HyNet North West Hydrogen Pipeline

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Appendix 6E

Archaeological Geophysical Survey Report

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Executive Summary

As part of an initial phase of archaeological geophysical field evaluation for the HyNet North West Hydrogen Pipeline Project in North West England, AOC Archaeology Group, for WSP UK, on behalf of Cadent Gas Limited, conducted magnetic gradiometer survey over 150ha of land pre-selected for its archaeological potential within the corridor of a proposed hydrogen gas network. The survey was undertaken between September 2023 and January 2024.

These preliminary surveys have identified nine groups of anomalies interpreted as having possible archaeological origins, and further buried features will less clear provenance but which are highlighted for further investigation. The surveys have also identified former mapped boundaries and other landscape features such as former extraction pits, trackways and former watercourses. In places, the survey results have been affected by magnetic interference from nearby structures or infrastructure, or by the spreading of green waste as a soil improver. The results largely reflect those identified or predicted in the previous desk-based assessments carried out during earlier phases of the Project.

Magnetic gradiometry has been demonstrated to be a useful large area rapid prospection method within the survey environments present in the area covered by the proposed network, however, the results from some specific environments are impacted by lack of magnetic contrasts related to waterlogging.

Abbreviation or Acronym	Definition in this report
1st Edition OS	First Edition Ordnance Survey Maps completed in the 1880's
aOD	Distance in meters above Ordnance Datum (mean high water line)
CPm_###	Cropmark identified in earlier project phases
DBA	Desk-Based Assessment
GIS	Geographical Information System
GMg_###	Unique Identifier used for Geophysical anomaly - Magnetic
HCH####	Historic Landscape Characterisation Areas in Cheshire
HER	Historic Environment Record
HGM####	Historic Landscape Characterisation Areas in Greater Manchester
HLC	Historical Landscape Characterisation / Classification
LDr_###	LiDAR feature identified in earlier project phases
LiDAR	Light Detection And Ranging – remote sensing technique which allows macro and micro topographic analysis
MCH######	specific sites or entries in the Cheshire Historic Environment Record
MGM######	specific sites or entries in the Greater Manchester, Historic Environment Record
MME######	specific sites or entries in the Merseyside Historic Environment Record
NHLE	National Heritage List for England

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1. Introduction

1.1 Project Background

1.1.1 AOC Archaeology Group was commissioned by WSP UK Limited, working on behalf of Cadent Gas Ltd (Cadent), to undertake an archaeological geophysical survey of a 150ha portion of the route of the proposed HyNet North West Hydrogen Pipeline Project (henceforth, the 'Project').

1.1.2 The Project is a proposal by Cadent Gas Ltd (Cadent) to construct and operate a hydrogen pipeline. It will deliver hydrogen to multiple industrial users and power generators. It comprises the construction, operation and maintenance of approximately 100km of new underground pipeline to distribute hydrogen to users across the gas network in the North West of England. The pipeline would connect a newly constructed Hydrogen Production Plant at Stanlow to a Central Hub, which serves as an onward distribution point to customers along southern, eastern and northern corridors. The Central Hub is known as a HAGI, (Hydrogen Above Ground Installation), a further 9 HAGIs and two Block Valves (also above ground) will be located across the network at points where pipeline dimensions are to change and/or where customer spurlines are proposed.

1.1.3 Please note that as part of the design process, the Order Limits have undergone a number of iterations (as described in **Appendix 2A: Design evolution**) and this report is based on the Preliminary Order Limits as it was at the time of the survey.

1.1.4 The Project crosses a landscape that is archaeologically rich, topographically diverse, and also dynamic, straddling several river valleys, their confluences, and the geologically and historically significant lower Mersey valley and estuary.

1.1.5 Archaeological geophysical survey uses non-intrusive and non-destructive techniques to determine the presence of anomalies likely to be caused by archaeological features, structures or deposits, as far as is reasonably possible (CIfA 2014, updated 2020). It is therefore a common component of the process of evaluating the impact of development on the historic environment. It is also a key tool in archaeological research as it is non-destructive and able to cover large areas, to allow below ground interventions to be appropriately targeted.

1.1.6 Magnetic gradiometry was selected as the preferred method for archaeological prospection, as despite some limitations expected in wetland areas, this method is a reliable, rapid and cost-effective tool for assessing the potential presence, extent and character of remains and deposits of archaeological interest at both the site the landscape scale. The significance of any such remains can only be determined with reference to further information. As such this report may form part of an assessment of significance but cannot stand alone as such.

1.1.7 The results of the geophysical survey are presented according to the different corridors and spurs that represent the components of the Project. These are described in **Section 1.2**.

1.2 Location

1.2.1 The Project lies in the North West of England where it traverses the counties of Cheshire, Merseyside, and Greater Manchester, and enters six local authorities: Cheshire West and Chester, Cheshire East, Halton, Warrington, St Helens, and Trafford (**Figure 1**). The majority of the Project crosses three National Character Areas (NCA); the Lancashire Coal Measures NCA (Natural England 2013a), the Mersey Valley NCA (Natural England 2013b), and the Shropshire, Cheshire, and Staffordshire Plain NCA (Natural England 2014a). In addition, a small section of the route traverses the lower eastern flanks of the Cheshire Sandstone Ridge NCA (Natural England 2014b). Measuring some 125km in total, the Project comprises four main corridors (North, West, South, and East) radiating from a Central Hub situated just to the north-east of Bartington, Cheshire (SJ 598377; **Figure 2**). In addition, there are seven spurs, of which the Northwich Spur is the most substantial and emanates south-eastward from the Central Hub. Parts of this section are summarised from the *Geoarchaeological Desk-Based Assessment* (DBA) produced by WSP E&IS for Cadent Gas Limited.

The Central Hub

1.2.2 The Central Hub Hydrogen Above Ground Installation (HAGI) lies immediately to the north-east of Bartington, Cheshire. The Hub occupies a rural area of the Shropshire, Cheshire, and Staffordshire Plain NCA that slopes gently southward to the Trent and Mersey Canal (just inside the Project) and the River Weaver (just beyond the Project).

1.2.3 No parcels located in the Central Hub were selected for archaeological geophysical survey at this stage of the archaeological evaluation.

North Corridor and Associated Spurs

1.2.4 The North Corridor extends broadly due north from the Central Hub, crossing first the Bridgwater Canal and then the Manchester Ship Canal at Higher Walton and Moore. The route then heads in a more north-westerly direction, crossing the River Mersey between Cuerdley and Penketh. From Sutton Manor, the route takes a more northerly direction, culminating 1km south-east of St Helens. The route of the North Corridor passes through the three main NCAs relevant to the Project.

1.2.5 The Warrington Spur splits from the North Corridor at Higher Walton. It extends to the east, passing through the built-up areas of Wilderspool and Westy, on the south bank of the River Mersey and always on the north side of the Manchester Ship Canal. Two smaller spurs on the north side of the Mersey occur near Sutton Manor (Clock Face Spur) and at the northern end of the route (St Helens Spur).

1.2.6 Twenty-nine parcels, covering approximated 97ha, were selected for survey during this phase of the archaeological evaluation, and of those access was obtained at twenty. Two of these subsequently proved unsuitable for survey due to ground conditions, and as a result eighteen parcels within this corridor were successfully surveyed, totalling 64.2ha of land. The geology and soils of the survey parcels in this area of the Project are summarised in **Table 6E** 1.1 below.

Table 6E 1.1 Survey Parcels in the North Corridor and their soils and geology

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
N_2740 (1)	1	2.81		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2740 (2)	2	5.62		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2200 (1)	3	6.46	11/10/2023	Y	Etruria Formation - Mudstone, Sandstone and Conglomerate (West, Centre) Kinnerton Sandstone Formation (East)	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2210 (1)	4	3.84	10/10/2023	Y	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
N_2190 (1)	5	8.35		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2160 (1)	6	1.16		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2160 (2)	7	4.06		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2160 (3)	8	1.98		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2130 (1)	9	1.30		N	Kinnerton Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
							base-rich loamy and clayey soils (18)
N_2140 (1)	10	2.91		N	Kinnerton Sandstone Formation (West) Chester Formation Sandstone (pebbly, gravelly) (East)	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_2110 (1)	11	0.78		N	Chester Formation Sandstone (pebbly, gravelly)	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_1950/ N_1980	12	10.35	16/01/2024	Y	Wilmslow Sandstone Formation	Devensian Till (Diamicton) with lenses of Shirdley Hill Sand Formation	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_1870 (1)	13	4.47	17/01/2024	Y	Wilmslow Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
N_1710 (1)	14	3.27	16/01/2024	Y	Devensian Till (Diamicton) (Thin north edge) Chester Formation Sandstone (pebbly, gravelly) (South)	Devensian Till (Diamicton) (Alluvium just to south of parcel)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_1710 (2)	15	13.58	18/01/2024	Y	Chester Formation Sandstone (pebbly, gravelly) (West) Wilmslow Sandstone Formation (Eastern Arm)	Devensian Till (Diamicton) (Alluvium in NW corner of parcel)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_1550 (1)	16	3.72	18/01/2024	Y	Wilmslow Sandstone Formation, tiny area of Chester Formation Sandstone (pebbly, gravelly) in NW corner of parcel	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_850 (1)	17	1.26	11/10/2023	Y	Wilmslow Sandstone Formation	Holocene Tidal Flat Deposit (clay silt and sand)	Naturally wet very acid sandy and loamy soils (15)
N_570 (1)	18	3.41	09/10/2023	Y	Helsby Sandstone Formation (pebbly, gravelly)	Shirdley Hill Sand Formation	Slowly permeable seasonally wet slightly acid but base-rich

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
							loamy and clayey soils (18)
N_347 (1)	19	2.67	18/10/2023	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_347 (2)	20	0.14	18/10/2023	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_289 (1)	21	1.94	18/10/2023	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_110 (1)	22	1.81	13/10/2023	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
N_60 (1)	23	1.76	30/01/2024	U	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_1876	44	1.00	25/01/2024	Y	Wilmslow Sandstone Formation	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_360a	65	1.01	01/02/2024	Y	Wilmslow Sandstone Formation	Shirdley Hill Sand Formation	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_360b	66	2.11		U	Wilmslow Sandstone Formation	Shirdley Hill Sand Formation (North) None recorded (South)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_320	67	1.95	31/01/2024	Y	Wilmslow Sandstone (west north) Tarporley Siltstone	Devensian Till (Diamicton) - thinning out	Slowly permeable seasonally wet slightly acid but

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
					Formation (siltstone, mudstone and sandstone) (east south)	westwards to no recorded deposits	base-rich loamy and clayey soils (18)
N_340	71	1.81	01/02/2024	Y	Tarporley Siltstone Formation (siltstone, mudstone and sandstone)	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
N_760	72	1.54	02/02/2024	Y	Helsby Sandstone Formation (pebbly, gravelly)	Tidal flat deposit of clay silt and sand (north), Shirdley Hill Sand Formation (centre, south)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

West Corridor and Runcorn Spur

1.2.7 The West Corridor of the Preliminary Order Limits would start at the Hydrogen Production Plant HAGI (HPP HAGI) at Stanlow with the pipeline running north-east to the Rocksavage HAGI and then south-east to the Central Hub HAGI. The Runcorn Spur crosses the Weaver Navigation and extends 2km between the Runcorn HAGI and Weston. The route of the West Corridor passes through the Shropshire, Cheshire, and Staffordshire Plain NCA and the Mersey Valley NCA.

1.2.8 Within the West Corridor, fourteen parcels covering approximately 29.5ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen. Of these, one was unsurveyable due to ground conditions, and one was only partially suitable, meaning that 26.8ha of survey was completed across twelve parcels. The geology and soils of the survey parcels in this area of the Project are summarised in **Table 6E 1.2** below.

Table 6E 1.2 Survey Parcels in the West Corridor and their soils and geology

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soildscape number in parenthesis)
W_280 (1)	26	2.02	31/01/2024	U	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels (west) none recorded (Centre) Devensian Till (Diamicton) (East)	Freely draining slightly acid sandy soils (10)
W_280 (2)	27	2.87	03/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_280 (3)	28	0.18	05/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_280 (4)	29	1.64	02/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_330 (1)	30	1.64	03/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_360 (1)	31	3.07	03/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soildscape number in parenthesis)
W_410 (1)	32	0.82		N	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_410 (2)	33	0.54	01/11/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_360 (2)	34	10.71	04/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_410 (3)	35	0.50	attempted w/c 16/10 - not re-scheduled	Partial	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_695 (1)	36	1.89	05/10/2023 & 01/11/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_695 (1)	37	3.13	18/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
W_20/W_21	43	0.65	16/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Loamy and clayey floodplain soils with naturally high groundwater (20)

South Corridor

1.2.9 The South Corridor traverses agricultural land. Heading due south, it crosses the River Weaver/Weaver Navigation at Dutton Locks, just to the south of Bartington, and then the Handforth Brook, to the west of Weaverham. From Gorstage it follows a more south-easterly direction, and again crosses the Weaver in the vicinity of Moulton. From there it heads east to the Hydrogen Storage Facility at Whatcroft, crossing on the way the River Dane, the Trent and Mersey Canal, and the Puddinglake Brook. The route of the South Corridor lies within the Shropshire, Cheshire, and Staffordshire Plain NCA.

1.2.10 Within the South Corridor, fifteen parcels covering approximately 36ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen. Of these, one was only partially suitable, meaning that 31.2ha of survey was completed across thirteen parcels. The geology and soils of the survey parcels in this area of the Project are summarised in **Table 6E 1.3** below.

Table 6E 1.3 Survey Parcels in the South Corridor and their soils and geology

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
SA_290 (1)	24	4.58	19/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels (thin strip of no recorded deposits along north)	Freely draining slightly acid sandy soils (10)
SA_290 (1)	25	0.09	16/10/2023	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
SA_760 (1)	38	2.60	25/01/2024	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels (South) Holocene Alluvium (North & Centre)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
SA_1020 (1)	39	5.60	12/10/2023	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
SA_1330 (1)	40	5.00	13/10/2023	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
SA_2640 (1)	41	2.82	13/10/2023	Y	Bollin Mudstone Member (north) and Northwich Halite Member (halite-stone and mudstone) (southern edge)	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
SA_2820 (1)	42	1.00	16/10/2023	Y	Northwich Halite Member (halite-stone and mudstone)	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
SA_1990 (1)	55	1.34	30/01/24 available area complete	Y	Bollin Mudstone Member	Peat	Freely draining slightly acid sandy soils (10)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
SA_1860 (1)	56	4.07		N	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels	Freely draining slightly acid sandy soils (10)
SA_1350 (1)	57	0.51		N	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
SA_1260 (1)	58	1.57	23/01/2024	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
SA_1260 (1)	59	1.38	23/01/2024	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
SA_1190 (1)	60	0.96	24/01/2024	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
SA_1110 (1)	61	1.45	22/01/2024	Y	Bollin Mudstone Member	Glaciofluvial deposits of Devensian sands and gravels, band of alluvium on northern edge	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
SA_1110 (2)	62	3.13	22/01/2024	Y	Bollin Mudstone Member	Devensian Till (Diamicton), band of alluvium on southern edge	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

East Corridor and Partington Spur

1.2.11 The East Corridor extends in a north-easterly direction, culminating at the Pilkington HAGI, and continuing for a little way as the Partington Spur in an industrial area of Carrington, on the south-western outskirts of Manchester. Otherwise, the landscape traversed is overwhelmingly rural, and the route crosses the Whitley Brook, the Gale Brook, the Crowley Brook, the Bridgewater Canal, the Agden Brook, the River Bollin, the Old Bollin (just to the north of which lies the short Warburton Spur and HAGI), the Caldwell Brook, and the Red Brook. Much of the route of the East Corridor passes through the Shropshire, Cheshire, and Staffordshire Plain NCA. Its most easterly end, however, traverses the Mersey Valley NCA.

1.2.12 Within the East Corridor, fifteen parcels covering approximately 33.4ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen. Of these, two were only partially suitable, meaning that 27.3ha of survey was completed across thirteen parcels. The geology and soils of the survey parcels in this area of the Project are summarised in **Table 6E 1.4** below.

Table 6E 1.4 Survey Parcels in the East Corridor and their soils and geology

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
E_3270	45	6.17	24/01/2024	Y	Tarporley Siltstone Formation (siltstone, mudstone and sandstone)	Glaciofluvial deposits of Devensian sands and gravels (north) Shirdley Hill Sand Formation (south)	Freely draining very acid sandy and loamy soils (14)
E_3272	46	2.49	29/01/2024	Y	Tarporley Siltstone Formation (siltstone, mudstone and sandstone) (string on north edge), Bollin Mudstone Member (south & centre)	Shirdley Hill Sand Formation	Raised bog peat soils (26)
E_3020 (1)	47	2.86		N	Bollin Mudstone Member	Shirdley Hill Sand Formation	Freely draining very acid sandy and loamy soils (14)
E_2750 (1)	48	3.02		N	Bollin Mudstone Member (North) Wilmslow Sandstone Formation (South)	Shirdley Hill Sand Formation	Freely draining very acid sandy and loamy soils (14)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
E_2450 (1)	49	1.34	31/01/2024	Y	Northwich Halite Member (halite-stone and mudstone)	Glaciofluvial deposits of Devensian sands and gravels (north) Shirdley Hill Sand Formation (south)	Naturally wet very acid sandy and loamy soils (15)
E_2680 (1)	50	0.24	30/01/2024	Y	Northwich Halite Member (halite-stone and mudstone)	Glaciofluvial deposits of Devensian sands and gravels	Naturally wet very acid sandy and loamy soils (15)
E_2680 (2)	51	2.56	30/01/2024	Y	Northwich Halite Member (halite-stone and mudstone)	Glaciofluvial deposits of Devensian sands and gravels (north tip) Shirdley Hill Sand Formation (centre and south)	Naturally wet very acid sandy and loamy soils (15)
E_2170 (1)	52	0.71	29/01/24 availabl e area complet ed	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
E_2170 (2)	53	0.32	29/01/24	Y available area complete	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
E_2000 (1)	54	2.83	19/01/20 24	Y	Bollin Mudstone Member	None recorded	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
E_2010 (1)	63	1.87	26/01/20 24	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
E_2010 (2)	64	3.00	26/01/20 24	Y	Bollin Mudstone Member	Devensian Till (Diamicton) (north east), None recorded (south west)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)

Name	AOC ID	Area (ha)	Survey Date(s)	Completion Status	Solid Geology	Superficial Geology	Soil (soilscape number in parenthesis)
E_1620	68	1.00	02/02/2024	Y	Bollin Mudstone Member	Devensian Till (Diamicton)	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils (18)
E_2510 (1)	69	2.42	01/02/2024	Y	Helsby Sandstone Formation (pebbly, gravelly)	Devensian Till (Diamicton) (south) Shirdley Hill Sand Formation (north)	Naturally wet very acid sandy and loamy soils (15)
E_2510 (2)	70	2.54	01/02/2024	Y	Northwich Halite Member (halite-stone and mudstone) (north and centre), Helsby Sandstone Formation (pebbly, gravelly) (south)	Shirdley Hill Sand Formation	Naturally wet very acid sandy and loamy soils (15)

1.3 National Character Areas

The Lancashire Coal Measures

1.3.1 The Lancashire Coal Measures NCA is characterised by farmland, scattered urban centres, and former and current extraction industries (Natural England 2013a). Although much of the NCA is underlain by coal measures, the solid geology of the area of the Project is dominated by Triassic sandstone. The landscape within the Lancashire Coal Measures NCA comprises gentle hills and valleys, with elevation ranging from 179m aOD at Billinge Hill, to 11m aOD towards the lowlands of the Mersey Valley. Large deposits of peat have accumulated in depressions and basins in many of the lower and flatter areas. Much of the peat in the area has been subjected to peat cutting and agricultural improvement since the 12th century, leaving black peaty soils and a network of drainage ditches..

The Mersey Valley

1.3.2 The Mersey Valley NCA covers the wide low-lying valley, estuary, and tributaries of the River Mersey, which extends from the mosslands west of Manchester to the wide estuary with intertidal mudflats, saltmarshes, and low exposed cliffs to the west (Natural England 2013b). The area has an average elevation of 23m OD, which rises to 144m OD towards the Cheshire Sandstone Ridge. The Mersey becomes estuarine between Warrington and Runcorn, where tidal influence increases and there is a transition between freshwater and marine habitats. The area either side of the river and estuary is a focus for industrial development and urban areas and has a dense network of communication routes. High-quality arable and pastoral farmland exists away from these developed areas.

1.3.3 The underlying geology comprises Triassic Sandstone, with extensive areas of drift geology and marine and freshwater alluvium, which are bordered in places by blown sand. The Mersey Valley is significant for its concentration of lowland fens and raised bogs, which developed in hollows during the early part of the Post-Glacial period. While much of this peat has been lost to 20th century development and agricultural improvement, remnants have survived and form the internationally recognised Manchester Mosses Special Areas of Conservation (SAC). To the west of Manchester, these include the extensive area of Chat Moss, just to the north of the Project, and Carrington Moss, which is traversed by the East Corridor. Prehistoric settlement has been located close to the River Mersey, its tributaries, and on minor promontories (Natural England 2013b). Very few prehistoric finds have been recovered from the Manchester Moss complex, which may partly be explained by the early development and subsequent spread of these boggy areas roughly seven thousand years ago. Any evidence for earlier prehistoric activity is likely to be buried by considerable depths of peat, which, at its deepest, reach up to 7m (Howard-Davies *et al* 1988). Subsequent settlement appears to have avoided these large areas of peat land (*ibid*; Natural England 2013b).

The Shropshire, Cheshire, and Staffordshire Plain

1.3.4 The Shropshire, Cheshire, and Staffordshire Plain NCA is a flat and gently undulating plain dominated by thick glacial deposits of sands and boulder clay; there are numerous glacial landforms, with ponds and meres developing in natural depressions. Subsequent colonisation of vegetation during the Post-Glacial period has created large areas of bog, which make up the nationally important Midlands Meres and Mosses complex, several having been designated SSSI and National Nature Reserve (NNR) status. The low-lying plain, which ranges in elevation from between 20 to 50m OD, is punctuated by a series of low, but prominent Triassic sandstone ridges, including the Cheshire Sandstone Ridge, which have been the foci for Iron Age settlement (Natural England 2014a&b, and below).

1.3.5 Although relatively flat, the area is a watershed for several major rivers and their tributaries, including the Rivers Dane, Weaver, and Gowy, which meander northwards to the River Mersey. The floodplains of many of these rivers have created rich grazing land, with alluvial marshes and hay meadows. There are well-defined examples of historic land use, including medieval dispersed settlement, ridge and furrow agricultural earthworks, and moated houses. Today, the plain is scattered with regularly spaced large farmsteads, dispersed hamlets, market

towns, and larger settlements, and there are numerous feeder reservoirs and canals (Natural England 2014). The area is nationally important for its sources of inland silica sand and salt, and has a rich history of salt extraction, which dates back to the Roman period; most notably those at Nantwich and Middlewich (Philpott 2008).

The Cheshire Sandstone Ridge

1.3.6 The Cheshire Sandstone Ridge NCA appears as a group of small, but prominent hills, which rise sharply from the surrounding lowlands of the Shropshire, Cheshire and Staffordshire NCA, and the Mersey Valley NCA to the north west. Elevation ranges from 4m OD, where it joins the lowlands, to 227m OD at Raw Head in the Peckforton Hills. The Sandstone Ridge is made up of Triassic Sandstone and conglomerate of the Sherwood Sandstone Group, whilst thick layers of Glacial Till and Glaciofluvial sands and gravels cover the lower slopes. The relatively high elevation and outlook provided by the ridge means that it has been the focus for several prehistoric sites and defensive fortifications. The Sandstone Trail, which stretches from Frodsham in the north, to Whitchurch in the south, follows a route which used to link the many Iron Age hill forts prevalent on the ridge. The NCA is sparsely populated and comprises a dispersed settlement pattern of farmland, villages, and hamlets. Place-name evidence indicates the presence of former deer parks, and remnants of a vast Royal Hunting Forest still survives at Delamere in the north. The ridge has many designated nature conservation sites, including Bickerton Hill SSSI, which contains the largest area of surviving lowland heath in Cheshire.

1.3.7 Magnetic gradiometry typically provides variable results over sedimentary geologies, with much depending on local factors of soil development and hydrology (David et al. 2008: 15). In **Section 3** below there is a more detailed description of the geological units described in **Table 6E** 1.1 to **Table 6E 1.4**, along with a comment on their likely impact on survey reliability. In summary, the general soil and geological environment of the survey area does not contraindicate the use of this method. Its overall effectiveness is assessed in the conclusion of this report.

1.4 Archaeological Background

1.4.1 The archaeological resource on the Project, both known, and potential, is vast, and is considered thoroughly in the *Archaeology Desk-based Assessment* (DBA; 2022a). It is not proposed to duplicate elements of that detailed document. Rather, the following sections are abstracted from the *Archaeology DBA* and provide a brief summary pertinent to the present report. It utilises the same abbreviations as the *Archaeology DBA* to ease cross-referencing with that document (for example, the prefixes HCH and HGM refer to Historic Landscape Characterisation (HLC) Areas in Cheshire and Greater Manchester, respectively, whilst the prefixes MCH, MGM, and MME represent specific sites on the Cheshire, Greater Manchester, and Merseyside Historic Environment Records, respectively; those prefixed NHLE are Scheduled Monuments appearing on the National Heritage List for England). As such, there is a focus on the potential prehistoric, Roman, and early medieval

remains. Evidence of medieval, post-medieval, and industrial-period activity is so copious as to defy meaningful summary.

1.4.2 This section also summarises the remote sensing observations contained in the *Archaeology DBA* which were recorded from LiDAR visualisations and Aerial images by the author of the DBA. LiDAR observations are prefixed **LDr**_ and cropmarks recorded from aerial images are prefixed **CPm**_ - these prefixes are then followed by a numerical identifier which refers to the respective gazette in the *Archaeology DBA*. This report should therefore be read in conjunction with the *Archaeology DBA* as all references should be followed up there, as material has not been reproduced in its entirety for the sake of brevity.

1.4.3 Typically, an archaeological background section in a report would progress by time period following standard conventions, but in this case, as all of the baseline material has been prepared considering each area defined in the Historic Landscape Characterisation, this report will use the same structuring principle. The landscape characterisation and the remote sensing observations for each survey parcel will be summarised in a table, one per Corridor of the scheme. The survey parcels will then be grouped with those that lie within the same HLC area, and specific archaeological background information for those areas will be discussed. This grouping will be retained in the results section to allow easy comparison between the background information and the survey results and interpretation, and for simple cross-referencing between this report and the *Archaeology DBA*. Unlike many archaeological backgrounds produced for geophysical survey reports, this report will not consider, except in specific circumstances, a fixed buffer zone around the survey areas; this detail must be followed up in the *Archaeology DBA*. This again is for reasons of brevity and the facilitation of cross referencing.

1.4.4 The following section uses the list of unique identifiers for each HLC unit within a particular group as the heading for each section (e.g. UID ####, HCH#####, following the structure of the desk-based assessment.

The Central Hub

1.4.5 No parcels located in the Central Hub were selected for archaeological geophysical survey at this stage of the archaeological investigation.

North Corridor and Associated Spurs

1.4.6 Twenty-nine parcels, covering approximated 97ha, were selected for survey during this phase of the archaeological evaluation, and of those access was obtained at twenty. Two of these subsequently proved unsuitable for survey due to ground conditions, and as a result eighteen parcels within this corridor were successfully surveyed, totalling 64.2ha of land. The HLC classification, area ID and any cropmark or LiDAR observations from the *Archaeology DBA* are summarised in **Table 6E 1.5** below.

Table 6E 1.5 Survey Parcels in the North Corridor, their HLC Area and recorded heritage

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
N_2740 (1)	1	2.81	Cropmarks - CPm_038, CPm_005, CPm_056	18766	Field System	High	flint scatters, ridge and furrow, boundaries
N_2740 (2)	2	5.62	Cropmarks - CPm_005, CPm_032, CPm_118, CPm_041, CPm_104, CPm_137	18766	Field System	High	flint scatters, ridge and furrow, boundaries
N_2200 (1)	3	6.46	Cropmarks - CPm_165, CPm_155, CPm_110, CPm042, CPm_129, CPm_071, CPm_096, CPm_192	12858	Field System	High	prehistoric settlement, boundaries prehistoric to post med
N_2210 (1)	4	3.84	LDr_140 - Extraction Pit. Cropmarks - CPm_182, CPm_067	12867	Field System	High	prehistoric settlement, boundaries prehistoric to post med
N_2190 (1)	5	8.35	LDr_140, LDr_139, LDr_137 - Extraction Pits. LDr_290 - former field boundary. Cropmarks - CPm_138, CPm_177, CPm_164.	12867	Field System	High	prehistoric settlement, boundaries prehistoric to post med

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
N_2160 (1)	6	1.16	LDr_128 - Extraction Pit	HCH13065	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_2160 (2)	7	4.06	LDr_130, LDR_123 - Extraction Pits. Cropmarks - CPm_010, CPm058, CPm_094, CPm_174.	HCH13065	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_2160 (3)	8	1.98	LDRr_285, LDr_287 - former field boundaries.	HCH13072	Communications	Negligible	railway
N_2130 (1)	9	1.30	LDr_286 - former field boundary. LDr_126 Extraction pit. Cropmarks - CPm_119.	HCH13069	Post Medieval Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_2140 (1)	10	2.91	LDr_120, LDr_121, LDr_122 - Extraction Pits. LDr_289 - former field boundary. Cropmarks - CPm_133, CPm_107, CPm_108, CPm_049	4766	Field System	High	prehistoric settlement, boundaries prehistoric to post med
N_2110 (1)	11	0.78	none noted	12954	Field System	High	prehistoric settlement, boundaries

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
							prehistoric to post med
N_1950/N_1980	12	10.35	LDr_117, LDr_113, LDr_112, LDr_111 - Extraction pits. LDr_284, LDr_283 - former field boundaries. Cropmarks - CPm_078, CPm_188, CPm_099; CPm_124, CPm_009, CPm_052	HCH13086	Communications	Negligible	Railway
N_1870 (1)	13	4.47	Cropmarks - CPm_150	HCH13080	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_1710 (1)	14	3.27	none noted	HCH13080	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_1710 (2)	15	13.58	LDr_103, LDr_101, LDr_104, LDr_102, LDr_105, LDr_180, LDr_177, LDr_181, LDr_182, LDr_183, - Extraction pits. Cropmarks -	HCH13080	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
			CPm_063, CPm_064				
N_1550 (1)	16	3.72	LDr_099, LDr_097 - Extraction pits. Cropmarks - CPm_014, CPm_144	HCH13080	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_850 (1)	17	1.26	Cropmarks - CPm_048, CPm_050	HCH13123	Ancient Fieldscapes	High	prehistoric RB settlement, boundaries, lithics
N_570 (1)	18	3.41	LDr_171 - linear bank - south of area aligned with ? service ? Cropmarks - CPm_062, CPm_121, CPm_008, CPm_013, CPm_122, CPm_082, CPM_102, CPm_163, CPm_136	HCH13246	Post Medieval Fieldscapes	High	prehistoric fields; ridge and furrow; pm boundaries
N_347 (1)	19	2.67	Cropmarks - CPm_151, CPm_148	HCH13229	C20th Fieldscapes	Medium	buried ditches
N_347 (2)	20	0.14	none noted	HCH13229	C20th Fieldscapes	Medium	buried ditches
N_289 (1)	21	1.94	Cropmarks - CPm_111, CPm_126	HCH13229	C20th Fieldscapes	Medium	buried ditches

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
N_110 (1)	22	1.81	LDr_047 - Extraction pit. Cropmarks - CPm_087, CPm_060, CPm_068, CPm_168	HCH13017	Post Medieval Fieldscapes	High	Med ridge and furrow and boundaries, prehistoric various
N_60 (1)	23	1.76	Cropmarks - CPm_068	HCH13017	Post Medieval Fieldscapes	High	Med ridge and furrow and boundaries, prehistoric various
N_1876	44	1.00	LDr_184 - Extraction pit. Cropmarks - CPm_064	HCH13080	C20th Fieldscapes	High	prehistoric settlement, boundaries prehistoric to post med
N_360a	65	1.01	none noted	HCH12953	Post Medieval Fieldscapes	High	Prehistoric to PM boundaries
N_360b	66	2.11	none noted	HCH12953	Post Medieval Fieldscapes	High	Prehistoric to PM boundaries
N_320	67	1.95	Cropmarks - CPM_074, CPm_125	HCH12961	C20th Fieldscapes	Medium	prehistoric fields and settlement; pm boundaries
N_340	71	1.81	LDr_265 former field boundary	HCH12961	C20th Fieldscapes	Medium	prehistoric fields and settlement; pm boundaries

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
N_760	72	1.54	none noted	HCH13246	-	-	-

UID 4766, UID 12858, UID 12867, UID 12954, HCH13065, HCH13080

1.4.7 This group of HLC Areas contains thirteen survey areas, AOC ID 3 – 7, AOC ID 9 – 11, AOC ID 13-16 and AOC ID 44. It is part of an extensive area of 20th century fieldscapes which enclose land between the M62 in the north and Fiddler's Ferry power station in the south. These fields were enclosed from the late 19th century onwards replacing an earlier pattern of smaller fields attested on historic tithe maps, many of the boundaries of which survive as buried ditches visible as cropmarks, along with buried remains of ridge and furrow cultivation. LiDAR analysis has revealed numerous extraction pits within the area, undated but presumably targeting the clay superficial geology underlying the area. The Severn Vyrnwy Aqueduct traverses the north west corner of the area as a tunnelled pipeline. The aqueduct was built in the late 1800s and was at the time of its construction the longest aqueduct in the world, supplying urban areas north of the study area with water from North Wales. There is a scheduled heavy anti-aircraft gunsite (NHLE 1019531) immediately to the south of the area, which includes the functional core of the gunsite with the command post, radar platform, four gun emplacements a generator building and further ancillary buildings. These no longer survive above ground, apart from a water tank in the southern part of the site. There is no tangible remaining evidence for medieval activity within the area, but the scheduled moated site at Cranshaw (NHLE 101188) is located immediately west of the area. There are undated cropmarks throughout the area, including an enclosure within a parcel of land currently in use as a golf course, which are potentially prehistoric or Romano-British in date (*Archaeology Desk Based Assessment:* PEIR Technical Appendix 6A, sections 3.5.209 to 3.5.212).

UID 18766

1.4.8 This HLC Area contains two survey areas, AOC ID 1 and 2. The area lies west of modern housing at Lea Green and south of modern housing at Sutton Heath. The three large fields it consists of have been agglomerated from smaller fields evidenced on a tithe map dating to 1838 – many of these smaller boundaries survive as buried ditches visible as cropmarks. Fieldwalking in the east of the area has resulted in the discovery of numerous prehistoric worked flints as well as medieval and post medieval pottery and industrial waste. The latter are likely to result from manuring in the post medieval period, or occupation of the local farm in the medieval period, as many of the removed boundaries have the reverse S shape characteristic of medieval furlongs. A watching brief in the east and south of the area identified undated ditches not depicted on historic maps (PEIR Technical Appendix 6A, sections 3.5.236 and 3.5.237).

HCH12953

1.4.9 This HLC Area contains two survey areas, AOC ID 65 and 66. This area lies west of the A56, a probable Roman Road, as is formed of rectangular fields enclosed late in the post medieval period, replacing an earlier pattern of smaller fields with reverse S shaped boundaries, suggesting they were in turn formed from medieval furlongs. Some cropmarks identified in aerial images appear to relate to this earlier post medieval pattern. Documentary and placename evidence suggests Acton Grange lies within this part of the landscape- it is first mentioned in 1141 in association with Norton Priory. No structures associated with a grange have been identified and it is possible that there were no specific buildings contemporary to the use of the area as a Grange of the Priory. Other linear cropmarks identified in the area do not match those attested on historic maps and may relate to an extensive area of cropmarks interpreted as late prehistoric or Romano-British field systems and settlement north of the area (PEIR Technical Appendix 6A, sections 3.5.149 and 3.5.150).

HCH12961

1.4.10 This HLC Area contains two survey areas, AOC ID 67 and 71. It lies north west of the village of Hatton and is bounded to the east by woodland and to the west by the Chester-to-Wilderspool Roman Road. The arable fields within the area have been consolidated from smaller fields with irregular and reverse S shaped boundaries depicted on the 1836 Acton Grange tithe map, suggesting these were in turn enclosed piecemeal from a medieval open field system. A cropmark complex identified as being of late prehistoric or Roman period in date lies 400m north of this area, though none have been recorded within the area. More recently, the area has been used to host an annual music festival (for at least 20 years); the ground disturbance is limited but modern ferrous debris related to the festival will potentially result in a noisy magnetic environment for the geophysical surveys (PEIR Technical Appendix 6A, sections 3.5.124 to 3.5.128).

HCH13017

1.4.11 This HLC Area contains two survey areas, AOC ID 22 and 23. It is located immediately south of the M56 and surrounds Hallamhall Farm. The current landscape organisation was established by the early 1800’s and reflects piecemeal enclosure of medieval open fields, with some boundaries retaining the reverse S shape characteristic of furlongs. Some former boundaries are visible as cropmarks. Other cropmarks in the area appear to relate to undated settlement activity 140m south of the farm and other sub-rectangular features to the east. LiDAR analysis has identified undated marl pits in the area.

HCH13072

1.4.12 This HLC Area contains one survey area, AOC ID 8. It lies within the footprint of the former L&NWR St Helens railway, which crosses agricultural land at this point. It is not maintained and is in use as a cycleway.

HCH13086

1.4.13 This HLC Area contains one survey area, AOC ID 12. It lies within the footprint of the L&NWR Frodsham Branch Railway, the Warrington and Garston Line and the Cheshire Lines Railway. The lines are extant. In section 4, the survey in AOC ID 12 is discussed along with those from AOC ID 13 – 16 as it is adjacent to that group and shares similar geology, soils and land use history.

HCH13123

1.4.14 This HLC Area contains one survey area, AOC ID 17. It lies east of the River Mersey and north of the Manchester Ship Canal. It retains an early pattern of enclosed fields which have not changed since the early 1800s. This pattern is characteristic of piecemeal enclosure of former marsh along the course of the river. There is a complex of cropmarks in the middle of the area interpreted as an undated settlement and field system, though the morphology suggests an Iron Age or Roman date.

HCH13229

1.4.15 This HLC Area contains three survey areas, AOC ID 19 – 21. The area lies 700m south of the village of Walton and is composed of agricultural fields which result from late post medieval and more recent development, which has almost wholly replaced the irregular boundaries depicted on a tithe map from 1843. The cropmarks within the area all appear to relate to former boundaries depicted on this map, though some of them may reflect earlier boundaries associated with prehistoric or Roman period settlement identified 400m north of the area.

HCH13246

1.4.16 This HLC Area contains two survey areas, AOC ID 18 and AOC ID 72. This area lies immediately south of the Manchester Ship Canal and comprises enclosed farmland around Grange Green Farm and the village of Walton. It is bisected in the north west by a disused railway line. There has been a large amount of boundary loss since the early 1800's, and some of the removed boundaries are visible as cropmarks. Many other cropmarks are visible in the area, and these do not have counterparts on historic maps. Instead, they clearly reflect the buried remains of a complex of rectilinear prehistoric or Romano-British settlement enclosures and associated field boundaries. A stray find of a Roman coin (MCH12907) is reported in the area of these cropmarks.

West Corridor and Runcorn Spur

1.4.17 Within the West Corridor, thirteen parcels covering approximately 29.5ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at twelve. Of these twelve, one was unsurveyable due to ground conditions, and one was only partially suitable, meaning that 26.8ha of survey was completed across eleven parcels. The HLC classification, area ID and any cropmark or LiDAR observations from the Archaeology DBA are summarised in **Table 6E 1.6** below.

Table 6E 1.6 Survey Parcels in the West Corridor and their HLC Area and recorded heritage

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
W_280 (1)	26	2.02	LDr_024, LDr_025 - Extraction pits. Cropmarks - CPm_167, CPm_076	HCH1248	C20th Fieldscapes	High	prehistoric fields, ridge and furrow
W_280 (2)	27	2.87	none noted	HCH1248	C20th Fieldscapes	High	prehistoric fields, ridge and furrow
W_280 (3)	28	0.18	none noted	HCH1248	C20th Fieldscapes	High	prehistoric fields, ridge and furrow
W_280 (4)	29	1.64	none noted	HCH1248	C20th Fieldscapes	High	prehistoric fields, ridge and furrow
W_330 (1)	30	1.64	none noted	HCH1247	Post Medieval Fieldscapes	High	lithics, prehistoric fields, settlement
W_360 (1)	31	3.07	LDr_300 - Possible feature. LDr_170 - Linear Bank.	HCH1235	C20th Fieldscapes	High	lithics, prehistoric, crofts, ridge furrow, aqueduct
W_410 (1)	32	0.82	none noted	HCH1225	Post Medieval Fieldscapes	High	Lithics, Barrows, ridge and furrow
W_410 (2)	33	0.54	none noted	HCH1225	Post Medieval Fieldscapes	High	Lithics, Barrows, ridge and furrow

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
W_360 (2)	34	10.71	LDr_168 - Linear Banks. LDr_167 - Enclosure. LDr_169 - Linear Bank.	HCH1225	Post Medieval Fieldscapes	High	Lithics, Barrows, ridge and furrow
W_410 (3)	35	0.50	none noted	HCH1225	Post Medieval Fieldscapes	High	Lithics, Barrows, ridge and furrow
W_695 (1)	36	1.89	Cropmarks - CPm_025	HCH1169	Post Medieval Fieldscapes	High	Prehistoric Barrows
W_695 (1)	37	3.13	LDr_005 - Possible Barrow	HCH1169	Post Medieval Fieldscapes	High	Prehistoric Barrows
W_20/W_21	43	0.65	Cropmarks - CPm_021, CPm_084, CPm_040, CPm_057, CPm_055, CPm_066	HCH1191	Post Medieval Fieldscapes	High	prehistoric fields and settlement

HCH1169

1.4.18 This HLC Area contains two survey parcels, AOC ID 36 and 37. The area is characterised by post-medieval enclosure, but proximity to the village of Sutton suggests it could have formed part of the open field system associated with the village in the medieval period. There is no recorded ridge and furrow cultivation within the area, but there are extant examples c 200m to the south west. The cropmark and LiDAR examinations showed evidence of possible extant round barrows and fieldwalking within the area has yielded a flint scatter of Mesolithic date. Surrounding fields also have cropmarks interpreted as Romano-British field boundaries (PEIR Technical Appendix 6A, sections 3.5.42 and 3.5.43).

HCH1191

1.4.19 This HLC Area contains one survey parcel, AOC ID 43. This area, comprised of low-lying land north of the River Weaver, seems to have been enclosed from water meadows fairly late in the post-medieval period, perhaps associated with the village of Bartington, which lies west of the area, which is mentioned in Domesday, suggesting a pre-conquest origin. Cropmarks in the eastern part of the area have been interpreted as either prehistoric or Romano-British field systems, and earthwork features interpreted from the LiDAR study as ditches and an isolated circular feature are suggested to be medieval or earlier in date (PEIR Technical Appendix 6A, sections 3.5.77 to 3.5.80).

HCH1225

1.4.20 This HLC Area contains four survey parcels, AOC ID 32 – 35. It sits to the east of the settlement of Sutton and is presently bisected by the route of the M56. The present landscape is a result of piecemeal enclosure of former open fields associated with Sutton, and many of the former boundaries depicted on tithe maps have the reverse S shape characteristic of medieval furlongs, however no trace of extant ridge and furrow earthworks could be identified in remote sensing images, suggesting the area has been subject to heavy ploughing in subsequent periods. The remote sensing studies have however revealed cropmarks that are interpreted as linear ditches forming field systems of prehistoric date in northern and central portions of the area. There is also a group of more enigmatic circular features of reduced crop growth 3m to 5m in diameter, with some linear linking elements. These may relate to prehistoric barrows, but it is also possible they relate to more recent agricultural activity, or that they have some relationship to a Scheduled heavy anti-aircraft gunsight (NHLE 1019849) which borders the area directly (PEIR Technical Appendix 6A, sections 3.5.47 and 3.5.48).

HCH1235

1.4.21 This HLC Area contains one survey parcel, AOC ID 31. This area is located northeast of the village of Acton. The area is characterized by 20th century rectangular fields which have developed from open fields and croft-plots (the boundaries of some of which remain visible as cropmarks) related to the village during the medieval period. The Severn Vyrnwy Aqueduct traverses the area as a tunnelled pipeline, which is visible as a low earthwork and negative cropmark along some parts of its route. The aqueduct was built in the late 1800s and was at the time of its construction the longest aqueduct in the world, supplying urban areas north of the study area with water from North Wales. As well as the aqueduct, numerous other linear cropmarks are visible on aerial images. These have been interpreted as late prehistoric or Romano-British field systems. A single find of worked flint not native to the local area is also reported from this HLC Area (PEIR Technical Appendix 6A, sections 3.5.55 to 3.5.57).

HCH1247

1.4.22 This HLC Area contains one survey parcel, AOC ID 30. This area is located to the east of the village of Acton. It is characterized by fields of post-medieval provenance that were enclosed piecemeal from the open fields surrounding the village during the medieval period. The Severn Vyrnwy Aqueduct crosses the western part of the area. The eastern portion of the area contains earthworks related to former boundaries, marl pits, lanes and woodland. Some of the former marl pits have survived to become ponds. Linear cropmarks across the area have been interpreted as prehistoric or Romano British field systems, with a possible settlement enclosure in the south west (PEIR Technical Appendix 6A, sections 3.5.59 to 3.5.81).

HCH1248

1.4.23 This HLC Area contains four survey parcels, AOC ID 26 – 29. This area lies north east of the village of Acton and the present landscape results from the piecemeal enclosure of the open fields that surrounded the village in the medieval period. Many boundaries depicted on historic maps have the reverse S shape characteristic of medieval furlongs, but there are no associated records of extant ridge and furrow earthworks, which implies heavy ploughing since the medieval period within the area. Cropmarks in the north of the area have been interpreted as forming elements of a prehistoric or Romano-British field system (PEIR Technical Appendix 6A, sections 3.5.63 and 3.5.64).

South Corridor

1.4.24 Within the South Corridor, fifteen parcels covering approximately 36ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen. Of these, one was only partially suitable, meaning that 31.2ha of survey was completed across thirteen parcels. The HLC classification, area ID and any cropmark or LiDAR observations from the Archaeology DBA are summarised in **Table 6E 1.7** below.

Table 6E 1.7 Survey Parcels in the South Corridor and their HLC Area and recorded heritage

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
SA_290 (1)	24	4.58	LDr_298 - former field boundary. Cropmarks - CPm_095, CPm_145	HCH1276	Post Medieval Fieldscapes	High	prehistoric fields, settlement

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
SA_290 (1)	25	0.09	none noted	HCH1276	Post Medieval Fieldscapes	High	prehistoric fields, settlement
SA_760 (1)	38	2.60	Cropmarks - CPm_127, CPm_003, CPm_166, CPm_161, CPm_146, CPm_139, CPm_138, CPm_170	HCH1581	Ancient Fieldscapes	High	lithics, prehistoric/ RB activity, med rf, post med boundaries, poss. early med settlement
SA_1020 (1)	39	5.60	Cropmarks - CPm_152, CPm_002, CPm_169, CPm_086	HCH1733	Post Medieval Fieldscapes	High	med/post med boundaries. possible Roman road
SA_1330 (1)	40	5.00	LDr_273, LDr_274, LDr_275, LDr_276 - former field boundaries. LDR_084, LDr_085 - Extraction pits.	HCH1729	C20th Fieldscapes	Medium	prehistoric settlement
SA_2640 (1)	41	2.82	LDr_203, LDr_204 - Extraction pits.	HCH112	Post Medieval Fieldscapes	High	lithics, prehistoric barrows, post medieval boundaries, small finds

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
SA_2820 (1)	42	1.00	LDr_089 - Extraction pit	HCH112	Post Medieval Fieldscapes	High	lithics, prehistoric barrows, post medieval boundaries, small finds
SA_1990 (1)	55	1.34	none noted	HCH543	Ancient Fieldscapes	High	artefacts and ecofacts in peat, small mounds of unknown date
SA_1860 (1)	56	4.07	none noted	HCH543	Ancient Fieldscapes	High	artefacts and ecofacts in peat, small mounds of unknown date
SA_1350 (1)	57	0.51	none noted	HCH1726	C20th Fieldscapes	High	med/post med boundaries. possible Roman road
SA_1260 (1)	58	1.57	none noted	HCH1724	Post Medieval Fieldscapes	High	med/post med boundaries. possible Roman road
SA_1260 (1)	59	1.38	none noted	HCH1724	Post Medieval Fieldscapes	High	med/post med boundaries. possible

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
							Roman road
SA_1190 (1)	60	0.96	none noted	HCH1724	Post Medieval Fieldscapes	High	med/post med boundaries. possible Roman road
SA_1110 (1)	61	1.45	none noted	HCH1724	Post Medieval Fieldscapes	High	med/post med boundaries. possible Roman road
SA_1110 (2)	62	3.13	LDr_083 - Extraction pit	HCH1733	Post Medieval Fieldscapes	High	med/post med boundaries. possible Roman road

HCH112

1.4.25 This HLC Area contains two survey areas, AOC ID 41 and 42. This area sits within a swathe of similarly characterised areas or enclosed agricultural land between Vale Royal Abbey in the west and the village of Bostock in the east. The L&NWR Grand Junction railway line crosses the area, and there is an area of industrial salt production just to the south. Aside from some internal boundary loss in recent times, the landscape organisation largely reflects that of tithe maps dated 1838 and 1840. Some of the removed boundaries can be identified in LiDAR data as low earthworks. Some of the boundaries have the reverse S shape characteristic of medieval furlongs, suggesting at least part of the area was enclosed piecemeal from a medieval open field system associated with the nearby settlements of Davenham and Moulton, both of which are mentioned in Domesday. The wider group of associated HLC Areas contains a scheduled bowl barrow (NHLE 1011123) around 160m north-east of Moultonbank Farm, which sits on a natural glacial mound. No similar monuments have been observed in the LiDAR analysis of the immediate area. The LIDAR analysis has identified numerous undated extraction pits throughout the area. Metal detecting within this specific HLC Area has recovered numerous stray finds, including the Davenham Hoard of Elizabethan coins, (MCH9381), the tip of a possible Bronze Age sword

(MCH9037), a Roman hairpin (MCH12542), a fourth century coin (MCH14474) and an early medieval pinhead (MCH14468), along with various coins dated to the medieval and post medieval periods. No features have been observed in association with these findspots either as cropmarks or earthworks (PEIR Technical Appendix 6A, sections 3.5.379 to 3.5.381).

HCH1276

1.4.26 This HLC Area contains two survey areas, AOC ID 24 and 25. This Area is located north and east of the Trent and Mersey Canal conservation area and is bounded by Dutton Hall to the west and Dean Brook to the east. The area is currently comprised of large arable fields which have survived with minor boundary loss from those depicted on tithe maps from the 1840s. Place name evidence suggests these were enclosed from an open field medieval landscape around the village of Dutton, which is mentioned in Domesday. Small finds have been recovered from the area through fieldwalking, including a medieval coin (MCH7622) and a possible Saxon brooch (MCH8048). To the west of Dutton Hall there is an area of earthworks which have been used as pasture since at least the early 1800s, however the tithe map describes this area as outbuildings, suggesting buried remains may be present. In the large fields in the east of the area, cropmarks are present that have been interpreted as prehistoric or Romano-British field systems (PEIR Technical Appendix 6A, sections 3.5.82 to 3.5.84).

HCH1581

1.4.27 This HLC Area contains one survey area, AOC ID 38. It sits in an area where the field pattern has largely been instituted in the late 1800s and the 20th century, with may former boundaries visible in remote sensing data and on older maps. These former boundaries display characteristics of having evolved from medieval open field cultivation. There are in places fait trances of ridge and furrow systems visible in LiDAR data. There are cropmarks interpreted as Romano-British or prehistoric field systems in nearby HLC areas, but none in this specific area (PEIR Technical Appendix 6A, sections 3.5.310 to 3.5.313).

HCH1724, HCH1726, HCH1733

1.4.28 This HLC Area contains seven survey areas, AOC ID 39 and AOC ID 57 – 62. This area is located west of the village of Weaverham and are within a broader group of fields bisected by the L&NWR railway line. Undated marl extraction pits are frequently identifiable in the remote sensing results from this area. The current field organisation dates to the late 1800s and reflects a loss of boundaries when compared to tithe maps from the early 1800s. Many of the removed boundaries are visible in remote sensing data for the area. Some of these removed boundaries have the characteristic reverse S shape of medieval furlongs, suggesting the successive enclosure of medieval open fields. A disputed identification of the Cotebrook to Cuddington Roman Road runs through HCH1726, but there is no tangible evidence to date of Romano-British activity in the area (PEIR Technical Appendix 6A, sections 3.5.326 to 3.5.329).

HCH1729

1.4.29 This HLC Area contains one survey area, AOC ID 40. This area is located around 150m west of Gorstage, which was formerly known as Hefferton Grange. It consists of secondary woodland, with a maintained open area around an overhead electrical line. LiDAR analysis has allowed the identification of 19th century boundaries of the fields which pre-dated the woodland, which dates to the early 2000s (PEIR Technical Appendix 6A, section 3.5.333).

HCH543

1.4.30 This HLC Area contains two survey areas, AOC 55 and 56. It is located immediately east of Sandiway golf course and contains enclosed fields which have remained largely unchanged since those depicted on the 1838 tithe map of the area. Part of the north west of the area sits on a peat deposit which has remained untilled, which may contain paleoenvironmental reservoirs (Historic England, 2021). The area is also characterised by irregular raised mounds, the origin of which is unclear (PEIR Technical Appendix 6A, section 3.5.350).

East Corridor and Partington Spur

1.4.31 Within the East Corridor, fifteen parcels covering approximately 33.4ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen. Of these, two were only partially suitable, meaning that 27.3ha of survey was completed across thirteen parcels. The HLC classification, area ID and any cropmark or LiDAR observations from the Archaeology DBA are summarised in **Table 6E 1.8** below.

Table 6E 1.8 Survey Parcels in the East Corridor and their HLC Area and recorded heritage

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
E_3270	45	6.17	none noted	HGM5691	Fields off Moss Lane and Sinderland Lane, South of Carrington Moss	High	lithics, prehistoric settlement and boundaries. post med boundaries
E_3272	46	2.49	none noted	HGM5738	Fields off Henshaw Lane and Sawpit Street, North of Dunham Woodhouses	High	prehistoric settlement and boundaries. post med boundaries

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
E_3020 (1)	47	2.86	none noted	HGM5738	Fields off Henshaw Lane and Sawpit Street, North of Dunham Woodhouses	High	prehistoric settlement and boundaries. post med boundaries
E_2750 (1)	48	3.02	none noted	HGM5738	Fields off Henshaw Lane and Sawpit Street, North of Dunham Woodhouses	High	prehistoric settlement and boundaries. post med boundaries
E_2450 (1)	49	1.34	none noted	HCH13380	Post Medieval Fieldscapes	High	prehistoric settlement and boundaries. post med boundaries
E_2680 (1)	50	0.24	none noted	HCH10322	Post Medieval Fieldscapes	High	Lithics, prehistoric settlement and boundaries. post med boundaries
E_2680 (2)	51	2.56	LDr_186 - Extraction Pit	HCH10322; HCH130327	Post Medieval Fieldscapes; Communications	High; Medium	Lithics, prehistoric settlement and boundaries. post med boundaries; Remains associated with historic use of canal

Name	AOC ID	Area (ha)	Heritage	HLCUID or UID	HLC Group	Potential	Rationale
E_2170 (1)	52	0.71	none noted	HCH9440	Industry	High	Post med boundaries, Roman road features
E_2170 (2)	53	0.32	none noted	HCH9440	Industry	High	Post med boundaries, Roman road features
E_2000 (1)	54	2.83	none noted	HCH9445	Post Medieval Fieldscapes	High	Post med boundaries, Roman road features
E_2010 (1)	63	1.87	none noted	HCH9208	C20th Fieldscapes	High	Post med boundaries, Roman road features
E_2010 (2)	64	3.00	none noted	HCH9442	Post Medieval Fieldscapes	High	Post med boundaries, Roman road features
E_1620	68	1.00	none noted	HCH9426	C20th Fieldscapes	High	Post med boundaries
E_2510 (1)	69	2.42	none noted	HCH9360	Post Medieval Fieldscapes	High	Post med boundaries, Roman road features
E_2510 (2)	70	2.54	none noted	HCH9360	Post Medieval Fieldscapes	High	Post med boundaries, Roman road features

HCH10322, HCH13380, HGM5691, HGM5738

1.4.32 This HLC Area contains seven survey parcels, AOC ID 45 – 50 and AOC ID 51. These areas are part of a wide swathe of enclosed land between Agden in the south and Partington in the north. The current field pattern is a mixture of piecemeal and parliamentary enclosure in the post-medieval period, with some further boundary loss in the last century. Some of the former boundaries are visible in remote sensing data. These areas contain numerous dispersed farms, reflecting changes in the settlement pattern and farming practices in the post medieval period. There is also evidence of limited industrial activity in the form of a windmill and a former salt works. There are linear and rectangular cropmarks visible in HGM5738, identified as part of the study of the landscape around Dunham Massey (Oxford Archaeology North 2016), and are undated though the nearby finds of a hoard and spindle whorls of Roman date suggests some of them may date to prehistory or the Romano-British period (PEIR Technical Appendix 6A, sections 3.5.275 to 3.5.280).

HCH9208

1.4.33 This HLC Area contains one survey parcel, AOC ID 63. This HLC Area is not described in detail in the PEIR Technical Appendix 6A, section 3.5, but it is mentioned in the accompanying tables as being of high archaeological potential, but for the predicted remains to be of medium significance (PEIR Technical Appendix 6A, Table 4.1).

HCH9360, HCH9440, HCH9442, HCH9445

1.4.34 This HLC Area contains six survey parcels, AOC ID 52 – 54, AOC ID 64, and AOC ID 69 - 70. They are part of a larger area of enclosed land between Sink Moss in the south west and the Bridgewater Clan in the north east. The fields which occupy these areas are largely the result of late post medieval and 20th century development reflecting boundary loss since the early 1800s. In some of the other fields within the group, there are low earthworks related to ridge and furrow cultivation, or cropmarks interpreted as such. Aside from this, there is little tangible evidence of medieval activity in these areas, aside from some Anglo-Saxon place names. The modern A50 runs on the same alignment as the North Cheshire Roman Ridge Road, which bisects these areas. No evidence of remains associated with the Roman construction of the road has been identified to date, but it is thought the lack of disturbance in fields within HCH9445 may have preserved some evidence from this period (PEIR Technical Appendix 6A, sections 3.5.268 to 3.5.271).

HCH9426

1.4.35 This HLC Area contains one survey parcel, AOC ID 68. This area sits within an extensive swathe of agricultural land between Whitley and the M6 motorway. The area contains large, enclosed fields and dispersed farms dated to the 18th and 19th centuries. The present landscape organisation results from a great deal of boundary loss since those depicted on tithe maps from the early 1800s. Many of the removed boundaries can be seen as low earthworks in the LiDAR data for the area. Some of these have the reverse S chape characteristic of medieval furlongs, which suggests some of the enclosure to be a result of piecemeal changes from an open field system, whereas other elements were enclosed by act of parliament. There is little evidence of medieval activity in the area beyond these boundary forms and some Anglo-Saxon place names (which suggest the area was woodland prior to the medieval period). Elsewhere in the nearby landscape, prehistoric activity is attested by the findspot of a stone axe, and scheduled bowl barrow (NHLE 1011166), but there are no cropmarks or other indirect evidence for this in the HLC Area target for survey (PEIR Technical Appendix 6A, sections 3.5.246 to 3.5.168).

2. Aims, Objectives, and Methodology

2.1 Aims of the Archaeological Geophysical Survey

2.1.1 The aim of the geophysical survey was to identify anomalies that suggest the presence of archaeological remains, in order to enhance the current understanding of the historical environment within the survey area.

2.1.2 Specifically, the aims of the gradiometer survey were:

- To locate, record and characterise any potential surviving sub-surface archaeological remains within the survey area, as part of a broader archaeological evaluation;
- To assess the viability of magnetic gradiometer survey on the soils and geology present within the project boundary;
- To help determine the next stage of works as per the client's instruction;
- To produce a comprehensive site archive (**Annex 6E1**) and report; and
- This phase of the geophysical surveys was conducted over areas assessed as being of high archaeological potential, or with potential to examine key questions established in the North West England Regional Research Framework (NWERRF, 2021), specifically:
  - the identification of previously unknown prehistoric sites (PH23); and
  - establishing whether there is a hierarchy for later prehistoric lowland settlement (PH35).

2.2 Methodology

2.2.1 The geophysical survey was undertaken between 02/10/2023 and 02/02/2024.

2.2.2 All geophysical survey work was conducted in accordance with current good practice specified in the EAC guidelines document (Schmidt et al. 2015), as recommended by Historic England, and in the Chartered Institute for Archaeologists' Standard and Guidance for Archaeological Geophysical Survey (2014, updated 2020).

2.2.3 Parameters and survey methods were selected that were suitable for the prospective aims of the survey and in accordance with recommended professional good practice (Schmidt et al. 2015).

2.2.4 Digital photographs of every survey parcel were taken before, during and after geophysical survey to show any changes to field conditions following the programme of works. The photos were downloaded and stored off site, and relevant examples are included as **Annex 6E5** of this report.

2.2.5 The gradiometer survey was conducted using a Bartington Non-Magnetic Cart. The cart system uses two/four/six Grad-01 fluxgate gradiometer sensors mounted upon a carbon fibre frame 1m apart, along with data logging equipment and batteries (see **Annex 6E2**). Before each session of use, the cart system was balanced around a single set up point within the Site specifically chosen for being magnetically quiet. Balancing the machine around this point produces a more uniform dataset throughout and allows all data to be plotted with ease on the same palette.

2.2.6 Data was collected using zig-zag traverses alongside a constant stream of GPS data collected through a Trimble R10 GPS, enabling the collected data to be spatially georeferenced without the need for a pre-determined grid system. The data was logged on a laptop mounted to the cart using Geomar MLGrad601 software.

2.2.7 Care was also taken to attempt to avoid metal obstacles present within the survey area, such as metal objects within and adjacent to the survey area as gradiometer survey is affected by 'above-ground ferrous disturbance' and avoiding these improves the overall data quality and results obtained.

2.2.8 The data was downloaded from MLGrad601 and exported as a text file in the format of .xyz in Geomar MultiGrad601 before being processed along with the GPS data in TerraSurveyor 64. The details of these processes can be found in Appendices 2 and 3.

2.2.9 Interpretations of the data were created in ArcGIS Pro and the technical terminology used to describe the identified features can be found in **Annex 6E4**.

3. Geological Survey Environment

3.1 Geological Background: Solid Geology

3.1.1 BGS mapping (1:50,000) indicates that the predominant bedrock of the Central Hub and North Corridor, on the Cheshire Plain and surrounding the River Mersey, comprises Triassic sedimentary rocks dominated by Bollin Mudstone, with outcrops of Tarporley Siltstone, Helsby Sandstone, and Wilmslow Sandstone in the area of the Mersey crossing. 1.5km north of the Mersey, the bedrock is dominated by further Triassic sandstone deposits comprising the Chester Sandstone and Kinnerton Sandstone Formations. Towards the northern end of the North Corridor, from Sutton Manor, the route passes through Carboniferous sedimentary rocks of the Etruria Formation (comprising mudstone, sandstone, and conglomerate), and the Pennine Middle Coal Measures Formation (interbedded bands of mudstone, siltstone, and sandstone).

3.1.2 The underlying geology of the West Corridor is predominantly Bollin Mudstone, with outcrops of Tarporley Siltstone west of Paddock Moor. Small pockets of Helsby Sandstone, Wilmslow Sandstone, and more extensive beds of the Chester Sandstone and Kinnerton Sandstone Formations underlay the Runcorn Spur, which ends at Weston.

3.1.3 BGS mapping (1:50,000) of the South Corridor indicates that roughly two thirds of this route comprises Bollin Mudstone. Following an eastern turn near Moulton, the route then traverses Triassic rocks of the Northwich Halite Member (Halite stone and mudstone) and the Sidmouth Mudstone Formation.

3.1.4 Roughly two thirds of the underlying bedrock of the East Corridor comprises Bollin Mudstone Member, with the final third, from High Legh, crossing outcrops of Tarporley Siltstone, Helsby Sandstone, rocks of the Northwich Halite Member, and Wilmslow Sandstone Formation.

3.2 Geological Background: Superficial Deposits

Sea Level Change in the Liverpool Bay Area

3.2.1 Records of early Pleistocene changes in sea level from the UK are relatively few, partly due to successive glaciations obliterating earlier deposits (Long and Roberts 1997).

3.2.2 The currently understood evidence suggests that the Holocene evolution of the Inner Mersey Estuary generally follows the tripartite pattern of estuary evolution common to other estuaries in the UK, which show early Holocene expansion followed by mid-Holocene contraction of the coastal zone driven by changes in the rate of regional Relative Sea level (RSL) rise. This is then followed by the re-establishment of lower intertidal conditions, probably due to an increase in terrigenous sediment influx triggered by catchment disturbance during the late Holocene.

Superficial Deposits

3.2.3 BGS mapping (1:50,000) indicates a range of superficial deposits within the Preliminary Order Limits. The key deposits are summarised below, along with their geoarchaeological and archaeological significance, and any observation of their potential impact on the reliability of magnetic gradiometry for archaeological prospection.

3.2.4 *Tidal Flat Deposits (Holocene)*: Comprising clay, silt, and sand, these sedimentary deposits are shallow marine in origin, forming beaches and bars in a coastal setting. They have the potential to seal waterlogged archaeology and paleoenvironmental remains, including proxy data associated with Holocene climate and sea-level change. They may also seal former land surfaces dated to the Late Glacial and early Post-Glacial Period. They are likely to be relatively magnetically enhanced compared to other deposits emplaced by water as the saltwater environment they formed in promotes the formation of highly magnetic minerals (Kattenberg & Aalbersberg, 2004). This may create more generally enhanced survey environments, which can in turn pose signal to noise problems during data interpretation.

3.2.5 *Alluvium (Holocene):* Described as clay, silt, sand, and gravel, with peat in places, these sedimentary deposits are fluvial in origin and reflect the channels, floodplains, and levees of a river or (if in a coastal setting) an estuary. Floodplain deposits and paleochannels (former water courses) are key contexts for the preservation of waterlogged archaeology and paleoenvironmental remains, including records of Holocene sea-level change (if in a coastal setting). They may seal former land surfaces dated to the Late Glacial and early Post-Glacial Period. Marginal areas adjacent to floodplains, and 'islands' of better-drained ground within floodplains and next to water courses are known to be foci for former activity. The impacts of alluvium on the reliability of magnetometer surveys vary due to a series of connected factors, such as the stratigraphic position of the (potential) archaeological features relative to the alluvium, the thickness of any overlying alluvium, and the past and present hydrology of the alluvial area. Deposits that are currently waterlogged or were waterlogged for the period in which the archaeological activities occurred typically inhibit the formation of magnetic enhancement as they are anaerobic. Deposits that are cyclically (seasonally) wetting and drying may have unusual magnetic characteristics unrelated to human activity that can obscure weaker anomalies that are associated with human activity.

3.2.6 *Peat (Late Devensian/Holocene):* Peat deposits are key strata for the preservation of waterlogged archaeology and paleoenvironmental remains. They may also seal former land surfaces and lake deposits dated to the Late Glacial and early Post-Glacial Period. Lacustrine and palustrine in origin, they comprise organic material, forming beds and lenses within lagoons, bogs, mosses, and swamps. Named mosses within and close to the Preliminary Order Limits of the Project include Whitley Reed, Sink Moss (both in Cheshire), and Carrington Moss (Greater Manchester). Peat environments are a challenge for archaeological prospection using magnetic means due to the anaerobic conditions mentioned above (Armstrong, 2010, 2019), though magnetic surveys can still be useful in these

environments for mapping former landforms and delimiting areas of peat formation.

3.2.7 *Shirdley Hill Sand Formation (probably late Devensian)*: The Shirdley Hill Sand formation is aeolian (wind-blown) deposits, forming lenses, beds, and locally, dunes. They are thought to have accumulated during the last glacial period under dry and lightly vegetated tundra conditions. They are often interspersed with outcrops of bedrock, boulder clay, and peat, creating diverse ecotonal landscape. Moreover, they have the potential to seal Late Glacial and early prehistoric archaeology and paleoenvironmental remains. Archaeology from earlier prehistory typically does not result in features which are detectable using magnetic gradiometry; in areas with these sand formations, the geophysical surveys are more likely to be successful in the identification of features cut into the relatively magnetically sterile sand which have magnetically enhanced fills.

3.2.8 *River Terrace Deposits:* River terrace deposits are key contexts for archaeological and geoarchaeological investigation. They represent fluvially deposited sand and gravel, and reflect the channels, floodplains and levees of a river or estuary (if in a coastal setting). The types of archaeological site and material expected in these contexts typically do not result in detectable magnetic contrasts. However, magnetic gradiometry can be a particularly useful tool for mapping river terrace deposits and identifying previous landforms such as paleochannels.

3.2.9 *Glaciofluvial Deposits (Devensian):* Comprising sand and gravel, these sedimentary deposits are glacio-fluvial in origin, and form beds, channels, plains, and fans associated with meltwater. Glacio-fluvial sands and gravels have generally little geoarchaeological potential but may contain archaeology eroded and redeposited from Palaeolithic contexts. They may also seal deeply stratified deposits of archaeological and paleoenvironmental potential. Magnetic gradiometry can help characterise and locate paleoenvironmental features such as paleochannels.

3.2.10 *Till, Diamicton (Devensian):* Unsorted sediment with gravel in a fine mud matrix. These sedimentary deposits are glaciogenic in origin, created by the action of ice and meltwater. Although the tills themselves have limited geoarchaeological potential, they may seal deeply stratified deposits of archaeological and geoarchaeological potential. Where till forms the underlying geology within a survey area, the potential effect on the reliability of the magnetic gradiometer results will depend on the particular characteristics of the till at that location. If the sediment contains a higher proportion of gravel and stones of an igneous or metamorphic origin, these magnetic items will cause small but strong anomalies in the survey results (when they are taken up into the topsoil by ploughing, for example). If these are present in strong concentrations, they can cause signal to noise issues for the interpretation of magnetometer data. However, till forms a quiet magnetic background against which cut features with magnetically enhanced fills can readily be discerned.

4. Results and Interpretation

4.1 Introduction

4.1.1 To provide a framework with which to present the results of the archaeological geophysical surveys, the results are presented following the common separation of the route into corridors and spurs, followed by a synthetic conclusion evaluating the survey methodology and discussing the results in reference to the aims established in section 2.1 above.

4.1.2 The gradiometer survey results have been visualised as greyscale plots, with the processed data plotted at -1nT to 2nT as seen in overview in Figures 3.1 – 3.27 and in detail in Figures 5.1 – 5.56. An interpretation of the data can be seen in overview in Figures 4.1 -4.27 and in detail in Figures 6.1 – 6.56. Figures 7.1 – 7.56 shows minimally processed data plotted as XY traces at 50nT/cm when reproduced at A3.

4.1.3 **Annex 6E4** contains a guide to the interpretation categories employed and the logic used to assign anomalies to specific classes, as well as a brief discussion of how past human activity results in these anomalies, however, some important points are noted below:

4.1.4 The classes have three sub-types (generally): anomalies (typically indicated by a solid colour polygon), spreads (a stippled polygon) and trends (a line with a colour matching the polygon colour). Anomalies refer to distinct changes in the survey data which suggest an abrupt boundary between materials below ground, such as a cut feature with a magnetically contrasting fill. Spreads of enhanced material refer to diffuse areas of altered magnetic contrast which suggest a localised spread of material with a magnetic contrast within the topsoil or ploughzone. Linear trends are less distinct and are typically visible as linear patterning in the overall texture of the data. A common example of these is the striping effect caused by recent ploughing.

4.1.5 Anomalies placed in the ‘Uncertain’ class may have an archaeological origin, but other explanations are equally likely. Where any particular interpretation is more likely than others, the anomaly is assigned to that class.

4.1.6 The definite ‘Archaeology’ class is only used for anomalies with no other explanation, either due to their diagnostic characteristics or because they are corroborated by other sources such as previous interventions within the survey area. Anomalies with magnetic characteristics or morphologies that suggest an archaeological origin will be assigned to the ‘Possible Archaeology’ class.

4.1.7 The anomaly type ‘Ferrous Spike’ is assigned to strong dipolar anomalies which cover a small spatial area and have a characteristic appearance in the XY traces of the survey data. These are strongly likely to be of recent origin in the form of magnetic or ferrous debris within the topsoil; ‘spikes’ of other origin will be assigned to their appropriate classification.

4.1.8 A distinction is made between modern disturbance from strongly ferrous materials within or adjacent to the survey area, such as the strong dipolar 'halos' produced by services like gas mains, and spreads of material within the topsoil causing noise that is assumed to have a recent origin. Generally speaking, 'Modern Disturbance' occurs at a distance from a magnetic source, whereas modern magnetic spreads/debris are related to material directly at that location.

4.1.9 Only anomalies (or groups thereof) of a likely archaeological or historical origin have been assigned an anomaly number on the interpretation figures. However, anomalies interpreted as resulting from other processes that are integral to the discussion of the results have also been assigned anomaly numbers. These anomaly identifiers are unique and following from the conventions established in other associated reports, they follow a numerical sequence (in order of discussion in the text), prefaced by GMg_ (Geophysical – Magnetic) as an identifier specific to this prospection method.

4.1.10 Where anomalies match in terms of their location and character with cropmarks digitised during the PEIR and ES phases of this project (supplied by WSP) these anomalies have been marked as being of potential archaeological interest, *unless they are also shown on the 1st Edition Ordnance Survey map* for the area, following consultation with WSP (Astbury, 2024, pers. com) as it is likely that these relate to boundaries and other features which pre-date the mid-19th century.

4.2 The Central Hub and North Corridor

UID 4766, UID 12858, UID 12867, UID 12954, HCH13065, HCH13080

4.2.1 This group of HLC Areas contains fourteen survey areas, AOC ID 3 – 7, AOC ID 9 - 16 and AOC ID 44. Of these, parcels 3, 4, 12 – 16 and 44 were surveyed. Parcels 3 and 4 are immediately adjacent to each other and are the northern most parcels surveyed during this period of work. The results are shown in Figures 3.2, 5.1 -5.3, and the interpretation in Figures 4.2 and 4.1-4.3. Parcels 12 – 16 and 44 form another adjacent group, bisected east-west by the Cheshire Lines Railway west of Penketh. These results are shown in Figures 3.4 -3.6 and 5.4 – 5.11, with the interpretation shown in Figure 4.4 – 4.6, and 6.4 – 6.11.

4.2.2 The magnetic environment in these areas is characterised by strong enhancements showing against a mottled background, which appears to reflect the natural soil environment of the survey area. In the southern group of parcels, all bar parcel AOC ID 13 have a very strongly magnetic background, with a noisy spread of small dipolar anomalies. This is consistent with ferrous or otherwise magnetic debris being present in the topsoil and can frequently be seen in areas treated with 'green waste' as part of soil improvement. In these parcels, the strong background may be masking weaker anomalies, but it has still been possible to discern stronger anomalies produced by former boundaries, services and drains.

4.2.3 The Severn – Vyrnwy Aqueduct is visible in the results crossing the western edge of parcel AOC ID 3 as a group of 3 closely parallel linear positive anomalies with a strong negative halo, occupying a 9m wide corridor running north west to south east. There is a further single linear anomaly also parallel to the group but offset

eastwards by 10m. This group of anomalies, **GMg_001,** has a strong overall halo which may obscure nearby weaker anomalies.

4.2.4 The same parcel that contains the anomalies interpreted as the aqueduct has a group of linear positive anomalies in the centre of the area which correspond well with crop marks interpreted from aerial photos which do not match boundaries depicted on the 1st Edition OS map of the area, **GMg_002**. These anomalies are positive with sharp margins and likely therefore relate to cut features with enhanced fills, such as field boundaries. Other boundaries which are depicted on historical maps have also been identified, such as that marked at **GMg_003 and GMg_005**, as well as a palimpsest of drains and ploughing trends. The anomalies not clearly seen on historical maps may have archaeological interest as they may pre-date the late 1800's when the maps were made. The group of anomalies making up a rectilinear enclosure marked **GMg_002** are also on a different orientation than either the modern boundaries or those depicted on historic maps, and this further lends weight to the idea they belong to a different, perhaps earlier phase of landscape organisation.

4.2.5 In the parcel immediately south of these anomalies, AOC ID 4, there are two distinct spreads of dipolar anomalies with well-defined edges that are distinct from the background noise of the area, **GMg_004**. These correspond with ponds depicted on the 1st Edition OS map of the area, though they are larger; the ponds depicted only cover about ¼ of the area the spread of dipolar anomalies does in both cases. These are interpreted as former extraction pits which were partially infilled at the time of the 1st Edition Map and which have subsequently been completely filled either deliberately to improve the field or as a result of natural processes.

4.2.6 Some ploughing trends can also be picked out against the noisy background within this survey area. Parcels 5 – 11 could not be surveyed during this phase of work as access could not be agreed.

4.2.7 Moving to the southern group of parcels within this group of HLC Areas, the survey areas are more impacted by the noisy background assumed to result from green waste. Areas 12 and 13 however, seem not to be as affected and perhaps as a result, a series of curvilinear strong positive anomalies are visible within the survey area which form an incomplete series of possible enclosures, marked **GMg_006**. These anomalies have been categorised as being of uncertain origin, because they do not match any crop marks nor boundaries depicted on historical maps, and so may be of archaeological interest, but they may also equally relate to more recent or historical activities which are not captured in the available maps, as their discontinuous nature means they lack diagnostic characteristics of any particular period.

4.2.8 South of the possible enclosures of uncertain date within parcels 15 and 44 there are a series of discrete areas of more strongly enhanced dipolar anomalies, smaller in extent but similar in character to those identified as GMg_004, discussed above, and marked **GMg_007**. Some, but not all of them have counterparts in the LiDAR analysis, but all of them are marked as ponds on the 1st Edition OS maps of the area. These are interpreted as further former extraction pits of unknown date, which have been infilled with magnetically enhanced material. There are linear anomalies in the results which correspond with

cropmarks, and some which correspond with former boundaries depicted on historic maps. Linear anomalies characteristic of field drains and ploughing trends have also been identified.

UID 18766

4.2.9 This HLC Area contains two survey areas, AOC ID 1 and 2. These parcels were not accessible for survey during this phase of the Project.

HCH12953

4.2.10 This HLC Area contains two survey areas, AOC ID 65 and 66. Only area 65 was accessible for survey during this phase of the Project. The results are shown in Figure 3.9 and 5.16, with the interpretation shown in Figure 4.9 and 6.16. The western boundary of the area may have shifted westward over time as there are strong linear anomalies that run parallel to the current boundary evident in the results. There are also strong linear anomalies orthogonal to this boundary which have been interpreted as disused and infilled open field drains, on the basis of their spatial relationship to the boundary. Though the general magnetic character of the survey area is noisy, with speckled background of small dipolar anomalies, two larger anomalies with a more coherent magnetic appearance have been identified within the data in the centre of the area and are marked **GMg_008**. There are linear trends within the noise close by them which have also been picked out. These anomalies are classified as uncertain in origin as there is no strong indication as to whether they relate to archaeological features such as pits or areas of heating or burning, or whether these related to more recent activity or natural processes. There are some indications of a spread of more enhanced material surrounding the pond just east of the survey area, and along the northern and western boundaries. These are assumed to result from modern debris in the topsoil. There are no anomalies that suggest the continuation of late prehistoric or Romano-British settlement activity identified north of this area (see section 1.4.8 above).

