Appendix F – Types of Waste Accepted

Waste Code	Waste Description	Entry Type
01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING & PHYSICAL & CHEMICAL TREATMENT OF MINERALS**	
01 01	**Wastes from mineral excavation**	
01 01 01	Wastes from mineral metalliferous excavation	AN
01 01 02	Wastes from mineral non-metalliferous excavation	AN
01 04	**Wastes from physical and chemical processing of non-metalliferous minerals**	
01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 07	MN
01 04 09	Waste sand and clays	AN
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**	
17 01	**Concrete, bricks, tiles and ceramics**	
17 01 01	Concrete	MN
17 01 02	Bricks	MN
17 01 03	Tiles and ceramics	MN
17 01 07	Mixture of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	MN
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**	
17 05 04	Soil and stone other than those mentioned in 17 05 03	MN
17 05 06	Dredging spoil other than those mentioned in 17 05 05	MN
17 09	**Other construction and demolition wastes**	
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 & 17 09 03	MN
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**	
19 12	**Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**	
19 12 09	Minerals (sand, stones etc.)	AN
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPERATELY COLLECTED FRACTIONS**	
20 02	**Garden and park waste (including cemetery waste)**	
20 02 02	Soil and stones	AN

Appendix G – Environmental Setting and Site Design Report

Environmental Permit Variation Application

Permit: EPR/FB3403XR

Eales Farm Landfill, Tamar View Industrial, Saltash

Environmental Setting and Site Design Report

Report: GCE00692/2020/ESSD

March 2021

GCE00692/2020/ESSDv2

Report prepared for:	Tamar Valley Projects Ltd Harscombe House 1 Darklake View Estover, Plymouth PL6 7TL
Report Number:	GCE00692/2020/ESSD
Version:	2
Issue Date:	March 2021
Report Prepared by:	Rose Ashmore MSci., MSc., FGS

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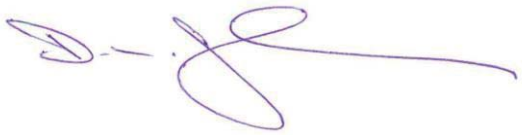
Report Reviewed by: David Jackson BSc., CEng., MICE., FGS



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APPENDICES

1.0 INTRODUCTION

Eales Farm Landfill is currently operated by Tamar Valley Projects Ltd (TVPL) who took ownership of the site in May 2017. The permit for the site (ref: EPR/FB3403XR) was transferred to TVPL from the previous operators, Downderry Construction (Western) Ltd (DCW), in September 2017.

The permit variation application has been compiled by Geo Consulting Engineering Ltd (GCEL) on behalf of TVPL.

As part of the permit application a supplementary ground investigation was carried out by GCEL on behalf of TVPL in February 2020. The findings from this investigation (see GCE00692/R3) have been used in conjunction with the quarterly monitoring data to produce the following reports:

- Ground Gas Risk Assessment
- Hydrological Risk Assessment
- Slope Stability Risk Assessment

The table below summarises the available data of the permit history:

Table 1: Permit History

Date	Event
March 1974	Permit issued to the then operators John Garrett and Sons Ltd.
November 1990	Granted permission to receive Category A (non-biodegradable wastes)
January 1991	Permit transferred to Downderry Construction Western Ltd
March 1997	Permit was altered to allow 100,000 tonnes per annum (up from 5,000 tonnes).
2004	Site ceased to accept inert waste.
November 2005	Closure Notice issued by the EA.
November 2016	Closure Report submitted by John Grime on behalf of DCW accepted by the EA.
September 2017	Permit transferred to TVPL
March 2019	Pre-application site meeting with EA to determine preferred approach to permitting to allow site filling to be completed.
June 2020	Variation application submitted to the EA requesting to re-open the inert landfill.

In accordance with the Closure Report, monitoring of the ground gas, groundwater and water quality across the site has been carried out quarterly since May 2017 with summary quarterly reports issued to the EA. The data recorded during these monitoring visits have been used to characterise the site.

Based on the original planning permission granted for the landfill at Eales Farm a void of approximately 210,000m^3 still remains in order to achieve the required final profile. In addition, the original restoration plan specified the site was to be restored back to agricultural land. Tamar Valley Projects Ltd aim to deposit inert waste into the remaining void space on site and, on completion, return the area to agricultural land use as per the original plans (see Appendix A).

The site location is presented on Figure 1.

