                | The northern boundary is no longer surveyed as tree-lined.<br><br>There is a cemetery approximately 140 m to the west.<br><br>No other significant changes to the site or surrounding area are noted.                                                                                                                                                                                                       |
| OS Mapping | 1951<br>1:10,560                               | There are two large structures surveyed on the site which are considered to be glasshouses. There is also a smaller structure to the south of one of these. The western part of the site is no longer annotated to be an orchard.<br><br>There are no other significant changes to the site or surrounding area.                                                                                            |
| OS Mapping | 1956<br>1:10,560                               | There are no significant changes to the site, other than the field boundary that split the site is no longer surveyed.<br><br>There are no significant changes to surrounding area.                                                                                                                                                                                                                         |

| Source        | Date             | Detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OS Mapping    | 1973<br>1:2,500  | The current layout of the site is established, including the western boundary configuration. There is now only one glasshouse located centrally on the site, with a small building to the south of this. There is also another building surveyed to the north of the glasshouse. The residential property is established in the south east of the site. The map also indicates tracks on site, which reflect the present-day configuration.                                                                                                                                                                                                                                                                                                                                                                                       |
|               | 1975<br>1:10,000 | There are residential properties surveyed immediately adjacent to the west of the site.<br><br>The school adjacent to the east is annotated as Surfleet Seas End County Primary School. There has been significant, mainly residential, development along Station Road between the site and the centre of Surfleet.<br><br>The railway line to the east of the site is surveyed as dismantled.<br><br>No other significant changes are noted.                                                                                                                                                                                                                                                                                                                                                                                     |
| OS Mapping    | 1990<br>1:10,000 | There are no significant changes to the site.<br><br>There is a sewage works surveyed immediately to the north west of the site. There are no other significant changes to the surrounding area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Aerial Images | 1999 to 2016     | The aerial images show the large glasshouse, with small buildings to the north and south. There are also several structures in the north eastern corner of the site, as well as the residential property in the south eastern corner.<br><br>There is an area between the glasshouse and the residential property that contains small structures, possibly sheds, as well as other miscellaneous items not discernible at the scale of the images.<br><br>The remainder of the site is formed by small fields under cultivation, with the scale and nature of the vegetation changing over time. The progression of aerial images does not show any significant changes to the site except the size and scale of items stored adjacent to the structures and in the storage area between the glasshouse and residential property. |

**Table 1 – Summary of Historical Archive Information**

## 6. WALKOVER SURVEY

A walkover survey was carried out on the 3 February 2017 to enable the identification of current land uses and other relevant details not otherwise identified from the archival information. The salient features are shown on Figure 17.047/Phase1/3 in Appendix B, with additional photographs also appended.

The site was a horticultural nursery, occupied by a large glasshouse, several relatively small buildings and sheds, and growing plots intersected by rough tracks and areas of hardstanding as well as soft landscaping. A residential property was located in the south eastern corner. The site was located in the village of Surfleet, and was accessed directly off Station Road from the south (drawing 17.041/Phase1/3). The site sloped very slightly to the north/north west.

Table 2 below presents a description of the structures and significant features on the site together with their assumed use, supported with anecdotal evidence where appropriate. The locations of the structures and their reference are defined on drawing 17.041/Phase1/2, appended.

| Structure Reference | Description and Suggested Usage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                   | Small building consisting of a pre-fabricated concrete panel construction, a timber framed corrugated cement board clad roof (possible asbestos containing material [ACM]), metal framed windows and a concrete hardstanding floor. The concrete floor was in relatively good condition. There was a cold store within the structure which was of timber construction and in use during the walkover for seed potato storage. The building also stored various agricultural/horticultural equipment and items, a tractor and a car. Anecdotal evidence provided by the Client suggests the building was built during World War Two and used by the Home Guard, and then became a packing shed when the nursery was in full operation.                                |
| 2                   | A large metal-framed glasshouse positioned centrally on the site. There was no internal floor. The glasshouse had timber doors and the metal frame around the external walls was supported on low concrete block walls. Internally the central southern area of the glasshouse had been partitioned using plastic sheet to provide a 'warm' area to cultivate daffodils. Inside the glasshouse were two metal diesel-powered fan heaters which circulated warm air via metal ducting. One was defunct, whilst the other was still operational.                                                                                                                                                                                                                       |
| 3                   | A single storey building of brick construction with a large brick chimney, corrugated cement board roof (possible ACM), and a concrete hardstanding floor in good condition. The building was used for general storage of miscellaneous items of furniture as well as agricultural and horticultural items, including polythene sheeting, fleece and tarpaulins. Anecdotal evidence suggests the building used to have a coal fired boiler which provided warm water to heat the glasshouse immediately to the south. The boiler was set approximately 1 m beneath the present-day floor level and it is understood that it was removed prior to the Client occupying the site circa the late 1950s and the resultant void was filled in and surfaced with concrete. |

