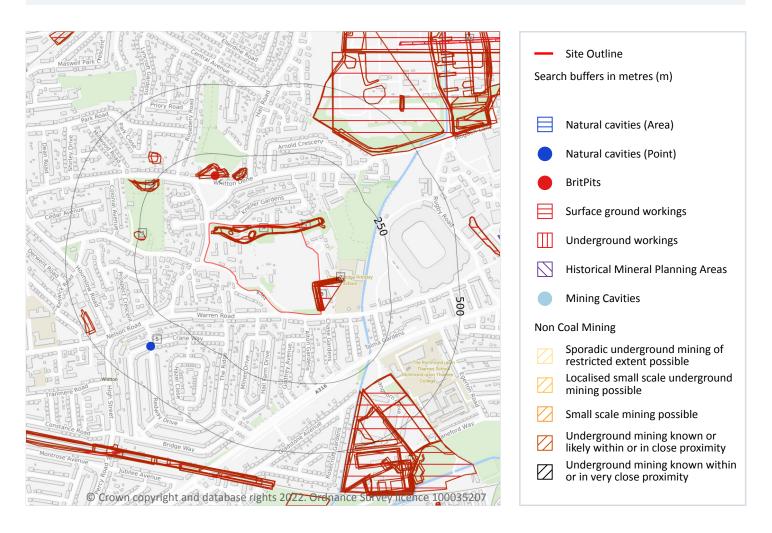


Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

18 Mining, ground workings and natural cavities



18.1 Natural cavities

Records within 500m 1

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

Features are displayed on the Mining, ground workings and natural cavities map on page 102



Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

ID	Location	Details	Source
5	363m SW	Type: Scour Hollows x 1 Superficial Geology: - Bedrock Geology: Chalk Group, Lambeth Group, London Clay Formation, Thanet Sand Formation	Simple Bibliography: - Full Bibliography: NEWMAN, T., The impact of adverse geological conditions on the design and construction of the Thames Water Ring Main in Greater London, 2009; Confidentiality: Data source can be revealed, data can be used freely

This data is sourced from Stantec UK Ltd.

18.2 BritPits

Records within 500m 1

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

Features are displayed on the Mining, ground workings and natural cavities map on page 102

ID	Location	Details	Description
С	170m N	Name: Whitton Dean Gravel Pit Address: TWICKENHAM, Surrey Commodity: Sand & Gravel Status: Ceased	Type: A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site Status description: Site which, at date of entry, has ceased to extract minerals. May be considered as Closed by operator. May be considered to have Active, Dormant or Expired planning permissions by Mineral Planning Authority

This data is sourced from the British Geological Survey.

18.3 Surface ground workings

Records within 250m 40

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining, ground workings and natural cavities map on page 102

ID	Location	Land Use	Year of mapping	Mapping scale
1	On site	Ponds	1865	1:10560
Α	On site	Pond	1959	1:10560
Α	On site	Pond	1938	1:10560





Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

ID	Location	Land Use	Year of mapping	Mapping scale
Α	On site	Pond	1912	1:10560
Α	On site	Water Body	1938	1:10560
Α	On site	Water Body	1912	1:10560
Α	On site	Water Body	1894	1:10560
Α	On site	Water Body	1933	1:10560
Α	On site	Water Body	1894	1:10560
Α	On site	Pond	1896	1:10560
Α	On site	Pond	1898	1:10560
В	On site	Unspecified Pit	1894	1:10560
В	On site	Unspecified Ground Workings	1938	1:10560
В	On site	Unspecified Ground Workings	1912	1:10560
В	On site	Unspecified Pit	1865	1:10560
В	On site	Unspecified Pit	1938	1:10560
В	On site	Unspecified Pit	1912	1:10560
В	On site	Unspecified Pit	1894	1:10560
В	On site	Unspecified Pit	1933	1:10560
В	On site	Unspecified Heap	1935	1:10560
В	On site	Unspecified Pit	1933	1:10560
В	On site	Unspecified Heap	1935	1:10560
В	On site	Unspecified Pit	1898	1:10560
2	52m E	Unspecified Pit	1894	1:10560
С	162m N	Gravel Pit	1912	1:10560
D	163m N	Unspecified Pit	1912	1:10560
D	164m N	Gravel Pit	1912	1:10560
D	167m N	Unspecified Pit	1933	1:10560
D	167m N	Unspecified Pit	1933	1:10560
D	168m N	Unspecified Pit	1938	1:10560
С	171m N	Gravel Pit	1933	1:10560



Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

ID	Location	Land Use	Year of mapping	Mapping scale
С	172m N	Gravel Pit	1912	1:10560
С	173m N	Gravel Pit	1938	1:10560
С	173m N	Gravel Pit	1912	1:10560
D	175m N	Unspecified Pit	1912	1:10560
3	226m W	Pond	1912	1:10560
Е	229m NW	Pond	1912	1:10560
Е	229m NW	Pond	1894	1:10560
Е	230m NW	Pond	1865	1:10560
Е	241m NW	Pond	1912	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground workings

Records within 1000m 6

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

Features are displayed on the Mining, ground workings and natural cavities map on page 102

ID	Location	Land Use	Year of mapping	Mapping scale
AB	738m NE	Tunnel	1987	1:10000
AB	738m NE	Tunnel	1974	1:10000
AB	738m NE	Tunnel	1966	1:10560
AE	807m NE	Tunnel	1987	1:10000
AE	807m NE	Tunnel	1974	1:10000
AE	807m NE	Tunnel	1966	1:10560

This is data is sourced from Ordnance Survey/Groundsure.



Ref: JOMAS-8446056 Your ref: P4134JJ2485-1 Grid ref: 514772 174269

18.5 Historical Mineral Planning Areas

Records within 500m 0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m 0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 Mining cavities

Records within 1000m 0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

18.8 JPB mining areas

Records on site 0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.9 Coal mining

Records on site 0

Areas which could be affected by past, current or future coal mining.

This data is sourced from the Coal Authority.