1.1 Site Details

1.1.1 Site Location and Access

Eales Farm landfill is situated just north of the Tamar View Industrial Estate, Saltash. The nearest post code to the site PL12 6LD. The Ordnance Survey Grid Reference for the rough centre of site is SX 4138 6056.

The access to the site is on the south boundary at the end of Edgcumbe Road. The Ordnance Survey Grid Reference of the site entrance is SX 4132 6041.

The permit boundary is presented on Figure 2.

1.1.2 Site Classification

The permit variation application is seeking to re-open and operate the site as an inert waste landfill.

1.1.3 Permit Boundaries and Site Security

Prior to any waste being accepted onto site (following the permit variation being approved) security fencing will be upgraded/installed along the perimeter and a new gate fitted at the site entrance.

1.1.4 Site Context

The site covers approximately 7.4ha of land, dropping from 70mAOD in the south-west to 39mAOD in the north-east of the site.

The landfill is situated in an old valley feature. Since the permit was issued in 1974 waste has been deposited across the valley. The current profile of site comprises three main slopes separated by two platforms; these are summarised in table below.

Table 2: Site Description

Area	Description	Approximate Levels	Approximate Slope Angle
Top platform	Across the south-west area of site. Area predominantly filled to planning permission level so little to no filling is proposed in this area.	70m AOD	-
South Slope	Slope along the south boundary (east of the site entrance) is part of the natural valley slope with little to no fill across it. A SWW drain runs along the base of slope. No waste can be deposited within this area as per the planning permission.	Crest of slope: 80m AOD Toe of slope: 69- 43m AOD	19°
Central Slope	Slope connecting the top platform to the bottom platform. Constructed from waste material. Spans from the south-east corner to the centre point of the north boundary.	Crest of slope: 68m AOD Toe of slope: 51- 49m AOD	29°
Bottom Platform	Across the north-east of site comprising of waste material. Levels currently well below planning permission completion levels, area where most filling is proposed.	48 – 44m AOD	-
East Slope	Slope at the site boundary in the north-east corner. Drops from the bottom platform down to the original valley floor level.	Crest of slope: 44m AOD Toe of slope: 20- 22m AOD	34°

The topography immediately surrounding site generally drops towards the north-east/east falling into the valley directly east of site. The Top Platform lies at roughly the same level as the industrial estate to the south and the residential properties to the north.

The Environmental Site Setting is presented on Figure 3.

A summary of the surrounding land uses is presented in the table below.

Table 3: Surrounding Land Uses

Surrounding land use	**Location to site**		
	Direction	**Distance (m)**	**Topographic situation**
Agricultural land	N	< 5	Up gradient
Wooded valley	NE	< 5	Down gradient
Hole Creek (tertiary river)	E	280	Down gradient
Agricultural land	SE	< 5	Down gradient
Tamar View Industrial Estate: incl. x-ray services (11m), waste disposal services (82m), car dealers (87m), dry cleaners (99m), tyre dealers (100m), carpets & rug manufactures (112m)	S	61	Up gradient
Commercial buildings: incl. petrol filling station, Fast food restaurant & hotel	SW	115	Up gradient
Residential area (Carkeel)	NW	70	Up gradient
Residential area	N	95	Up gradient
Nature Protection Zones	**Location to site**		
	Direction	**Distance (m)**	**Topographic situation**
Areas of Outstanding Natural Beauty (Tamar Valley)	N & E	< 5	Down gradient
SSSI (Tamar – Tavy Estuary)	NE	143	Down gradient
Special Area of Conservation (Plymouth Sound & Estuaries)	NE	143	Down gradient
Marine Nature Reserves	NE	231	Down gradient
Special Protection Areas (Tamar Estuaries Complex)	NE	233	Down gradient
Ancient Woodland (Burrhills Wood)	NE	474	Down gradient

The cultural and natural heritage of the area is presented in Figure 4.

The Groundwater protection policy (GPP3), withdrawn March 2017, states:

"'Direct input' into groundwater is defined in Schedule 22 of EPR 2010 as 'the introduction of a pollutant to groundwater without percolation through soil or subsoil'.

Direct input is equivalent to the term 'direct discharge' in the Water Framework Directive and the definition supersedes that in the former Groundwater Directive. While the new definition does not specifically refer to rock unsaturated zones you should assume this is included."