| Structure Reference | Description and Suggested Usage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4                   | This structure was partially collapsed and overgrown with ivy and internal access was not possible. The roof was of a corrugated cement board construction (possible ACM) which was clearly fractured due to the collapse. Anecdotal evidence suggests this building was of a similar configuration to structure 3 and used to contain a coal fired boiler for heating the former glasshouse immediately to the south. It was understood that a chimney was removed prior to the Client occupying the site.            |
| 5                   | A single storey timber framed open-sided shed used for agricultural equipment storage, including several tractors. It had a concrete hardstanding floor and was clad in corrugated metal sheeting.                                                                                                                                                                                                                                                                                                                     |
| 6                   | A single storey prefabricated timber building, with no internal access possible. The roof was clad with felt. This building was suggested to have been used for entertainment purposes, including as a pool room. To the rear was a timber framed lean-to with corrugated metal sheet cladding which stored a tractor.                                                                                                                                                                                                 |
| 7                   | A single-storey bungalow of brick construction, set within a domestic garden. No internal access was made and it is proposed to retain the bungalow.                                                                                                                                                                                                                                                                                                                                                                   |
| 8                   | A partially collapsed structure of brick construction, overgrown with ivy. Anecdotal evidence suggests the small structure formerly contained toilets for use by those who worked at the nursery.                                                                                                                                                                                                                                                                                                                      |
| X <sup>1</sup>      | A single-skin metal diesel tank raised off the ground on concrete blocks, with soft ground beneath. The tank showed signs of rust, with a small plastic container beneath one of the corners indicating potential signs of leakages and spillages. Anecdotal evidence suggests the pipe connecting it to the fan heaters inside the glasshouse was changed when one of the fan heaters became defunct.                                                                                                                 |
| X <sup>2</sup>      | There were three tanks in this area. A single skin metal water tank was raised off the ground by approximately 8 m. This was supported on a steel frame attached to a concrete plinth at ground level. The tank showed signs of potential leakage with occasional drips from the base and it was rusty.<br>Adjacent to the concrete plinth were two single skin metal tanks which were not in use and were being stored. They were in a rusty condition and it is understood that they have been used to store diesel. |
| X <sup>3</sup>      | A cylindrical storage tank constructed from corrugated metal sheet. No internal access was possible.                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Table 2: Description of structures on the site with structure reference defined on drawing 17.041/Phase1/2**

During the walkover there were hardstanding tracks leading from Station Road to the glasshouse (structure 2) and the packing shed (structure 1), and then around the former glasshouse (no surface expression remains) in the east of the site, leading to structures 4 and 5 in the north eastern corner.

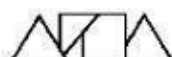
Between structures 2 and 6, and adjacent to the tanks located at X<sup>2</sup>, there was an area which was used for general storage. There were also three small timber sheds in various states of repair, including one which was partially collapsed. All three sheds had corrugated cement board roofs (possible ACM). The sheds housed various pieces of agricultural equipment. In this area there were also mounds of soil, as well as sporadically dispersed items of furniture, agricultural and horticultural equipment, and

timber pallets. Anecdotal evidence suggests a building similar to Structure 1 used to be present here. This was used as a packing shed when there was a glasshouse present to the north of this area.

Drawing 17.041/Phase1/2 defines open fields in the south, northwest and north east of the site. These comprised cultivated soils during the walkover, and part of the field area immediately to the west of the glasshouse retained a cauliflower crop.

A slightly raised area of discarded soil and ash was located on the northern boundary with a drainage ditch immediately beyond. Mature trees were present along the western part of this boundary. The north western corner of the site was open to Hungate. The western boundary was demarcated by timber fencing with residential properties and gardens immediately adjacent and the southern boundary was lined with mature coniferous hedging. The eastern boundary was shared with a school and was defined by a low concrete wall and mature trees which were located within the school site.

The surrounding area included residential buildings to the west, Station Road and the River Glen beyond to the south, a school to the east and fields to the north. There was a sewage works immediately adjacent to the north west of the site. The wider surroundings include low-lying agricultural land with prevalent drainage ditches and Surfleet village centre to the west.



## **7. DISCUSSION OF ENVIRONMENTAL ISSUES**

A review of historical and contemporary archives reveals that the site was fields until the early-1900s when it was developed as a nursery with two glasshouses. The present-day configuration of the site was established by the mid-1900s with a single glasshouse positioned centrally. There was understood to have been two coal-fired boiler houses in the north of the site associated with the glasshouses. The site is still in use as a nursery with small arable plots used to cultivate vegetables.

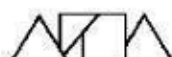
The current proposal for the site is to redevelop it for a residential end use whilst retaining the current bungalow in the south eastern corner.

The immediate surrounding land use was predominately agricultural to the north and south, with the centre of the village of Surfleet slowly developing along Station Road to the east. The majority of the immediate surrounding land use to the west is currently residential, with a school immediately to the east and a sewage treatment works to the north west.

The site is located on Oxford Clay bedrock which is overlain by superficial cohesive deposits, both of which are considered to have a very low to low permeability and to be unproductive. The site is not in a Mineral Consultation Area or an area that requires specific protection measures for Radon.

Any groundwater present, which is likely to be perched within the superficial deposits, is of a negligible significance for water supply or river base flow and the site is not within a Groundwater Source Protection Zone or a Drinking Water Safeguard Zone. Given the information above, groundwater is considered to be of a negligible sensitivity.

The nearest surface water course is the River Glen which is on the opposite side of Station Road approximately 10 m south of the site. There is also a drainage ditch running along the northern boundary of the site. There are no surface water abstractions licences within 500 m of the site. Surface water is considered to be of a moderate to high sensitivity.



The historic and current use of the site as a nursery could have potentially introduced significant near surface contamination. General sources of contamination include the use of fertilisers, pesticides and herbicides across the site, as well as more specific sources related to:

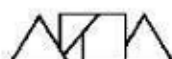
- Steel single skin diesel tank located at X<sup>1</sup> showing signs of leakages and spillages and at X<sup>2</sup> where two tanks were stored.
- Degrading asbestos containing materials (ACMs), including corrugated cement board cladding on structure 4 and sheds located near structure 6.
- Coal-fired boiler houses (structures 3 and 4) and the introduction of made ground (filled in floor of structure 3).
- Disposal of soil, including ash, in slightly raised area adjacent to the drainage ditch along the northern boundary.

It is considered that proposed domestic gardens provide a pathway between human end users and sources of potential contamination.

Sensitive surface water is potentially at risk from mobile and leachable contamination, particularly with respect to material immediately adjacent to the drainage ditch. However, significant lateral and vertical migration of contaminants will be limited by the presence of low to very low permeability superficial deposits and bedrock.

No significant off-site sources of contamination have been identified that would adversely affect the site.

There are no potentially significant areas of infilled ground or other sources of ground gas on or within 500 m of the site.



## 8. KEY CONTAMINANTS

Potential site-wide sources of near surface contamination and specific sources of contamination have been identified associated with the agricultural/horticultural use. The historical development of the site and the degradation of buildings and removal of a glasshouse have the potential to have introduced made ground, the provenance of which is unknown and could include a variety of potential contaminants.