(106)

Ref: JOMAS-8446056 Your ref: P4134JJ2485-1 Grid ref: 514772 174269

18.10 Brine areas

Records on site 0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.11 Gypsum areas

Records on site 0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.12 Tin mining

Records on site 0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.13 Clay mining

Records on site 0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).





Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

19 Radon



19.1 Radon

Records on site 1

Estimated percentage of dwellings exceeding the Radon Action Level. This data is the highest resolution radon dataset available for the UK and is produced to a 75m level of accuracy to allow for geological data accuracy and a 'residential property' buffer. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain. The data was derived from both geological assessments and long term measurements of radon in more than 479,000 households.

Features are displayed on the Radon map on page 108

Location	Estimated properties affected	Radon Protection Measures required
On site	Less than 1%	None**

This data is sourced from the British Geological Survey and Public Health England.





Ref: JOMAS-8446056 Your ref: P4134JJ2485-1 Grid ref: 514772 174269

20 Soil chemistry

20.1 BGS Estimated Background Soil Chemistry

Records within 50m 8

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km². In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km²; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data
On site	No data	No data	No data	No data	No data	No data	No data
24m N	No data	No data	No data	No data	No data	No data	No data
29m NW	No data	No data	No data	No data	No data	No data	No data
33m W	No data	No data	No data	No data	No data	No data	No data
34m W	No data	No data	No data	No data	No data	No data	No data
41m E	No data	No data	No data	No data	No data	No data	No data

This data is sourced from the British Geological Survey.

20.2 BGS Estimated Urban Soil Chemistry

Records within 50m 28

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km²).

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromiu m (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/k g)
On site	19	3.3	138	95	0.7	53	47	23	18





Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

Location	Arsenic (mg/kg)	Bioaccessible Arsenic (mg/kg)	Lead (mg/kg)	Bioaccessible Lead (mg/kg)	Cadmium (mg/kg)	Chromiu m (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Tin (mg/k g)
On site	20	3.5	138	95	0.7	52	50	24	21
On site	21	3.7	150	103	0.7	53	57	26	25
On site	21	3.7	181	124	0.8	56	63	28	30
On site	25	4.4	258	177	1	66	103	35	60
On site	28	4.9	436	300	1.3	79	164	45	114
On site	28	4.9	413	284	1.2	76	146	42	105
On site	29	5.1	344	236	1.1	73	143	42	93
On site	30	5.3	468	322	1.2	80	174	47	120
On site	30	5.3	374	257	1	74	147	45	88
On site	31	5.4	358	246	1.1	72	153	45	95
On site	34	5.9	424	291	1.1	78	189	51	123
On site	36	6.3	547	376	1.4	87	242	58	174
On site	38	6.7	514	353	1.3	83	239	57	171
On site	41	7.2	592	407	1.3	89	284	64	207
On site	42	7.3	633	435	1.4	92	314	67	238
On site	46	8.1	692	475	1.5	95	376	74	303
14m N	22	3.8	234	161	0.8	64	76	31	38
16m NW	26	4.6	382	262	1	73	114	37	76
20m NW	27	4.7	381	262	1	75	119	38	76
21m N	23	4	262	180	1	67	93	33	53
26m W	30	5.3	454	312	1.3	82	176	48	115
31m NE	20	3.5	208	143	0.8	59	64	29	30
33m W	24	4.2	387	266	1.2	73	132	39	100
40m SW	37	6.5	573	394	1.2	86	240	59	167
41m SE	12	2.1	51	35	0.5	36	17	13	5
43m E	12	2.1	46	32	0.5	33	15	12	5



Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

This data is sourced from the British Geological Survey.

20.3 BGS Measured Urban Soil Chemistry

Records within 50m 1

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km².

Location	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Tin	Sample
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	Type
17m S	47.8	1.5	96.4	398.8	76.4	718.2	327.5	Topsoil

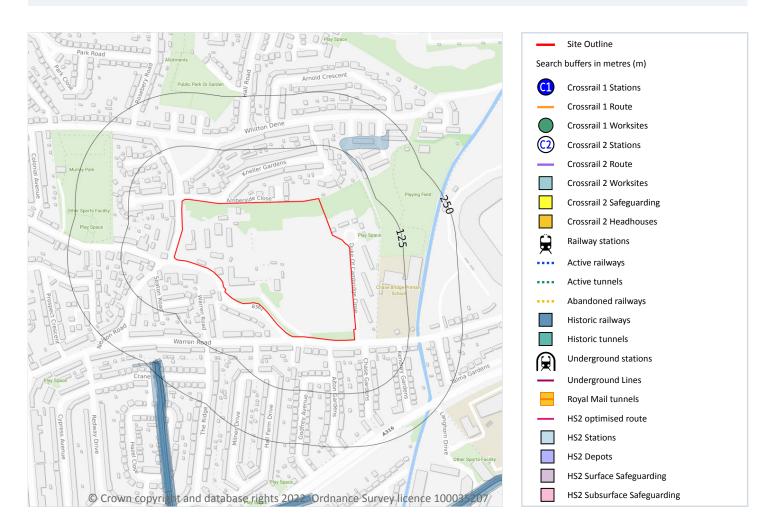
This data is sourced from the British Geological Survey.





Ref: JOMAS-8446056 Your ref: P4134JJ2485-1 Grid ref: 514772 174269

21 Railway infrastructure and projects



21.1 Underground railways (London)

Records within 250m 0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

21.2 Underground railways (Non-London)

Records within 250m

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.



Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

This data is sourced from publicly available information by Groundsure.

21.3 Railway tunnels

Records within 250m 0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

21.4 Historical railway and tunnel features

Records within 250m 11

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on page 112

Location	Land Use	Year of mapping	Mapping scale
116m NE	Railway Sidings	1935	2500
218m SW	Tramway Sidings	1912	10560
218m SW	Tramway Sidings	1933	10560
223m SW	Tramway Sidings	1894	10560
225m SW	Tramway Sidings	1896	2500
227m SW	Tramway Sidings	1912	10560
228m SW	Tramway Sidings	1894	10560
228m SW	Tramway Sidings	1915	2500
228m SW	Tramway Sidings	1896	10560
230m SW	Tramway Sidings	1898	10560
232m SW	Tramway Sidings	1912	10560

This data is sourced from Ordnance Survey/Groundsure.