Based on the definition above it is not believed any 'direct input' will occur as a result of the proposed landfill works.

2.0 SOURCE

2.1 Historical Development

A summary of the site history is presented in Table 4 below.

Table 4: Site History

Date	Site History
1889	The site comprised several agricultural fields within a valley. A stream flowed across site from the south-west corner, along the valley floor, exiting site in the north-east corner.
1974	Permit to deposit waste at Eales Farm was granted to John Garrett and Sons Ltd. Historical mapping shows backfilling began in the south-west corner and gradually extended towards the north-east over time. It is understood that the stream was culverted in sections as the backfilling was extended across the site.
1991	Ownership of Eales Farm and the permit were transferred to Downderry Construction (Western) Ltd (DCW).
1997	The permit was altered from 5,000 tonnes to 100,000 tonnes per annum.
2004	Waste ceased to be accepted on site.
2005	A Closure Notice was issued to DCW by the EA.
Nov 2016	The Closure Report (ref: 12933/R6) was accepted by the EA
May 2017	Eales Farm ownership was transferred to Tamar Valley Projects Ltd.
Sept 2017	The Environmental Permit for Eales Farm Landfill was transferred from DCW to Tamar Valley Projects Ltd.

A copy of the historic maps is included within Appendix B.

An Envirocheck® report, generated on the 5th August 2016, identified two Pollution Incidents to Controlled Water records on site. The records were dated November 1994 and March 1995; both were recorded as Category 3 – Minor Incidents. The pollutant is only known for the record from 1994, marked as 'Chemicals – Pesticides'.

A copy of the Envirocheck® datasheet in provided in Appendix C.

TVPL and GCEL have been provided with very limited records of the waste operation carried out at the site prior to TVPL taking ownership in May 2017. To our knowledge there are no records of the waste imported to site.

Several ground investigations have been carried out on the site since April 2016 to characterise the deposited materials and underlying strata and to identify any potential contamination risks present within the existing waste. Findings from the investigations are discussed in Section 3.0 (see GCE00692/R3 for full details).

Service plans for the site indicate that a South West Water (SWW) drain crosses the site. A 225mm diameter vitrified clay public – combined pipe runs along the south side of the site, entering near the south-west corner and exiting just north of the south-east corner.

A plan showing the SWW drain is presented in Figure 2.

A 900mm concrete culvert passes through the site, entering near the south-west corner and exiting site near the north-east corner. The culvert is believed to have been placed along the valley floor prior to landfilling and discharges into the unnamed stream at the north-east corner of the site.

A CCTV survey was carried out along the culvert in June 2017 by Exjet on behalf of GCEL. The inlet of the culvert appears to be fed by surface runoff from the neighbouring industrial estate. The report identified localised sections of the concrete pipe as being damaged and water from within the waste was entering through fractures in the concrete. As part of the proposed development a new culvert will be constructed (discussed in Section 2.2.3). The anticipated route of the new culvert in presented on Figure 2.

A copy of the CCTV culvert survey is included in Appendix D.

2.2 Proposed Development

Tamar Valley Projects Ltd is seeking to reopen Eales Farm Landfill, accepting up to 100,000 tonnes of waste per annum. An outline of the procedures for waste acceptance on site are outlined within the Operational Management Plan (GCE00692/2020/OMP) included with this application. Any wastes accepted onto site are required to be within the inert waste landfill values set within the Landfill Waste Acceptance Criteria Limits.

2.2.1 Waste Types

The waste that will be accepted on site includes:

Table 5: Waste Types

Waste Code	Waste Description	Entry Type
01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING & PHYSICAL & CHEMICAL TREATMENT OF MINERALS**	
01 01	**Wastes from mineral excavation**	
01 01 01	Wastes from mineral metalliferous excavation	AN
01 01 02	Wastes from mineral non-metalliferous excavation	AN
01 04	**Wastes from physical and chemical processing of non-metalliferous minerals**	
01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 07	MN
01 04 09	Waste sand and clays	AN
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**	
17 01	**Concrete, bricks, tiles and ceramics**	
17 01 01	Concrete	MN
17 01 02	Bricks	MN
17 01 03	Tiles and ceramics	MN
17 01 07	Mixture of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	MN
17 05	**Soil (including excavated soil from contaminated sites), stones and dredging spoil**	
17 05 04	Soil and stone other than those mentioned in 17 05 03	MN
17 05 06	Dredging spoil other than those mentioned in 17 05 05	MN
17 09	**Other construction and demolition wastes**	
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 & 17 09 03	MN
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTEWATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**	
19 12	**Wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**	
19 12 09	Minerals (sand, stones etc.)	AN
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPERATELY COLLECTED FRACTIONS**	
20 02	**Garden and park waste (including cemetery waste)**	
20 02 02	Soil and stones	AN