Key contaminants considered therefore include:

- Fertilisers; including nitrogen, phosphate, potassium
- Pesticides and herbicides; including organophosphorus, organochlorine, triazine herbicides, phenoxy acid herbicides and organotins
- Metals
- Petroleum hydrocarbons including BTEX<sup>3</sup>
- Polyaromatic hydrocarbons (PAHs)
- Asbestos fibres and asbestos containing material (ACM)

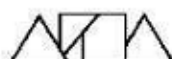
## 9. PRELIMINARY CONCEPTUAL MODEL

Following a review of the archival information and the walkover survey a Preliminary Conceptual Model was devised to determine the risk to appropriate targets from the potential contaminating activities assessed for the site.

A Preliminary Conceptual Model (PCM) collates the evidence gained and establishes the potential linkages that may exist under the principle of "source-pathway-receptor". This is presented in Table 3 below.

A risk category is determined for the potential linkages and an assessment made of risk and the significance of that risk from professional judgement. Where appropriate, further work is recommended to assess whether the potential linkages are realised.

<sup>3</sup> BTEX – Benzene, Toluene, Ethylbenzene and Xylene



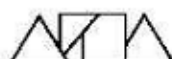
| Source of Contamination                                     | Pathway                                                                          | Receptor             | Probability and Reasoning                                                                                                                                                                                       | Consequence and Reasoning                                                    | Risk Classification         |
|-------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------|
| Potentially contaminated soils (historical and current use) | Direct contact (inhalation/ingestion)                                            | Human end-users      | <b>Likely</b> – General, site-wide, and localised potential sources of contamination identified on site.                                                                                                        | <b>Medium</b> – Chronic damage to human health                               | <b>Moderate Risk</b>        |
|                                                             |                                                                                  | Construction workers | <b>Likely</b> – General, site-wide, and localised potential sources of contamination identified on site, although personal protective equipment and proper hygiene practices lower the likelihood.              |                                                                              | <b>Moderate to Low Risk</b> |
|                                                             | Percolation of leachate / mobile contaminants                                    | Groundwater          | <b>Unlikely</b> – General, site-wide, and localised potential sources of contamination identified on site. Soil is considered very low to low permeability so inhibiting significant migration of contaminants. | <b>Mild</b> – Groundwater is of negligible sensitivity                       | <b>Very Low Risk</b>        |
|                                                             |                                                                                  | Surface Water        | <b>Low Likelihood</b> – General, site-wide, and localised potential sources of contamination identified on site, which have the potential to impact surface water                                               | <b>Medium</b> – Pollution of moderate to high sensitivity surface water      | <b>Moderate to Low Risk</b> |
|                                                             | Direct Contact                                                                   | Water supply         | <b>Likely</b> – General, site-wide, and localised potential sources of contamination identified on site, particularly contaminants such as hydrocarbons that may permeate plastic water supply pipes.           | <b>Medium</b> – Permeation of contaminants into water supply pipes possible. | <b>Moderate Risk</b>        |
| Radon Gas                                                   | Gas migration through permeable strata, ingress and accumulation into structures | Human end-users      | <b>Unlikely</b> – Site outside of radon affected area                                                                                                                                                           | <b>Medium</b> – Chronic risk to human end users                              | <b>Low Risk</b>             |
| Hazardous ground gas (unidentified fill)                    | Gas migration through permeable strata, ingress and accumulation into structures | Human end-users      | <b>Unlikely</b> – No significant on or off site sources identified within 500 m of the site.                                                                                                                    | <b>Severe</b> – Acute risk to (human) end users and structures               | <b>Low Risk</b>             |
|                                                             |                                                                                  | Structures           |                                                                                                                                                                                                                 |                                                                              | <b>Low Risk</b>             |

Table 3 – Preliminary Conceptual Site Model



## 10. SUMMARY AND RECOMMENDATIONS

1. A Phase I investigation was undertaken to address Condition 4 of Planning Permission Reference H17-0798-15 for a proposed residential redevelopment at land associated with, and including, No. 72 Station Road, Surfleet, Lincolnshire. The development is proposed to include the demolition of existing structures and the construction of residential dwellings with domestic gardens.
2. The site was historically, and is currently, a horticultural nursery, with the present-day configuration of the site established during the mid-1950s. There have been previous buildings on the site that are no longer present, including a large glasshouse in the east. Several structures on the site are in a poor state of repair, including the partial collapse of Structure 4. There is understood to have been two coal-fired boiler houses in the north of the site, with the floor of structure 3 having been infilled. There are several single skin steel diesel tanks, in varying states, on the site.
3. Geological mapping indicates the bedrock geology is Oxford Clay overlain by superficial Tidal Flat deposits. These cohesive deposits are considered to have a very low to low permeability, and are designated Unproductive Strata.
4. The site is not in a Mineral Consultation Area or an area that requires specific protection measures for Radon.
5. There is not considered to be significant groundwater beneath the site, although there may be shallow perched groundwater within the superficial deposits. Therefore groundwater is considered to be of a negligible sensitivity.
6. The nearest surface water course is the River Glen which is approximately 10 m south of the site and a drainage ditch is also present along the northern boundary. Surface water is considered to be of a moderate to high sensitivity.
7. Potential sources of contamination have been identified on site associated with the general agricultural/horticultural use, as well as specific sources including diesel storage, degrading asbestos containing materials, coal-fired boiler houses, and disposal of burnt material adjacent to the drainage ditch on the northern boundary.