Ref: JOMAS-8446056 **Your ref**: P4134JJ2485-1 **Grid ref**: 514772 174269

21.5 Royal Mail tunnels

Records within 250m 0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

21.6 Historical railways

Records within 250m 0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

21.7 Railways

Records within 250m 0

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

This data is sourced from Ordnance Survey and OpenStreetMap.

21.8 Crossrail 1

Records within 500m 0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

21.9 Crossrail 2

Records within 500m 0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.





Ref: JOMAS-8446056 Your ref: P4134JJ2485-1 **Grid ref**: 514772 174269

21.10 HS2

Records within 500m 0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

This data is sourced from HS2 ltd.





Ref: JOMAS-8446056 Your ref: P4134JJ2485-1 Grid ref: 514772 174269

Data providers

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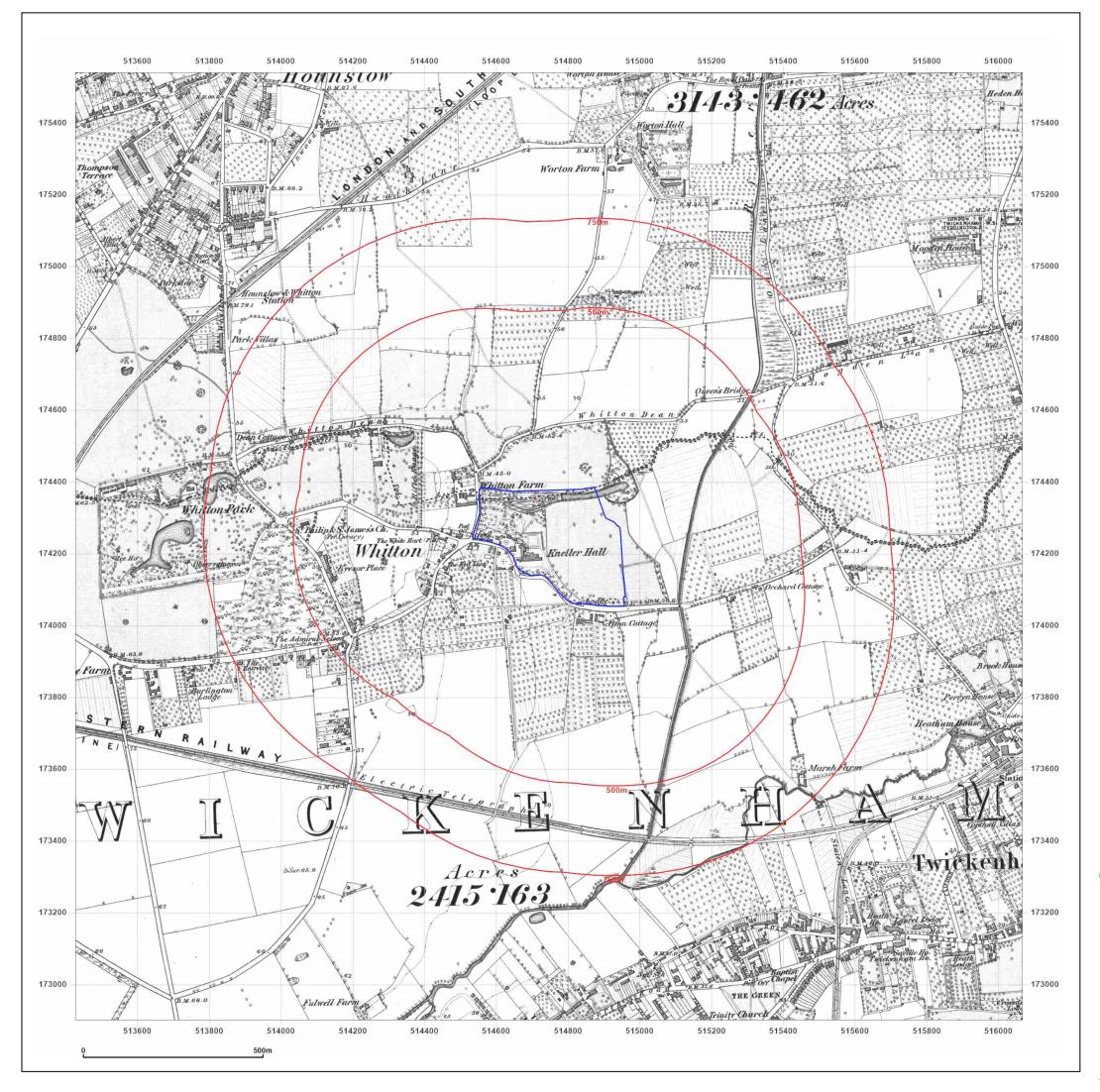
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APPENDIX 3 – OS HISTORICAL MAPS