HCH12961

4.2.11 This HLC Area contains two survey areas, AOC ID 67 and 71. The results are shown in Figure 3.9 and 5.17 and the interpretation is shown in Figures 4.9 and 6.17. There is a noisy background, as expected, likely to be related to modern ferrous rubbish related to camping for a musical festival held annually on the fields. There is also a spread of strong dipolar responses along the line of the current field boundary which suggests it was more substantial in the past. There are strong ferrous anomalies probably related to the festival in the eastern part of the survey area, and a few positive and negative anomalies of uncertain origin. There are no clear anomalies that can be related to the Roman Road west of the area or to the late prehistoric or Romano-British settlement identified to the north of the area.

HCH13017

4.2.12 This HLC Area contains two survey areas, AOC ID 22 and 23. It was only possible to complete survey in parcel 22, as the owner called off survey in parcel 23 due to deteriorating ground conditions. The results are shown in Figures 3.11 and 5.21 - 5.22. The interpretation is shown in figures 4.11 and 6.21 -6.22. The results in area 22 have a mottled appearance which suggests natural variability in the magnetic properties of the soil and geology rather than green waste. Within this, some sinuous broad trends can be observed that are interpreted as resulting from natural processes like fluvial action. Standing out against this, there are more distinct positive linear anomalies or groups of discrete positive anomalies which form a rectilinear pattern with no clear relationship to current or historical boundaries marked **GMg_009**. These are interpreted as possible archaeology on the basis of their magnetic properties, morphology and proximity to undated settlement activity located 140m south of the area. There are also more ambiguous anomalies in the survey area, including isolated stronger dipolar anomalies, which may relate to burning, and a group of dipolar anomalies forming a linear group that crosses the northern part of the survey area on the alignment of a linear crop mark. A LiDAR feature in the same area was interpreted as an extraction pit, but there is no corresponding geophysical anomaly. This feature is most likely some sort of drain or service, but as other causes cannot be ruled out, it has been classified as being of uncertain origin. In the small part of area 23 that was completed, it has been possible to identify ploughing trends.

HCH13072

4.2.13 This HLC Area contains one survey area, AOC ID 8. This parcel was not available for survey during this period of the Project.

HCH13123

4.2.14 This HLC Area contains one survey area, AOC ID 17. The results are shown in Figures 3.7 and 5.12. The interpretation is shown in figures 4.7 and 6.12. Within this area, the results are characterized by a noisy background that likely results from the local soils and hydrogeology, lying in an area of former marsh close to the river Mersey. Against this background positive linear anomalies corresponding with both a cropmark and a boundary depicted on the 1st Edition OS map of the area have been identified and marked as **GMg_010**. There are other positive anomalies in the same south eastern corner of the survey area, but these have been interpreted as related to former watercourses within the marsh system, as the 1st Edition OS map shows a system of banked drains that also lie along a civic boundary that marsh has been drained by, which lead to the river to the north.

HCH13229

4.2.15 This HLC Area contains three survey areas, AOC ID 19 – 21. The results are shown in Figures 3.10 and 5.18 -5.20. The interpretation is shown in figures 4.10 and 6.18 -6.20. These surveys have a generally quiet magnetic background which has clear and distinct patches of noisier responses, with two different characters. The southern parcel has its eastern half dominated by a broad area of dipolar responses which extends beyond the survey area to the east. This is consistent

with the use of green waste as a soil improver. In the northern pair of parcels, there are discrete patches of dipolar noise of a different character, the main element of which sits between two ponds which are probably former extraction pits. It is possible this spread of material reflect the infilling of a further undated pit that was not depicted on the 1st Edition OS maps, or visible in the LiDAR analysis or crop marks, but it has been classified as being of uncertain origin. Field drains and ploughing trends are also visible in the results.

HCH13246

4.2.16 This HLC Area contains two survey areas, AOC ID 18 and 72. The results are shown in Figures 3.8 and 5.13 -5.15. The interpretation is shown in figures 4.8 and 6.13 -6.15. The area has a strong magnetic background producing some noise in the survey results, which likely results from the geology. There is also a service following the western side of the survey parcel which has a broad halo that is obscuring weaker anomalies in the western quarter of the area. The cropmark and other evidence assessed for the PEIR report in an earlier phase of the Project was interpreted as suggesting roman period settlement within this broader HLC Area, but this has not been confirmed by the survey results. There are strong linear trends in line with the current agricultural regime which are obscuring weaker linear trends and anomalies on a different alignment. Some of these weaker trends align with some of the cropmarks recorded in the area, but not all of them. The weaker linear trends have been interpreted as being of possible archaeological interest but given their weak and discontinuous nature, it has not been possible to suggest what sort of features they relate to, or what period they may date to. It is also possible that some or all of them have a non-archaeological explanation.

4.3 Warrington Spur

4.3.1 No parcels within the Warrington spur were selected for archaeological geophysical prospection at this stage in the Project due to the fact that the majority of the route is previously developed land and/or highway.

4.4 West Corridor

4.4.1 This corridor contains thirteen parcels, AOC ID 26 - 37 and AOC ID 43. Access was not granted to AOC ID 32. AOC ID 26 was unsurveyable due to ground conditions and AOC ID 35 was only partially suitable, meaning that 26.8ha of survey was completed across eleven parcels.

4.4.2 Though their HLC Area types differ slightly, parcels 26 – 37 occupy a contiguous linear swathe of arable land between the river Weaver to the south and the West Coast Mainline and M56 corridor to the north, though with further buffers of arable land a green space between them and the transport corridors. These are characterised as either 20th century fieldscapes or post-medieval fieldscapes and given their similarity in character and contiguous position, they will be reported together below. The results are shown in Figures 3.12 – 3.14 and 5.23 -5.29. The interpretation is shown in figures 4.12 – 4.14 and 6.23 -6.29.

HCH1169, HCH1225, HCH1235, HCH1247, HCH1248

4.4.3 The survey results from these parcels are characterised by a noisy background of variable intensity. Some areas of this have a distinct margin and a different density and character of magnetic dipoles, especially in the western end of the area. These are interpreted as areas treated with green waste or similar material for soil improvement purposes. There are modern services within many of the parcels, including a strong one with a substantial halo which runs north west to south east along the northern border of parcels 27 – 31 and 34. What appears to be the same service makes a right angled turn in the northern corner of parcel 35, continuing in parcel 36 parallel to a similar service and exiting the survey area on a south west north east alignment in the middle of the southern edge of parcel 36. There are other less substantial services within the survey. Together, the haloes from these services have likely obscured weaker anomalies in their immediate vicinity.

4.4.4 The Severn – Vyrnwy Aqueduct also crosses the survey area running north north west to south south east through parcel 31. It has the distinctive parallel group of three linear positive anomalies with a negative halo to the east, with a single linear dipolar anomaly offset 10m, this time to the west, marked **GMg_011**. The triple anomaly lies in the same location as a linear earthwork visible in the LiDAR analysis of the parcel, LDr_300. Between the Aqueduct and the modern services in the parcel, there is a group of strongly positive anomalies of uncertain origin, visible despite the strong magnetic disturbance here. Their origin may relate to the Aqueduct or the services, but they may also be of archaeological interest, and so have been marked as **GMg_012.**

4.4.5 At the eastern end of the area in parcels 27 – 29, the background signal is much quieter. A number of different classes of linear trend are visible in the survey results, the clearest of which are the herringbone-patterned arrangements of field drains. There are also weak linear parallel cultivation trends, though these are too discontinuous and ephemeral to attempt to characterise by period or cultivation method. There are also weak positive linear anomalies which have been interpreted as possible archaeology on the basis of their similarity of orientation and organisation to cropmarks in the surrounding area which have been interpreted as former field systems of uncertain date. There are other linear trends which do not fall readily onto one of these classes, and these have been assigned to the uncertain class of anomalies.

4.4.6 West of these parcels, in area 30 and 31, the background becomes more noisy. This is interpreted as being a result of natural variations in the soils of the survey area rather than the use of green waste as curving shapes can be discerned which imply these variations are a result of fluvial activity at some point in the past. Close to this there is an amorphous patch of altered magnetic response with a clear but weakly positive boundary, **GMg_013**. This does not appear to be the same type of anomaly as the natural variation, but it also does not share characteristics with former extraction pits in the survey. It has as a result been interpreted as a spread of material in the topsoil (rather than a cut feature) which may be of archaeological interest.

4.4.7 To the west of here, the junction of the Aqueduct and other services occurs in parcel 31. West of this again, in parcel 34 the background becomes increasingly affected by noise, some of which seems to result from fluvial action, and some possible related to imported debris in the topsoil. This area has a number of LiDAR features which have been interpreted as being of possible archaeological interest as they form a rectilinear group, along with possible barrows. While it has been possible to recognise linear trends within the noisy background here, it has not been possible to resolve these into a coherent and interpretable pattern. This palimpsest of noise from debris, curvilinear spreads which appear to be fluvial in origin and linear trends related to cultivation, potential archaeology and with uncertain origins continues to the western edge of this particular survey group in parcel 37, close to Sutton Hall.

HCH1191

4.4.8 This HLC Area contains one survey parcel, AOC ID 43. The results are shown in Figures 3.15 and 5.31 -5.32. The interpretation is shown in figures 4.15 and 6.31 - 6.32. The area is affected by a noisy survey environment that is difficult to determine the origin of, given the keyhole nature of the survey area and the lack of a broad area for comparison. Against this background, a modern service is clearly visible, and it has been possible to discern ploughing trends. There are also weak linear trends interpreted as being of possible archaeological interest as they match the orientation (if not location) of nearby linear cropmarks interpreted as being a possible field system of late prehistoric or Romano-British date.

4.5 Runcorn Spur

4.5.1 No parcels within the Runcorn spur were selected for archaeological geophysical prospection at this stage in the Project due to the fact that the majority of the route is previously developed land and/or highway verge.

4.6 South Corridor

4.6.1 Within the South Corridor, fifteen parcels covering approximately 36ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen – areas AOC ID 24, 25, 38 – 42, 55, and 58 - 62. These areas are somewhat spread out in the landscape and so the character of the results in each group of parcels is commented upon rather than an overview here.

HCH112

4.6.2 This HLC Area contains two survey areas, AOC ID 41 and 42. The results are shown in Figures 3.21 and 5.42 -5.43. The interpretation is shown in figures 4.21 and 6.42 -6.43. The area has a relatively quiet magnetic background in comparison to other parcels within the survey areas. Against this background, curving patches of slightly enhanced magnetic specking can be picked out, and these have been classified as natural variations. Within the northern part of parcel 41, one such band passes though LiDAR anomalies interpreted as former

extraction pits. The geophysical survey data does not have results consistent with former extraction pits seen elsewhere in the survey area, but there are a cluster of more coherent positive anomalies in both cases – these have been marked as being of uncertain origin as a result, **GMg_017**. To the east of these, and just north of a Y shaped strongly positive linear anomaly interpreted as a drain, there is a cluster of strong positive anomalies, **GMg_018** which have an appearance characteristic of localised burning or heating, particularly when viewed as XY traces. These anomalies may relate to high temperature processes associated with past industrial activity such as firing or smelting, or salt production. Throughout these parcels, linear trends related to ploughing can be identified, and there is magnetic interference at the survey margins related to nearby structures, and in the case of parcel 42, to the magnetic fill of the former sand pit immediately to the south of the survey parcel.

HCH1276

4.6.3 This HLC Area contains two survey areas, AOC ID 24 and 25. The results are shown in Figures 3.15 and 5.30 -5.31. The interpretation is shown in figures 4.15 and 6.30 -6.31. This area is located north and east of the Trent and Mersey Canal conservation area and is bounded by Dutton Hall to the west and Dean Brook to the east. The background of the survey results here is relatively quiet in comparison to nearby areas, possibly reflecting a slightly different land use history than parcel 43, which sits to the south, and as discussed above, is considerably noisier. The area has a series of curving linear anomalies with an inconsistent degree of enhancement. These were initially interpreted as natural variations, perhaps former water courses, on the basis of their morphology, but given their proximity to Dutton Hall and their magnetic character, which is more coherently enhanced than fluvial anomalies, these have been classified as being of possible archaeological interest – **GMg_014**, especially those with right-angled and more strongly positive elements, **GMg_015**. They are possibly boundaries or tracks and droveways associated with the Hall. The southern elements of these anomalies are located close to observed cropmarks. In the northern part of the parcel there are also discrete positive anomalies, **GMg_016**, which may relate to cut features with enhanced fills, such as pits. Parts of these areas were inaccessible for survey, and the anomalies appear to continue into the unsurveyed parts of the parcels.

HCH1581

4.6.4 This HLC Area contains one survey area, AOC ID 38. The results are shown in Figures 3.16 and 5.33. The interpretation is shown in figures 4.16 and 6.33. The parcel is crossed by a strong modern service on the northern side, and there are areas within the parcel where it was not possible to survey. There is a Y shaped group of anomalies, one of which is interpreted as a drain but the others as being of uncertain origin, marked **GMg_019**. It is possible that the drain element was laid in an existing ditch or depression, given the way the different anomalies intersect. There are further linear anomalies of uncertain origin in the southern half of the parcel which generally reflect the pattern and arrangement of crop marks seen to the south, some of which relate to boundaries depicted on the 1st Edition OS map.

HCH1724, HCH1726, HCH1733, HCH1729

4.6.5 This HLC Area contains eight survey areas, AOC ID 39 - 40 and AOC ID 57 – 62. The results are shown in Figures 3.16 - 3.19 and 5.34 -5.40. The interpretation is shown in figures 4.16 -4.19 and 6.34 -6.40. This area is located west of the village of Weaverham and are within a broader group of fields bisected by the L&NWR railway line. They form a relatively contiguous linear group. The survey results in this area have a noisy background that appears to relate to local soil and geology variations, though in parcel 40 the background is more strongly enhanced, which likely relates to the removal of woodland from this parcel in the post medieval period. All of the parcels were available for survey except for AOC ID 57, but some elements of the areas within them were not suitable to cover during the survey due to ground conditions. The most prominent anomalies in the survey area **GMg_020** are two former ponds in parcel 39 (likely to be extraction pits prior to being mapped as ponds on the 1st Edition OS map). In the northern part of the survey area, former boundaries known on historic maps are only visible as weak linear trends, and perhaps would not be picked out from the results without prior knowledge of their existence. This suggests that other ephemeral linear anomalies of uncertain origin may relate to more substantial below-ground deposits than their appearance in the results suggests. This picture is further complicated by ploughing trends and strong linear positive anomalies interpreted as drains, some of which match with cropmarks. This is also generally the case in the southern part of the survey area, except for a group of unusual strong dipolar anomalies within parcels 58 and 60, marked **GMg_021**. The anomalies here appear to result from small highly magnetised features or objects, which have a broad halo of either positive or negative signal as a result, but dipolar anomalies do not usually take this form – it is more common for small ferrous objects to produce two equally sized negative and positive anomalies displaced north-south of the object, rather than surrounding a central point of the opposite polarity as seen here. It is possible these relate to metal objects vertically placed in the ground such as dip wells or vents of some sort, but this is far from certain. There are no strong anomalies that suggest Romano British activity or the presence of Roman roads in the survey area as discussed in Section 2 above but note that known former boundaries have been difficult to pick out in the results here and it is possible that weaker anomalies may not be sufficiently contrasted to be visible in this survey environment. There are faint but infrequent linear trends of uncertain origin present in the results, which may have an archaeological explanation.

HCH543

4.6.6 This HLC Area contains two survey areas, AOC 55 and 56. Of these, only parcel 55 was accessible for survey, and of that only around half was suitable to cover, with the rest being waterlogged. Within the area completed it has been possible to identify ploughing trends and some areas of magnetic disturbance which may relate to efforts to drain and improve the land by importing material.

4.7 East Corridor

4.7.1 Within the East Corridor, fifteen parcels covering approximately 33.4ha were selected for archaeological geophysical survey during this phase of the archaeological evaluation, and of those, access was obtained at thirteen. Of these, two were only partially suitable, meaning that 27.3ha of survey was completed across thirteen parcels. The surveys have varying magnetic characters, with those grouped in the eastern side of the corridor being noisier and generally strongly enhanced, and those in the western part of the corridor having a more quiet magnetic environment. This arises from the differences in their underling soils, geology and local hydrology.

HCH10322, HCH13380, HGM5691, HGM5738, HCH10327

4.7.2 This HLC Area contains seven survey parcels, AOC ID 45 - 51. The results are shown in Figures 3.27 - 28 and 5.52 -5.56. The interpretation is shown in figures 4.27 -4.28 and 6.52 -6.56. These areas are part of a wide swathe of enclosed land between Agden in the south and Partington in the north. The parcels targeted for survey from two clusters, one in the north between Warburton and Altrincham, parcels 45 – 48, and one to the south just north of the Bridgewater Canal at Agden with the rest of this group.

4.7.3 The northern group of parcels have a noisy survey environment, with strong enhancement from more recent sub-surface features such as drains, and the current cultivation pattern. Against this, some earlier landscape features can be discerned, such as a former boundary, marked **GMg_022.** There are also possible paleochannels, **GMg_023**. In parcel 46, which is the only one in this cluster where it was possible to complete the whole parcel, there are a series of anomalies of uncertain origin, that perhaps form a linear grouping running east – west across the parcel, **GMg_024**. The strong enhancement overall in the parcel makes it difficult to offer a more precise interpretation, but it is possible these are archaeological in origin, though other causes cannot be ruled out.

4.7.4 The results in the southern cluster of parcels, 49 – 51 are dominated by a modern service which runs through the middle of the parcels and which has a strong halo which is masking weaker anomalies within around 60m of either side of the service itself. There are a group of positive anomalies of uncertain origin in the very north eastern edge of parcel 51, **GMg_025**. They are a series of elongated positive anomalies arranged in a slight curve, and almost certainly continue beyond the survey margin. One interpretation of them could be a segmented ditch of unknown date, but too little of their overall character and shape is captured within the survey area to be certain, hence their classification. There are also some linear trends in the same location as a track marked on historic maps, and some field drains visible despite the strong halo from the service.

HCH9208

4.7.5 This HLC Area contains one survey parcel, AOC ID 63. The results are shown in Figures 3.24 and 5.48. The interpretation is shown in figures 4.24 and 6.48. Parts of the survey area were too wet to be traversed during the period of this phase of the Project. The magnetic environment of this parcel is relatively quiet, with linear trends of uncertain origin and a spread of material in the centre of the area of equally unclear provenance. There are also isolated discrete positive anomalies. All of these may have an archaeological explanation, but there are other just as likely causes such as recent agricultural activity. It sits within the same general landscape area as those discussed immediately below.

HCH9360, HCH9440, HCH9442, HCH9445

4.7.6 This HLC Area contains six survey parcels, AOC ID 52 – 54, AOC ID 64, and AOC ID 69 - 70. They are part of a larger area of enclosed land between Sink Moss in the south west and the Bridgewater Canal in the north east. The results are shown in Figures 3.23 – 3.25 and 5.45 -5.51. The interpretation is shown in figures 4.23 - 4.25 and 6.45 -6.51. Much of parcel 64 was too wet for survey during the period of time for this phase of the Project. Those parts that could be surveyed were magnetically quiet, as was the general background of the other parcels in this group, which is probably a result of their low lying and rather wet position in the landscape. In the northern section of the area, along the southern side of the M56, the anomalies visible against this quiet but somewhat speckled background consist of ploughing trends and areas of magnetic disturbance from nearby infrastructure or topsoil debris most likely related to the road construction, with the exception of the uncertain anomalies in parcel 63, discussed directly above.

4.7.7 Further to the south, in parcel 54, the overall character of the background of the results is the same, but here effort has been made to drain the wetter ground, with an extensive network of drains clearly identifiable in the survey results. There is also a spread of material of uncertain origin in the centre of the parcel, and former field boundaries are present as weaker linear anomalies. The former boundaries constrain the drainage system, suggesting they are contemporary.

HCH9426

4.7.8 This HLC Area contains one survey parcel, AOC ID 68. The results are shown in Figures 3.22 and 5.44. The interpretation is shown in figures 4.22 -4.28 and 6.44. This area sits within an extensive swathe of agricultural land between Whitley and the M6 motorway. The results are dominated by a spread of magnetic debris in the topsoil in the western half of the parcel, presumably related to the construction of the M6, though there are linear trends visible within the noise. There is also a drain or service running parallel to Moss Lane at the eastern side of the parcel.

5. Conclusions

5.1 Synthetic Discussion of Results

5.1.1 The gradiometer surveys have overall been successful, despite a lack of anomalies that can be conclusively identified as archaeological in nature. In broad terms, it has been possible to recognise expected buried remains such as former field boundaries, extraction pits and other previously known features at their expected locations in the survey results. This suggests that the surveys are, reliable. It also suggests there are no substantial archaeological remains with magnetic contrasts that have gone unrecognised within the survey results.

5.1.2 However, it is clear that in a number of cases, the survey environment has not allowed for the identification of weaker or more ephemeral anomalies, or of potential features with little or no magnetic contrast with their surroundings. This is the risk of adopting a single method approach.

5.1.3 Broadly speaking, the anomalies of possible archaeological interest, historical provenance and those of uncertain origin reflect the baseline information contained within Wood Group UK Ltd (2022) relating to heritage, with possible enclosures and field systems predominant in the interpreted features. One point of interest is that many of the features interpreted as former extraction pits in the LiDAR record appear to be more spatially extensive than they appear in the LiDAR results. Another point of note is that while many of the cropmarks within areas covered by this phase of survey were visible as linear trends interpreted as ditches (of varying origin), not all of them could be identified, suggesting there are buried features present with moisture contrasts but without magnetic contrasts.

5.2 Evaluation of Magnetic Gradiometry as a Primary Prospection Tool

5.2.1 Despite the caveats raised in the preceding section, magnetic gradiometry has performed well as a large-scale prospection method, allowing the rapid evaluation of priority areas for the presence of buried remains.

5.3 Performance Against Survey Aims and Objectives

5.3.1 In assessing the results of the geophysical survey against the specific aims set out in Section 4:

- The survey has succeeded in locating, recording and characterising surviving sub-surface remains within the survey area, though more remains may be present that are not suitable for detection using magnetic methods;
- The survey will help in determining the next stage of works as it has provided evidence that remains of a possible archaeological or uncertain origin are most likely present in some parcels within the survey area and has provided a number of targets for further investigation; and

- The survey has resulted in a comprehensive report and archive.

5.3.2 This phase of the geophysical surveys was conducted over areas assessed as being of high archaeological potential, or with potential to examine key questions established in the North West England Regional Research Framework (NWERRF, 2021), specifically:

- the identification of previously unknown prehistoric sites (PH23); and
- establishing whether there is a hierarchy for later prehistoric lowland settlement (PH35).

5.3.3 In terms of the above NWERRF objectives, the survey results in conjunction with remote sensing assessments in earlier phases have identified possible enclosures of prehistoric date, and it is likely that further geophysical surveys in later phases will continue to identify remains of potential prehistoric date for further investigation, and through this better understand any settlement hierarchies in effect during this period.

6. Statement of Indemnity

6.1.1 Although the results and interpretation detailed in this report have been produced as accurately as possible, it should be noted that the conclusions offered are a subjective assessment of collected datasets.

6.1.2 The success of a geophysical survey in identifying archaeological remains can be heavily influenced by several factors, including geology, seasonality, field conditions and the properties of the features being detected. Therefore, the geophysical interpretation may only reveal certain archaeological features and not produce a complete plan of all the archaeological remains within a survey area.

7. Archive Deposition

7.1.1 In accordance with professional standard practice an online OASIS database record will be completed for submission to the HER and Archaeological Data Service (ADS) (**Annex 6E2**).

7.1.2 7.2 One digital and hard copy of the report and data will be submitted to the relevant Historic Environment Record (HER) at the Client's discretion.

7.1.3 7.3 A digital copy of the report and data will also be submitted to the ADS at the Client's discretion.

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Annex 6E1
Survey Metadata

Field	Description
Surveying company	AOC Archaeology Group
Data collection staff	Reed Haywood, Marguerite Hall, Kinnie Wade, Victoria Huggett
Client	WSP on behalf of Cadent Gas
Site name	HyNet North West Hydrogen Pipeline Project
County	Chester and Greater Manchester
NGR	n/a – extensive corridor survey
Land use/field condition	Mixed arable and pasture
Duration	November 2023 to February 2024
Weather	Varied but generally wet
Survey type	Gradiometer Survey
Instrumentation	601-2, Trimble R10 GNSS System
Area covered	148ha
Download software	MLGrad601
Processing software	Geomar, MultiGrad601 and TerraSurveyor
Visualisation software	ArcGIS Pro
Geology	Various (BGS, 2024)
Soils	Various (Soilscapes 2024)
Scheduled Monuments	NO
Known archaeology within survey area	Yes – see HyNet PEIR Technical Appendix 6A
Historical documentation/ mapping of survey area	Yes – see HyNet PEIR Technical Appendix 6A
Report title	Site Name, County: Archaeological Geophysical Survey
Project number	40593
Report author	Kayt Armstrong, Anna Chmielowska
Quality Checked by	Susan Ovenden

Annex 6E2
Archaeological Prospection Techniques, Instrumentation and Software Utilised

Gradiometer Survey

Gradiometer surveys measure small changes in the earth's magnetic field. Archaeological materials and activity can be detected by identifying changes to the magnetic values caused by the presence of weakly magnetised iron oxides in the soil (Aspinall *et al*. 2008: 23; Sharma 1997: 105). Human habitation often causes alterations to the magnetic properties of the soils and sediments present in the area (Aspinall *et al*. 2008: 21). There are two physical transformations that produce a significant contrast between the magnetic properties of archaeological features and the surrounding soil: the enhancement of magnetic susceptibility and thermoremanent magnetization (Aspinall *et al*. 2008: 21; Heron and Gaffney 1987: 72).

Ditches and pits can often be detected through gradiometer survey as the topsoil within and around settlements typically has a greater magnetisation than the subsoil, due to human activity. This enhanced material accumulates in cut features such as ditches and pits. Areas of burning or materials which have been subjected to heat commonly also have high magnetic signatures, such as hearths, kilns, fired clay and mudbricks (Clark 1996: 65; Lowe and Fogel 2010: 24).

It should be noted that negative anomalies can also be useful for characterising archaeological features. If the buried remains are composed of a material with a lower magnetisation compared to the surrounding soil, the feature in question will display a negative signature. For example, stone-built structures composed of sedimentary rocks that are less magnetic than the surrounding soils can appear as negative features within the dataset if the local soils and sediments are at all magnetised.

Ferrous objects – i.e. iron and its alloys - are strongly magnetic and are typically detected as high-value peaks in gradiometer survey data; small (in spatial terms) spikes are generally assumed to derive from ferrous material of recent origin (e.g. stray bits of farm equipment) in the topsoil, though archaeological sources cannot be ruled out. Broader dipolar anomalies and those with diagnostic characteristics of form will be assigned to other classifications based on their character, which might include archaeology, burning, modern ferrous or uncertain.

Bartington Non-Magnetic Cart Instrumentation and Software

AOC Archaeology's cart-based surveys are carried out using a Bartington Non-Magnetic Cart. The cart enables multiple traverses of data to be collected at the same time, increasing the speed at which surveys may be carried out and offers the benefits of reduced random measurement noise and rapid area coverage (Schmidt *et al.* 2015, 60-62; David *et al*. 2008, 21).

The cart uses a configuration of four Grad-01-1000L sensors mounted upon a carbon fibre frame along with two DL601 dataloggers and one BC601 battery cassette. The sensors are normally positioned at 1m intervals on a horizontal bar, with the datalogger taking readings every 12.5cm along each traverse, though this can be altered to increase / reduce resolution if required. The data is georeferenced via a Trimble R10 Real Time

Kinematic (RTK) VRS Now GNSS GPS which streams data throughout survey and allows the data to be recorded relative to a WGS1984 UTM coordinate system.

The gradiometer data is collected through Geomar MLGrad601 software on a laptop in real-time during the survey. The data is downloaded and converted into a .xyz file in Geomar MultiGrad601 before being processed along with the GPS data in TerraSurveyor v3.0.34.10 (see Appendix 3 for a summary of the processes used in TerraSurveyor to create final data plots).

Annex 6E3
Summary of Data Processing

Process	Effect
Clip	Limits data values to within a specified range
De-spike	Removes small spatial scale exceptionally high readings in the data. In resistivity survey, these can be caused by poor contact of the mobile probes with the ground. In gradiometer survey, these can be caused by highly magnetic items such as buried modern ferrous objects.
De-stagger	Corrects a misalignment of data when the survey is conducted in a zig-zag traverse pattern.
Discard Overlap (TerraSurveyor)	Removes datapoints which occur too closely together and can cause digital artefacts in the data which are caused by the overlapping of parallel traverses.
Edge Match	Counteracts edge effects in grid composites by subtracting the difference between mean values in the two lines either side of the grid edge from one of the grids.
Filter (MAGNETO)	Much like a zero-mean traverse, it resets the median value of each point to zero, in order to address the effect of striping in the data and counteract edge effects. In MAGNETO, the individual values take into account the value of all uncorrected points within a certain distance to create its own median.
GPS Filter (MAGNETO)	Used to either remove or reduce the appearance of constant and reoccurring features that are not consistent with the GPS signal in use by the cart system.
High pass filter	Removes low-frequency, large spatial scale variance in order to remove background trends in the data, such as variations in geology.
Interpolate	Increases the resolution of a survey by interpolating new values between surveyed data points, creating a smoother overall effect.
Low Pass filter	Uses a Gaussian filter to remove high-frequency, small spatial scale variance, typically for smoothing the data.

Process	Effect
Periodic Filter	Used to either remove or reduce the appearance of constant and reoccurring features that distort other anomalies, such as recent plough lines.
Remove Turns (TerraSurveyor)	Uses analysis of the direction of travel derived from the GNSS data to break continuous streams of data into individual traverses.
Zero Mean Grid	Resets the mean value of each grid to zero, in order to counteract grid edge discontinuities in composite assemblies.
Zero Mean Traverse	Resets the mean value of each traverse to zero, in order to address the effect of striping in the data and counteract edge effects.

Processing Steps

Process	Settings
Base Settings	Interval 0.121m, Track Radius 1.06m
Remove Turns	Threshold Angle 90°, Cut Length 5m
Discard Overlap	Threshold Distance 0.4m, Minimum Track 5, Newest
Despike	Mean Diameter 3 Threshold 12
Destripe	Mean Traverse SD 1.5
High Pass Filter	Uniform (Median) 12
Clip	-30/30

Annex 6E4
Technical Terminology

Type of Anomaly	Description of Type/Class and rationale for interpretation
Anomaly	Usually linear / curvilinear / rectilinear / discrete anomalies characterised by a sharp-edged increase or decrease in values compared to the magnetic background. Some interpretation classes may have more gradual transitions in magnetic character- this is used as part of the classification process.
Spread	Spreads of enhanced material refer to diffuse areas of altered magnetic character, which suggest a localised spread of material with a magnetic contrast within the topsoil or ploughzone or a generalised enhancement of the magnetic properties over a specific area. These anomalies do not have the high dipolar response characteristic of ferrous material anomaly unless specifically classified as a spread of ferrous debris.
Linear Trend	Linear trends are less distinct and are typically visible as linear patterning in the overall texture of the data. A common example of these is the striping effect caused by recent ploughing.
Class of Anomaly	**Description**
Probable Archaeology	Interpretation is supported by the presence of known archaeological remains or by other forms of evidence such as HER records, LiDAR data or cropmarks identified through aerial photography. OR the data contains diagnostic anomalies in terms of character or morphology which allow a secure interpretation. Anomalies typically have well defined edges with abrupt transitions indicative of cut features with magnetically enhanced fills, such as ditches. Discrete anomalies will be checked on XY traces for their magnetic character; discrete anomalies in this class likely to be cut features such as pits; anomalies indicating high temperature processes will alternatively be classified as 'burned area' - see below. Ferrous material creates distinct 'spikes' and is classified as such.
Possible Archaeology	Anomalies are interpreted as likely to have an archaeological origin, though other explanations are also possible, but less likely. Anomalies typically have well defined edges with abrupt transitions indicative of cut features with magnetically enhanced fills, such as ditches. Discrete anomalies checked on XY traces; discrete anomalies in this class likely to be cut features such as pits; anomalies indicating high temperature processes classified as 'burned area' - see below.
Burned Area	An anomaly with a form on the XY trace plot that is characteristic of high temperature activity such as a kiln or hearth. Should be considered as possible archaeology and should be assigned an anomaly number if a more specific interpretation is possible based on the anomaly characteristics (for example, a clear kiln) so that this can be discussed in text.

Type of Anomaly	Description of Type/Class and rationale for interpretation
Historical Features	Features observed on historical mapping that correspond with anomalies in the data. Linear anomalies caused by removed field boundaries often exhibit distinct characteristics related to the removal process. Areas of enhanced magnetism in this class could relate to former buildings, trackways, quarries or ponds and their nature should be clarified with the use of anomaly numbers and discussion in the results section.
Unclear Origin	These anomalies are (often) magnetically weak and discontinuous or isolated making their context difficult to ascertain. OR they are indistinct for other reasons such as magnetic disturbance in their vicinity. Anomalies in this category have no more likely explanation than another, so whilst an archaeological origin is possible, an agricultural, geological, or modern origin is also equally likely.
Agricultural	Anomalies associated with agricultural activity, either historical (unless shown on a map, then classed as a historical feature) or modern. Usually, this interpretation is arrived at due to on the ground observations of (for example) ploughing, access tracks and the like, or from observation of recent aerial images of the survey area. Recent ploughing is shown as a dashed line and Ridge and Furrow ploughing is shown as a solid line.
Ridge and Furrow / Rig and Furrow	A series of regular linear or slightly curvilinear anomalies which are broad and usually have diffuse edges, either composed of an increased or decreased magnetic response compared to background values. Wide regular spacing between the anomalies is consistent with that of a ridge and furrow / rig and furrow ploughing regime, and the regime may also have a degree of sinuosity characteristic of certain types of ridge and furrow cultivation. Often, multiple directions will be present, with distinct headlands in between. The pattern might follow the general landscape organisation, or it may radically differ from it, depending on the local sequence of inclosure. The anomalies often present as a positive ‘ridge’ anomaly adjacent to a negative ‘furrow’ anomaly.
Ploughing Trends	A series of regular linear anomalies or changes in the texture of the survey data, either composed of an increased or decreased magnetic response compared to background values. Anomalies seen parallel to field edges are representative of headlands caused by ploughing.
Drains	A series of magnetic linear anomalies (often with a characteristic alternating positive-negative pattern, which indicates a ceramic drain) of an indeterminate date, usually with a regular dendritic or herringbone patterning which reflects the topography of the survey area.
Geology / Natural	An area of enhanced magnetism that is composed of irregular (usually) weak increases or decreases in magnetic values, frequently with gradual transitions in character, compared with background readings. These are likely to indicate natural variations in soil composition or reflect variations in the bedrock or superficial geology. In areas where

Type of Anomaly	Description of Type/Class and rationale for interpretation
	former water courses were present, paleochannels may present as distinct curving and banded or braided linear anomalies.
Service	Strong linear anomalies often composed of contrasting high positive and negative dipolar values, with a halo of magnetic disturbance extending from the causative body. Such anomalies are characteristic of below-ground services.
Magnetic Disturbance	A zone of strong magnetic response (usually alternating between positive and negative with abrupt transitions) that has been caused by modern infrastructure or ferrous material within or adjacent to the survey area, such as metallic boundary fencing, gateways. The magnetic haloes around services and changes in the background texture of the data resulting from overhead power lines also fall into this class. These haloes are strong enough to obscure other anomalies (including those of possible archaeological interest) in the area they affect.
Ferrous Anomalies / Ferrous (iron spikes) and ferrous or debris spreads	A response caused by ferrous materials on the ground surface or within the subsoil, which causes a strong but localised dipolar response in the data. These generally represent modern material often re-deposited during manuring, rubbish at field edges and spreads of debris or building material used to surface tracks or left behind following demolition. Distinct from magnetic disturbance, these anomalies relate to material at their spatial location, rather than an effect occurring at a distance from the material responsible.

Annex 6E5 Plates

Plate 1: Field 3 1
Plate 2: Field 4 2
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Appendix 5: Plates



Plate 1: Field 3



Plate 2: Field 4



Plate 3: Field 12



Plate 4: Field 13



Plate 5: Field 14



Plate 6: Field 15 unsurveyable area



Plate 7: Field 15



Plate 8: Field 18



Plate 9: Field 19



Plate 10: Field 20



Plate 11: Field 23



Plate 12: Field 24



Plate 13: Field 26



Plate 14: Plate 28



Plate 15: Field 31



Plate 16: Field 33



Plate 17: Field 34



Plate 18: Field 35



Plate 19: Field 36



Plate 20: Field 37



Plate 21: Field 38



Plate 22: Field 39



Plate 23: Field 41



Plate 24: Field 42



Plate 25: Field 43



Plate 26: Field 44



Plate 27: Field 45



Plate 28: Field 46



Plate 29: Field 51



Plate 30: Field 54



Plate 31: Field 55



Plate 32: Field 60



Plate 33: Field 62



Plate 34: Field 63



Plate 35: Field 64



Plate 36: Field 67



Plate 37: Field 68



Plate 38: Field 69



Plate 39: Field 70

Annex 6E6 Figures

Figure 1	Site Location	
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Figure 4.1 – 4.28	Interpretation of Processed Gradiometer Data – Overview	1:3000
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Figure 6.1 – 6.56	Interpretation of Processed Gradiometer Data – Detail	1:1200
Figure 7.1 – 7.56	Minimally Processed Gradiometer Data – XY Trace	1:1200

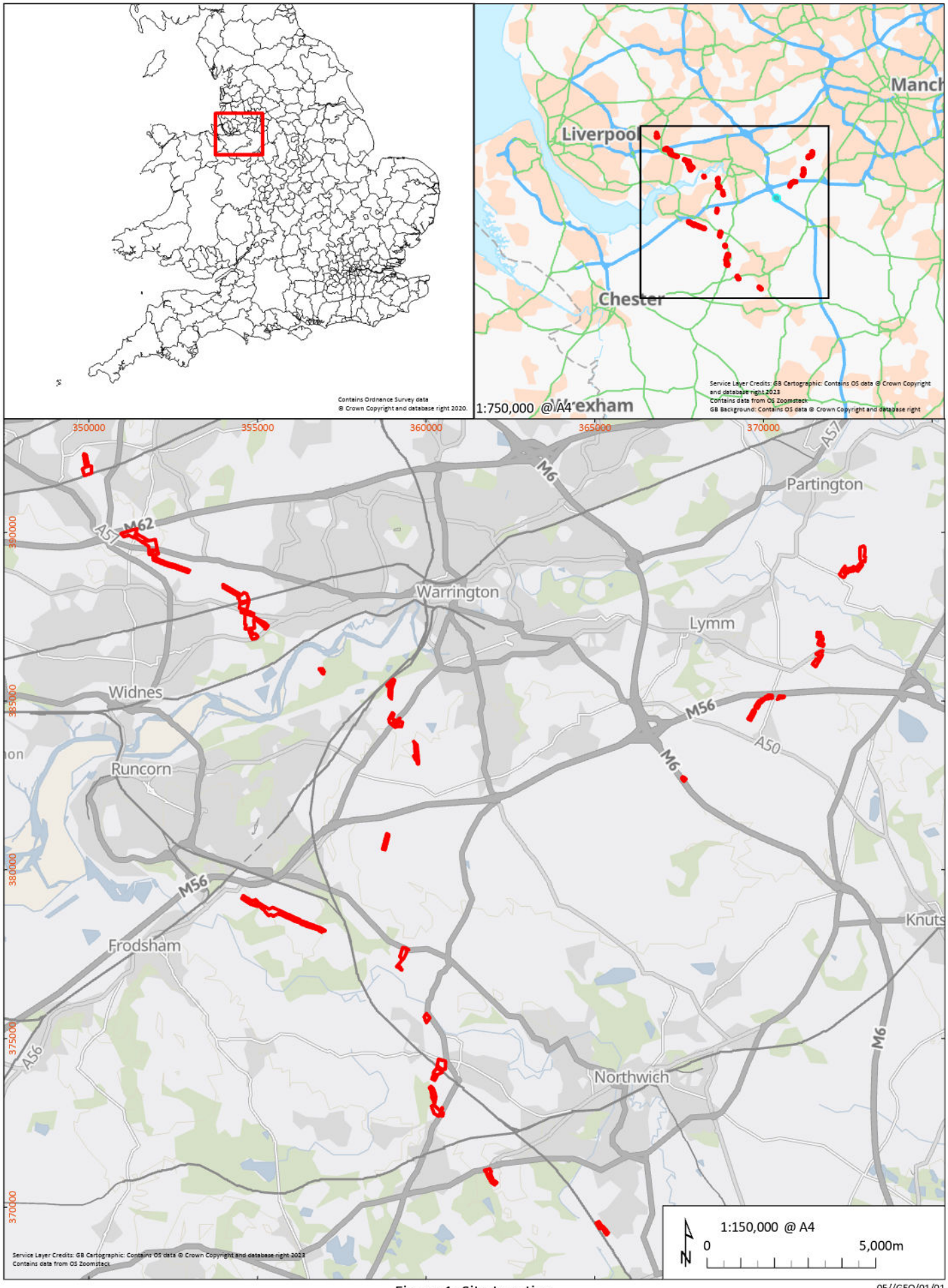
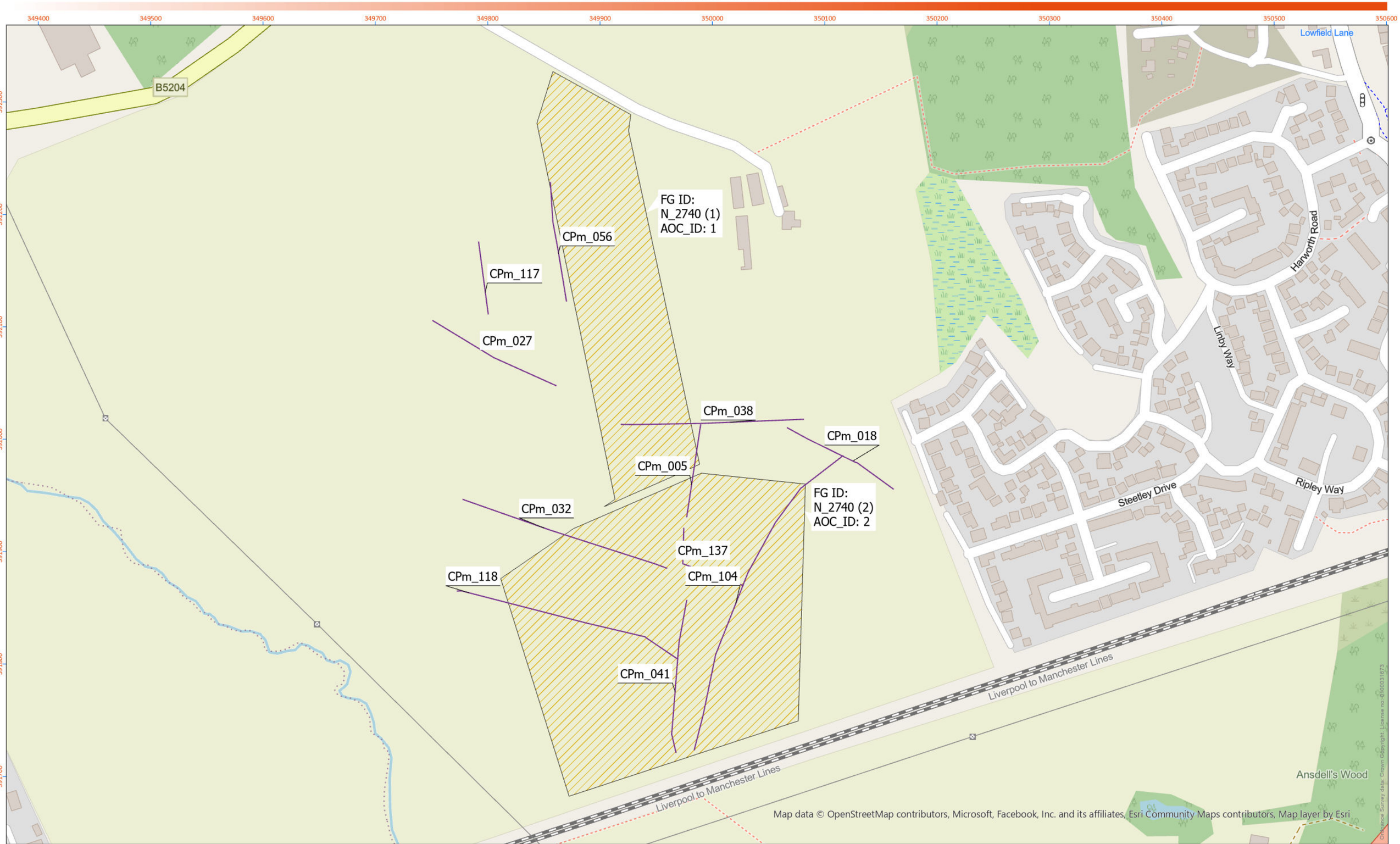


Figure 1: Site Location

05//GEO/01/01



Survey Areas

Figure 2.1

- No Access
- Cropmarks
- LiDAR Features



N

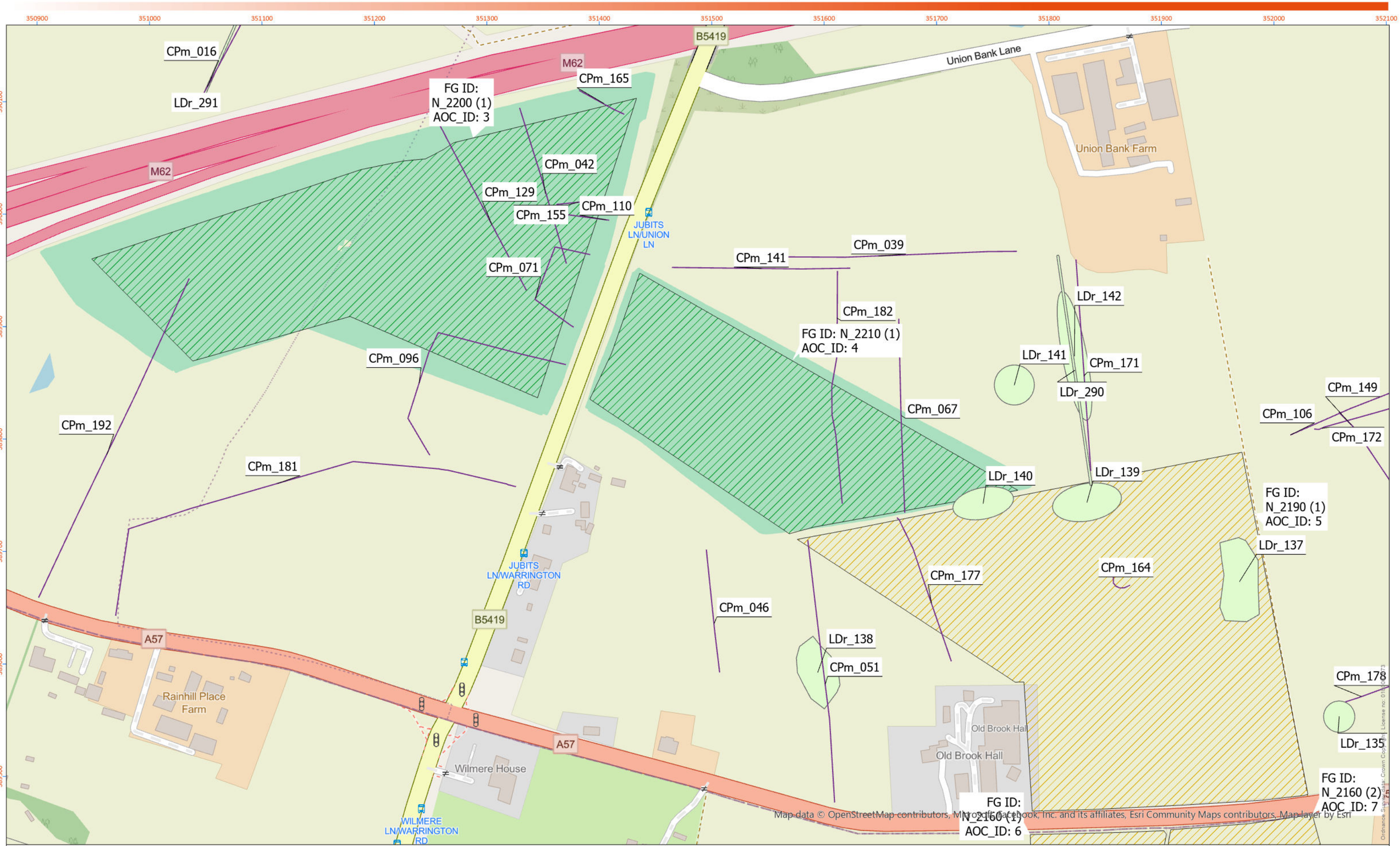
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Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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Survey Areas

Figure 2.2

No Access
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

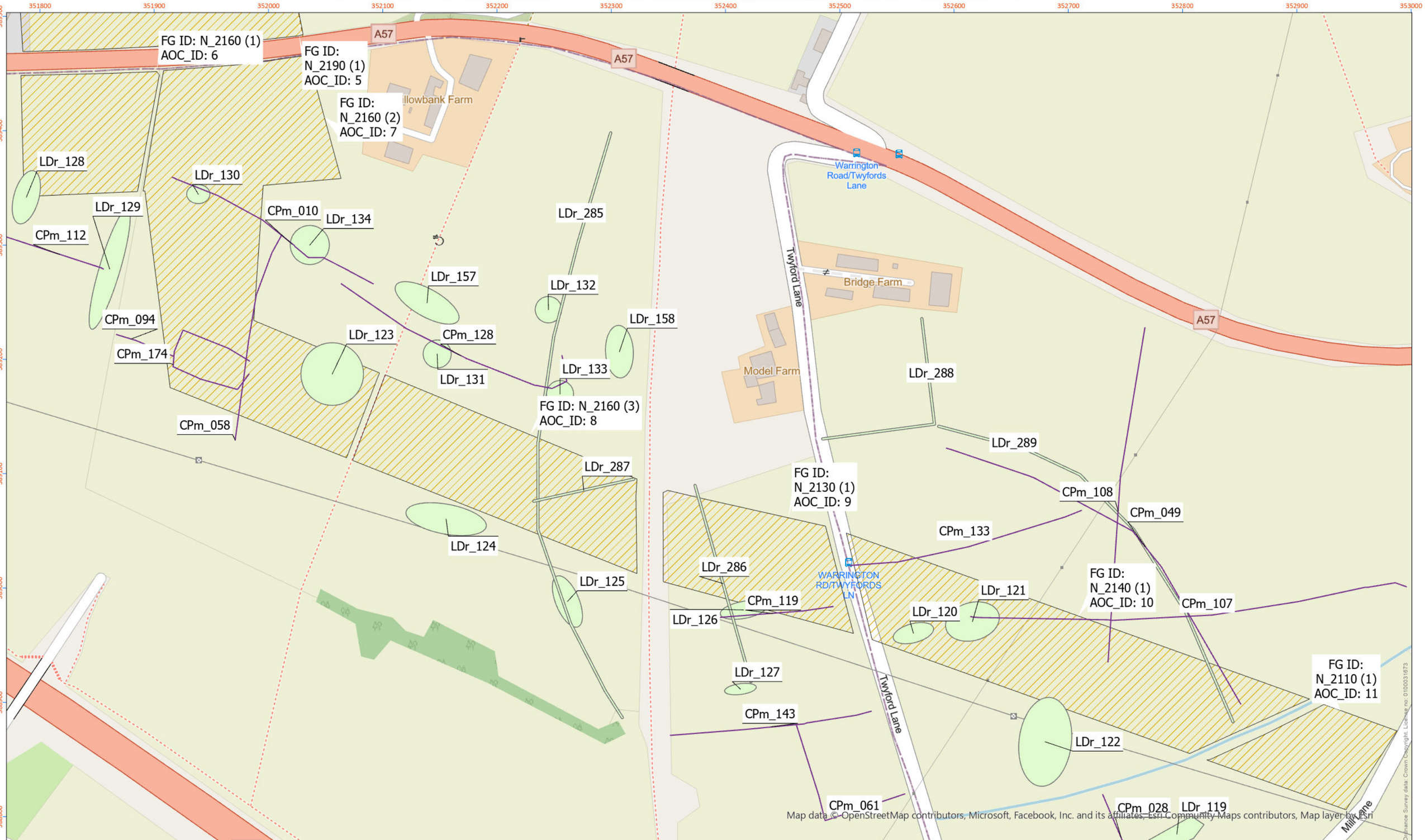
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Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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Survey Areas

Figure 2.3

- No Access
- Cropmarks
- LiDAR Features



N

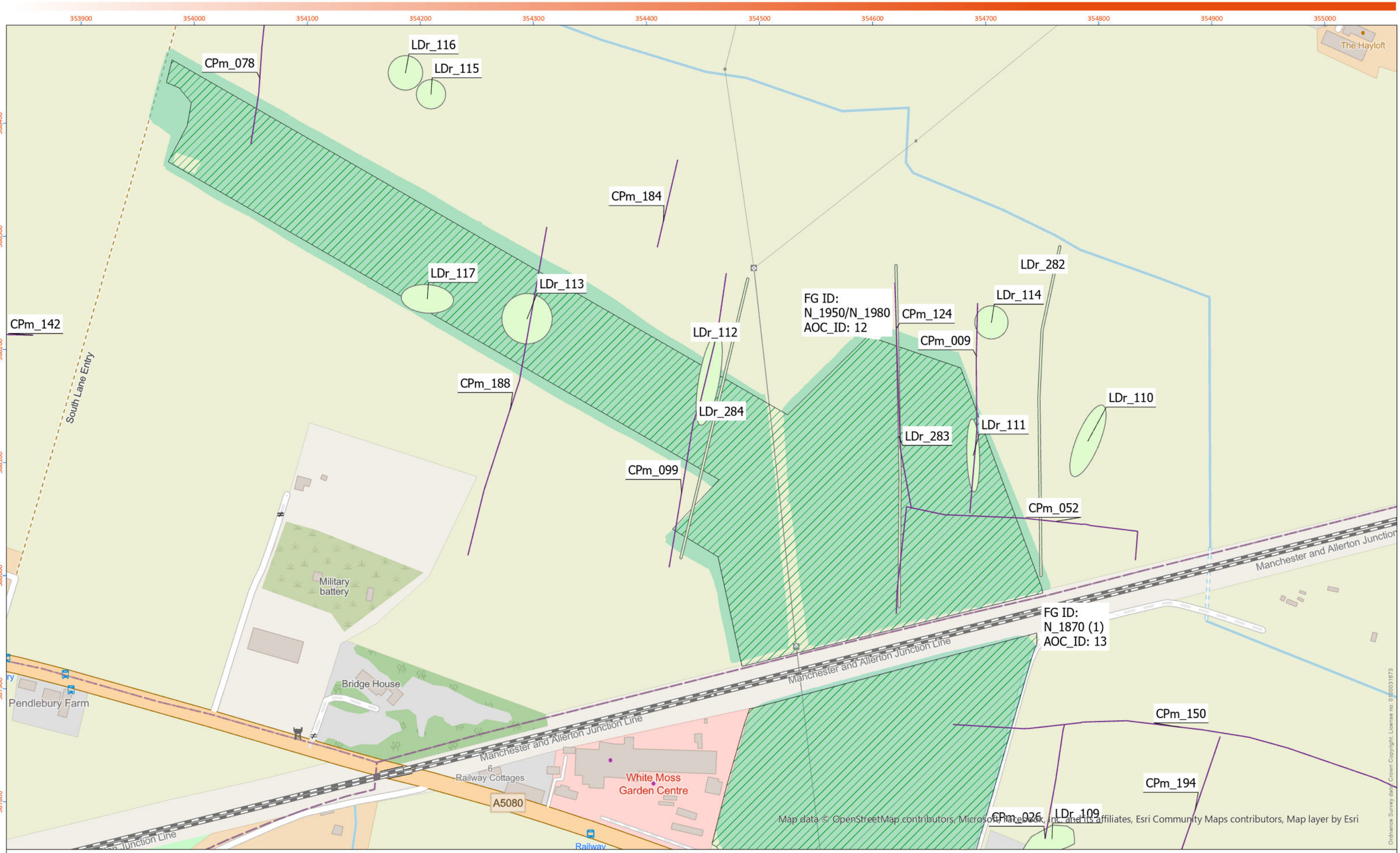
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Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

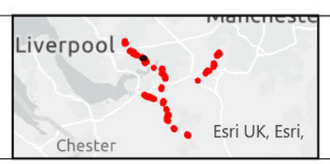
Delivering clean growth



Survey Areas

Figure 2.4

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.4/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354400 354500 354600 354700 354800 354900 355000 355100 355200 355300 355400

387900 387800 387700 387600 387500 387400 387300 387200

Manchester and Allerton Junction Line
6 Railway Cottages
White Moss Garden Centre
A5080
Railway Cottages
FG ID: N_1870 (1) AOC_ID: 13
CPm_150
CPm_026
LDr_109
CPm_194
LDr_108
FG ID: N_1710 (1) AOC_ID: 14
A5080
A5080
Oak Trees
A5080
Farnworth Road
A5080
Perch Pit
Penketh Brook
Penketh Brook
Brook Farm
LDr_107
CPm_083
FG ID: N_1710 (2) AOC_ID: 15
LDr_103
LDr_102
LDr_180
Doe Green
Cuerdley Road
LDr_182
LDr_183
LDr_184
LDr_177
LDr_104
LDr_101
LDr_105
LDr_178
LDr_106
LDr_181
FG ID: N_1876 AOC_ID: 44
CPm_064
LDr_179
LDr_100
CPm_063
Fowl Farm

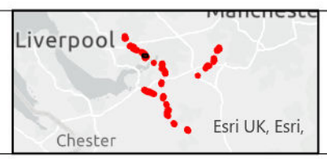
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Survey Areas

Figure 2.5

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

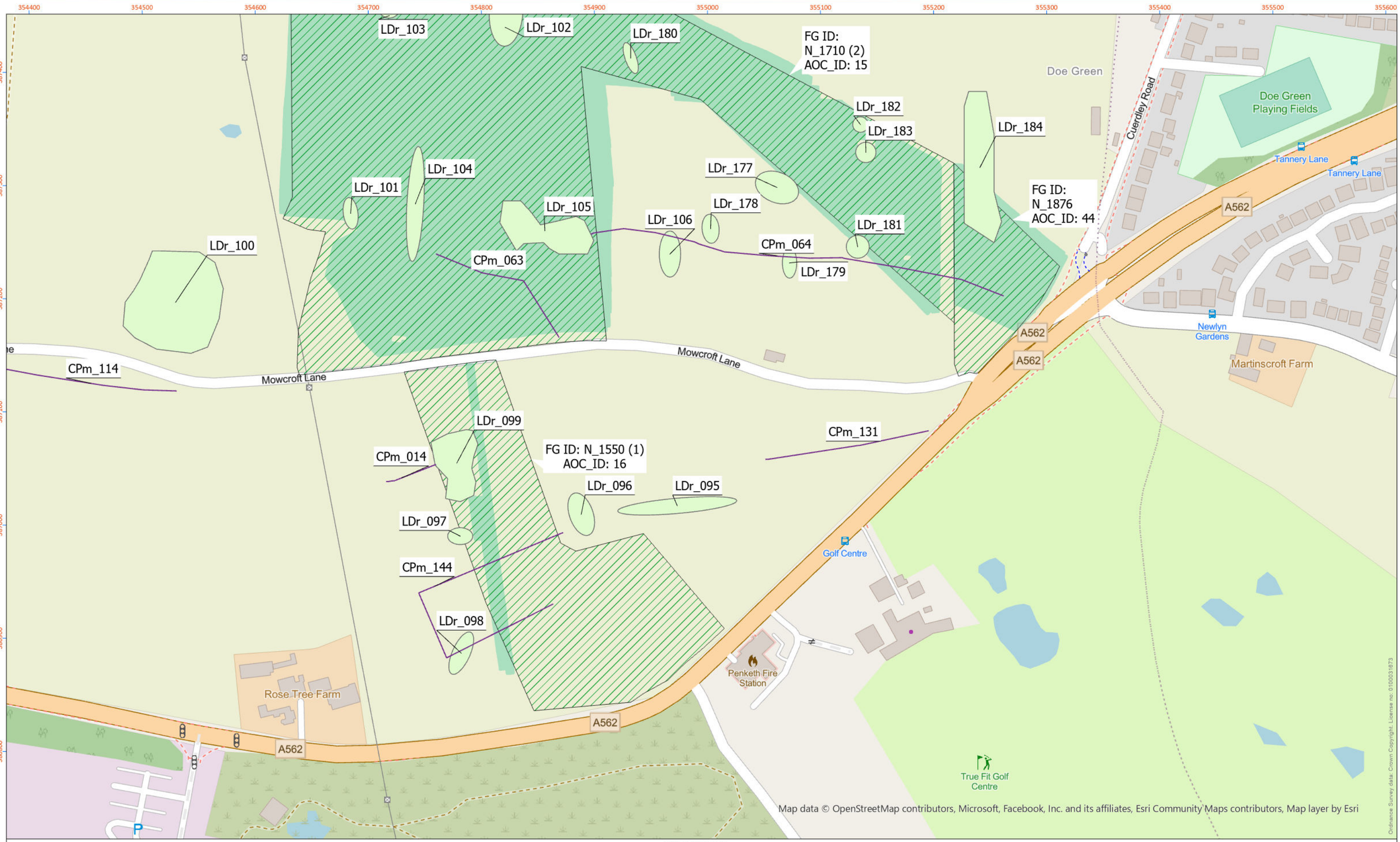
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.5/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

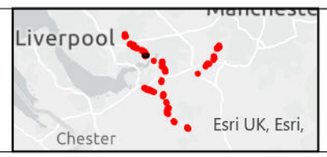
Delivering clean growth



Survey Areas

Figure 2.6

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

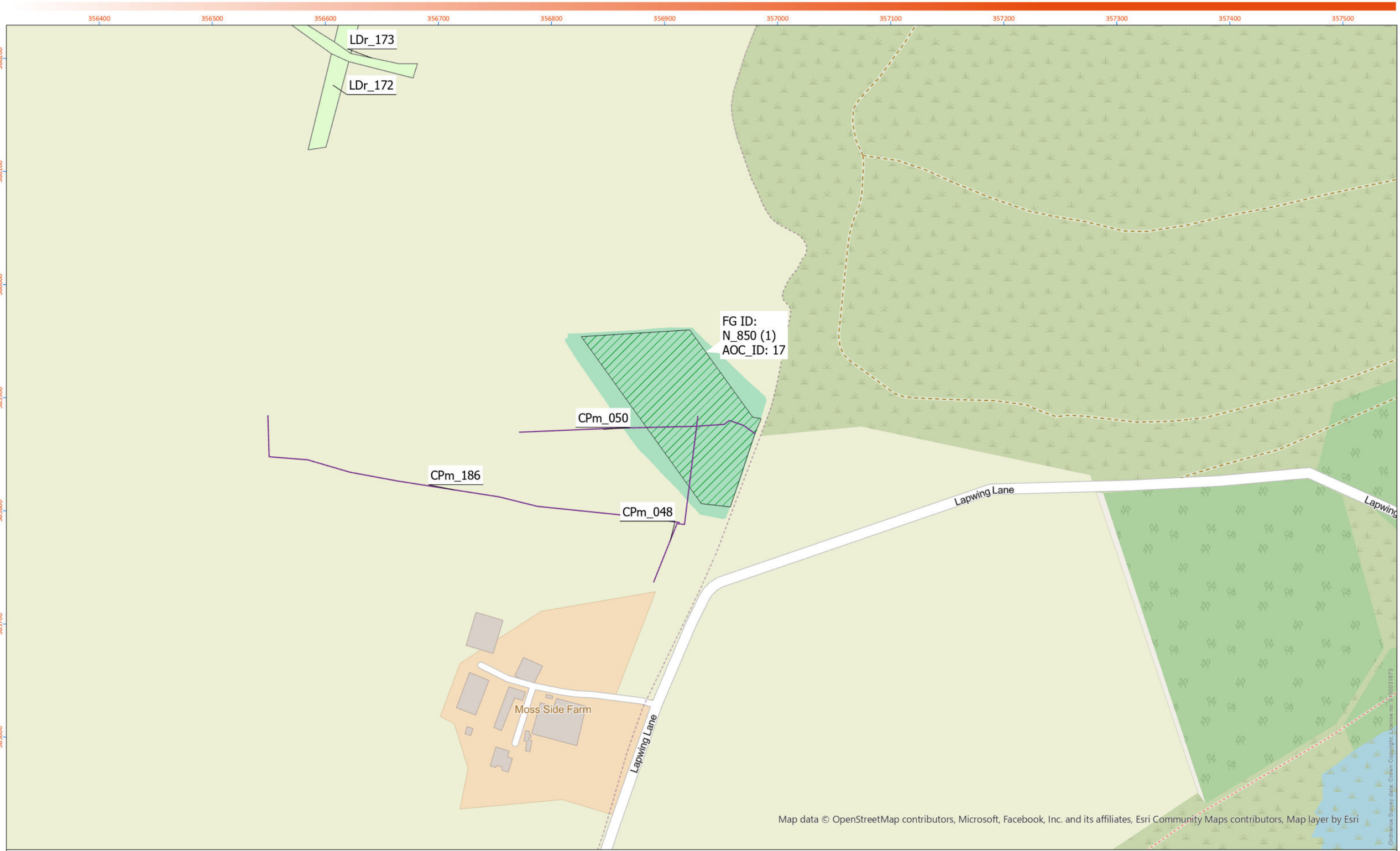
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.6/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Survey Areas

Figure 2.7

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

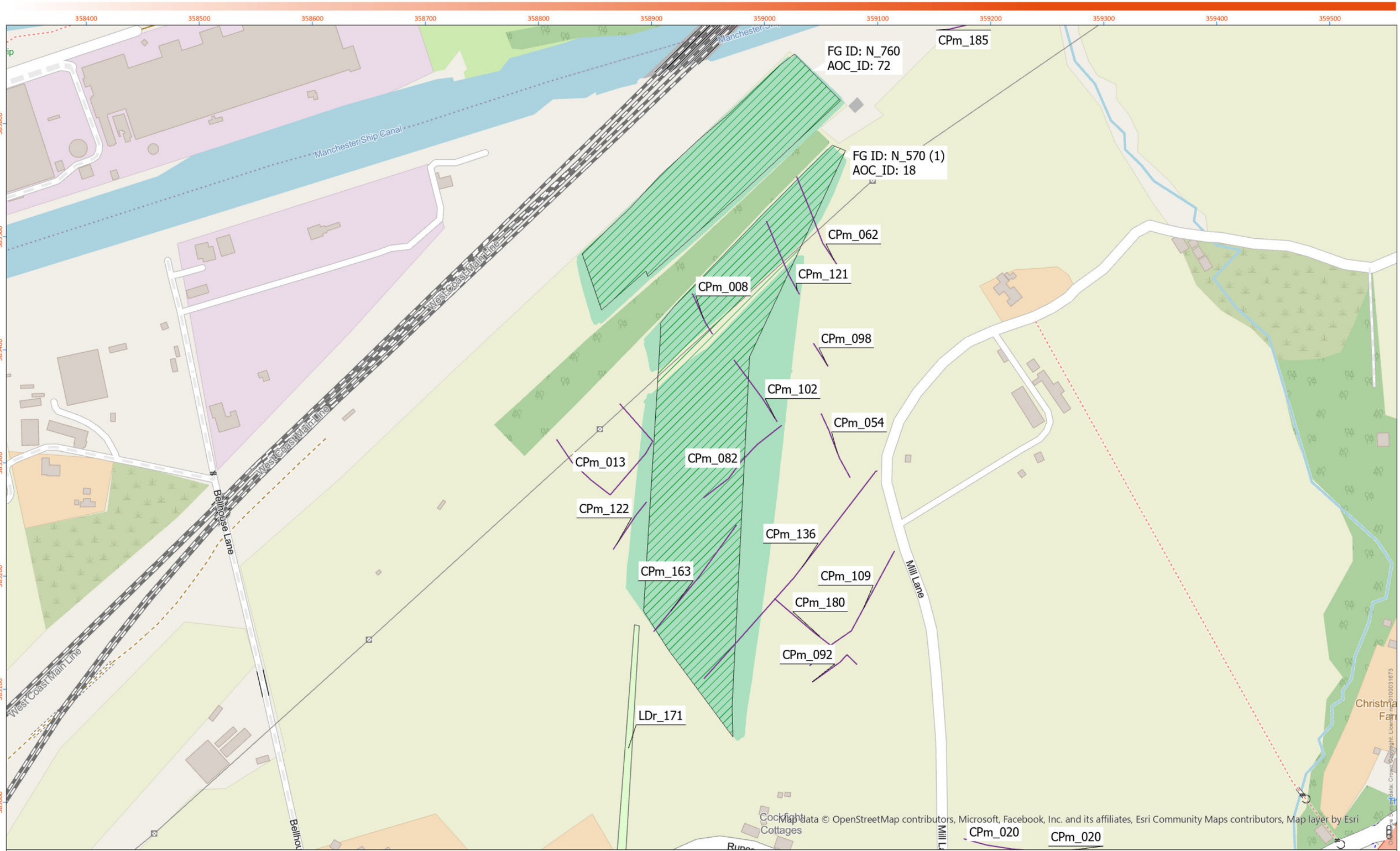
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.7/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

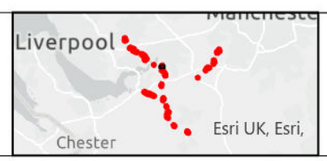
Delivering clean growth



Survey Areas

Figure 2.8

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

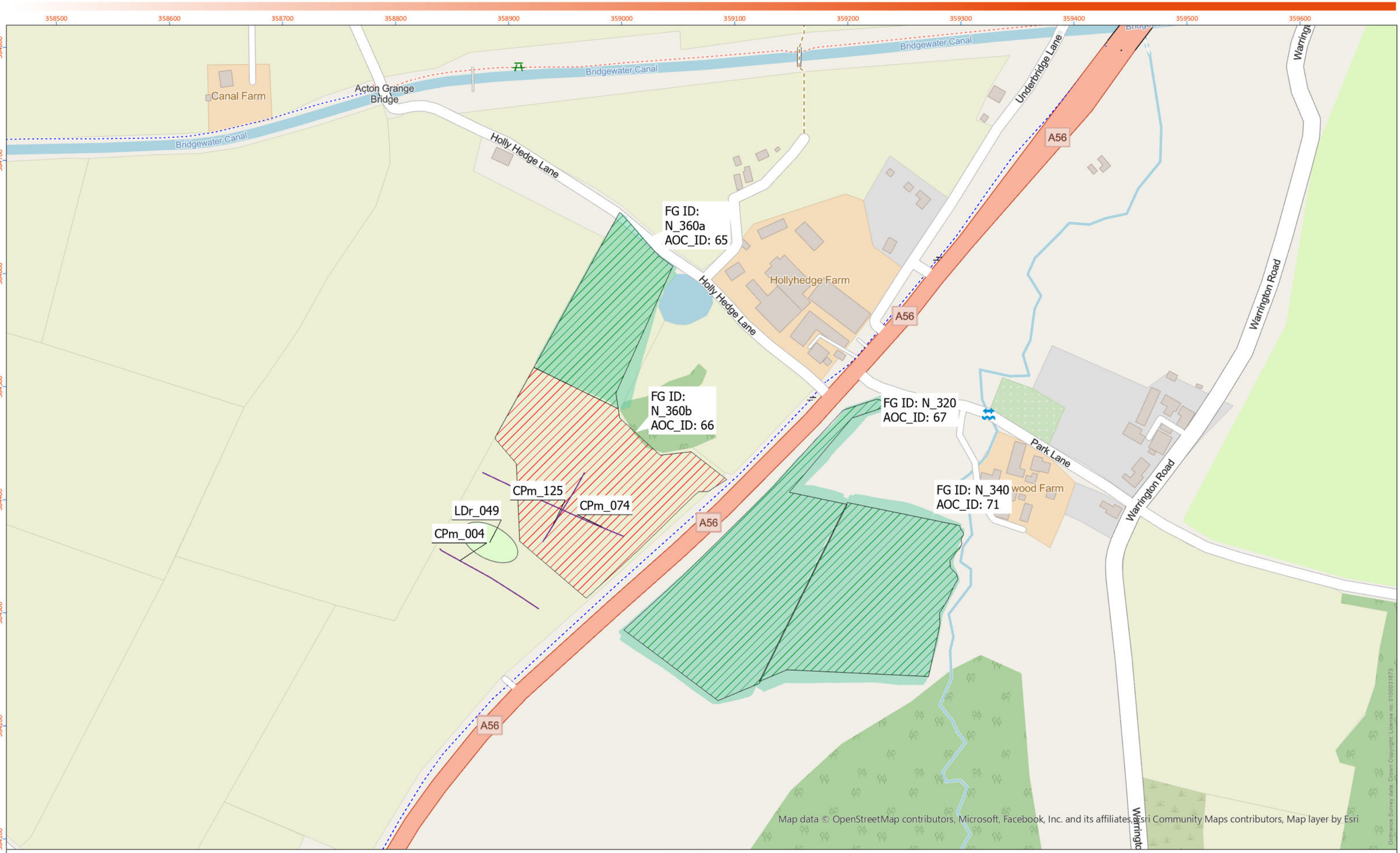
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.8/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Survey Areas

Figure 2.9

Unsuitable
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.9/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359200 359300 359400 359500 359600 359700 359800 359900 360000 360100 360200 360300

383800 383700 383600 383500 383400 383300 383200

CPm_147

FG ID:
N_347 (2)
AOC_ID: 20

Warrington Road

FG ID:
N_347 (1)
AOC_ID: 19

CPm_148

CPm_176

Hatton Lodge

CPm_029

CPm_151

Hurst Farm

Warrington Road

FG ID: N_289 (1)
AOC_ID: 21

CPm_111

CPm_126

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Survey Areas

Figure 2.10

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

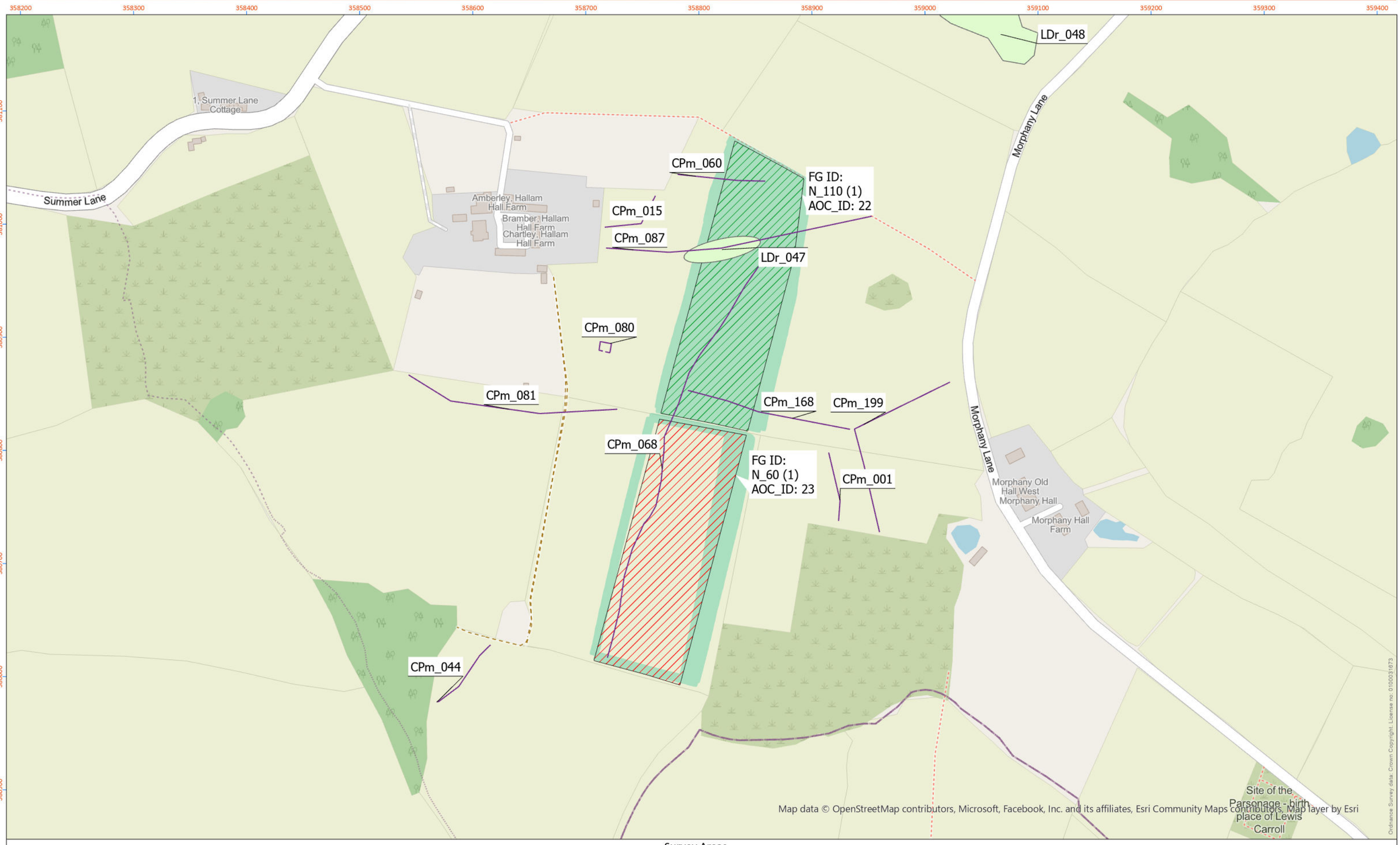
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.10/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

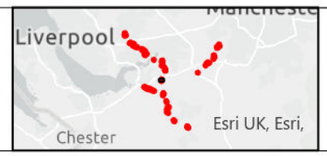
Delivering clean growth



Survey Areas

Figure 2.11

Unsuitable
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.11/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354400 354500 354600 354700 354800 354900 355000 355100 355200 355300 355400

379300 379200 379100 379000 378900 378800 378700

Heatherdene
Lark Rise
Maple Knoll
Willow House
Rose Mount
The Vicarage
Aston Lane
Sutton Hall Golf Club
Sutton Hall
Farm
Wood

CPm_158
FG ID: W_695 (1) AOC_ID: 37
FG ID: W_410 (3) AOC_ID: 35
CPm_043
FG ID: W_410 (2) AOC_ID: 33
FG ID: W_410 (1) AOC_ID: 32
LDr_005
CPm_025
CPm_154
CPm_135
CPm_065
CPm_197
CPm_120
FG ID: W_695 (1) AOC_ID: 36
FG ID: W_360 (2) AOC_ID: 34
LDr_168