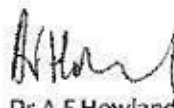


8. Human end users are considered to be at a moderate risk in proposed domestic gardens due to potential contamination associated with the sources identified in point 7, above.
9. Groundwater is considered to be at a very low risk from contamination, whilst surface water is considered to be at a moderate to low risk, associated with potential leaching of contaminants into the drainage ditch along the north boundary of the site, and less so to the off site River Glen.
10. Plastic water supply pipes are considered to be at a moderate risk from permeation of localised contamination, which includes potential petroleum hydrocarbons.
11. No significantly infilled ground has been identified on or off site. Therefore the site is considered to have a low risk from ground gas.
12. An intrusive investigation of near surface soils should be undertaken across the site, and in areas associated with the aforementioned specific contamination sources. The risk to human end users and water supply pipes should be assessed. The investigation should include laboratory testing of samples of near surface soil for key contaminants outlined in Section 9 and an assessment against appropriate soil screening values made in order to confirm the suitability for re-use of the site for residential purposes.
13. The investigation should include an assessment of the mobile and leachable contamination in near surface soils to further detail the risk to sensitive surface water. The presence and depth of groundwater should also be established.
14. It is recommended that the burnt material adjacent to the drainage ditch should be removed prior to redevelopment and its removal documented and validated.

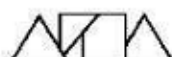


Daniel J Myhill  
MSc FGS

A F HOWLAND ASSOCIATES  
28 February 2017



Dr A F Howland  
MSc PhD DIC CEng FIMMM CGeol FGS



## **APPENDIX A: REFERENCES**

BRITISH RESEARCH ESTABLISHMENT. 2015. BRE 211. Radon: Guidance on protective measures for new buildings. British Research Establishment. Bracknell.

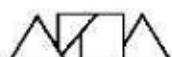
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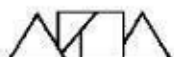
HARRISON, D J, AND 8 NO. OTHERS. 2002. Mineral Resources Information for National, Regional and Local Planning: Lincolnshire. British Geological Survey Commissioned Report CR/02/128N

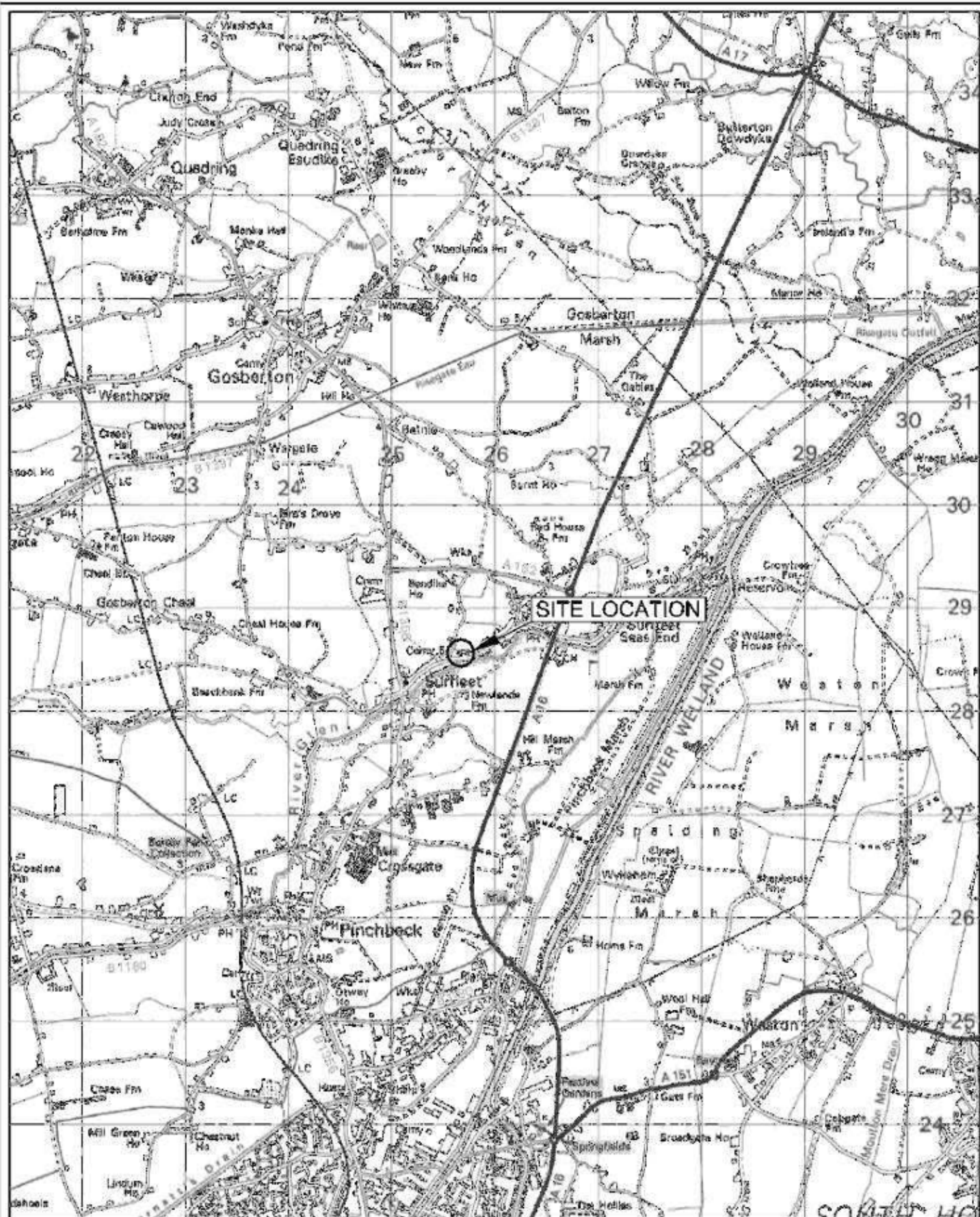
INSTITUTE OF GEOLOGICAL SCIENCES. 1967. Hydrogeological map of North and East Lincolnshire including hydrometric areas 29, 30 and parts of 31. British Geological Survey, Nottingham.



