CONTAMINATIONCONSULTANTS**LTD**

CONTAMINATED LAND RISK ASSESSMENT

DESKTOP STUDY

Mr Lee Atkin

Foulstone Workshops
Barnsley

Contamination Consultants Ltd
March 2010

Our Ref: CC/LA/FW/150310 **Date: 30th March 2010**

Client:

Mr Lee Atkin
49 Brampton Cresent
Wombwell
Barnsley
S73 0S2

CONTAMINATED LAND RISK ASSESSMENT

DESKTOP STUDY

Foulstone Workshops
Barnsley

A report prepared on behalf of ***Contamination Consultants*** by:



Dr Robin S Davies BSc PhD MISoilSci CSci PGC *Contaminated Land Management*
Chartered Scientist

Date: 30th March 2010

INSTITUTE OF PROFESSIONAL SOIL SCIENTISTS

This report has been prepared by Contamination Consultants with all reasonable skill, care and diligence, within the terms of the Contract with the Client. The report is the property of the client and Contamination Consultants accept no responsibility of whatever nature to third parties to whom this report may be made known.

No part of this document may be reproduced without prior written approval of the Client.

CONTAMINATIONCONSULTANTS**LTD**
Contaminated Land
Risk Assessment, Mineral Extraction Soil Planning
The Nanotechnology Centre, Herschel Building, Kings Rd, Newcastle upon Tyne NE1 7RU
Tel: 0191 243 0678 Fax: 0191 222 3528
Email: robind@contamination-consultants.co.uk
www.contamination-consultants.co.uk

CONTENTS

		Page
1.	INTRODUCTION AND OBJECTIVES	4
2.	SITE CHARACTERISATION AND FORMER INVESTIGATIONS	5
3.	CONCEPTUAL SITE MODEL	7
	3.1 Sources	7
	3.2 Pathways	8
	3.3 Receptors	9
4.	PLAUSIBLE POLLUTANT LINKAGES AND RISK ASSESSMENT	10
	4.1 Human health	10
	4.2 Controlled waters	11
	4.3 Ecology	11
5.	CONCLUSIONS	12

DRAWING CSM/1	Current site location
APPENDIX A	Historical maps
APPENDIX B	Environmental data

1. INTRODUCTION AND OBJECTIVES

The purpose of this assessment is to examine specifically the current and potential risks to human, ecological and ground and surface water receptors associated with possible contamination of the ground at the site located at:

Foulstone Workshops
Foulstone Row
Wombwell
Barnsley
S73 0AU

Grid Ref. 440098,402970

The site is to be re-developed for residential purposes.

This risk assessment has been designed within the source/pathway/receptor framework for contaminated site investigation as outlined by:

Model Procedures for the Management of Contaminated Land CLR11 (2004).

Reporting and all site work is based on the format outlined in:

Investigation of Potentially contaminated sites – Code of practice BS10175 (2001)

Evaluation of the risks are given and subsequently, if needed, further investigation or remediation recommendations made with regard to risk reduction and or evaluation.

2. SITE CHARACTERISATION AND FORMER INVESTIGATIONS

Current setting and condition

The site assessed for this investigation currently comprises an area of land located in Wombwell, Barnsley. The site consists of workshop buildings with a car park to the north west, a medical centre to the north east, a lane bounding the south west and buildings to the west (Photo 1).

Photo 1. (NB This aerial photo is a number of months out of date).



Site history (see Appendix A - Historical maps)

A building was located on the site in 1850. By 1892, further buildings had been constructed to the north, south and west of the site and a gas works was located 150 m north east and a glass and bottle works were located 175 m north of the site. A smithy was located 25 m to the south west of the site but had been relocated to the north of the site by 1903. The smithy was not named on the 1931 map.

Buildings had been developed to the north of the site and two works 35 m north and 75 m north east had been constructed by 1962. By 1994 a works was marked on the site and 18 m to the south east and an electricity substation was marked 100 m north of the site. The site is currently in use as a builder's yard.

Soils, geology and hydrology

The site is located on Middle Coal Measures from the Upper Carboniferous period which consist of well drained coarse loamy soils over sandstone.

Flow to groundwater could exist through the permeable soils finding a possible route to the aquifer at depth and to the River Dove 890 m north of the site.

Surface water flow could find a possible route via surface water drains and channels to the north leading to the River Dove 890 m north of the site.

The site is on a variably permeable minor aquifer zone and is not in a groundwater source protection zone.

Previous reports and environmental data

Environmental data (Appendix B) indicates the following:

The site is on a variably permeable minor aquifer zone
The site is not in a groundwater source protection zone
Two current landfill sites within 250 m
Two historic landfill sites within 250 m
No pollution inventory sites within 250 m
No waste treatment sites within 250 m
No pollution incidents within 250 m
Radon is not considered to be a risk
No fuel sites within 250 m

Former investigations

No former investigations have taken place.

3. THE CONCEPTUAL SITE MODEL

The conceptual site model detailed here is by a written and diagrammatical (Drawing CSM/1) description of the sources, pathways and receptors.

3.1 Sources of contamination

Possible sources generated on-site:

Works
The works on the site is currently in use as a builders yard and may possibly generate potential contaminants (associated with materials and goods stored or used at the site) such as metals and hydrocarbons.

Possible sources generated off-site:

Former smithy
The former smithy located 25 m to the south west and to the north of the site may possibly have generated potential contaminants (associated with materials and goods stored or used at the site) such as metals, sulphides and sulphates, asbestos and hydrocarbons.

Active landfill sites
The two active landfill sites (see Appendix B) located 250 m north west and 125 m south of the site may possibly be backfilled with potential contaminants (metals, sulphides and sulphates, asbestos and hydrocarbons) and also putrescible material that could possibly generate methane gas during decomposition.

Historical landfill sites
The two historical landfill sites (see Appendix B) located 245 m to the north west of the site may possibly have been backfilled with potential contaminants (metals, sulphides and sulphates, asbestos and hydrocarbons) and also putrescible material that could possibly generate methane gas during decomposition.

Electric sub-station

The electric sub-station located 100 m to the south of the site may generate potential contaminants such as PCB's and hydrocarbons.

Gas Works

The gas works located 150 m north east of the site may possibly generate potential contaminants such as metals and hydrocarbons.

Glass Bottle Works

The glass bottle works located 175 m north east of the site may possibly generate potential contaminants such as metals and hydrocarbons.

Works

The works 35 m north, 75 m north east and 18 m south east may generate potential contaminants (associated with materials and goods stored or used at the site) such as metals and hydrocarbons.

3.2 Pathways

Service channels are considered as a possible pathway to and from the site.

Human health

The main pathways considered possible are:

1. Ingestion of soil
2. Ingestion of dust
3. Ingestion of contaminated vegetables
4. Ingestion of soil attached to vegetables
5. Dermal contact with soil
6. Dermal contact with dust
7. Inhalation of fugitive soil dust
8. Inhalation of fugitive dust
9. Inhalation of vapours outside
10. Inhalation of vapours inside
11. Ingress to water supplies is also considered

Controlled waters

Flow to groundwater could exist through the permeable soils finding a possible route to the aquifer at depth and to the River Dove 890 m north of the site

Surface water flow could find a possible route via surface water drains and channels to the north leading to the River Dove 890 m north of the site.

The site is on a variably permeable minor aquifer zone and is not in a groundwater source protection zone.

3.3 Receptors

Humans

- Personnel in the proposed development.
- Personnel involved with any site development.

Controlled waters

- The River Dove 890 m north of the site.
- The site is on a variably permeable minor aquifer zone.
- The site is not in a groundwater source protection zone.

Ecology

- Plants and animals are considered to be possible receptors.

4. PLAUSIBLE POLLUTANT LINKAGES AND RISK ASSESSMENT

4.1 Human health

Risks from possible sources generated on-site:

Works

The works on the site is considered to pose a possible risk to human health. This is due to the fact that the site has been marked as a works since 1994 and is currently in use as a builders yard. Potential spillages and leaks into soils beneath the site may result in plausible pollutant linkages.

Risks from possible sources generated off-site:

Former smithy

The former smithy located 25 m to the south west and north of the site is not considered to pose a risk to human health due to the length of time since the former smithy ceased to exist.

Active landfill sites

The two active landfill sites (see Appendix B) located 250 m north west and 125 m south of the site are not considered to pose a risk to human health due to the distance from the site.

Historical landfill sites

The two historical landfill sites (see Appendix B) located 245 m to the north west of the site are not considered to pose a risk to human health due to the distance from the site and the length of time since the landfill and excavation were in-filled (any gas production is likely to have peaked).

Electric sub-station

The electric sub-station located 100 m to the south is not considered to pose a risk to human health given the distance from the site and the buildings located between the site and the sub-station.

Gas Works

The gas works located 150 m north east of the site is not considered to pose a risk to human health due to the distance from the site and the topography of the land sloping away to the north east.

Glass Bottle Works

The glass bottle works located 175 m north east of the site is not considered to pose a risk to human health due to the distance from the site and the topography of the land sloping away to the north east.

Works

The works 35 m north, 75 m north east and 18 m south east are not considered to pose a risk to human health due to the distance from the site.

4.2 Controlled waters

The site is currently considered to pose a possible risk to controlled waters due to the builders yard on the site and the number of contaminants associated with the activities together with the plausible pollutant linkages to surface waters via surface drains and channels.