FLAT, KNELLER HALL ROYAL MILITARY SCHOOL OF MUSIC, KNELLER ROAD, TWICKENHAM, TW2 7DU

Client Ref: P4134JJ2485-1 Report Ref: JOMAS-8446055 Grid Ref: 514746, 174220

Map Name: County Series

Map date: 1865

Scale: 1:10,560

Printed at: 1:10,560

Surveyed 1865 Revised 1865 Edition N/A

Copyright N/A Levelled N/A



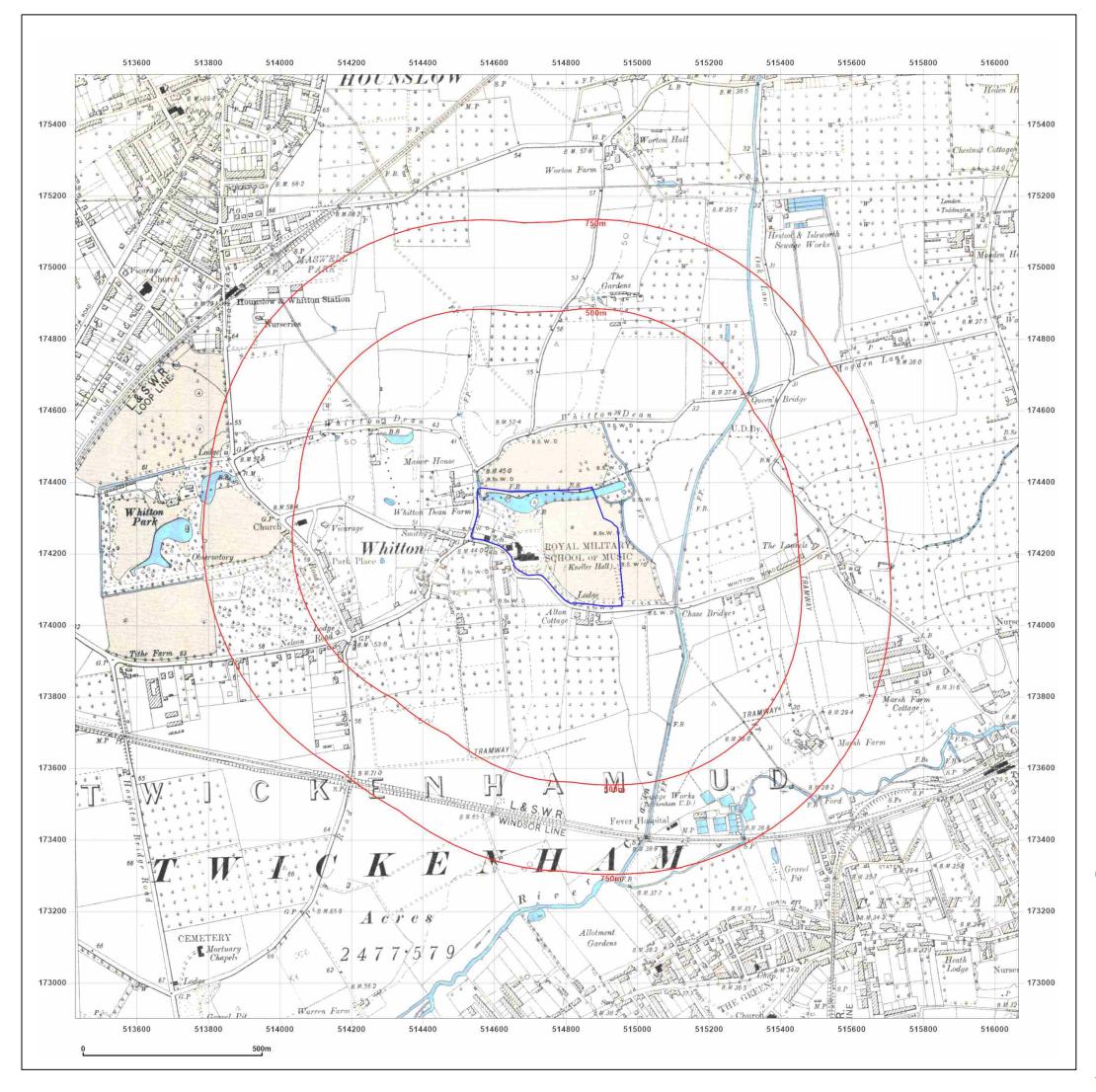


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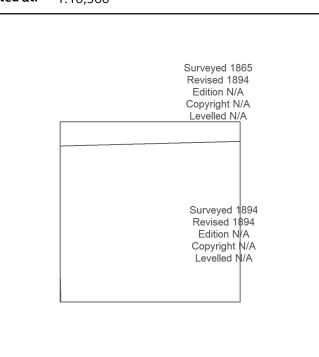
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Map Name: County Series

Map date: 1894

Scale: 1:10,560

Printed at: 1:10,560







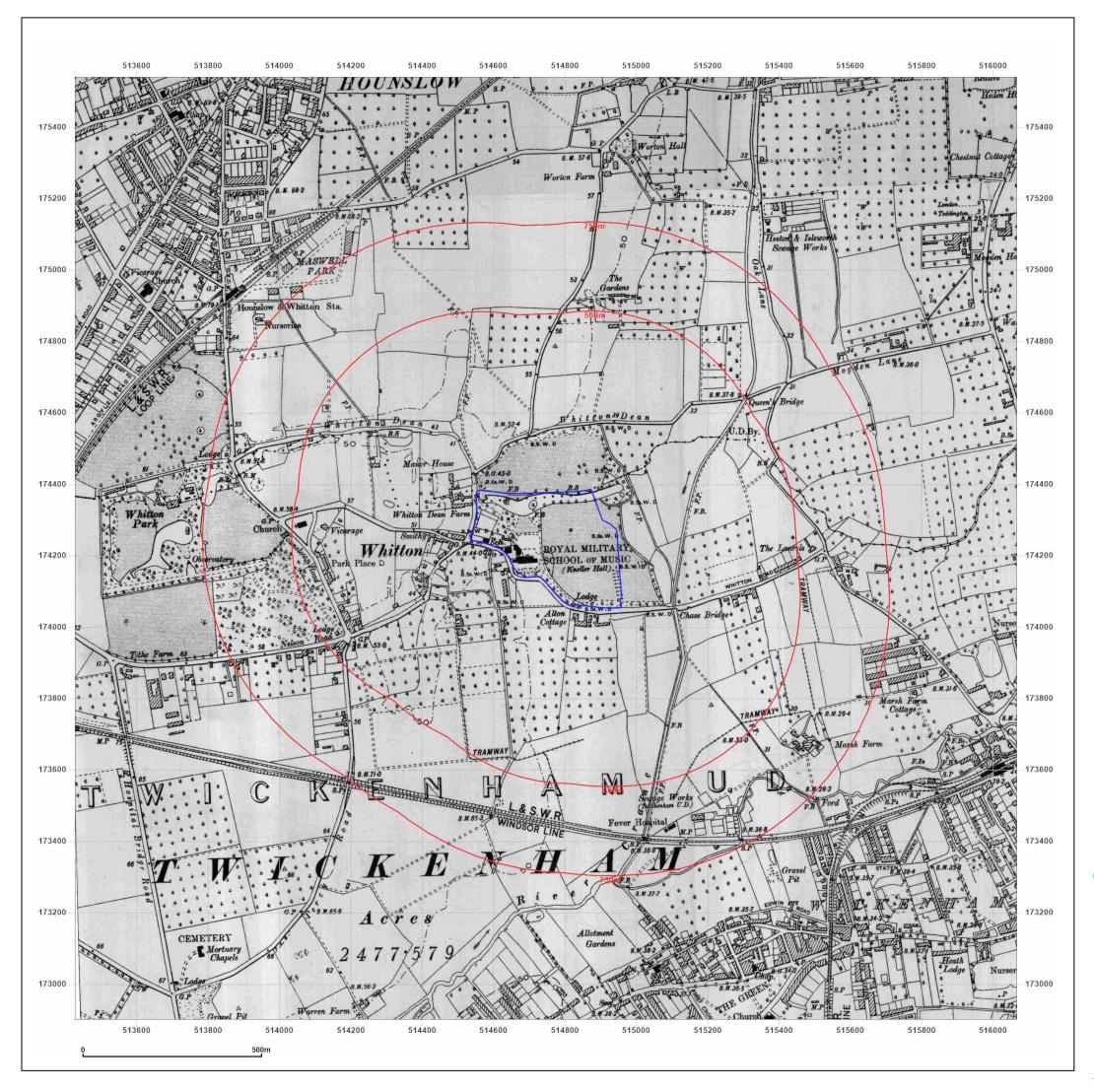
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JIMAS ENGINEERING ENVIRONMENTAL