## **APPENDIX B: DRAWINGS**

|                        |                         |
|------------------------|-------------------------|
| Drawing 17.041/Phase/1 | Site Location Plan      |
| Drawing 17.041/Phase/2 | Structure Location Plan |
| Drawing 17.041/Phase/3 | Relevant Feature Plan   |





North



Circle indicates approximate location of site

Scale 1:50,000 @ A4

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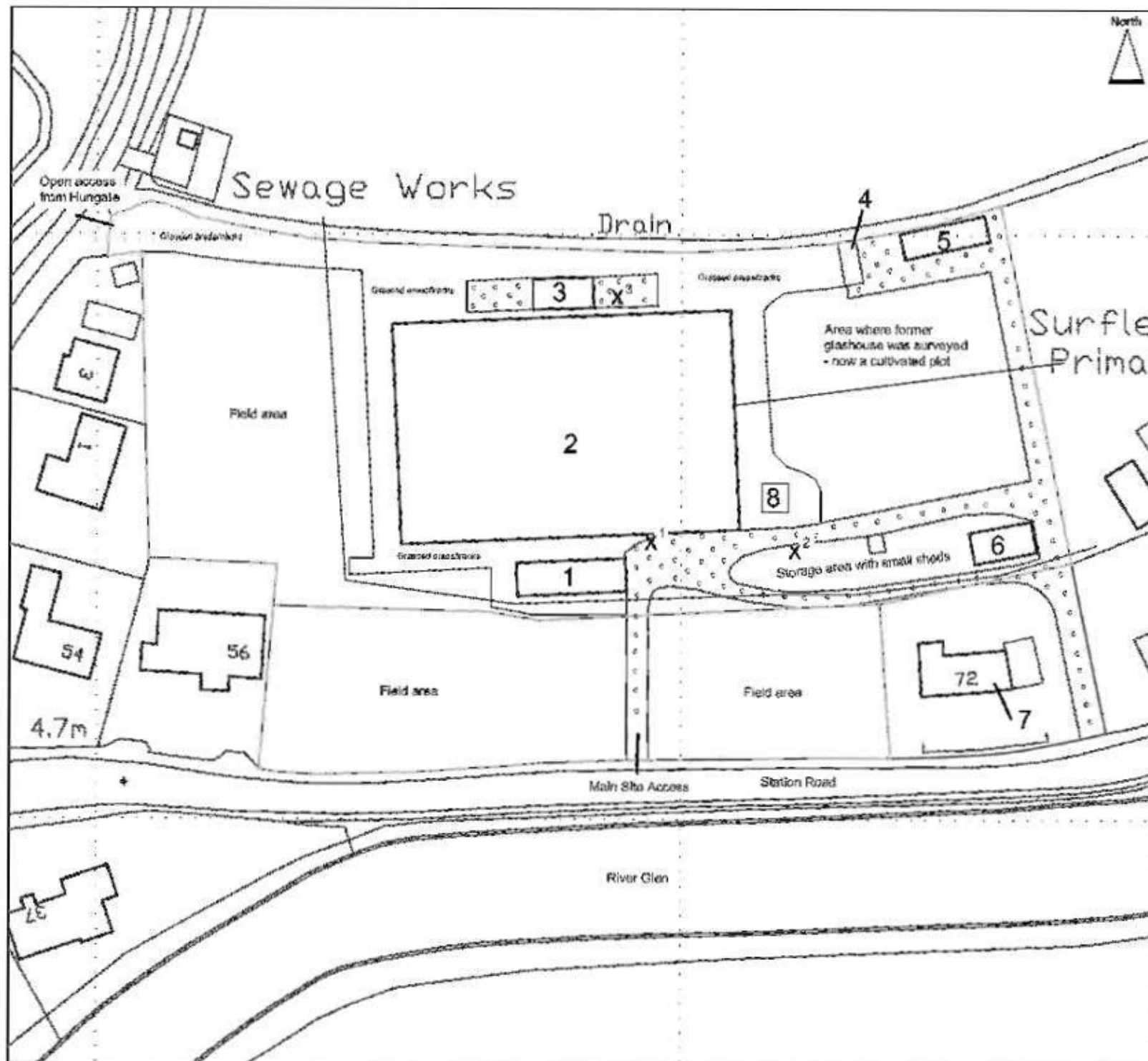
**Site:** Land adjacent to 72 Station Road, Surfleet, PE11 4DB

**SITE LOCATION PLAN**

**Client :** Mr J W & Mrs G M Needham

**Date :** February 2017

**Dwg :** 17.041/Phase1/I



Key:

- '1' Approximate structure location and reference
- X Approximate tank location
- □ □ □ □ □ Approximate areas of flooding
- Approximate location of foul sewer
- Approximate location of water pipe

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| Rev | Date | Revision Description | Drawn | Checked |
|-----|------|----------------------|-------|---------|
|     |      |                      |       |         |

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mail: [admin@howland.co.uk](mailto:admin@howland.co.uk)

Client: Mr J W & Mrs G M Needham

Site:  
Land adjacent to 72 Station Road, Surfleet

Job No.: 17,041

Drawing Title:  
STRUCTURE LOCATION PLAN

Date: February 2017

Drawing No: 17,041/Phase1/2

Scale: Not to scale



Photo 1 – Looking towards the residential property



Photo 2 – Looking east along the front of the site on Station Road, with River Glen adjacent



Photo 3 – Looking north east over the site



Photo 4 – Looking north west over the site



Photo 8 – Looking west across northern area of the site towards old boiler house



Photo 9 – Looking east at discarded material adjacent to old boiler house



Photo 10 – Looking north over the western part of site



Photo 5 – Looking west within the glasshouse



Photo 6 – looking east towards the storage area between the glasshouse and house

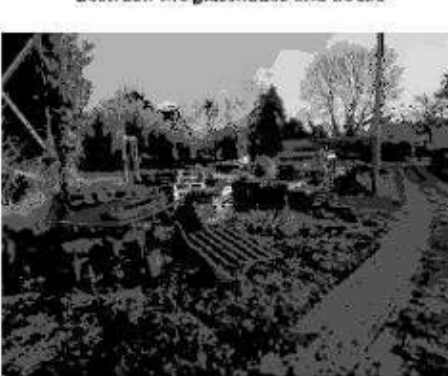


Photo 7 – Looking north in the eastern half of the site



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Client: Mr J W & Mrs G M Needham  
Site: Land adjacent to 72 Station Road, Surfleet  
Job No.: 17.041  
Drawing title: Relevant Feature Plan  
Drawing No.: 17.041/Phase/3  
Date: February 2017