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Survey Areas

Figure 2.12

No Access
Partial
Completed
Actual Survey Extent
Cropmarks
LiDAR Features

Liverpool
Chester
Esri UK, Esri,

N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.12/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

355100 355200 355300 355400 355500 355600 355700 355800 355900 356000 356100 356200

379000 378900 378800 378700 378600 378500 378400

FG ID: W_410 (2) AOC_ID: 33

FG ID: W_410 (1) AOC_ID: 32

FG ID: W_695 (1) AOC_ID: 36

FG ID: W_360 (2) AOC_ID: 34

LDr_168

LDr_167

LDr_169

FG ID: W_360 (1) AOC_ID: 31

LDr_170

LDr_300

LDr_301

FG ID: W_330 (1) AOC_ID: 30

CPm_088

CPm_160

Aston Heath Cottage

Aston Lane

Kidney Plantation

Chapel Wood

Aston by Sutton Primary School

St. Peters Church

Aston, Aston Lane / War Memorial

Aston Gardens

The Bungalow

Aston

2 Smithy Cottage

West Barn

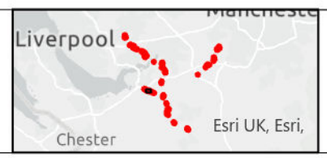
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Survey Areas

Figure 2.13

No Access
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

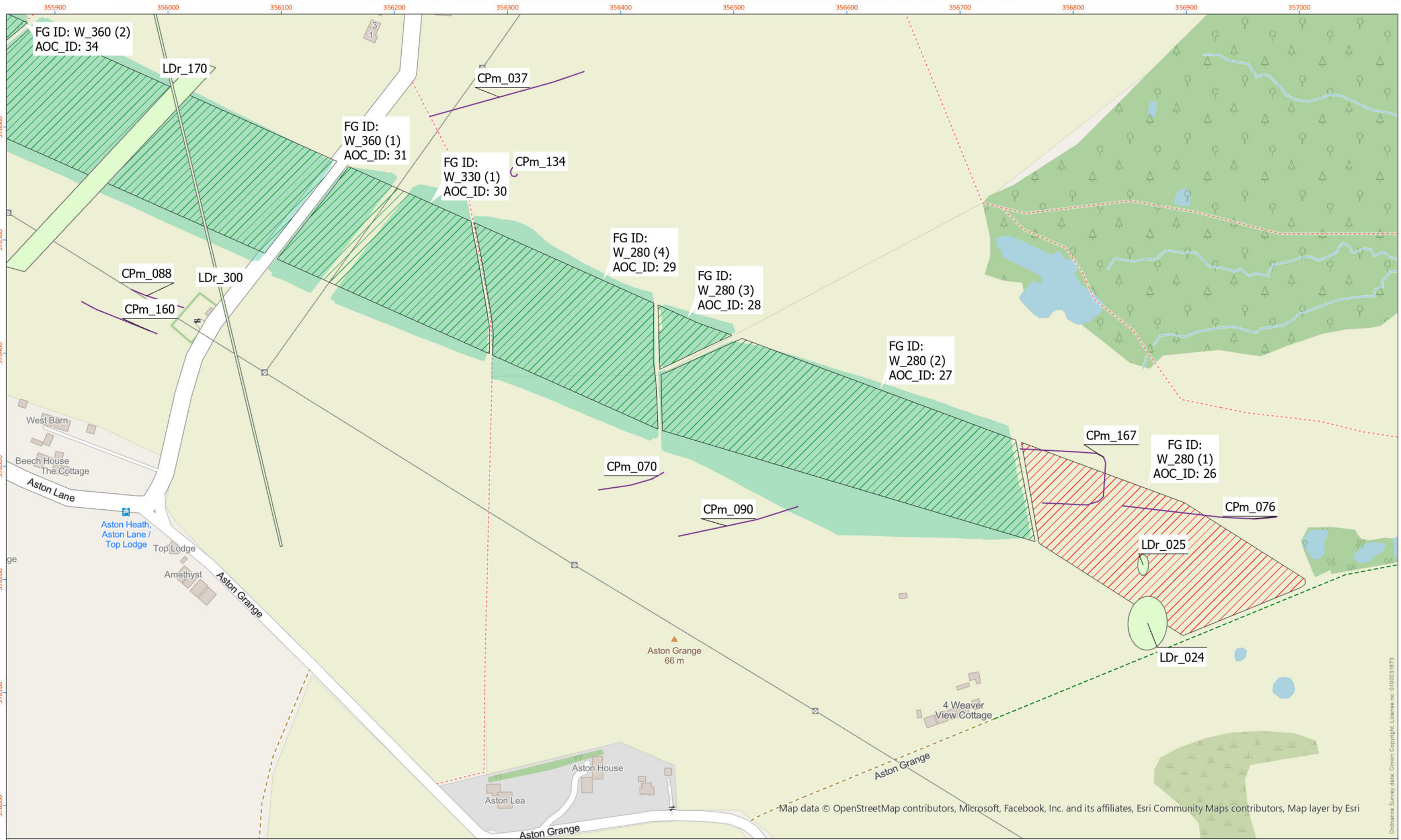
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.13/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Survey Areas

Figure 2.14

Unsuitable
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.14/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358700 358800 358900 359000 359100 359200 359300 359400 359500 359600 359700 359800 359900

377700 377600 377500 377400 377300 377200 377100 377000

Garden Wood
Garden Wood
Trent and Mersey Canal
A533
A533
FG ID:
SA_290 (1)
AOC_ID: 24
Woodside Farm
Dutton Hall
CPm_059
CPm_073
CPm_145
LDr_298
LDr_268
LDr_008
LDr_009
LDr_023
LDr_238
CPm_095
FG ID:
SA_290 (1)
AOC_ID: 25
FG ID:
W_20/W_21
AOC_ID: 43
Trent and Mersey Canal
LDr_020
LDr_022
LDr_021
CPm_084
CPm_021
CPm_093
CPm_057
CPm_017
CPm_055
CPm_066
Dutton Sluice
Hydro
River Weaver
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Survey Areas

Figure 2.15

Completed
Actual Survey Extent
Cropmarks
LiDAR Features

Liverpool
Chester
Esri UK, Esri,

N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.15/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359500 359600 359700 359800 359900 360000 360100 360200 360300 360400 360500 360600

375900 375800 375700 375600 375500 375400 375300

Bancroft
Cliff Road
Acton Lane
Willow Green Lane
River Weaver
Weaver Navigation
A49
Strawberry Lane

Acton Bridge, Acton Lane / Warrington Road
Weaver Valley Cruises
Acton Bridge, Warrington Road / Riverside Inn
Riverside Inn
Acton Bridge, Cliff Road / Hall Green Farm
Acton Bridge, Hill Top Road / Cliff Road
Woodbine Caravan Park
Acton Bridge, Warrington Road / Dingley Dell

FG ID:
SA_760 (1)
AOC_ID: 38

CPm_130
CPm_003
CPm_139
CPm_146
CPm_161
CPm_166
CPm_138
CPm_170

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Survey Areas

Figure 2.16

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

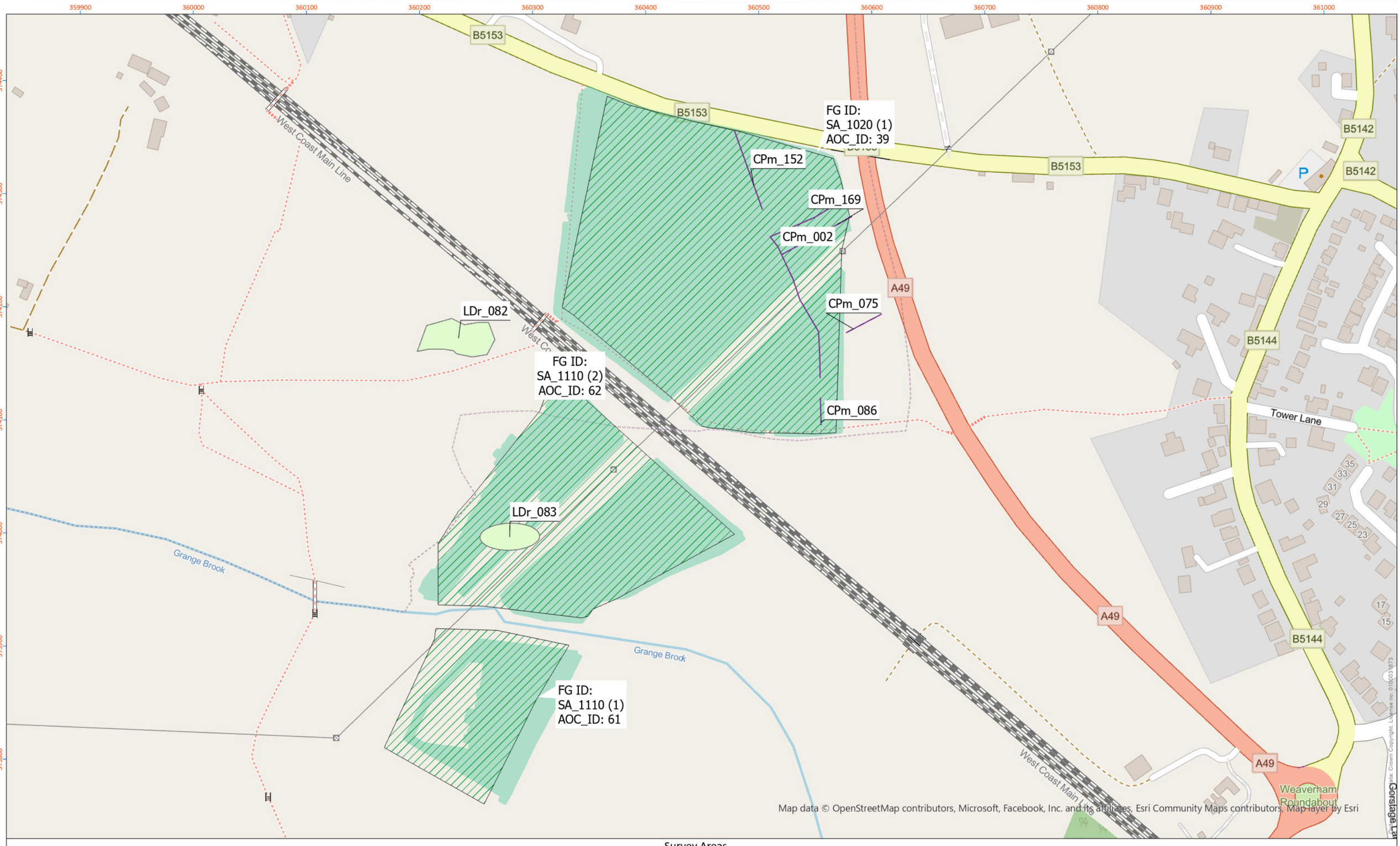
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.16/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

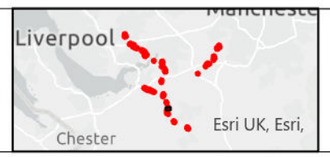
Delivering clean growth



Survey Areas

Figure 2.17

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.17/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359800 359900 360000 360100 360200 360300 360400 360500 360600 360700 360800 360900 361000

373700 373600 373500 373400 373300 373200 373100

FG ID:
SA_1190 (1)
AOC_ID: 60

FG ID:
SA_1260 (1)
AOC_ID: 58

FG ID:
SA_1260 (1)
AOC_ID: 59

FG ID:
SA_1330 (1)
AOC_ID: 40

Hefferston Grange Drive
Hefferston Hall
Weaverham, Hefferston Rise / Hefferston Grange
Grange Brook
Grange Lane
Grange Lane
Grange Lane
A49
A49
A49
West Coast M
Handforth

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Survey Areas

Figure 2.18

Completed
Actual Survey Extent
Cropmarks
LiDAR Features

Liverpool
Chester
Esri UK, Esri,

N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.18/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

FG ID:
SA_1260 (1)
AOC_ID: 59

LDr_274

LDr_276

FG ID:
SA_1330 (1)
AOC_ID: 40

LDr_275

CPm_189

LDr_084

LDr_085

LDr_273

FG ID:
SA_1350 (1)
AOC_ID: 57

LDr_086

LDr_087

Grange Lane

A49

Gorstage Lane

Bag Lane

Cuddington Brook

Millington Lane

Bryn Smithy

Cuddington Lane

The Oaklands Hotel

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Survey Areas

Figure 2.19

No Access
Completed
Actual Survey Extent
Cropmarks
LiDAR Features

Liverpool
Chester
Esri UK, Esri,

N

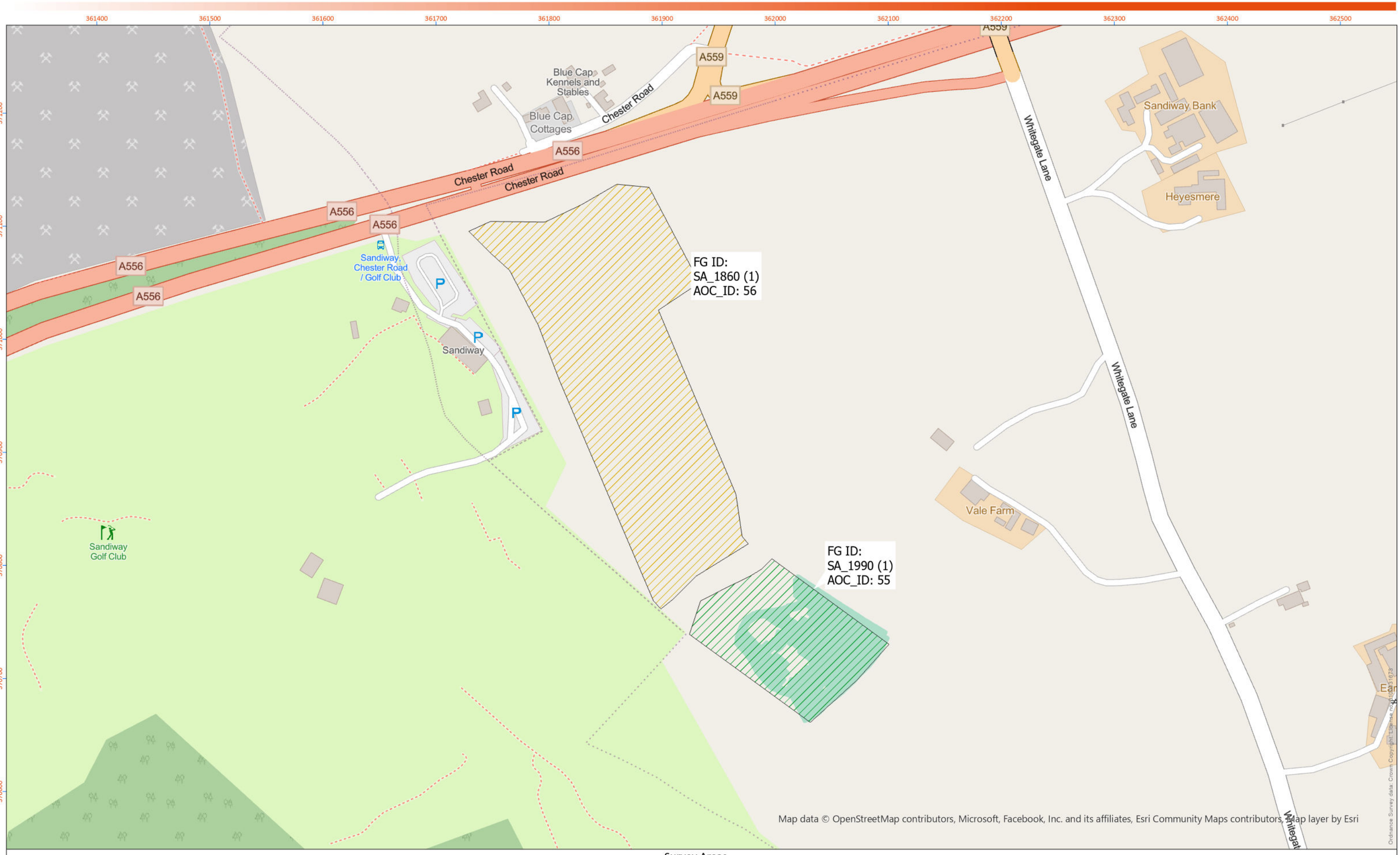
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.19/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Survey Areas

Figure 2.20

No Access
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

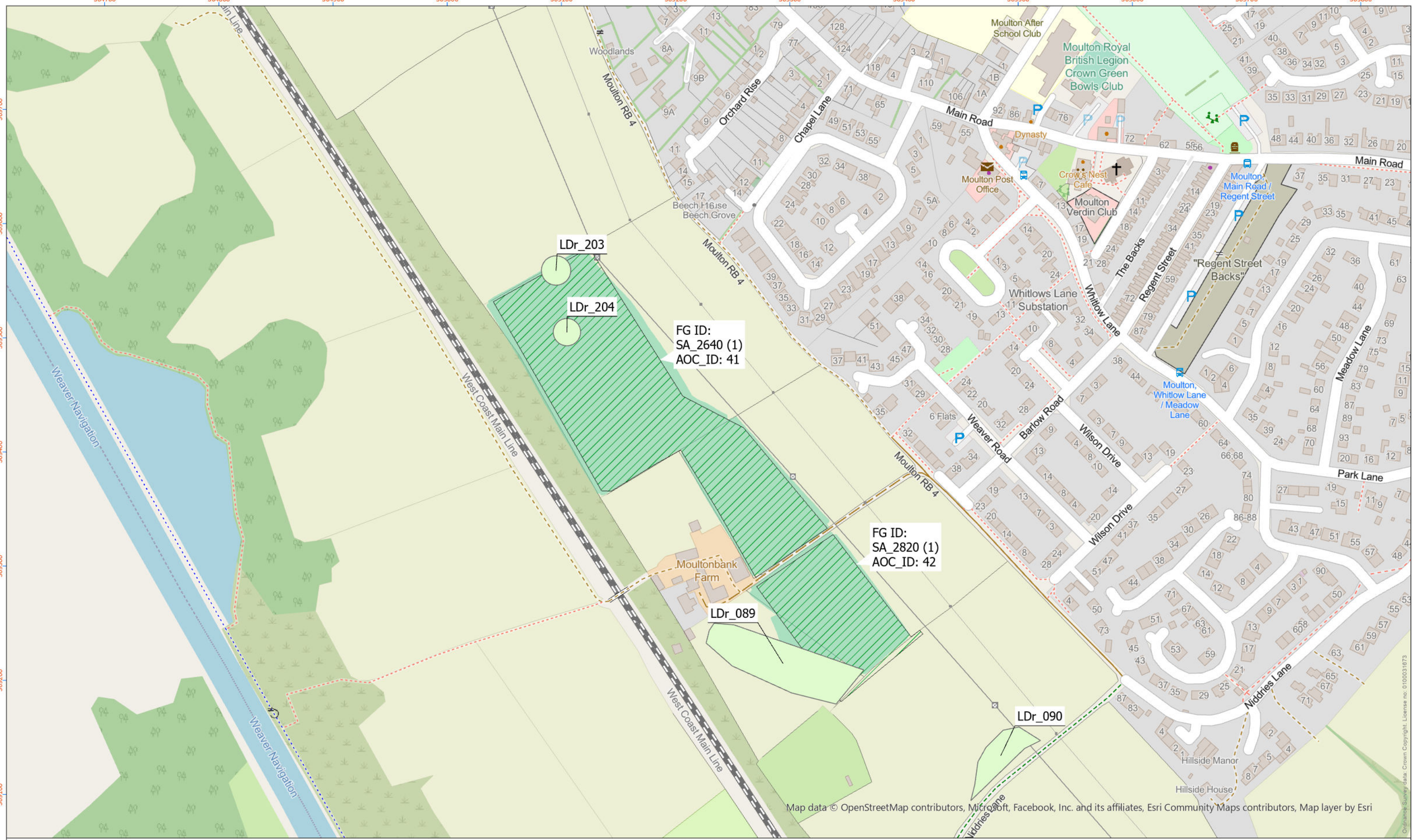
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.20/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

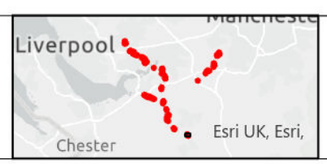
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Survey Areas

Figure 2.21

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

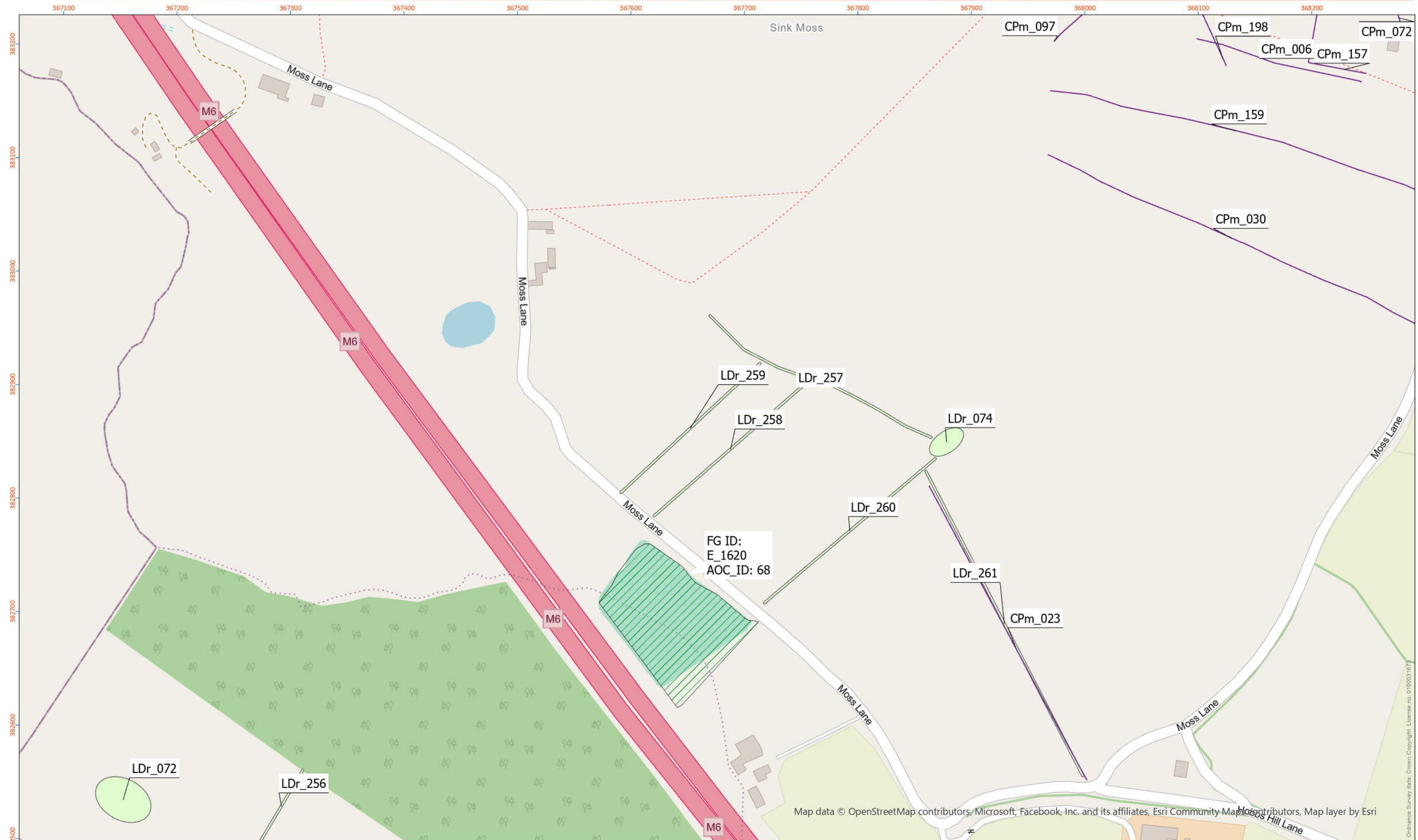
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.21/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

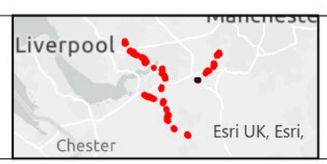
Delivering clean growth



Survey Areas

Figure 2.22

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

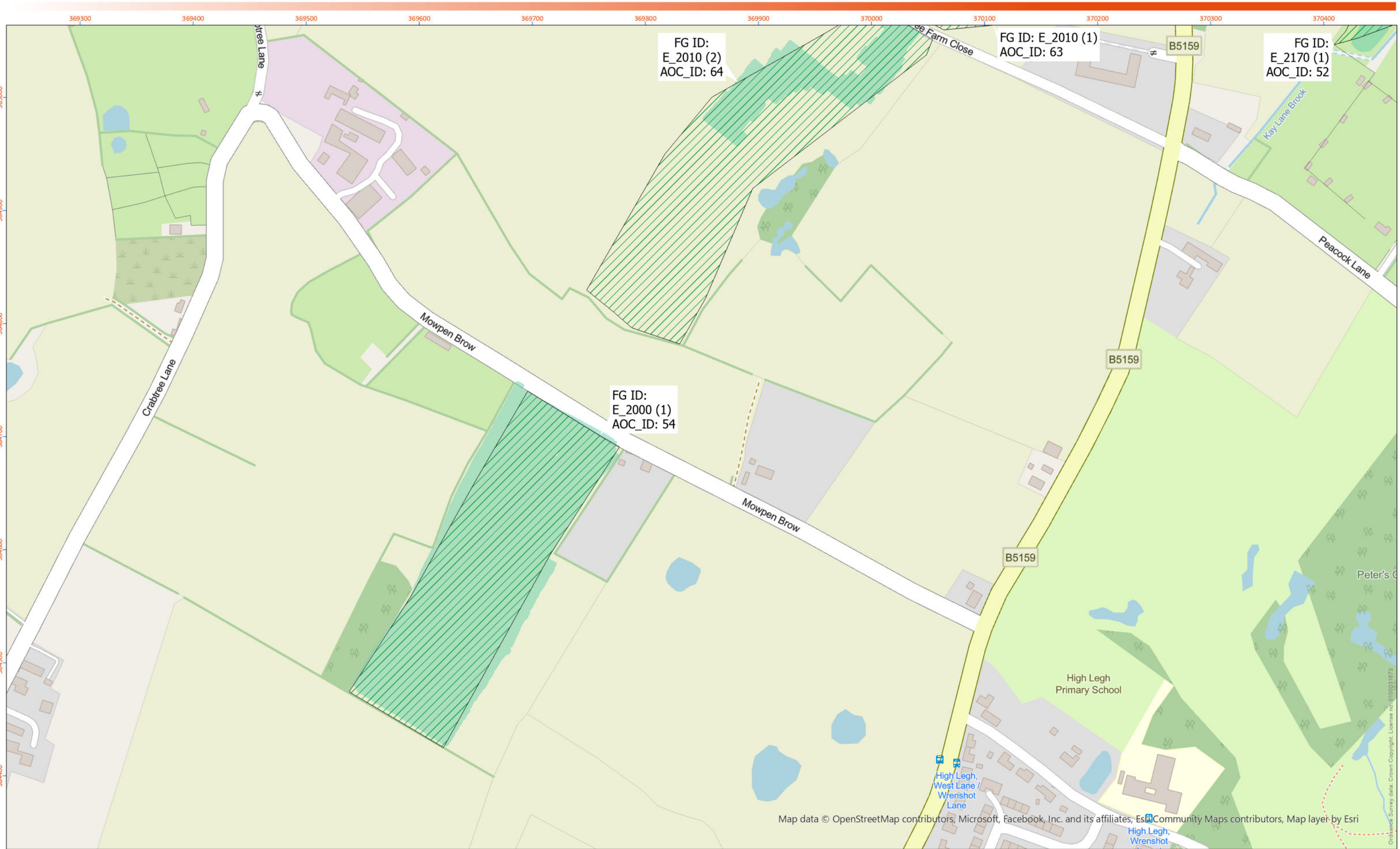
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.22/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

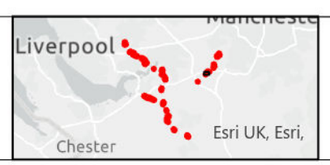
Delivering clean growth



Survey Areas

Figure 2.23

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.23/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

369600 369700 369800 369900 370000 370100 370200 370300 370400 370500 370600 370700

385400 385300 385200 385100 385000 384900 384800

Crouchley Lane
Crouchley Lane
Crouchley Lane
West Lane
West Lane
High Legh, West Lane / Kay Lane
B5159
B5159
B5159
B5159
M56
M56
M56
M56
FG ID: E_2010 (1) AOC_ID: 63
FG ID: E_2010 (2) AOC_ID: 64
FG ID: E_2170 (1) AOC_ID: 52
FG ID: E_2170 (2) AOC_ID: 53
Beechtree Farm Close
Kay Lane Brook
Peacock Lane
Lime Tree Lane
Mowpen Brow

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Ordnance Survey data: Crown Copyright. License no: 0100031673

Survey Areas

Figure 2.24

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

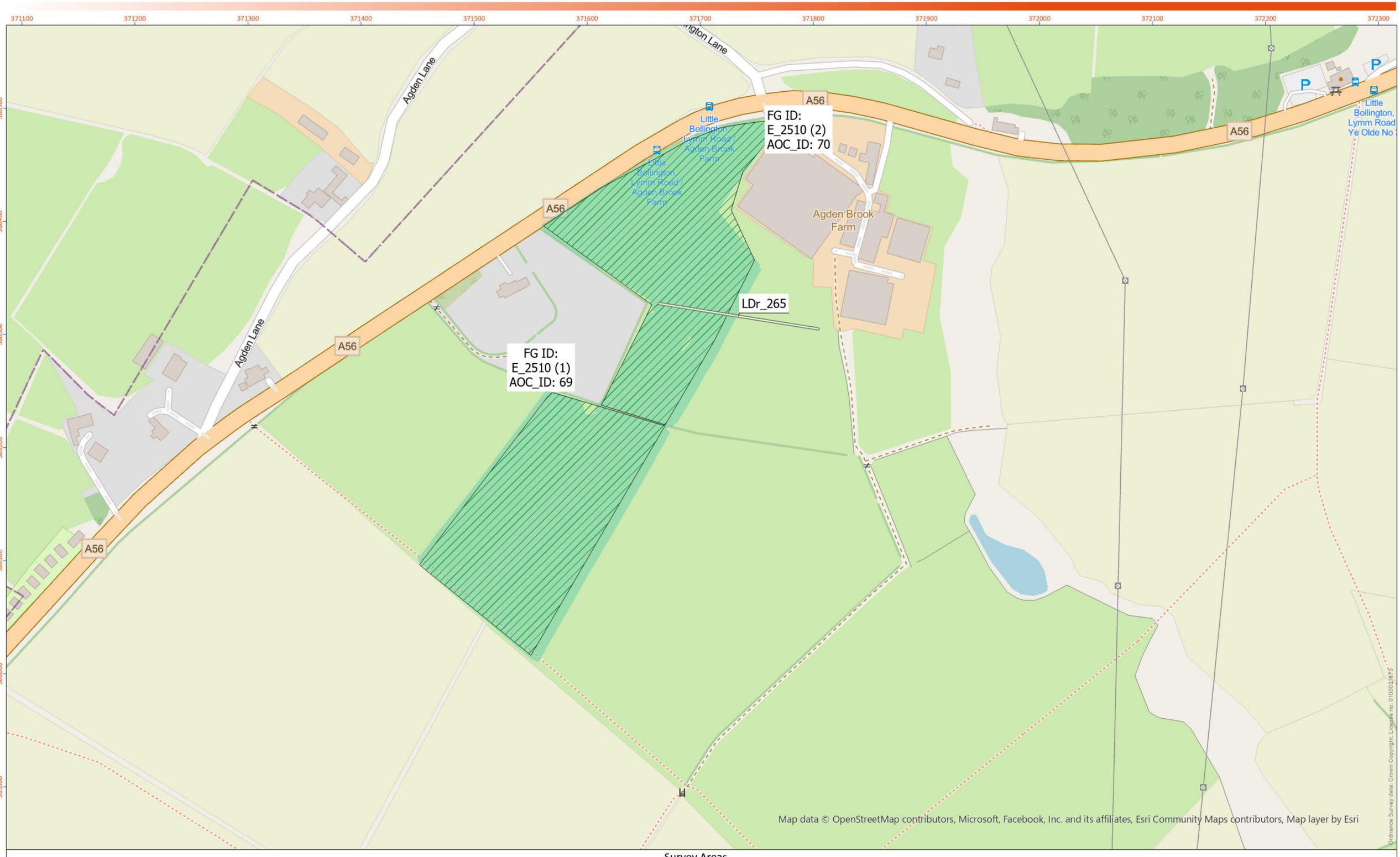
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.24/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Survey Areas

Figure 2.25

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

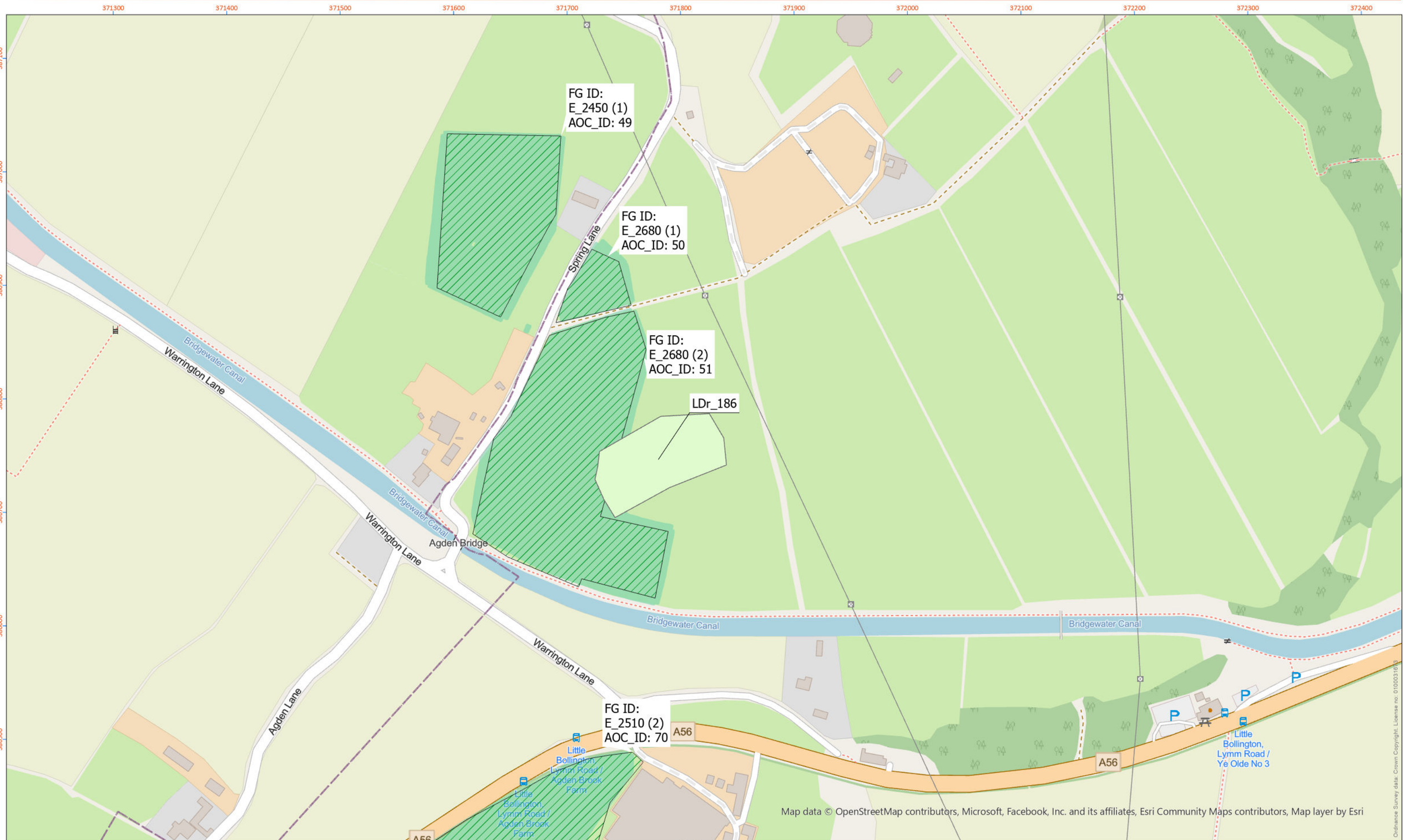
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.25/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

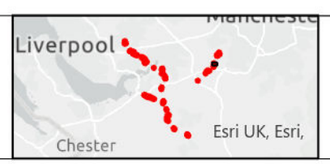
Delivering clean growth



Survey Areas

Figure 2.26

Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

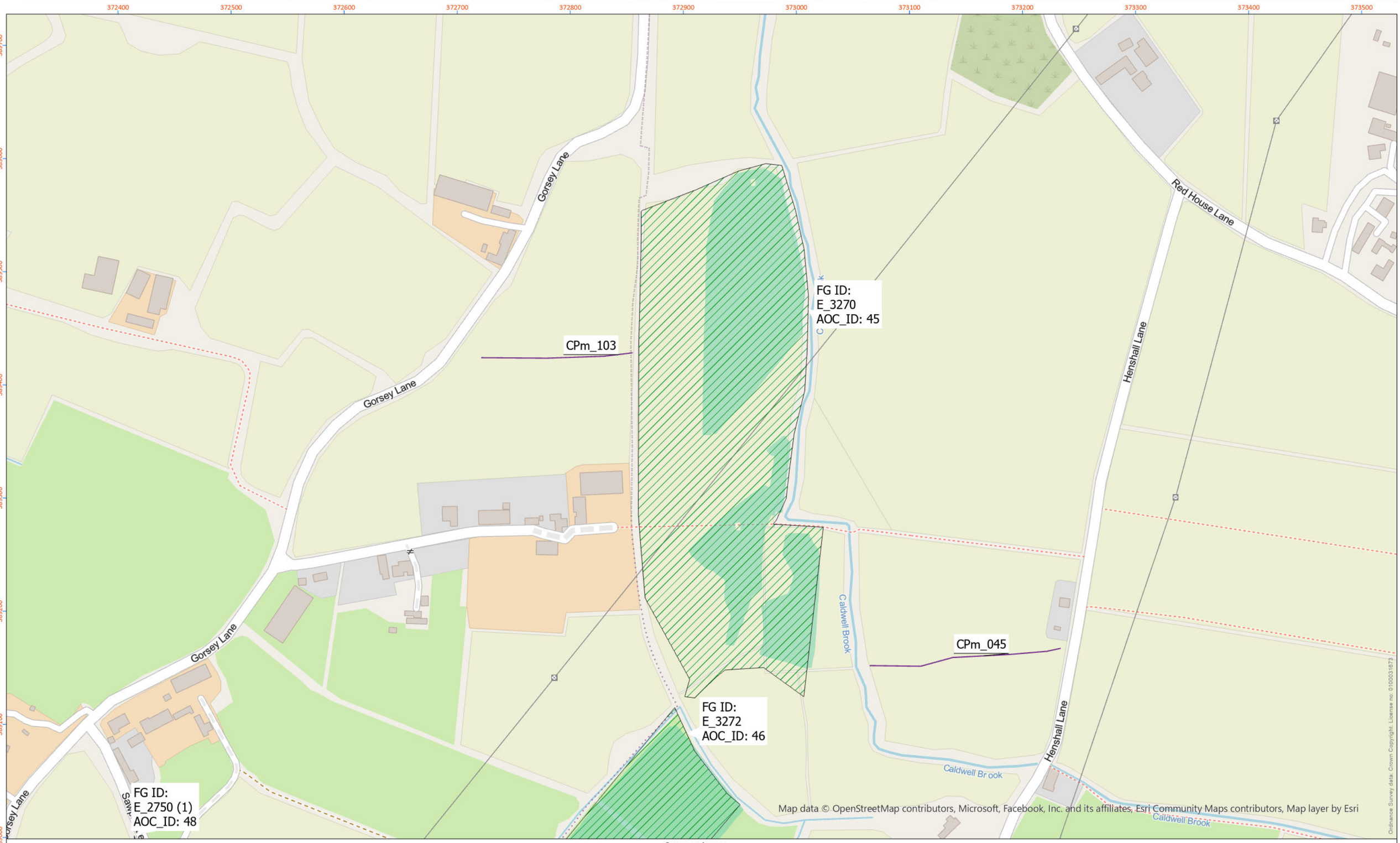
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.26/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

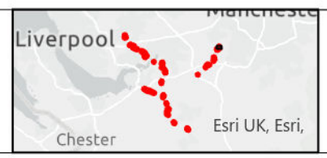
Delivering clean growth



Survey Areas

Figure 2.27

No Access
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

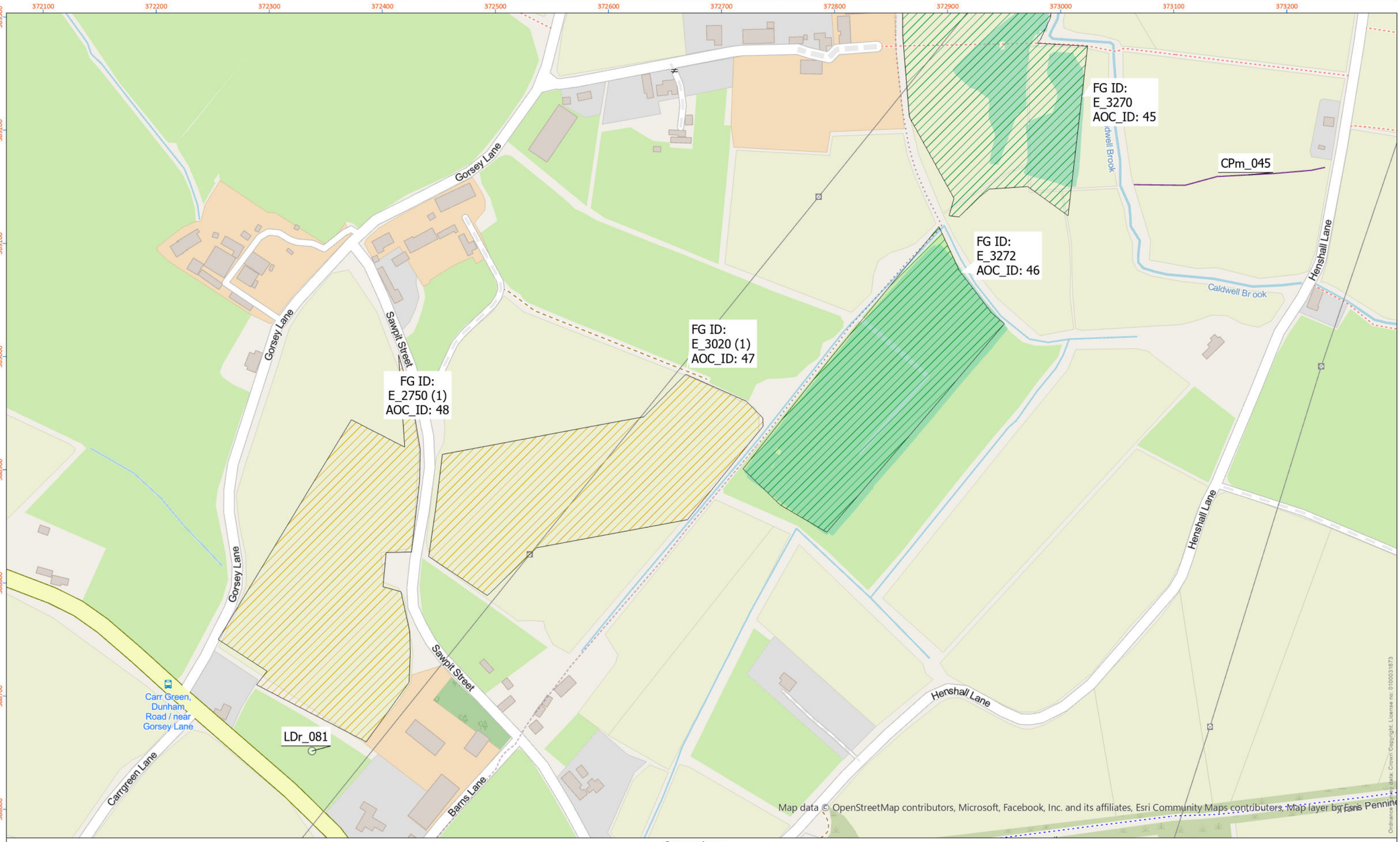
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.27/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

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Survey Areas

Figure 2.28

No Access
Completed
Actual Survey Extent
Cropmarks
LiDAR Features



N

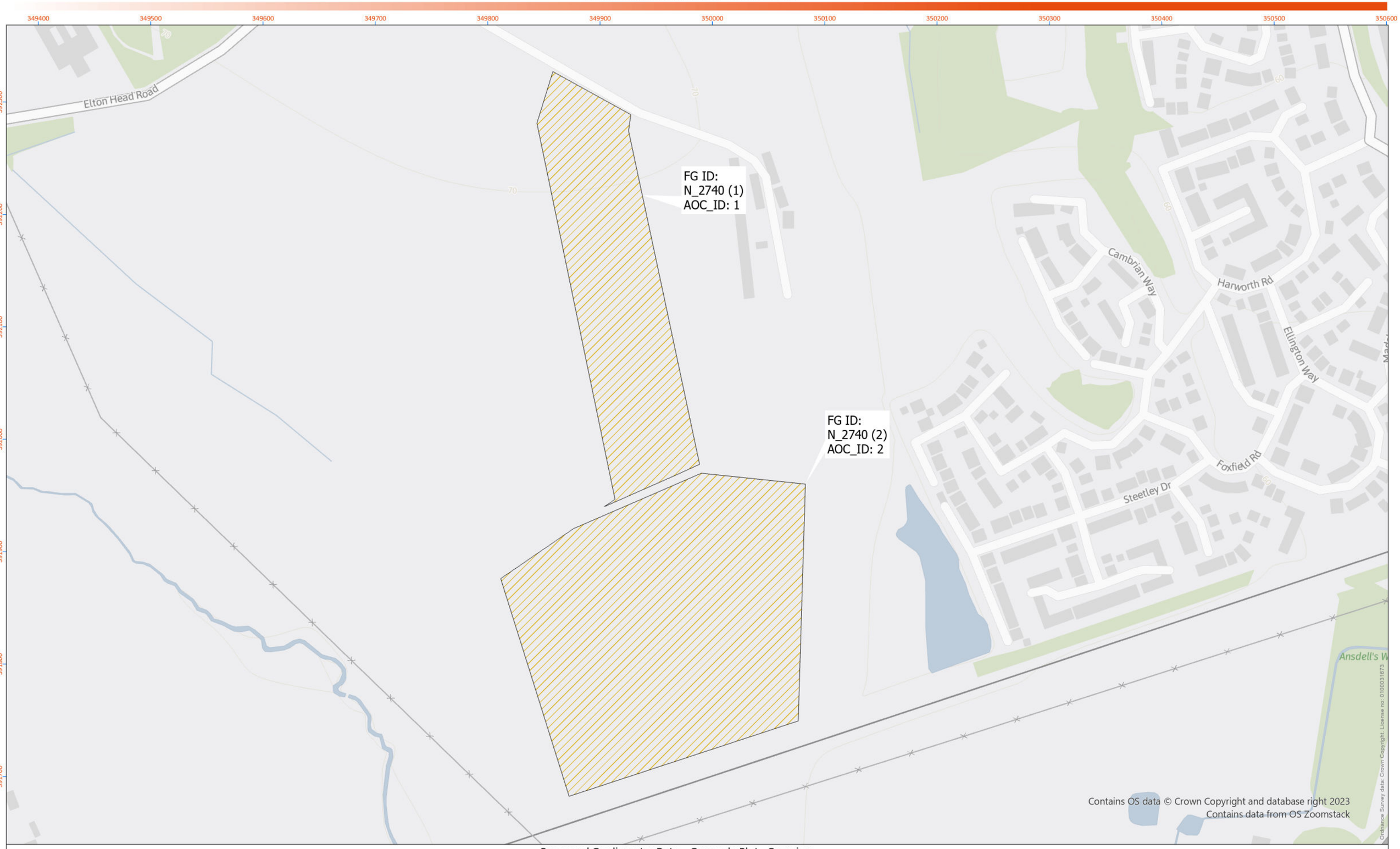
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/2.28/02	
Created by: KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.1

2 nT
-1 nT

No Access



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.1/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

350900 351000 351100 351200 351300 351400 351500 351600 351700 351800 351900 352000 352100

390100 390000 389900 389800 389700 389600 389500

FG ID:
N_2200 (1)
AOC_ID: 3

FG ID:
N_2210 (1)
AOC_ID: 4

FG ID:
N_2190 (1)
AOC_ID: 5

FG ID:
N_2160 (1)
AOC_ID: 6

FG ID:
N_2160 (2)
AOC_ID: 7

M62
M62
M62
Union Bank La
Union Bank Farm
Jubits Lane
B5419
A57
Warrington Road
Rainhill Place Farm
Warrington Road
Old Brook Cottages
A57
Old Brook Hall Farm
Warrington Road
Warrington Road

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.2

2 nT
-1 nT

No Access
Completed Parcel

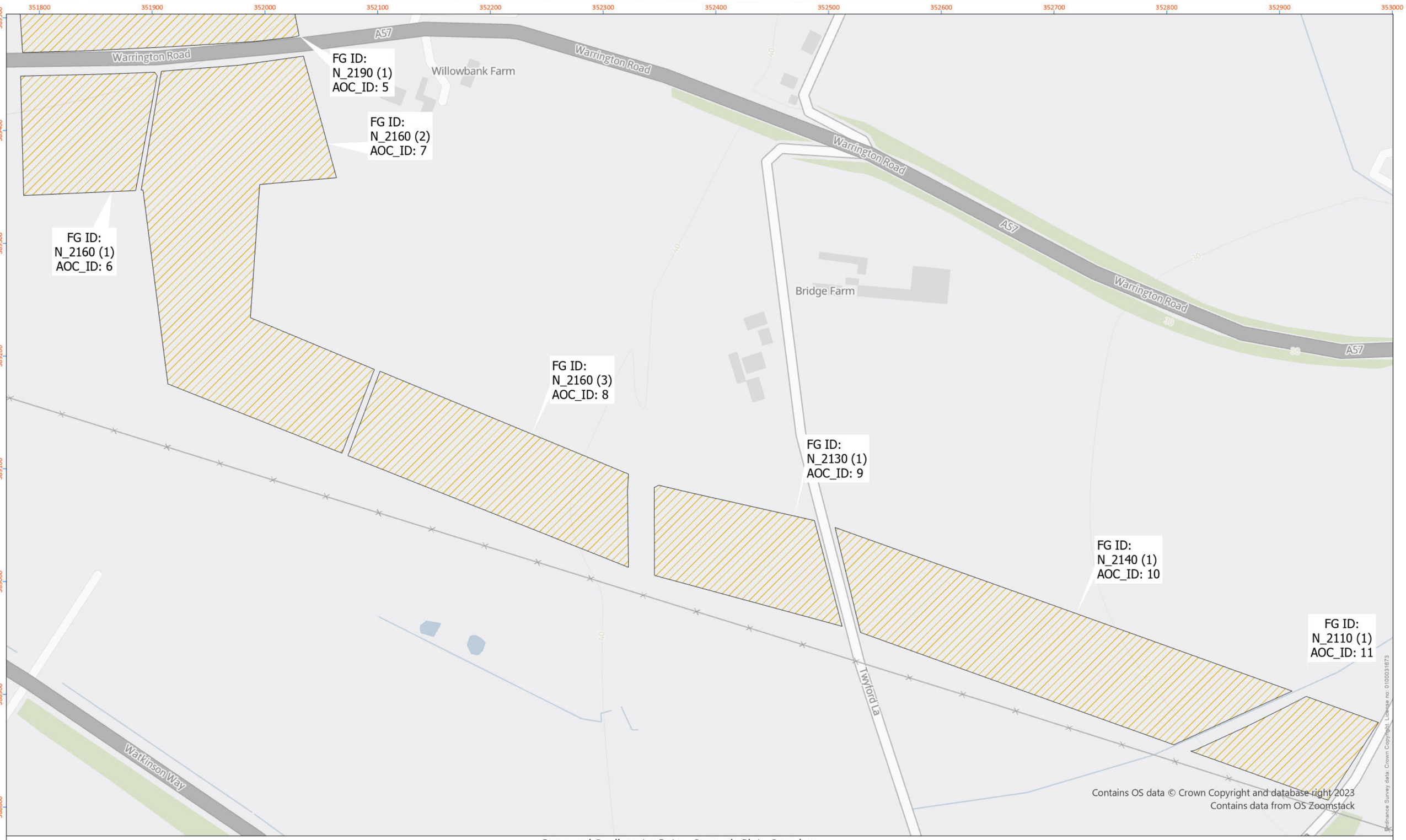
Liverpool
Chester
Esri UK, Esri,

N
0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.2/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

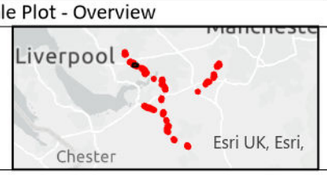


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.3

2 nT
-1 nT

No Access



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.3/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

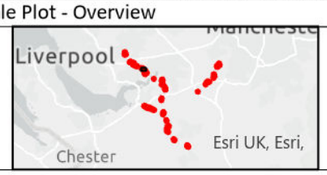


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.4

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.4/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354400 354500 354600 354700 354800 354900 355000 355100 355200 355300 355400

387900 387800 387700 387600 387500 387400 387300 387200

FG ID:
N_1870 (1)
AOC_ID: 13

FG ID:
N_1710 (1)
AOC_ID: 14

FG ID:
N_1710 (2)
AOC_ID: 15

FG ID:
N_1876
AOC_ID: 44

South Lane
A5080
Four Top'd Oak
Farnworth Road
Doe Green
Fowl Farm
Tannery La

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.5

2 nT
-1 nT

Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.5/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.6

2 nT
-1 nT

Completed Parcel



N

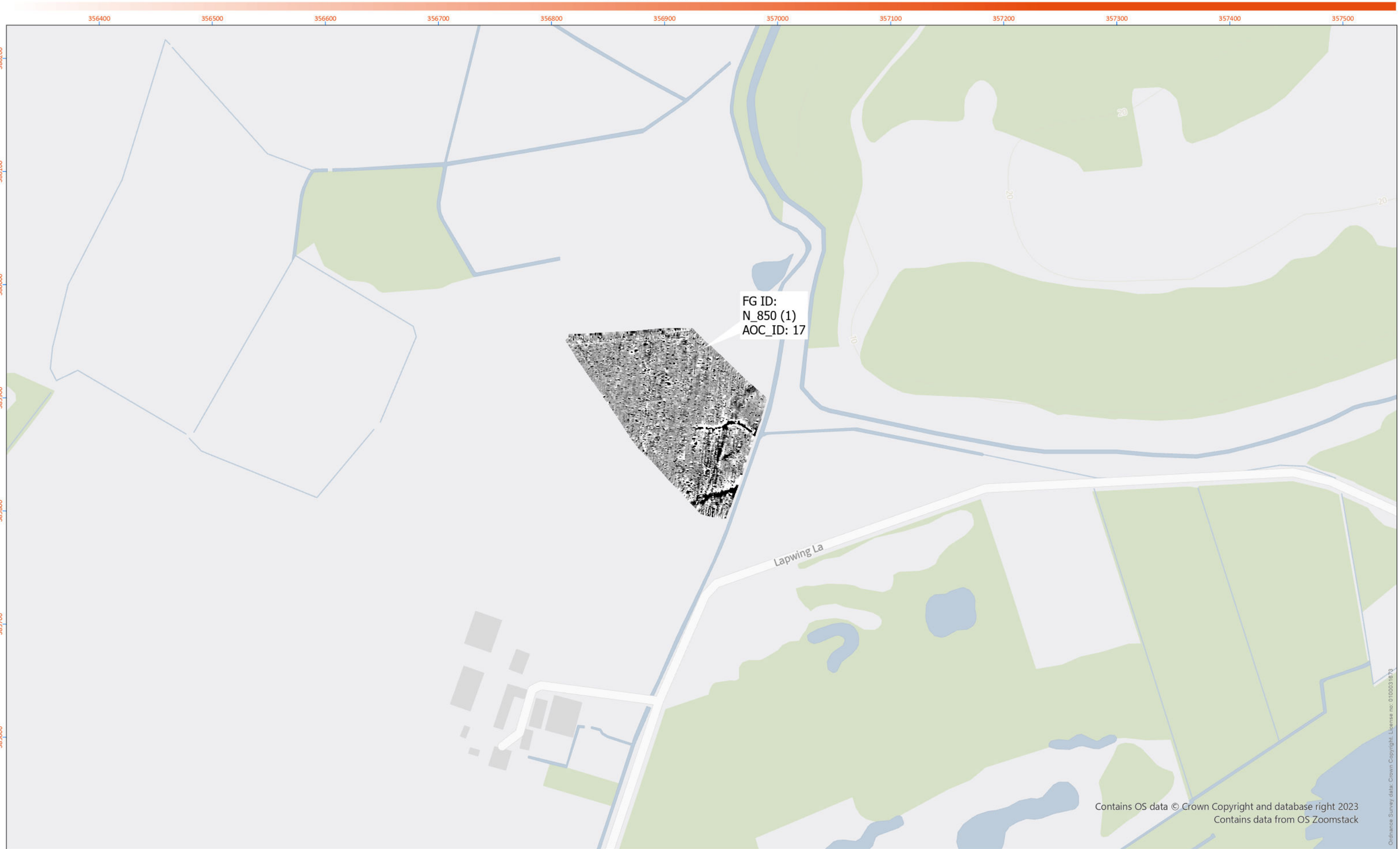
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.6/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

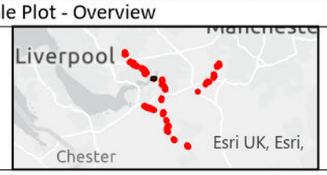


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.7

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.7/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.8

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.8/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

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358500 358600 358700 358800 358900 359000 359100 359200 359300 359400 359500 359600

384800 384700 384600 384500 384400 384300 384200 384100

Rivington Cottage

FG ID:
N_360a
AOC_ID: 65

FG ID:
N_360b
AOC_ID: 66

FG ID: N_320
AOC_ID: 67

FG ID: N_340
AOC_ID: 71

Underbridge La
A56
Warrington Rd
Chester Road
Allotments
Park La
Park
Chester Road
Chester Road

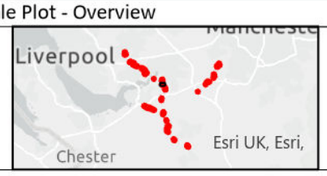
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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.9

2 nT
-1 nT

Unsuitable
Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.9/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359200 359300 359400 359500 359600 359700 359800 359900 360000 360100 360200 360300

383800 383700 383600 383500 383400 383300 383200

FG ID:
N_347 (2)
AOC_ID: 20

FG ID:
N_347 (1)
AOC_ID: 19

FG ID:
N_289 (1)
AOC_ID: 21

Hatton Lodge

Warrington Rd

Park La

Hurst

60

50

60

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.10

2 nT
-1 nT

Completed Parcel

Liverpool
Chester
Esri UK, Esri,

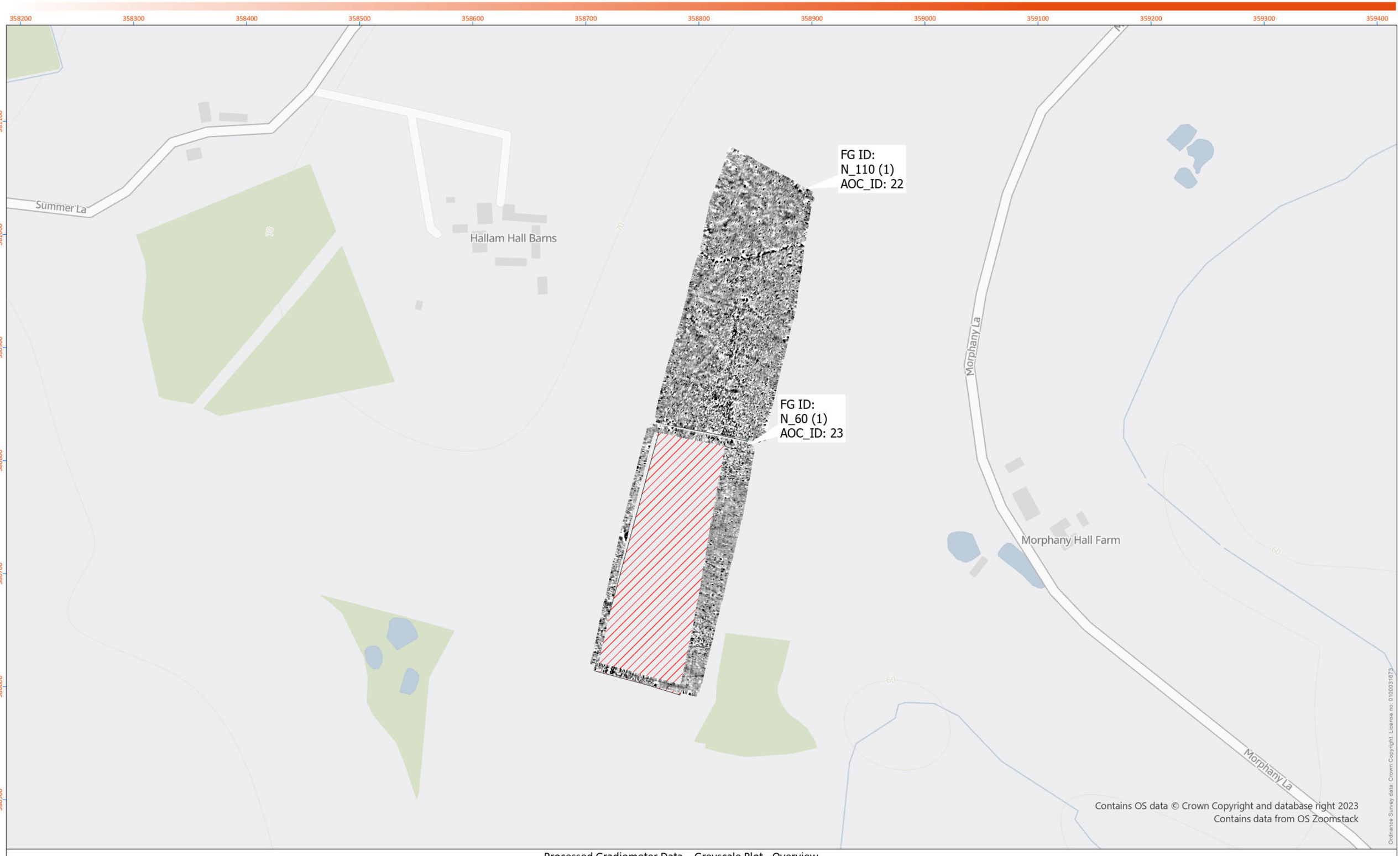
N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.10/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.11

2 nT
-1 nT

Unsuitable
Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.11/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354400 354500 354600 354700 354800 354900 355000 355100 355200 355300 355400

379300 379200 379100 379000 378900 378800 378700

A56

Other Sports Facility

Bowling Green

Sutton Weaver

FG ID:
W_695 (1)
AOC_ID: 37

FG ID:
W_695 (1)
AOC_ID: 36

FG ID:
W_410 (3)
AOC_ID: 35

FG ID:
W_410 (2)
AOC_ID: 33

FG ID:
W_410 (1)
AOC_ID: 32

FG ID:
W_360 (2)
AOC_ID: 34

Golf Course

50 40 30

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.12

2 nT
-1 nT

No Access
Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.12/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

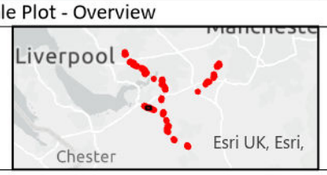


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.13

2 nT
-1 nT

No Access
Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.13/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

FG ID: W_360 (2) AOC_ID: 34

FG ID: W_360 (1) AOC_ID: 31

FG ID: W_330 (1) AOC_ID: 30

FG ID: W_280 (4) AOC_ID: 29

FG ID: W_280 (3) AOC_ID: 28

FG ID: W_280 (2) AOC_ID: 27

FG ID: W_280 (1) AOC_ID: 26

Aston La

Aston

Weaver View Cottages

Grange House

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.14

2 nT
-1 nT

Unsuitable
Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N
0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.14/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358700 358800 358900 359000 359100 359200 359300 359400 359500 359600 359700 359800 359900

377700 377600 377500 377400 377300 377200 377100 377000

FG ID:
SA_290 (1)
AOC_ID: 24

FG ID:
SA_290 (1)
AOC_ID: 25

FG ID:
W_20/W_21
AOC_ID: 43

A533
Northwich Road
Northwich Road
Woodside Farm
Garden Wood
Dean Brook
Dutton Dean

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.15

2 nT
-1 nT

Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.15/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359500 359600 359700 359800 359900 360000 360100 360200 360300 360400 360500 360600

375900 375800 375700 375600 375500 375400 375300

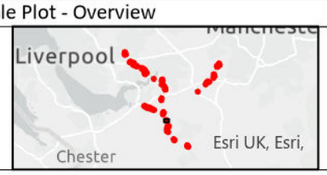


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.16

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.16/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

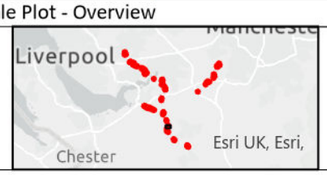


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.17

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.17/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359800 359900 360000 360100 360200 360300 360400 360500 360600 360700 360800 360900 361000

373700 373600 373500 373400 373300 373200 373100

FG ID:
SA_1190 (1)
AOC_ID: 60

FG ID:
SA_1260 (1)
AOC_ID: 58

FG ID:
SA_1260 (1)
AOC_ID: 59

FG ID:
SA_1330 (1)
AOC_ID: 40

Hefferston Hall New Lodge

Hefferston Grange Dr

Hefferston Rise

East Lodge

Grange La

A49

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.18

2 nT
-1 nT

Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.18/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

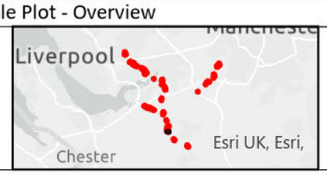


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.19

2 nT
-1 nT

No Access
Completed Parcel



N

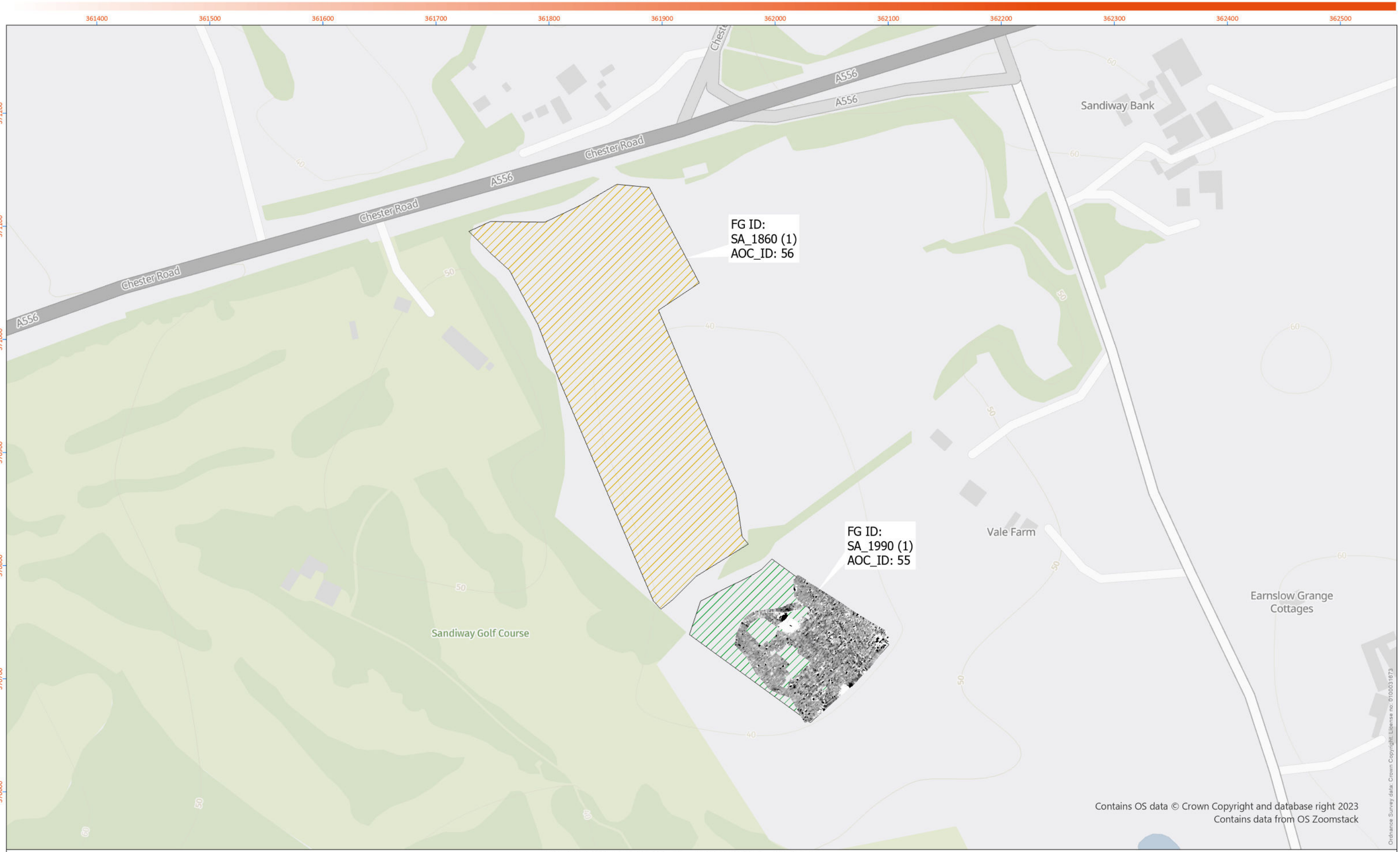
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.19/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

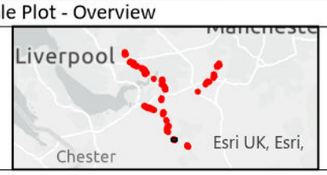


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.20

2 nT
-1 nT

No Access
Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.20/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

364700 364800 364900 365000 365100 365200 365300 365400 365500 365600 365700 365800

369700 369600 369500 369400 369300 369200 369100

Moulton County Primary School
Other Sports Facility
Play Space
Summerfield Dr
Orchard Rise
Main Rd
School La
Moulton
Chapel La
Religious Grounds
Whitlow La
Church St
Regent St
Eaton Bank Wood
Public Park Or Garden
Barlow Rd
Weaver Rd
Park La
Lodge Dr
Lodge Dr
Moultonbank Farm
Niddries La

FG ID:
SA_2640 (1)
AOC_ID: 41

FG ID:
SA_2820 (1)
AOC_ID: 42

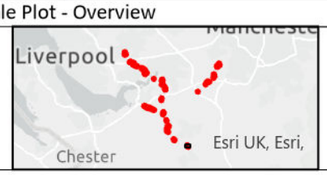
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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.21

2 nT
-1 nT

Completed Parcel

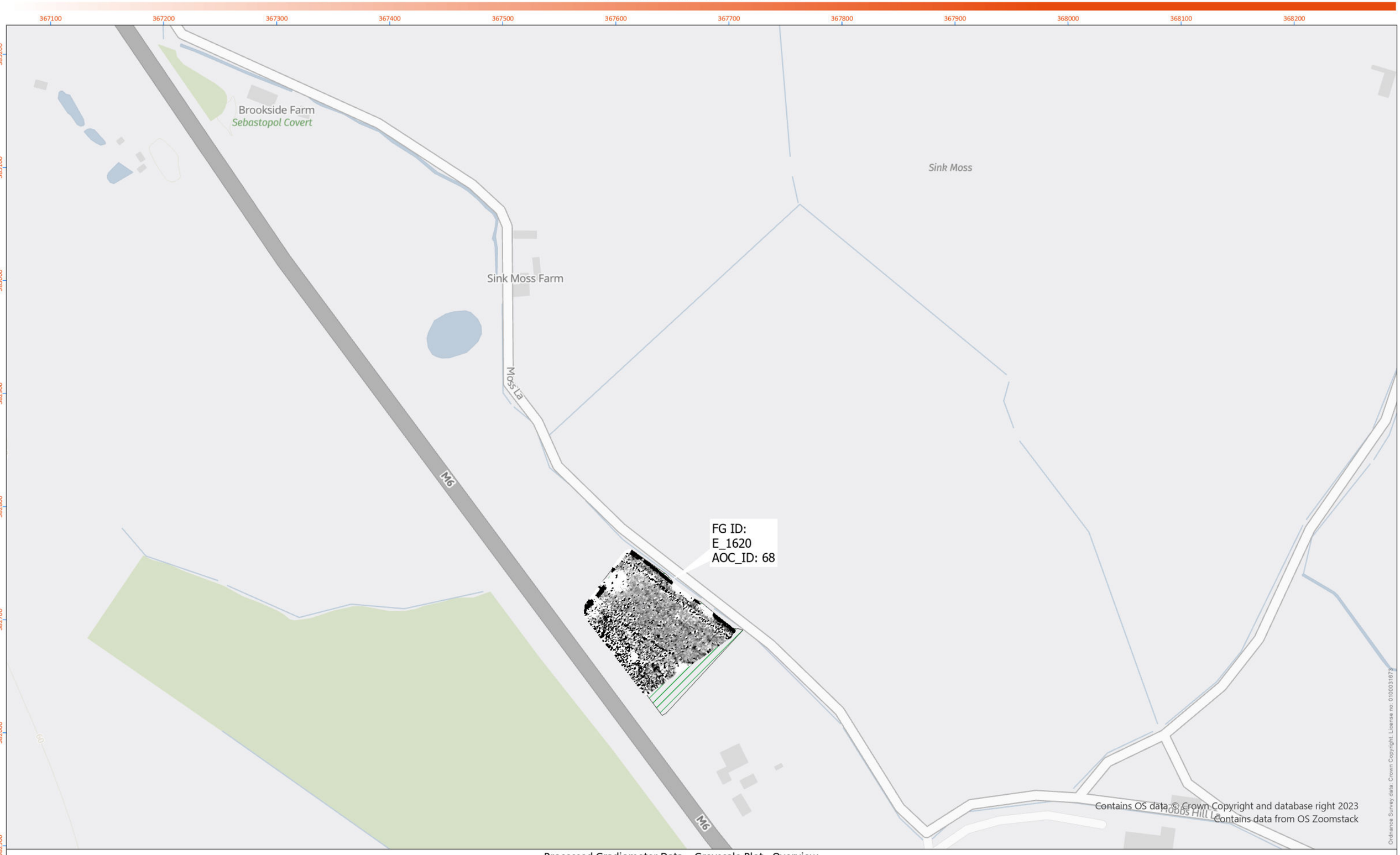


N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.21/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.22

2 nT
-1 nT

Completed Parcel



N

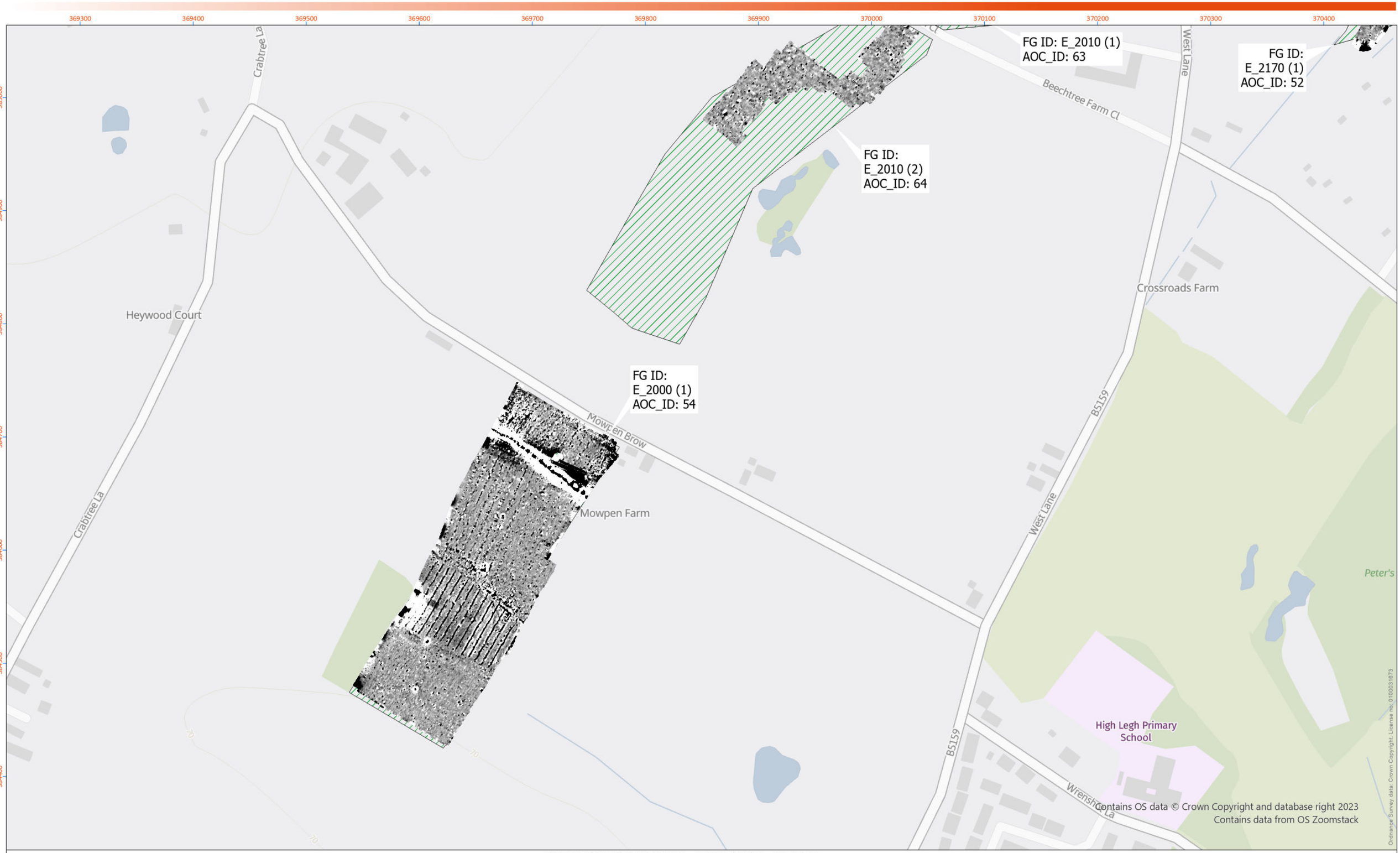
0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.22/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

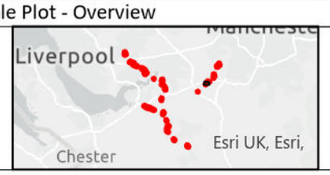


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.23

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.23/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.24

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.24/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

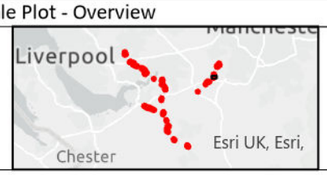


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.25

2 nT
-1 nT

Completed Parcel



N

0 60m

Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.25/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

371300 371400 371500 371600 371700 371800 371900 372000 372100 372200 372300 372400