4.3 Ecology

Animals and plants are considered to be at a potential risk due to the current builders yard on the site, the number of possible contaminants and the possibility for exposed soils and vegetation in the new residential development.

5. CONCLUSIONS

Given the current conditions and based on this information, the site can be considered to pose a possible risk to human health, controlled waters and the ecology as plausible pollutant linkages may exist within the current and future development.

It is recommended that a site walkover is undertaken in order to assess the risks from possible contamination.

DRAWING CSM/1

Current site location

NOTES:

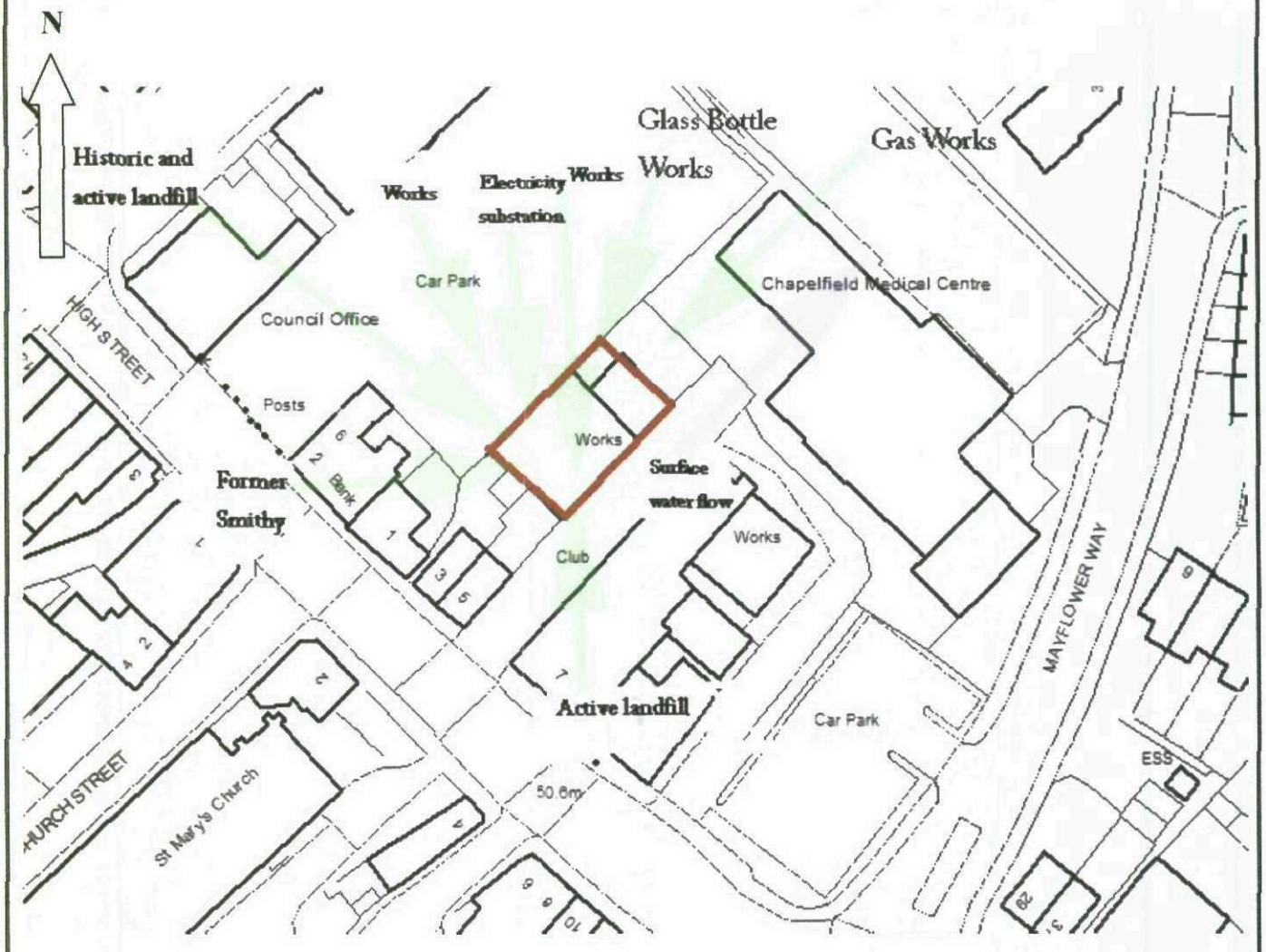
Site boundary

Potential surface water flow

Contamination Consultants

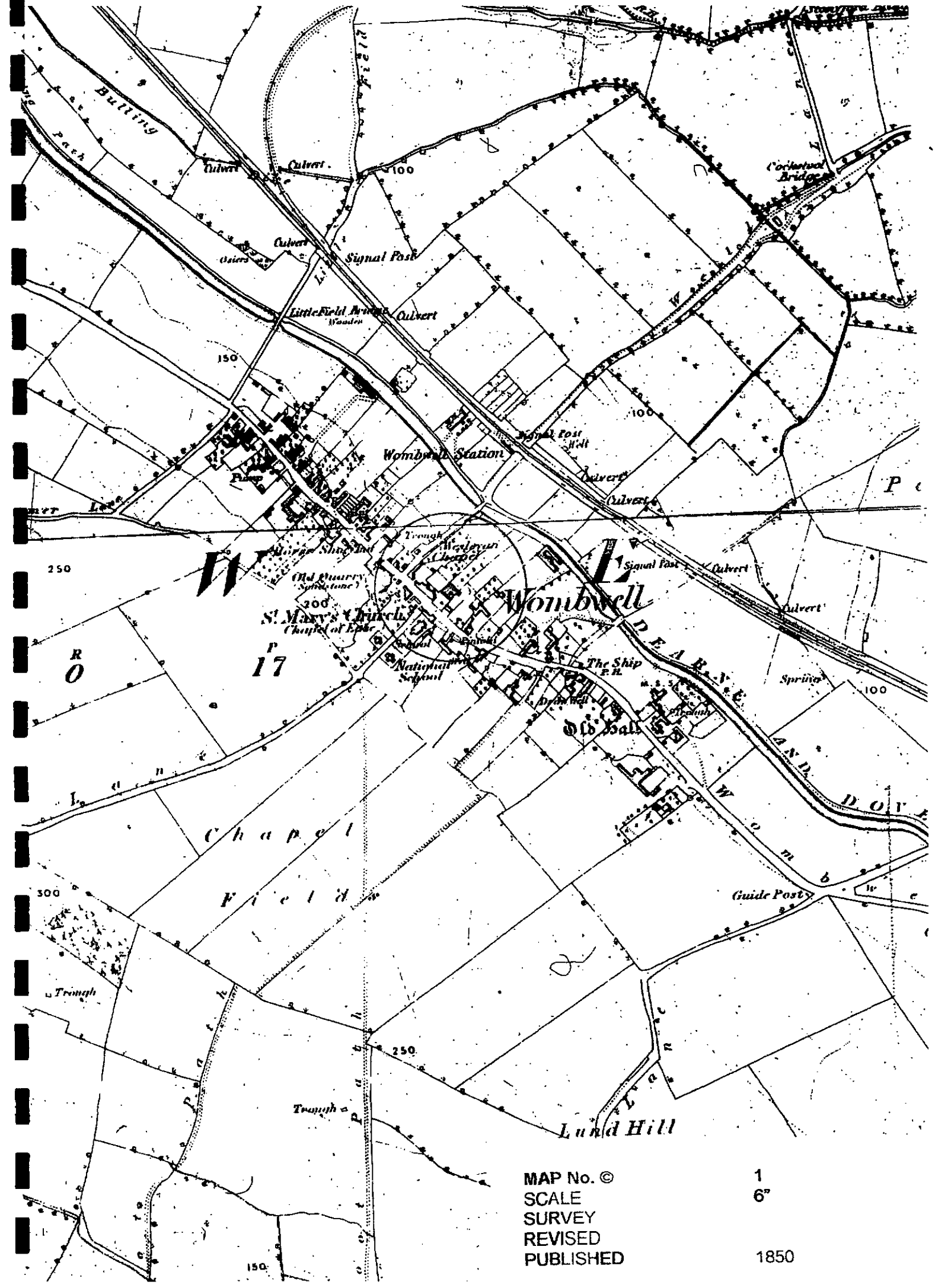
Contaminated Land Risk Assessment
Tel.: 0191 243 0678
www.contamination-consultants.co.uk

Drawing Title: Current site location	Drawing No.: CSM/1
Client: Mr Atkin	Project: Foulstone Workshops, Barnsley
Scale: 1: 420	Date: 30th March 2010