## APPENDIX C: ADDITIONAL PHOTOGRAPHS

1. Structure 1



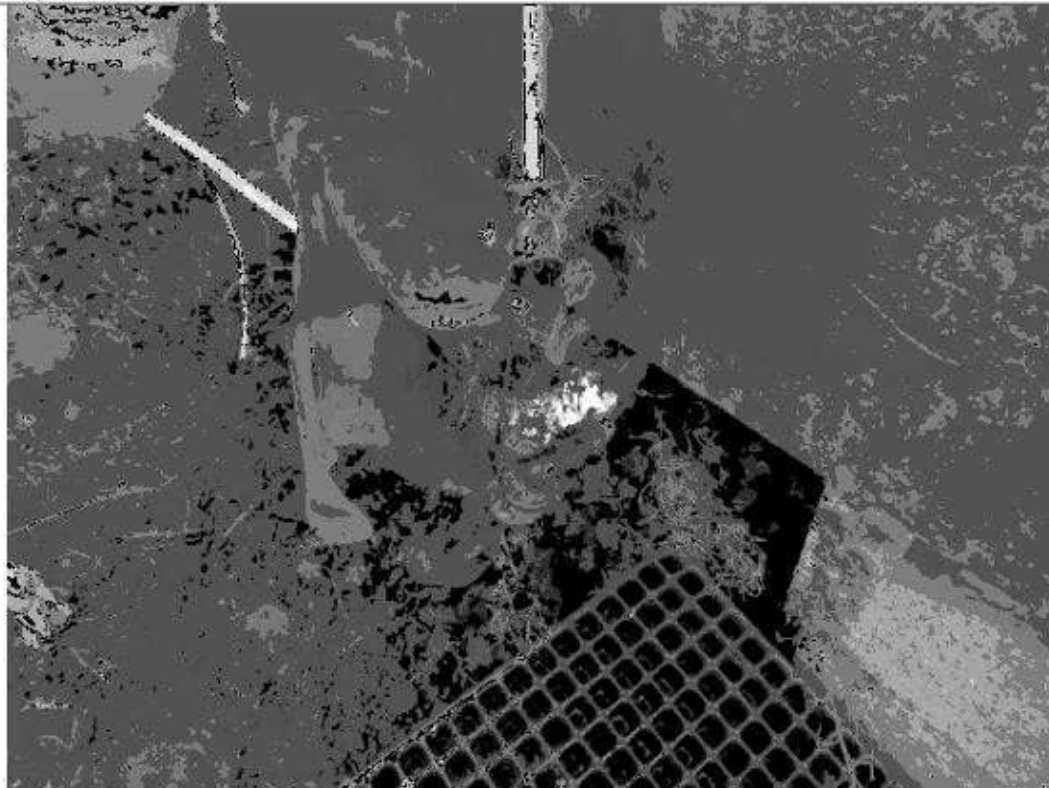
2. Inside structure 1



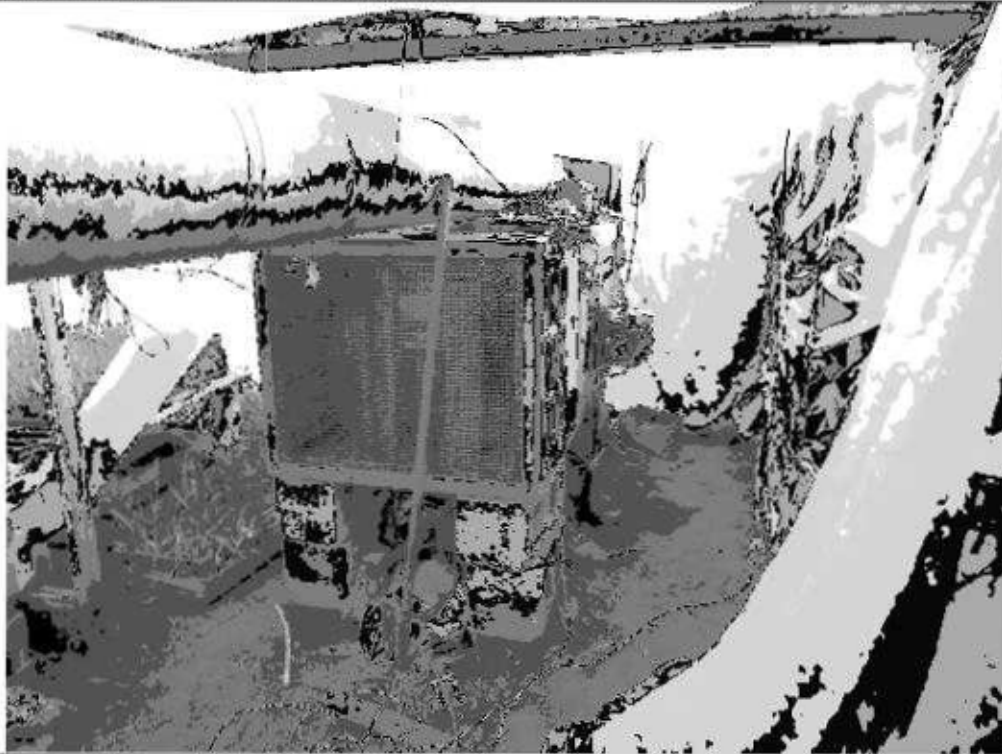
3. Single skin steel diesel tank, labelled X<sup>1</sup> on drawing 17.041/Phase1/2