2.2.2 Phasing

Enabling Works:

Prior to the site receiving any waste material 'enabling works' will be carried out, this is to include:

- Establishing a site office and associated infrastructure including new haul road on south side of site to provide access into main filling area which minimises noise impact to properties to the north,
- Constructing and improving surface water ditches around site
- Construction of new culvert
- Reprofiling the north-east boundary slope to a flatter angle.
- Material generated from north-east boundary slope reprofiling to be used in construction of bund on north boundary,
- Constructing the surface water containment ponds,
- Preparing the Containment Bay
- Improving site security with installation of new site gate and perimeter fences.

A plan of the enabling works is presented on Figure 5. During the 'Enabling Works' clean imported clays will be used to line the containment ponds ensuring they have a permeability equal to or greater than 1 x 10^{-9}m/s. The procedure of accepting imported clays onto site will follow the procedures set out in the Operational Management Plan (GCE00692/2021/OMP).

Based on the proposed surface run off catchment areas for the containment ponds the following measurements have been calculated:

Table 6: Catchment Pond Details

Pond	`Catchment Areas	Minimum volume required	Retained Water Volume	Average Depth
N	Phase 2	520m^3	260m^3	2.0m
E	Phase 2	618m^3	309m^3	2.0m
S	Phase 3	61m^3	31m^3	1.0m
W	Phase 3	324m^3	162m^3	2.0m

See Appendix E for surface run off calculations.

Waste Filling Phasing:

Following the completion of the 'enabling works' the site will be filled in five phases. The estimated areas and volumes of each phase are as follows:

Table 7: Estimated areas and volumes of phasing

Phase	Estimated Area (m^2)	Estimated Volume (m^3)	Schematic
Enabling	11,718	-16,650 (net)	Figure 5
Phase 1	8,364	55,436	Figure 6a
Phase 2	11,781	83,432	Figure 6b
Phase 3	14,608	75,305	Figure 6c
Restoration	34,697	10,409	Figure 7
Total		**207,932**	

Phase 1 will develop the bund on the north boundary by filling to form the finished profile of the northern edge of the site (gradient 1:2.5) with a steeper (1:2) internal southern slope. This is intended to minimise the noise impact on the residents to the north for the remainder of the works. The outer, northern edge of this bund will be topsoiled and planted as soon as practical to improve soil retention and reduce visual impact.

Phase 2 will take the bulk fill area up to 3m below proposed finished level; again, to minimise noise impact on residents to the north. The containment ponds will be relocated upwards as the filling progresses with the number of times the ponds have to be moved being minimised.

Phase 3 will complete the remaining 3m of filling, commencing with the formation of a temporary bund on the northern margin, again to minimise noise impact, the bund being the last fill material to be incorporated into the mass.

On completion of the final 3m lift, the surface will be capped with 300mm of clean imported topsoil and seeded. Once all phases have been completed the site will be restored back to agricultural land. The site will be profiled to direct the surface water runoff into the open ditch along the north boundary. A lined ditch will also be installed

along the eastern boundary of the site in order to prevent surface water runoff flowing over the slope that forms the eastern boundary of the site.

A schematic of the restored site is presented in Figure 7.

Further details outlining the construction of each phase is included in the table below:

Table 8: Construction process of phases

Phase	Proposed construction
Phase 1	- Clearing vegetation - Preparing the surface including minor reprofiling - Placing basal liner sourced from acceptable site won material generated from the reprofiling of the existing slope to the east. - Form northern "bund" using imported waste soils placed and compacted in layers and benched into existing slope with side liner constructed using "Christmas tree" method. - Once finished profile reached level north face, topsoil surface and seed.
Phase 2	- Clearing vegetation - Preparing the surface including minor reprofiling - Placing basal liner - Constructing side liner using 'Christmas tree method'. - Place and compact waste in layers - Stop filling at level approximately 3m below finished surface.
Phase 3	- Form temporary bund on north boundary of remaining filling area. - Place and compact waste in layers. - Final filling to be with temporary bund on north margin of filling area. - Level surface, topsoil and seed. - Decommission containment ponds. - Construct lined ditches along the bund between the proposed slope and North Slope. - Decommission and remove the site office and compound.
Restoration	- Return site to agricultural land

A Closure & Aftercare Plan is included as part of this application (see GCE00692/2020/CAP).