387100 387000 386900 386800 386700 386600 386500

FG ID:
E_2450 (1)
AOC_ID: 49

FG ID:
E_2680 (1)
AOC_ID: 50

FG ID:
E_2680 (2)
AOC_ID: 51

FG ID:
E_2510 (2)
AOC_ID: 70

Woolstencroft Farm
Agden Bridge Farm
Agden Brook Farm
Agdenlane Farm
Warrington La
Agden La
Lymm Road
A56
20

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.26

2 nT
-1 nT

Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N

0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.26/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

372400 372500 372600 372700 372800 372900 373000 373100 373200 373300 373400 373500

389700 389600 389500 389400 389300 389200 389100 389000

Longridge Farm
Moss Hall Farm
Orchardhouse Farm
Brookfield Cottage
Sinderland Hou Farm
Red House La
Henshall La
Caldwell Brook

FG ID:
E_3270
AOC_ID: 45

FG ID:
E_3272
AOC_ID: 46

FG ID:
E_2750 (1)
AOC_ID: 48

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Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.27

2 nT
-1 nT

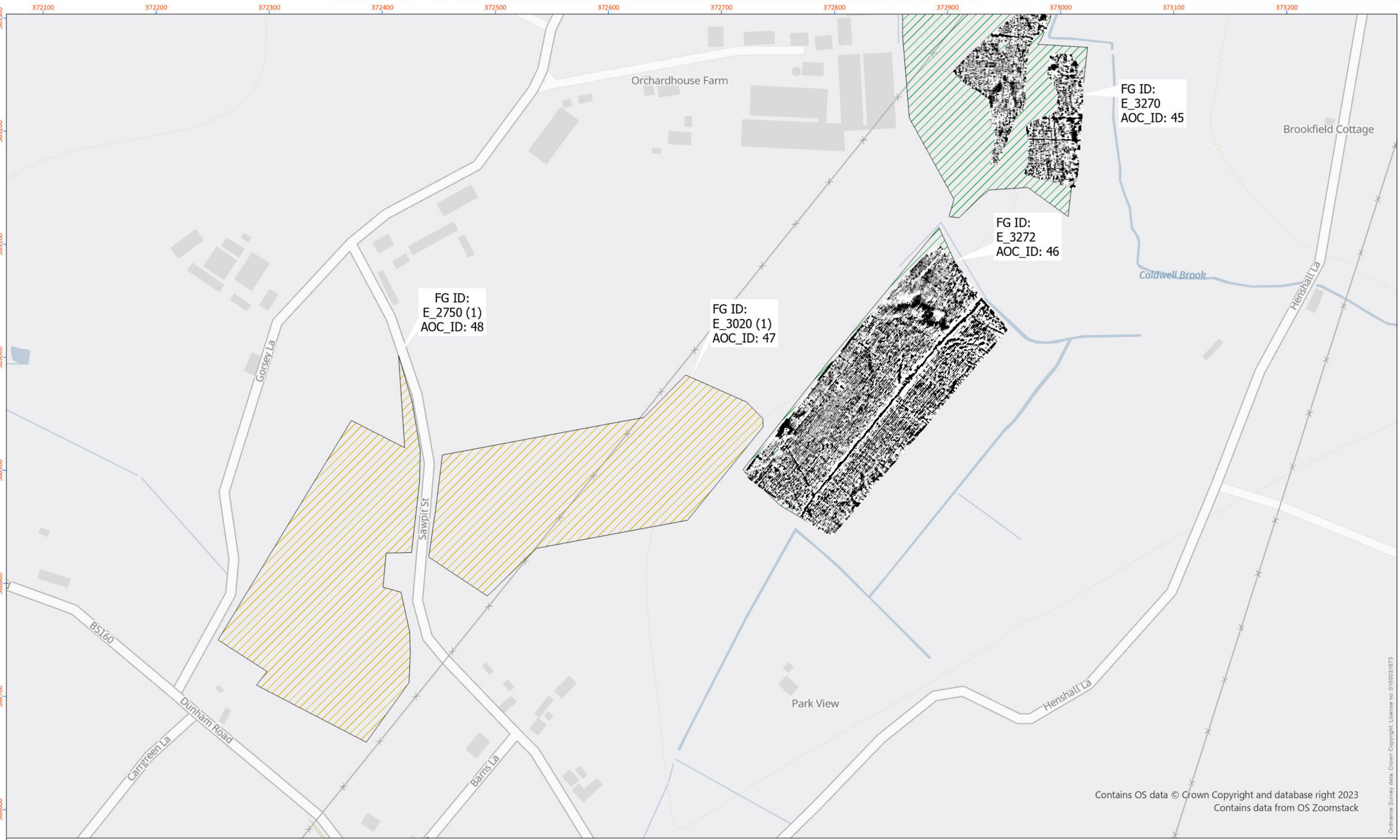
No Access
Completed Parcel

Liverpool
Chester
Esri UK, Esri,

N
0 60m
Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.27/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline
Delivering clean growth

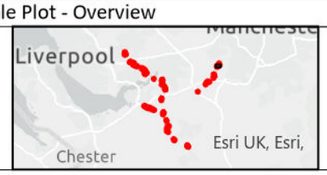


Processed Gradiometer Data – Greyscale Plot - Overview

Figure 3.28

2 nT
-1 nT

No Access
Completed Parcel



N

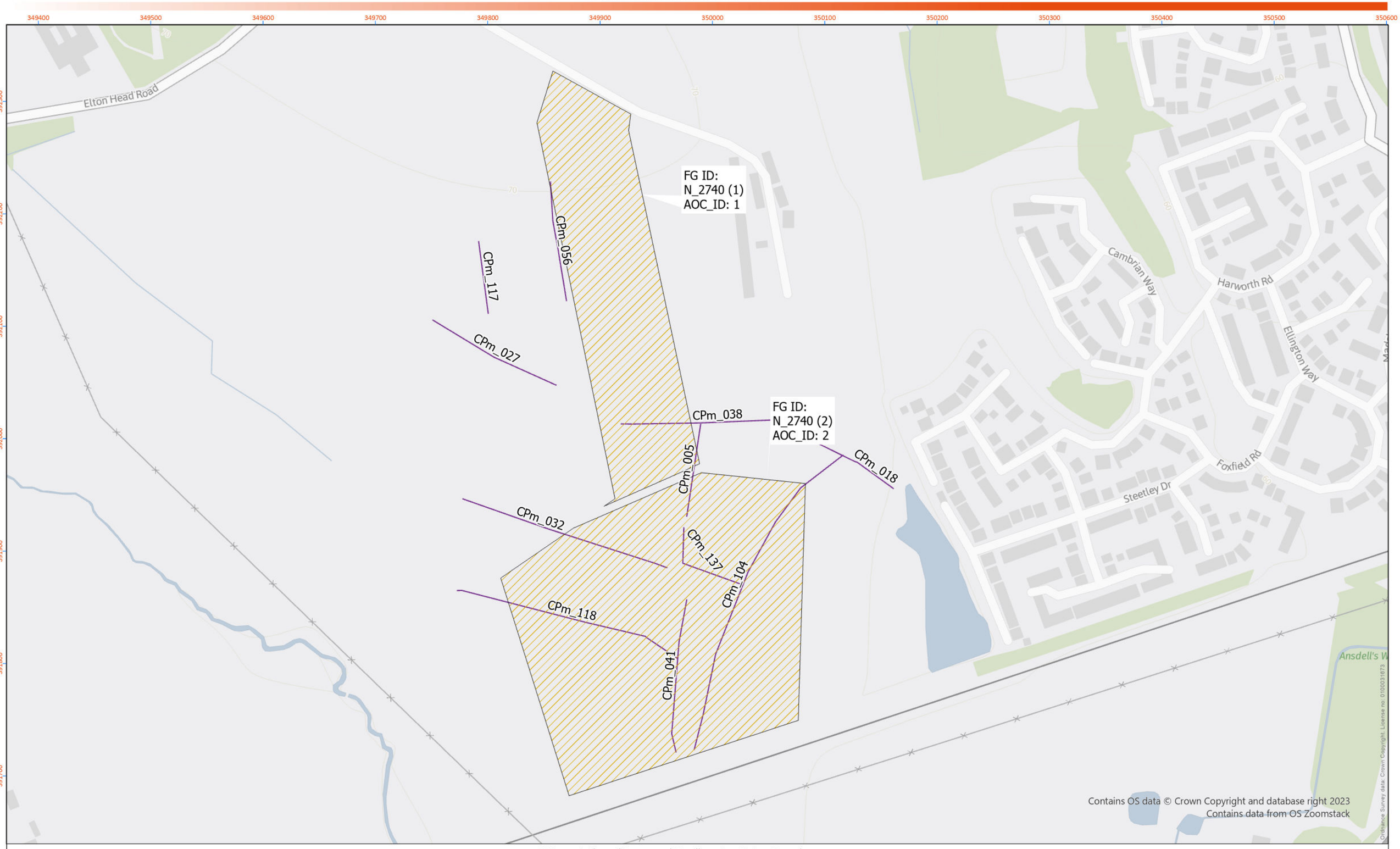
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Scale: 1:3,000 @ A3

Drawing Number: 05/40593/GEO/3.28/02	
Created by: AC	Date: 11/03/2024
Checked by: KA	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.1

- No Access
- Cropmarks
- LiDAR Features



N

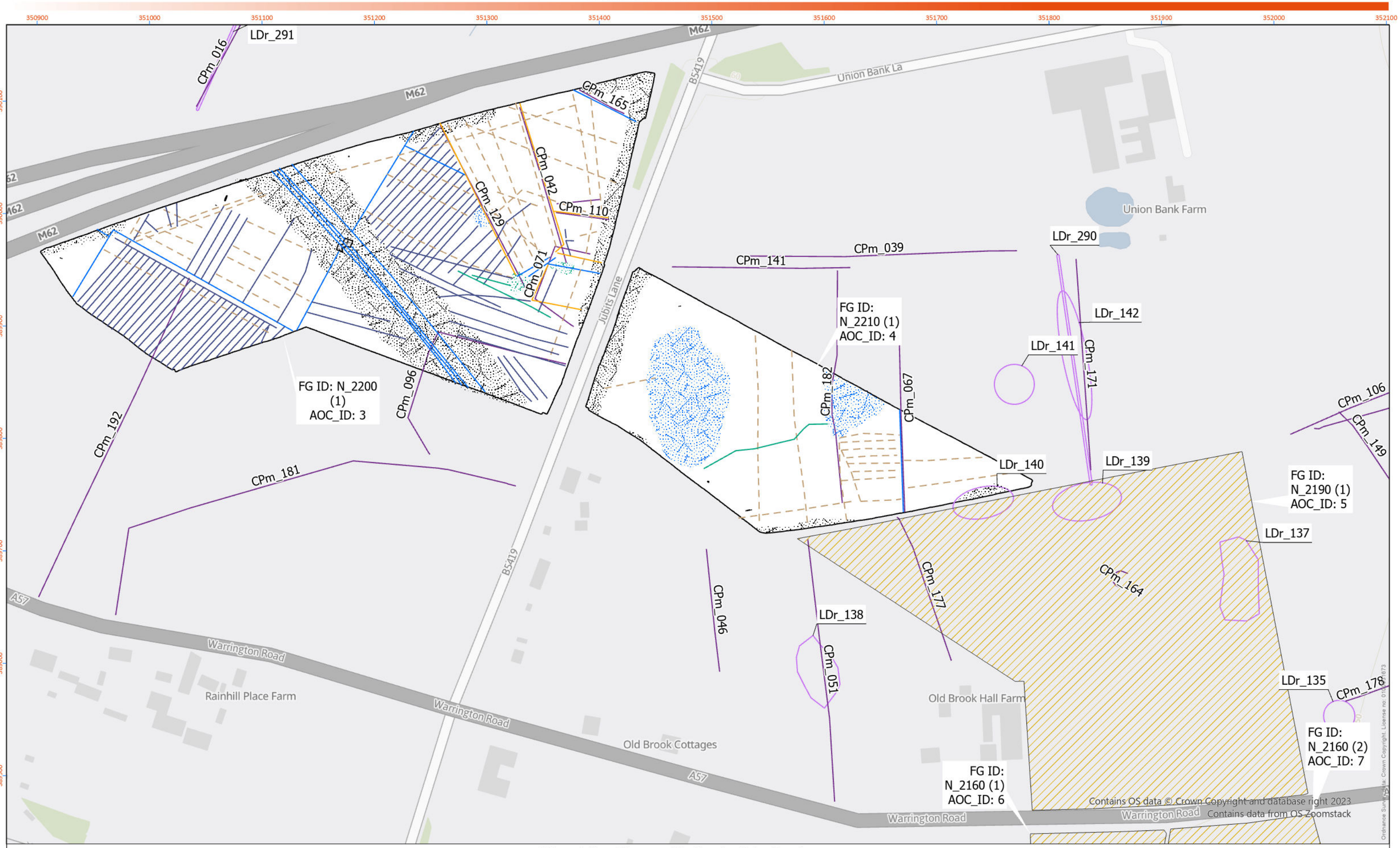
0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.1/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

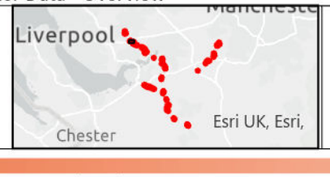
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.2

- No Access
- Spread (Historic Feature)
- Spread (Unclear Origin)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Cropmarks
- LiDAR Features



N

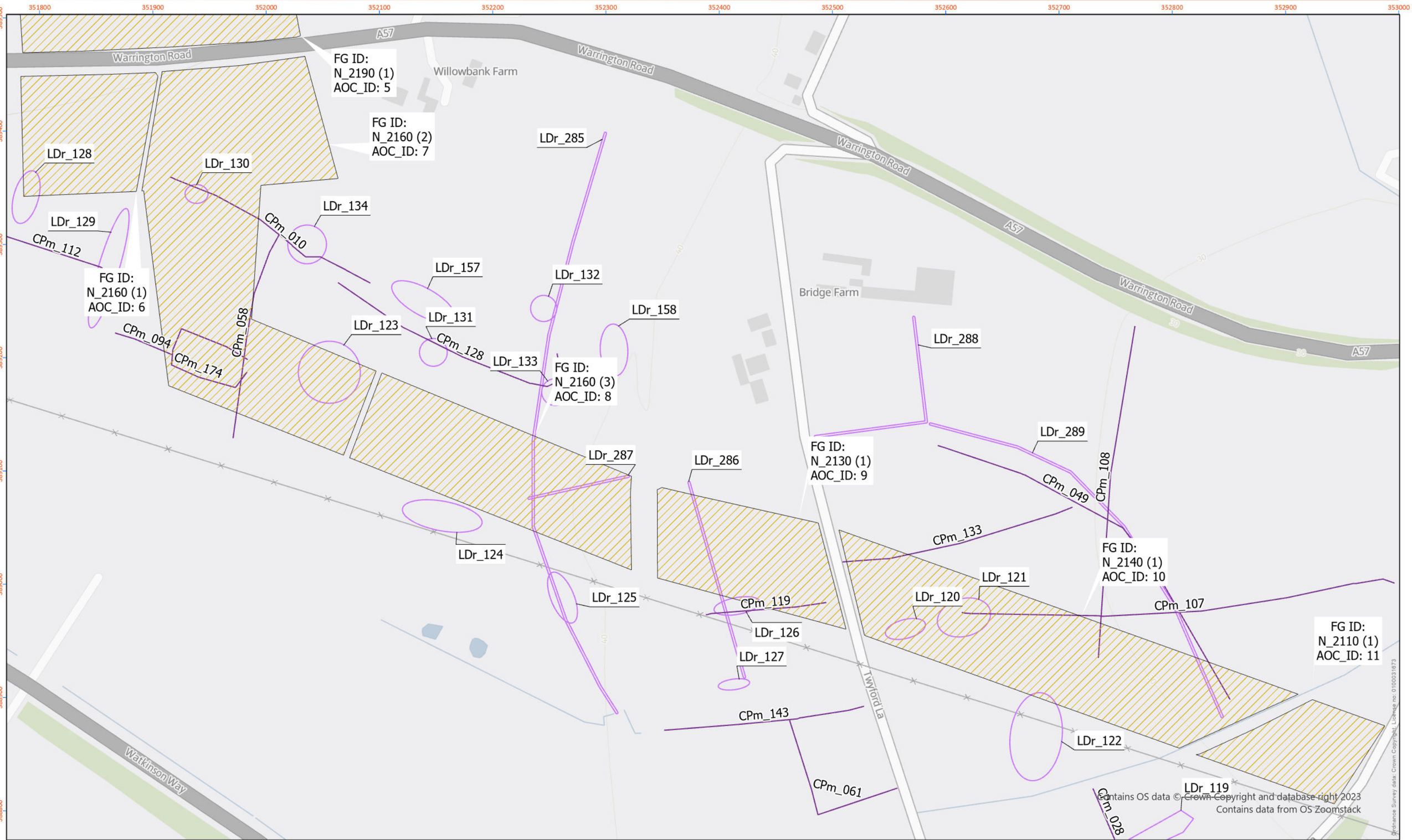
0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.2/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

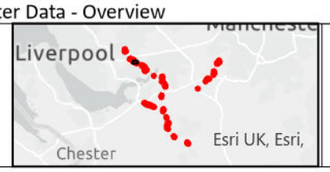
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.3

No Access
Cropmarks
LiDAR Features



N

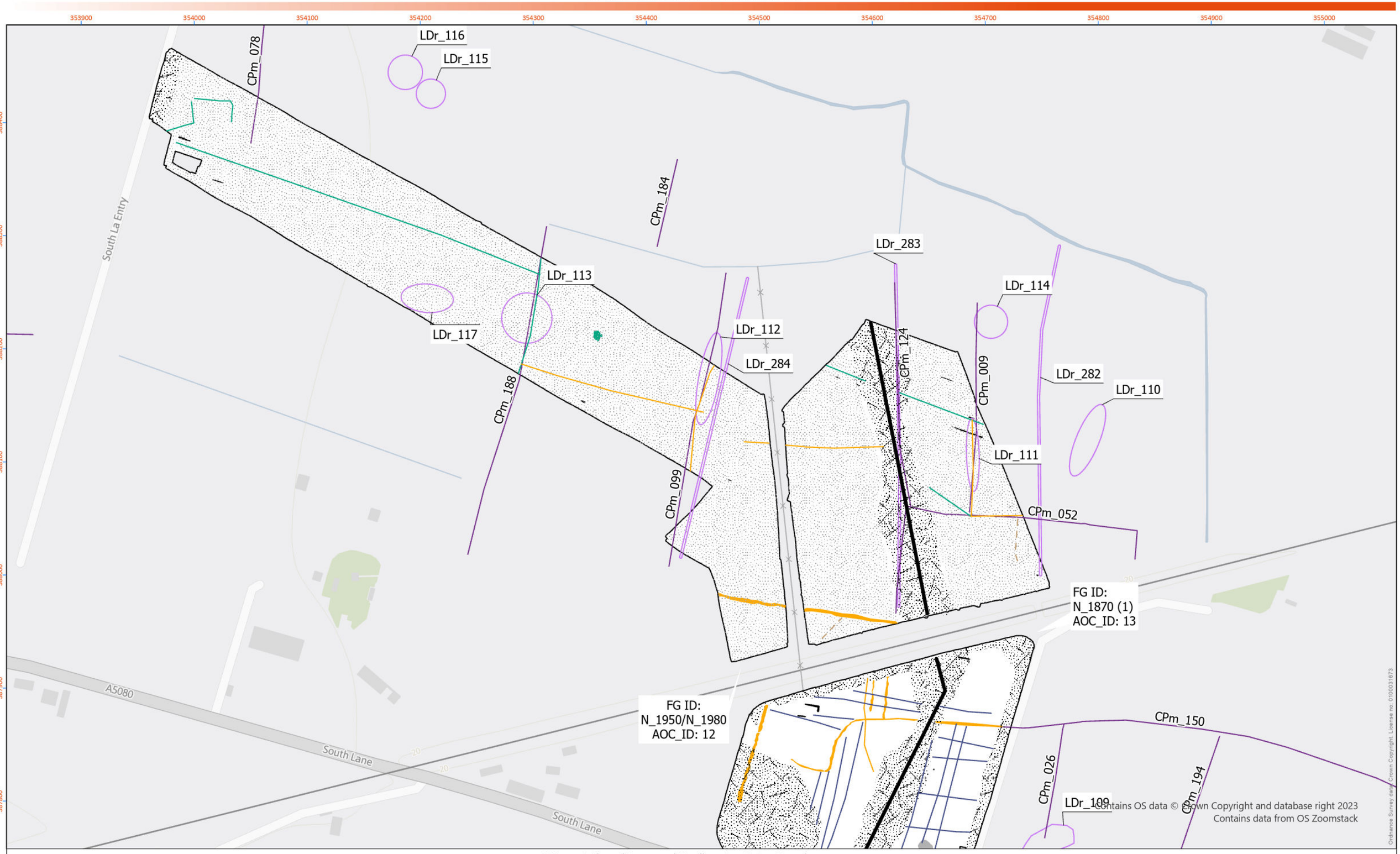
0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.3/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.4

- Anomaly (Possible Archaeology)
- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.4/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354400 354500 354600 354700 354800 354900 355000 355100 355200 355300 355400

387900 387800 387700 387600 387500 387400 387300 387200

FG ID:
N_1870 (1)
AOC_ID: 13

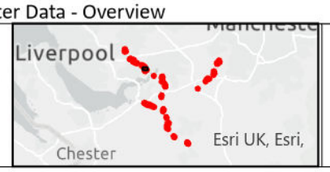
CPm_150
CPm_026
CPm_194
LDr_109
LDr_108
South Lane
A5080
Four Top'd Oak
FG ID:
N_1710 (1)
AOC_ID: 14
FG ID:
N_1710 (2)
AOC_ID: 15
LDr_107
CPm_083
Farnworth Road
A5080
LDr_102
LDr_103
LDr_180
LDr_182
LDr_183
LDr_184
Doe Green
LDr_177
LDr_178
LDr_105
LDr_181
LDr_106
FG ID:
N_1876
AOC_ID: 44
LDr_100
LDr_101
LDr_104
CPm_063
CPm_064
LDr_179
Fowl Farm
Tannery La

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.5

- Anomaly (Possible Archaeology)
- Spread (Historic Feature)
- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

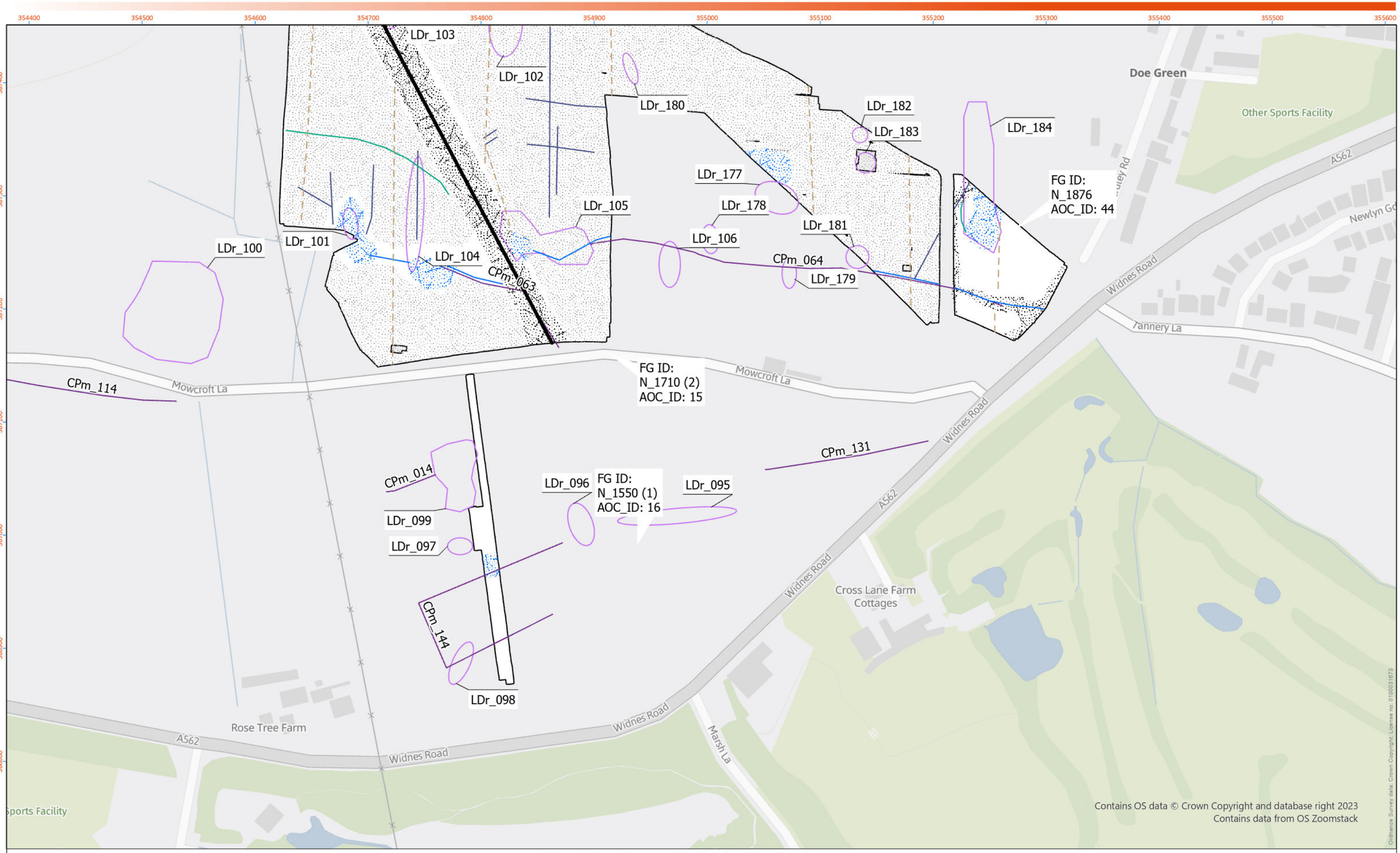
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Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.5/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

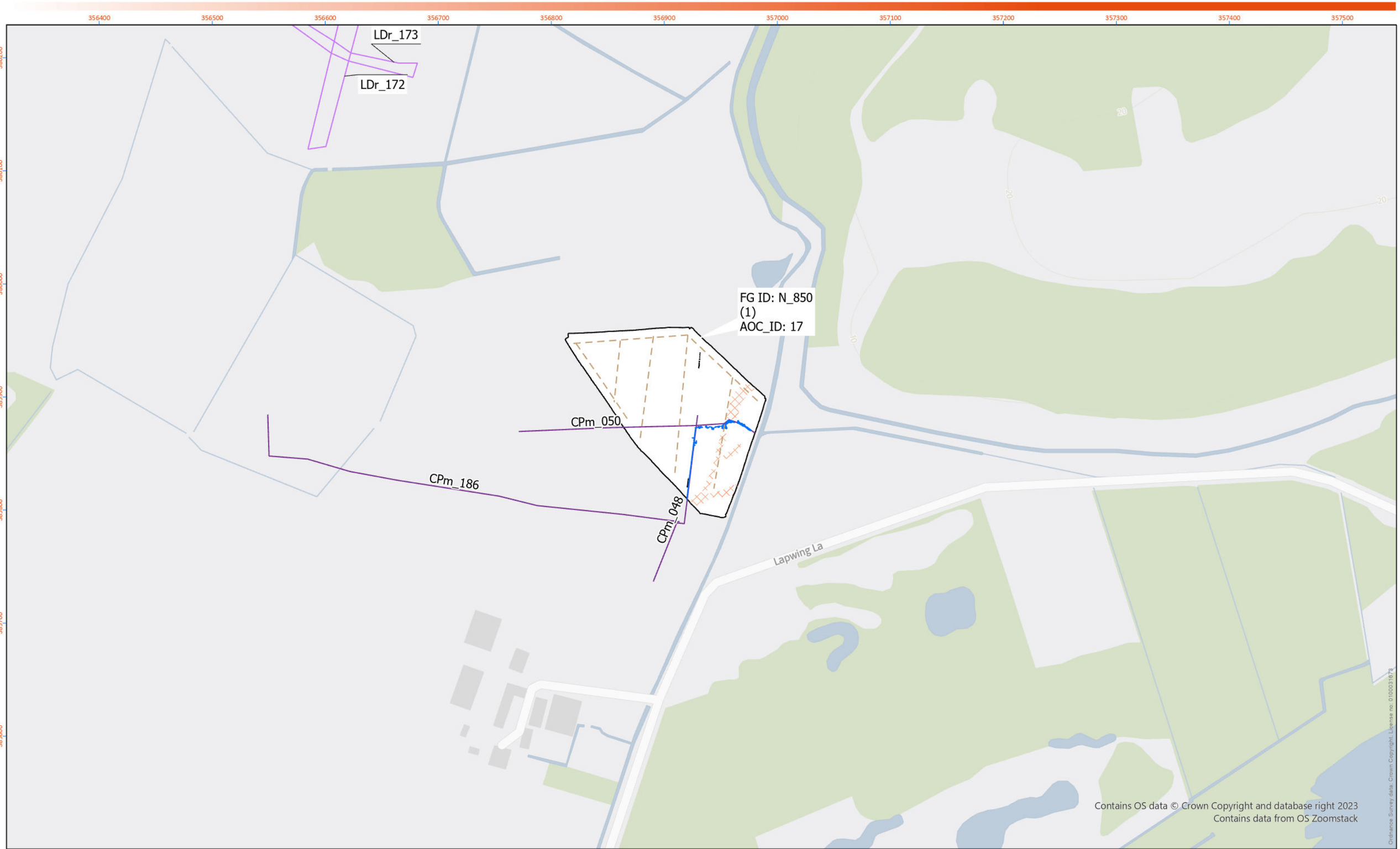
Figure 4.6

- Spread (Historic Feature)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features

Drawing Number:	05/40593/GEO/4.6/02
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

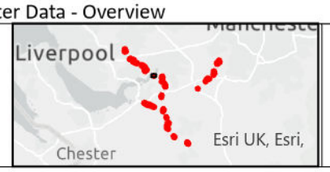
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.7

- Anomaly (Historic Feature)
- Spread (Geology/Natural)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.7/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358400 358500 358600 358700 358800 358900 359000 359100 359200 359300 359400 359500

385600 385500 385400 385300 385200 385100 385000

FG ID: N_760
AOC_ID: 72

FG ID:
N_570 (1)
AOC_ID: 18

CPm_062
CPm_121
CPm_008
CPm_098
CPm_102
CPm_082
CPm_054
CPm_013
CPm_122
CPm_163
CPm_136
CPm_180
CPm_109
CPm_092
LDr_171
CPm_020

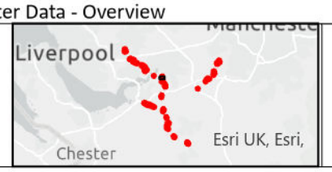
Mill La
Grange Green Manor
Bellhouse Farm
Bellhouse La
Cockfight Cottages
Higher Walt

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.8

- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.8/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358500 358600 358700 358800 358900 359000 359100 359200 359300 359400 359500 359600

384800 384700 384600 384500 384400 384300 384200 384100

Rivington Cottage

FG ID: N_360a
AOC_ID: 65

FG ID:
N_360b
AOC_ID: 66

FG ID: N_320
AOC_ID: 67

FG ID: N_340
AOC_ID: 71

CPm_074

CPm_125

LDr_049

CPm_004

A56

Chester Road

Chester Road

Underbridge La

Warrington Rd

Allotments

Park La

Park

30 40 50

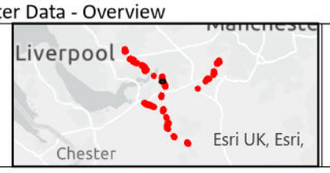
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Interpretation of Processed Gradiometer Data - Overview

Figure 4.9

- Unsuitable
- Spread (Historic Feature)
- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.9/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359200 359300 359400 359500 359600 359700 359800 359900 360000 360100 360200 360300

383800 383700 383600 383500 383400 383300 383200

FG ID:
N_347 (2)
AOC_ID: 20

CPm_147

FG ID:
N_347 (1)
AOC_ID: 19

CPm_148
CPm_176
CPm_029
CPm_151

Hatton Lodge

FG ID:
N_289 (1)
AOC_ID: 21

CPm_111
CPm_126

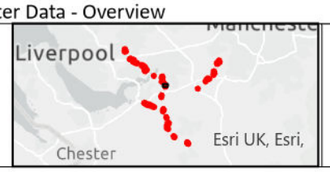
Park La
Hurst

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.10

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.10/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358200 358300 358400 358500 358600 358700 358800 358900 359000 359100 359200 359300 359400

381100 381000 380900 380800 380700 380600 380500

Summer La
Hallam Hall Barns
LDr_048
CPm_060
FG ID:
N_110 (1)
AOC_ID: 22
CPm_015
LDr_047
CPm_087
CPm_080
CPm_081
CPm_168
CPm_068
CPm_199
CPm_001
FG ID:
N_60 (1)
AOC_ID: 23
CPm_044
Morphany La
Morphany Hall Farm
60
Morphany La

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.11

- Unsuitable
- Anomaly (Possible Archaeology)
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Agricultural, Ridge and Furrow)
- Linear Trend (Drainage)
- Linear Trend (Magnetic Distrubance)
- Ferrous Anomalies/Iron Spike
- Cropmarks
- LiDAR Features



N

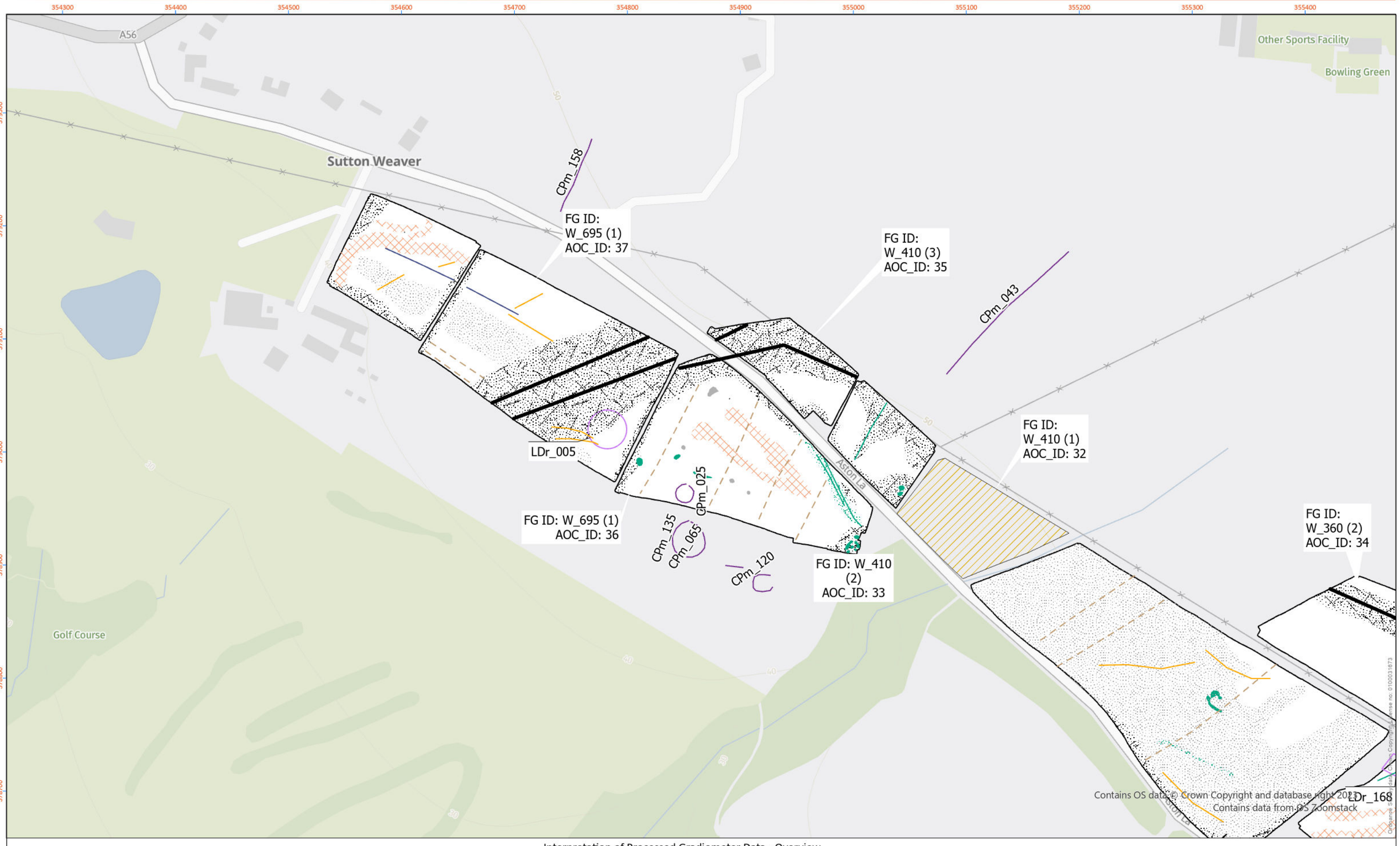
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Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.11/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

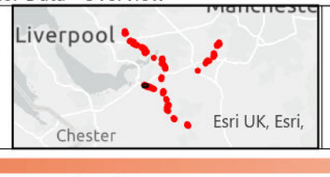
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.12

- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Geology/Natural)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.12/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

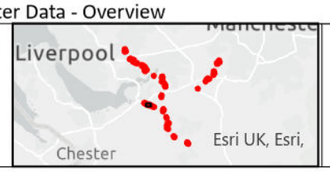
Delivering clean growth

FG ID: W_695 (1) AOC_ID: 36
FG ID: W_410 (1) AOC_ID: 32
FG ID: W_410 (2) AOC_ID: 33
FG ID: W_360 (2) AOC_ID: 34
FG ID: W_360 (1) AOC_ID: 31
FG ID: W_330 (1) AOC_ID: 30
LDr_168
LDr_167
LDr_302
LDr_301
LDr_300
LDr_169
LDr_170
CPm_088
CPm_160
Kidney Plantation
Chapel Wood
Aston by Sutton Primary School
St Peter's Church
Aston La
Aston H
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Interpretation of Processed Gradiometer Data - Overview

Figure 4.13

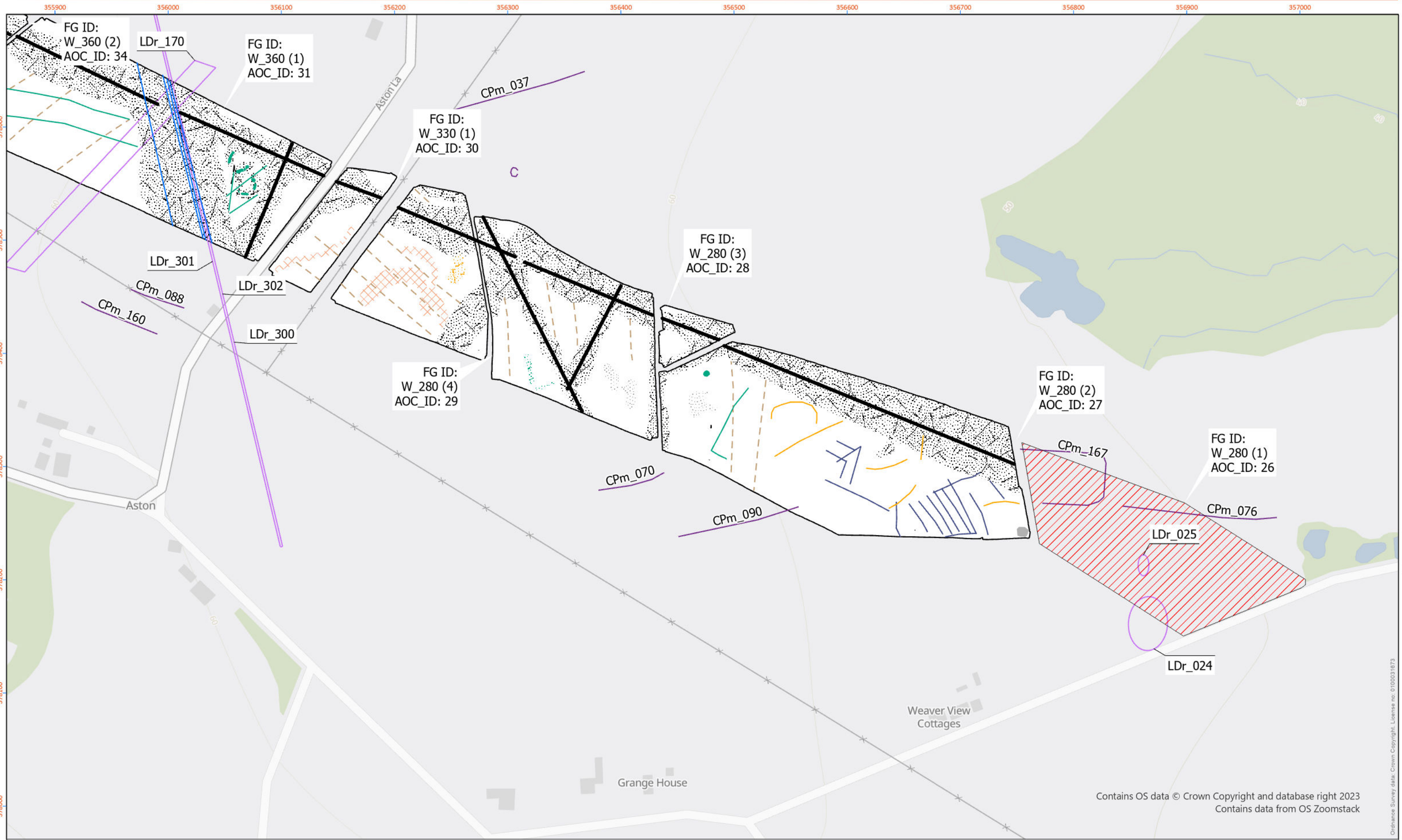
- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Geology/Natural)
- Linear Trend (Service)
- Linear Trend (Magnetic Distrubance)
- Cropmarks
- LiDAR Features



N
0 60m
Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.13/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

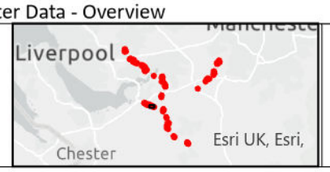
HyNet North West Hydrogen Pipeline
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.14

- Unsuitable
- Spread (Possible Archaeology)
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Linear Trend (Magnetic Distrubance)
- Cropmarks
- LiDAR Features



N

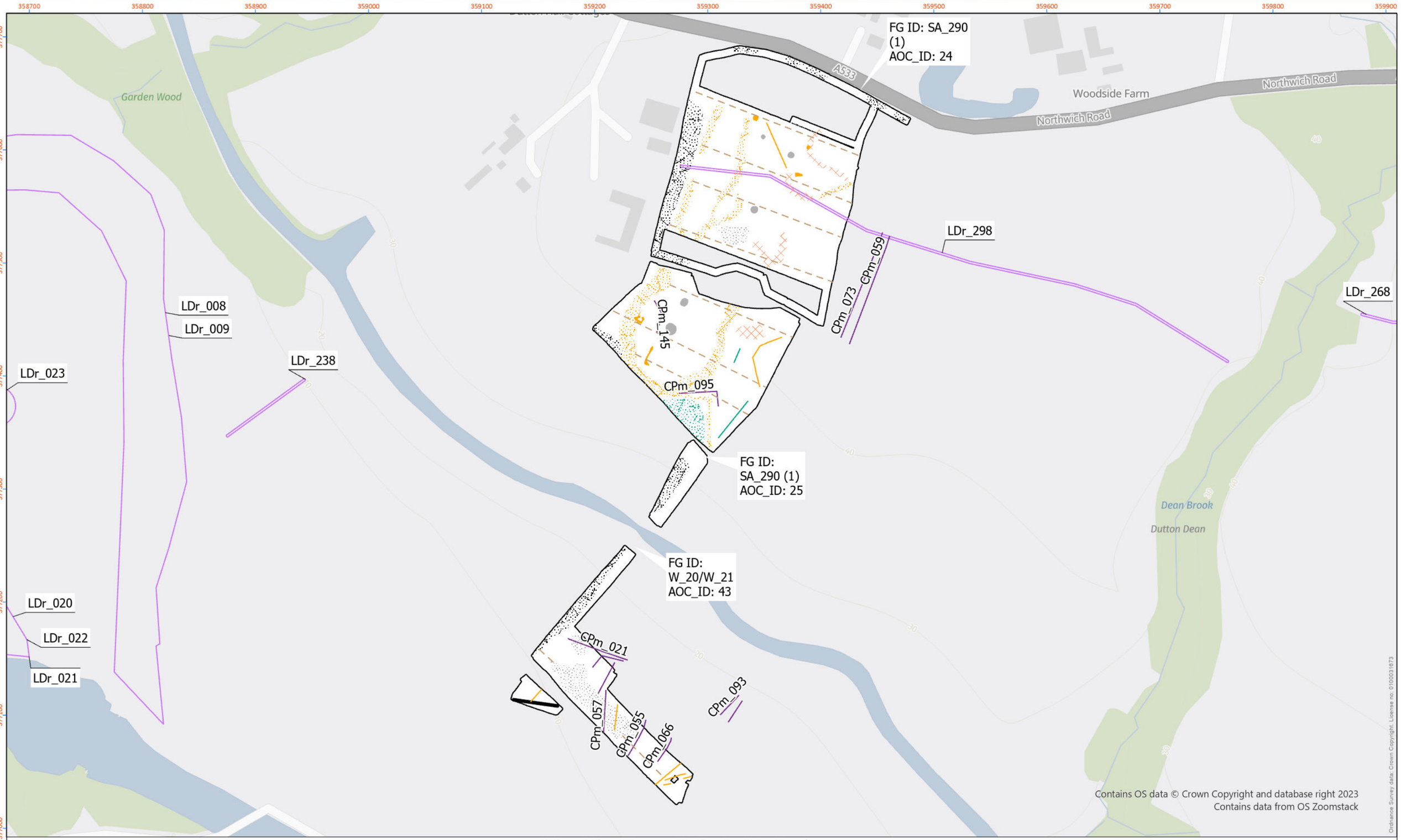
0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.14/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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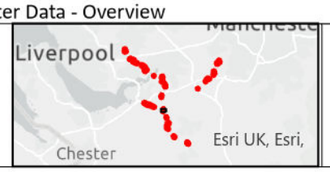
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.15

- Anomaly (Possible Archaeology)
- Spread (Possible Archaeology)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.15/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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359500 359600 359700 359800 359900 360000 360100 360200 360300 360400 360500 360600

375900 375800 375700 375600 375500 375400 375300

FG ID:
SA_760 (1)
AOC_ID: 38

CPm_130
CPm_170
CPm_195
CPm_161
CPm_139

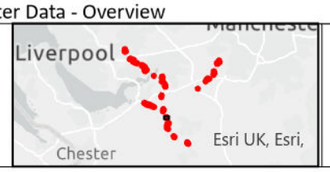
Warrington Road
Acton La
A49
Cliff Rd
Bancroft
Wall Hill Way
Strawberry La
Hill Top Rd
Acton Bridge
Holly Tree Cottage
Valley Farm
Weaver Navigation
Woodbine Cottage
Strawberry Farm

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.16

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



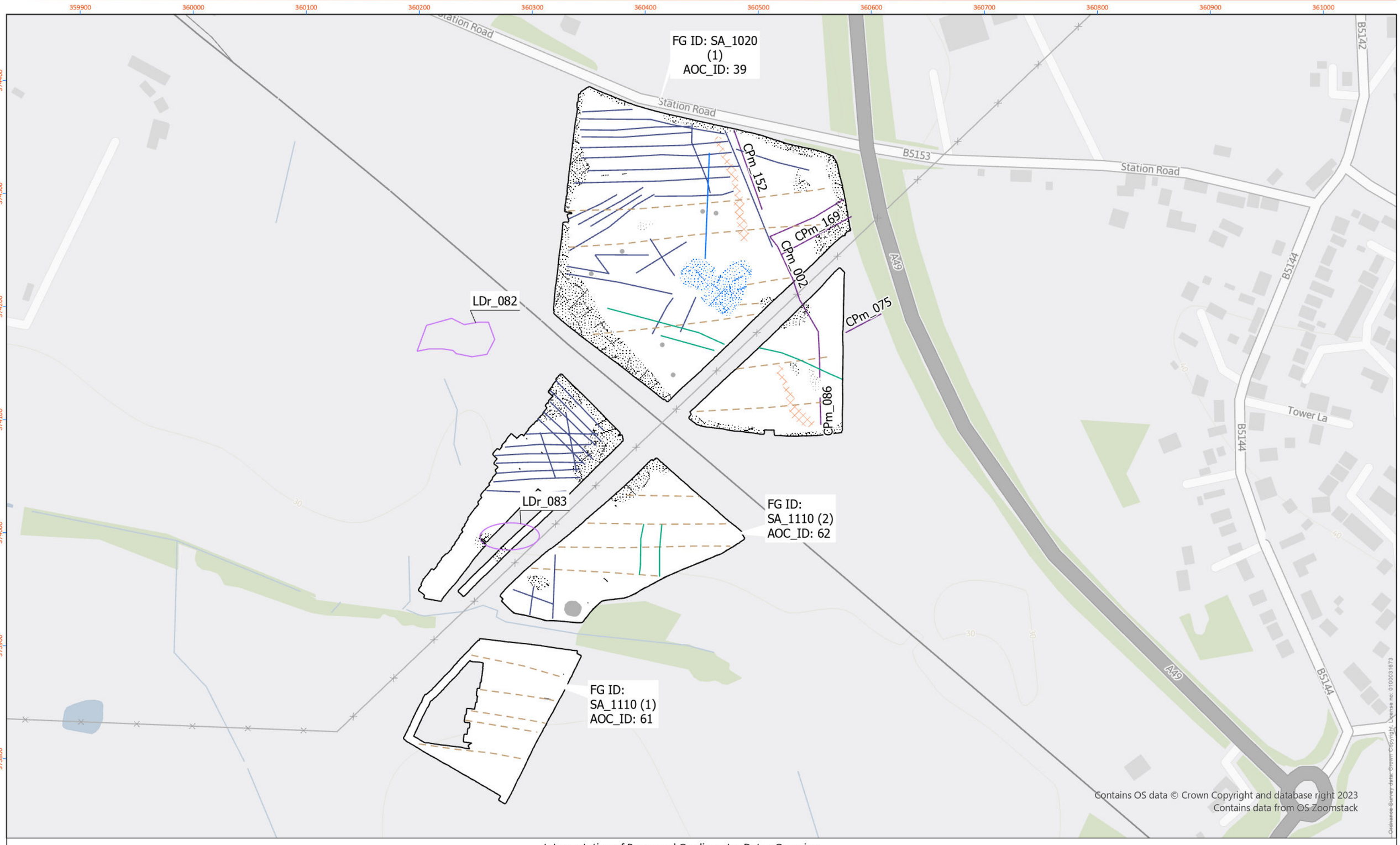
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Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.16/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.17

- Spread (Historic Feature)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Ferrous Anomalies/Iron Spike
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.17/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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359800 359900 360000 360100 360200 360300 360400 360500 360600 360700 360800 360900 361000

373700 373600 373500 373400 373300 373200 373100

FG ID:
SA_1190 (1)
AOC_ID: 60

FG ID:
SA_1260 (1)
AOC_ID: 58

FG ID: SA_1260
(1)
AOC_ID: 59

FG ID:
SA_1330 (1)
AOC_ID: 40

Hefferston Hall New Lodge
Hefferston Grange Dr
Hefferston Rise
East Lodge
Grange La
A49
A49
40
40
40
30
30
80

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.18

- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Magnetic Distrubance)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.18/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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FG ID:
SA_1260 (1)
AOC_ID: 59

FG ID:
SA_1330 (1)
AOC_ID: 40

FG ID:
SA_1350 (1)
AOC_ID: 57

LDr_274
LDr_276
LDr_275
LDr_084
LDr_085
LDr_273
LDr_086
LDr_087
CPm_189

Grange La
Cuddington Manor
A49
Bag La
Bryn Smithy House
Cuddington La
The Cottage
Millington La
Millington

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.19

- No Access
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Magnetic Distrubance)
- Cropmarks
- LiDAR Features



N

0 60m
Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.19/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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Delivering clean growth

361400 361500 361600 361700 361800 361900 362000 362100 362200 362300 362400 362500

371200 371100 371000 370900 370800 370700 370600

Chester Road
A556
Chester Road
A556
Chester Road
A556
Sandiway Bank
Vale Farm
Earnslow Grange Cottages
Sandiway Golf Course

FG ID:
SA_1860 (1)
AOC_ID: 56

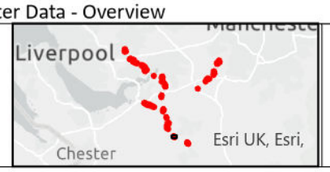
FG ID:
SA_1990 (1)
AOC_ID: 55

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.20

- No Access
- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Agricultural, Ploughing)
- Cropmarks
- LiDAR Features



N

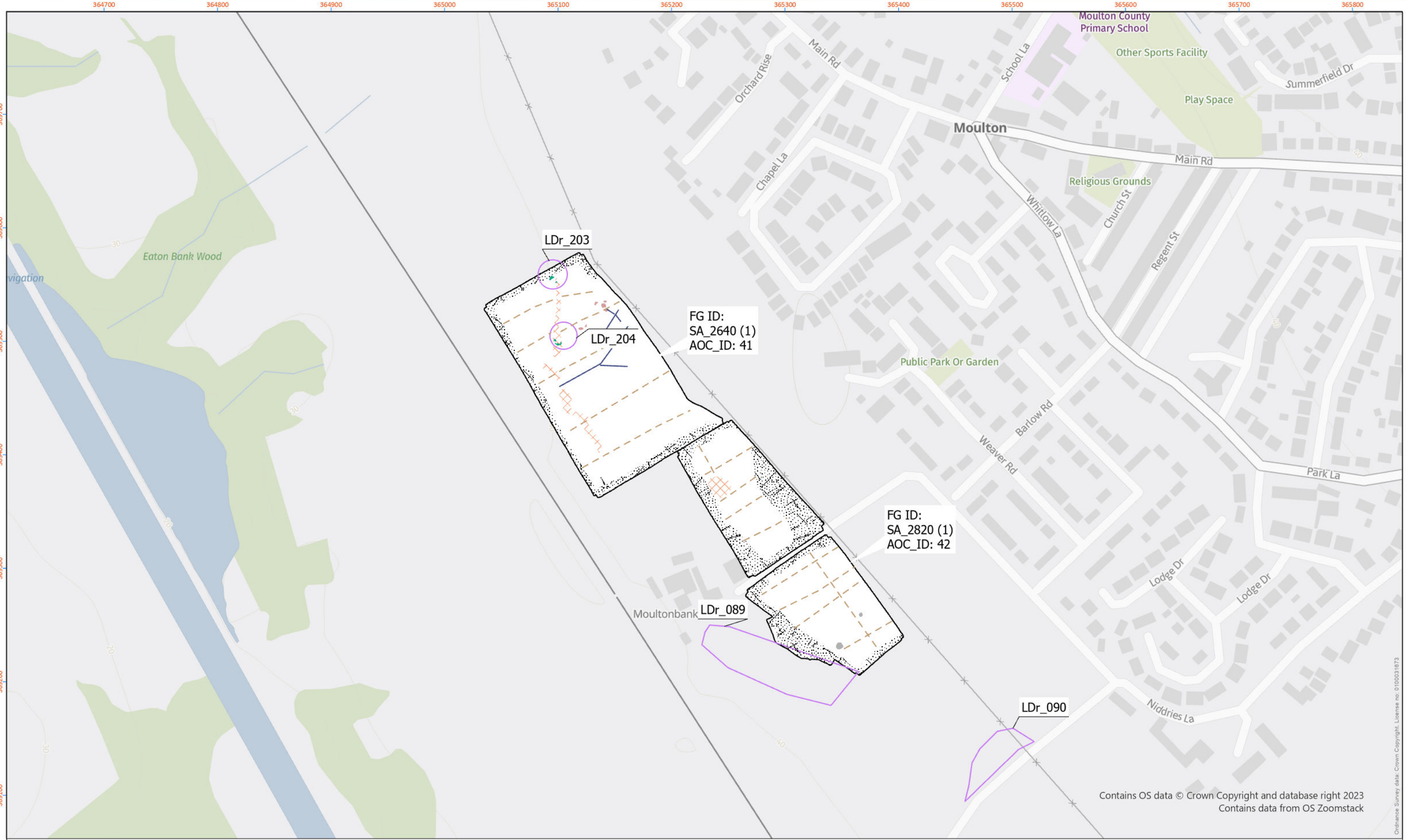
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Drawing Number: 05/40593/GEO/4.20/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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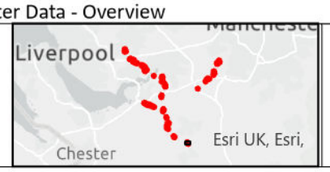
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Interpretation of Processed Gradiometer Data - Overview

Figure 4.21

- Anomaly (Burned Area)
- Anomaly (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Cropmarks
- LiDAR Features



N

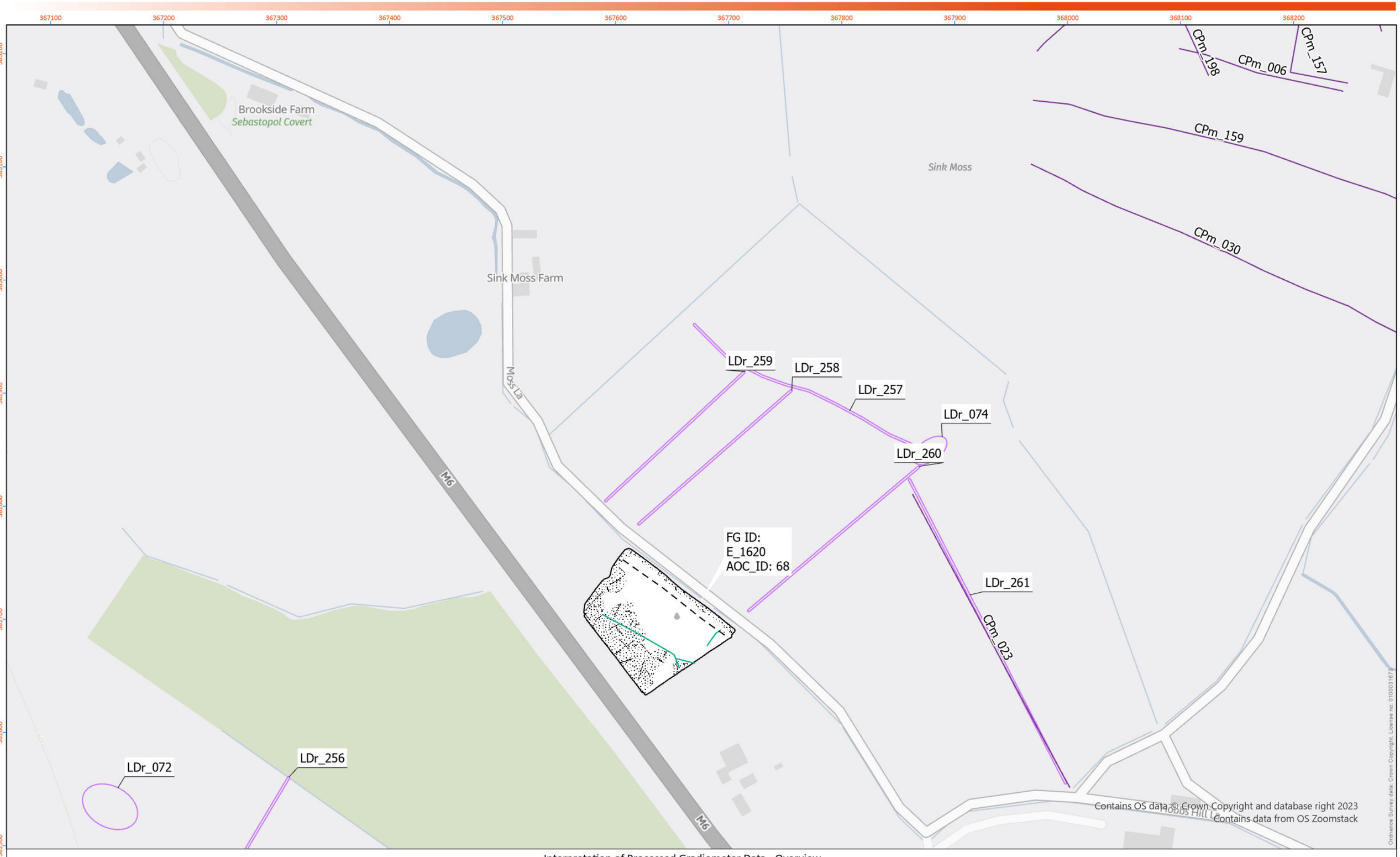
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Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.21/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.22

- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Unclear Origin)
- Linear Trend (Magnetic Distrubance)
- Cropmarks
- LiDAR Features



N

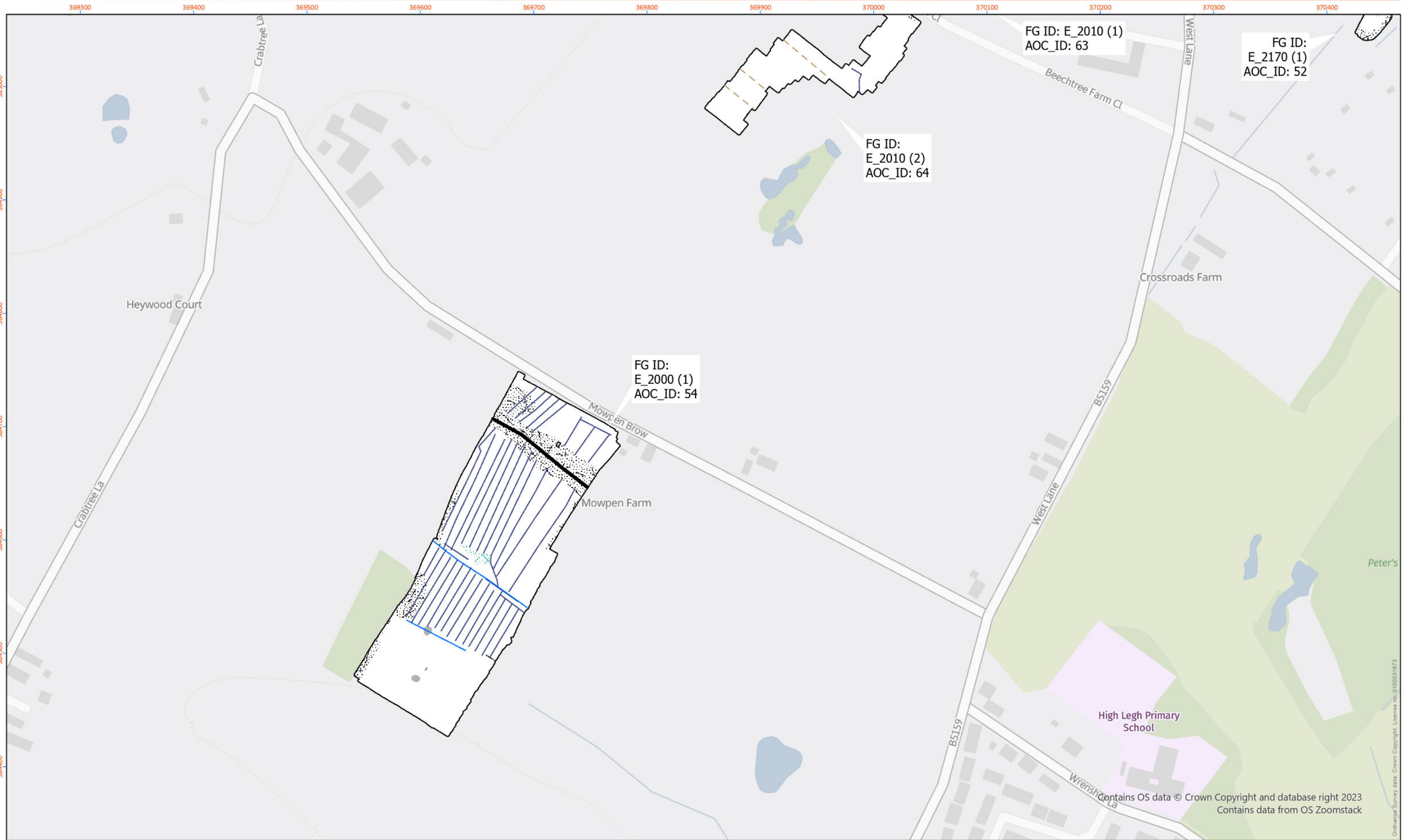
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Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.22/02	
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Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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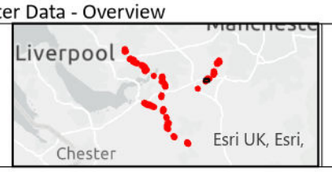
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Interpretation of Processed Gradiometer Data - Overview

Figure 4.23

- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

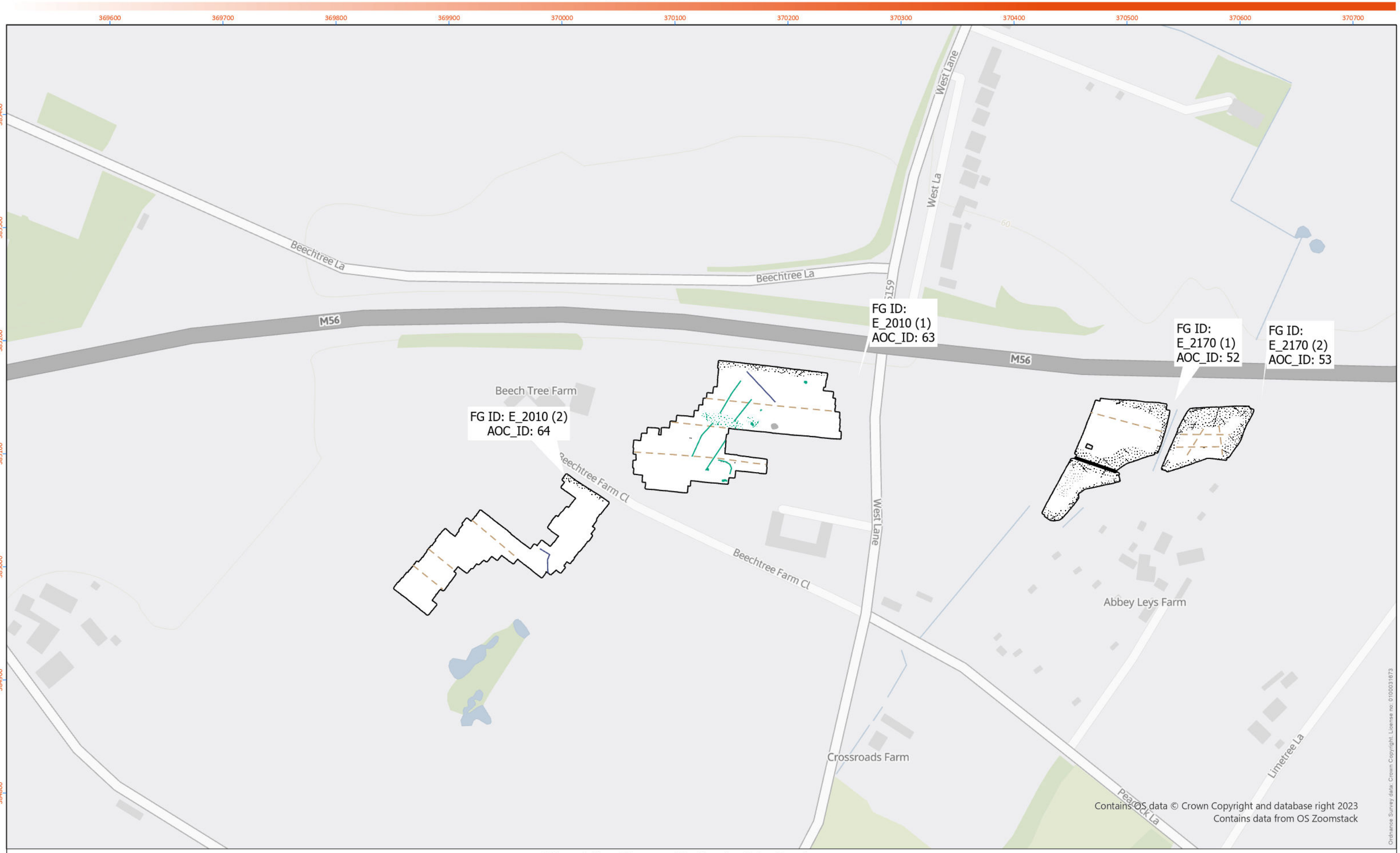
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Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.23/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

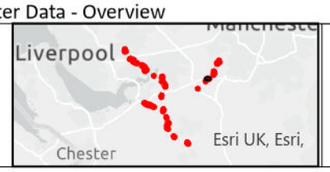
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.24

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.24/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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FG ID:
E_2510 (2)
AOC_ID: 70

LDr_265

FG ID:
E_2510 (1)
AOC_ID: 69

Agden Brook Farm

Agdenlane Farm

Agden La

Lymm Road

A56

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.25

Spread (Magnetic Disturbance)
Linear Trend (Drainage)
Linear Trend (Service)
Cropmarks
LiDAR Features

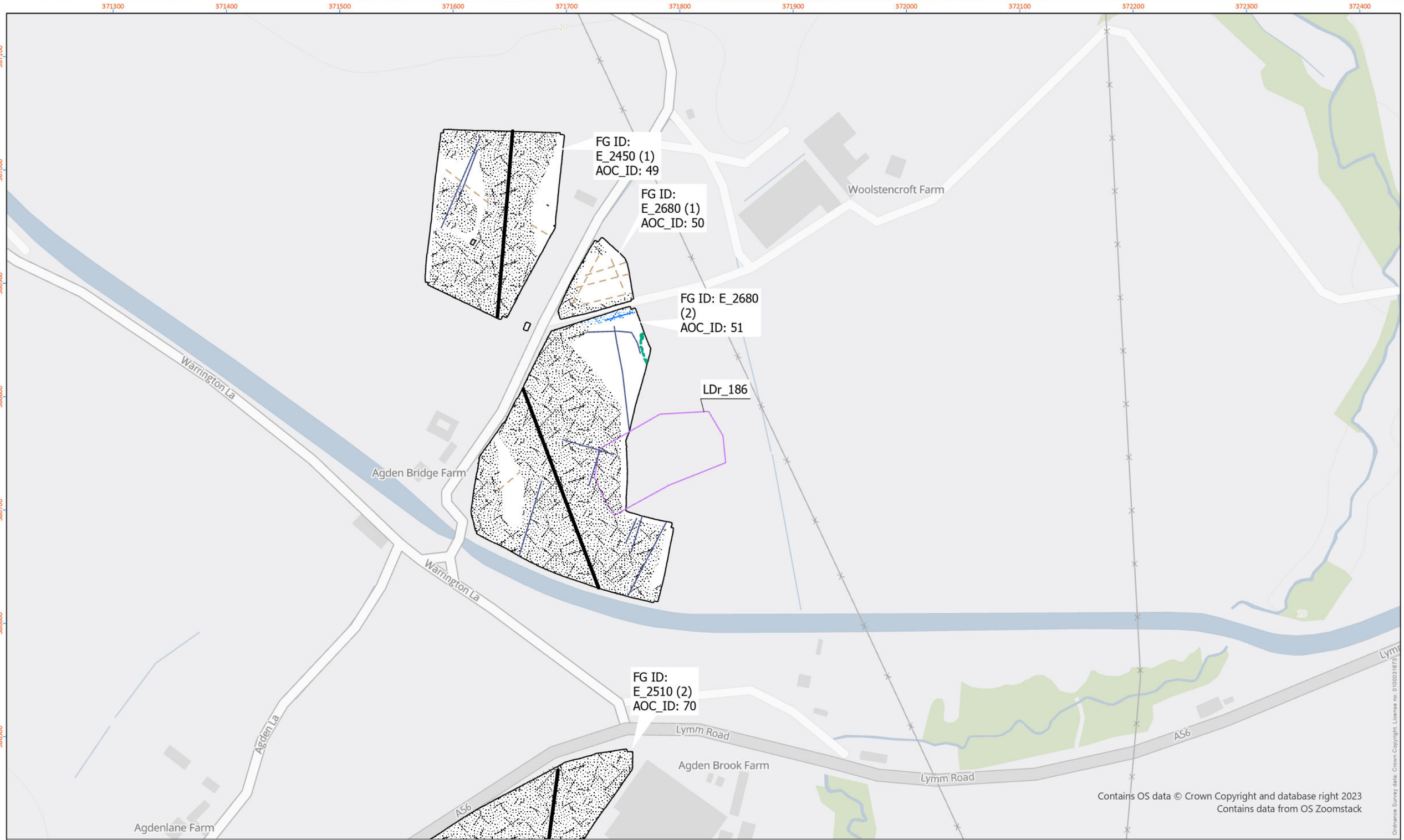
Liverpool
Chester
Esri UK, Esri,

N
0 60m
Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.25/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

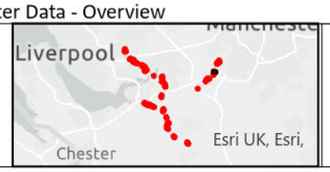
Delivering clean growth



Interpretation of Processed Gradiometer Data - Overview

Figure 4.26

- Spread (Historic Feature)
- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.26/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

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372400 372500 372600 372700 372800 372900 373000 373100 373200 373300 373400 373500

389700 389600 389500 389400 389300 389200 389100 389000

Longridge Farm
Moss Hall Farm
Orchardhouse Farm
Sinderland Ho Farm
Red House La
Henshall La
Brookfield Cottage
Caldwell Brook
CPm_103
CPm_045
FG ID:
E_3270
AOC_ID: 45
FG ID:
E_3272
AOC_ID: 46
FG ID:
E_2750 (1)
AOC_ID: 48

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Interpretation of Processed Gradiometer Data - Overview

Figure 4.27

- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.27/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

372100 372200 372300 372400 372500 372600 372700 372800 372900 373000 373100 373200

389300 389200 389100 389000 388900 388800 388700 388600

Orchardhouse Farm

FG ID:
E_3270
AOC_ID: 45

Brookfield Cottage

CPm_045

FG ID:
E_3272
AOC_ID: 46

Caldwell Brook

FG ID:
E_2750 (1)
AOC_ID: 48

FG ID:
E_3020 (1)
AOC_ID: 47

Gorsey La

Sawpit St

Henshall La

B5160

Dunham Road

Carrgreen La

Barns La

Park View

LDr_081

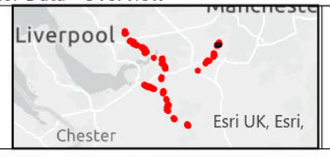
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Interpretation of Processed Gradiometer Data - Overview

Figure 4.28

- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Cropmarks
- LiDAR Features



N

0 60m

Scale: 1:3,000 @A3

Drawing Number: 05/40593/GEO/4.28/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

351150 351200 351250 351300 351350 351400 351450 351500 351550 351600

390150 390100 390050 390000 389950 389900

M62 M62 M62

FG ID:
N_2200 (1)
AOC_ID: 3

FG ID:
N_2210 (1)
AOC_ID: 4

Union Bank La

Jubilts Lane

B5419

Lane

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.1

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.1/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

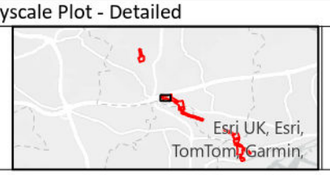
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.2

2 nT
-1 nT



N

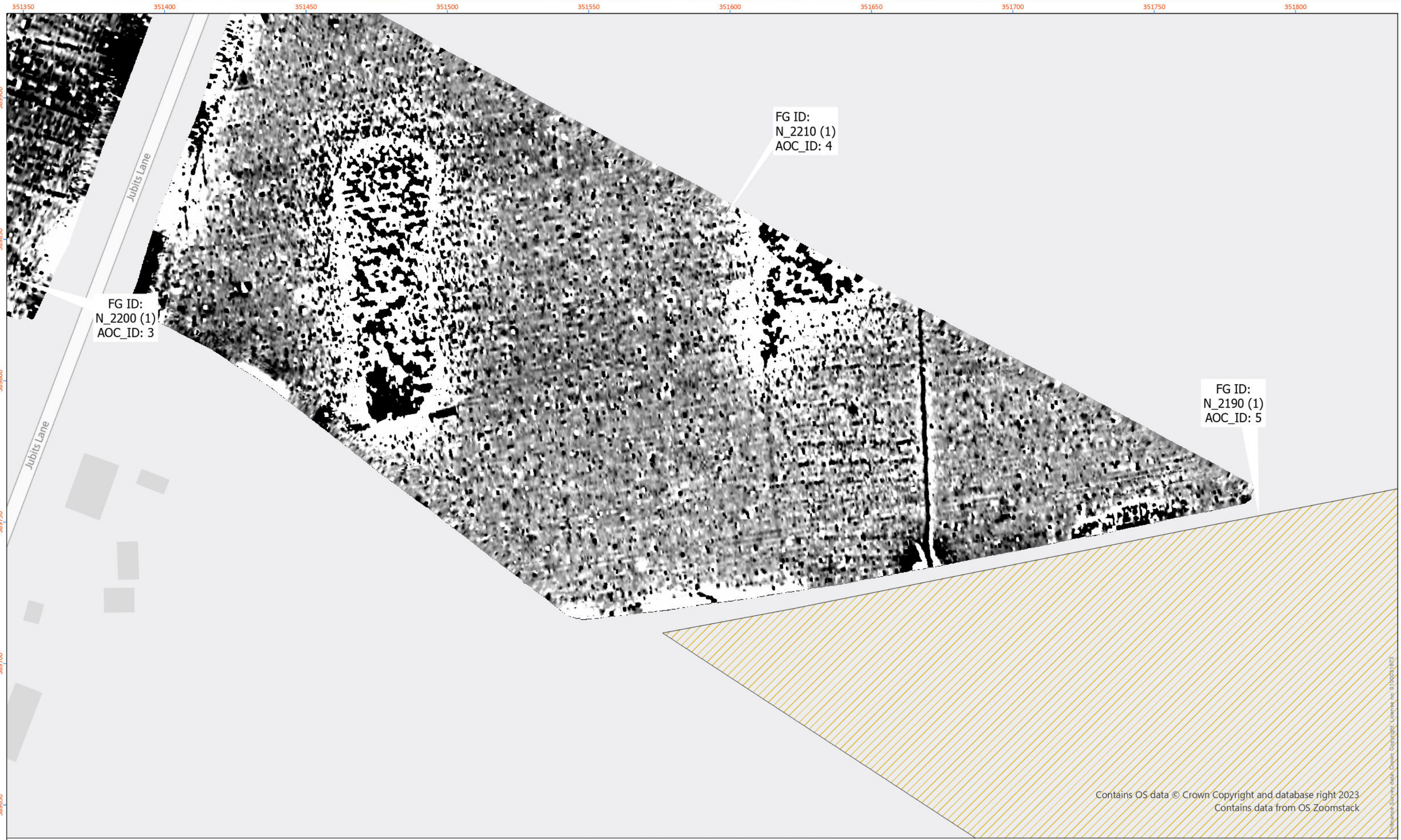
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/5.2/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