Site Details:

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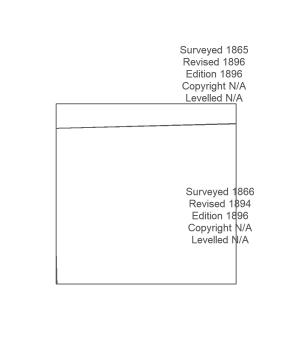
Client Ref: P4134JJ2485-1 Report Ref: JOMAS-8446055 Grid Ref: 514746, 174220

Map Name: County Series

Map date: 1896

Scale: 1:10,560

Printed at: 1:10,560







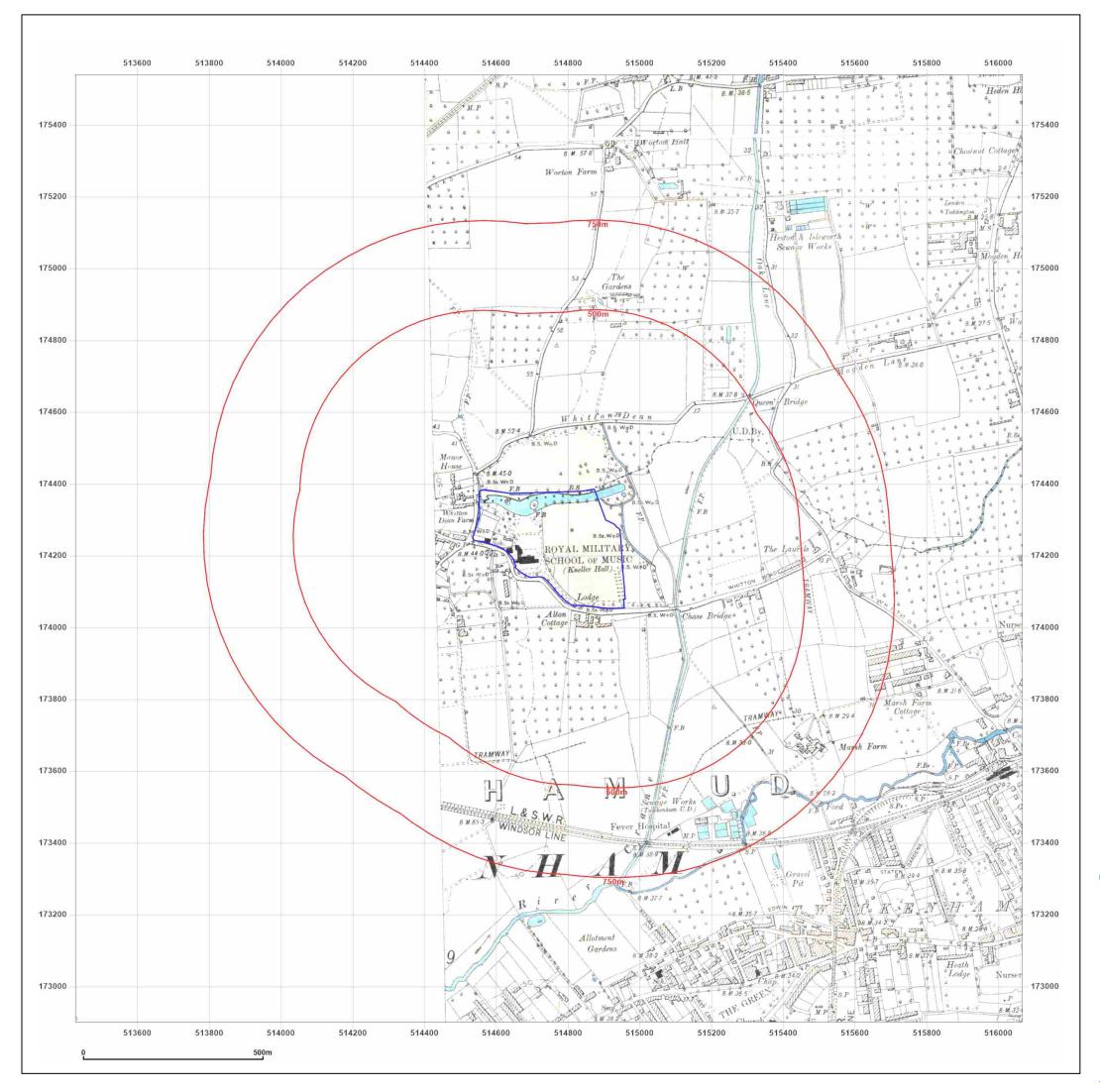
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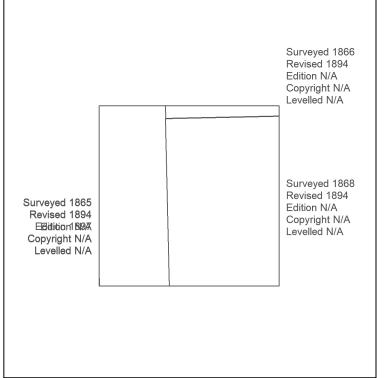
Client Ref: P4134JJ2485-1 Report Ref: JOMAS-8446055 Grid Ref: 514746, 174220