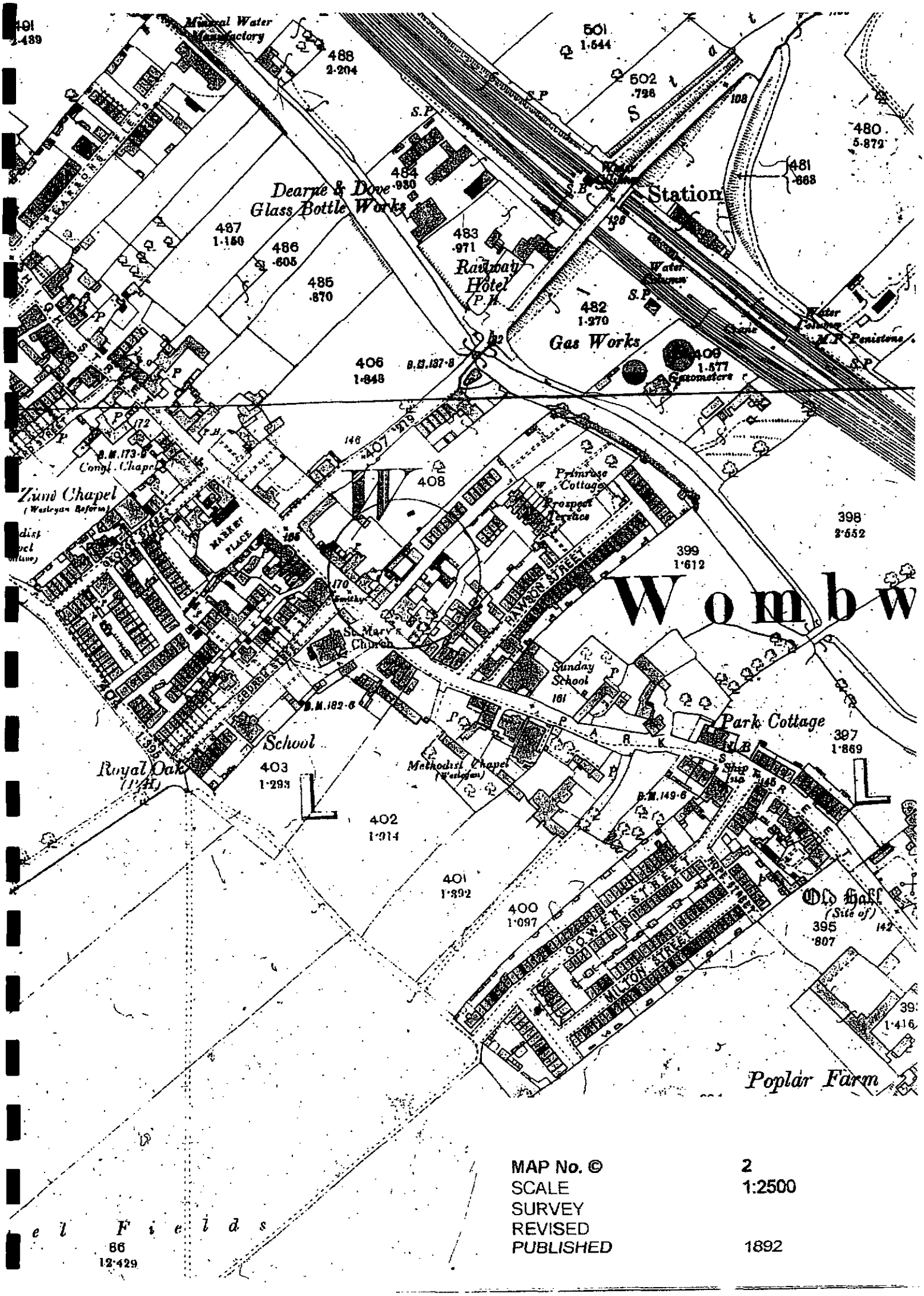


APPENDIX A

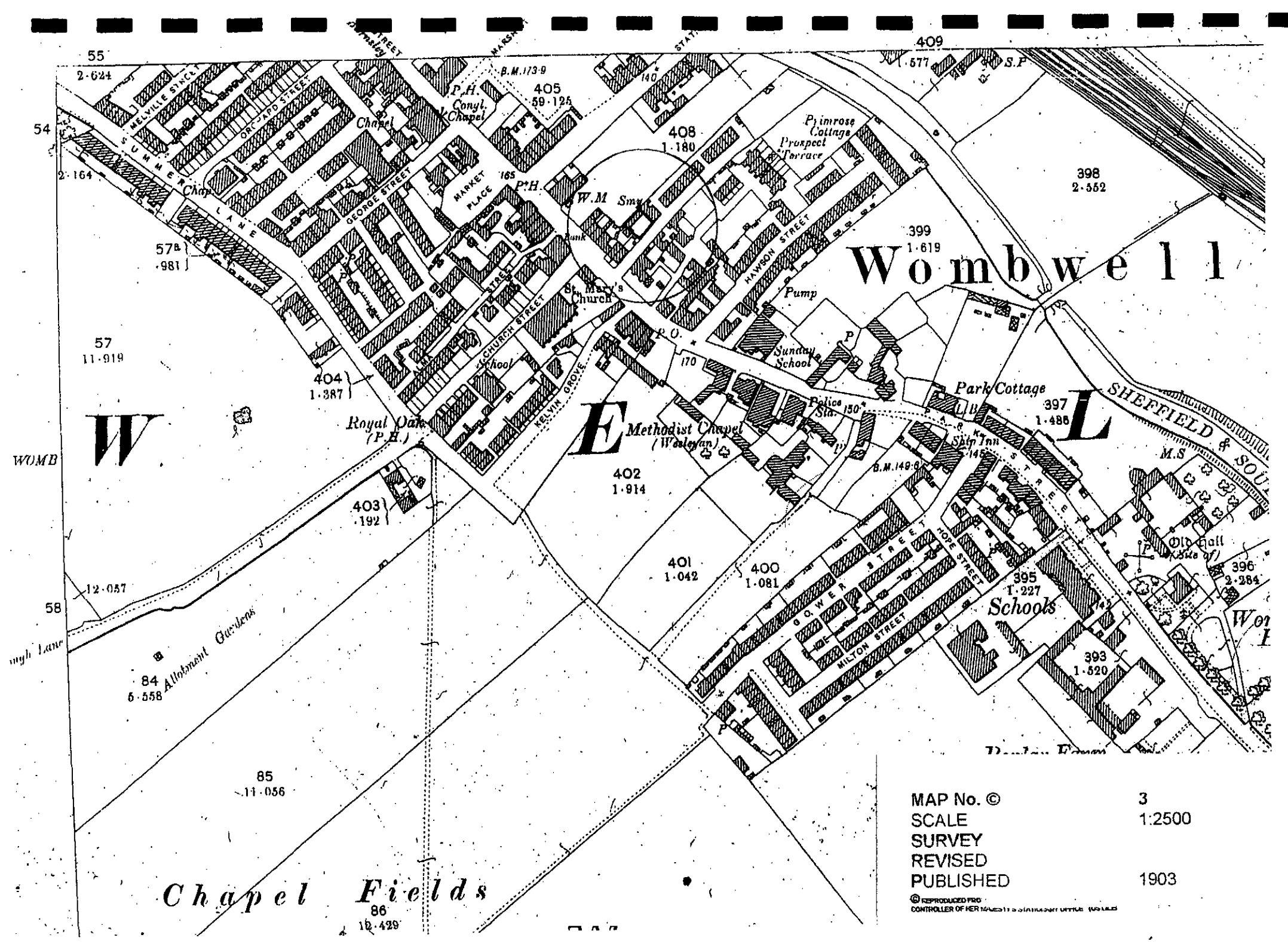
Historical maps



MAP No. ©	1
SCALE	6"
SURVEY	
REVISED	
PUBLISHED	1850

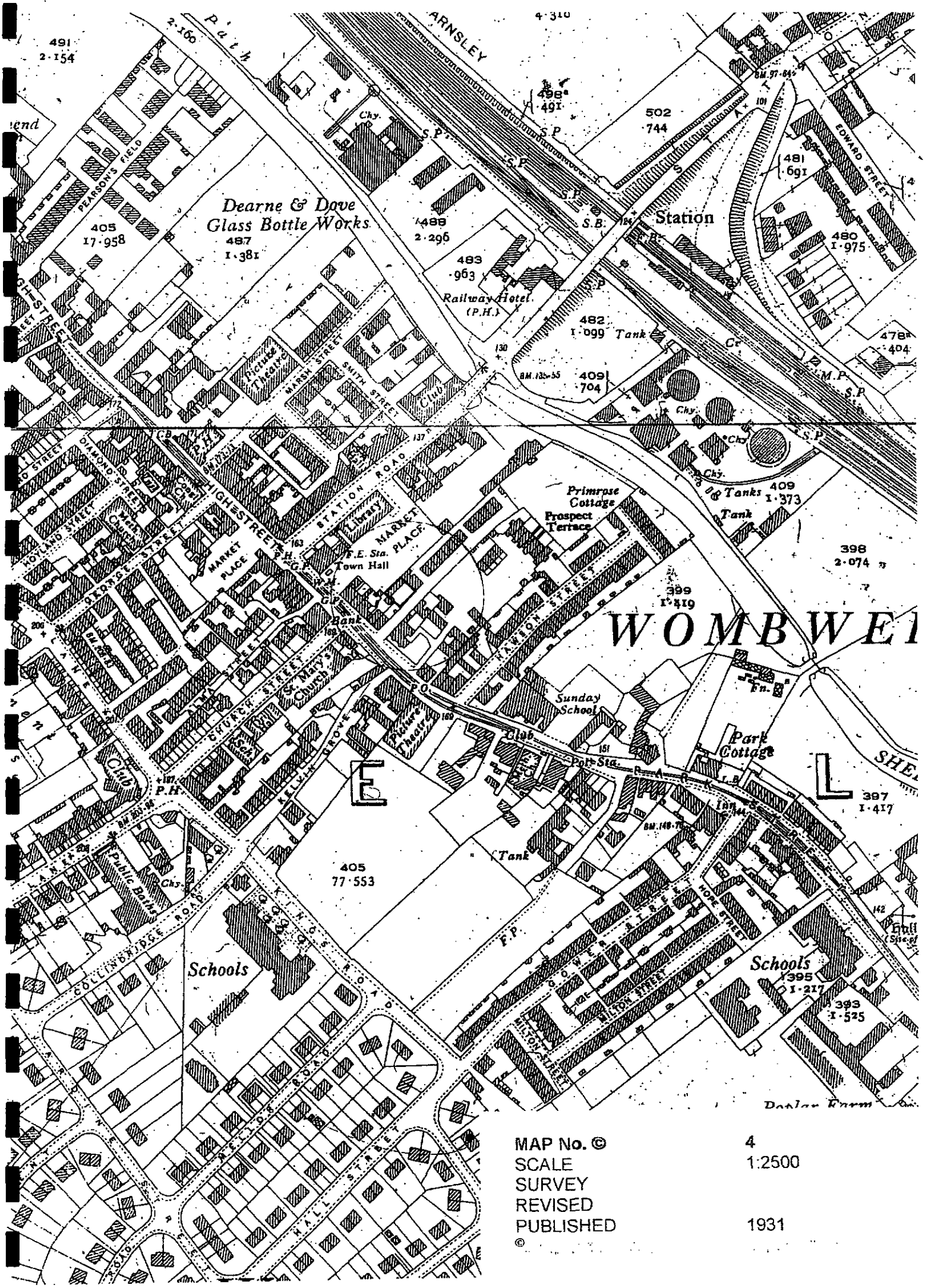


MAP No. ©	2
SCALE	1:2500
SURVEY	
REVISED	
PUBLISHED	1892