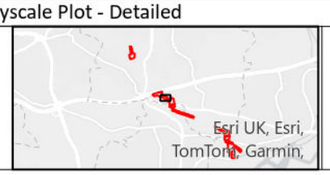


Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.3

2 nT
-1 nT

No Access



N

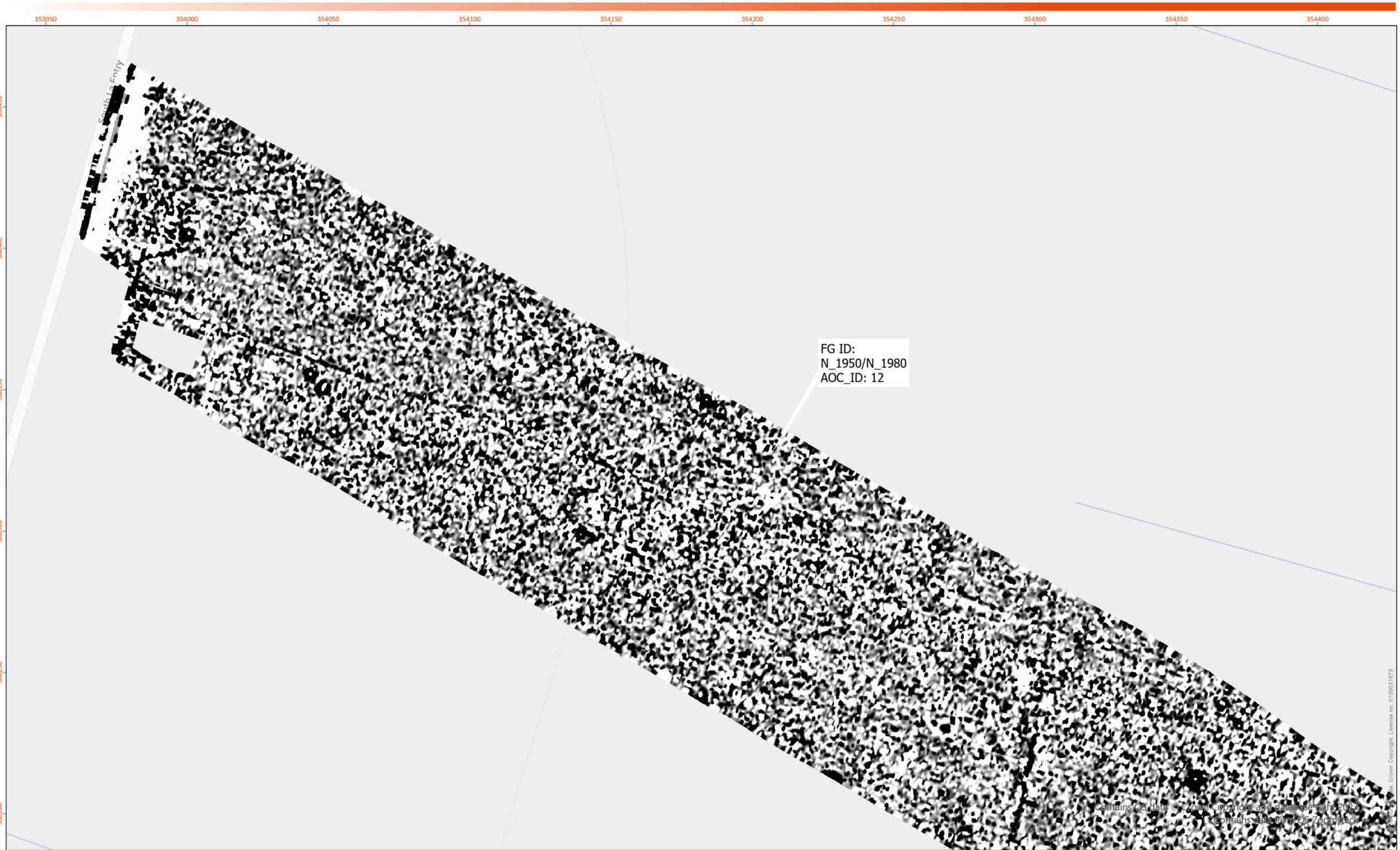
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.3/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

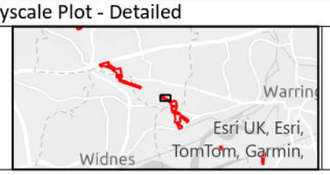


Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.4

2 nT

-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.4/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

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354300 354350 354400 354450 354500 354550 354600 354650 354700 354750

388300 388250 388200 388150 388100 388050

FG ID:
N_1950/N_1980
AOC_ID: 12

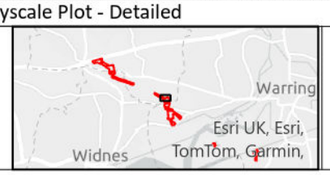
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.5

2 nT
-1 nT



N

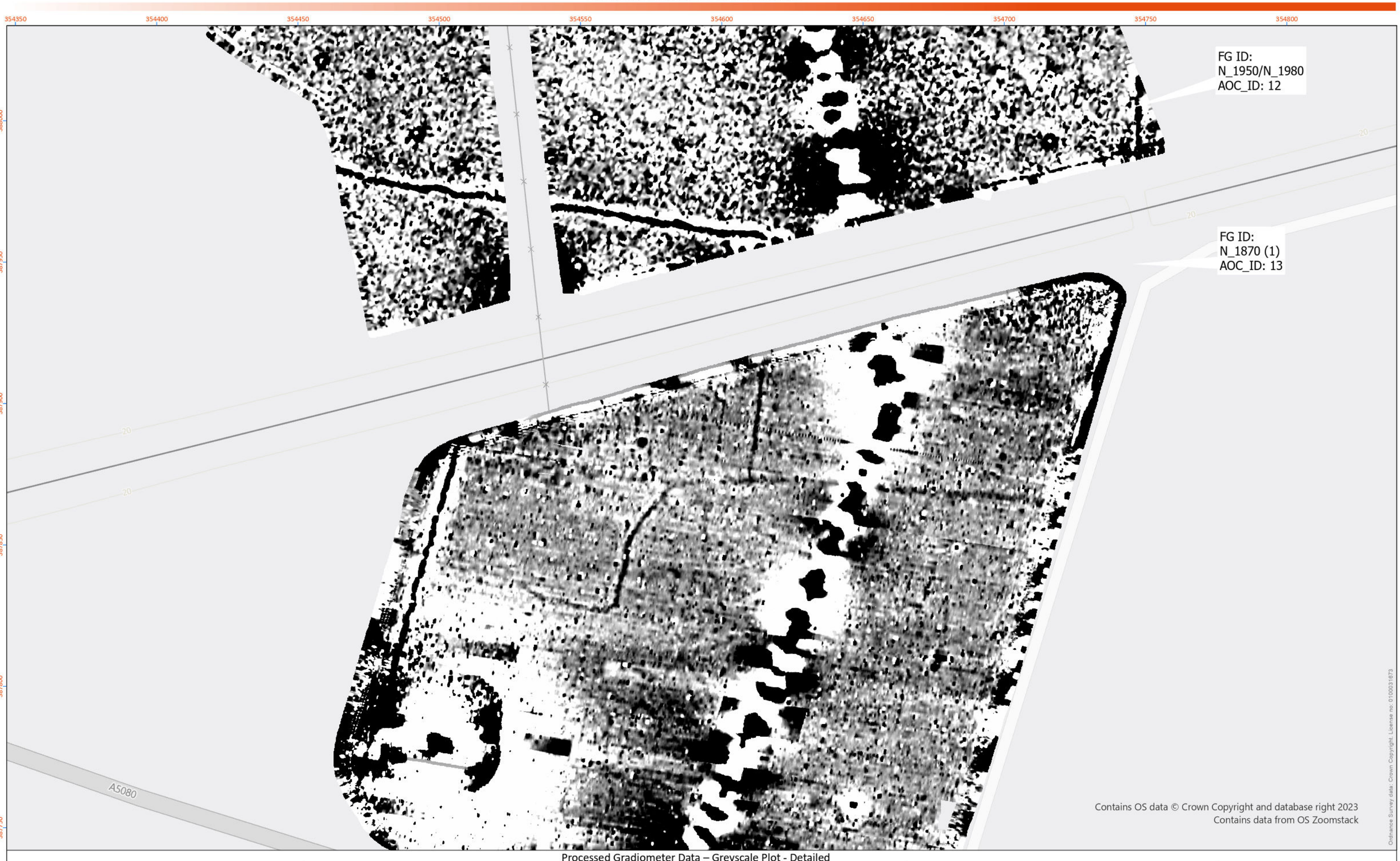
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.5/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

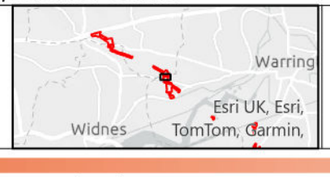
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.6

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.6/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354450 354500 354550 354600 354650 354700 354750 354800 354850 354900

387750 387700 387650 387600 387550 387500

FG ID:
N_1870 (1)
AOC_ID: 13

FG ID:
N_1710 (1)
AOC_ID: 14

FG ID:
N_1710 (2)
AOC_ID: 15

South Lane
A5080
South Lane
A5080
South Lane
South Lane
Four Top'd Oak

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.7

2 nT
-1 nT



N

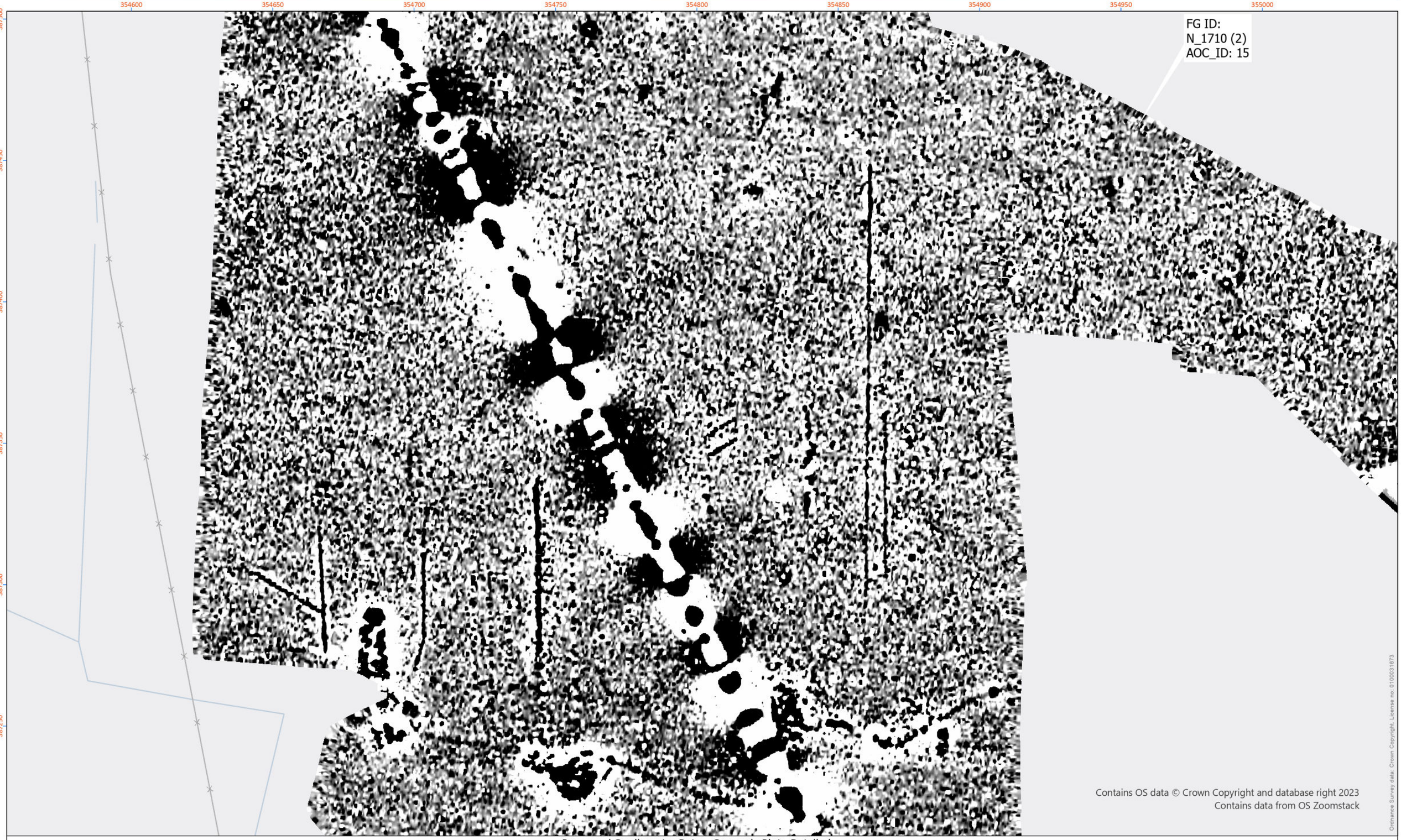
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.7/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

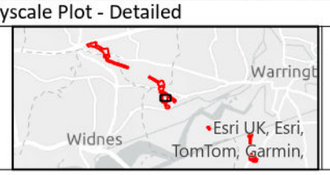
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.8

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.8/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

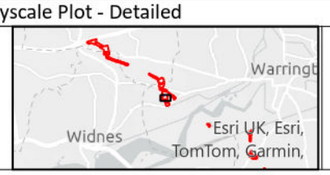
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.9

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.9/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354950 355000 355050 355100 355150 355200 355250 355300 355350 355400

387450 387400 387350 387300 387250 387200

FG ID:
N_1710 (2)
AOC_ID: 15

FG ID:
N_1876
AOC_ID: 44

Doe Green

Cuerdley Rd

Cuerdley Rd

Widnes Road

A562

Tannery La

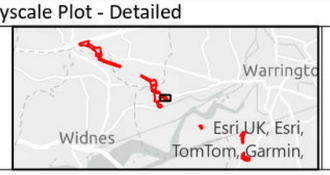
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.10

2 nT
-1 nT



N

0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.10/02		
Created by: AC, KA	Date: 11/03/2024	
Checked by: SO	Date: 11/03/2024	
Approved by: JL	Date: 11/03/2024	

HyNet North West Hydrogen Pipeline

Delivering clean growth

354600 354650 354700 354750 354800 354850 354900 354950 355000 355050

387100 387050 387000 386950 386900

Mowcroft La

FG ID:
N_1710 (2)
AOC_ID: 15

FG ID:
N_1550 (1)
AOC_ID: 16

A562

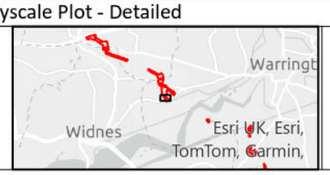
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.11

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.11/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

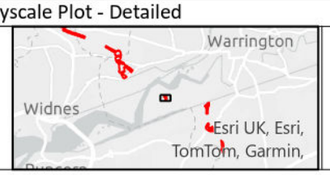
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.12

2 nT
-1 nT



N

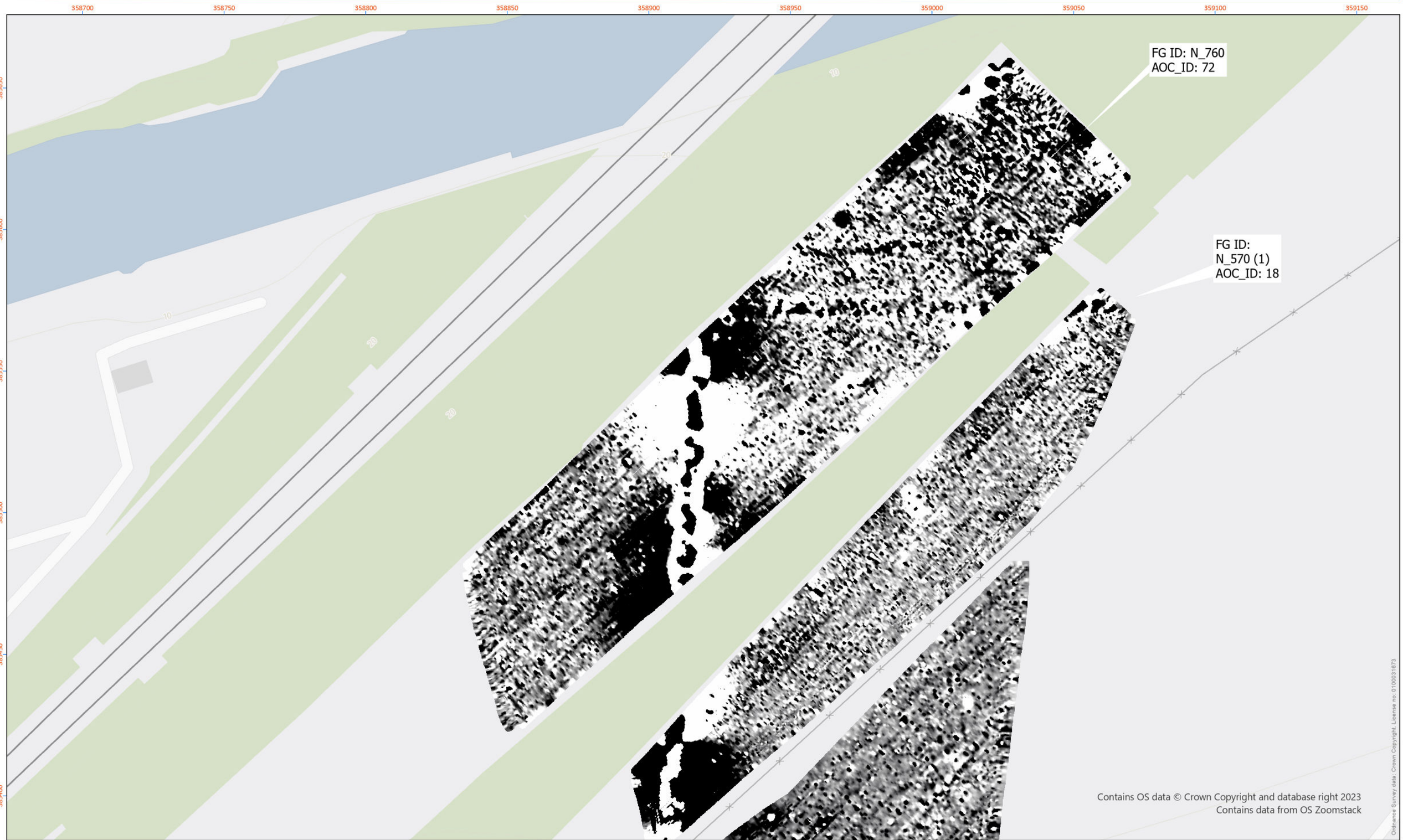
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.12/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

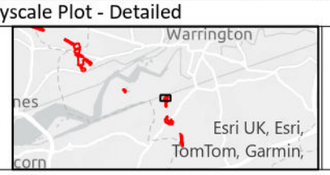


Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.13

2 nT

-1 nT



N

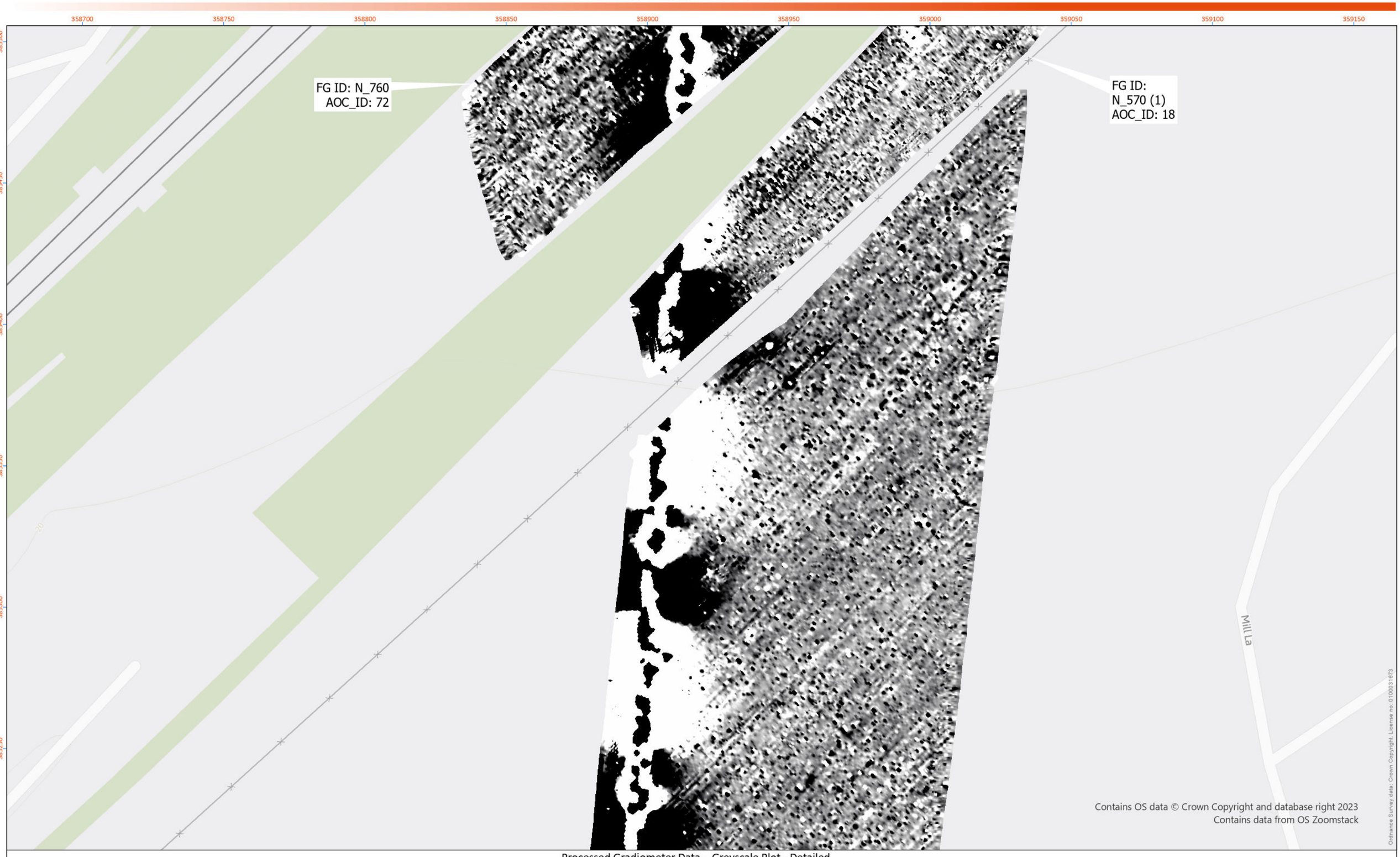
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.13/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

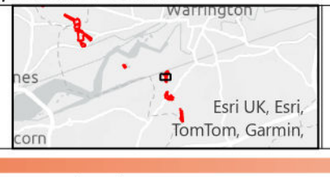
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.14

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.14/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

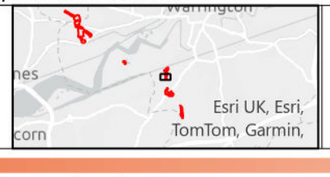
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.15

2 nT
-1 nT



N

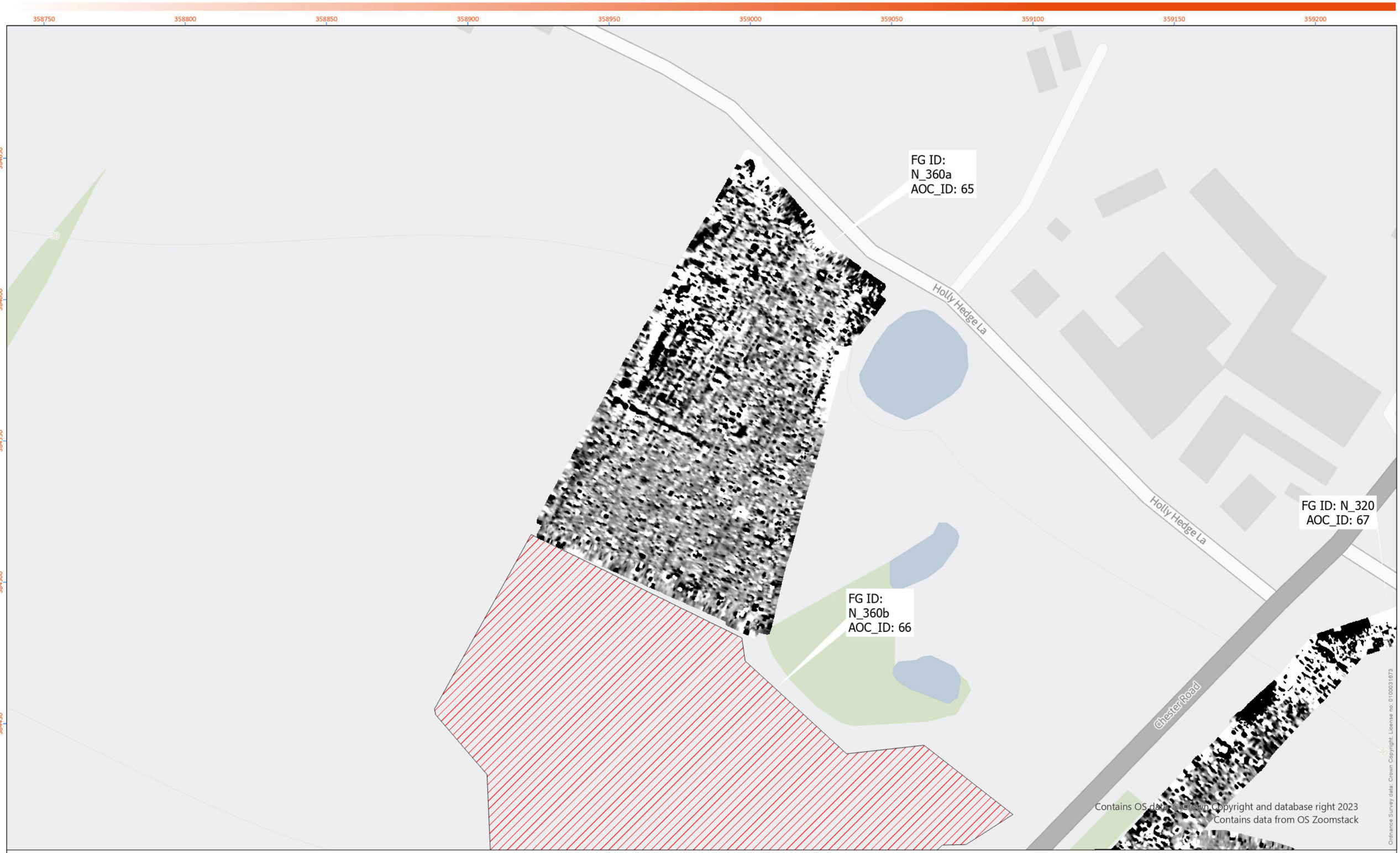
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.15/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

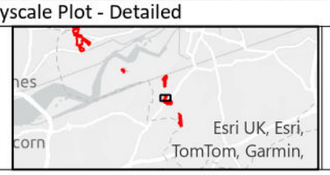


Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.16

2 nT
-1 nT

Unsuitable



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.16/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

FG ID: N_360a
AOC_ID: 65

FG ID:
N_360b
AOC_ID: 66

FG ID: N_320
AOC_ID: 67

FG ID: N_340
AOC_ID: 71

Chester Road

A56

Park La

Allotments

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.17

2 nT
-1 nT

Unsuitable

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.17/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359450 359500 359550 359600 359650 359700 359750 359800 359850 359900

383800 383750 383700 383650 383600 383550

FG ID:
N_347 (2)
AOC_ID: 20

FG ID:
N_347 (1)
AOC_ID: 19

Warrington Rd

Hatton Lodge

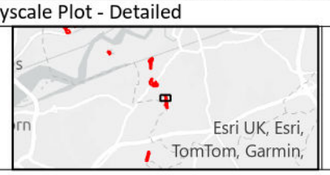
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.18

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.18/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359450 359500 359550 359600 359650 359700 359750 359800 359850 359900

383600 383550 383500 383450 383400 383350

Warrington Rd

Hatton Lodge

50

60

FG ID:
N_347 (1)
AOC_ID: 19

FG ID:
N_289 (1)
AOC_ID: 21

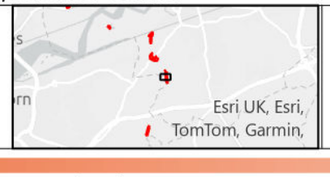
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.19

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.19/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359500 359550 359600 359650 359700 359750 359800 359850 359900

383400 383350 383300 383250 383200 383150

FG ID:
N_347 (1)
AOC_ID: 19

FG ID:
N_289 (1)
AOC_ID: 21

Warrington Rd

50

60

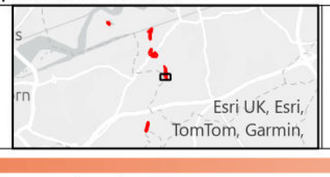
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.20

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.20/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358600 358650 358700 358750 358800 358850 358900 358950 359000 359050

381100 381050 381000 380950 380900 380850

Hallam Hall Barns

Morphany La

FG ID:
N_110 (1)
AOC_ID: 22

FG ID:
N_60 (1)
AOC_ID: 23

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.21

2 nT
-1 nT

Unsuitable



N

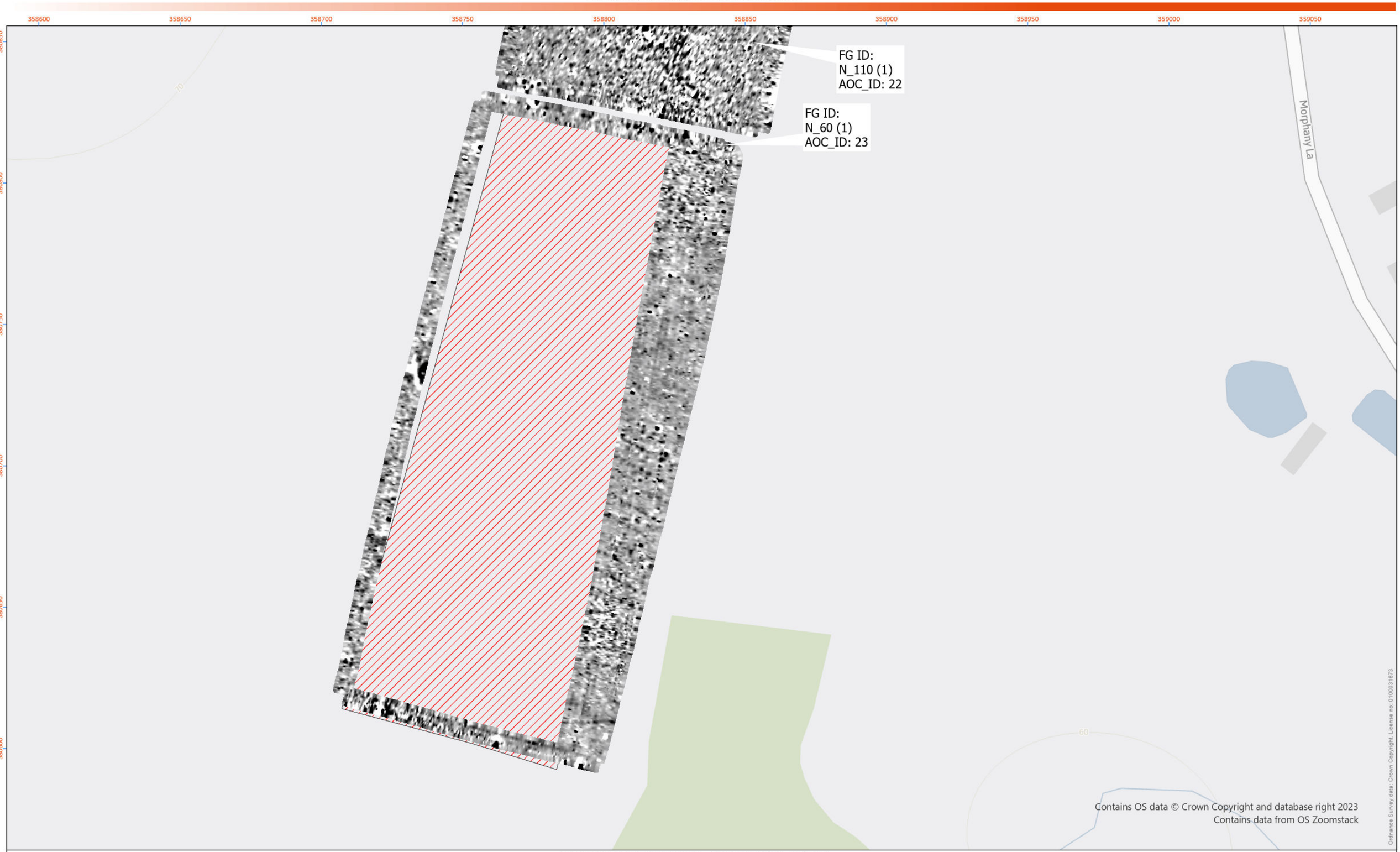
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.21/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

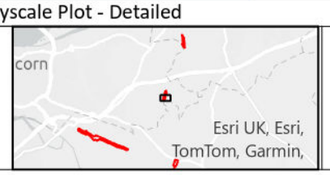


Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.22

2 nT
-1 nT

Unsuitable



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.22/02		
Created by: AC, KA	Date: 11/03/2024	
Checked by: SO	Date: 11/03/2024	
Approved by: JL	Date: 11/03/2024	

HyNet North West Hydrogen Pipeline

Delivering clean growth

354450 354500 354550 354600 354650 354700 354750 354800 354850 354900

379250 379200 379150 379100 379050

Sutton Weaver

Aston La

FG ID:
W_695 (1)
AOC_ID: 37

FG ID:
W_410 (3)
AOC_ID: 35

FG ID: W_695 (1)
AOC_ID: 36

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.23

2 nT
-1 nT

Runcorn
Esri UK, Esri, TomTom, Garmin,

N
0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.23/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline
Delivering clean growth

354650 354700 354750 354800 354850 354900 354950 355000 355050 355100

379150 379100 379050 379000 378950 378900

FG ID:
W_695 (1)
AOC_ID: 37

FG ID:
W_695 (1)
AOC_ID: 36

FG ID:
W_410 (3)
AOC_ID: 35

FG ID:
W_410 (2)
AOC_ID: 33

FG ID:
W_410 (1)
AOC_ID: 32

FG ID:
W_360 (2)
AOC_ID: 34

Aston La

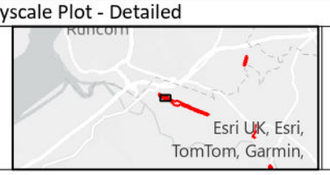
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.24

2 nT
-1 nT

No Access



N

0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.24/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

355100 355150 355200 355250 355300 355350 355400 355450 355500 355550

378900 378850 378800 378750 378700

FG ID:
W_410 (1)
AOC_ID: 32

FG ID:
W_360 (2)
AOC_ID: 34

Aston La

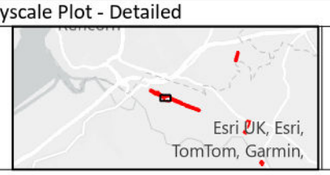
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.25

2 nT
-1 nT

No Access



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.25/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

355400 355450 355500 355550 355600 355650 355700 355750 355800

378850 378800 378750 378700 378650 378600

FG ID:
W_360 (2)
AOC_ID: 34

FG ID: W_360 (1)
AOC_ID: 31

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Ordnance Survey data

Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.26

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.26/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

355750 355800 355850 355900 355950 356000 356050 356100 356150 356200

378700 378650 378600 378550 378500

FG ID:
W_360 (2)
AOC_ID: 34

FG ID:
W_360 (1)
AOC_ID: 31

FG ID:
W_330 (1)
AOC_ID: 30

Aston La

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.27

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.27/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

356100 356150 356200 356250 356300 356350 356400 356450 356500

378550 378500 378450 378400 378350 378300

FG ID: W_360 (1)
AOC_ID: 31

FG ID:
W_330 (1)
AOC_ID: 30

FG ID:
W_280 (4)
AOC_ID: 29

FG ID:
W_280 (3)
AOC_ID: 28

FG ID:
W_280 (2)
AOC_ID: 27

Aston La

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.28

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin,

N

0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.28/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

356400 356450 356500 356550 356600 356650 356700 356750 356800

378450 378400 378350 378300 378250 378200

FG ID: W_280 (3)
AOC_ID: 28

FG ID:
W_280 (2)
AOC_ID: 27

FG ID:
W_280 (1)
AOC_ID: 26

FG ID:
W_280 (4)
AOC_ID: 29

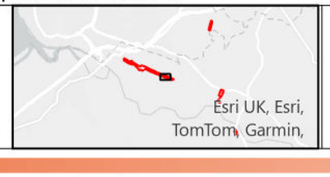
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.29

2 nT
-1 nT

Unsuitable



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/5.29/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

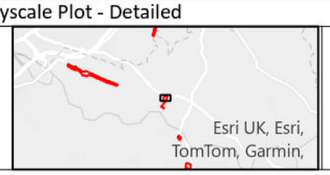
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.30

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.30/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377400 377350 377300 377250 377200

FG ID:
SA_290 (1)
AOC_ID: 24

FG ID:
SA_290 (1)
AOC_ID: 25

FG ID:
W_20/W_21
AOC_ID: 43

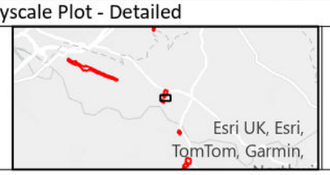
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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.31

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.31/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377200 377150 377100 377050 377000

FG ID:
W_20/W_21
AOC_ID: 43

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.32

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin, Northwi

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.32/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359800 359850 359900 359950 360000 360050 360100 360150 360200 360250

375750 375700 375650 375600 375550 375500

Acton La

Warrington Road

A49

Warrington Rd

FG ID:
SA_760 (1)
AOC_ID: 38

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.33

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin, Northwich

N

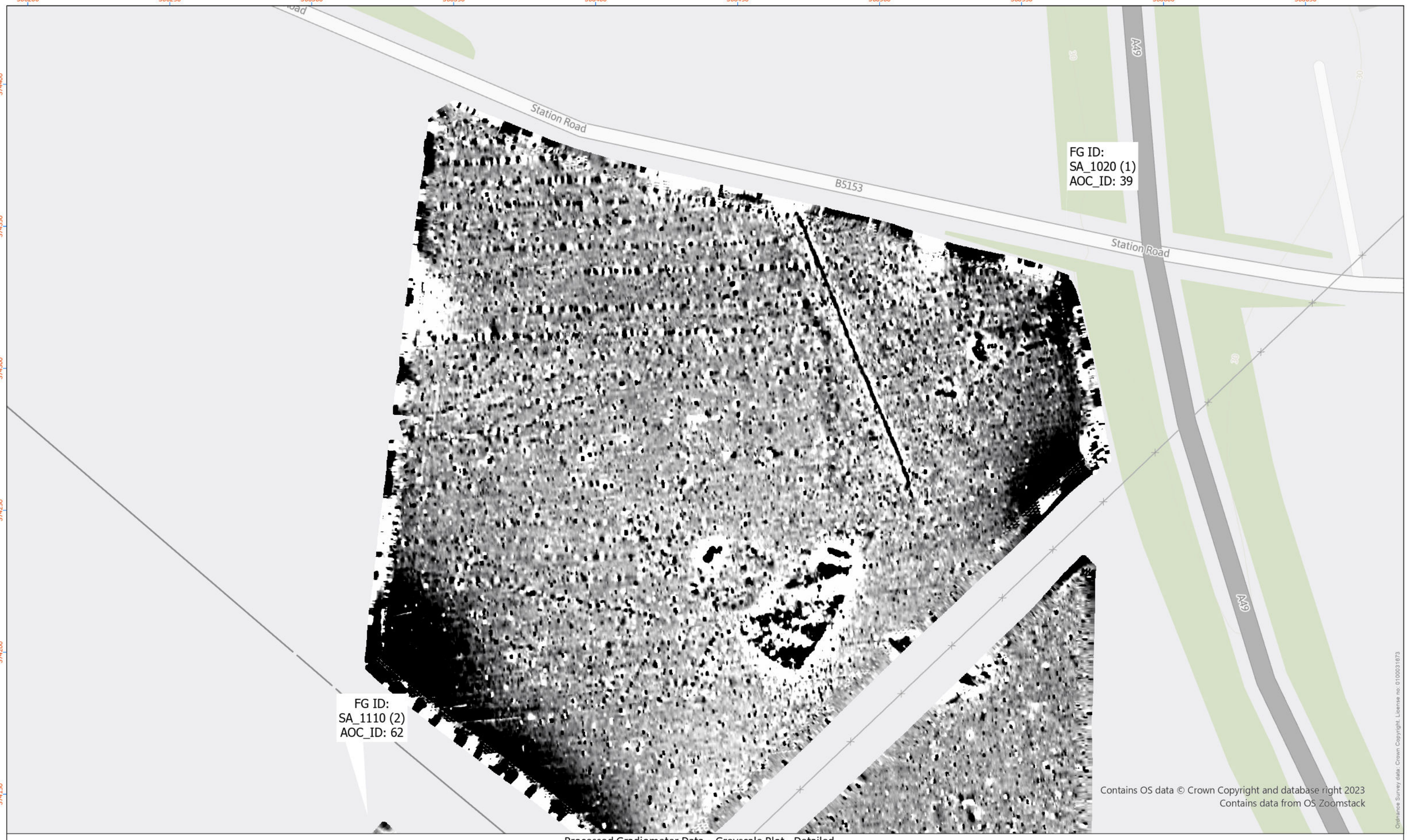
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.33/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

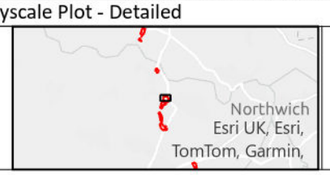
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.34

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.34/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360200 360250 360300 360350 360400 360450 360500 360550 360600 360650

374150 374100 374050 374000 373950 373900

FG ID:
SA_1110 (2)
AOC_ID: 62

FG ID:
SA_1020 (1)
AOC_ID: 39

FG ID:
SA_1110 (1)
AOC_ID: 61

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.35

2 nT
-1 nT

Northwich
Esri UK, Esri, TomTom, Garmin,

N

0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.35/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

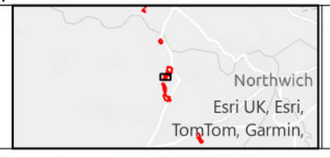
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.36

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.36/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360000 360050 360100 360150 360200 360250 360300 360350 360400

373600 373550 373500 373450 373400

FG ID:
SA_1190 (1)
AOC_ID: 60

FG ID:
SA_1260 (1)
AOC_ID: 58

Hefferston Hall New Lodge

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.37

2 nT
-1 nT

Northwich

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.37/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

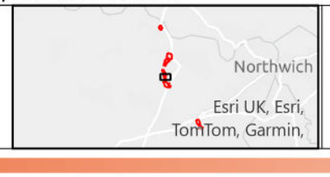
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.38

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.38/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360100 360150 360200 360250 360300 360350 360400 360450 360500 360550

373050 373000 372950 372900 372850

FG ID:
SA_1260 (1)
AOC_ID: 59

FG ID:
SA_1330 (1)
AOC_ID: 40

FG ID:
SA_1350 (1)
AOC_ID: 57

Cuddington Manor Farm

Grange La

A49

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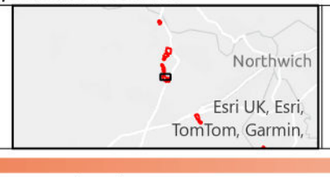
Ordnance Survey data: Crown Copyright. License no: 0100031673

Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.39

2 nT
-1 nT

No Access



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.39/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360100 360150 360200 360250 360300 360350 360400 360450 360500 360550

372850 372800 372750 372700 372650

FG ID: SA_1330 (1)
AOC_ID: 40

FG ID:
SA_1350 (1)
AOC_ID: 57

A49

Grange La

Grange La

A49

Millington La

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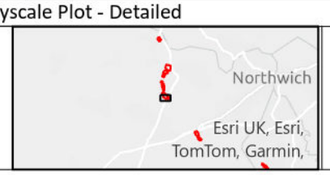
Ordnance Survey data: Crown Copyright. License no. 0100031673

Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.40

2 nT
-1 nT

No Access



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.40/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

361800 361850 361900 361950 362000 362050 362100 362150 362200

370850 370800 370750 370700 370650 370600

FG ID:
SA_1860 (1)
AOC_ID: 56

FG ID:
SA_1990 (1)
AOC_ID: 55

Vale Farm

rse

40 50

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.41

2 nT
-1 nT

No Access

Northwich

Esri UK, Esri, TomTom, Garmin,

N

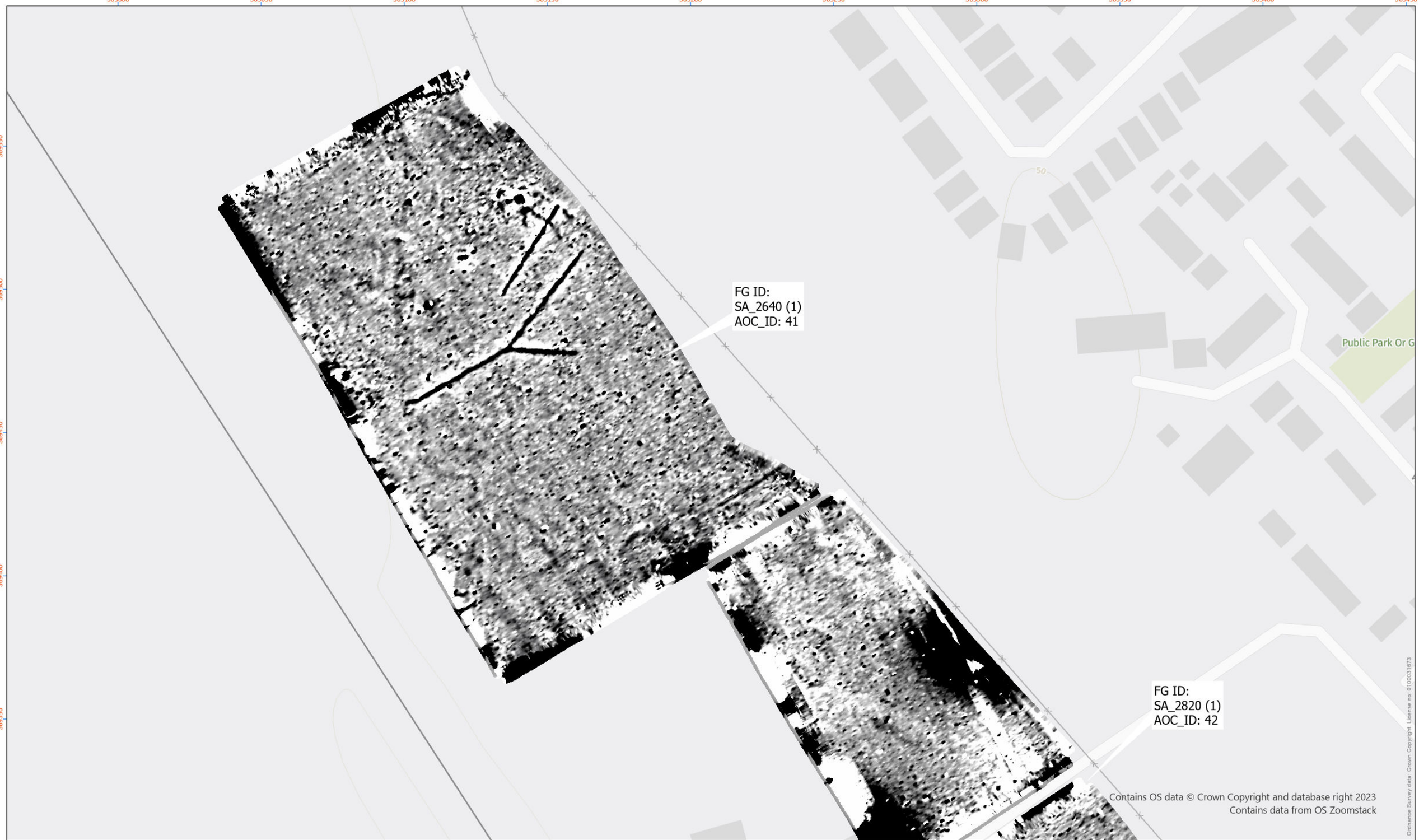
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.41/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

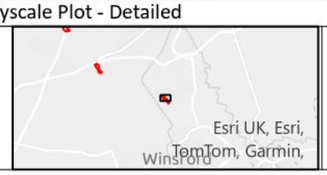
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.42

2 nT
-1 nT



N

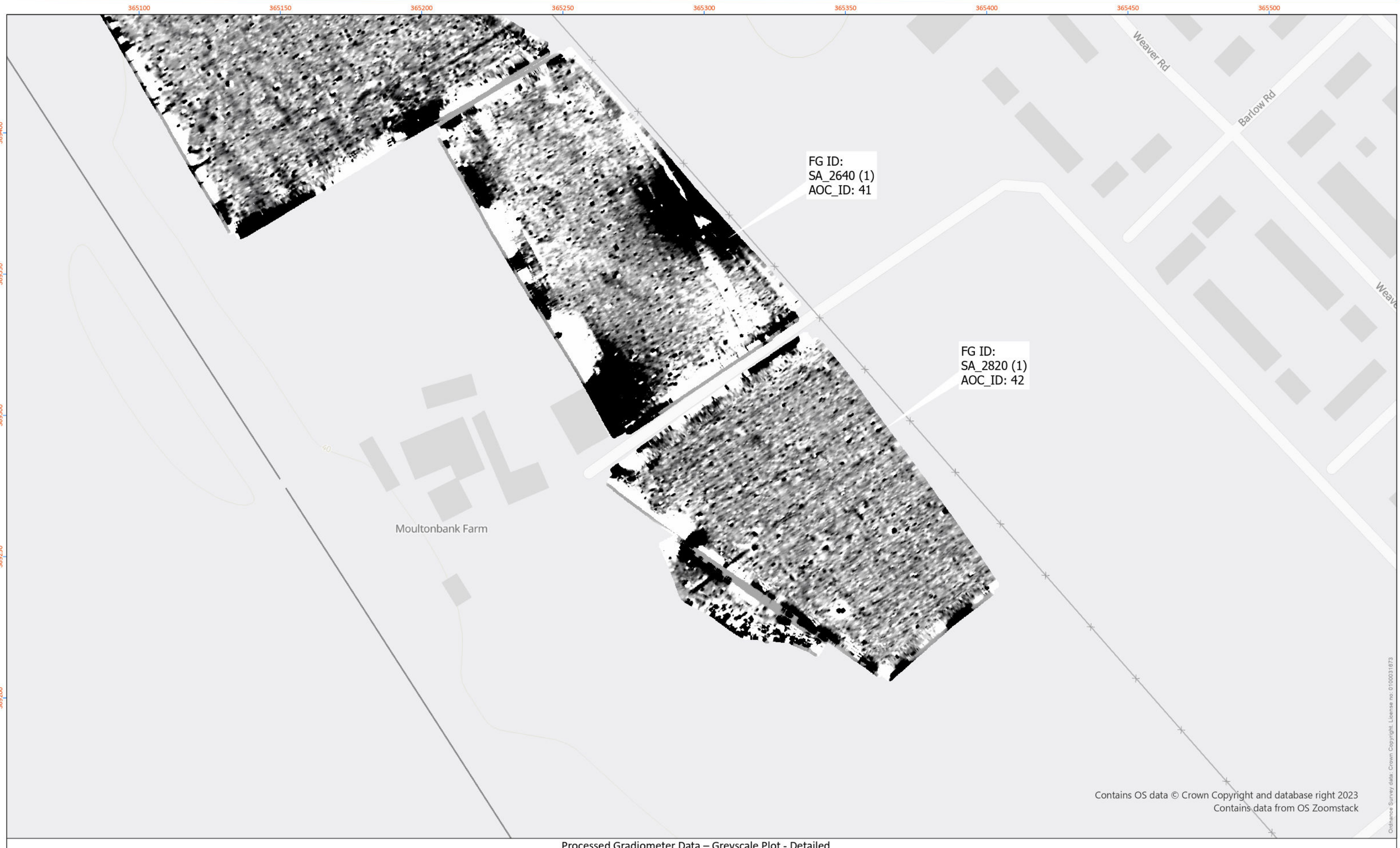
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.42/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

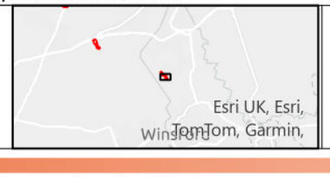
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.43

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.43/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

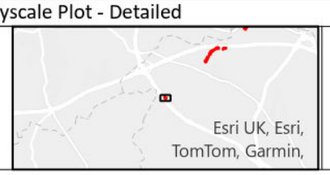
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.44

2 nT
-1 nT



N

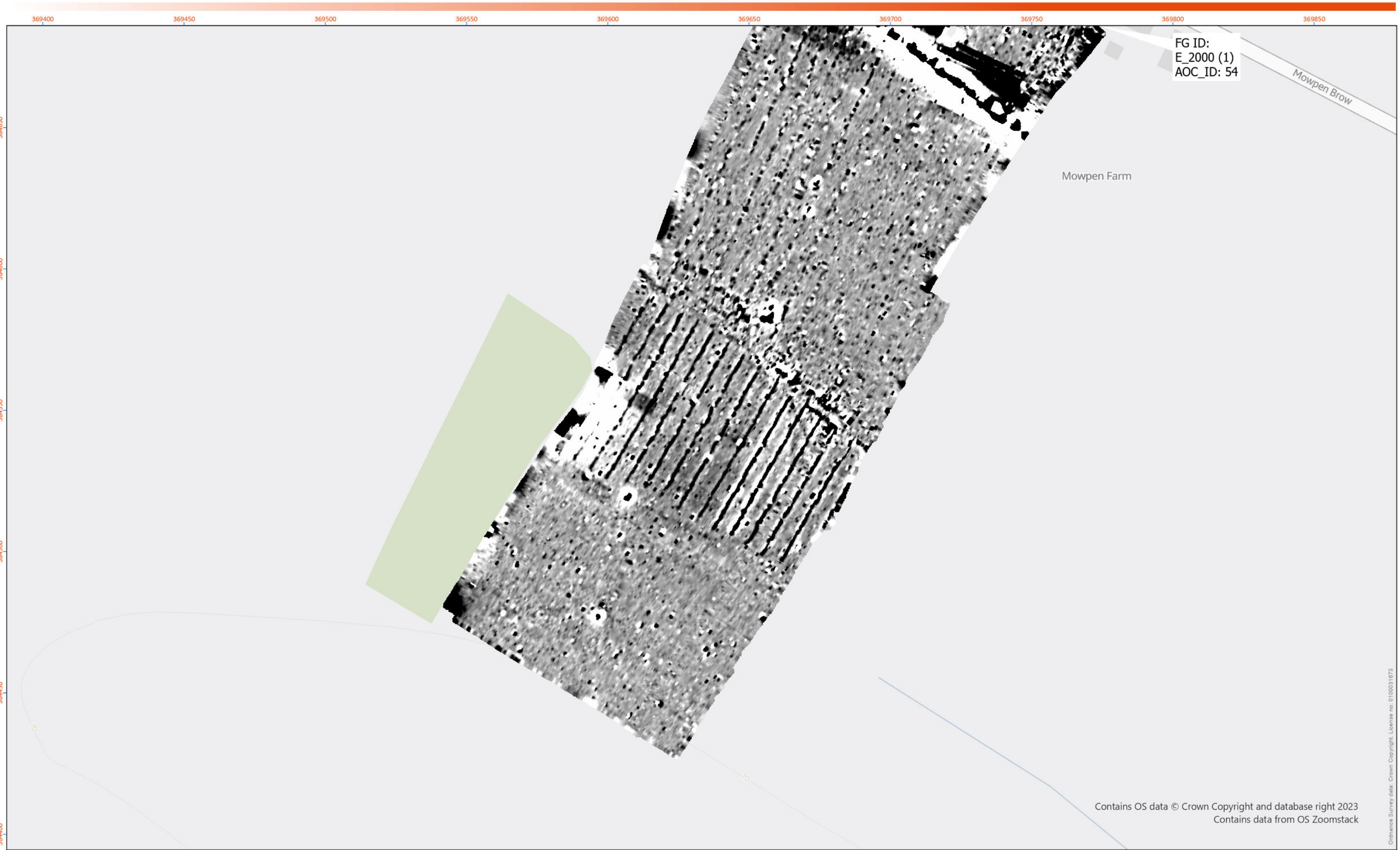
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.44/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

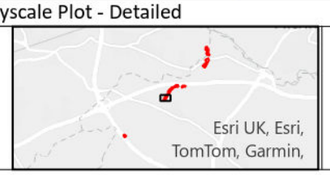
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.45

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.45/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

369500 369550 369600 369650 369700 369750 369800 369850 369900 369950

384850 384800 384750 384700 384650

Mowpen Brow

FG ID:
E_2010 (2)
AOC_ID: 64

FG ID:
E_2000 (1)
AOC_ID: 54

Mowpen Farm

Mowpen Brow

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.46

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin,

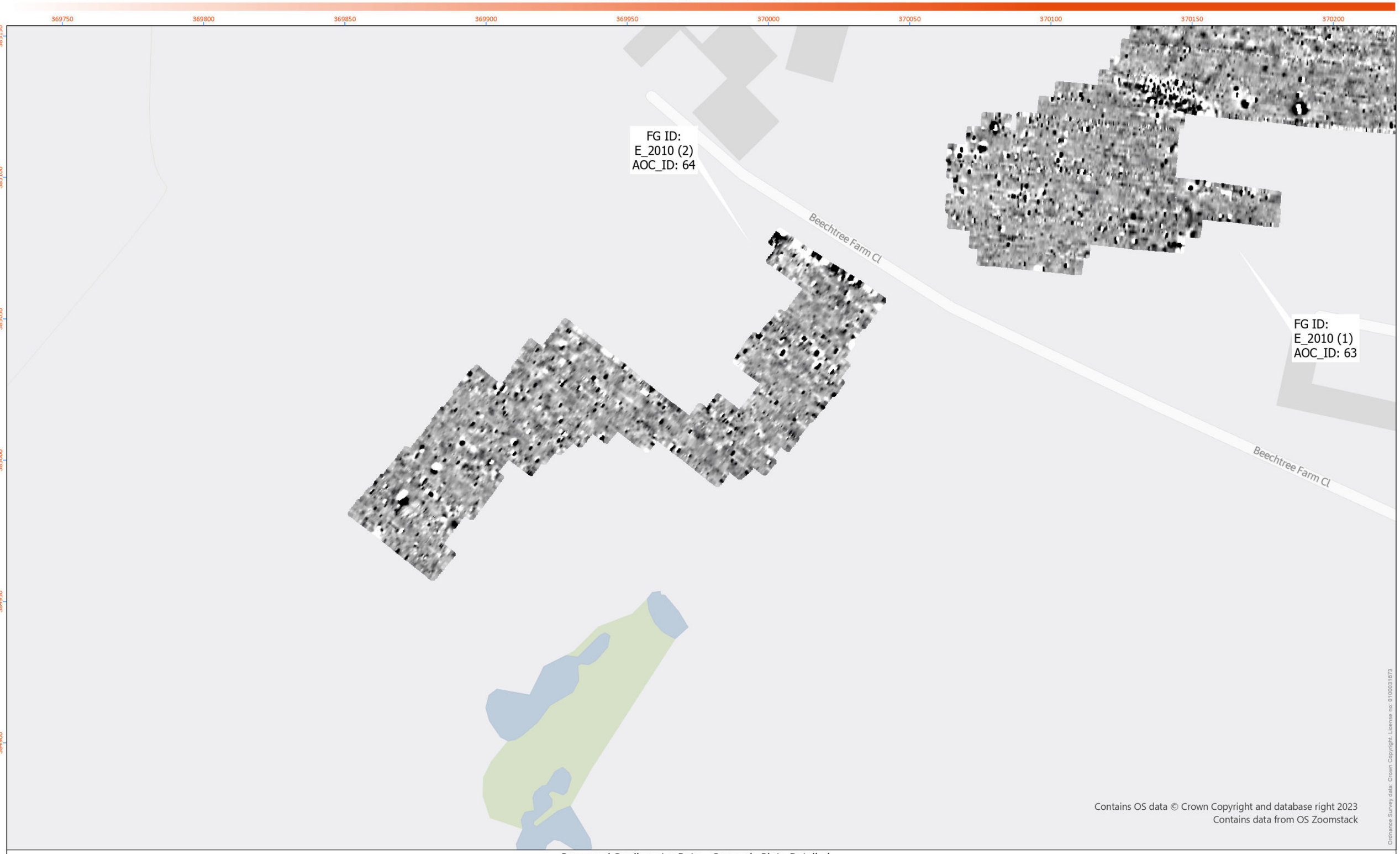
N

0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.46/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

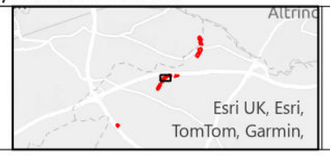


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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.47

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.47/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

370000 370050 370100 370150 370200 370250 370300 370350 370400 370450

385250 385200 385150 385100 385050 385000

FG ID:
E_2010 (1)
AOC_ID: 63

FG ID:
E_2170 (1)
AOC_ID: 52

FG ID:
E_2010 (2)
AOC_ID: 64

M56

West Lane

B5159

Farm

Beechtree Farm Cl

Beechtree Farm Cl

West Lane

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.48

2 nT
-1 nT

Altrinc

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.48/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

370300 370350 370400 370450 370500 370550 370600 370650 370700 370750

385200 385150 385100 385050 385000

FG ID:
E_2170 (1)
AOC_ID: 52

FG ID:
E_2170 (2)
AOC_ID: 53

M56

Abbey Leys Farm

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure
5.49

2 nT
-1 nT

Altrinch

Esri UK, Esri, TomTom, Garmin,

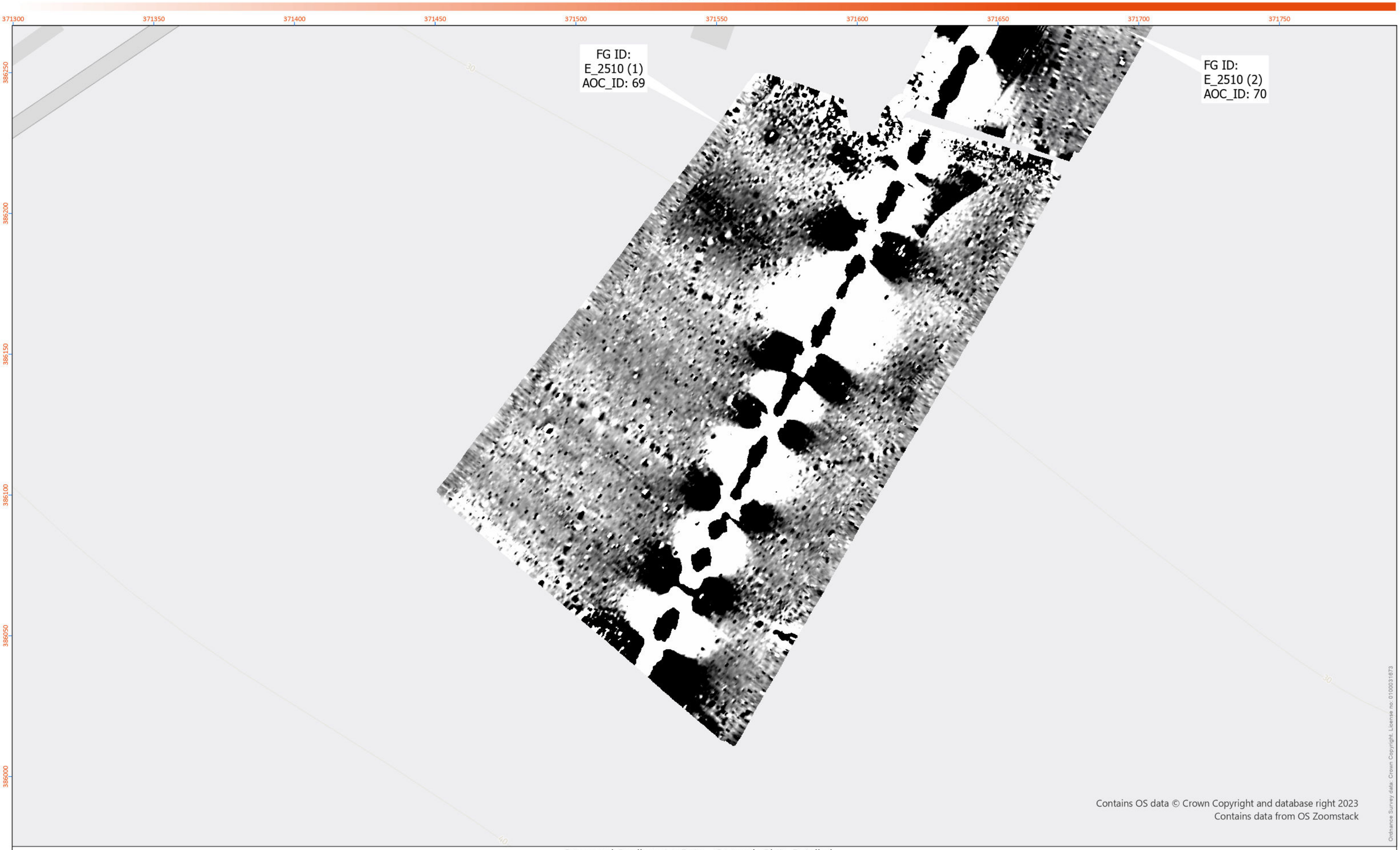
N

0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.49/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

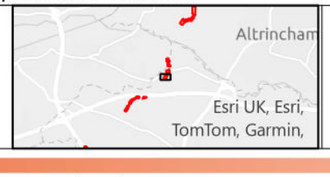
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.50

2 nT
-1 nT



N

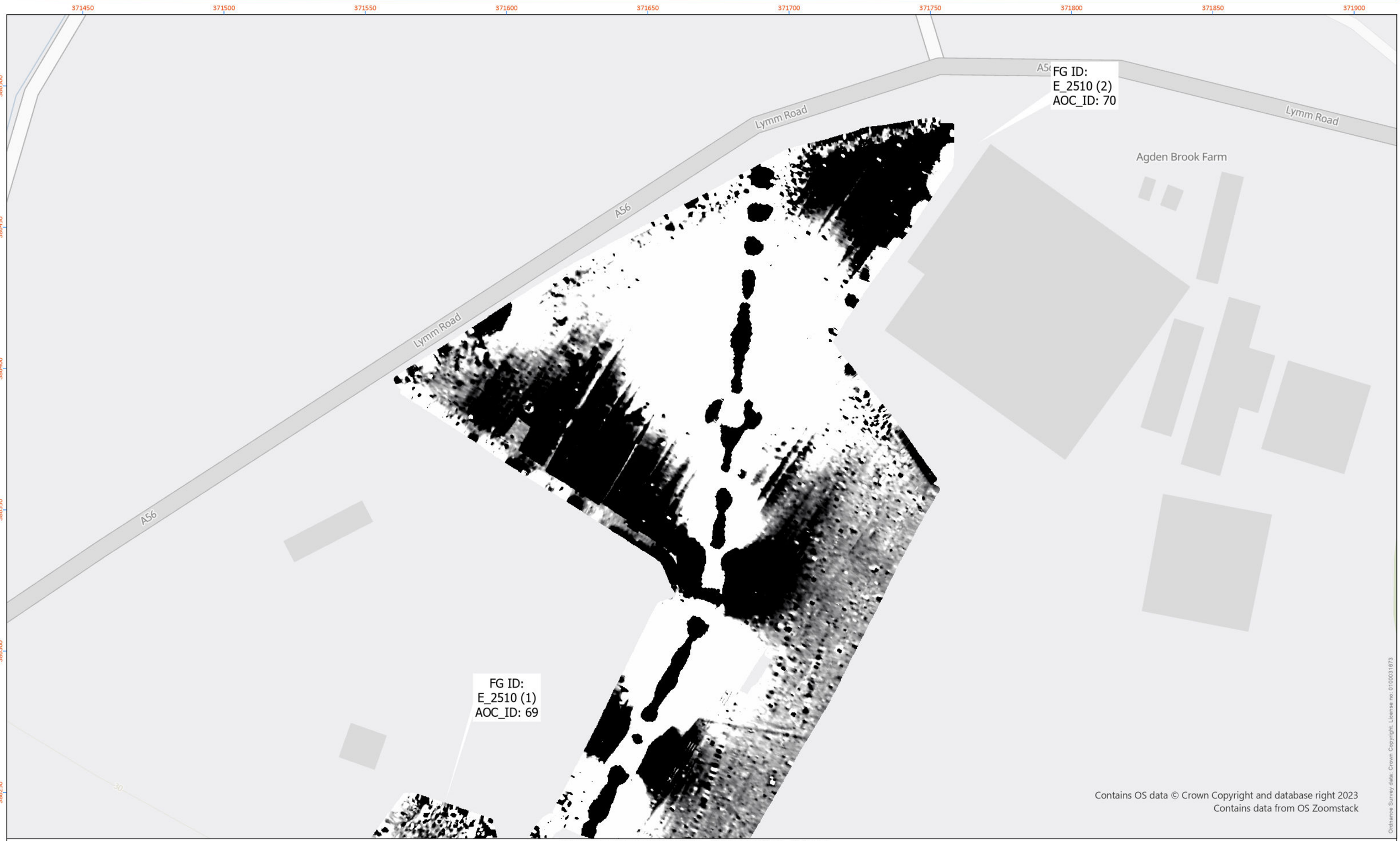
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.50/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.51

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.51/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

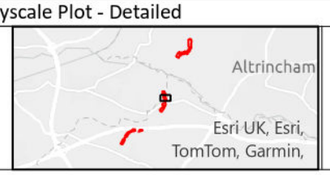
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.52

2 nT
-1 nT



N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.52/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

FG ID:
E_2450 (1)
AOC_ID: 49

FG ID:
E_2680 (1)
AOC_ID: 50

FG ID:
E_2680 (2)
AOC_ID: 51

Spring La

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.53

2 nT
-1 nT

Altrincham

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.53/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

372600 372650 372700 372750 372800 372850 372900 372950 373000 373050

389100 389050 389000 388950 388900 388850

FG ID:
E_3270
AOC_ID: 45

FG ID:
E_3272
AOC_ID: 46

FG ID:
E_3020 (1)
AOC_ID: 47

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Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.54

2 nT
-1 nT

No Access

Altrincham
Esri UK, Esri, TomTom, Garmin,

N
0 20m
Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.54/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

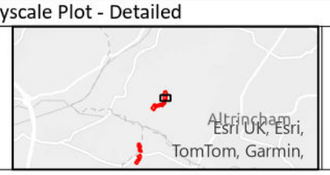
Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.55

2 nT
-1 nT



N

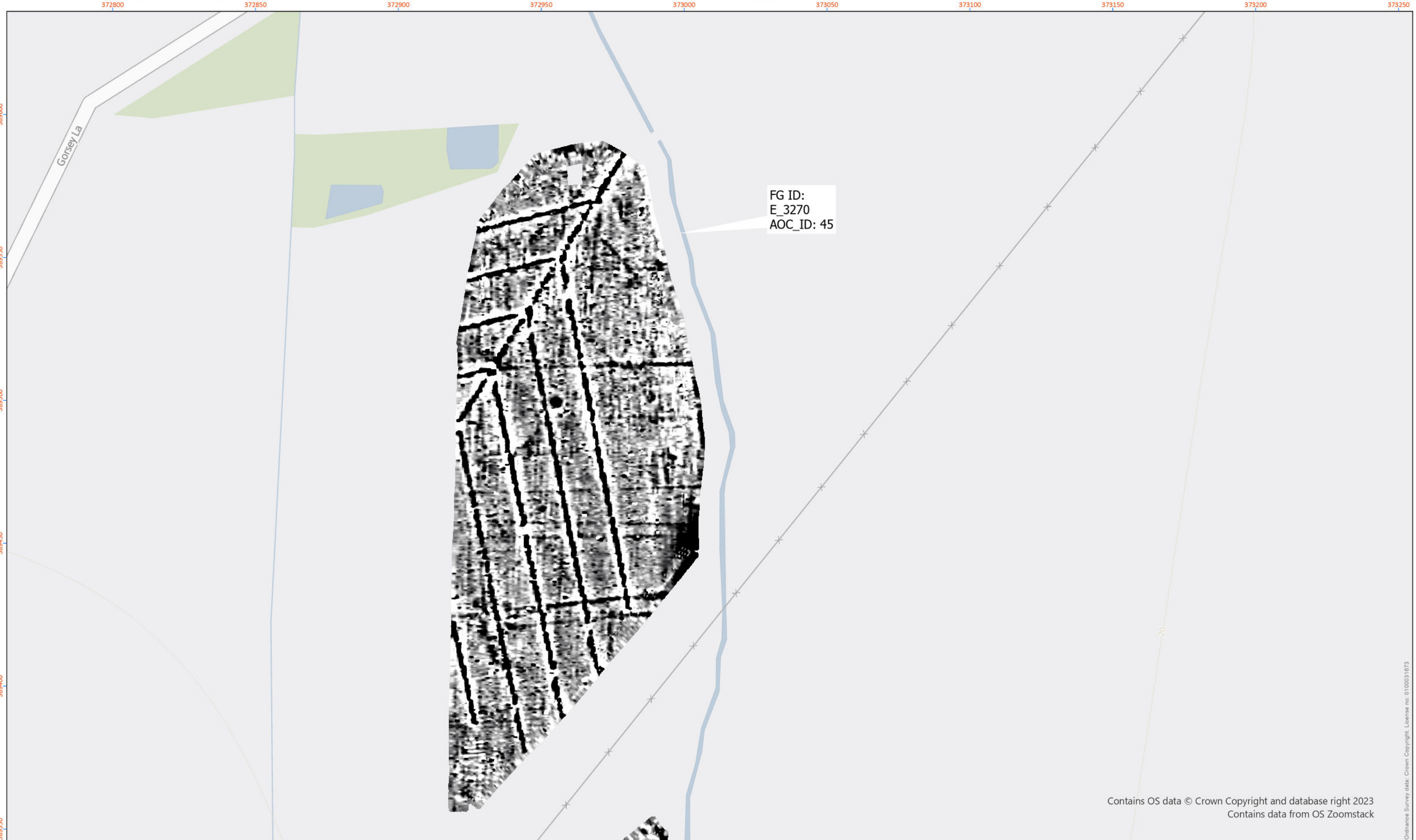
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.55/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Processed Gradiometer Data – Greyscale Plot - Detailed

Figure 5.56

2 nT
-1 nT

Esri UK, Esri, TomTom, Garmin,

N

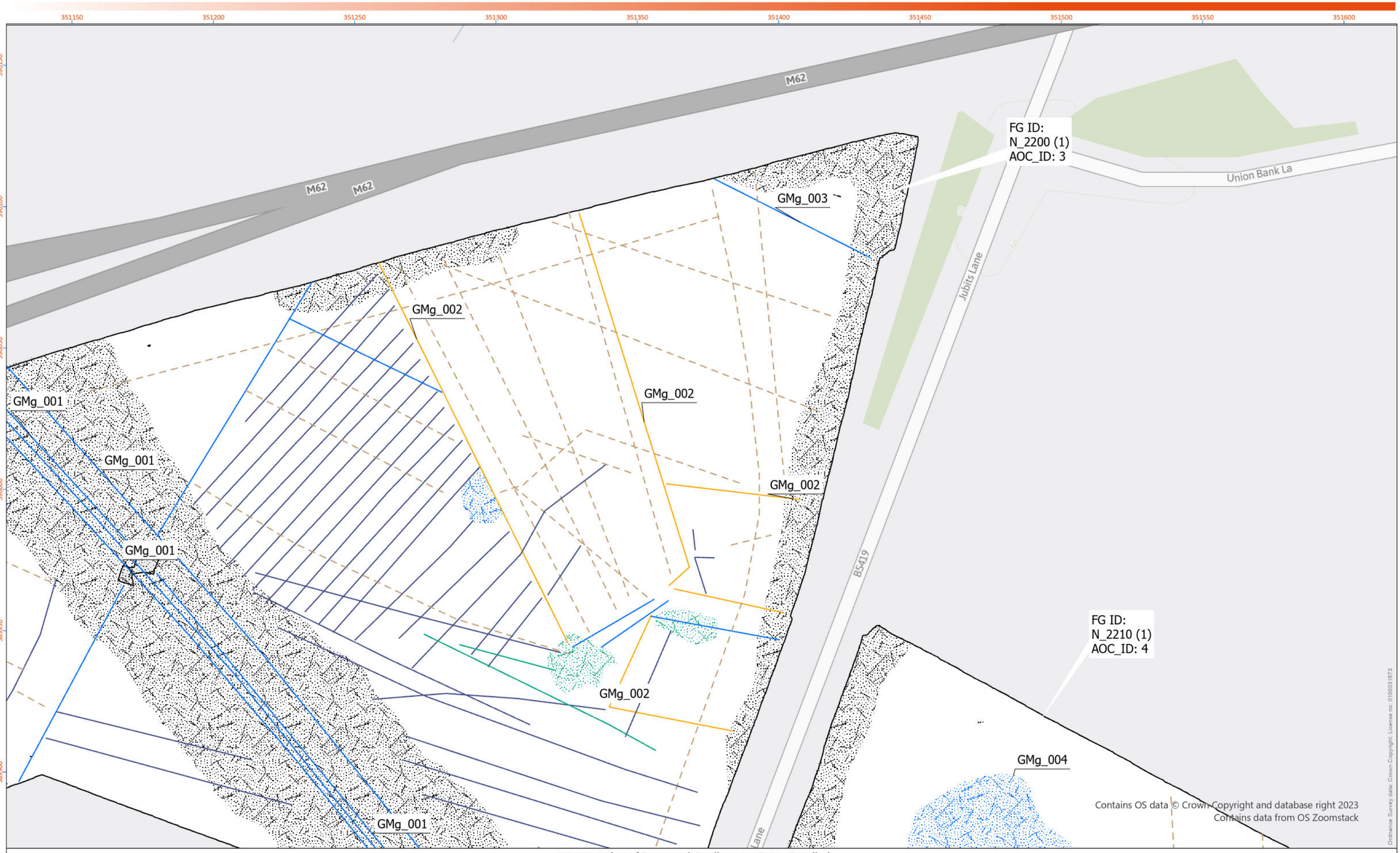
0 20m

Scale: 1:1,200 @A3

Drawing Number: 05/40593/GEO/5.56/02	
Created by: AC, KA	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.1

- Spread (Historic Feature)
- Spread (Unclear Origin)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