Map Name: County Series

Map date: 1894-1897

Scale: 1:10,560

Printed at: 1:10,560







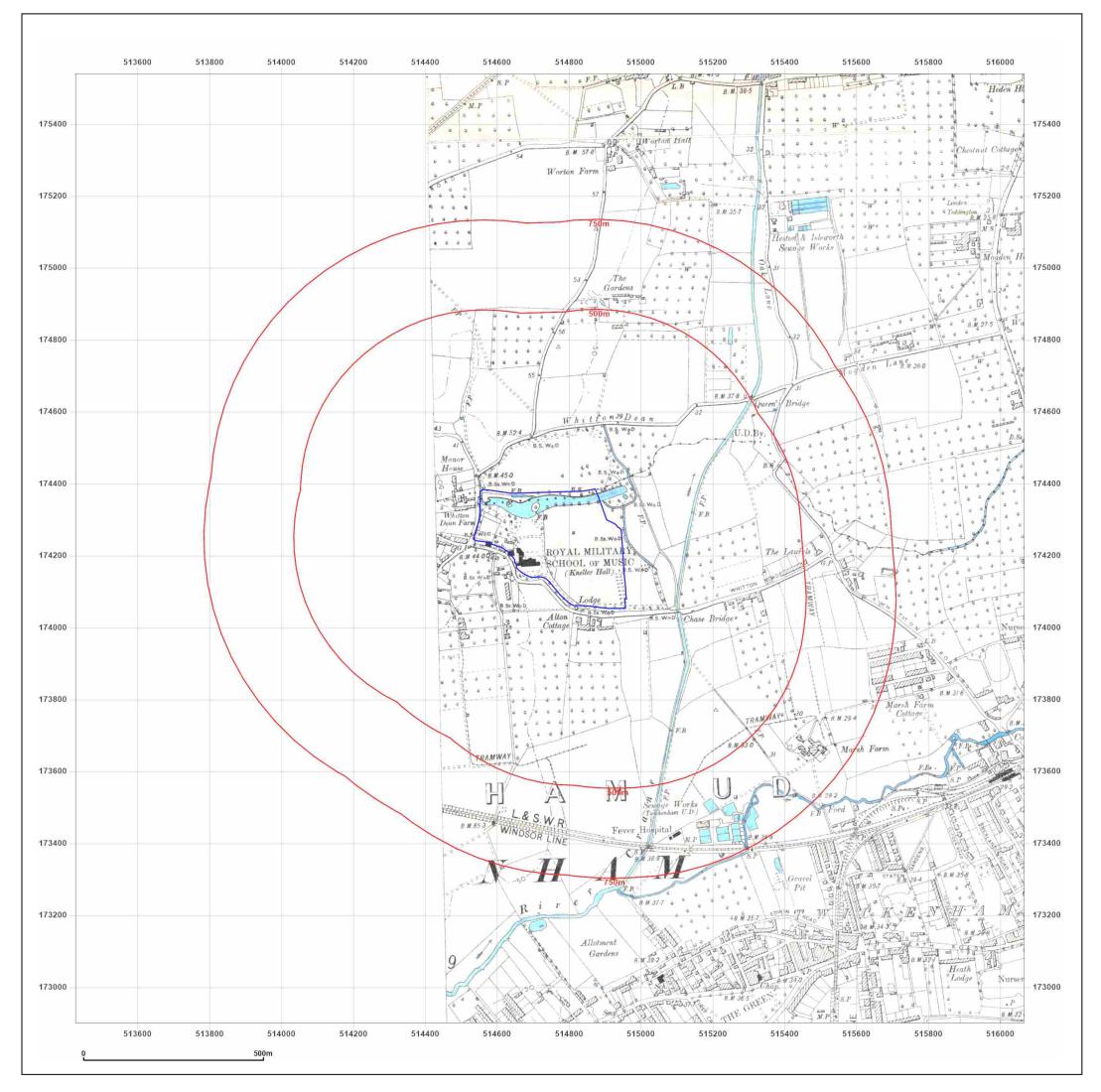
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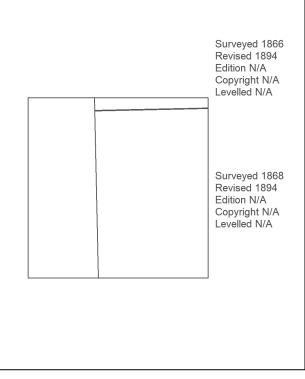
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Map Name: County Series