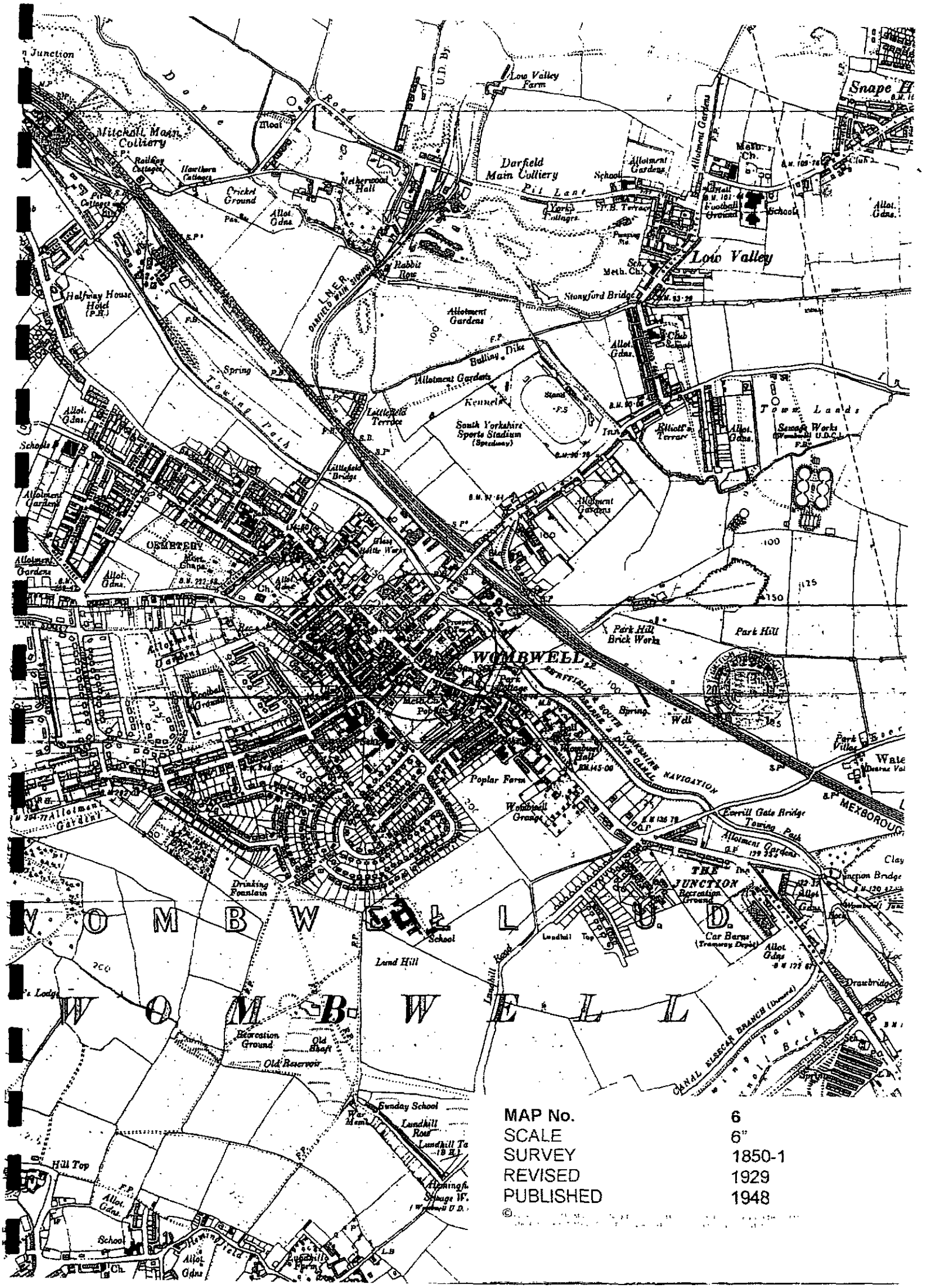
MAP No. ©	3
SCALE	1:2500
SURVEY	
REVISED	
PUBLISHED	1903

© REPRODUCED FROM CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE



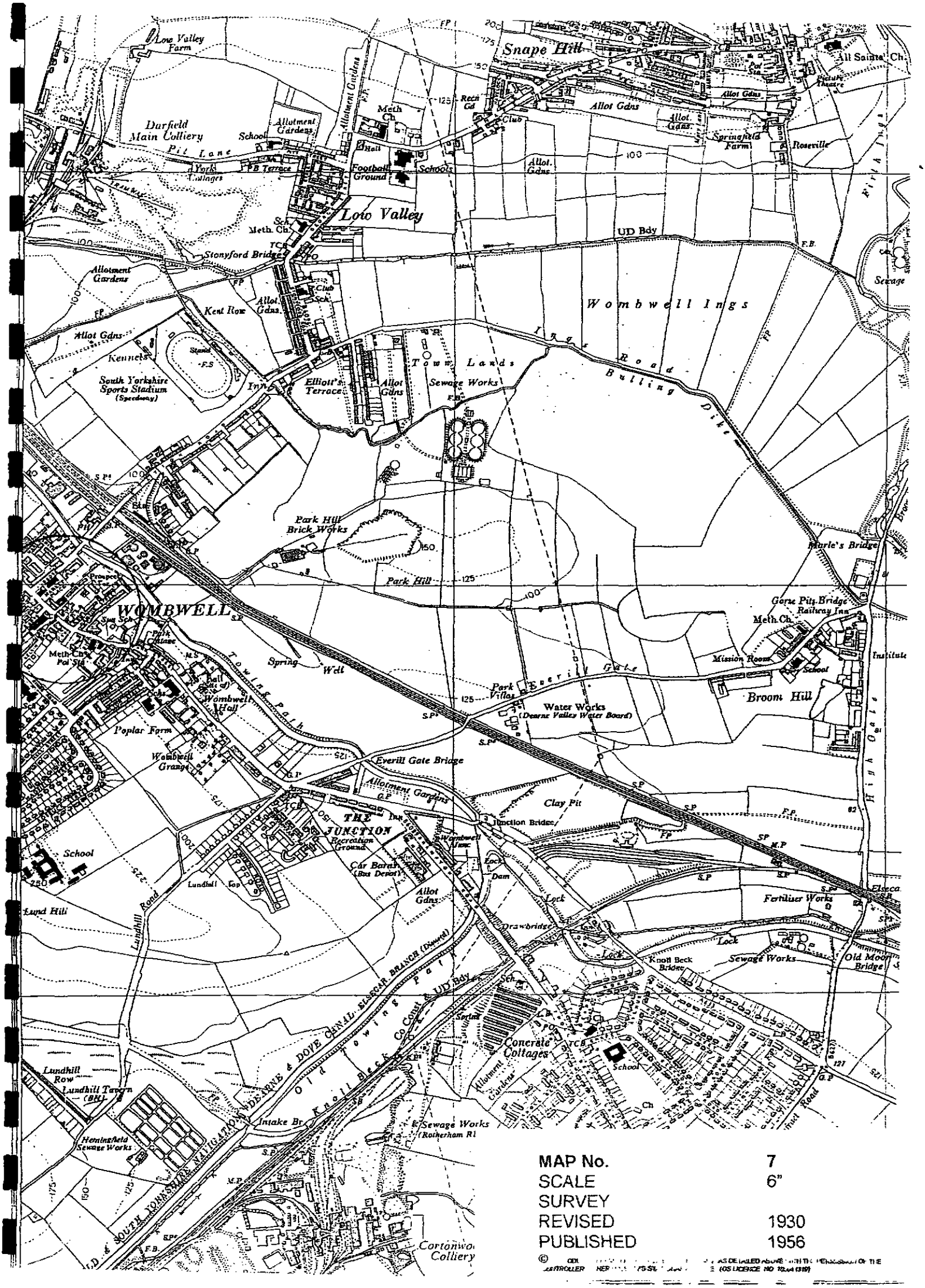
MAP No. ©	4
SCALE	1:2500
SURVEY	
REVISED	
PUBLISHED	1931
©	