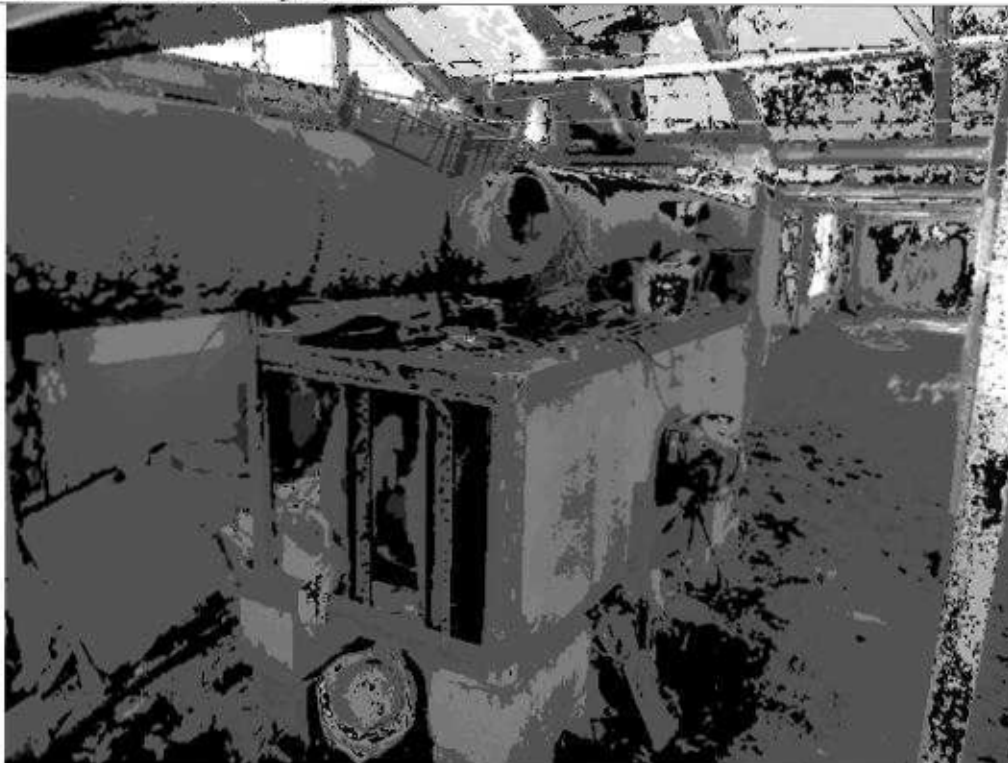
4. Pipe-work associated with diesel tank X<sup>1</sup>



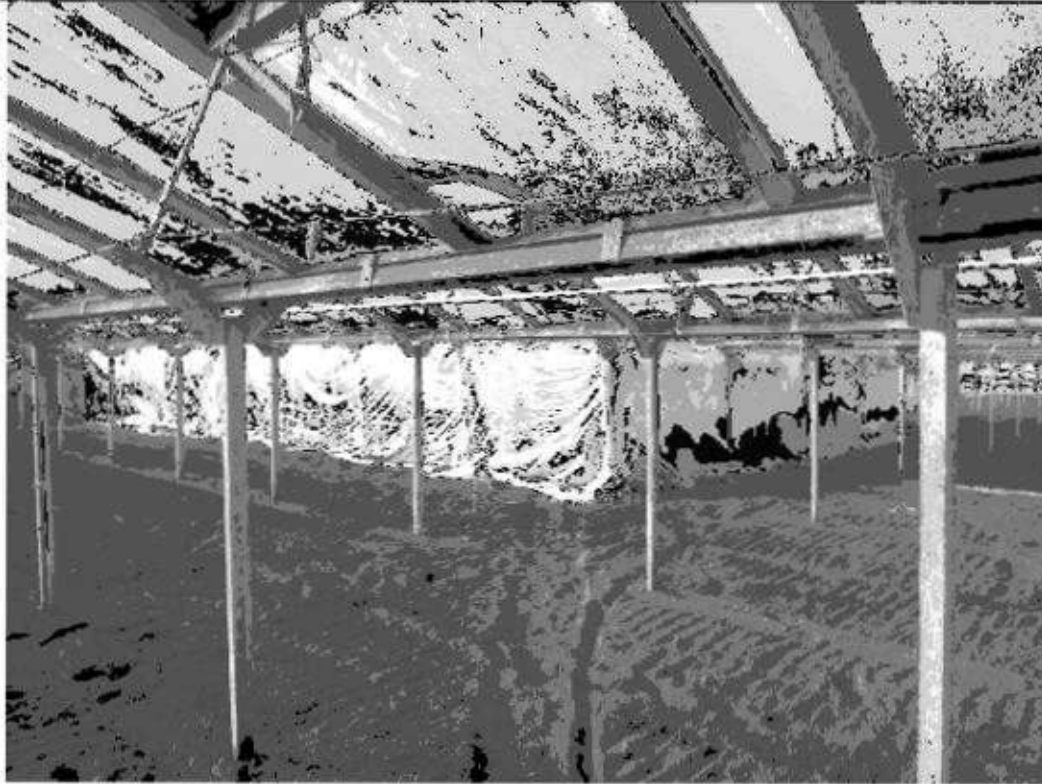
5. Inside structure 2, showing operation fan heater in glasshouse



6. Defunct fan heater in glasshouse



7. Inside structure 2 showing partitioned area



8. Single skin steel diesel tanks stored adjcant to water tank, at X<sup>2</sup>



9. Raised water tank, X<sup>2</sup>



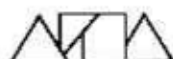
10. External view of structure 2, eastern side