Map date: 1894-1898

Scale: 1:10,560

Printed at: 1:10,560







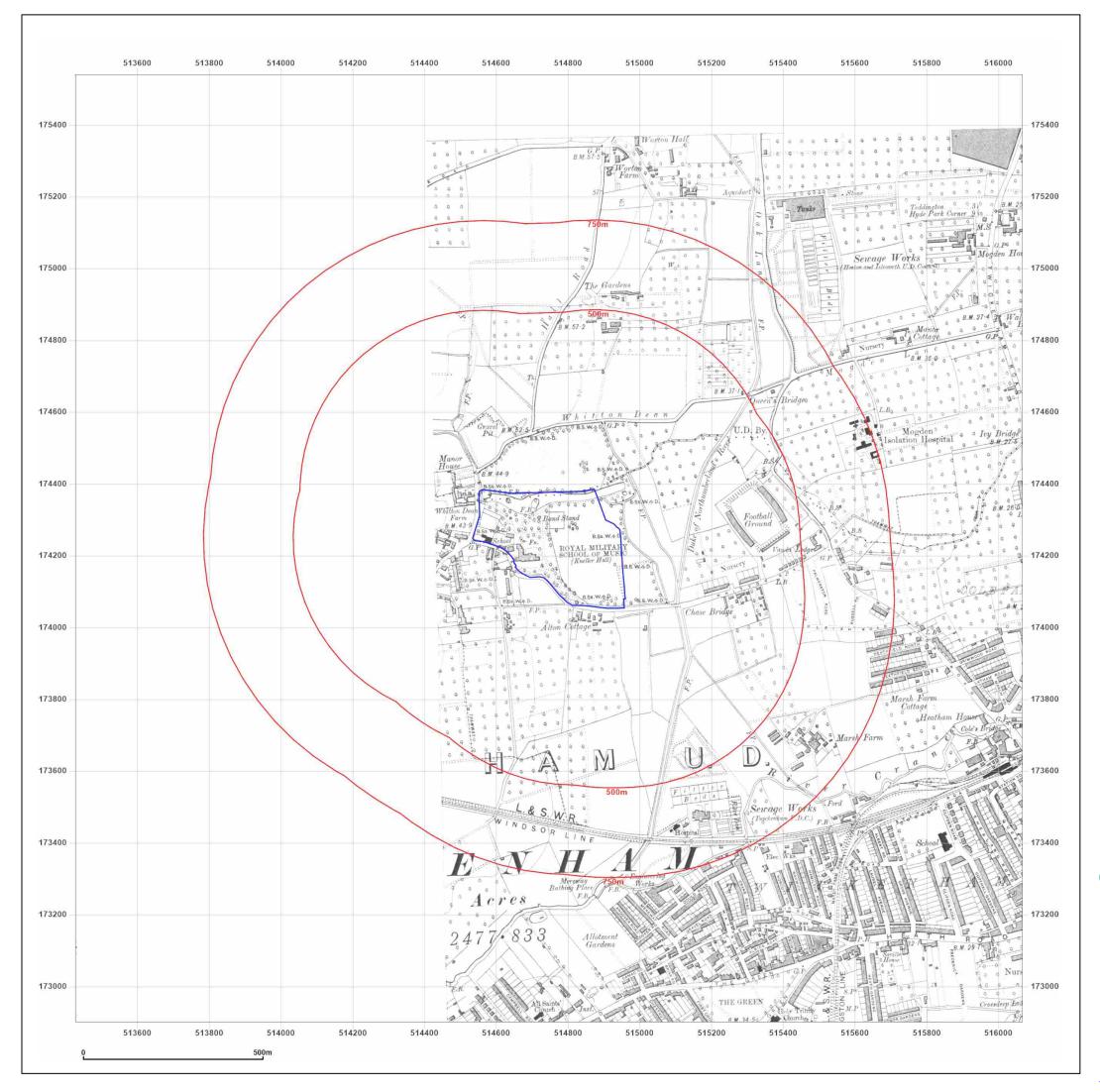
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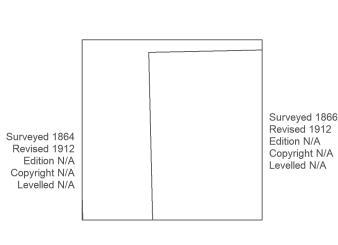
Client Ref: P4134JJ2485-1 Report Ref: JOMAS-8446055 Grid Ref: 514746, 174220

Map Name: County Series

Map date: 1912

Scale: 1:10,560

Printed at: 1:10,560







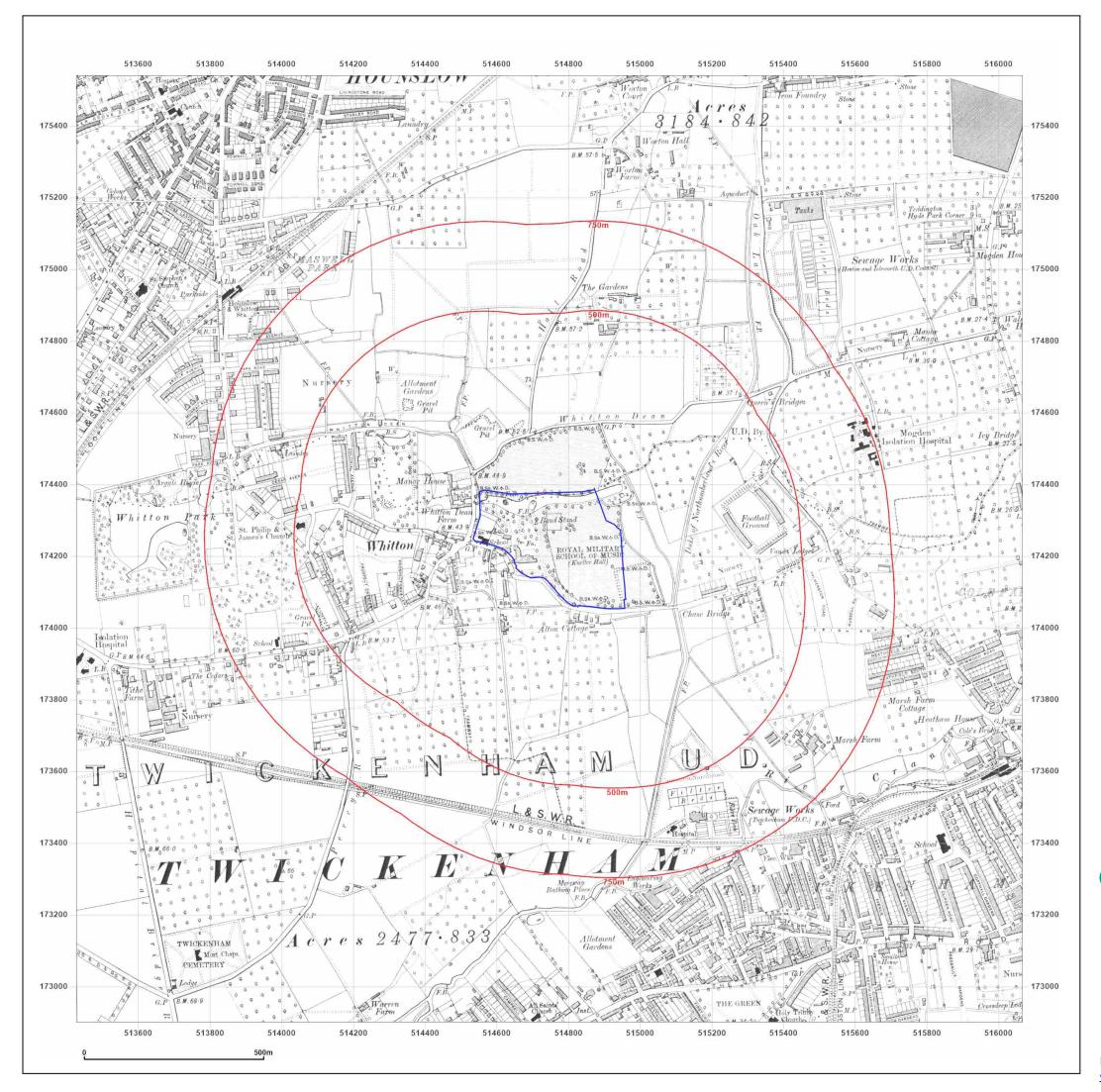
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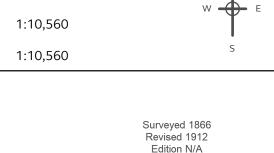
Client Ref: P4134JJ2485-1 Report Ref: JOMAS-8446055 514746, 174220 **Grid Ref:**