Mitchell Main Colliery
Darfield Main Colliery
Low Valley
Snape
Low Valley Farm
Hit Lane
Rabbit Row
Stonyford Bridge
Kent Row
Bulling Dike
Allotment Gardens
Kenada
Little Field Terrace
South Yorkshire Sports Stadium (Speedway)
New Station
Elliott Terrace
Town Lands
Sewage Works (Wombwell U.D.C.)
Ings Road Stadium
Cricket Ground
Netherwood Hall
Tiger Row
Halfway House Hotel (P.H.)
Spring
Towing Path
L.N.E.R. DARFIELD MAIN STORES
CEMETERY
Park Hill
Park Hill Brick Works
WOMBWELL
Spring Well
Poplar Farm
Woodhall Grange
Barrill Gate Bridge
Towing Path
THE JUNCTION Recreation Ground
Car Barns (Tramway Depot)
Lundhill Top
Land Hill
Lundhill Road
Keeper's Lodge
Recreation Ground
Old Reservoir
Old Shaft
Sunday School
War Meml.
Hill Top
Recreation Ground
Knoll Beck
CANAL BARNSLEY BRANCH (Disused)
DEARNE & DOVE CANAL NAVIGATION
SOUTH YORKSHIRE & DOVE CANAL NAVIGATION
Drinking Fountain
Football Ground
Meth. Ch.
Schools
Allotment Gardens
Pumping Station
Work Cottages
Railway Cottages
Houthers Cottages
Pit Cottages
Club
Sch.
Allot. Gdns.
Meth. Ch.
Sch.
Club
Allot. Gdns.
Allotment Gardens
Allotment Gardens
Allotment Gardens



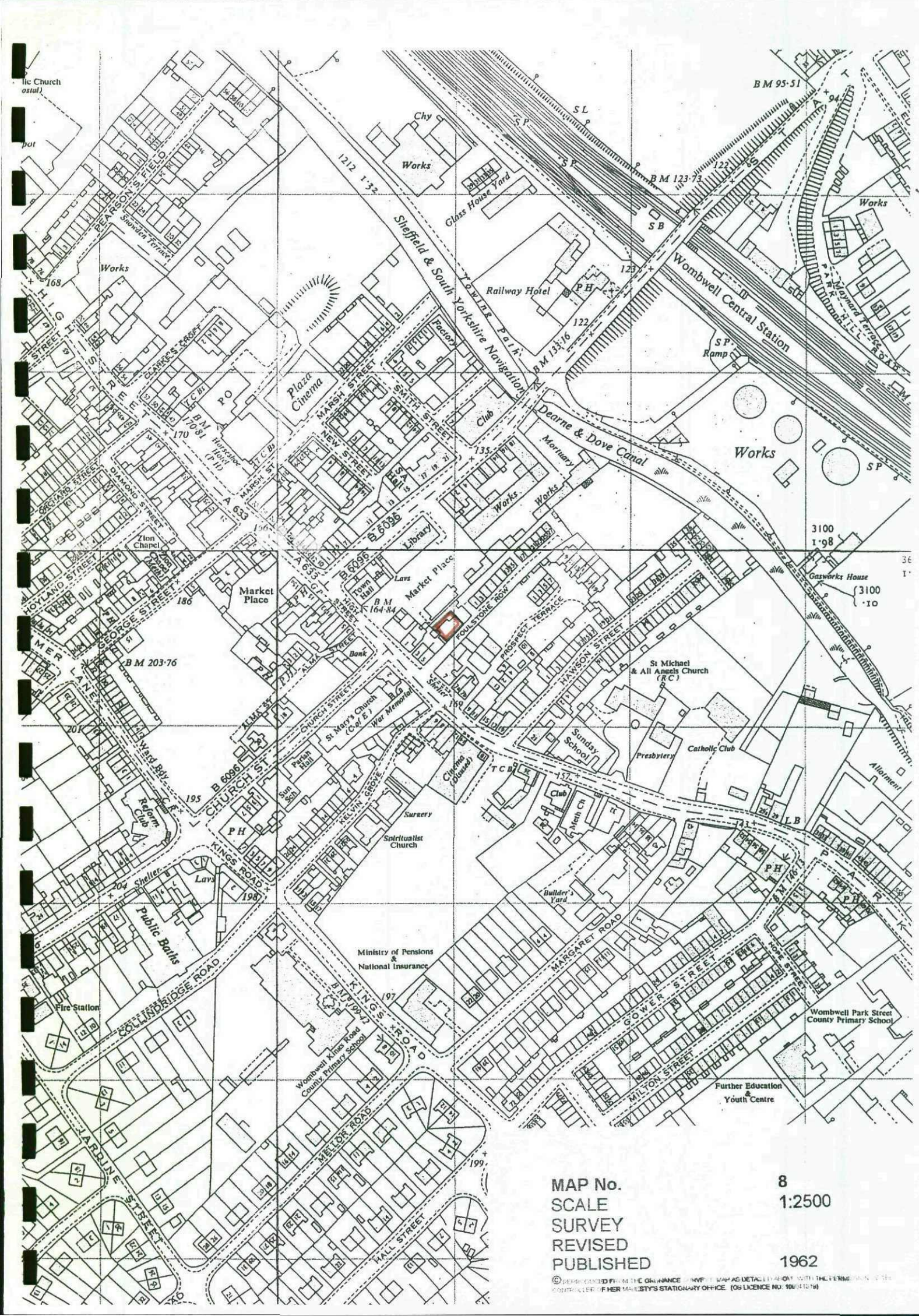
MAP No.	6
SCALE	6"
SURVEY	1850-1
REVISED	1929
PUBLISHED	1948

©



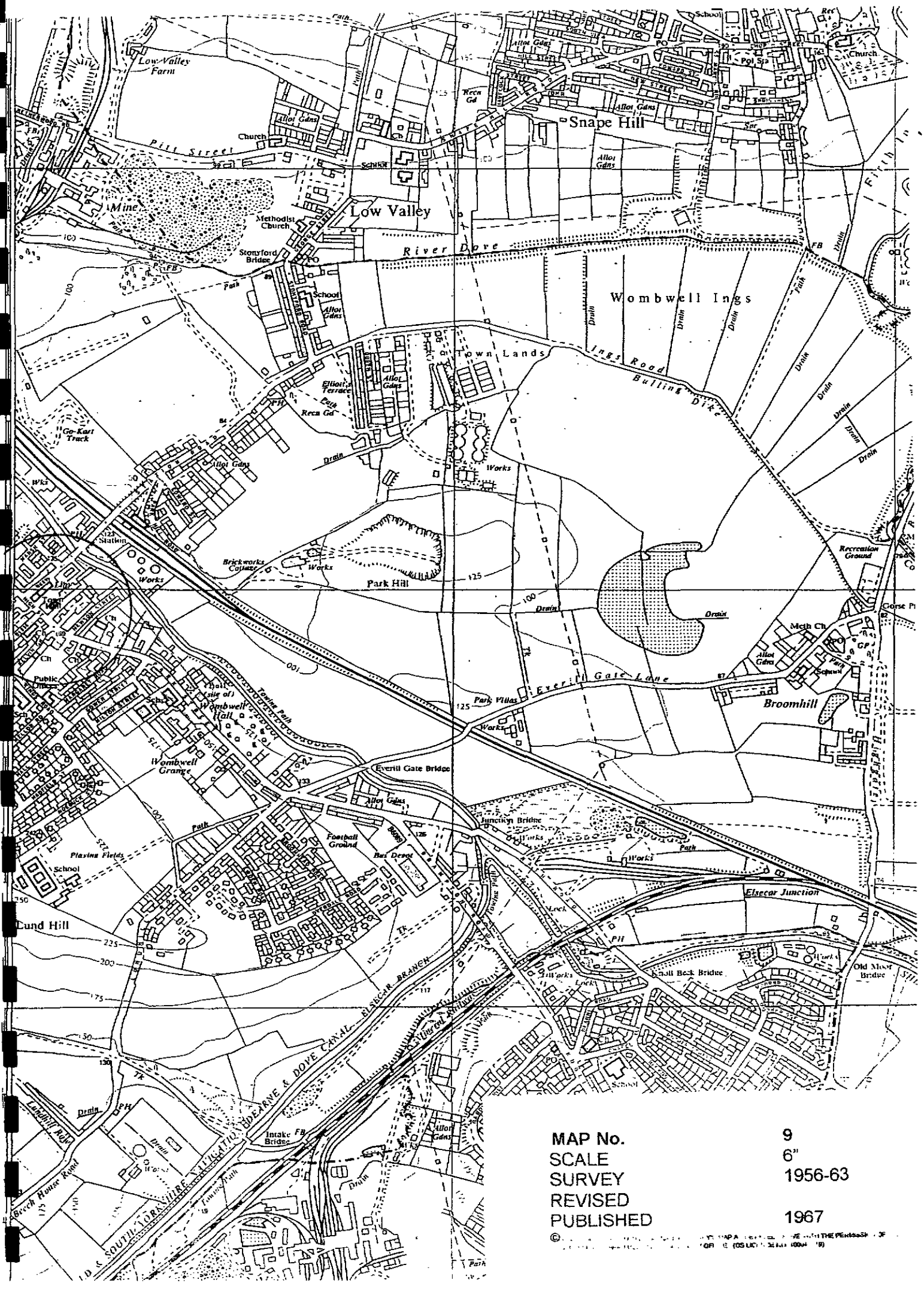
MAP No.	7
SCALE	6"
SURVEY	
REVISED	1930
PUBLISHED	1956