2.2.3 Culvert Diversion

A 900mm concrete culvert crosses the site, it is believed to lie along the base of the valley below the existing waste, roughly following the route of the former stream (an approximate route of the culvert is shown in Figure 2). A CCTV survey of the culvert carried out in June 2017 revealed the pipe is locally in poor condition. The culvert lies beneath up to 23m of waste in areas and therefore direct replacement is neither feasible nor desirable. It is therefore proposed that a new culvert be installed along an alignment that allows the culvert to "daylight" as early as possible with flows then carried by open ditch. As part of the 'Enabling Works' the new culvert will be constructed from the existing inlet point close to the southern boundary of the site and re-route the water, discharging in the existing pond situated on the north boundary from where the existing ditch network will be enhanced to carry the flow over ground to the current discharge point. The existing culvert will remain in-situ as it is likely to pick up small amounts of sub-surface water flow within the former valley feature.

The proposed new route of the culvert is included in Figure 5.

See Teignconsult drawings 477-DR1 to 477-DR5 (Appendix F) for full details regarding the proposed culvert re-alignment.

3.0 PATHWAY AND RECEPTOR

3.1 Geology

The British Geological Survey (BGS) memoir for 1:50,000 geological sheet 348 indicates the site is underlain by the Skinham division of the Torpoint Formation. The Torpoint Formation lies within the South Devon Basin Succession and comprises brownish purple to purplish red cleaved mudstones and green to yellowish green fine-grained siltstones, coarse grained siltstone and fine-grained sandstone. The mudstone beds are typically structureless, although some grade upwards from basal siltstone laminae. As shown on Figure 8, no large-scale faults are present in close proximity to the site. The BGS geological mapping also shows Devonian to Carboniferous unnamed microgabbro intrusions lie just south of the site beneath the Tamar View Industrial Estate.

Several ground investigations have been carried out since 2016, these are summarised in the table below:

Table 9: Summary of Previous ground investigations

Investigation / Monitoring	Investigation Methods	Comments	Report Reference and Date Issued
Closure Report by JGP on behalf of Downderry Construction (Western) Ltd.	- 5 Trial pits (TP01 – TP05) - 12 Boreholes (BH1 – BH12) - 15 Groundwater/Ground gas monitoring wells - Chemical laboratory testing of water samples - 7 PSD tests	The main site investigation was carried out in April 2016. Boreholes were drilled using cable percussive and rotary methods.	12933/R6 November 2016
	Topographic Survey of site	Carried out by Cornish Engineering Surveys Ltd in May 2016	
	CCTV survey of 900mm culvert	Carried out by Aqua South West in March 2016. Surveyed 13.8m downstream from the inlet and 88.8m upstream from the outlet.	
Survey commissioned by GCEL on behalf of TVPL	Topographic Survey of site	Carried out by West Country Land Surveys Ltd. Due to dense vegetation several areas were not accessible during the survey.	September 2016
Phase 2 Ground Investigation by GCEL on behalf of TVPL	- 10 Trial pits (TP01 – TP10) - 5 Boreholes (BH13 – BH17) - 3 Groundwater/Ground gas monitoring wells (BH13, BH15, BH16) - Chemical laboratory testing of soil and water samples	Investigation limited to the top platform to assess the potential for re-development across this area.	GCE00692/R2 October 2016
Survey commissioned by GCEL on behalf of TVPL	CCTV survey of 900mm culvert	Carried out by Exjet. Surveyed 249.35m downstream from the inlet and 150.35m upstream from outlet.	36142/17 June 2017
Survey commissioned by Burcombe Haulage for TVPL	Topographic Survey of site	Carried out by Glanville Environmental and surveyed in February 2018.	00535_T_500_1of1 March 2018
Quarterly Monitoring by GCEL on behalf of TVPL	- Ground gas monitoring - Groundwater monitoring - Groundwater quality monitoring - Surface Water quality monitoring	From May 2017 to May 2019 monthly monitoring of ground gas and water quality was carried out to provide a baseline data set.	GCE00692/LR1-LR11 From May 2017 to present
Phase 2b Supplementary Ground Investigation by GCEL on behalf of TVPL	9 boreholes by combined dynamic sampling with rotary follow-on. (B19-1 to B19-9) 27 trial pits (T19-1 to T19-27) 10 dynamic probes 6 combined groundwater/ground gas monitoring wells 10 drive-in piezometers. Geotechnical and chemical testing of soil samples. Chemical testing of water samples.	Investigation scope developed following EA site meeting of March 2019 to target specific concerns raised at that meeting.	GCE00692/R3 June 2020