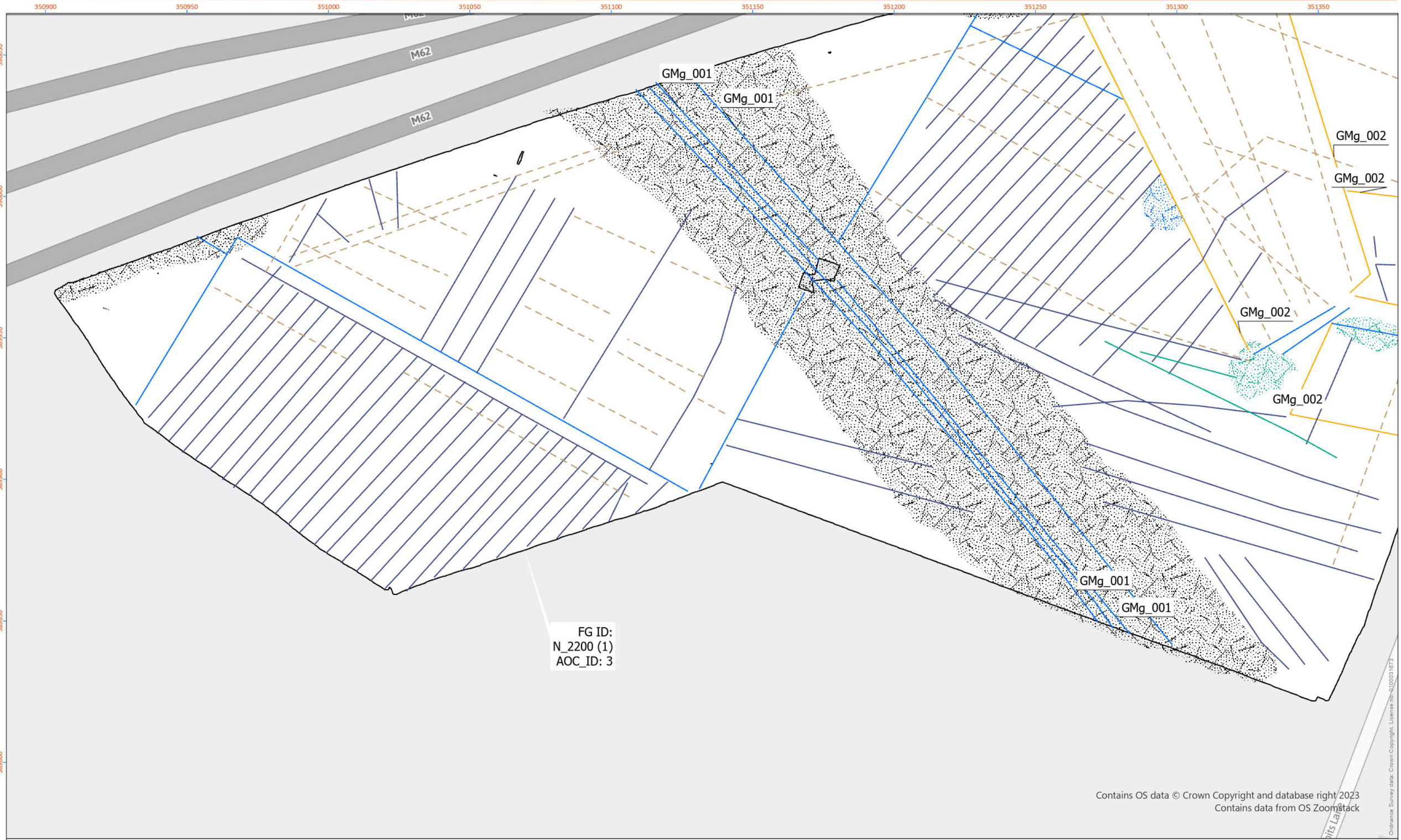
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.1/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.2

- Spread (Historic Feature)
- Spread (Unclear Origin)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

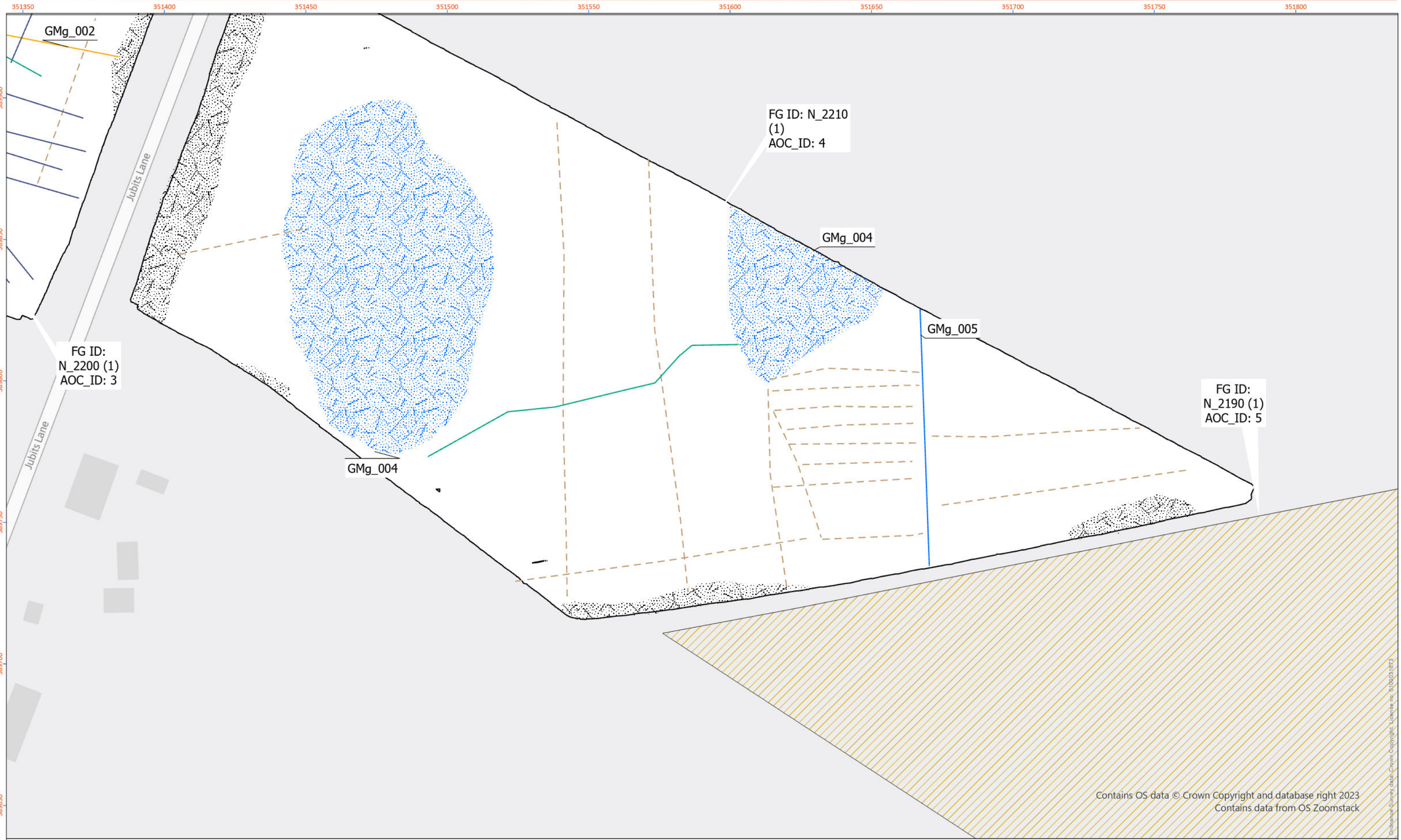
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.2/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

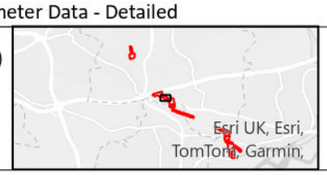
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.3

- No Access
- Spread (Historic Feature)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

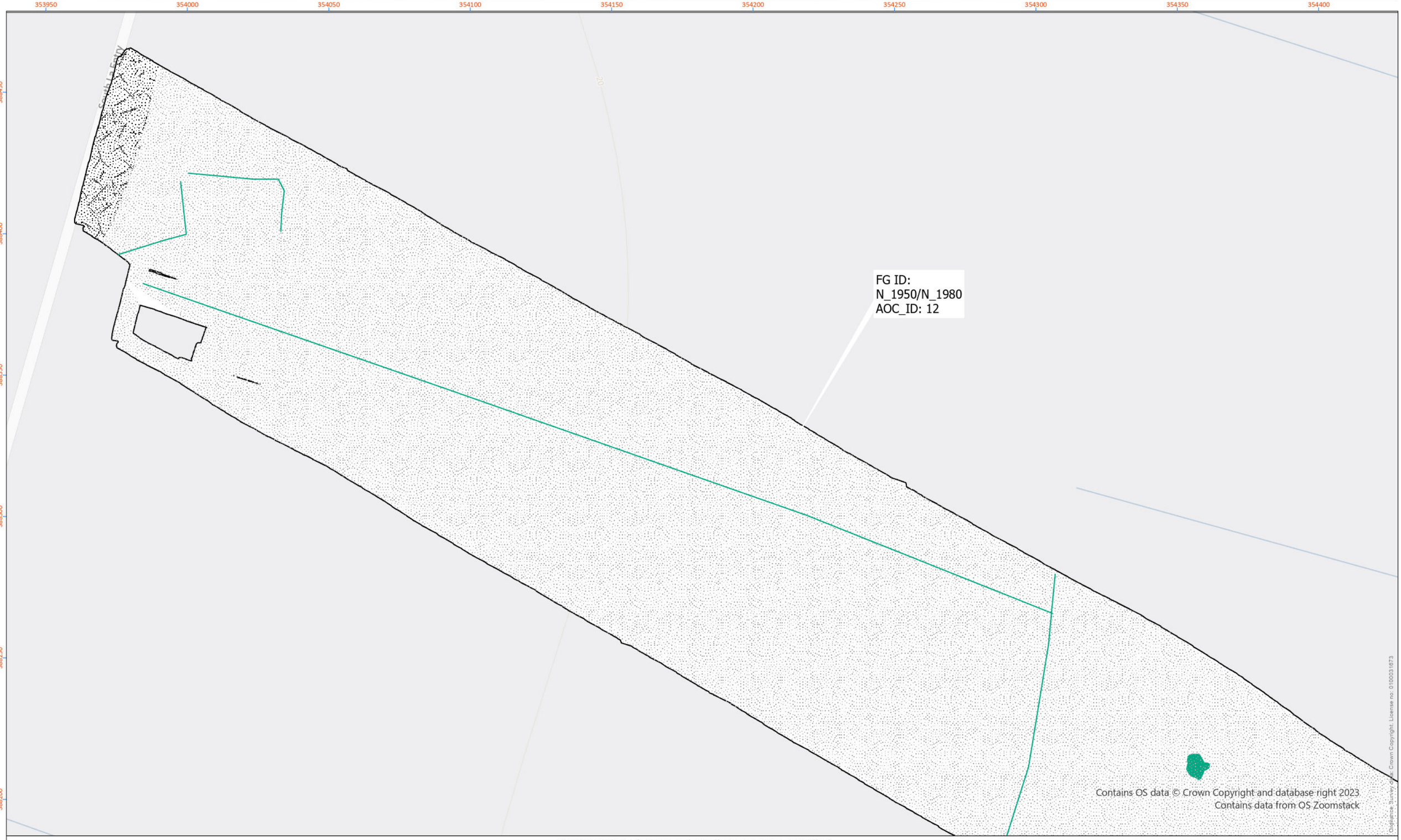
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.3/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.4

- Anomaly (Unclear Origin)
- Spread (Ferrous/Iron Spike)
- Spread (Magnetic Disturbance)
- Linear Trend (Unclear Origin)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.4/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354350 354400 354450 354500 354550 354600 354650 354700 354750

388300 388250 388200 388150 388100 388050

FG ID:
N_1950/N_1980
AOC_ID: 12

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.5

- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)



N

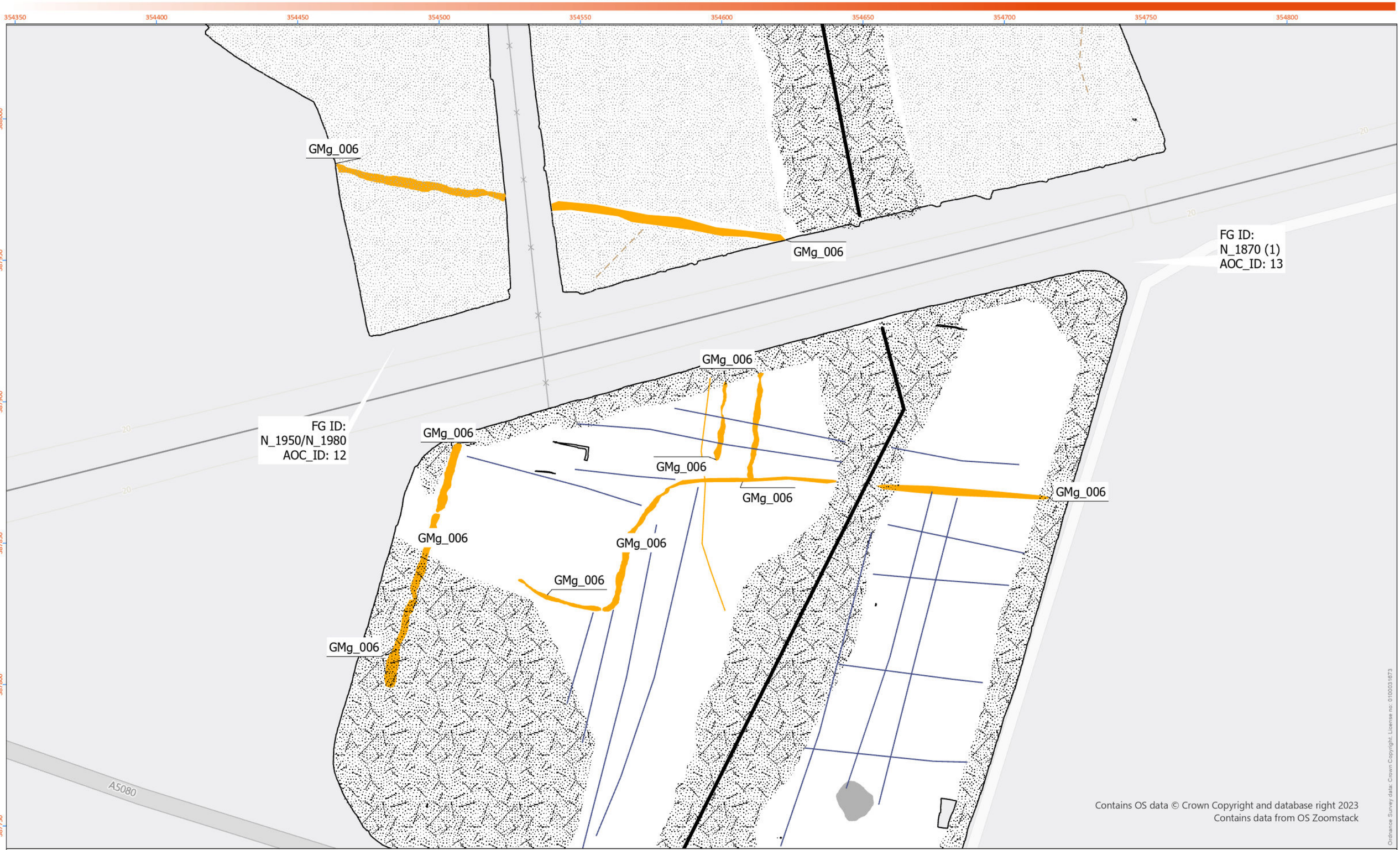
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.5/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

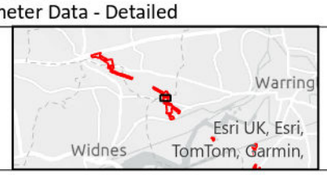
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.6

- Anomaly (Possible Archaeology)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.6/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354450 354500 354550 354600 354650 354700 354750 354800 354850 354900

387750 387700 387650 387600 387550 387500

FG ID:
N_1870 (1)
AOC_ID: 13

FG ID:
N_1710 (1)
AOC_ID: 14

FG ID:
N_1710 (2)
AOC_ID: 15

South Lane
A5080
South Lane
A5080
South Lane
South Lane
Four Top'd Oak

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.7

- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



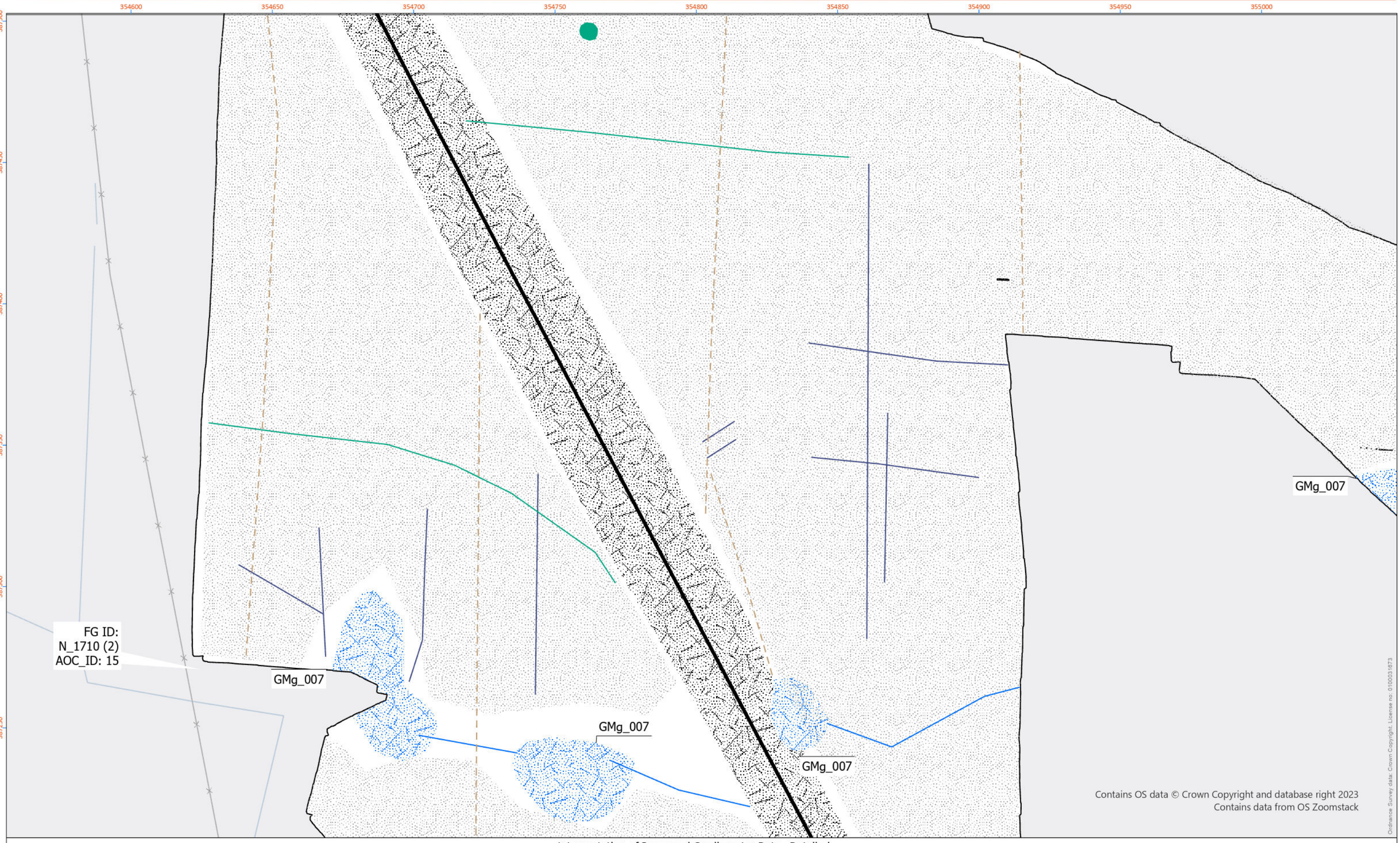
N

0 20m
Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.7/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.8

- Spread (Historic Feature)
- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.8/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354600 354650 354700 354750 354800 354850 354900 354950 355000

387350 387300 387250 387200 387150 387100

GMg_007

GMg_007

GMg_007

GMg_007

Mowcroft La

Mowcroft La

FG ID:
N_1710 (2)
AOC_ID: 15

FG ID:
N_1550 (1)
AOC_ID: 16

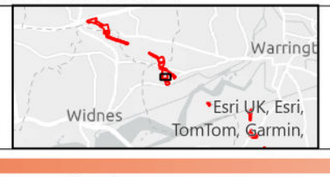
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.9

- Spread (Historic Feature)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.9/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354950 355000 355050 355100 355150 355200 355250 355300 355350 355400

387450 387400 387350 387300 387250 387200

FG ID:
N_1710 (2)
AOC_ID: 15

GMg_007

GMg_007

FG ID:
N_1876
AOC_ID: 44

Cuerdley Rd

Doe Green

Cuerdley Rd

Widnes Road

A562

Tannery La

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.10

- Spread (Historic Feature)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

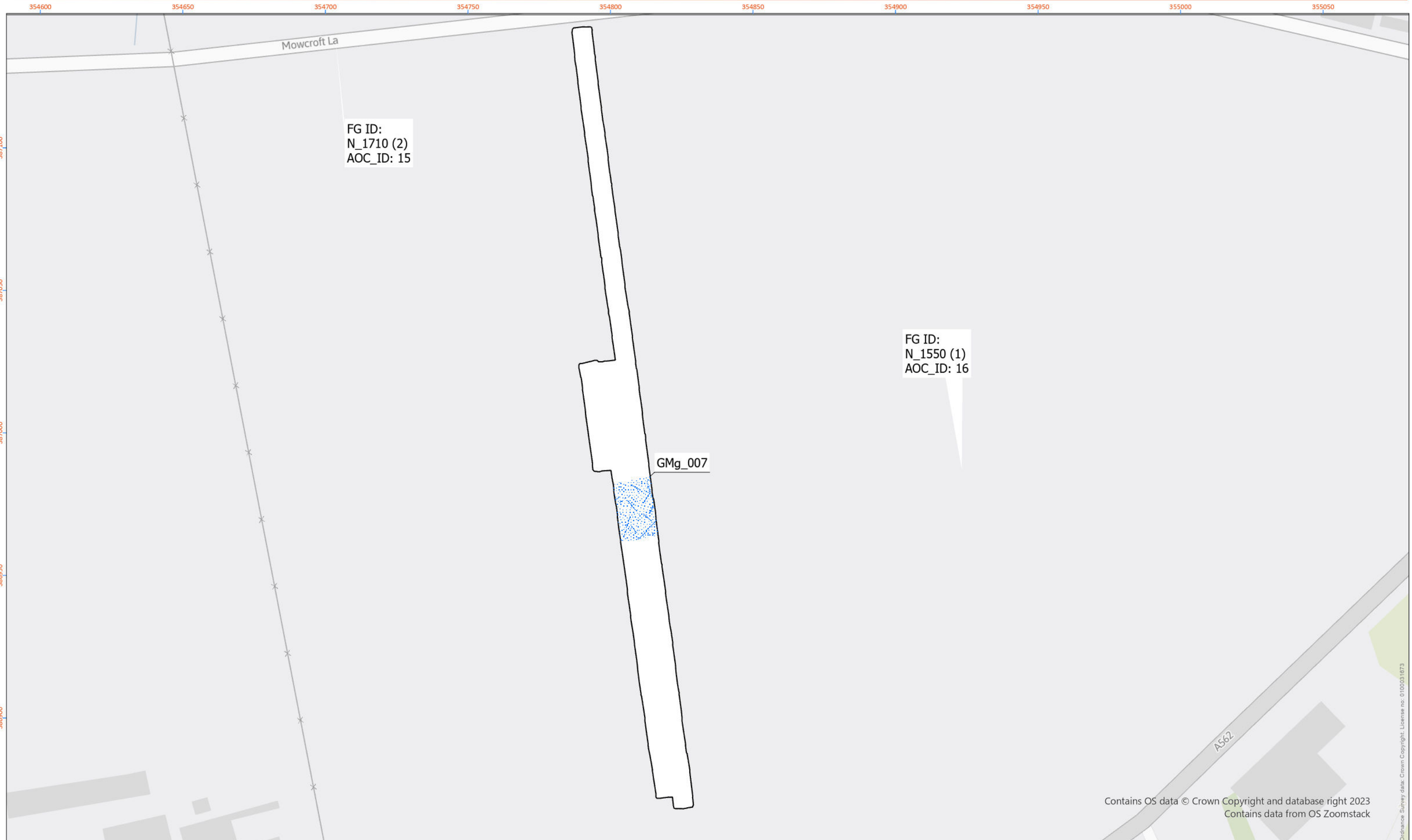
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.10/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.11

Spread (Historic Feature)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.11/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

356700 356750 356800 356850 356900 356950 357000 357050 357100 357150

386000 385950 385900 385850 385800 385750

FG ID:
N_850 (1)
AOC_ID: 17

GMg_010
GMg_010
GMg_010
GMg_010
GMg_010
GMg_010
GMg_010
GMg_010

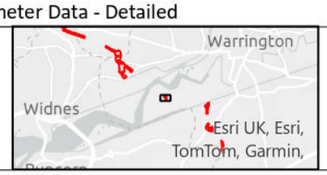
Lapwing La

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.12

Anomaly (Historic Feature)
Spread (Geology/Natural)
Linear Trend (Historic Feature)
Linear Trend (Agricultural, Ploughing)



N

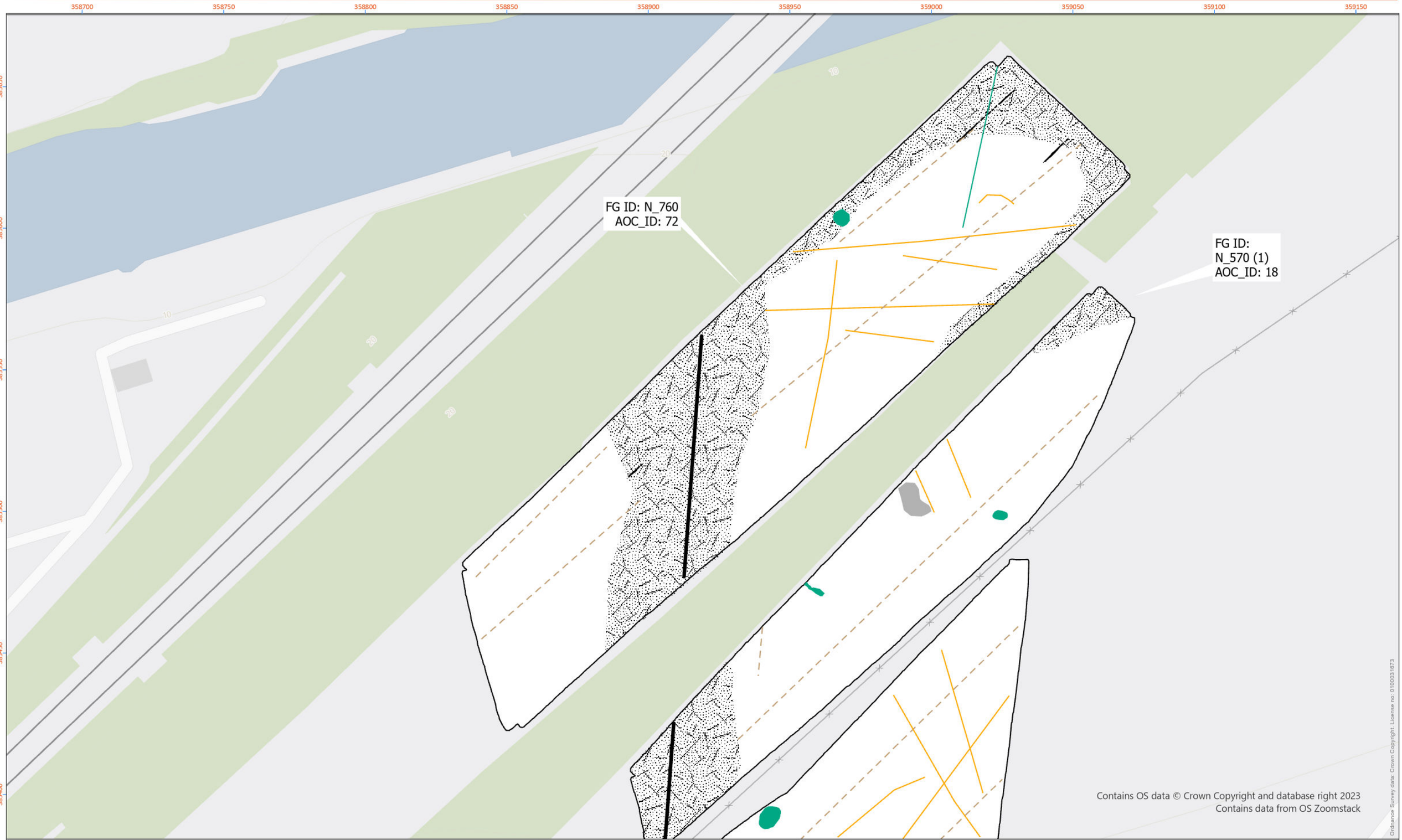
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Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

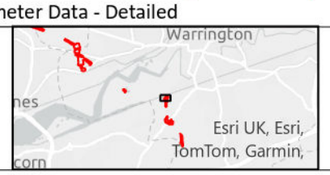
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.13

- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)



N

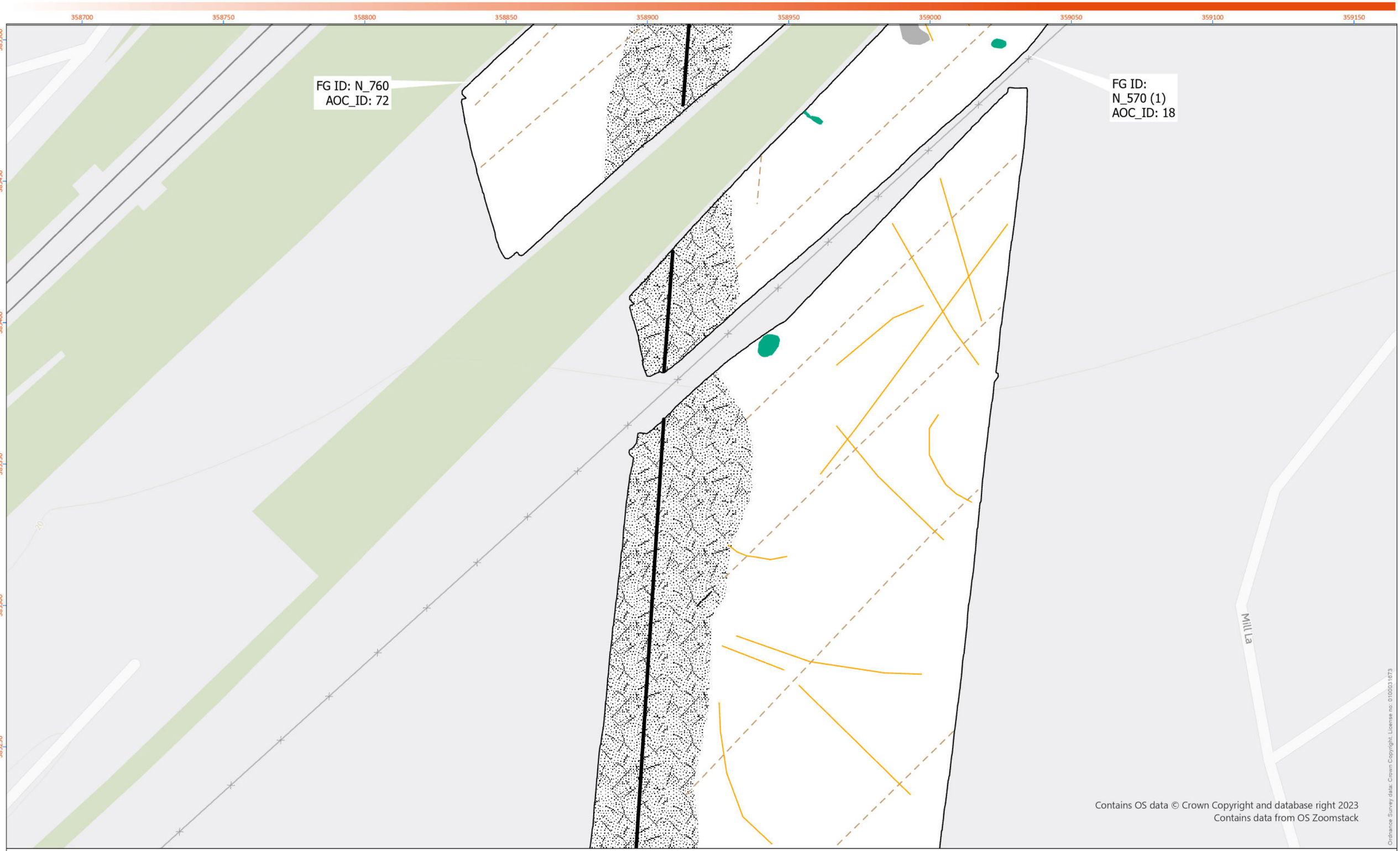
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

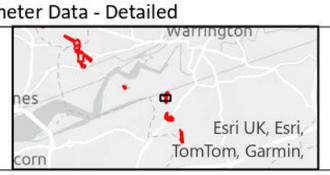
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.14

- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)



N

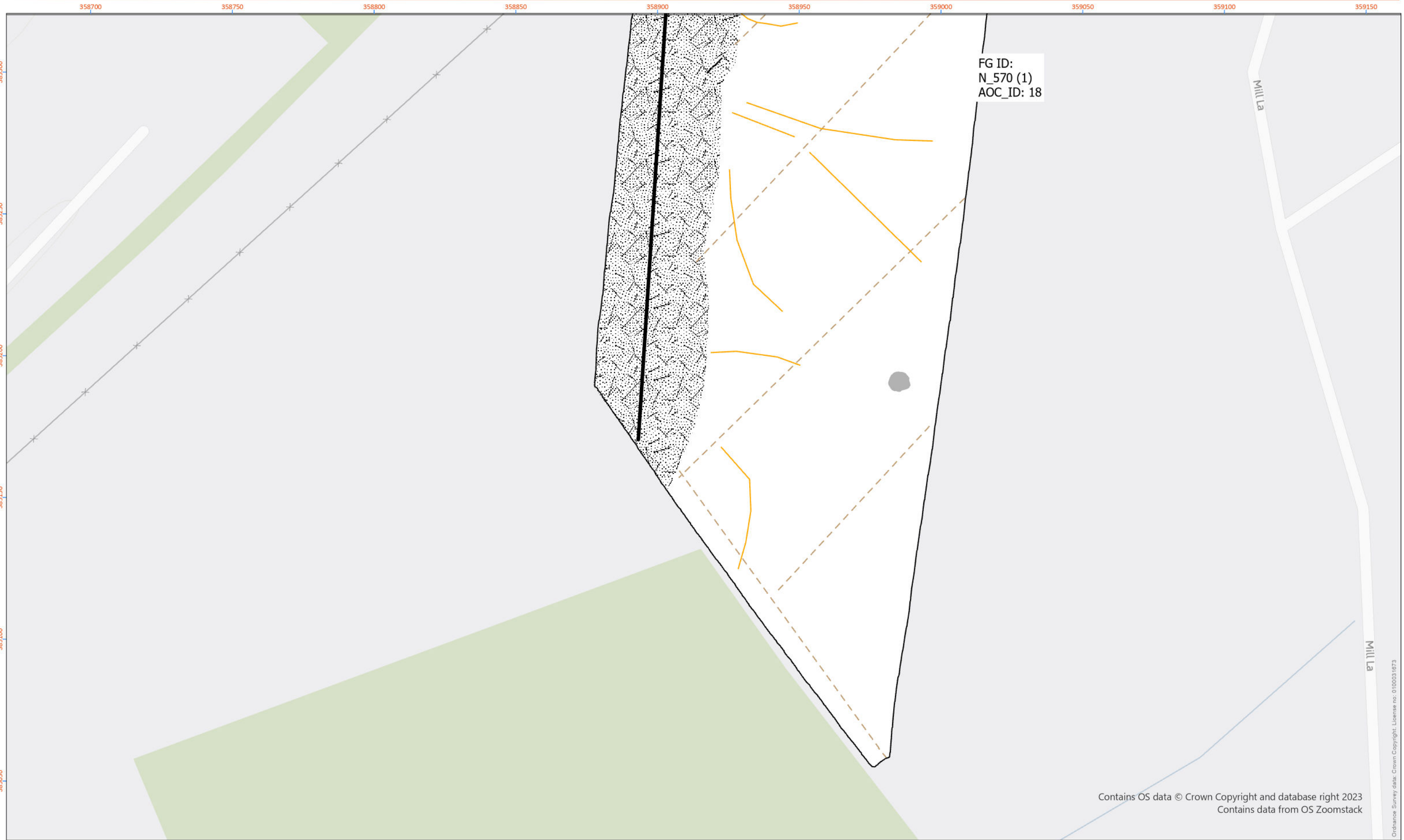
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

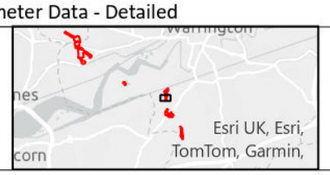
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.15

- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Possible Archaeology)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.15/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358750 358800 358850 358900 358950 359000 359050 359100 359150 359200

384650 384600 384550 384500 384450

FG ID: N_360a
AOC_ID: 65

GMg_008

GMg_008

FG ID:
N_360b
AOC_ID: 66

FG ID: N_320
AOC_ID: 67

Holly Hedge La

Holly Hedge La

A56

Chester Road

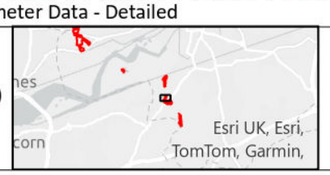
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.16

- Unsuitable
- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.16/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

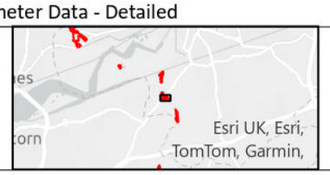
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.17

- Unsuitable
- Spread (Historic Feature)
- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



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0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.17/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359450 359500 359550 359600 359650 359700 359750 359800 359850 359900

383800 383750 383700 383650 383600 383550

FG ID:
N_347 (2)
AOC_ID: 20

FG ID:
N_347 (1)
AOC_ID: 19

Warrington Rd

Hatton Lodge

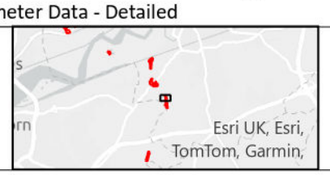
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.18

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.18/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359450 359500 359550 359600 359650 359700 359750 359800 359850 359900

383600 383550 383500 383450 383400 383350

Warrington Rd

Hatton Lodge

FG ID:
N_347 (1)
AOC_ID: 19

FG ID:
N_289 (1)
AOC_ID: 21

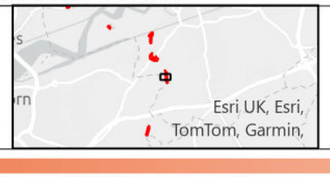
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.19

Anomaly (Unclear Origin)
Spread (Unclear Origin)
Spread (Magnetic Disturbance)
Spread (Ferrous/Iron Spike)
Linear Trend (Drainage)
Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.19/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359500 359550 359600 359650 359700 359750 359800 359850 359900

383400 383350 383300 383250 383200 383150

FG ID: N_289 (1)
AOC_ID: 21

FG ID:
N_347 (1)
AOC_ID: 19

Warrington Rd

50

60

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.20

- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.20/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358600 358650 358700 358750 358800 358850 358900 358950 359000 359050

381100 381050 381000 380950 380900 380850

Hallam Hall Barns

Morphany La

FG ID:
N_110 (1)
AOC_ID: 22

GMg_009

GMg_009

GMg_009

GMg_009

GMg_009

GMg_009

FG ID:
N_60 (1)
AOC_ID: 23

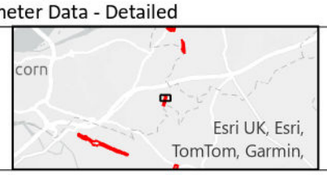
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.21

- Unsuitable
- Anomaly (Possible Archaeology)
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Drainage)
- Linear Trend (Magnetic Distrubance)
- Ferrous Anomalies/Iron Spike



N

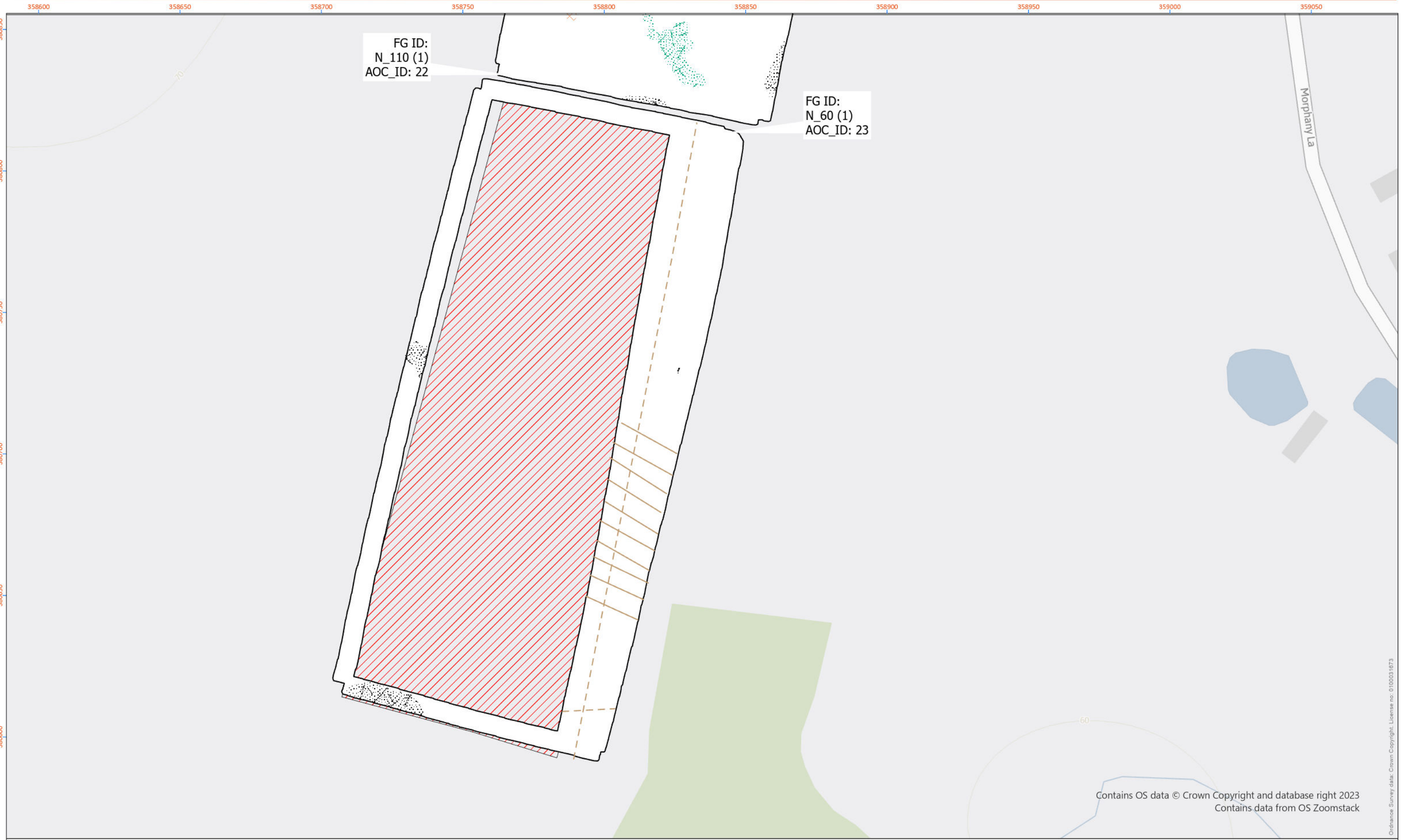
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.22

- Unsuitable
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Agricultural, Ridge and Furrow)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.22/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354450 354500 354550 354600 354650 354700 354750 354800 354850 354900

379250 379200 379150 379100 379050

Sutton Weaver

Aston La

FG ID:
W_695 (1)
AOC_ID: 37

FG ID:
W_410 (3)
AOC_ID: 35

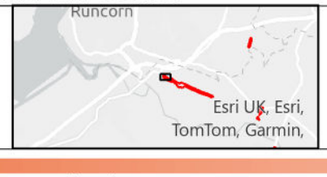
FG ID:
W_695 (1)
AOC_ID: 36

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.23

- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.23/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354650 354700 354750 354800 354850 354900 354950 355000 355050 355100

379150 379100 379050 379000 378950 378900

FG ID: W_695 (1)
AOC_ID: 37

FG ID:
W_695 (1)
AOC_ID: 36

Aston La

FG ID:
W_410 (3)
AOC_ID: 35

FG ID:
W_410 (1)
AOC_ID: 32

Aston La

FG ID:
W_410 (2)
AOC_ID: 33

FG ID:
W_360 (2)
AOC_ID: 34

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.24

- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.24/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

355100 355150 355200 355250 355300 355350 355400 355450 355500 355550

378900 378850 378800 378750 378700

FG ID:
W_410 (1)
AOC_ID: 32

FG ID:
W_360 (2)
AOC_ID: 34

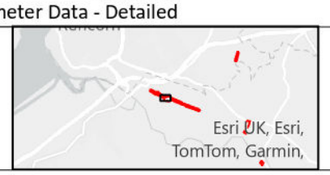
Aston La

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.25

- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Geology/Natural)
- Linear Trend (Service)



N

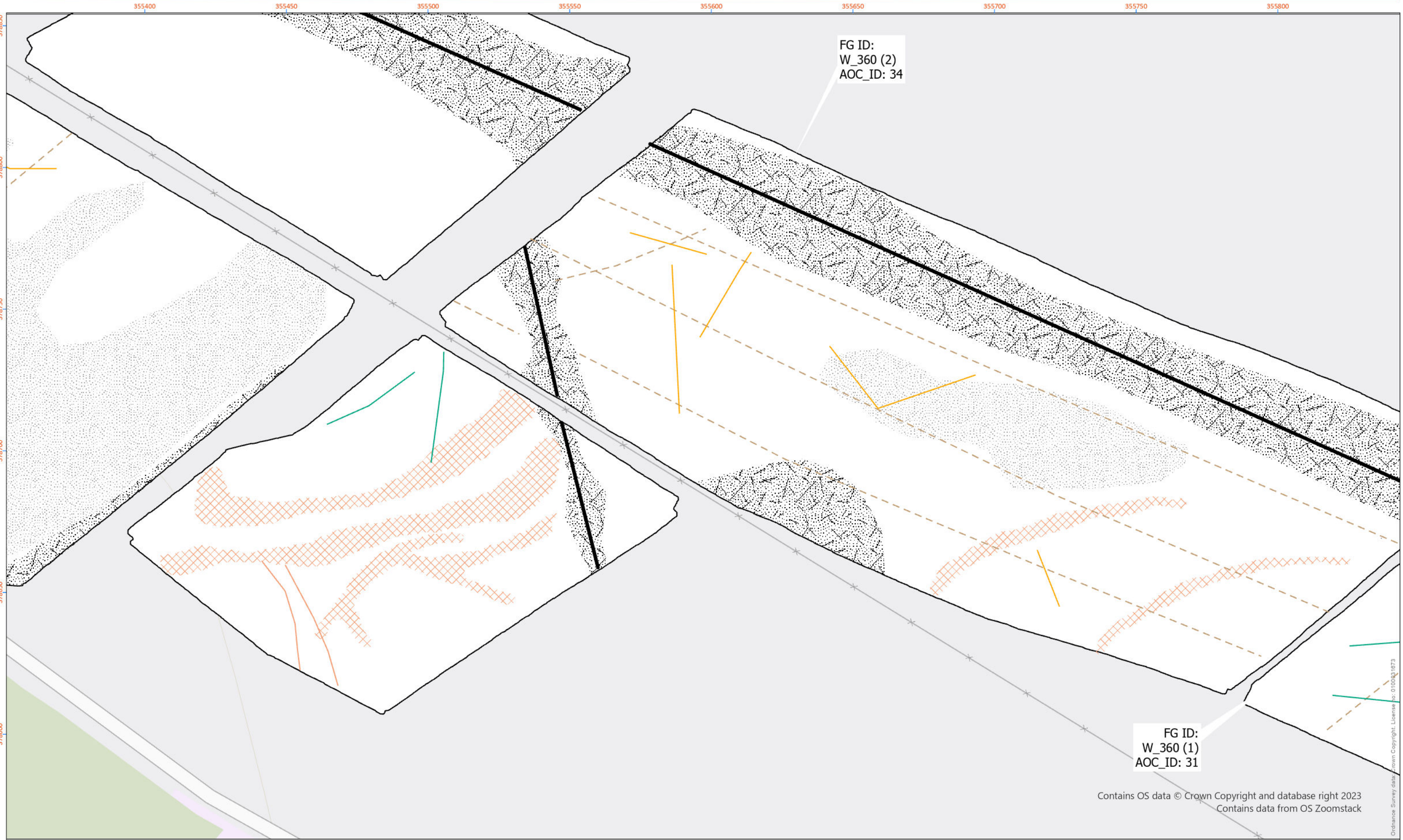
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

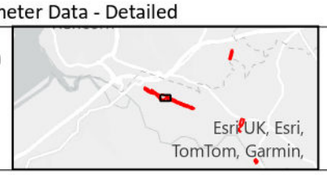
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.26

- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Geology/Natural)
- Linear Trend (Service)



N

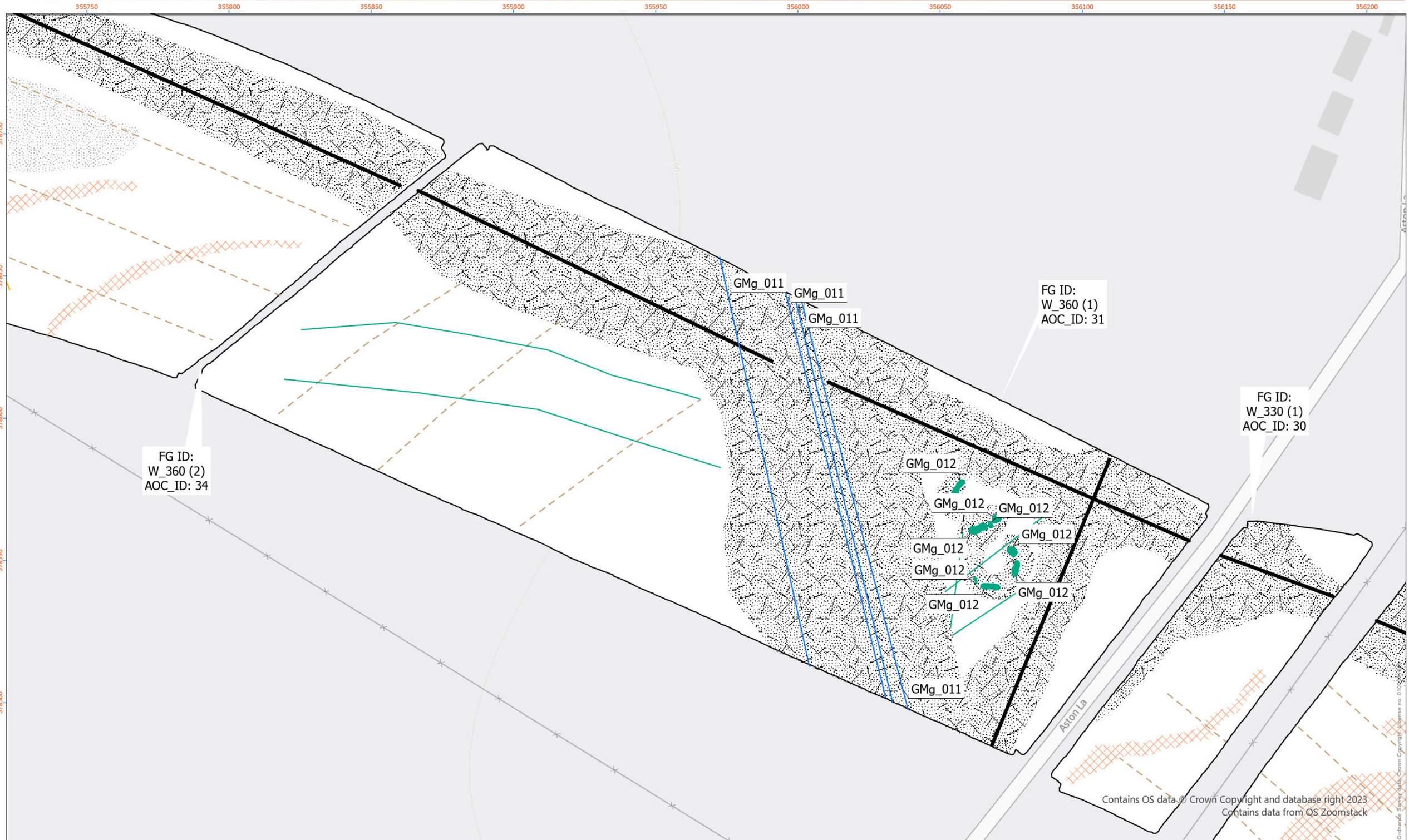
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Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

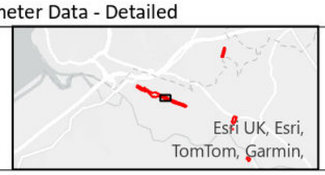
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.27

- Anomaly (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)
- Linear Trend (Magnetic Distrubance)



N

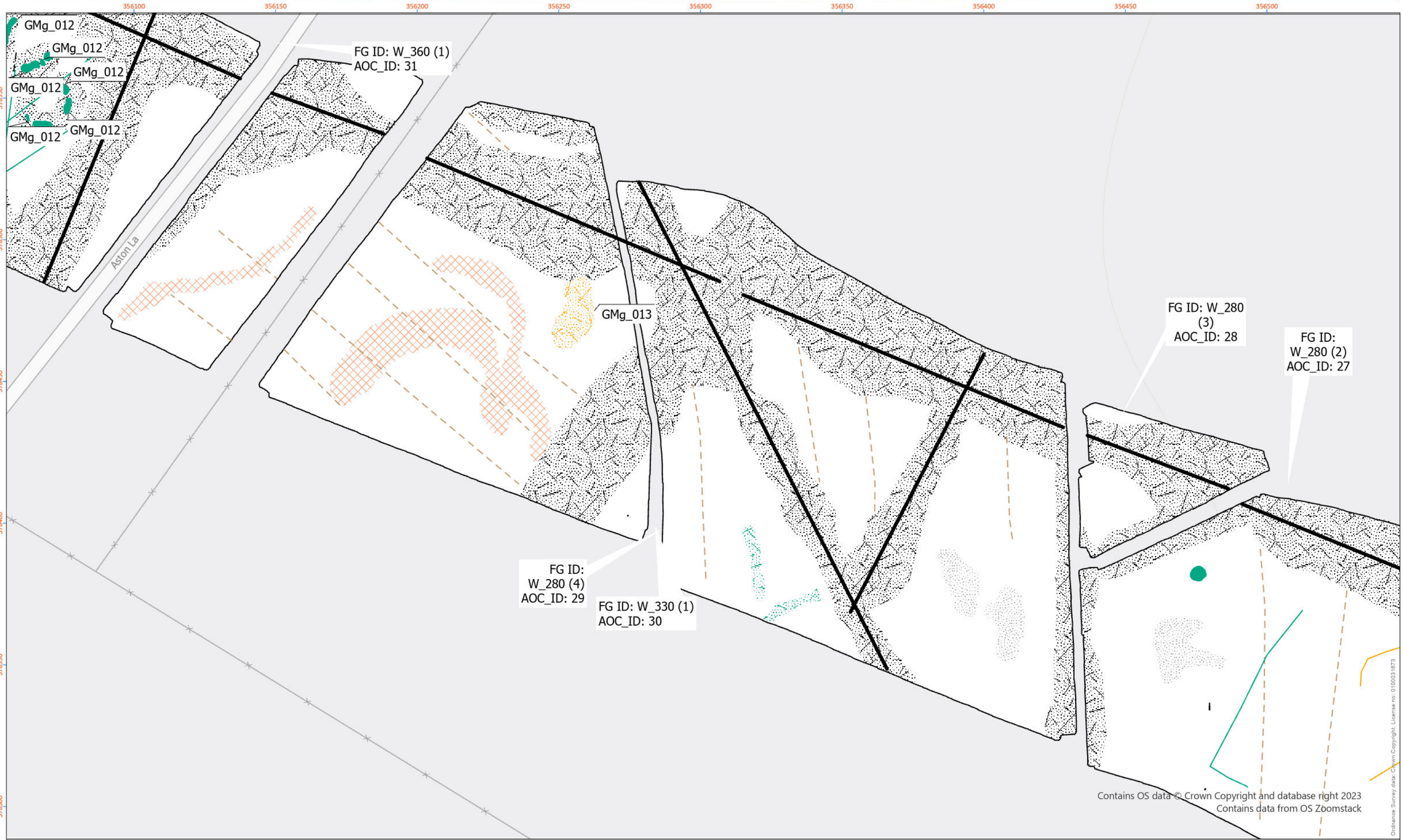
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HyNet North West Hydrogen Pipeline

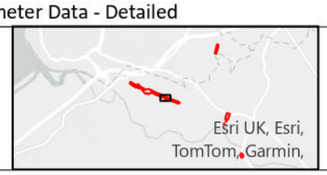
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.28

- Spread (Possible Archaeology)
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)
- Linear Trend (Magnetic Distrubance)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.28/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

356400 356450 356500 356550 356600 356650 356700 356750 356800

378450 378400 378350 378300 378250 378200

FG ID: W_280 (3)
AOC_ID: 28

FG ID:
W_280 (1)
AOC_ID: 26

FG ID:
W_280 (4)
AOC_ID: 29

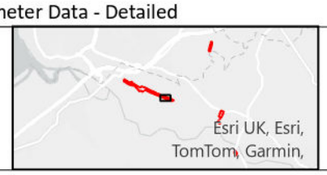
FG ID:
W_280 (2)
AOC_ID: 27

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.29

- Unsuitable
- Anomaly (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.29/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377700 377650 377600 377550 377500 377450

Northwich Road

Northwich Road

A533

FG ID: SA_290
(1)
AOC_ID: 24

GMg_014
GMg_016
GMg_016
GMg_014
GMg_016
GMg_014
GMg_014
GMg_014
GMg_015
GMg_015

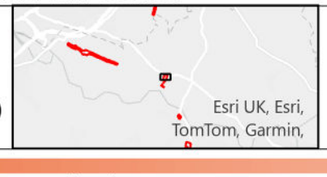
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.30

- Anomaly (Possible Archaeology)
- Spread (Possible Archaeology)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.30/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377400 377350 377300 377250 377200

GMg_015

GMg_015

GMg_014

GMg_015

FG ID:
SA_290 (1)
AOC_ID: 24

FG ID:
SA_290 (1)
AOC_ID: 25

FG ID:
W_20/W_21
AOC_ID: 43

30 40 20 20

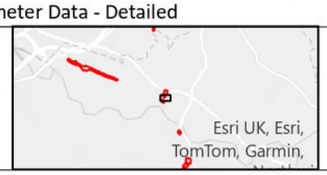
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.31

- Anomaly (Possible Archaeology)
- Spread (Possible Archaeology)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.31/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

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377200 377150 377100 377050 377000

FG ID:
W_20/W_21
AOC_ID: 43

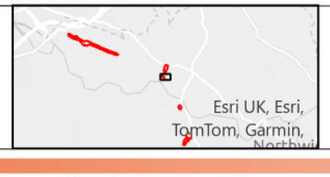
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.32

- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Possible Archaeology)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Service)



N

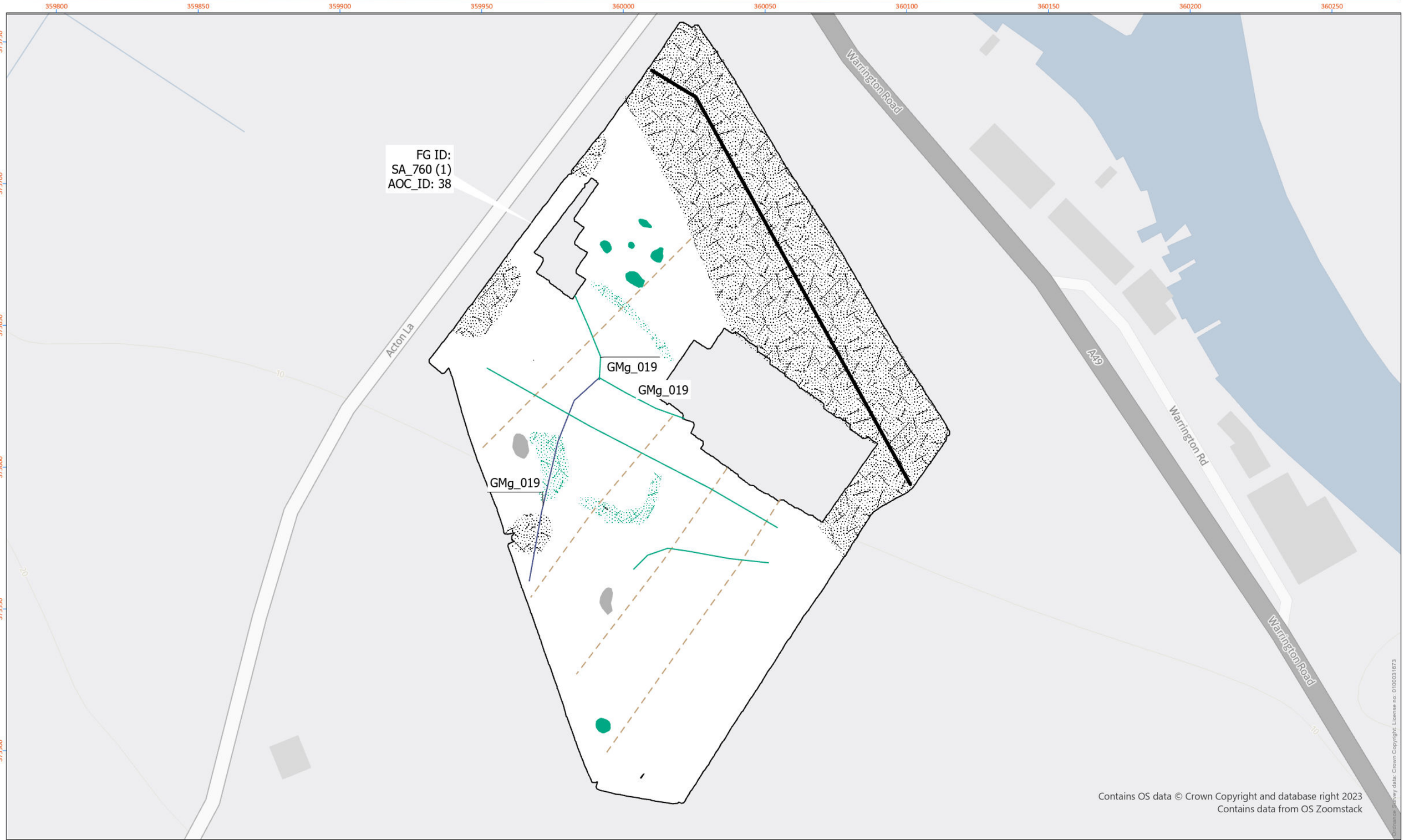
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Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

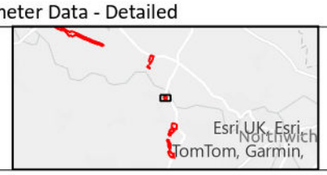
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.33

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

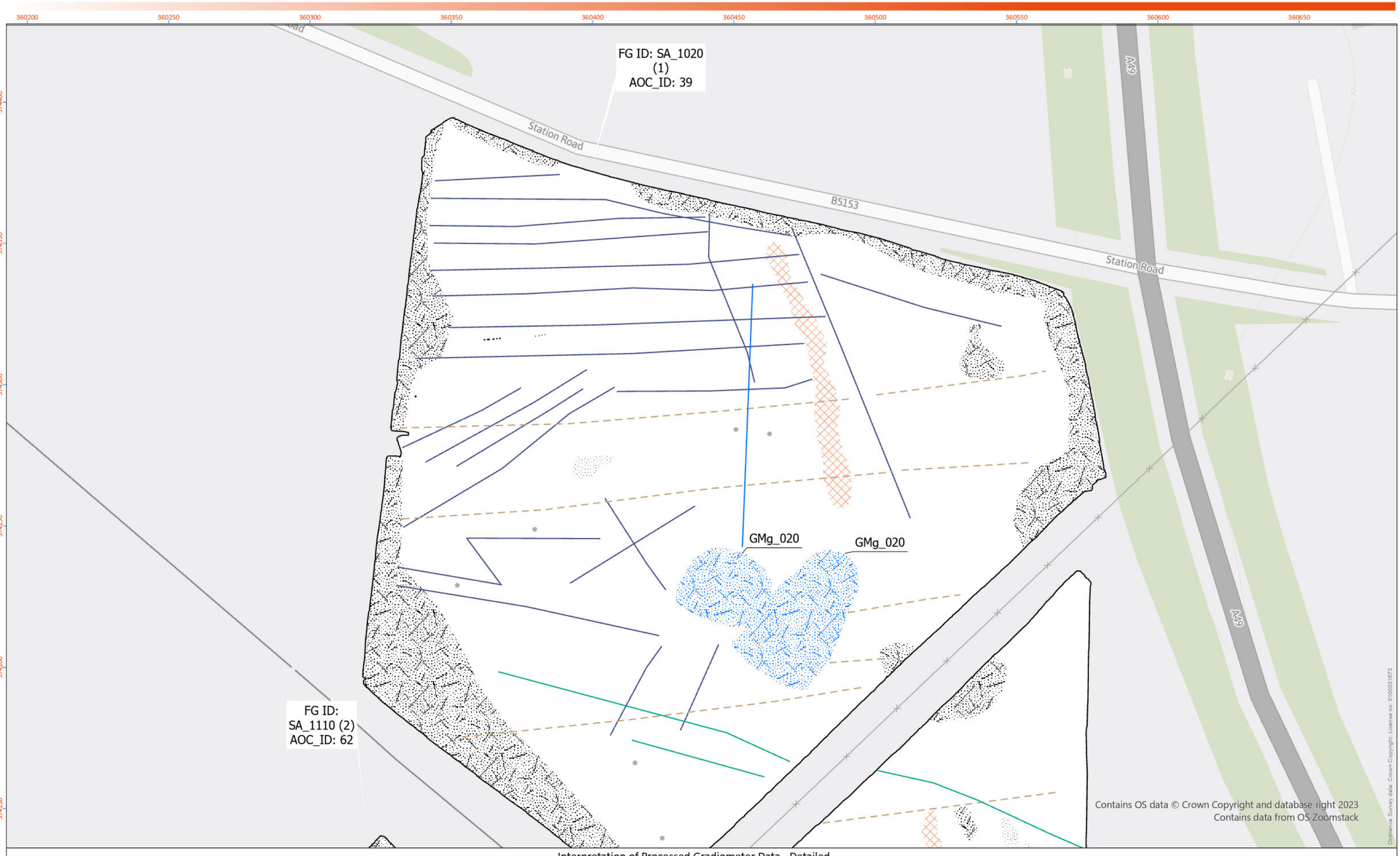
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Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.33/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

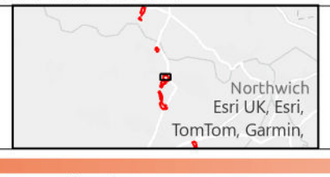
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.34

- Spread (Historic Feature)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Ferrous Anomalies/Iron Spike



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.34/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

FG ID:
SA_1110 (2)
AOC_ID: 62

FG ID:
SA_1020 (1)
AOC_ID: 39

FG ID:
SA_1110 (1)
AOC_ID: 61

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.35

- Spread (Geology/Natural)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Ferrous Anomalies/Iron Spike

Northwich
Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.35/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360050 360100 360150 360200 360250 360300 360350 360400 360450 360500

374000 373950 373900 373850 373800 373750

FG ID:
SA_1110 (1)
AOC_ID: 61

FG ID:
SA_1110 (2)
AOC_ID: 62

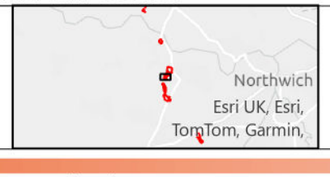
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.36

- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.36/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360000 360050 360100 360150 360200 360250 360300 360350 360400

373600 373550 373500 373450 373400

FG ID:
SA_1190 (1)
AOC_ID: 60

FG ID:
SA_1260 (1)
AOC_ID: 58

GMg_021

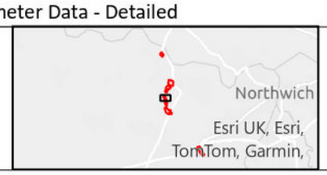
Hefferston Hall New Lodge

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.37

Anomaly (Unclear Origin)
Spread (Magnetic Disturbance)
Linear Trend (Agricultural, Ploughing)
Linear Trend (Drainage)

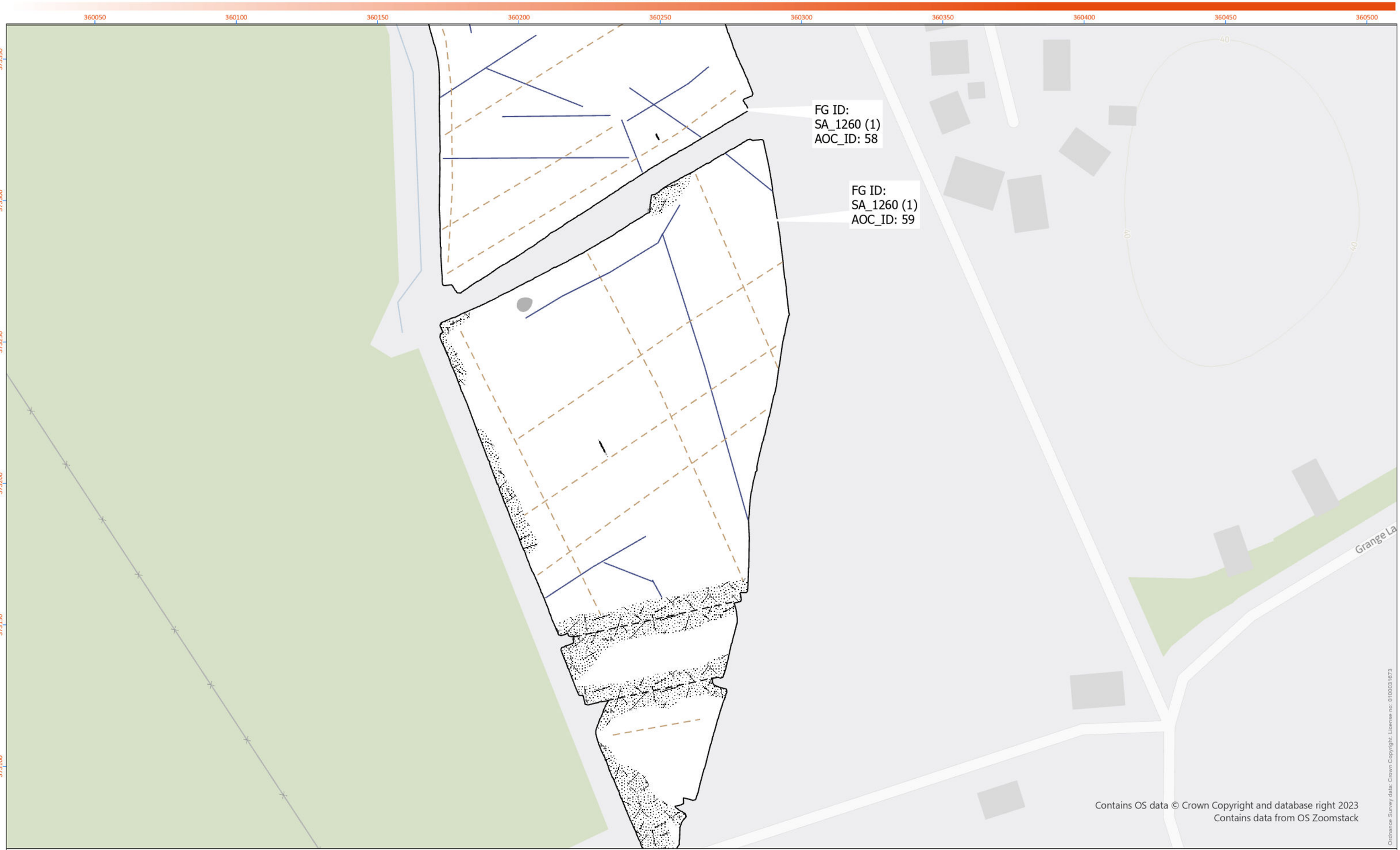


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Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.37/02	
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Approved by: SO	Date: 11/03/2024

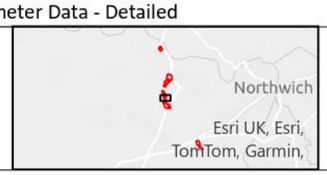
HyNet North West Hydrogen Pipeline
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.38

- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Magnetic Distrubance)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.38/02	
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HyNet North West Hydrogen Pipeline

Delivering clean growth

360100 360150 360200 360250 360300 360350 360400 360450 360500 360550

373050 373000 372950 372900 372850

FG ID:
SA_1260 (1)
AOC_ID: 59

FG ID: SA_1330
(1)
AOC_ID: 40

FG ID:
SA_1350 (1)
AOC_ID: 57

Cuddington Manor
Farm

Grange La

A49

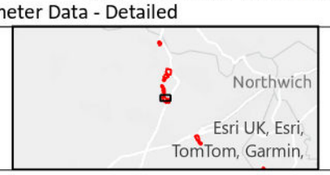
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Interpretation of Processed Gradiometer Data - Detailed

Figure
6.39

- No Access
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.39/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360100 360150 360200 360250 360300 360350 360400 360450 360500 360550

372850 372800 372750 372700 372650

FG ID:
SA_1350 (1)
AOC_ID: 57

FG ID:
SA_1330 (1)
AOC_ID: 40

A49

Grange La

Millington La

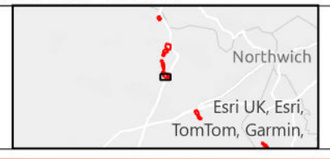
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.40

- No Access
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.40/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

361800 361850 361900 361950 362000 362050 362100 362150 362200

370850 370800 370750 370700 370650 370600

FG ID:
SA_1860 (1)
AOC_ID: 56

FG ID:
SA_1990 (1)
AOC_ID: 55

Vale Farm

rse

50 40

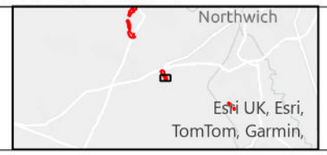
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.41

- No Access
- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Agricultural, Ploughing)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.41/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

365000 365050 365100 365150 365200 365250 365300 365350 365400 365450

369550 369500 369450 369400 369350

GMg_017
GMg_017
GmG_018
GmG_018
GmG_018
GmG_018
GMg_018
GMg_018
GMg_017
GMg_017

FG ID:
SA_2640 (1)
AOC_ID: 41

FG ID:
SA_2820 (1)
AOC_ID: 42

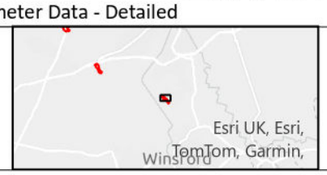
Public Park Or G

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.42

- Anomaly (Burned Area)
- Anomaly (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

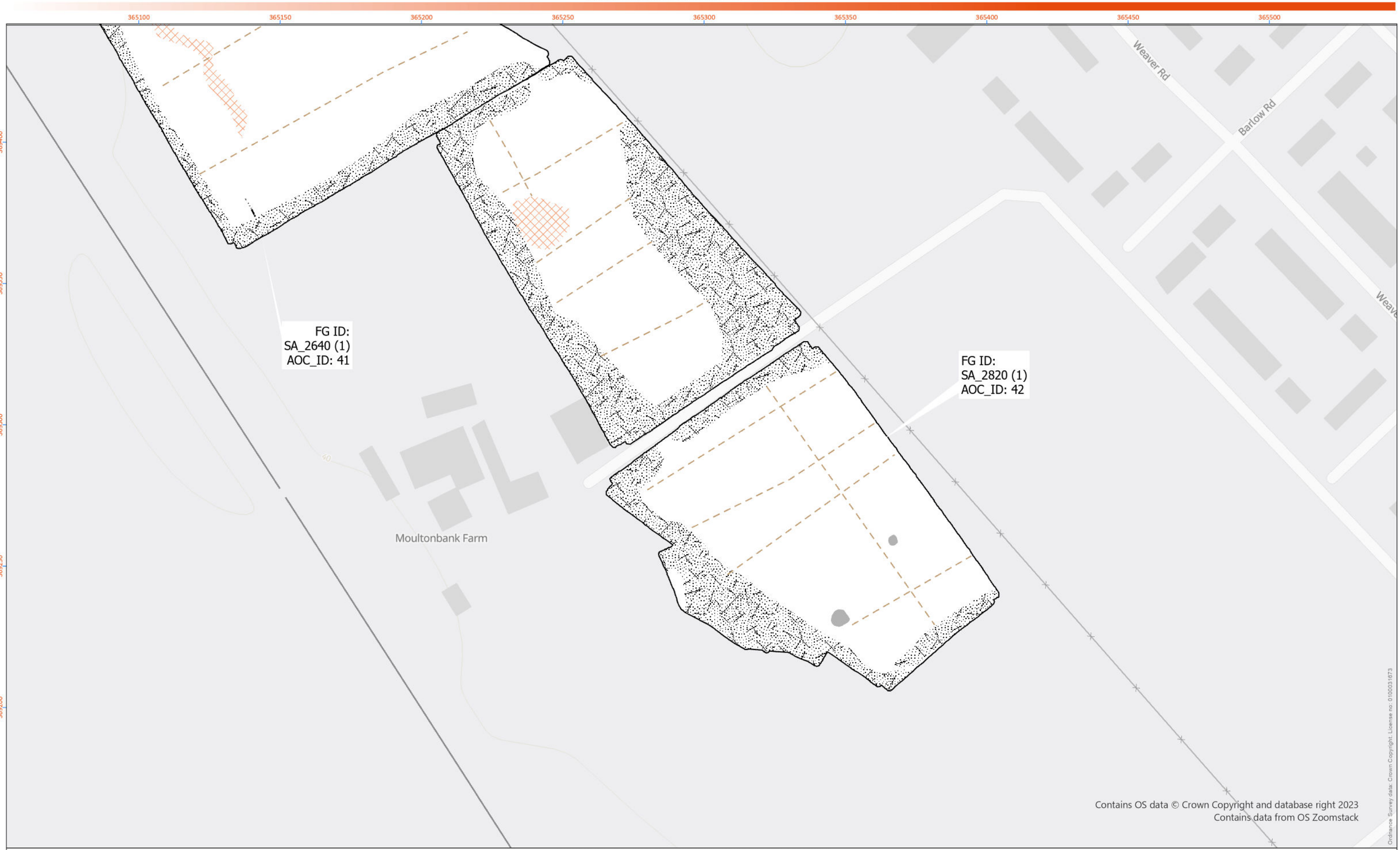
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HyNet North West Hydrogen Pipeline

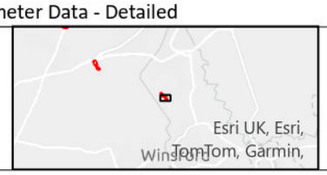
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.43

Spread (Geology/Natural)
Spread (Magnetic Disturbance)
Anomaly (Magnetic Disturbance)
Linear Trend (Agricultural, Ploughing)