© ODL ... AS DETAILED ABOVE ... OF THE CONTROLLER HER ... (OS LICENCE NO 10441 (1959)



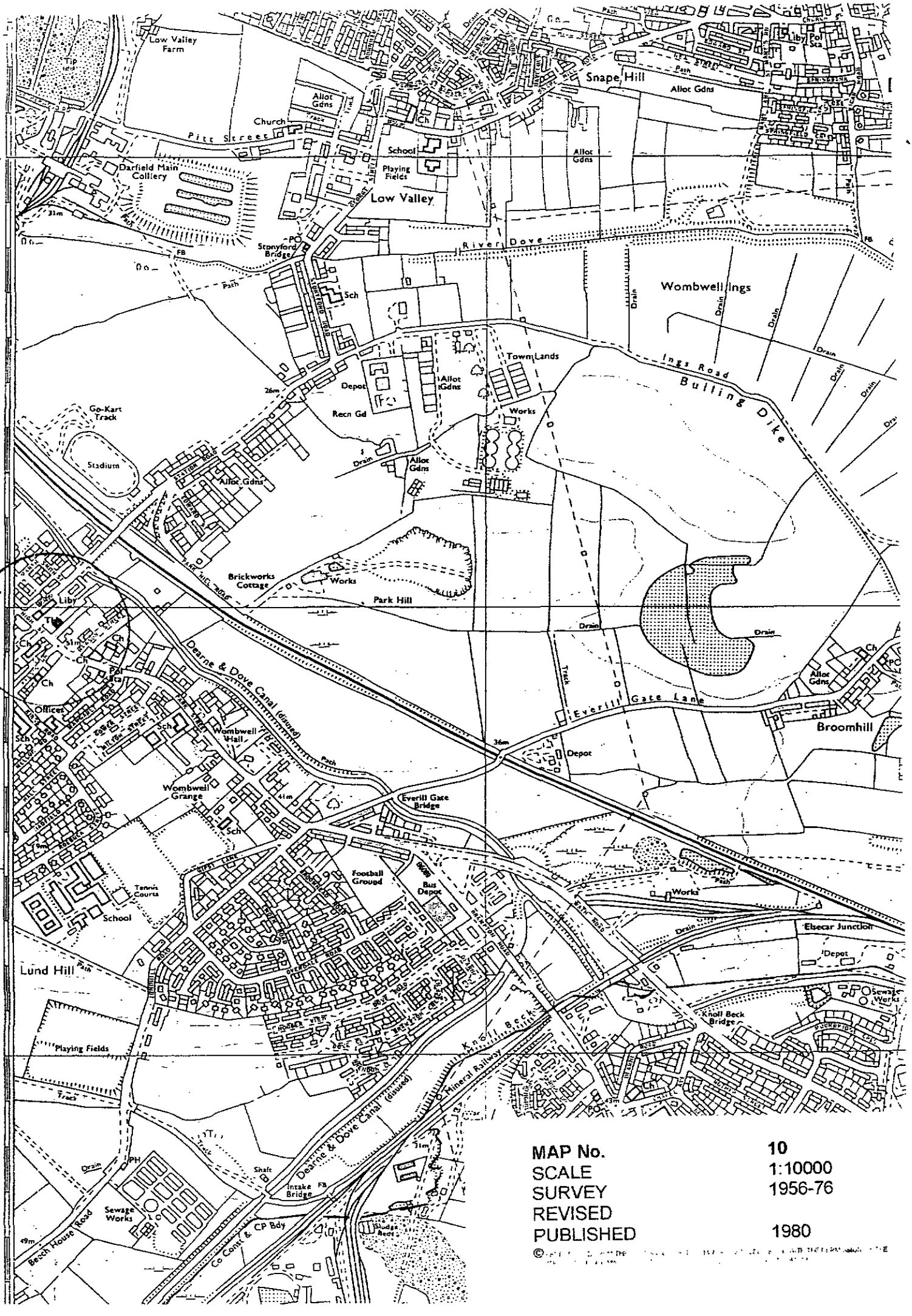
MAP No. 8
SCALE 1:2500
SURVEY
REVISED
PUBLISHED 1962

© REPRODUCED FROM THE ORDNANCE SURVEY MAP AS DETAILED ABOVE WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE. (OS LICENCE NO. 100031673H)



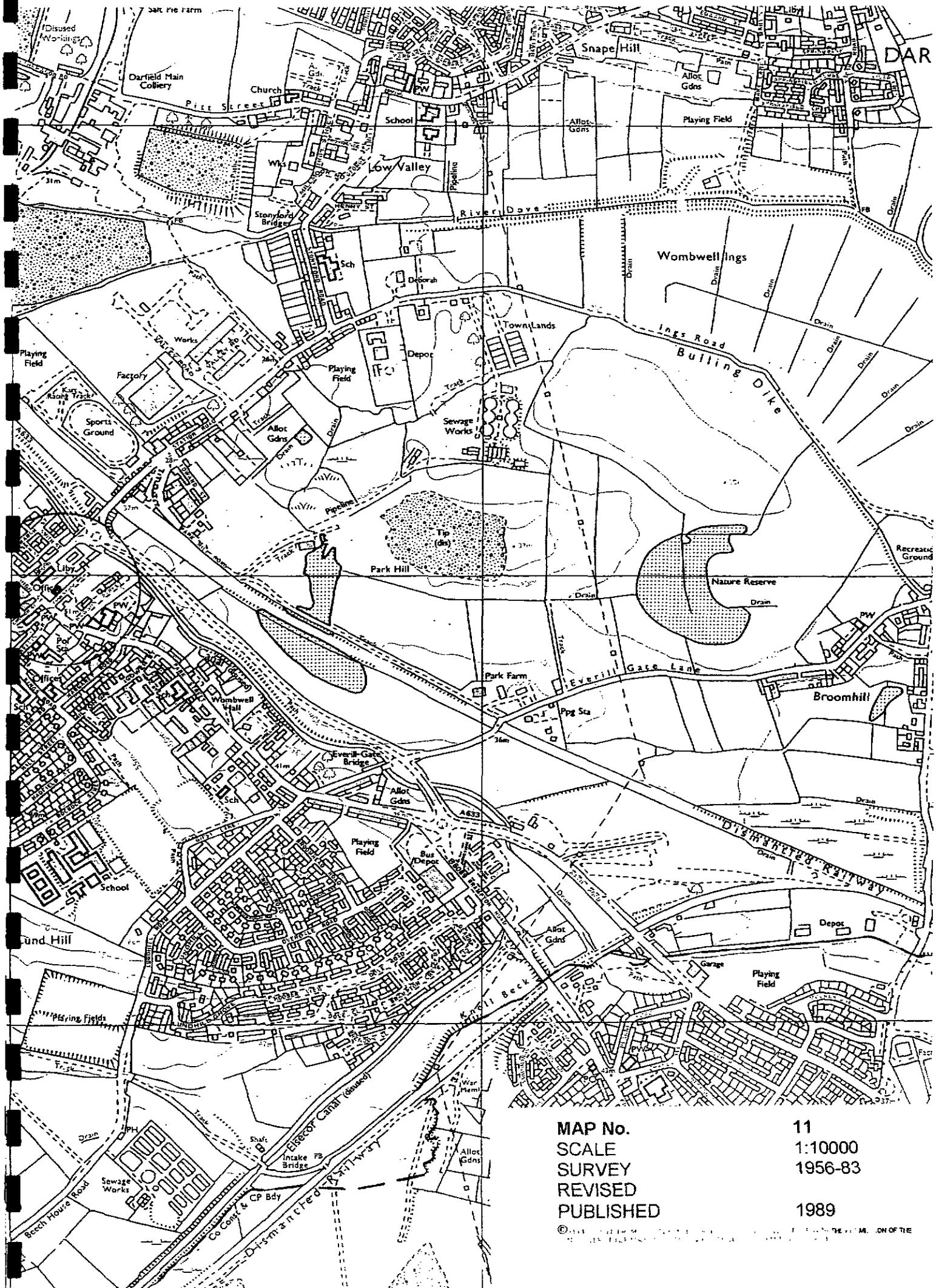
MAP No.	9
SCALE	6"
SURVEY	1956-63
REVISED	
PUBLISHED	1967

© ... THE PENINSULA ... (OS LIC) ...