The table below summarises the local geology encountered during the ground investigations:

Table 10: Local Geology

Type	Details
Existing landfill waste	Predominantly comprises very gravelly slightly sandy clays tending to very clayey gravels of angular platey mudstone. Contains zones with an abundance of rubble with boulders of concrete, granite and occasional blacktop. Occasional pieces of organic matter within the waste typically comprising old branches or fragments of wooden pallets. The waste infills an old valley feature resulting in the thickest deposits running roughly SW-NE through the centre of site and waste deposits thinning out towards the north and south. The thickest part of the landfill (B19-5) contains 22.3m of waste.
Torpoint Formation	Comprises extremely weak to very weak cleaved extremely closely fractured purple mudstone. Fractures within the bedrock are principally along cleavage planes typically dipping between 40° to 50°. Some variation in the cleavage was seen across the site with the dip recorded at 80° in B19-5 and around 20° to 30° in B19-7. Minor distortions (apparent kink bands) were noted along some of the cleavage planes in several locations suggesting some deformation has occurred in the area. Light green siltstone beds were encountered within B19-2, B19-5 & B19-7. The siltstone beds are generally more competent ranging from very weak to weak. Quartz veins within the siltstones (and occasional within the mudstones) contain inclusions of black minerals possibly containing manganese and/or iron.

Cross-sections produced for the slope stability assessment (GCE00692/2020/SSA) clearly show the waste sits within the former valley with the thickest deposits along the old valley floor. Copies of the sections are included within Appendix G.

3.1.1 Landfill Waste Chemical Analysis

As part of the ground investigations chemical analysis of the existing waste has been carried out.

Asbestos fibres were identified within ten out of thirty-five samples tested during the supplementary ground investigation (see GCE00692/R3).

High manganese concentrations have been detected within the existing landfill waste ranging from 1,000mg/kg to 3,300mg/kg. The elevated concentrations are thought to reflect the natural mineralisation of the local geology (see GCE00692/R3).

No other significant sources of contamination have been identified within the waste.

For details of the testing and laboratory results see GCE00692/R2 and GCE00692/R3 (both have been included as part of the permit application).

3.2 Hydrology

The table below summaries the watercourses that may influence or be impacted by the landfill.

Table 11: Watercourses

Watercourse	Location to landfill	Comments
Ditch along north boundary	On-site	Collects surface water run-off from the site and channels it along the north boundary towards the north-east corner. The ditch is typically dry especially during summer months.
Unnamed stream to the north	Upstream	Flows onto site from the north bringing water from off-site onto site. Stream flows into the pond on edge of site.
Pond	On-site	Situated on the north boundary the pond receives water from the section of ditch to the west (when flowing) and the unnamed stream to the north. Based on observations during monitoring visits the pond contains water all year round.
Unnamed stream to the east	Downstream	Receives all surface water run-off from site and the culvert discharge. The stream flows from the north-east corner of site eastwards towards Hole Creek.

A plan showing the watercourses is presented on Figure 9.

Based on the EA flood risk mapping, the site does not lie within a flood risk zone as highlighted on Figure 3.

3.2.1 Surface Water Quality

Surface water quality testing has been carried out on a quarterly basis since May 2017. The sample locations were set out in the JGP Closure Report (see report 12933/R6).