Map Name: County Series

1912 Map date:

Scale:

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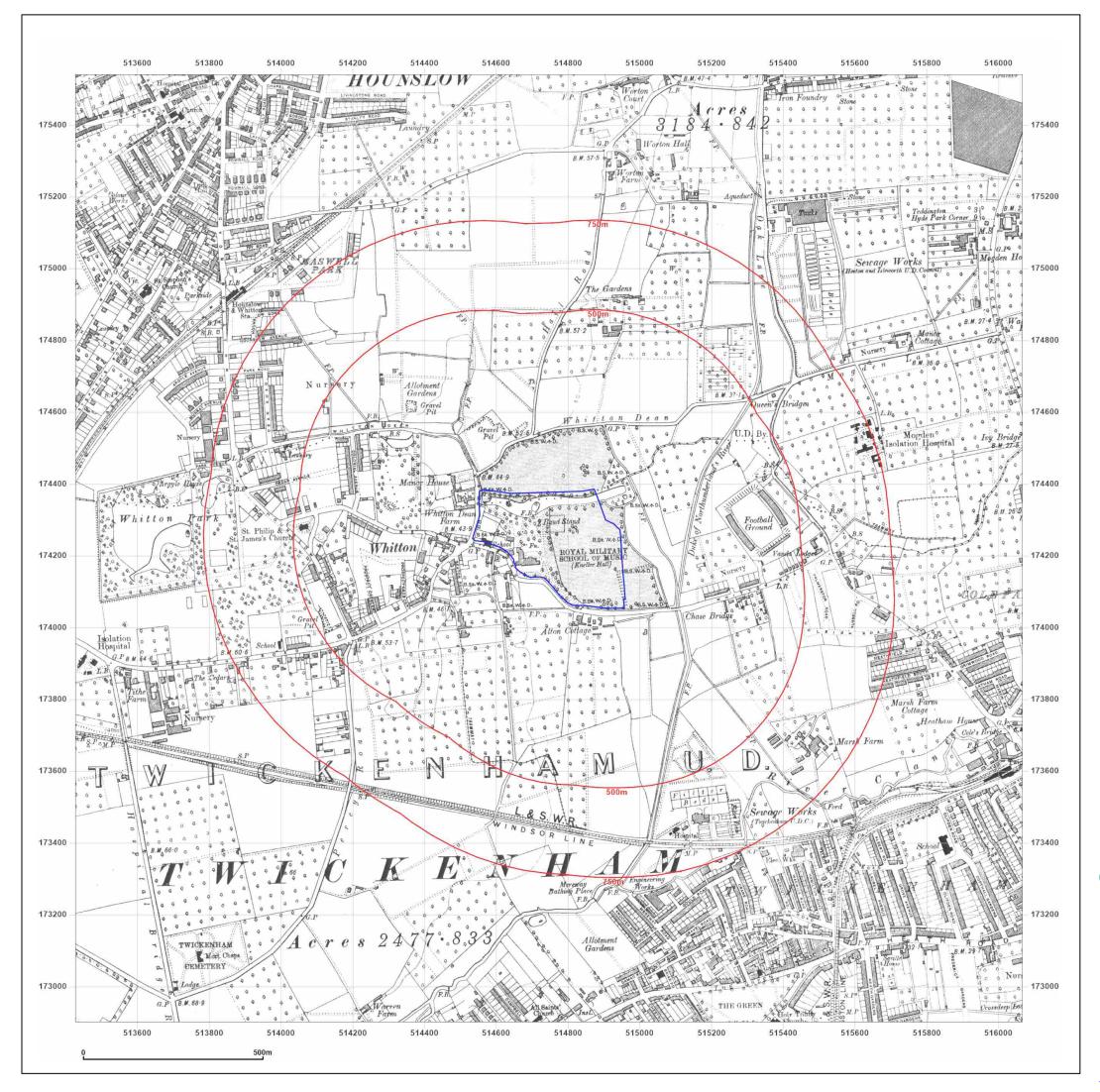
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Client Ref: P4134JJ2485-1 Report Ref: JOMAS-8446055 Grid Ref: 514746, 174220

Map Name: County Series

Map date: 1912

Scale: 1:10,560

Printed at: 1:10,560

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