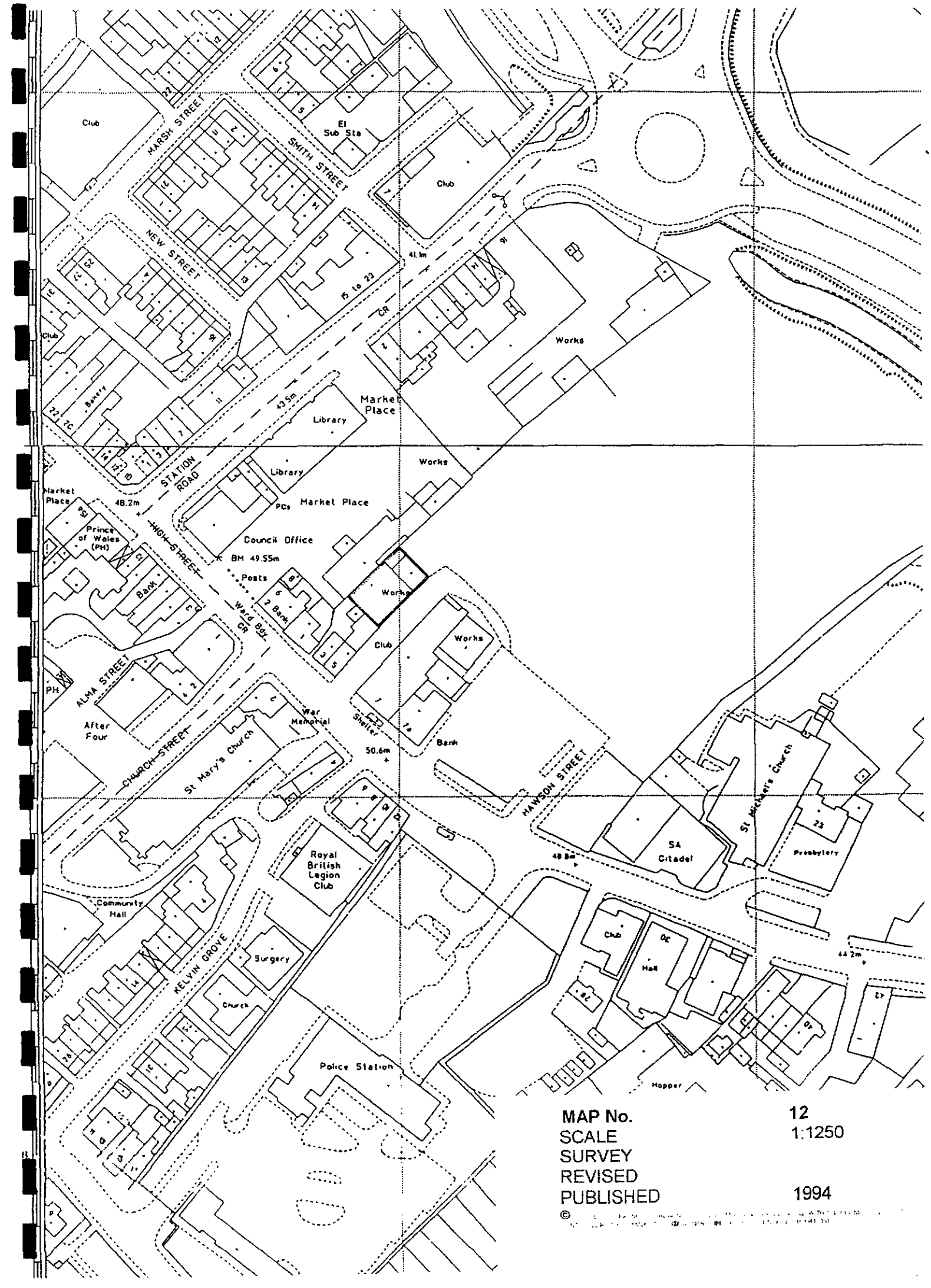
MAP No.	10
SCALE	1:10000
SURVEY	1956-76
REVISED	
PUBLISHED	1980

©



MAP No.	**11**
SCALE	1:10000
SURVEY	1956-83
REVISED	
PUBLISHED	1989

©



MAP No. 12
SCALE 1:1250
SURVEY
REVISED
PUBLISHED 1994

©

APPENDIX B

Environmental data

Environmental Search

Site Description

Foulstone Row
Wombwell
Barnsley
S73 0AU

Grid Reference: **440098, 402970**

Client Reference

Contamination Consultants
The Nanotechnology Centre
Herschel Building
Kings Road
Newcastle upon Tyne
NE1 7RU

Date: 16th March 2010
PO Number: CC/FR/LA/080310

Environment Agency

Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk

Contents

	Page No.
Summary of Data Set	3
Groundwater Vulnerability	4
Groundwater Source Protection Zone	6
Landfill	7
Industrial Pollution	8
Pollution Incidents	8
Radon Risk	8
Fuel Sites	9
Disclaimer	10

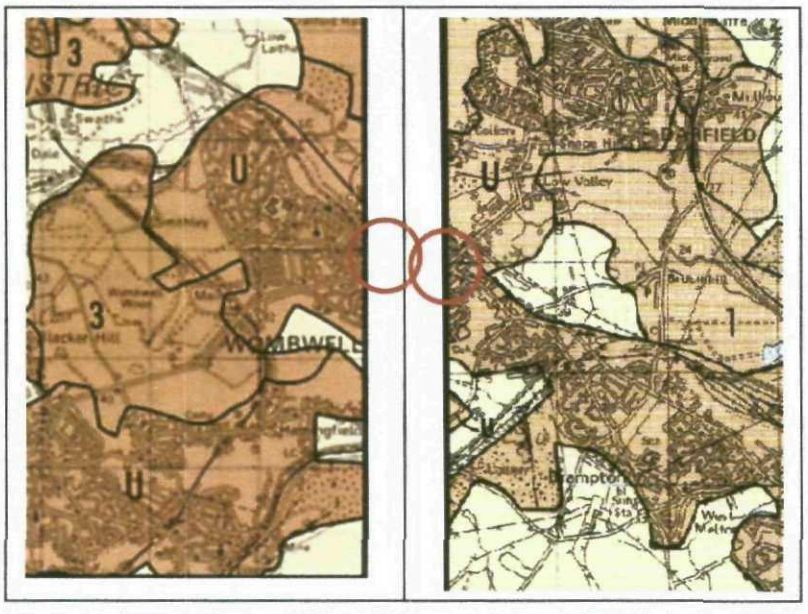
Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk

Data Set	*0-250m*
AEA Technology	
Air Quality	n/a
British Geological Survey	
1:50,000 Solid Geology	n/a
Borehole Index	n/a
Mines, Quarries and Shallow mining	n/a
Natural Subsidence	n/a
Radon Protection Measures	none required
Coal Authority	
Coal Fields	n/a
Conservation Sites	
National Parks	n/a
Areas of Outstanding Natural Beauty	n/a
National Nature Reserves	n/a
RAMSAR Sites	n/a
Sites of Special Scientific Interest	n/a
DEFRA	
Nitrate Vulnerable Zones	n/a
Nitrate Sensitive Areas	n/a
Environmentally Sensitive Areas	n/a
Environment Agency	
Abstractions Licences	n/a
Discharge Consents	n/a
Hazardous Waste	n/a
Radioactive Consents	n/a
IPC Authorisations	n/a
Pollution Inventory	0
Pollution Incidents	0
Prosecutions & Enforcements	n/a
River Quality Assessment	n/a
Flood Risk	n/a
Groundwater Vulnerability	✓
Waste Treatment Sites	0
Waste Carrier & Broker	n/a
Landfill	4
National Radiological Protection Board	
Radon Risk	1-3%
Radiocommunication Agency	
Mobile Phone Base Stations	n/a
Other	
Fuel Sites	0

Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk

Groundwater Vulnerability

Records within 0 – 250m



Source: *Environment Agency, 1997 (sheet to west); National Rivers Authority, 1995 (sheet to east)*

Geological Classification

Minor Aquifer (Variably permeable) – all brown shading

Fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although these will seldom produce large quantities of water for abstraction, they are important for local supplies and supplying base flow to rivers.

Soil Classification

Soils of high leaching potential (dark brown shading) – these soils have little ability to attenuate diffuse source pollutants and in which non-adsorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater.

> *Subclass* 3 - Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but which have some ability to attenuate adsorbed pollutants because of their clay or organic matter contents.

NB. Soil information for urban areas and restored mineral workings is based on fewer observations than elsewhere. A worst case vulnerability classification (high / H) is therefore assumed for these areas and for current mineral workings. All are given a designation HU until proved otherwise.

Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk

Soils of <u>low</u> leaching potential (pale brown shading) – soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants. Lateral flow from these soils may contribute to groundwater recharge elsewhere in the catchment. They generally have high clay or organic matter contents.

Groundwater (Source Protection Zones)

Records within 0 – 250m



Source: *Environment Agency, 2010*

Key:

Groundwater source protection zones

- Inner zone
- Outer zone
- Total catchment
- Special interest

Water abstraction management areas (CAMS)

- Managing water resources
- Thames Corridor
- Midland Corridor

NB. The Environment Agency does not restrict activities that may pollute water supplies in this area.

Explanation of Zones

The shape and size of a zone depends on the condition of the ground, how the groundwater is removed, and other environmental factors.

Inner Protection Zone:
Any pollution that can travel to the borehole within 50 days from any point within the zone is classified as being inside this zone. This applies at and below the water table. This zone also has a minimum 50m protection radius around the borehole. These criteria are designed to protect against the transmission of toxic chemicals and water-borne disease.

Outer Protection Zone:
The outer zone covers pollution that takes up to 400 days to travel to the borehole or 25% of the total catchment area, whichever area is the biggest. This travel time is the minimum amount of time that the Environment Agency estimate pollutants need to be diluted, reduced in strength or delayed by the time they reach the borehole.