N

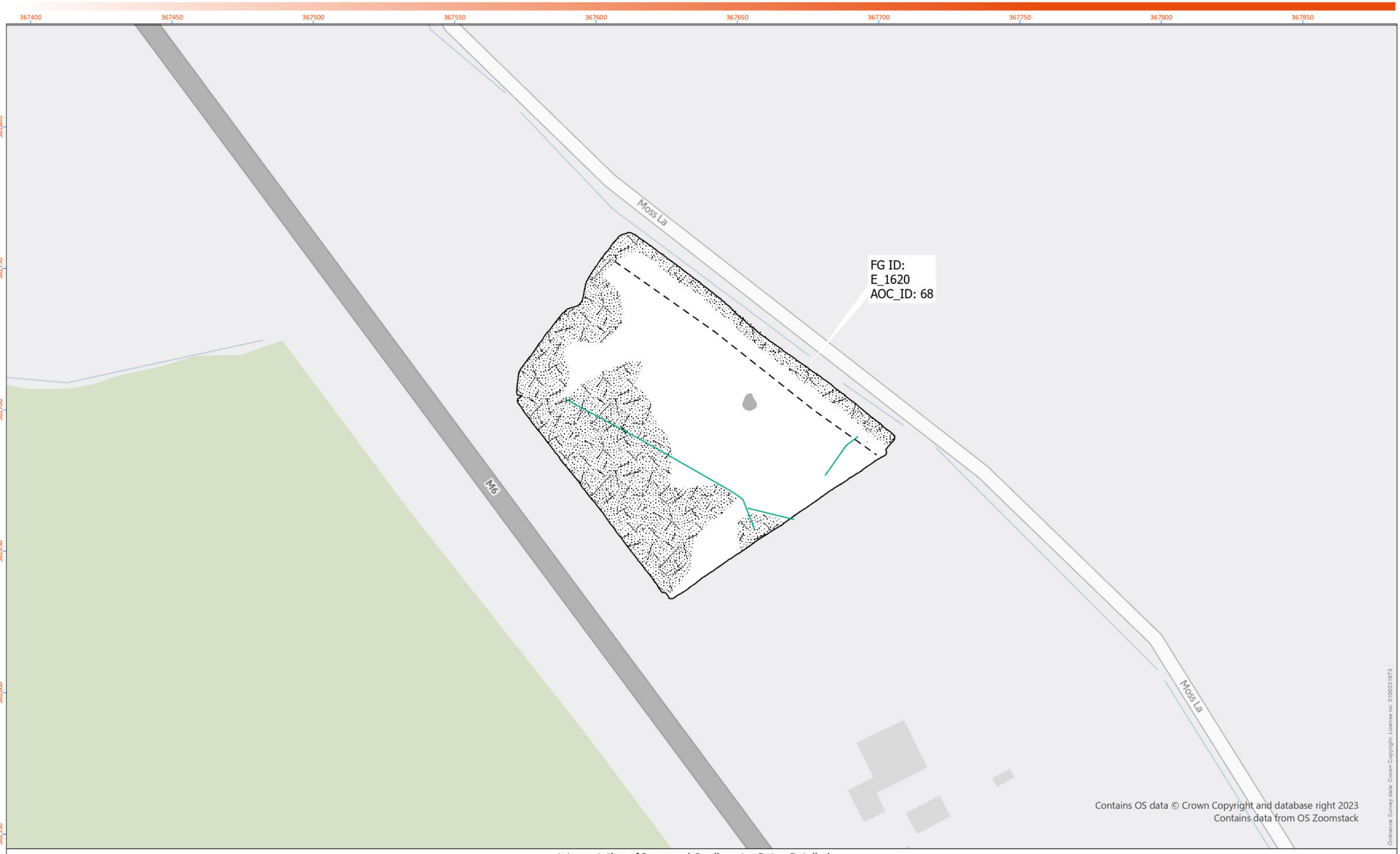
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.44

Anomaly (Magnetic Disturbance)
Spread (Magnetic Disturbance)
Linear Trend (Unclear Origin)
Linear Trend (Magnetic Distrubance)



N

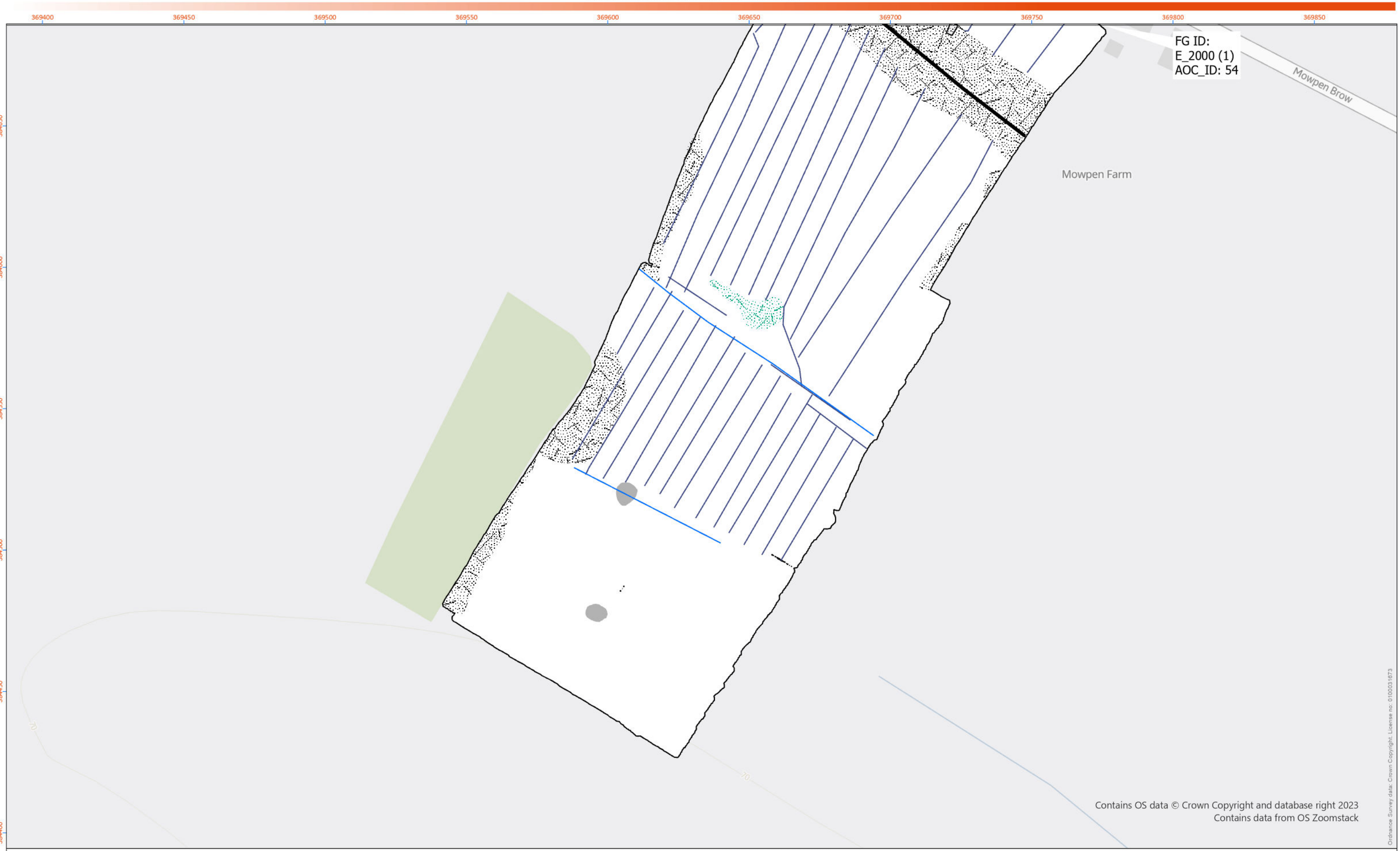
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.45

- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.45/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

369500 369550 369600 369650 369700 369750 369800 369850 369900 369950

384850 384800 384750 384700 384650

FG ID:
E_2010 (2)
AOC_ID: 64

FG ID:
E_2000 (1)
AOC_ID: 54

Mowpen Brow

Mowpen Brow

Mowpen Farm

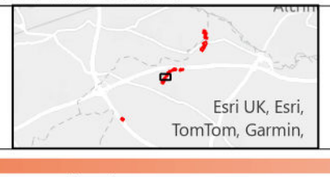
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.46

- Spread (Magnetic Disturbance)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

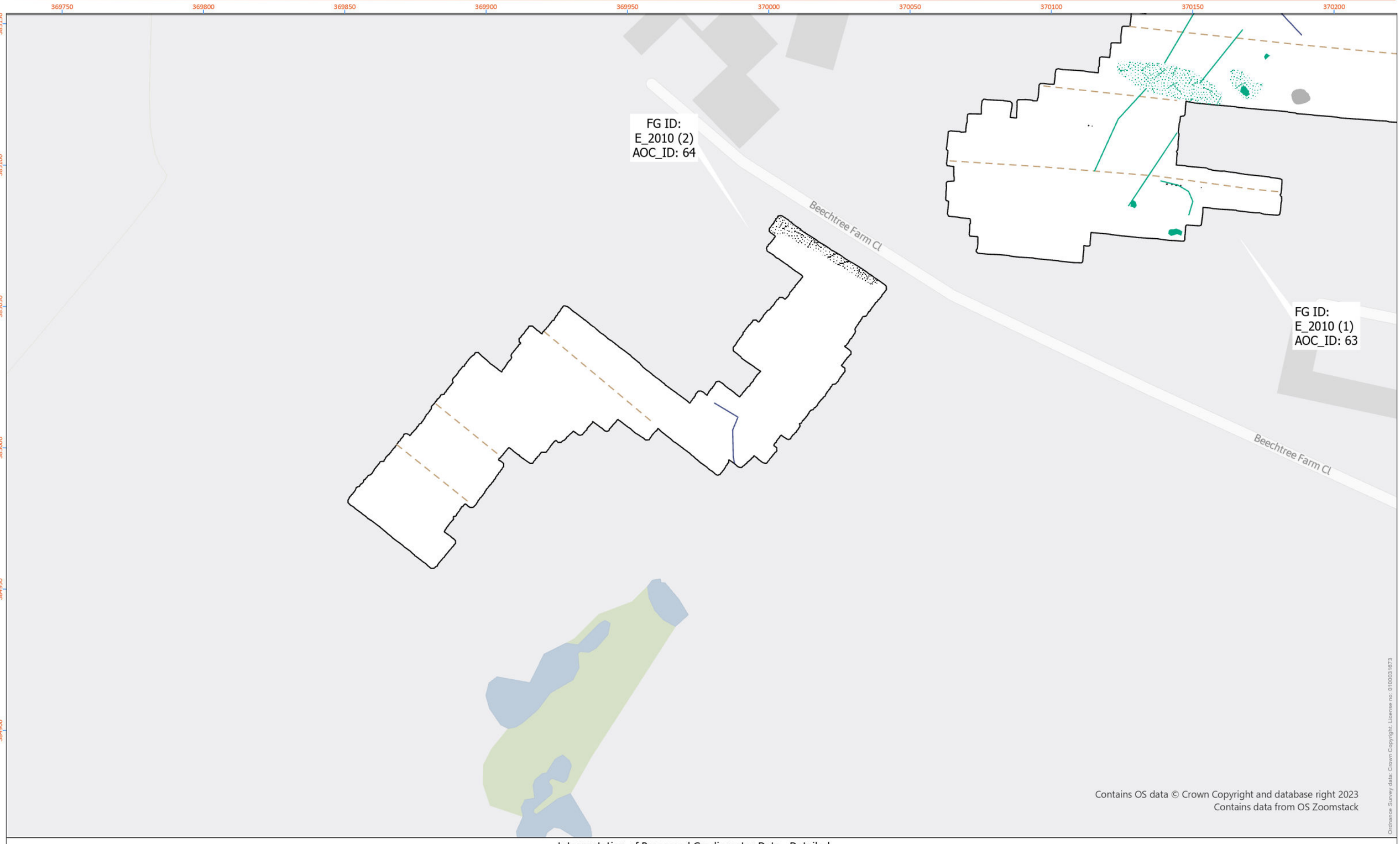
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Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.47

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.47/02	
Created by: AC	Date: 11/03/2024
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Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

370000 370050 370100 370150 370200 370250 370300 370350 370400 370450

385250 385200 385150 385100 385050 385000

FG ID:
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AOC_ID: 63

FG ID:
E_2170 (1)
AOC_ID: 52

FG ID:
E_2010 (2)
AOC_ID: 64

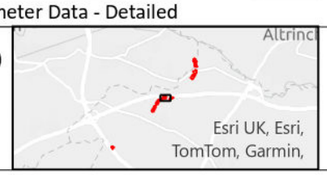
M56
West Lane
B5159
Beechtree Farm Cl
Beechtree Farm Cl
West Lane
Farm

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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.48

- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Anomaly (Magnetic Disturbance)
- Spread (Magnetic Disturbance)
- Spread (Ferrous/Iron Spike)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.48/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

370300 370350 370400 370450 370500 370550 370600 370650 370700 370750

385200 385150 385100 385050 385000

FG ID:
E_2170 (1)
AOC_ID: 52

FG ID:
E_2170 (2)
AOC_ID: 53

M56

60

Abbey Leys Farm

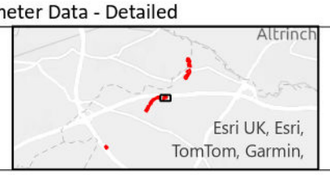
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.49

Spread (Magnetic Disturbance)
Spread (Ferrous/Iron Spike)
Linear Trend (Agricultural, Ploughing)
Linear Trend (Service)



N

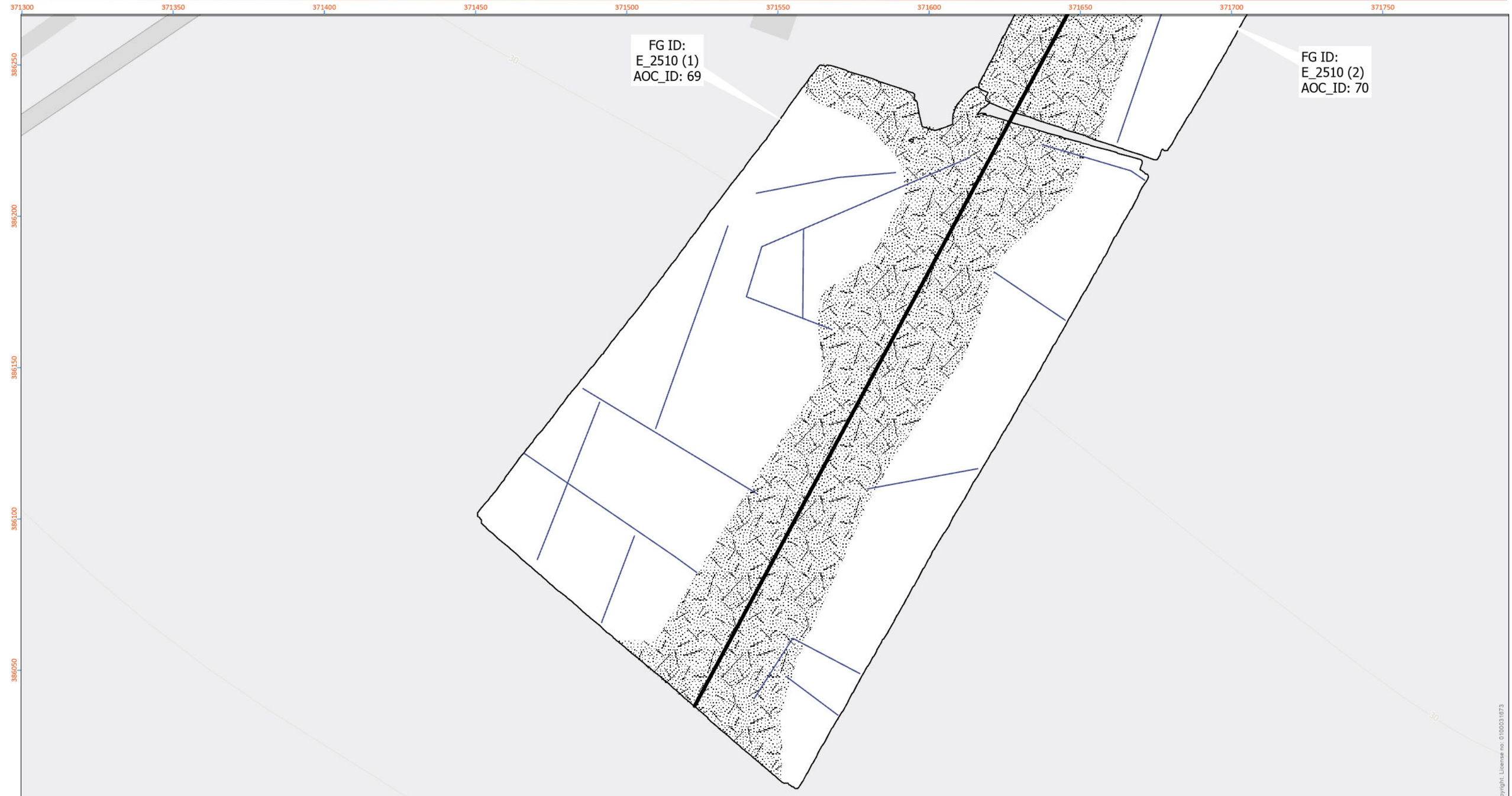
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.49/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

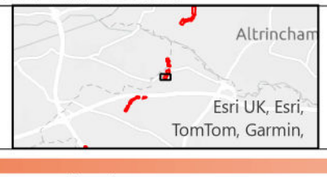
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.50

- Spread (Magnetic Disturbance)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

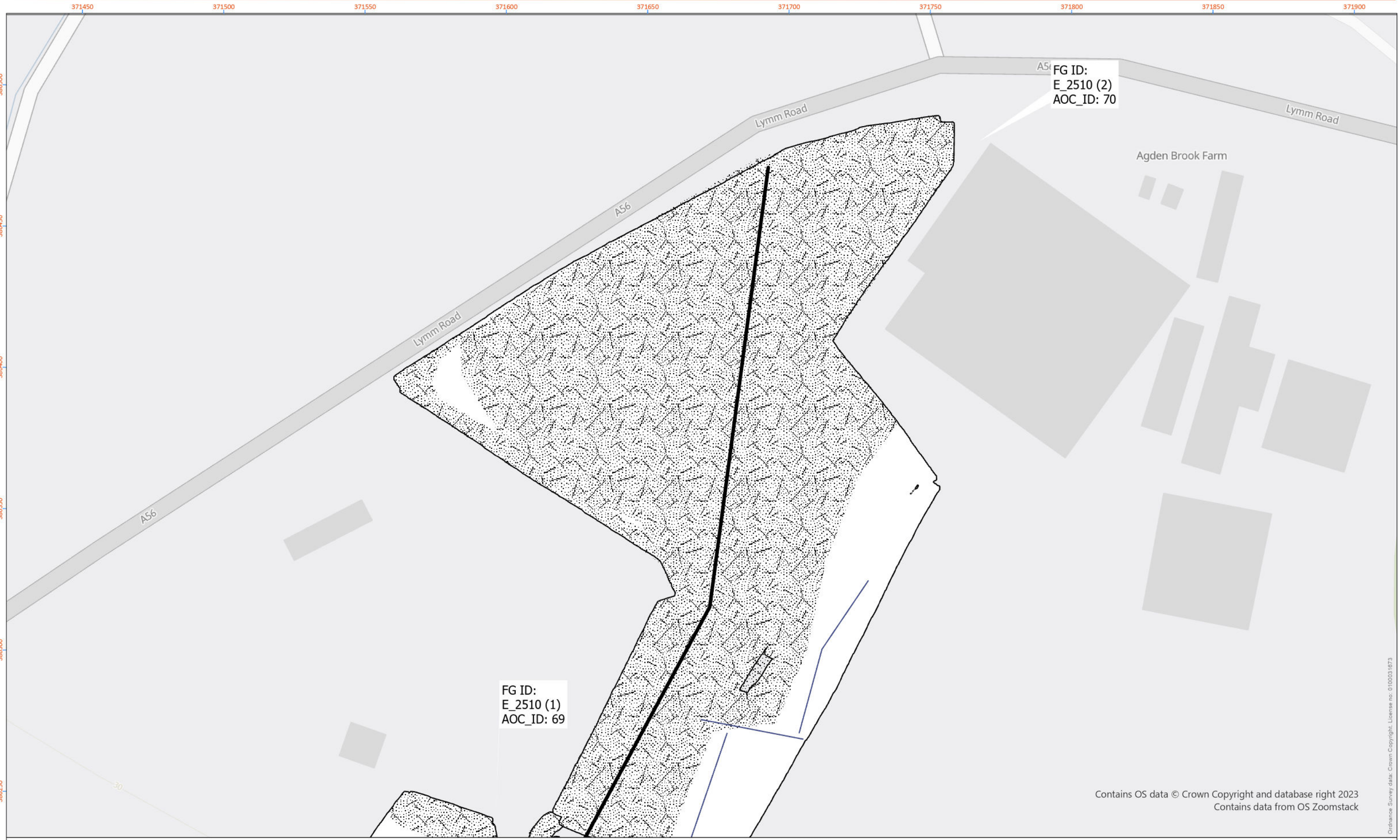
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.50/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

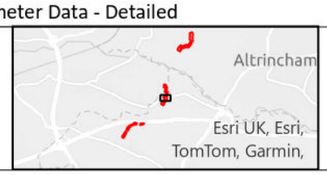
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.51

- Spread (Magnetic Disturbance)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

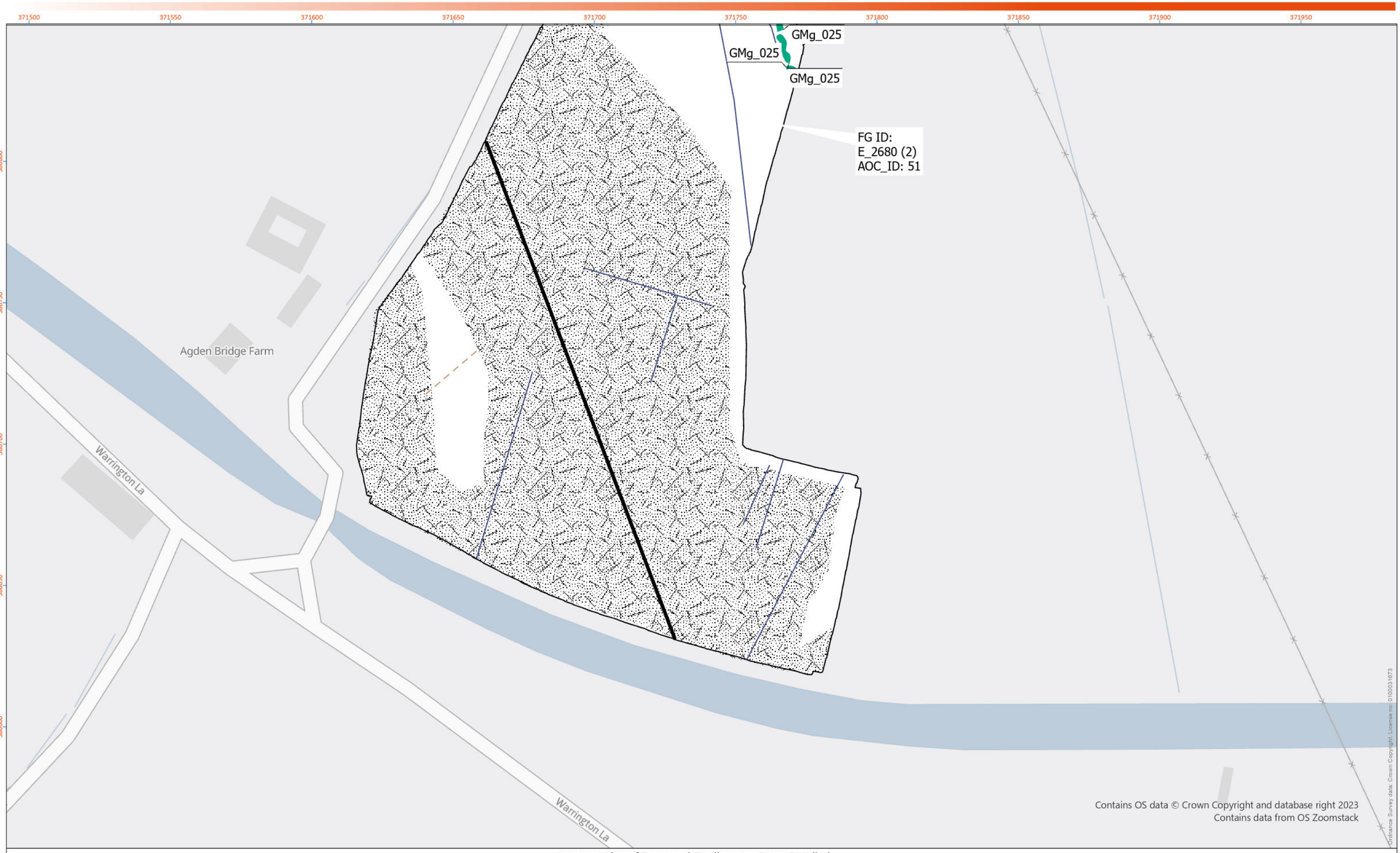
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.51/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.52

- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

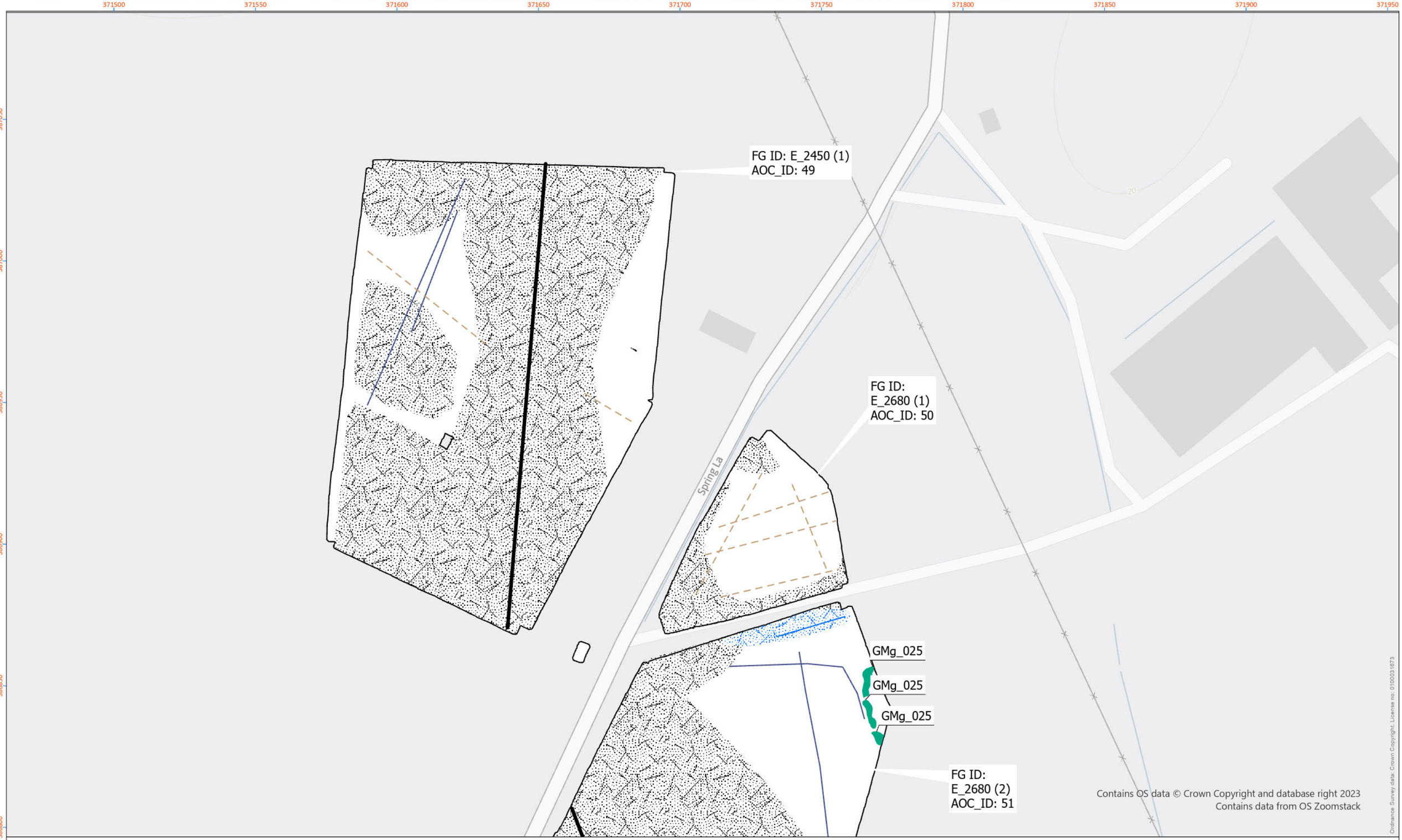
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.52/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

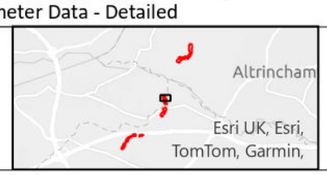
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.53

- Spread (Historic Feature)
- Anomaly (Unclear Origin)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)
- Linear Trend (Service)



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.53/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

372600 372650 372700 372750 372800 372850 372900 372950 373000 373050

389100 389050 389000 388950 388900 388850

FG ID:
E_3270
AOC_ID: 45

FG ID:
E_3272
AOC_ID: 46

FG ID:
E_3020 (1)
AOC_ID: 47

GMg_023

GMg_024

GMg_024

GMg_024

GMg_024

GMG_024

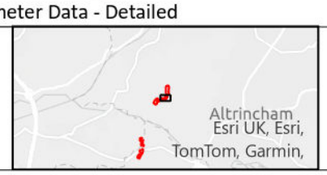
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Interpretation of Processed Gradiometer Data - Detailed

Figure 6.54

- No Access
- Anomaly (Unclear Origin)
- Spread (Unclear Origin)
- Spread (Geology/Natural)
- Spread (Magnetic Disturbance)
- Linear Trend (Historic Feature)
- Linear Trend (Unclear Origin)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

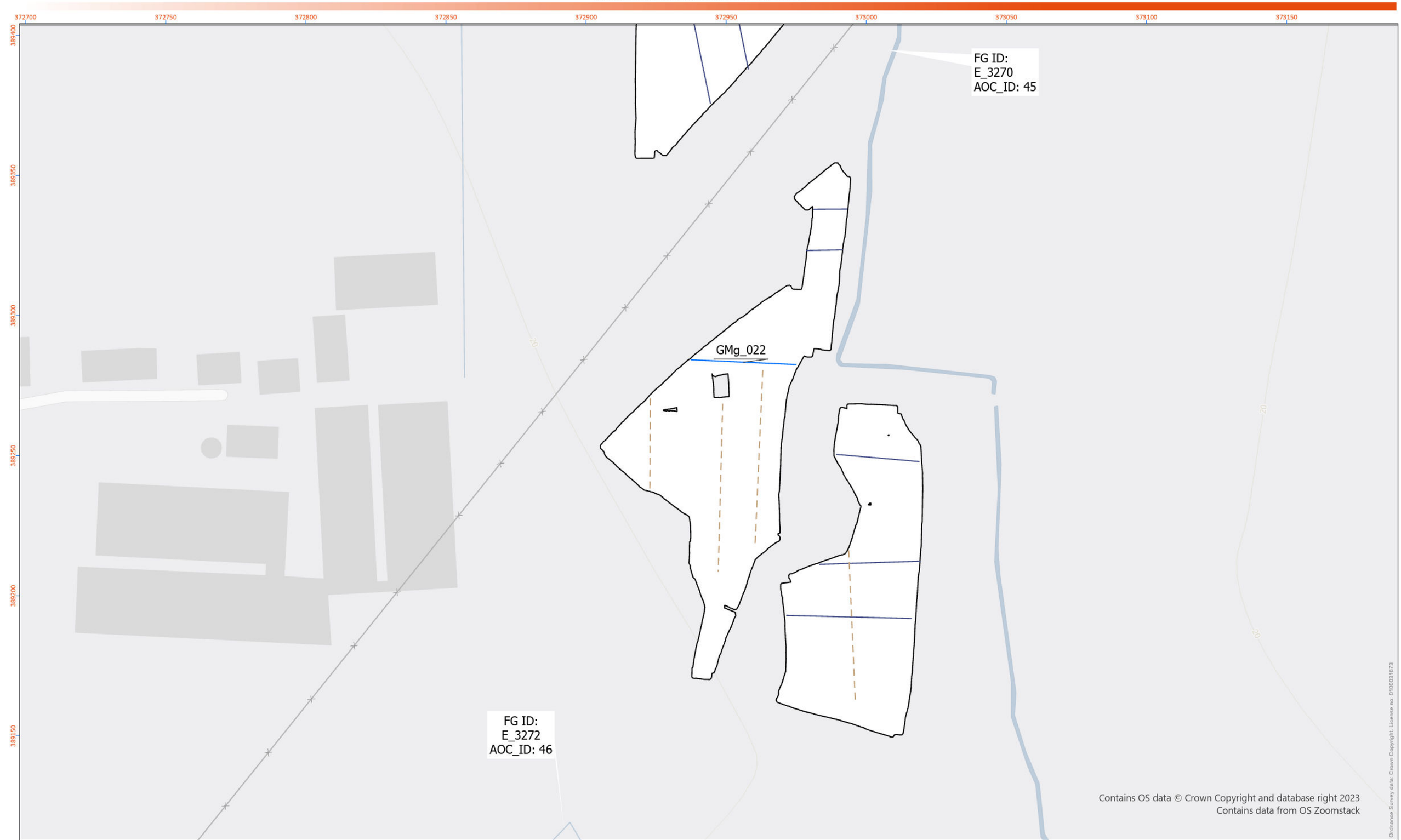
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Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.54/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

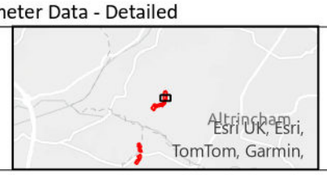
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.55

- Linear Trend (Historic Feature)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

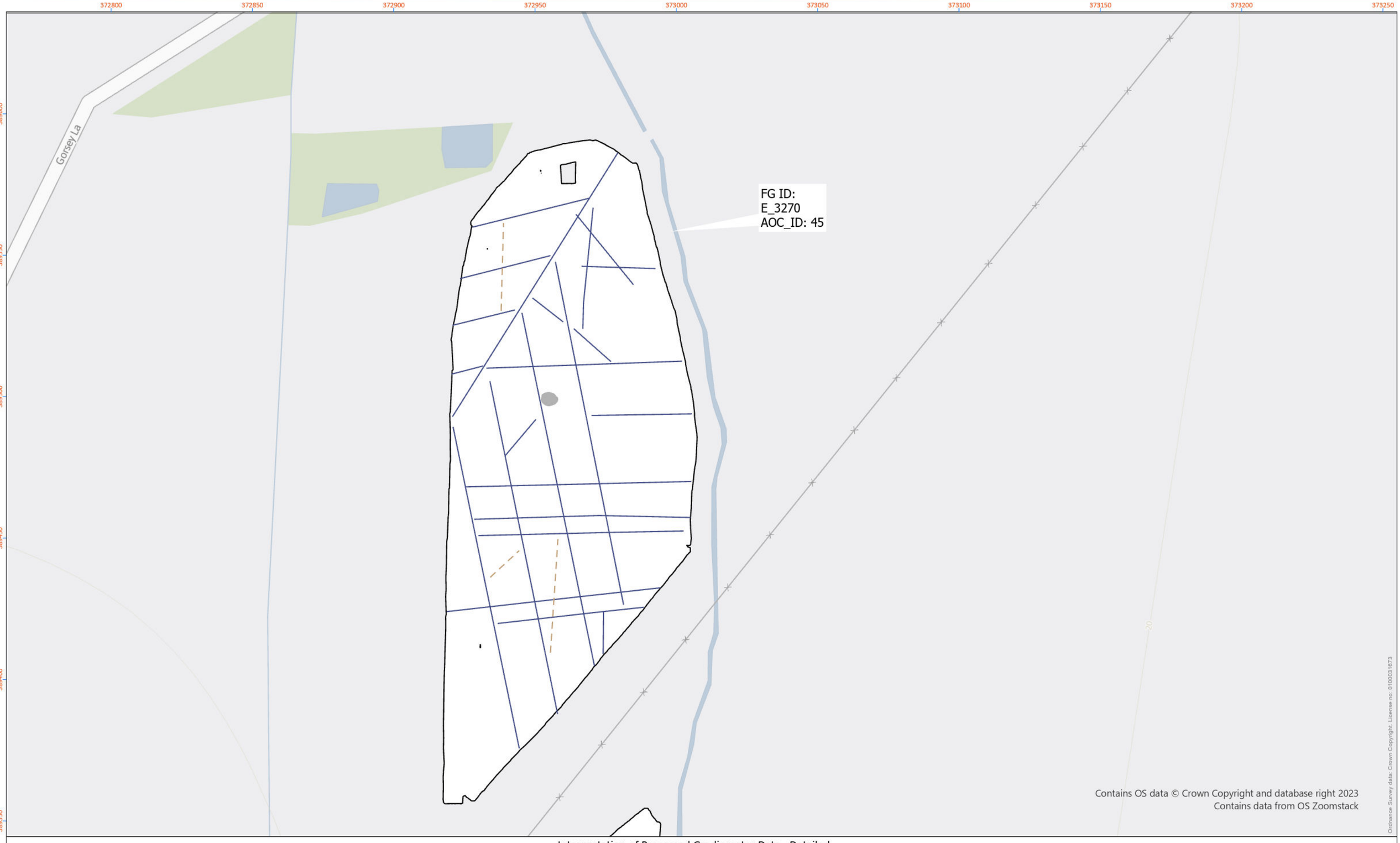
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.55/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

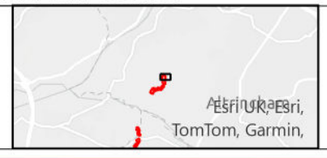
Delivering clean growth



Interpretation of Processed Gradiometer Data - Detailed

Figure 6.56

- Anomaly (Magnetic Disturbance)
- Linear Trend (Agricultural, Ploughing)
- Linear Trend (Drainage)



N

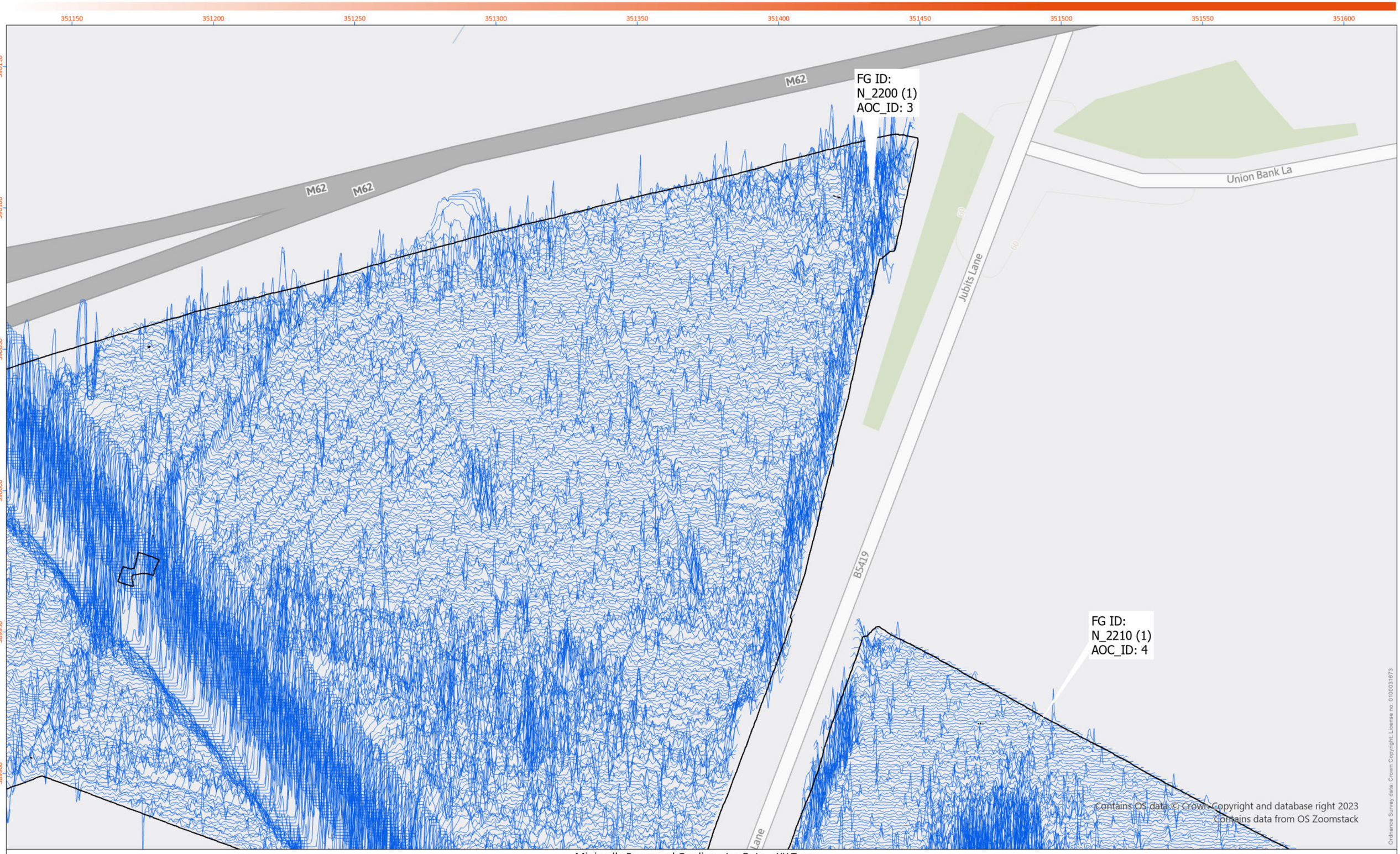
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Scale: 1:1,200 @ A3

Drawing Number: 05/40593/GEO/6.56/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: SO	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.1

50nT

-50nT



N

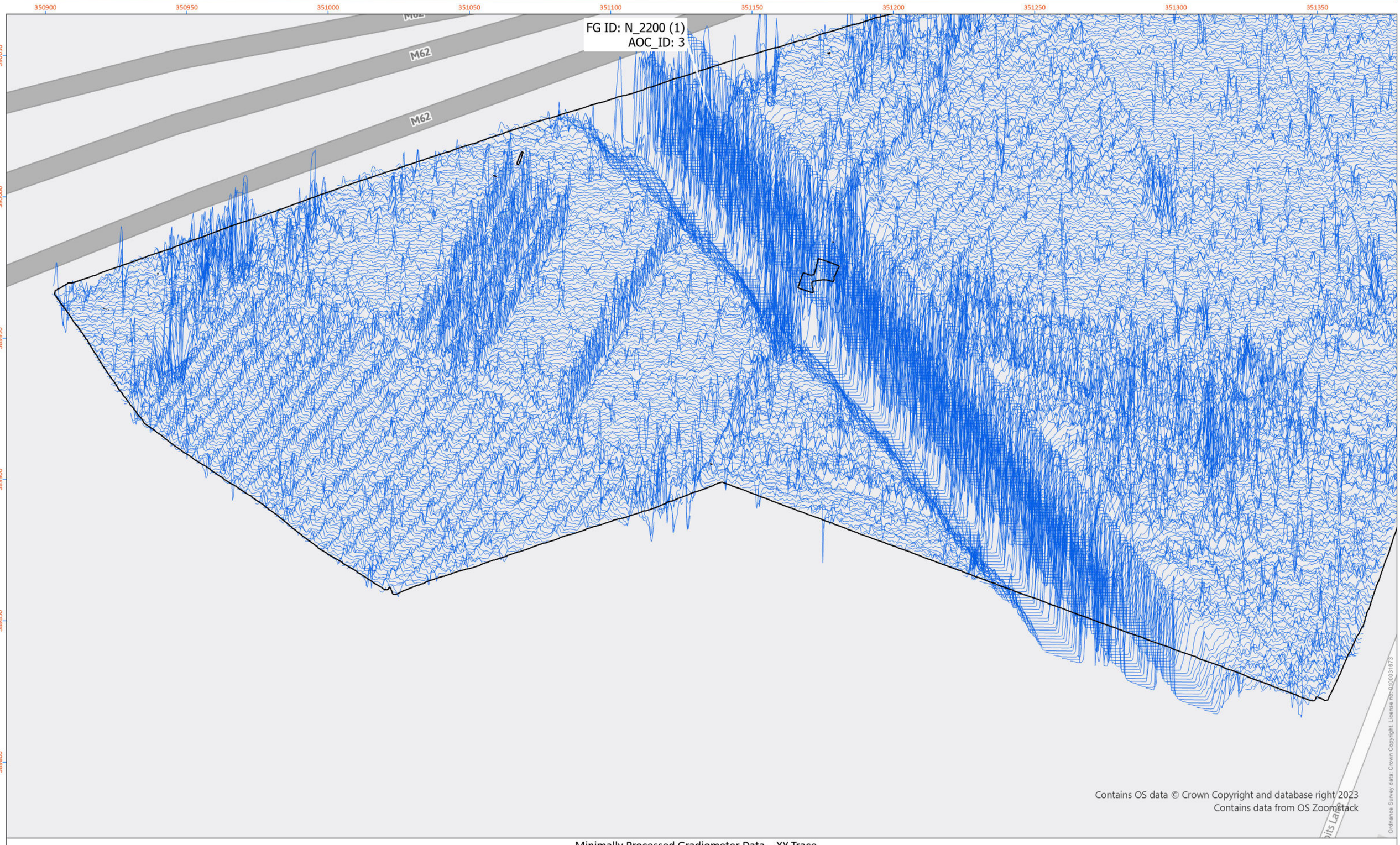
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.1/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.2

50nT

-50nT



N

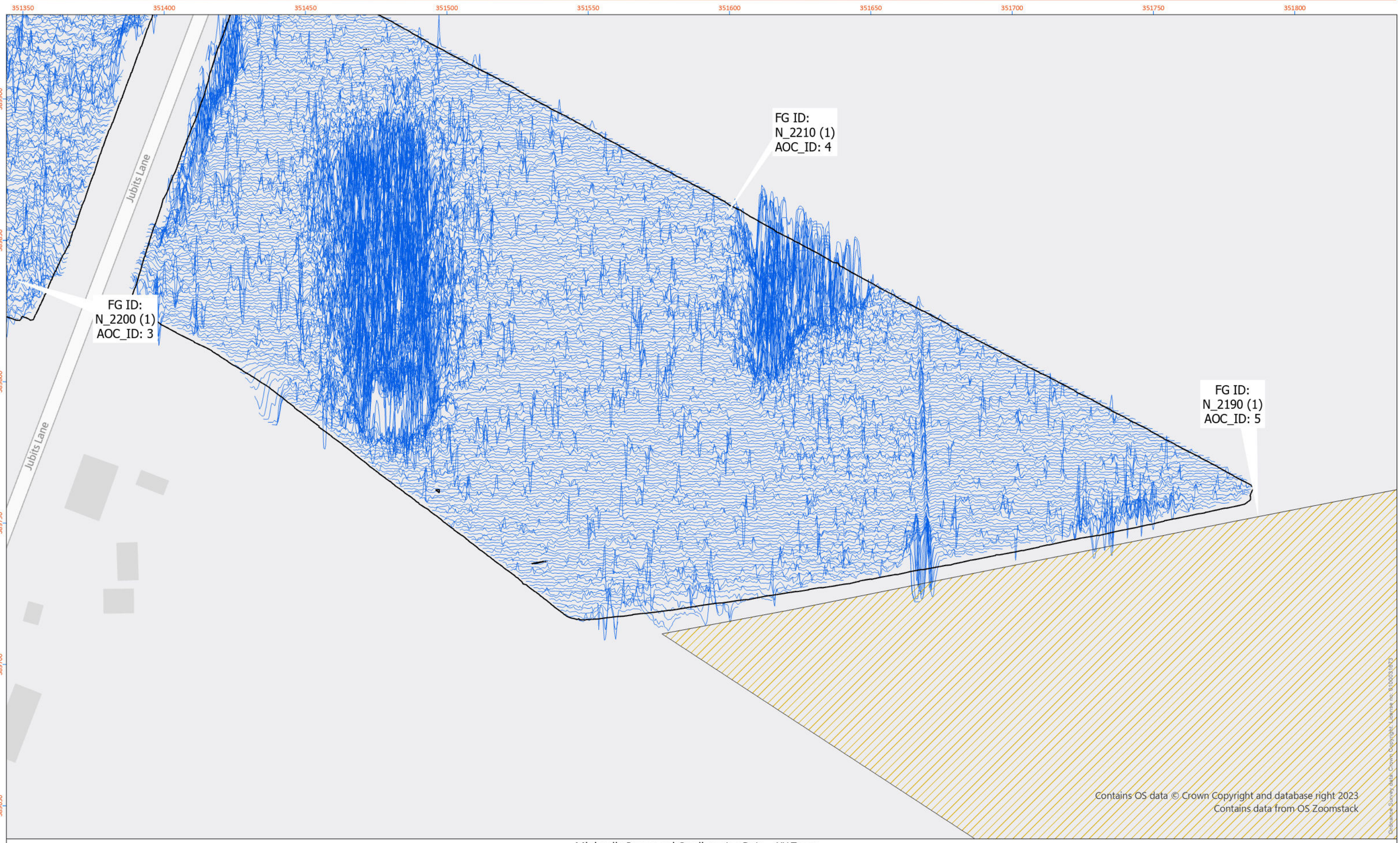
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.2/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

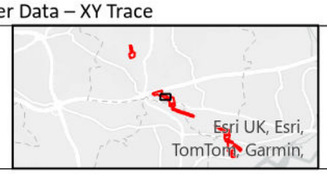


Minimally Processed Gradiometer Data – XY Trace

Figure 7.3

50nT

-50nT



N

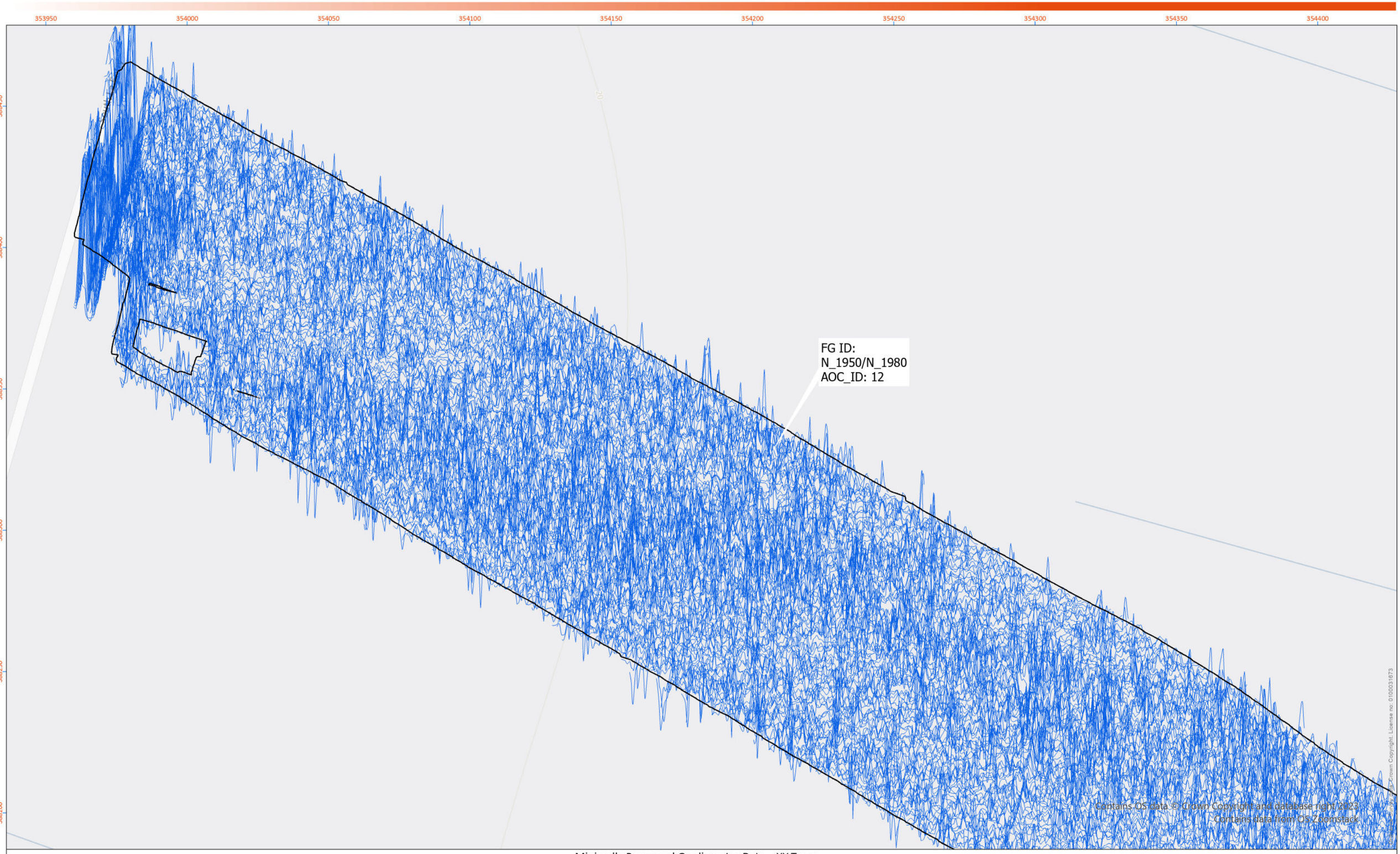
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.3/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.4

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.4/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354300 354350 354400 354450 354500 354550 354600 354650 354700 354750

388300 388250 388200 388150 388100 388050

FG ID:
N_1950/N_1980
AOC_ID: 12

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Minimally Processed Gradiometer Data – XY Trace

Figure 7.5

50nT
-50nT



N

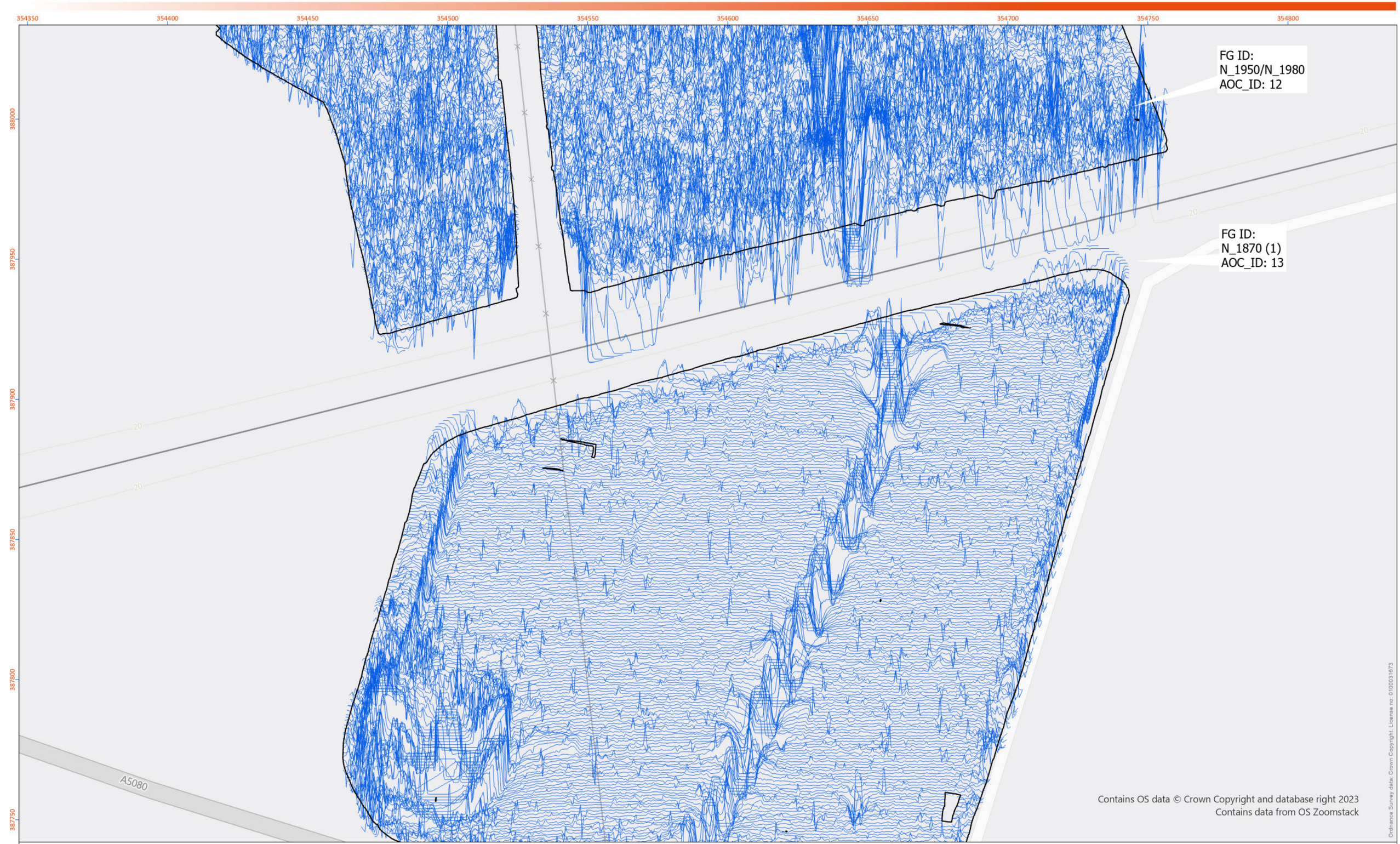
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Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.5/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

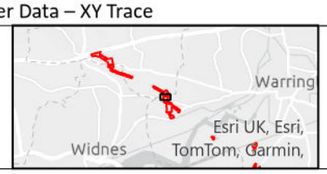
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.6

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.6/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354450 354500 354550 354600 354650 354700 354750 354800 354850 354900

387750 387700 387650 387600 387550 387500

FG ID:
N_1870 (1)
AOC_ID: 13

FG ID:
N_1710 (1)
AOC_ID: 14

FG ID:
N_1710 (2)
AOC_ID: 15

South Lane
A5080
South Lane
A5080
South Lane
South Lane
Four Top'd Oak

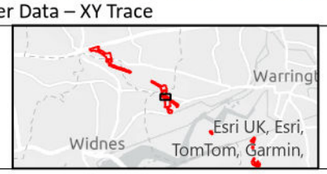
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Contains data from OS Zoomstack

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Minimally Processed Gradiometer Data – XY Trace

Figure 7.7

50nT
-50nT



N

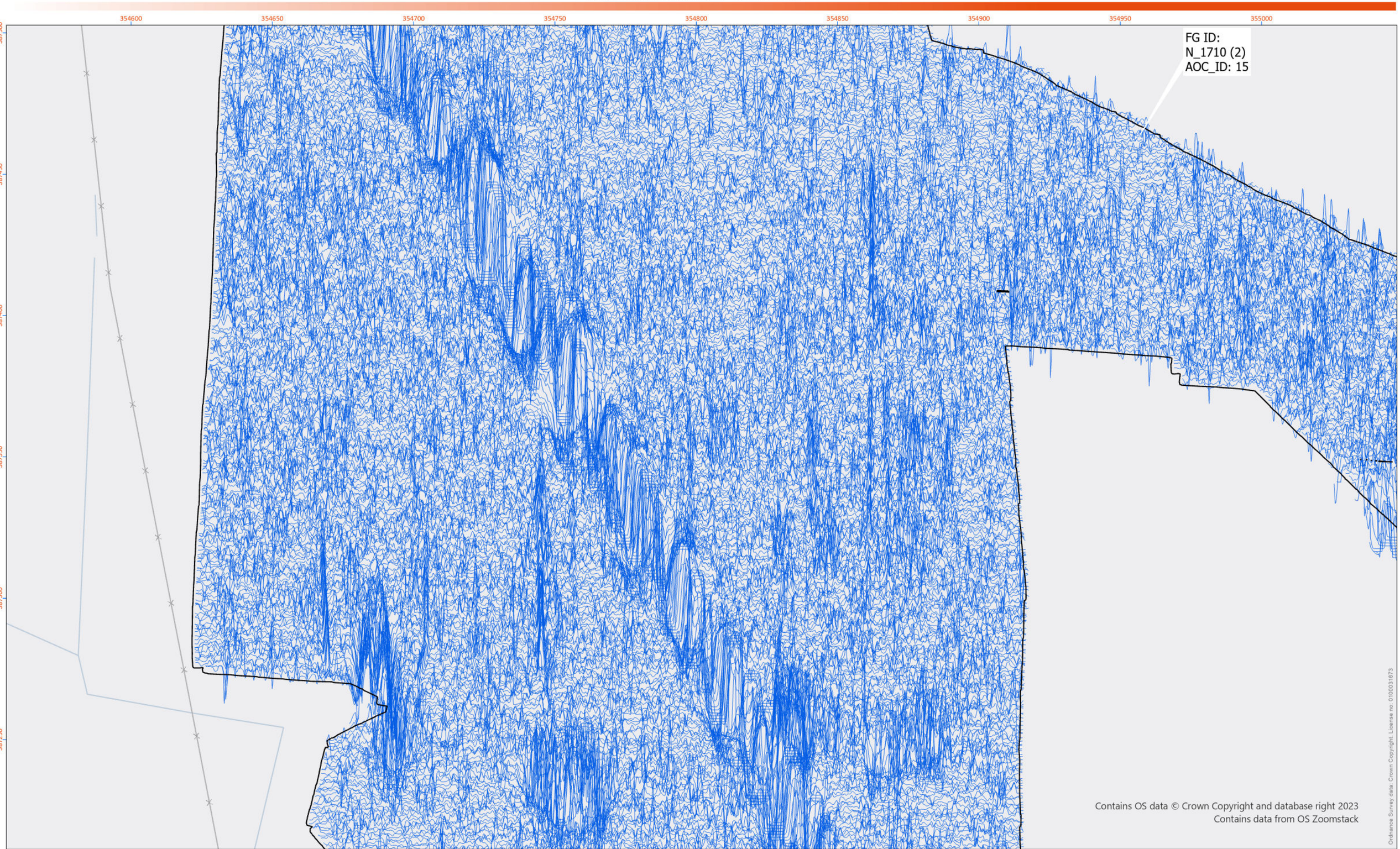
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Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.7/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

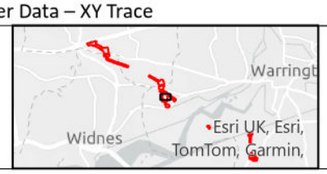
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.8

50nT
-50nT



N

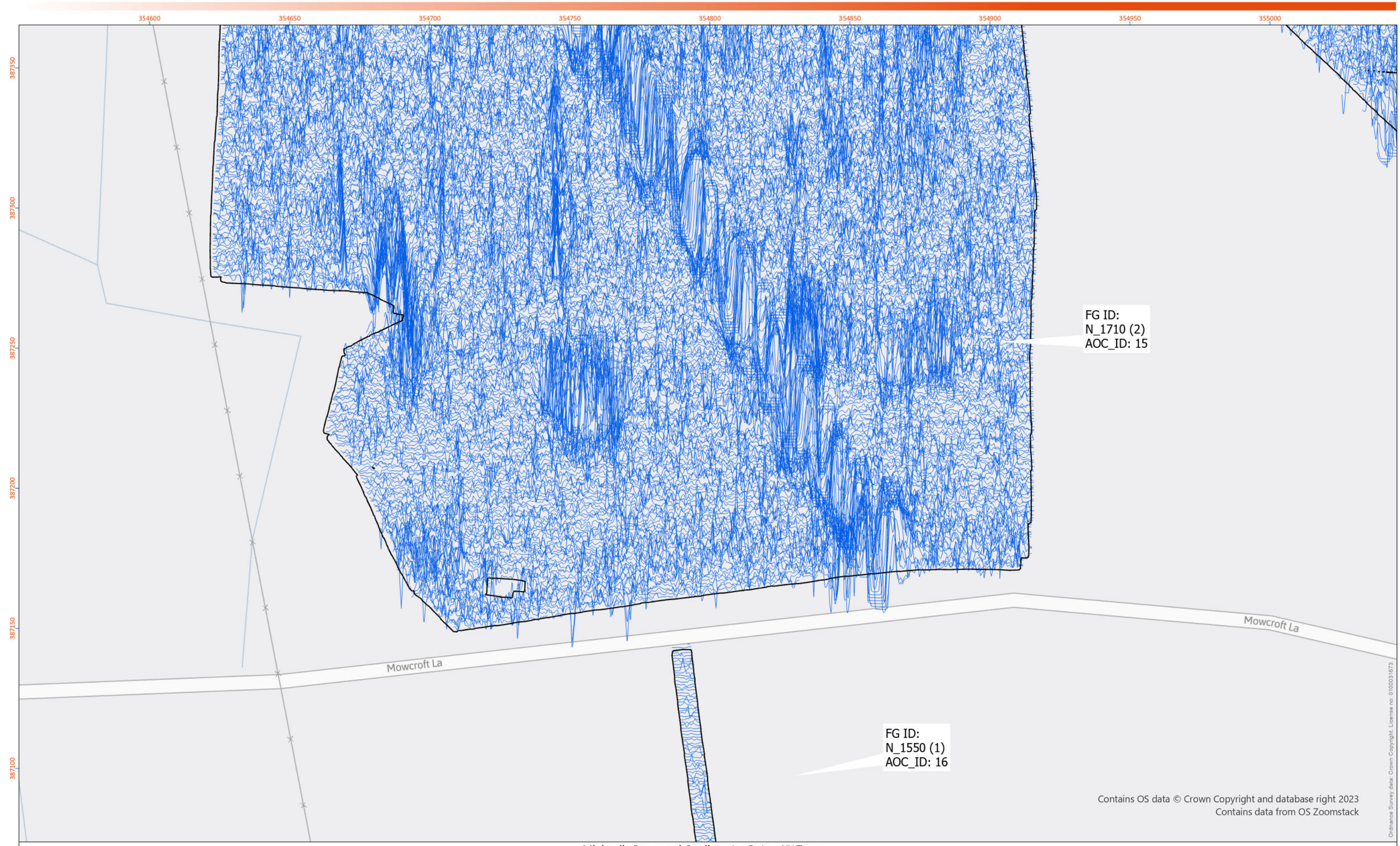
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.8/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

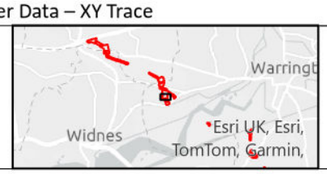
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.9

50nT
-50nT



N

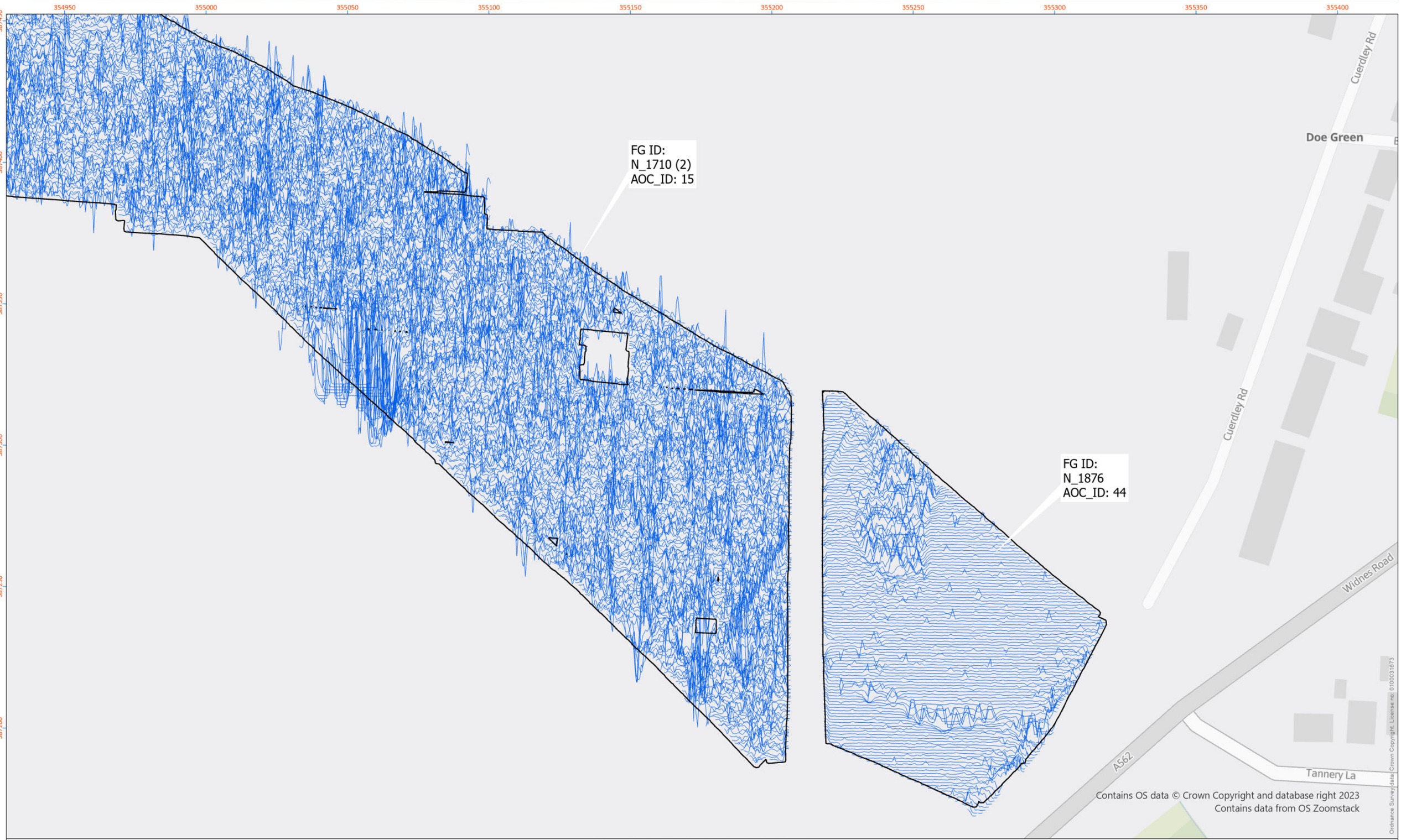
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.9/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

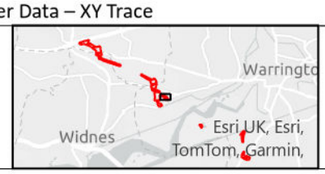


Minimally Processed Gradiometer Data – XY Trace

Figure 7.10

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.10/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.11

50nT
-50nT



N

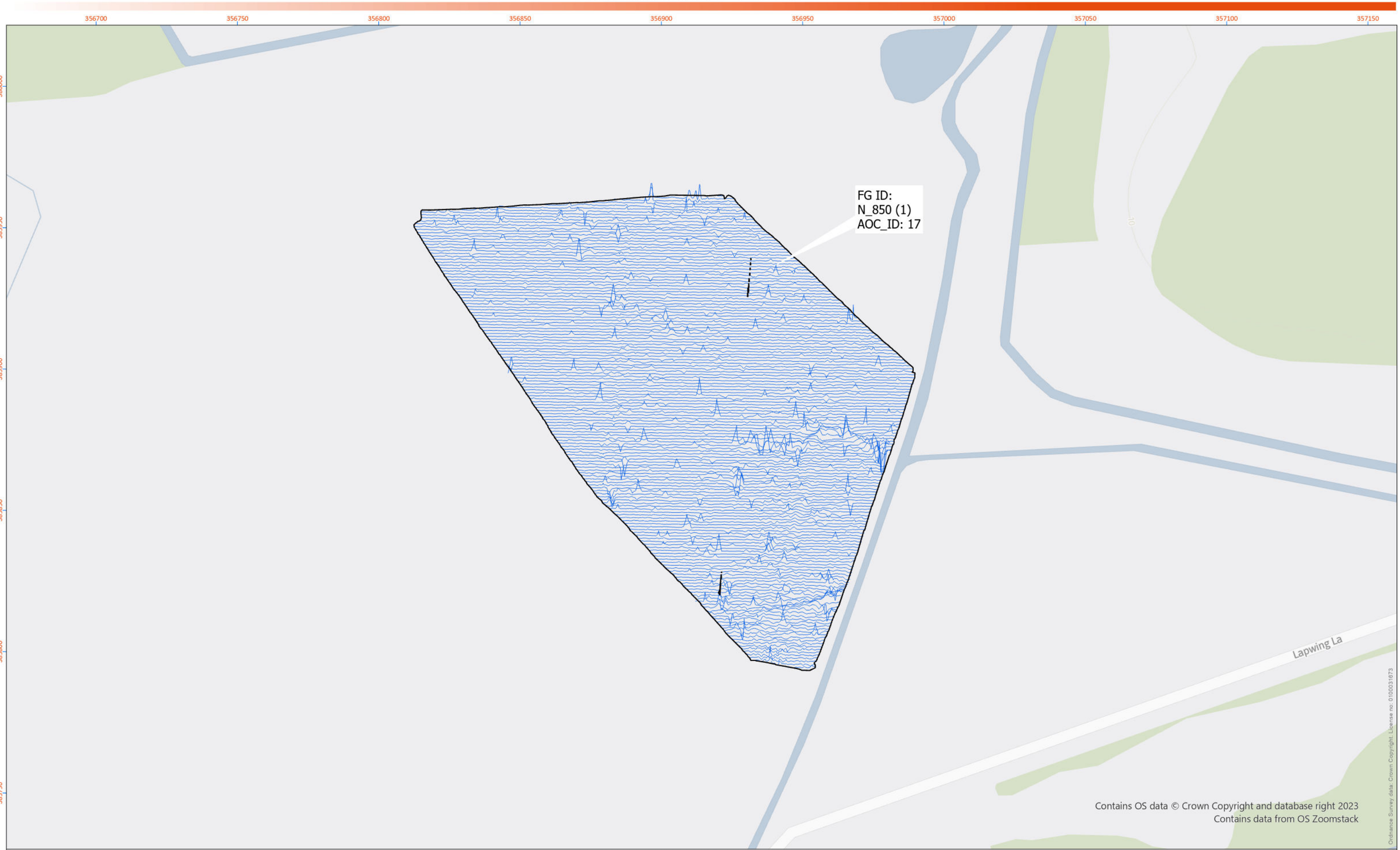
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.11/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.12

50nT
-50nT



N

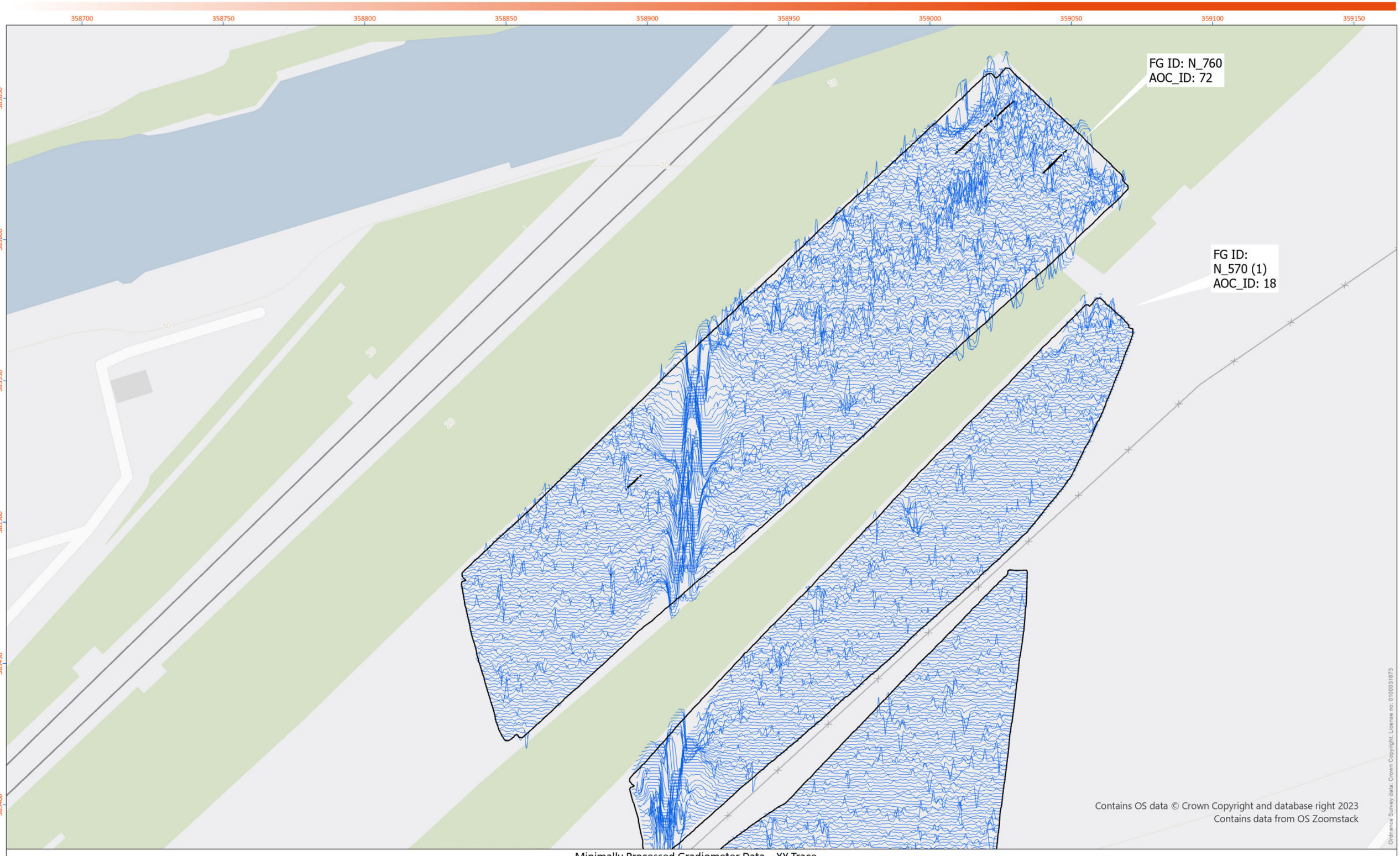
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.12/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

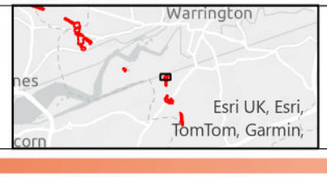


Minimally Processed Gradiometer Data – XY Trace

Figure 7.13

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.13/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

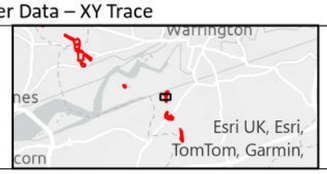
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.14