11. Sheds adjacent to Structure 6 and tanks X<sup>2</sup> with ACM roofing



12. Partially collapsing shed adjacent to tanks X<sup>2</sup> with ACM roofing



13. Rear of structure 6, showing tractor storage in lean-to



14. Structure 5



15. Discarded material adjacent to drainage ditch on northern boundary including ash



16. Discarded material adjacent to drainage ditch on northern boundary including ash



17. Ivy-clad partially collapsed structure 4, viewed from the west



18. Ivy-clad partially collapsed structure 4, viewed from the east



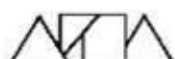
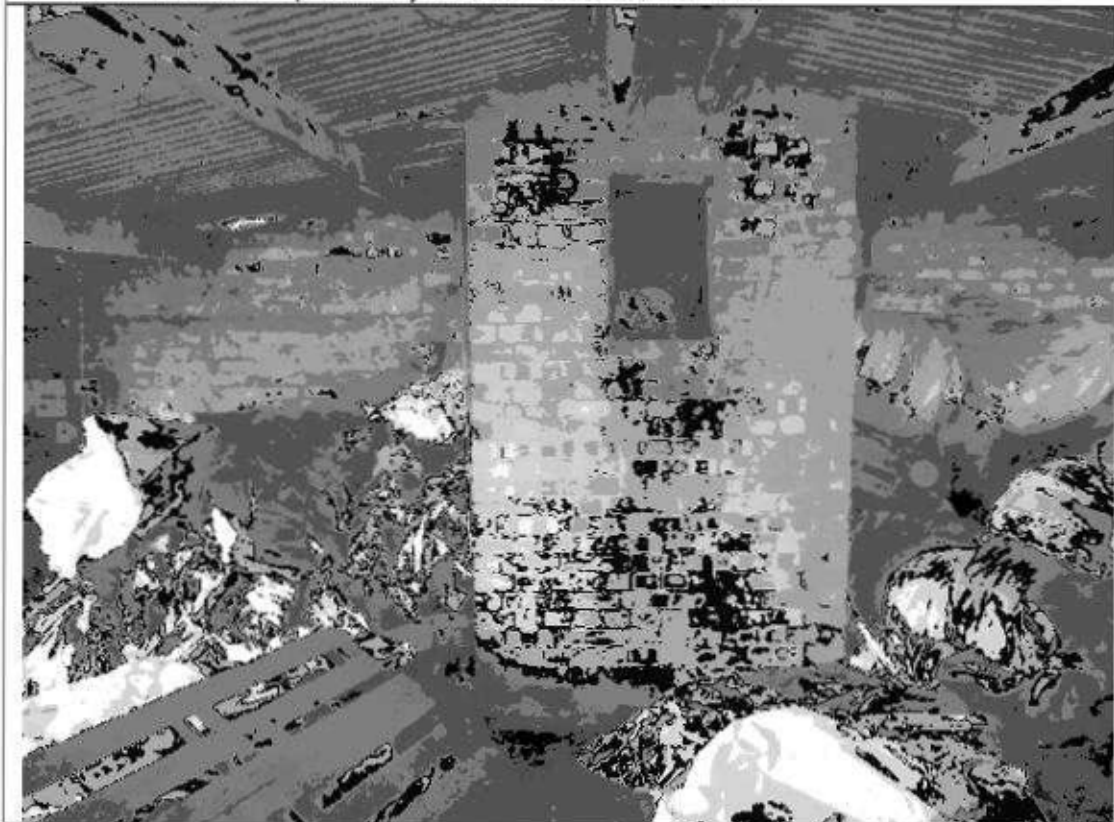
19. Fractured ACM roofing of structure 4



20. Tank X<sup>3</sup> and structure 3, which is ivy-clad, with large brick chimney



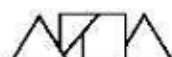
21. Inside structure 3, formerly the coal-fired boiler house



## APPENDIX D: RISK ASSESSMENT CLASSIFICATION

| Classification | Definition                                                                                                                                                                                                                                                                                         | Examples                                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Severe</b>  | Short term (acute) risk to human health. Short term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short term risk to a particular ecosystem, or organism forming part of such ecosystem.                                                             | High concentrations of cyanide on the surface of an informal recreation area.<br><br>Major spillage of contaminants from Site into controlled water.            |
| <b>Medium</b>  | Chronic damage to Human Health. Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.                                                                                                                                | Concentrations of a contaminant from Site exceeds the generic, or Site specific assessment criteria.<br><br>Leaching of contaminants from a Site to an aquifer. |
| <b>Mild</b>    | Pollution of non-sensitive water resources. Significant damage to buildings/structures and crops ("significant harm" as defined in the Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures or the environment.                                                    | Pollution of non-classified groundwater.<br><br>Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).             |
| <b>Minor</b>   | Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as Personal Protective Clothing, etc). Easily repairable effects of damage to buildings/structures. | The presence of contaminants at such concentrations that protective equipment is required during Site works.<br><br>The loss of plants in a landscaping scheme. |

### Classification of consequence

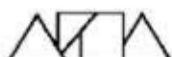


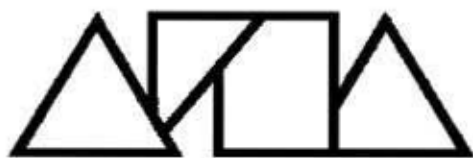
| Classification         | Definition                                                                                                                                                                                                                                                              |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>High Likelihood</b> | There is a pollution linkage and an event which would either appear very likely in the short term and almost inevitable over the long term, or, there is evidence at the receptor of harm or pollution.                                                                 |
| <b>Likely</b>          | There is a pollution linkage and all the elements are present and in the right place which means that it is probable that an event will occur.<br>Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. |
| <b>Low Likelihood</b>  | There is a pollution linkage and circumstances are possible under which an event could occur.<br>However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.                                 |
| <b>Unlikely</b>        | There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term                                                                                                                                      |

**Classification of probability**

|             |                 | CONSEQUENCE       |                   |                   |                   |
|-------------|-----------------|-------------------|-------------------|-------------------|-------------------|
|             |                 | Severe            | Medium            | Mild              | Minor             |
| PROBABILITY | High Likelihood | Very High Risk    | High Risk         | Moderate Risk     | Moderate/Low Risk |
|             | Likely          | High Risk         | Moderate Risk     | Moderate/Low Risk | Low Risk          |
|             | Low Likelihood  | Moderate Risk     | Moderate/Low Risk | Low Risk          | Very Low Risk     |
|             | Unlikely        | Moderate/Low Risk | Low Risk          | Very Low Risk     | Very Low Risk     |

**Comparison of consequence against probability**





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