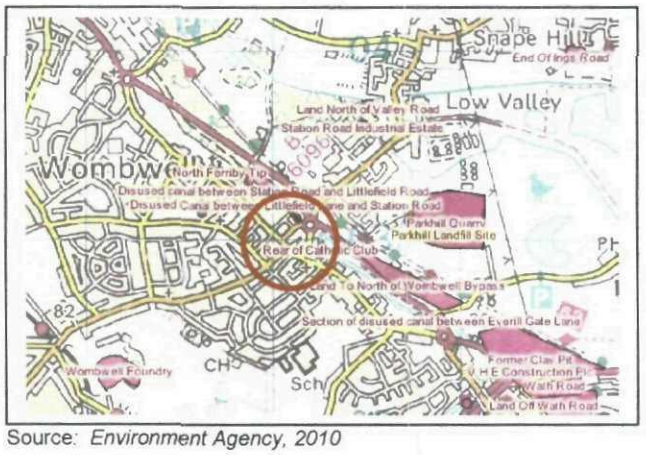
Total Catchment:
The total catchment is the total area needed support removal of water from the borehole and to support any discharge from the borehole.

Zone of special interest:
This is usually where local conditions mean that industrial sites and other polluters could affect the groundwater source even though they are outside the normal catchment area.

Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk

Active and Historical Landfill

Records within 0 – 250m



Source: *Environment Agency, 2010*

Please Note
The data in this report is based on information currently supplied to Environmental Data Analytics by its data providers. Environmental Data Analytics cannot guarantee the accuracy or the completeness of any information supplied to it by its data providers. If there are any queries regarding the information provided, please contact the data provider cited in each section for more detail or clarification.

Site Name: Disused Canal between Littlefield Lane and Station Road
Site Address: Wombwell, Barnsley
First waste received: 31 Dec 1988
Last waste received: 30 Nov 1990
Types of waste buried: Inert – waste which remains largely unaltered once buried such as glass, concrete, bricks, tiles, soil and stones

Site Name: Disused canal between Station Road and Littlefield Lane
Site Address: Wombwell, Barnsley
First waste received: 26 Sep 1988
Last waste received: 22 Apr 1993
Types of waste buried: Inert – waste which remains largely unaltered once buried such as glass, concrete, bricks, tiles, soil and stones

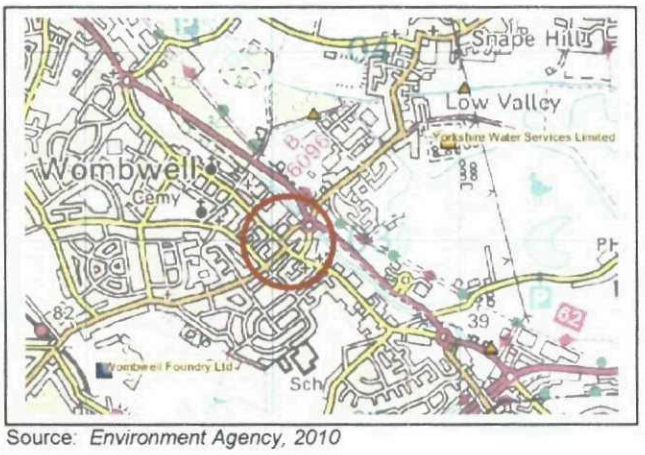
Site Name: North Ferriby Tip
Site Address: Church Road, North Ferriby
Types of waste buried:

Inert	waste which remains largely unaltered once buried such as glass, concrete, bricks, tiles, soil and stones
Industrial	waste from a factory or industrial process. It excludes waste from wines, quarries and agricultural wastes
Commercial	waste from premises used wholly or mainly for trade, business, sport, recreation or entertainment. Excludes household and industrial waste.
Household	waste from dwellings of various types including houses, caravans, houseboats, campsites, prisons and wastes from schools, colleges and universities

Site Name: Rear of Catholic Club
Site Address: 23 Park Street, Wombwell, Barnsley
First waste received: 31 Dec 1979
Last waste received: -
Site operator: P J Burke Limited

Industrial Pollution and Pollution Incidents

Records within 0 – 250m



Source: *Environment Agency, 2010*

Please Note
The data in this report is based on information currently supplied to Environmental Data Analytics by its data providers. Environmental Data Analytics cannot guarantee the accuracy or the completeness of any information supplied to it by its data providers. If there are any queries regarding the information provided, please contact the data provider cited in each section for more detail or clarification.

NB. According to Environment Agency data, there have been no pollution incidents; and no pollution inventory or waste treatment sites within 250m.

National Radiological Protection Board

Records within 0 – 250m

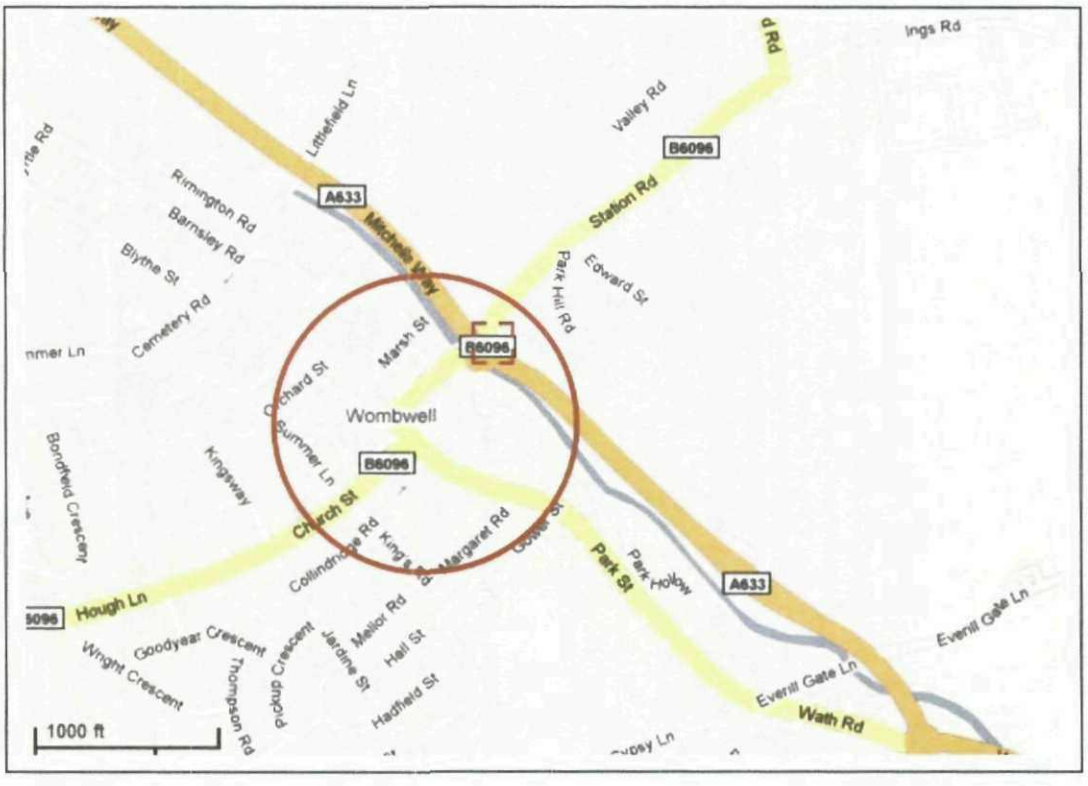
1-3% of homes above the action level of 200 becquerels per cubic metre (Bq m^{-3}), protection is not considered necessary.

For further advice, please contact the Health Protection Agency:

Telephone	01235 831600
Fax	01235 833891
Email	rpd@hpa-rp.org.uk

Fuel Sites

Records within 0 – 250m



NB. According to Experian Catalist data, there are no fuel sites within 250m.

Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk

Disclaimer for report

Whilst Environmental Data Analytics will use reasonable care and skill in providing data, the following should be acknowledged:

1. The report is based on the address and or grid reference supplied at the time of ordering. The grid reference shown on the cover represents the centre of the search area.
2. The information in the report is supplied under licence to Environmental Data Analytics from various sources including: Environment Agency and British Geological Survey.
3. This report is a search of statutory and non-statutory sources of information which does not include any on-site survey or inspection of the property or its environs. Accordingly, the report cannot in any way provide information as to the actual state of the property or land.
4. The data in this report is based on information currently supplied to Environmental Data Analytics by its data providers and or derived from publicly available records. Environmental Data Analytics cannot guarantee the accuracy or the completeness of any information supplied to it by its data providers.
5. Environmental Data Analytics does not guarantee that all past or current land uses or features will be identified in the report.
6. The data provided in the report are derived from the above mentioned sources and are specifically cited in the report. Environmental Data Analytics does not claim that these sources represent an exhaustive or comprehensive list of all the sources that might be consulted.

Environment Agency

1. Enforcement and Prosecution Data – The information is primarily for Agency internal use only and there are concerns over compliance with the Data Protection Act. It is hoped that this issue will be resolved by the Agency in the near future.
2. While most information may be available, there are instances where the site operator considers the information to be commercially confidential. This only occurs when the Agency agrees the information can be classified as commercially confidential.
3. All intellectual property right in the data and information are owned by the Environment Agency.

Groundwater Vulnerability Maps

All maps involve a compromise between the representation of natural complexity and ease of interpretation of the map. Such compromises place limitations on the resolution and precision of map information. In this case, the variety of soils, geological strata and potential contaminants that have to be covered is wide, and the classification used is, o necessity, generalised.

Individual sites and circumstances will always require further and more detailed assessments to determine the specific impact on groundwater resources. The maps only represent conditions at the surface and therefore where the soil and/or underlying formations have been disturbed or removed, for example during mineral extraction, the vulnerability class may have been changed. Hence, where there is evidence of disturbance there will be a need to determine groundwater vulnerability using more site-specific data.

Environmental Data Analytics PO Box 49296 London SE9 6WJ
www.environmentaldata.co.uk