50nT
-50nT



N

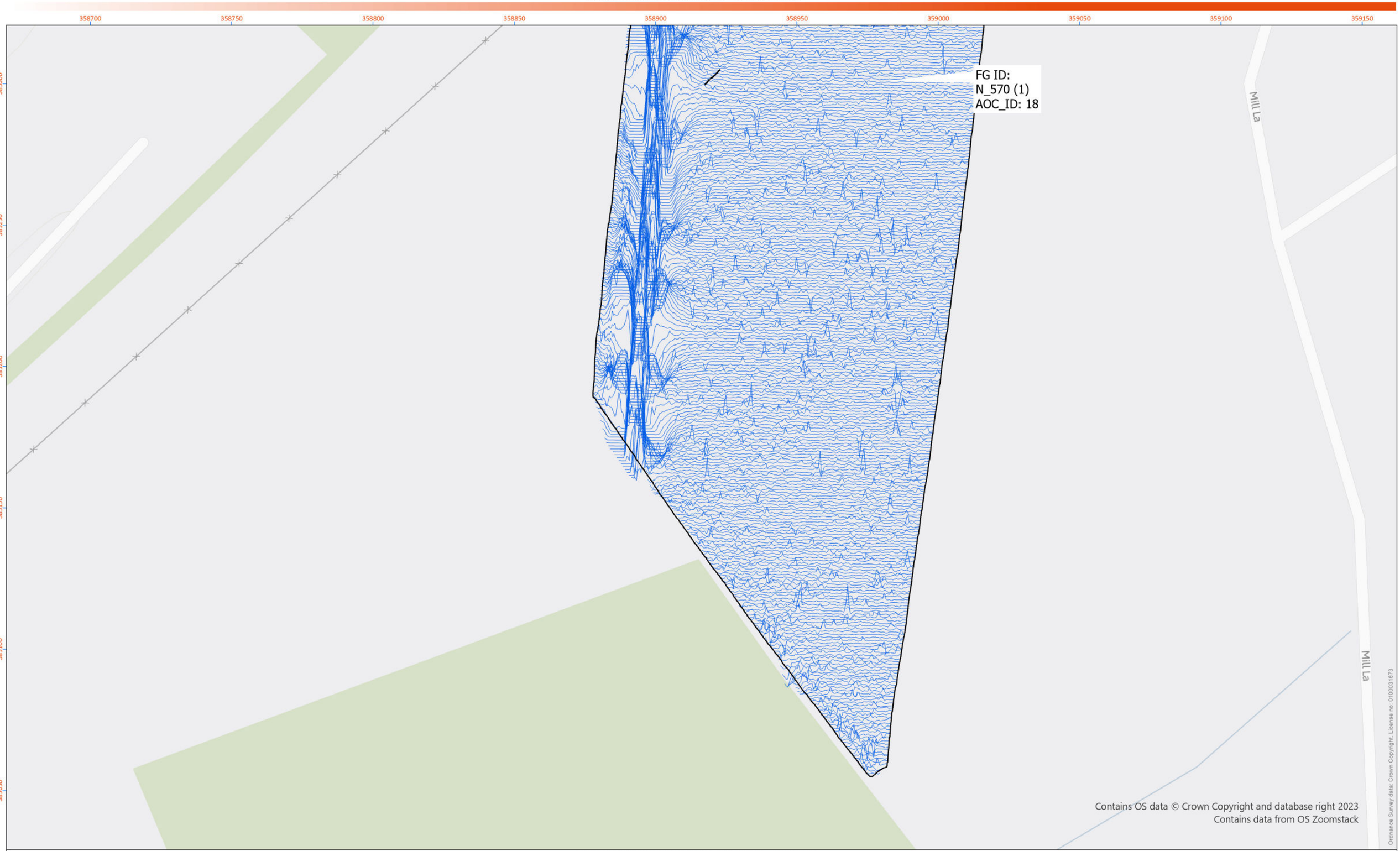
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.14/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

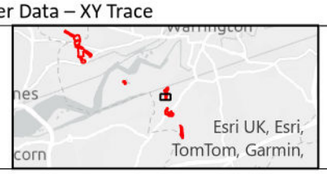


Minimally Processed Gradiometer Data – XY Trace

Figure 7.15

50nT

-50nT



N

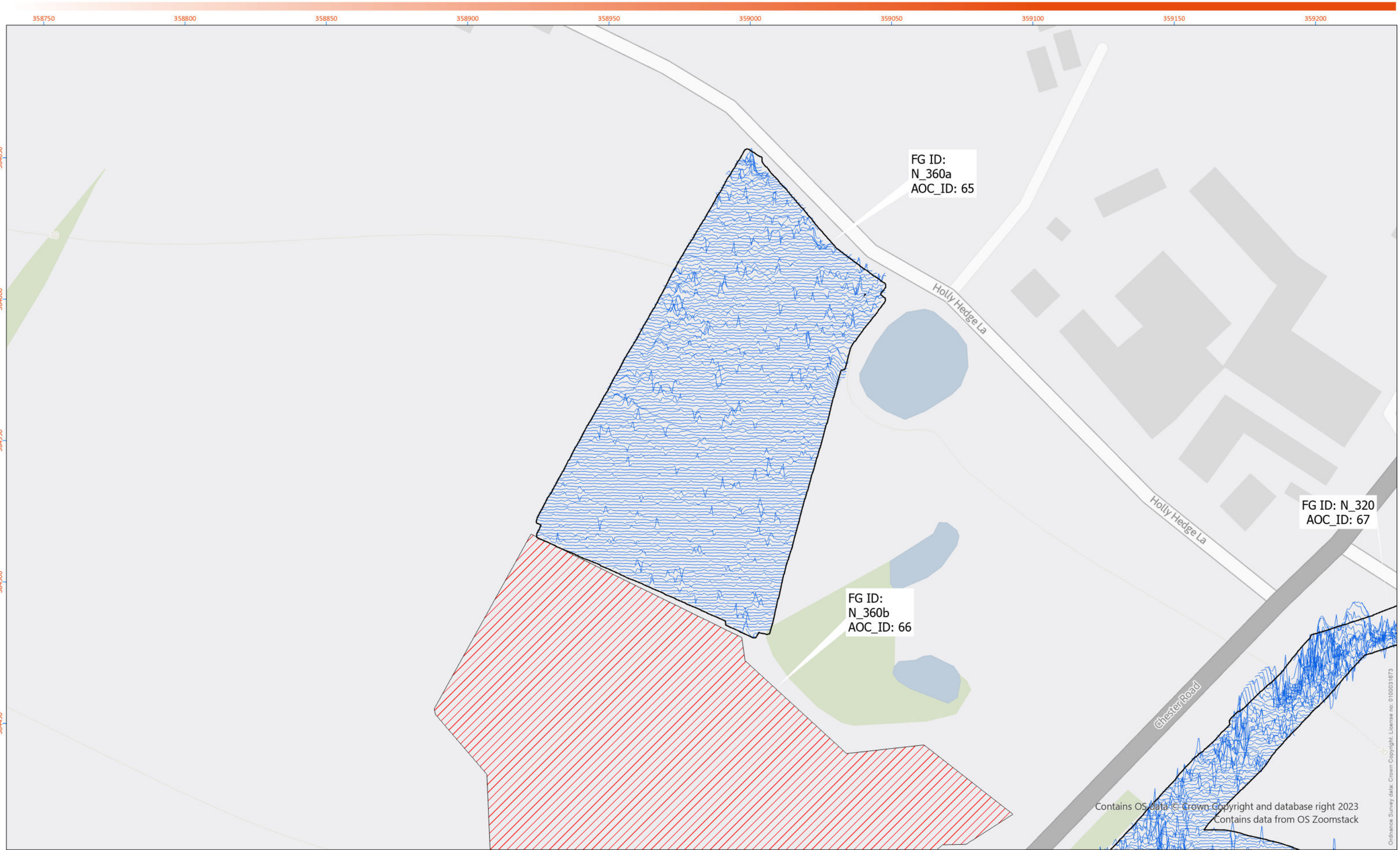
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.15/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

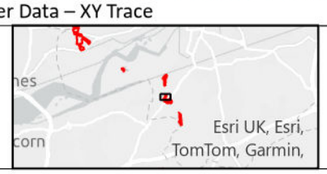
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.16

50nT
-50nT



N

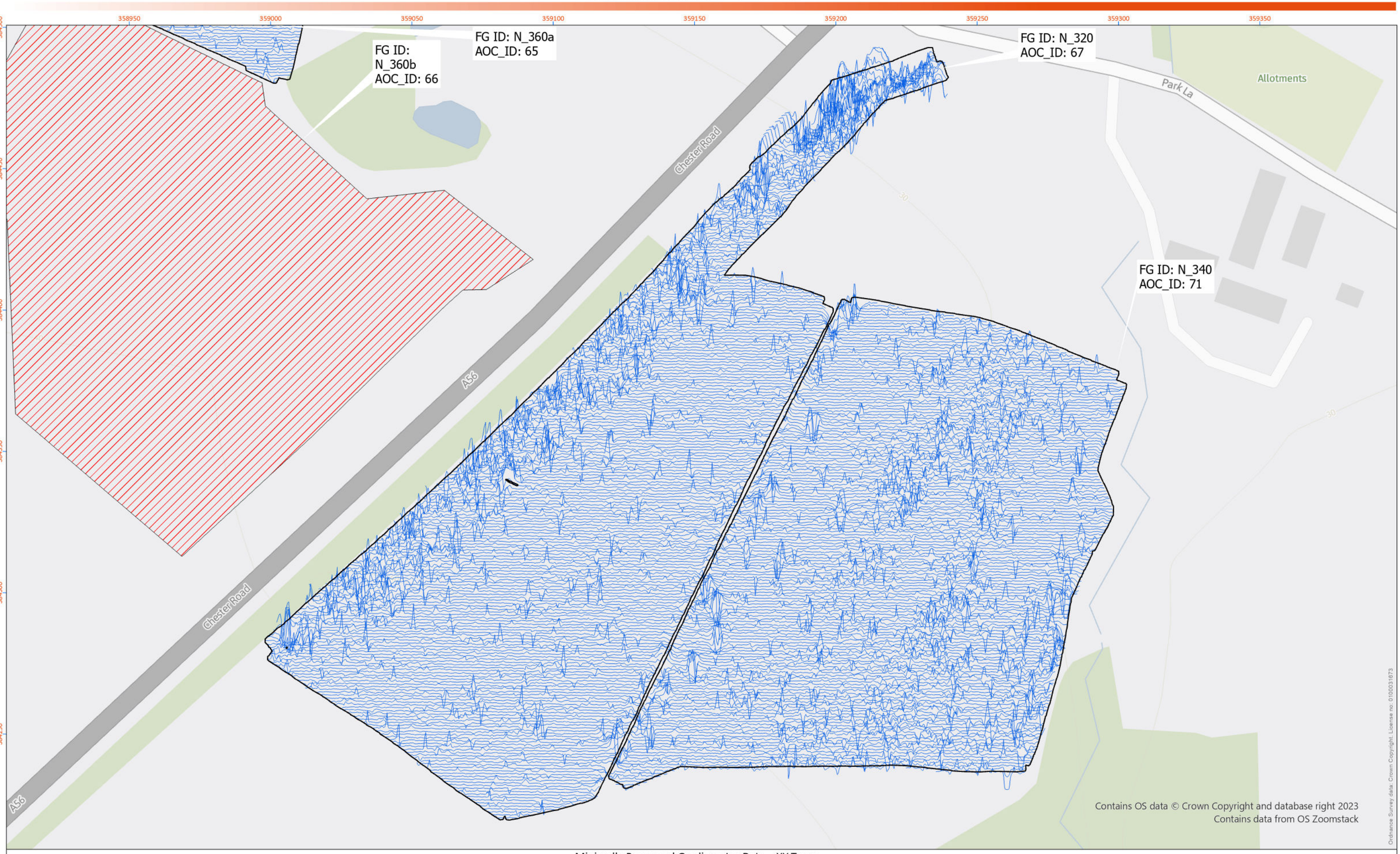
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.16/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

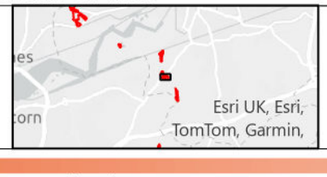
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.17

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.17/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359450 359500 359550 359600 359650 359700 359750 359800 359850 359900

383800 383750 383700 383650 383600 383550

FG ID:
N_347 (2)
AOC_ID: 20

FG ID:
N_347 (1)
AOC_ID: 19

Warrington Rd

Hatton Lodge

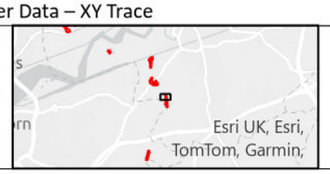
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.18

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.18/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359450 359500 359550 359600 359650 359700 359750 359800 359850 359900

383600 383550 383500 383450 383400 383350

Warrington Rd

Hatton Lodge

50

60

FG ID:
N_347 (1)
AOC_ID: 19

FG ID:
N_289 (1)
AOC_ID: 21

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Minimally Processed Gradiometer Data – XY Trace

Figure 7.19

50nT
-50nT

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.19/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359500 359550 359600 359650 359700 359750 359800 359850 359900

383400 383350 383300 383250 383200 383150

FG ID:
N_347 (1)
AOC_ID: 19

FG ID:
N_289 (1)
AOC_ID: 21

Warrington Rd

50

60

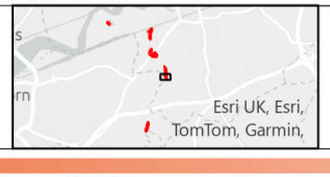
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Minimally Processed Gradiometer Data – XY Trace

Figure
7.20

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.20/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358600 358650 358700 358750 358800 358850 358900 358950 359000 359050

381100 381050 381000 380950 380900 380850

Hallam Hall Barns

Morphany La

FG ID:
N_110 (1)
AOC_ID: 22

FG ID:
N_60 (1)
AOC_ID: 23

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Minimally Processed Gradiometer Data – XY Trace

Figure
7.21

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.21/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

358600 358650 358700 358750 358800 358850 358900 358950 359000 359050

380850 380800 380750 380700 380650 380600

FG ID:
N_110 (1)
AOC_ID: 22

FG ID:
N_60 (1)
AOC_ID: 23

Morphany La

70

60

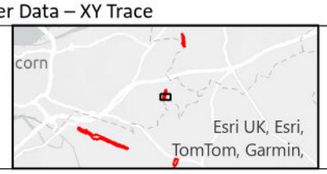
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Minimally Processed Gradiometer Data – XY Trace

Figure
7.22

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.22/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354450 354500 354550 354600 354650 354700 354750 354800 354850 354900

379250 379200 379150 379100 379050

Sutton Weaver

Aston La

FG ID:
W_695 (1)
AOC_ID: 37

FG ID:
W_410 (3)
AOC_ID: 35

FG ID: W_695 (1)
AOC_ID: 36

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Minimally Processed Gradiometer Data – XY Trace

Figure
7.23

50nT
-50nT

Runcorn

Esri UK, Esri, TomTom, Garmin,

N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.23/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

354650 354700 354750 354800 354850 354900 354950 355000 355050 355100

379150 379100 379050 379000 378950 378900

FG ID:
W_695 (1)
AOC_ID: 37

FG ID:
W_695 (1)
AOC_ID: 36

FG ID:
W_410 (3)
AOC_ID: 35

FG ID:
W_410 (2)
AOC_ID: 33

FG ID:
W_410 (1)
AOC_ID: 32

FG ID:
W_360 (2)
AOC_ID: 34

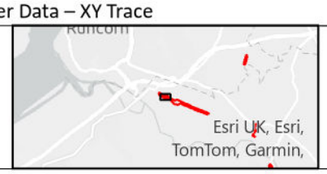
Aston La

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Minimally Processed Gradiometer Data – XY Trace

Figure
7.24

50nT
-50nT

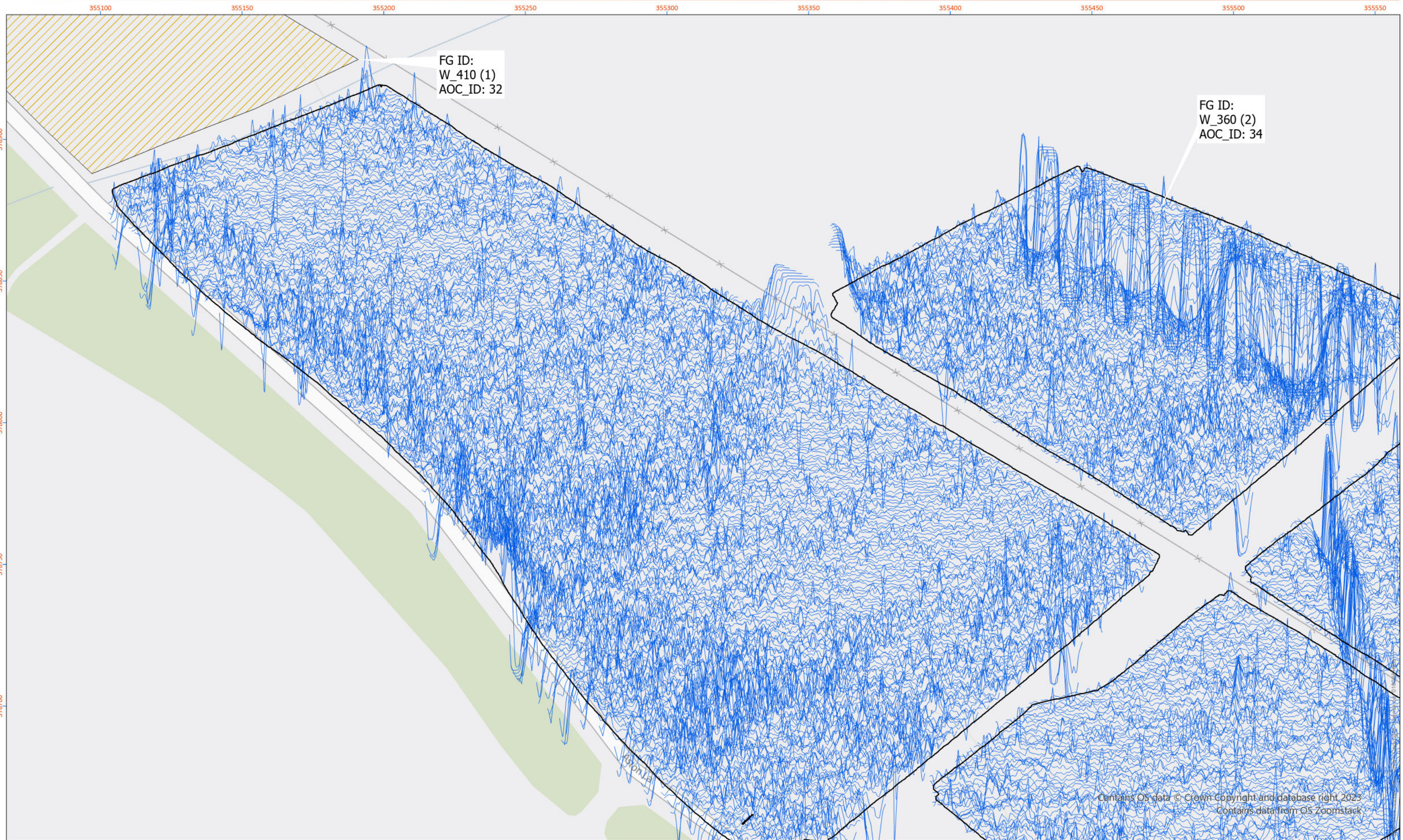


N
0 20m
Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.24/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

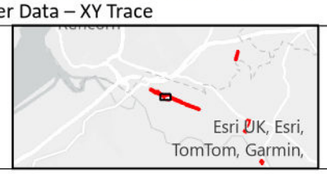
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.25

50nT
-50nT



N

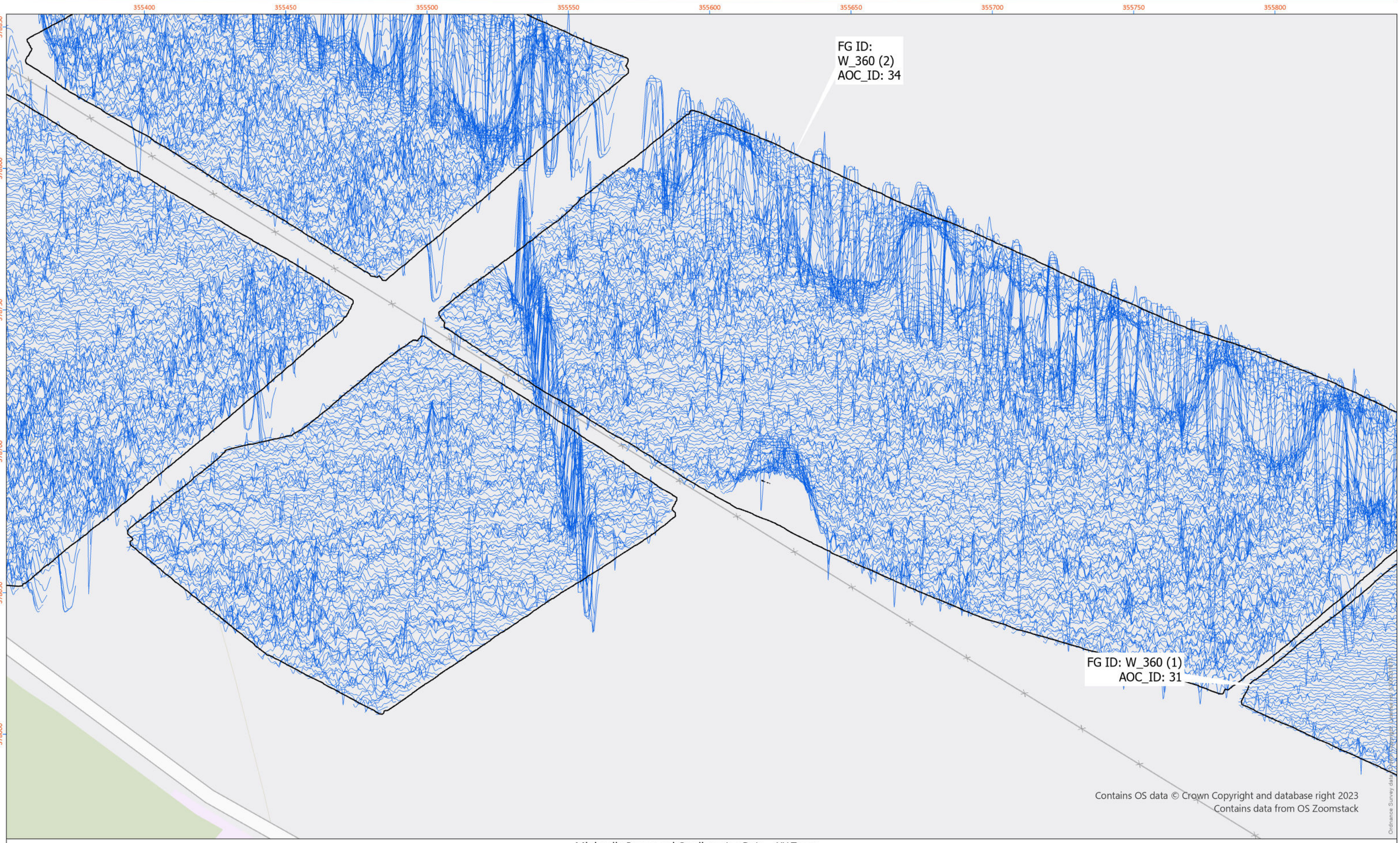
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.25/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

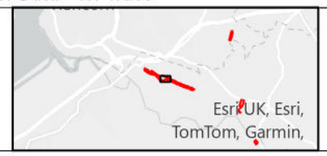
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.26

50nT
-50nT



N

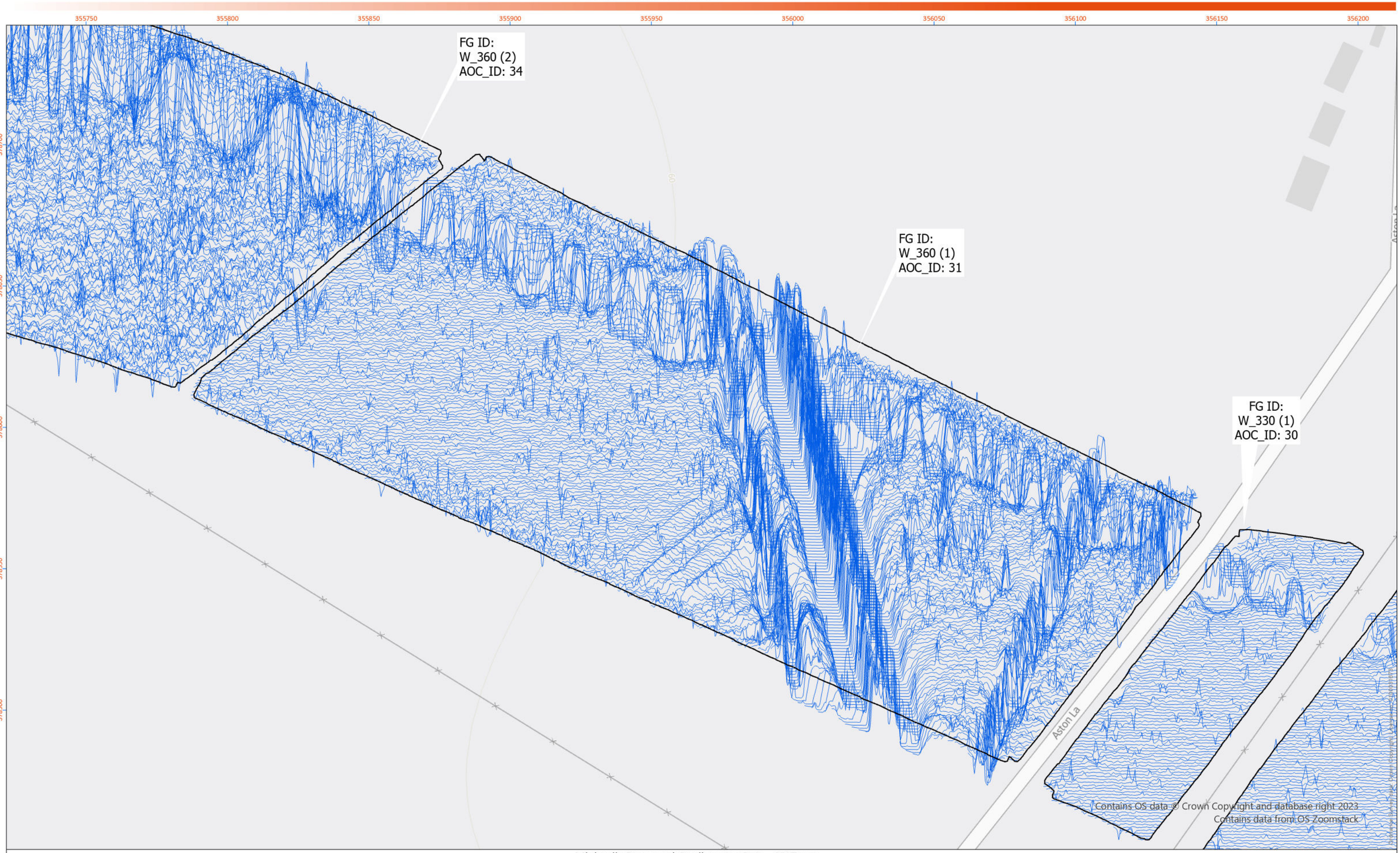
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.26/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

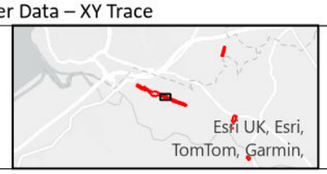


Minimally Processed Gradiometer Data – XY Trace

Figure 7.27

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.27/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

356100 356150 356200 356250 356300 356350 356400 356450 356500

378550 378500 378450 378400 378350 378300

FG ID: W_360 (1)
AOC_ID: 31

FG ID:
W_330 (1)
AOC_ID: 30

FG ID:
W_280 (4)
AOC_ID: 29

FG ID:
W_280 (3)
AOC_ID: 28

FG ID:
W_280 (2)
AOC_ID: 27

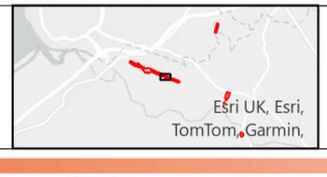
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Minimally Processed Gradiometer Data – XY Trace

Figure
7.28

50nT
-50nT



N

0 20m
Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.28/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

356400 356450 356500 356550 356600 356650 356700 356750 356800

378450 378400 378350 378300 378250 378200

FG ID: W_280 (3)
AOC_ID: 28

FG ID:
W_280 (2)
AOC_ID: 27

FG ID:
W_280 (1)
AOC_ID: 26

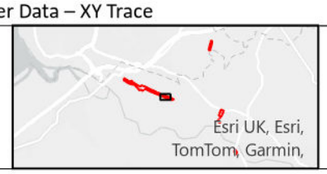
FG ID:
W_280 (4)
AOC_ID: 29

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Minimally Processed Gradiometer Data – XY Trace

Figure
7.29

50nT
-50nT



N
0 20m
Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.29/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377700 377650 377600 377550 377500 377450

Northwich Road

Northwich Road

A533

FG ID:
SA_290 (1)
AOC_ID: 24

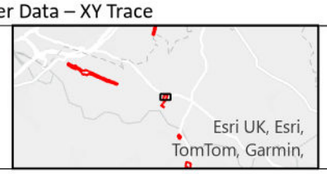
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Minimally Processed Gradiometer Data – XY Trace

Figure
7.30

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.30/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377400 377350 377300 377250 377200

FG ID:
SA_290 (1)
AOC_ID: 24

FG ID:
SA_290 (1)
AOC_ID: 25

FG ID:
W_20/W_21
AOC_ID: 43

30 40 20 20

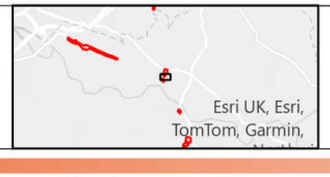
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.31

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.31/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359100 359150 359200 359250 359300 359350 359400 359450 359500 359550

377200 377150 377100 377050 377000

FG ID:
W_20/W_21
AOC_ID: 43

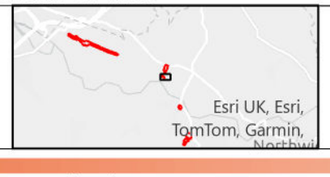
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.32

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.32/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

359800 359850 359900 359950 360000 360050 360100 360150 360200 360250

375750 375700 375650 375600 375550 375500

Acton La

Warrington Road

A49

Warrington Rd

Warrington Road

FG ID:
SA_760 (1)
AOC_ID: 38

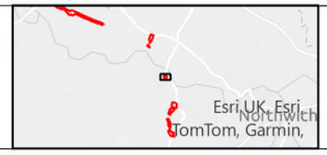
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Minimally Processed Gradiometer Data – XY Trace

Figure
7.33

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.33/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360200 360250 360300 360350 360400 360450 360500 360550 360600 360650

374400 374350 374300 374250 374200 374150

Station Road

B5153

Station Road

A49

A49

FG ID:
SA_1020 (1)
AOC_ID: 39

FG ID:
SA_1110 (2)
AOC_ID: 62

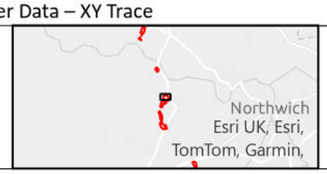
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.34

50nT
-50nT



N

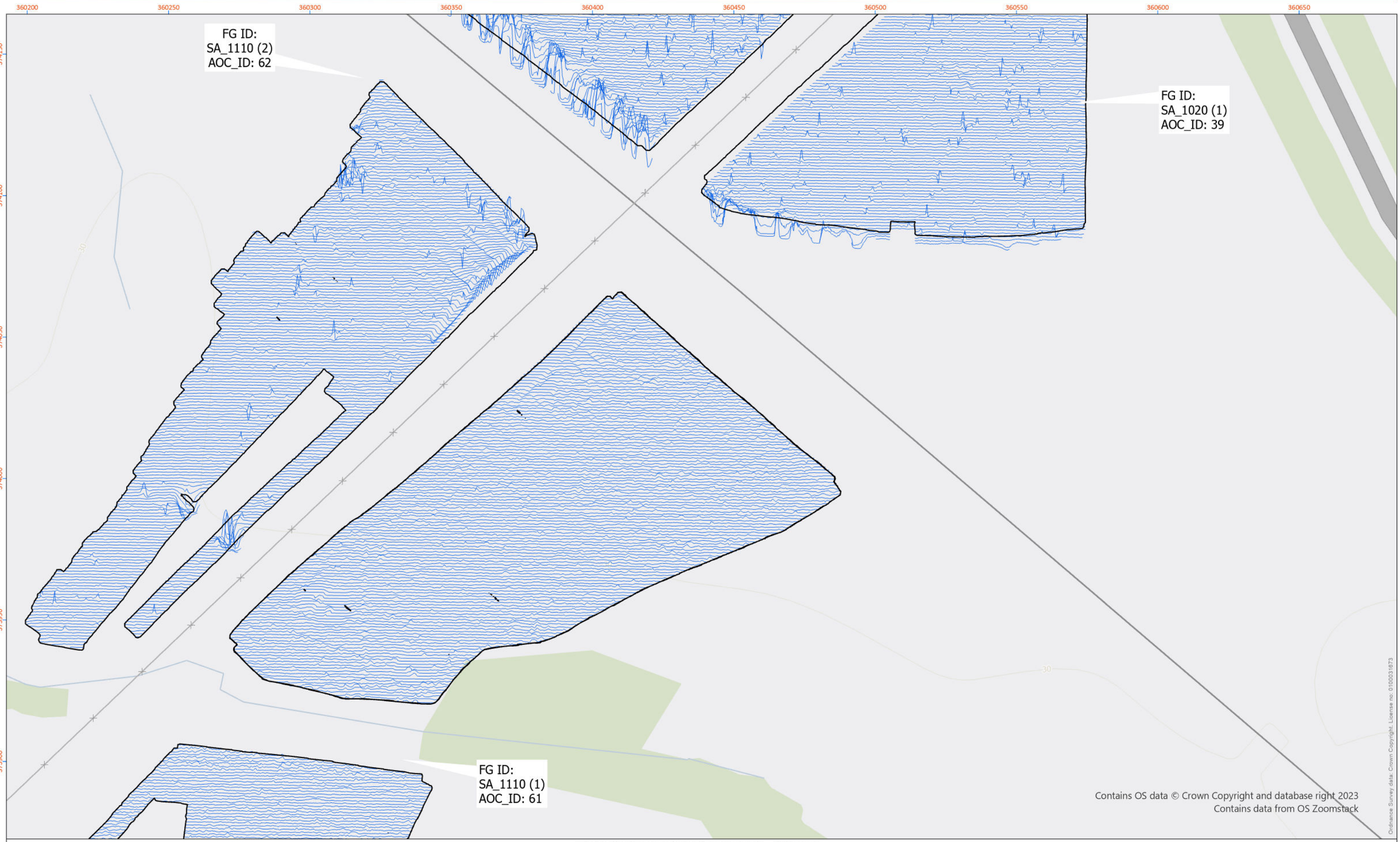
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.34/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

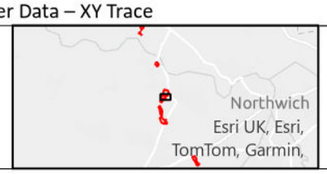
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.35

50nT
-50nT



N

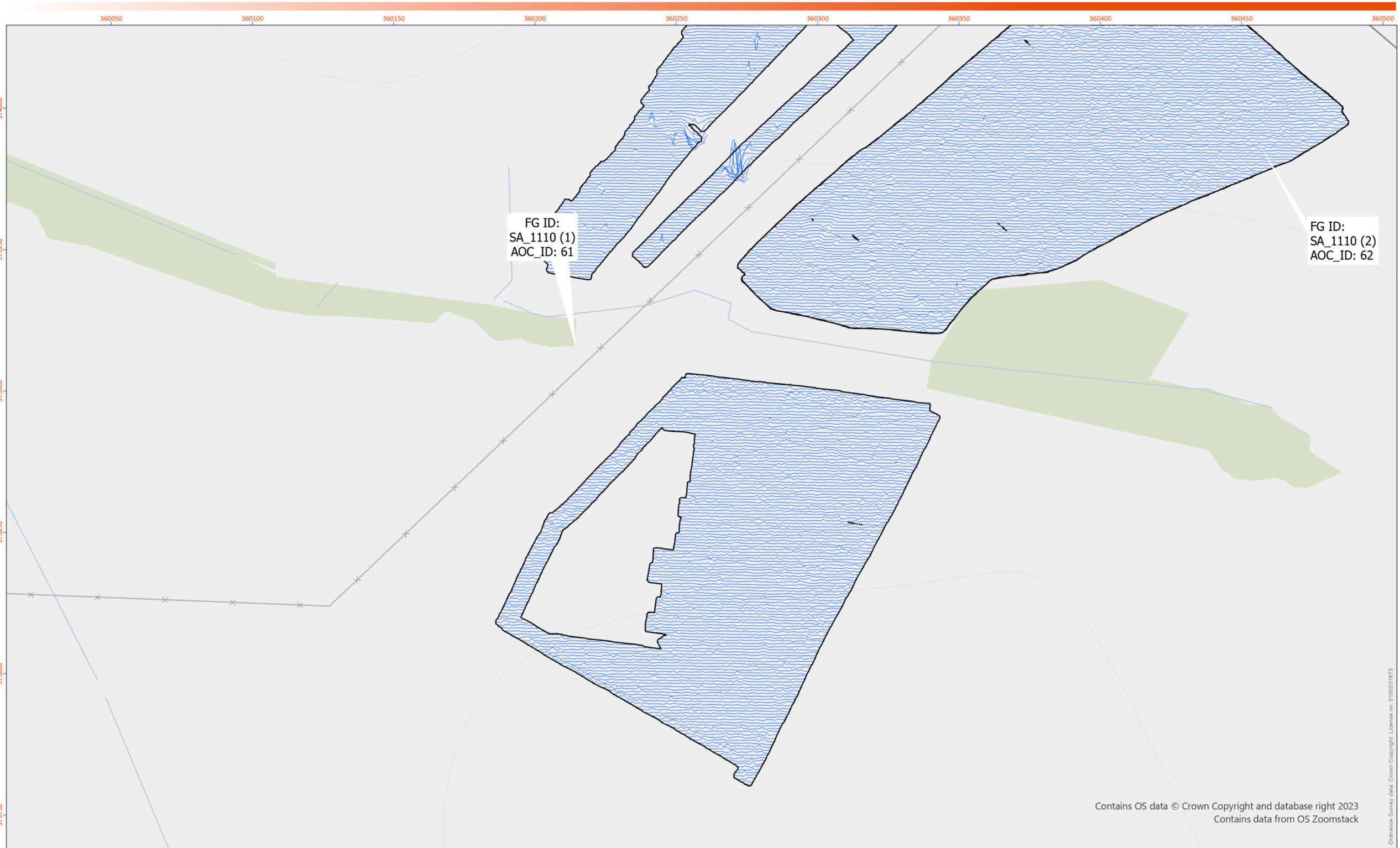
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.35/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

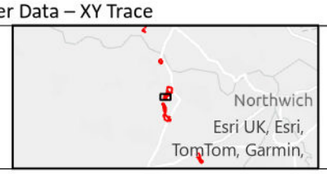
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.36

50nT
-50nT



N

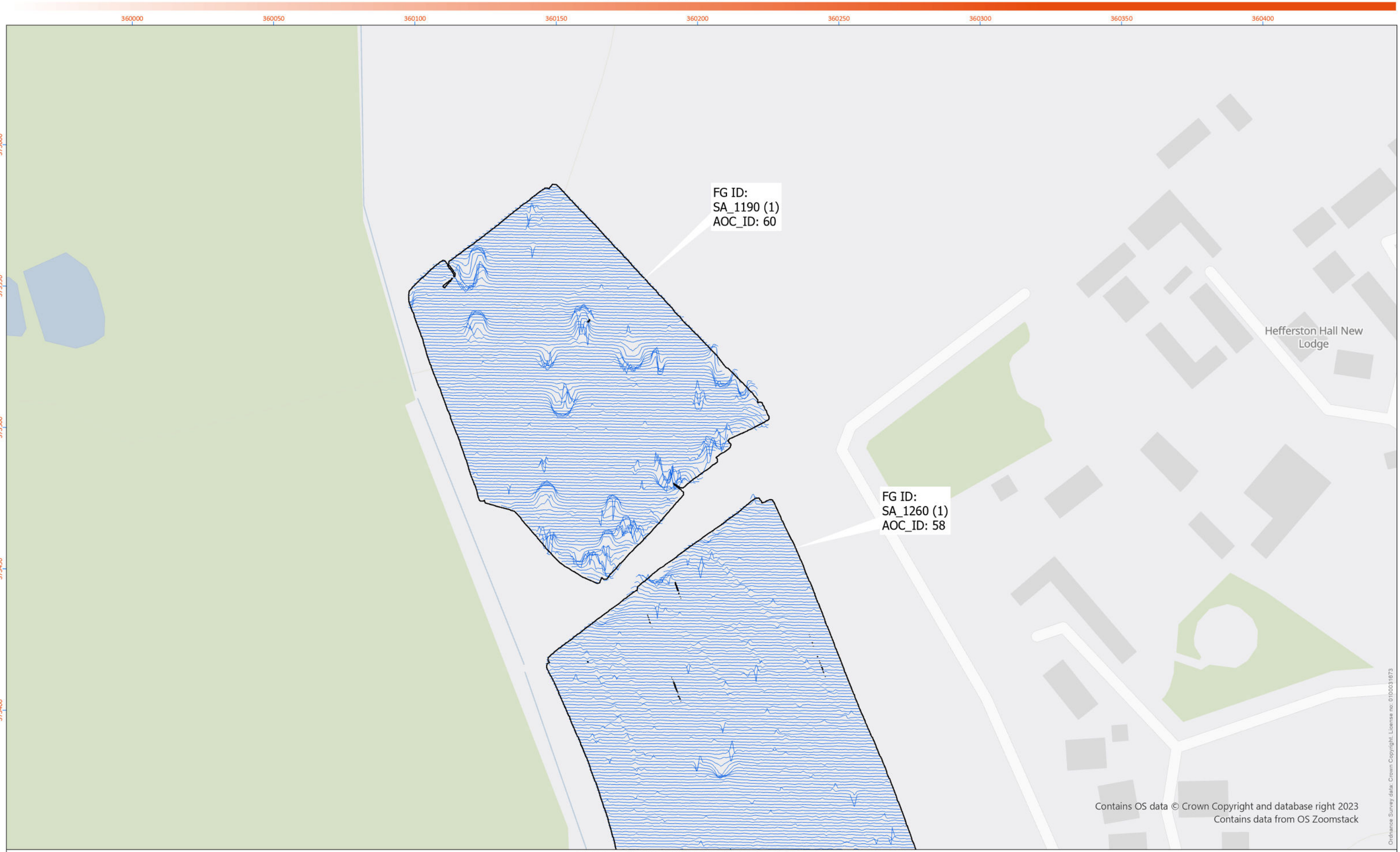
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.36/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

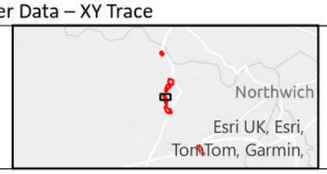
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.37

50nT
-50nT



N

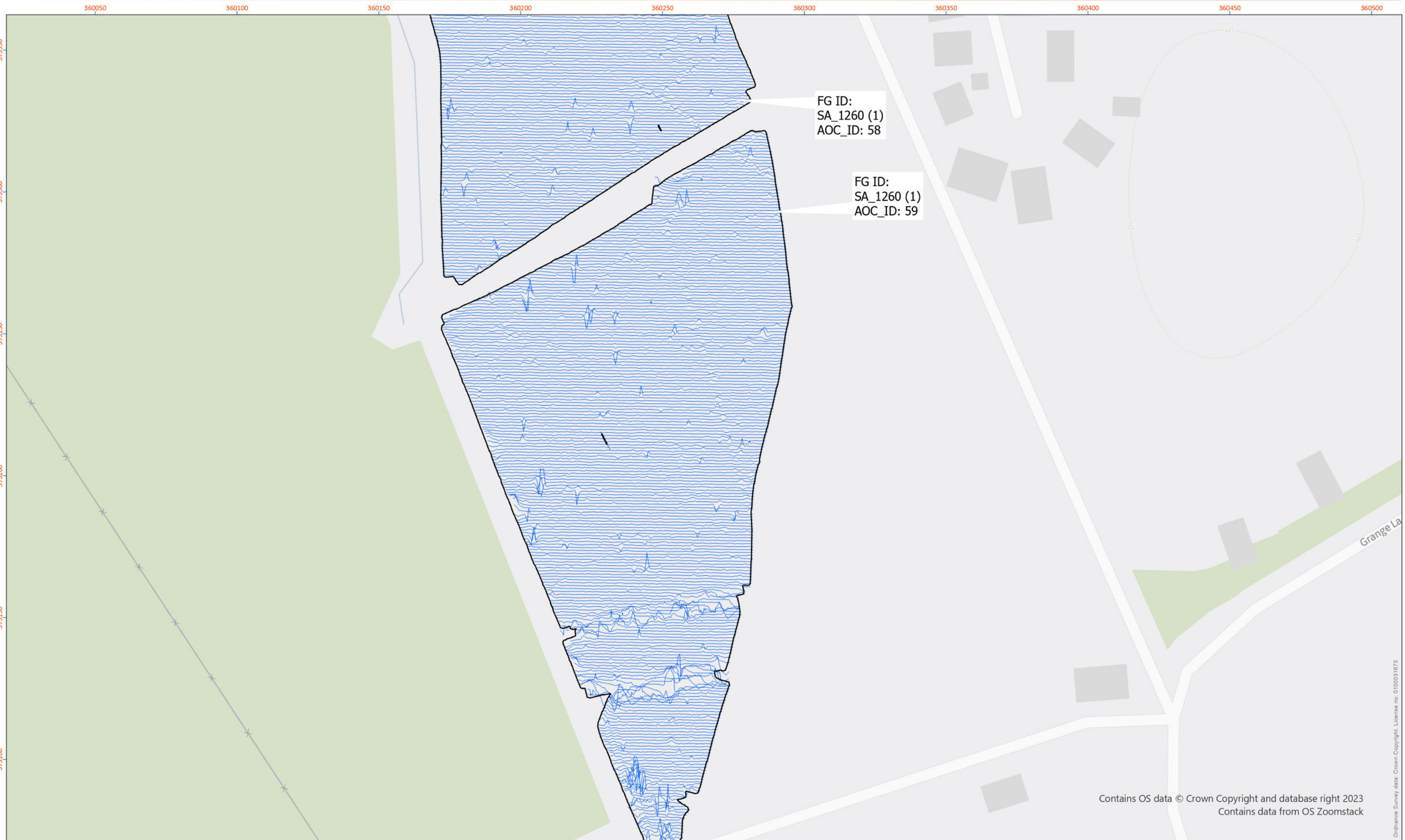
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.37/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

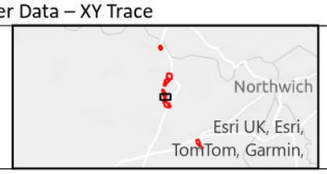


Minimally Processed Gradiometer Data – XY Trace

Figure 7.38

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.38/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

360100 360150 360200 360250 360300 360350 360400 360450 360500 360550

373050 373000 372950 372900 372850

FG ID:
SA_1260 (1)
AOC_ID: 59

FG ID:
SA_1330 (1)
AOC_ID: 40

FG ID:
SA_1350 (1)
AOC_ID: 57

Cuddington Manor Farm

Grange La

A49

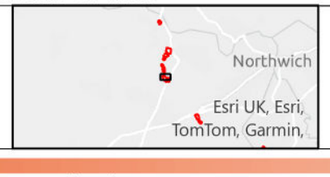
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.39

50nT
-50nT



N

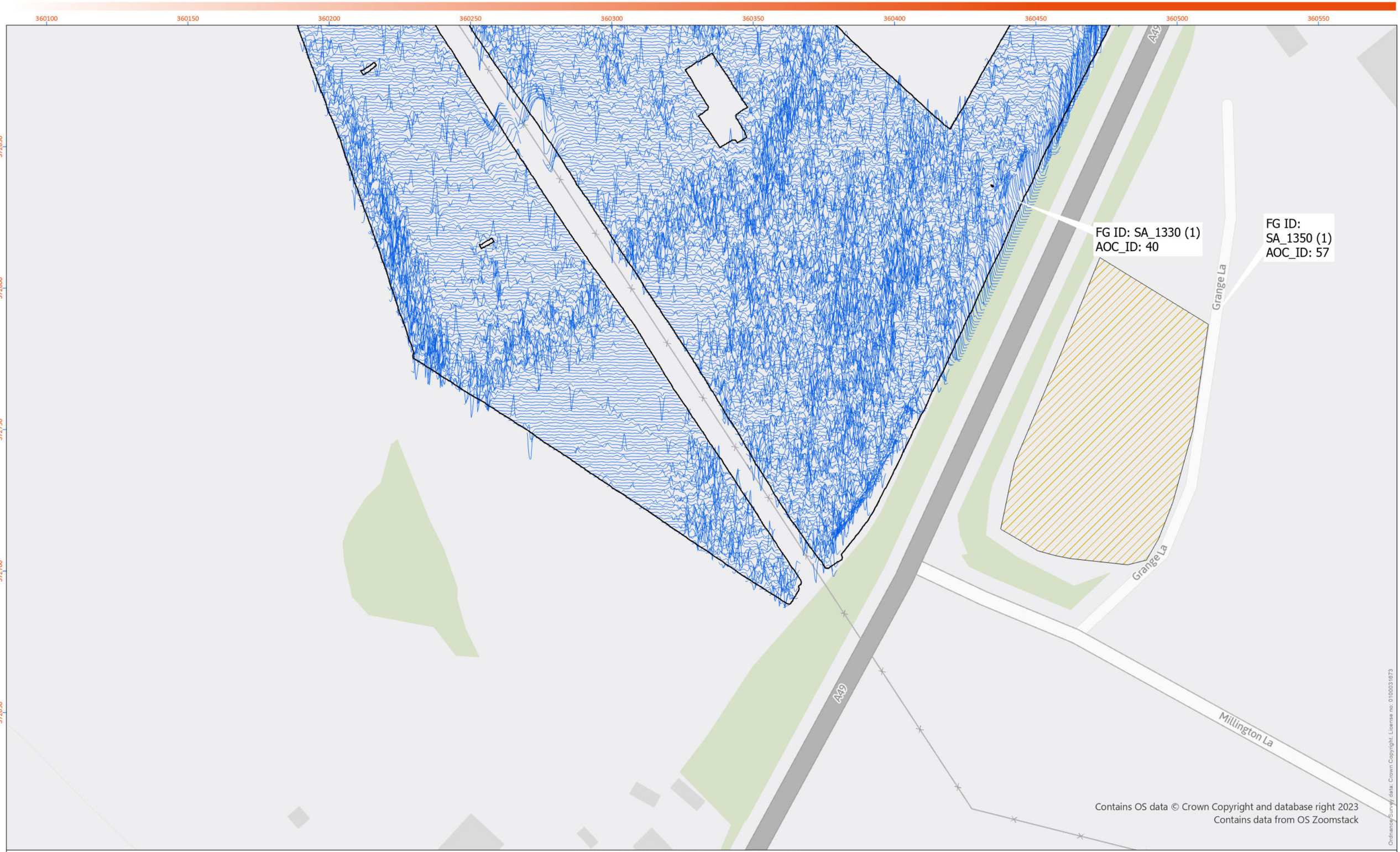
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.39/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

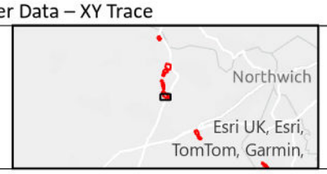
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.40

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.40/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

361800 361850 361900 361950 362000 362050 362100 362150 362200

370850 370800 370750 370700 370650 370600

FG ID:
SA_1860 (1)
AOC_ID: 56

FG ID:
SA_1990 (1)
AOC_ID: 55

Vale Farm

rse

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Minimally Processed Gradiometer Data – XY Trace

Figure 7.41

50nT
-50nT

Northwich

Esri UK, Esri, TomTom, Garmin,

N

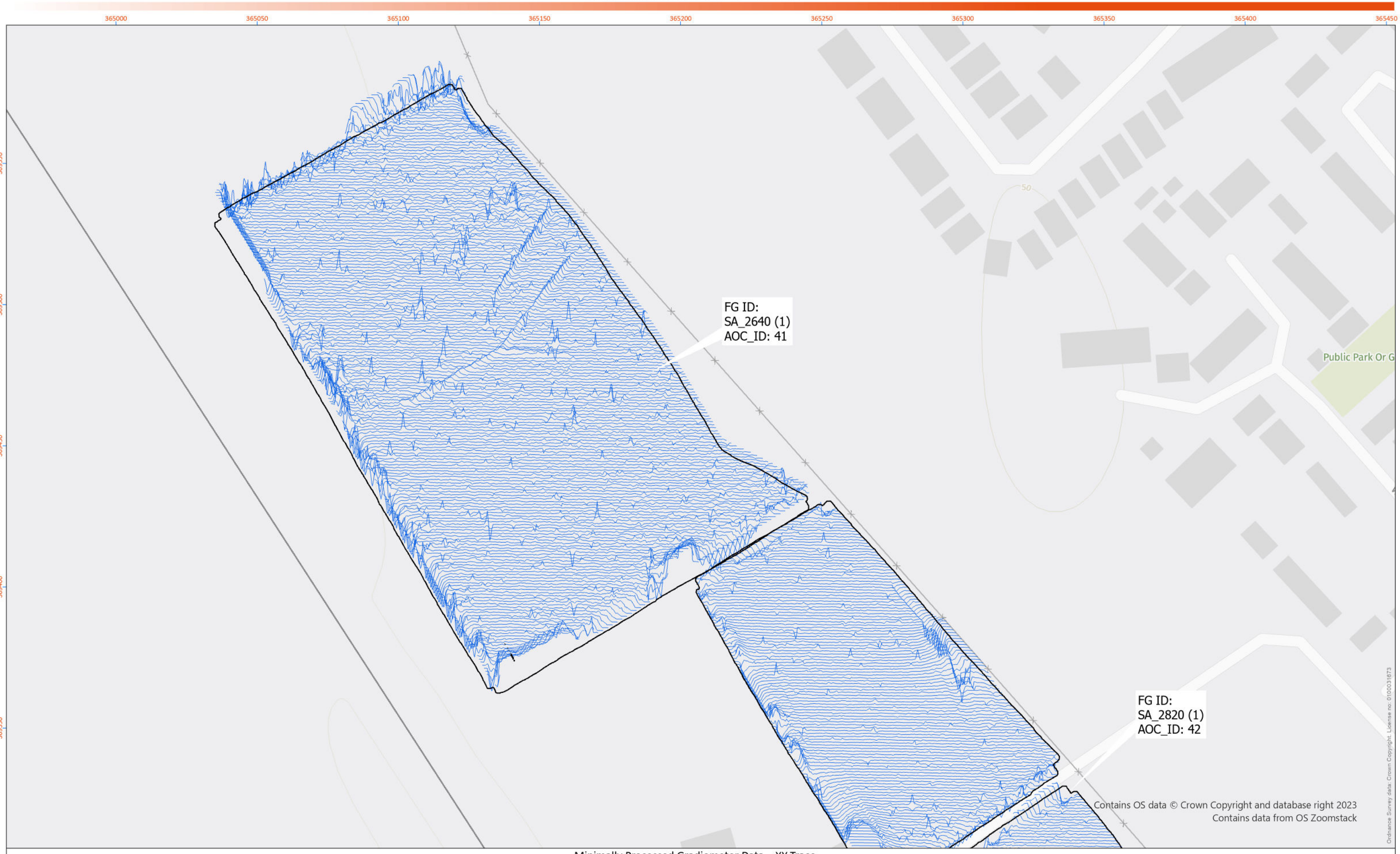
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.41/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

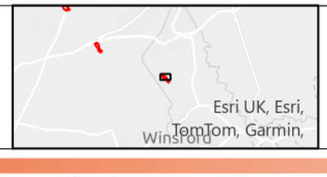
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.42

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.42/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

365100 365150 365200 365250 365300 365350 365400 365450 365500

369400 369350 369300 369250 369200

FG ID:
SA_2640 (1)
AOC_ID: 41

FG ID:
SA_2820 (1)
AOC_ID: 42

Weaver Rd

Barlow Rd

Weave

Moultonbank Farm

40

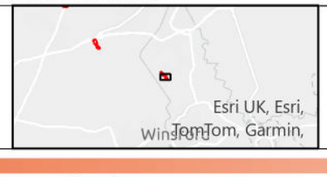
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.43

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.43/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

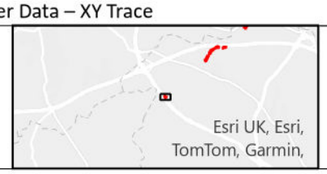
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.44

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.44/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

369400 369450 369500 369550 369600 369650 369700 369750 369800 369850

384650 384600 384550 384500 384450 384400

FG ID:
E_2000 (1)
AOC_ID: 54

Mowpen Brow

Mowpen Farm

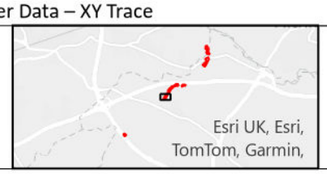
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.45

50nT
-50nT



N

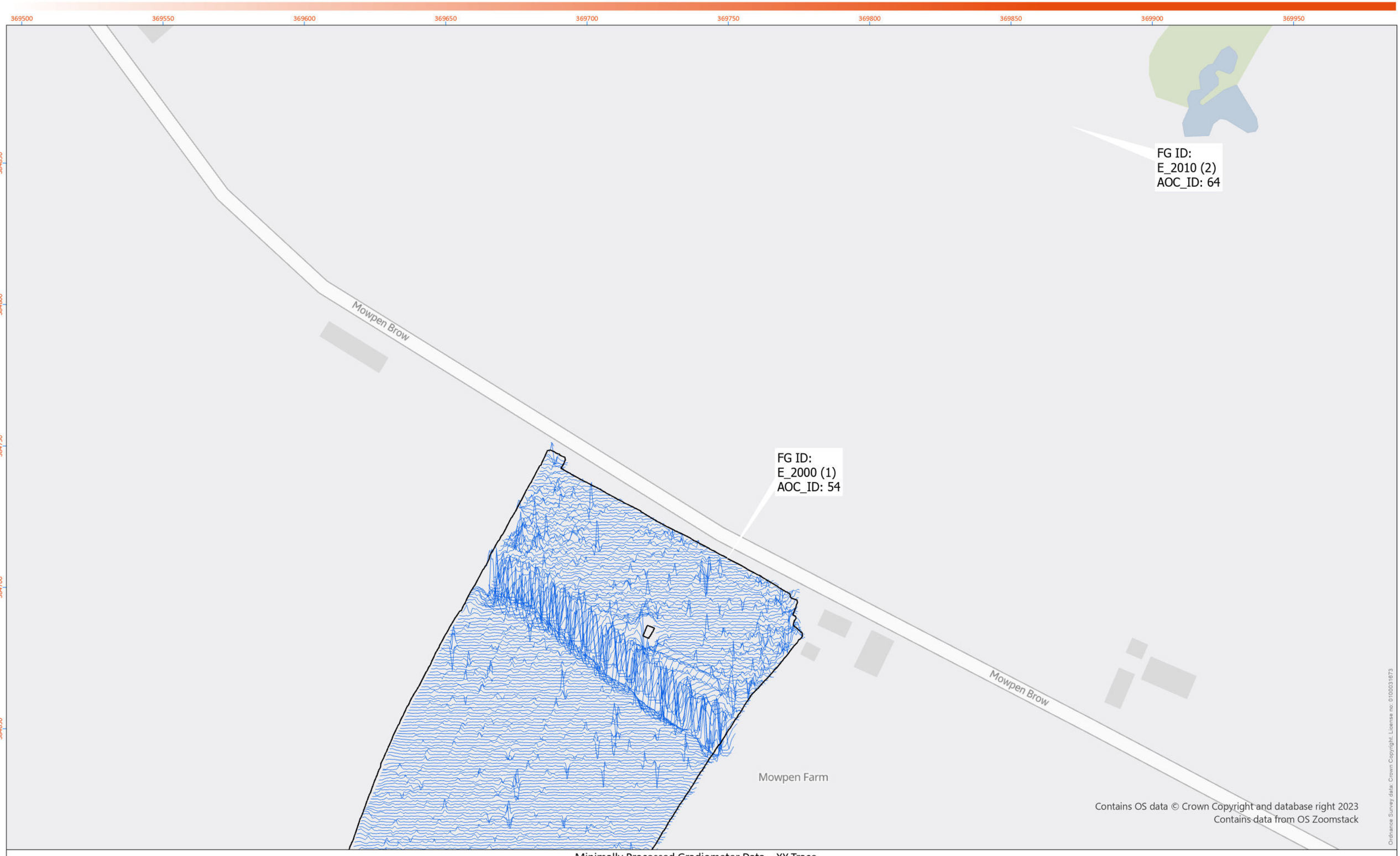
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.45/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.46

50nT

-50nT



N

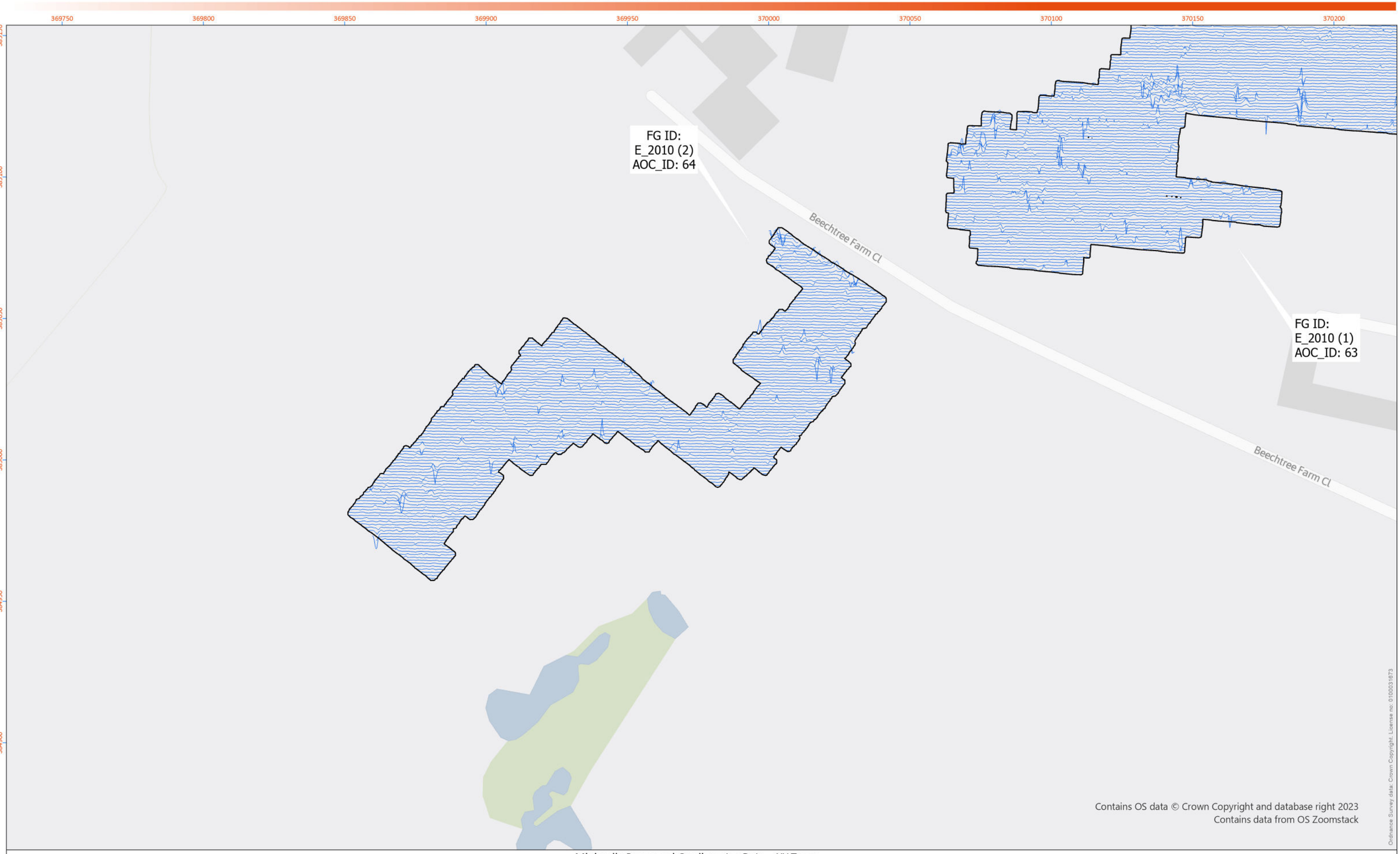
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.46/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

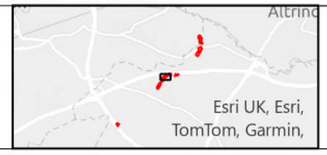
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.47

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.47/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

370000 370050 370100 370150 370200 370250 370300 370350 370400 370450

385250 385200 385150 385100 385050 385000

FG ID:
E_2010 (1)
AOC_ID: 63

FG ID:
E_2170 (1)
AOC_ID: 52

FG ID:
E_2010 (2)
AOC_ID: 64

M56
West Lane
B5159
Beechtree Farm Cl
Beechtree Farm Cl
West Lane
Farm

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Minimally Processed Gradiometer Data – XY Trace

Figure
7.48

50nT
-50nT



N
0 20m
Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.48/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline
Delivering clean growth

370300 370350 370400 370450 370500 370550 370600 370650 370700 370750

385200 385150 385100 385050 385000

FG ID:
E_2170 (1)
AOC_ID: 52

FG ID:
E_2170 (2)
AOC_ID: 53

M56

Abbey Leys Farm

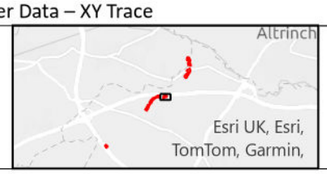
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Minimally Processed Gradiometer Data – XY Trace

Figure 7.49

50nT
-50nT



N

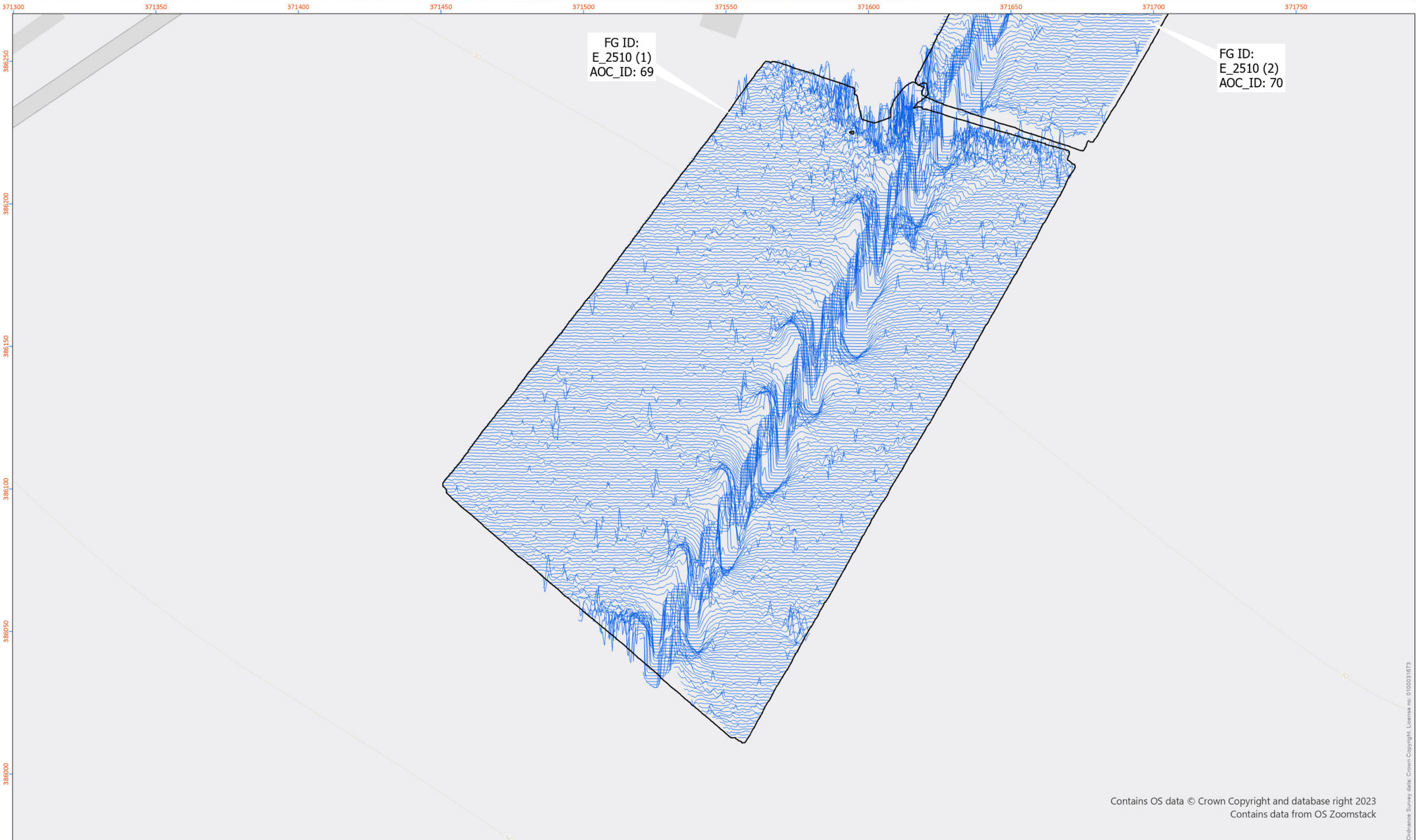
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.49/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

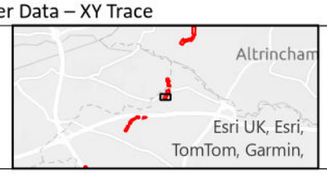


Minimally Processed Gradiometer Data – XY Trace

Figure 7.50

50nT

-50nT



N

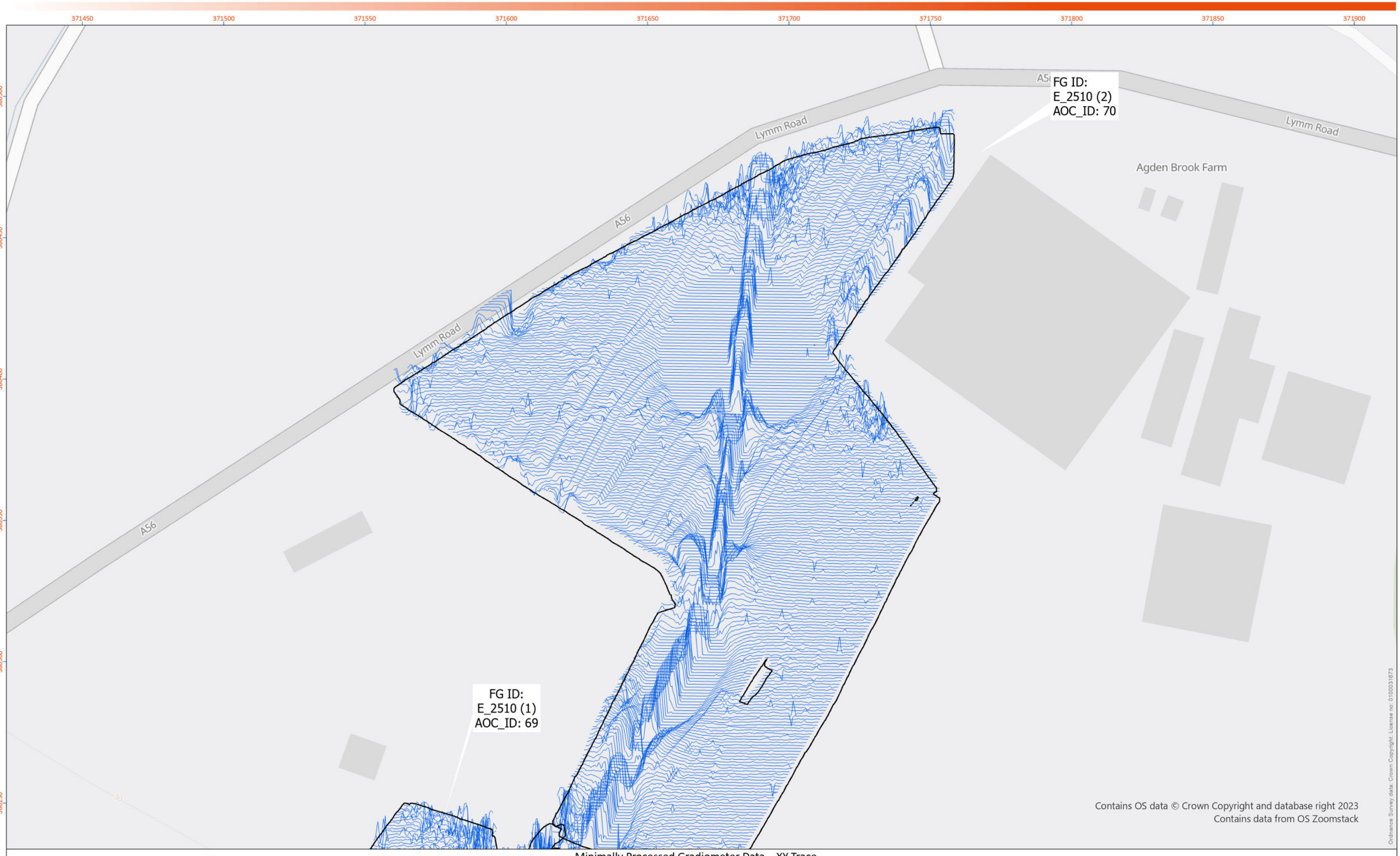
0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.50/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.51

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.51/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

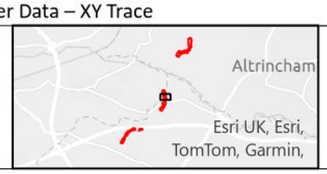
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.52

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.52/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

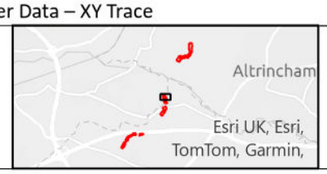
Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.53

50nT
-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.53/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth



Minimally Processed Gradiometer Data – XY Trace

Figure 7.54

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.54/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

372700 372750 372800 372850 372900 372950 373000 373050 373100 373150

389400 389350 389300 389250 389200 389150

FG ID:
E_3270
AOC_ID: 45

FG ID:
E_3272
AOC_ID: 46

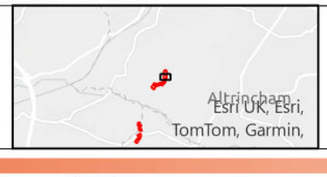
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Minimally Processed Gradiometer Data – XY Trace

Figure
7.55

50nT
-50nT

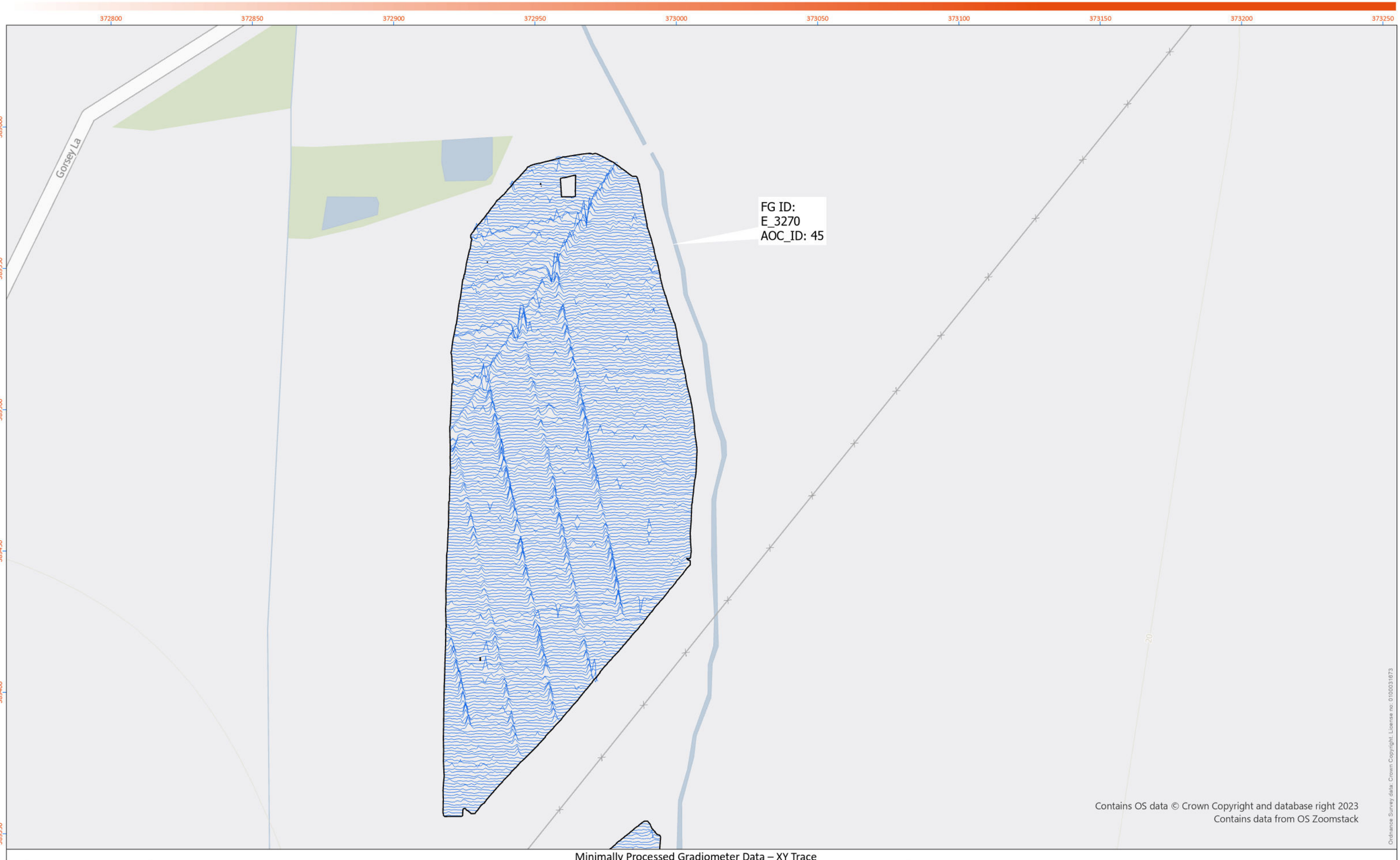


N
0 20m
Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.55/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

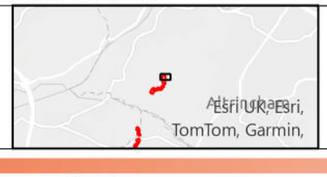


Minimally Processed Gradiometer Data – XY Trace

Figure 7.56

50nT

-50nT



N

0 20m

Scale: 1:1,200 @ A3

Drawing Number: 05/4059/GEO/7.56/02	
Created by: AC	Date: 11/03/2024
Checked by: SO	Date: 11/03/2024
Approved by: JL	Date: 11/03/2024

HyNet North West Hydrogen Pipeline

Delivering clean growth

HyNet North West Hydrogen Pipeline

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