A summary of the water quality testing is presented in the table below, the sample locations are included in Figure 11:

Table 12:Summary of Surface Water Quality Chemical Data

Determinand	Units	*Drinking Water Guidelines	SW1		SW2		SW3		SW4		SW5		SW6	
			Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean
pH		NGA	9.2	8.0	8.9	8.1	8.7	7.8	8.5	8.1	8.4	8.1	8.3	8.2
Electrical Conductivity	µS/cm		440	359	500	350	840	686	630	518	480	400	720	705
Suspended Solids At 105C	mg/l	NGA	8300	3294	330	54	160	42	84	32	520	150	390	375
Alkalinity (Total)	mg CaCO3/l		230	137	150	116	470	332	340	234	150	130	420	380
Chloride	mg/l	NGA	30	26	81	36	48	34	55	41	48	40	30	29
Ammoniacal Nitrogen	mg/l	NGA	5.1	1.4	5.9	1.1	4.7	0.9	4.9	1.0	4.4	1.7	1.6	1.2
Nitrite	mg/l	3	0.3	0.1	0.4	0.1	3.3	0.4	0.6	0.2	0.9	0.3		<0.02
Nitrate	mg/l	50	23.0	11.4	21.0	8.4	19.0	5.4	15.0	6.1	12.0	5.6	3.5	2.9
Sulphate	mg/l	NGA	37.0	24.6	35.0	20.6	100.0	70.0	77.0	30.9	33.0	23.4	65.0	61.8
Calcium	mg/l		60.0	43.8	47.0	33.8	270.0	114.5	130.0	81.4	80.0	50.0	99.0	97.0
Potassium	mg/l	NGA	7.4	5.4	9.1	5.5	15.0	8.2	9.0	5.9	7.0	3.0	8.2	7.1
Magnesium	mg/l	NGA	15.0	8.8	11.0	6.3	21.0	14.5	18.0	10.0	9.9	5.5	16.0	15.5
Sodium	mg/l	NGA	21.0	16.1	22.0	15.1	31.0	22.2	32.0	25.6	26.0	20.7	22.0	21.5
Total Hardness as CaCO3	mg/l		200	148	160	111	760	343	400	245	240	148	310	305
Arsenic (Dissolved)	µg/l	10	4.2	4.2	2.3	1.7	3.6	2.4	3.0	1.7	4.2	2.7	2.4	1.9
Boron (Dissolved)	µg/l	2400	700	173.3	710	213.1	690	291.4	1200	377.8	740	363	670	361.5
Cadmium (Dissolved)	µg/l	3	0.1	0.1		<0.08		<0.08		<0.08		<0.08		<0.08
Chromium (Dissolved)	µg/l	50	7.2	3.6	13.0	6.7	33.0	8.6	35.0	11.5	39.0	13.3	2.6	2.6
Copper (Dissolved)	µg/l	2000	2.4	1.8	4.4	2.7	5.4	2.1	4.0	1.9	36.0	9.4		<1.0
Iron (Dissolved)	µg/l	NGA	310	135	840	193	590	259	510	248	650	171	560	288
Mercury (Dissolved)	µg/l	6	2.0	2.0	1.8	1.8	1.6	1.5	1.2	1.1	1.3	1.3		<0.5
Manganese (Dissolved)	µg/l	NGA	3600	305.5	300	26.5	1100	77.0	1300	457.0	160	46.5	8.4	5.6

Determinand	Units	*Drinking Water Guidelines	SW1		SW2		SW3		SW4		SW5		SW6	
			Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean	Max.	Mean
Nickel (Dissolved)	µg/l	70	2.1	1.6	4.3	3.6	3.4	2.5	3.9	3.2	4.3	3.4		<1.0
Lead (Dissolved)	µg/l	10		<1.0		<1.0		<1.0		<1.0	2.5	2.5		<1.0
Selenium (Dissolved)	µg/l	40	3.9	1.9	1.8	1.5	2.1	1.5	1.6	1.2	1.3	1.3	1.3	1.3
Zinc (Dissolved)	µg/l	NGA	48.0	11.2	35	13.8	97	15.1	110.0	18.8	1400	290	9.3	5.6
Chromium (Hexavalent)	µg/l			< 20		<20		<20		< 20		< 20		< 20
Total Organic Carbon	mg/l		24.0	10.2	22.0	9.8	62.0	12.3	32.0	10.5	24.0	11.5	8.0	5.6
Total TPH >C6-C40	µg/l			<10		<10		<10		<10		<10		<10
Total Of 16 PAH's	µg/l		2.3	2.3		<2.0		<2.0		<2.0		<2.0		<2.0

**Guideline values provided by 'Guidelines for Drinking-water Quality 4th edition, World Health Organization'*
NGA = No Guidelines Available as no health concerns at levels found in drinking water
Mean concentrations calculated from samples with concentrations above laboratory limit of detection.
Sample locations shown in Figure 11

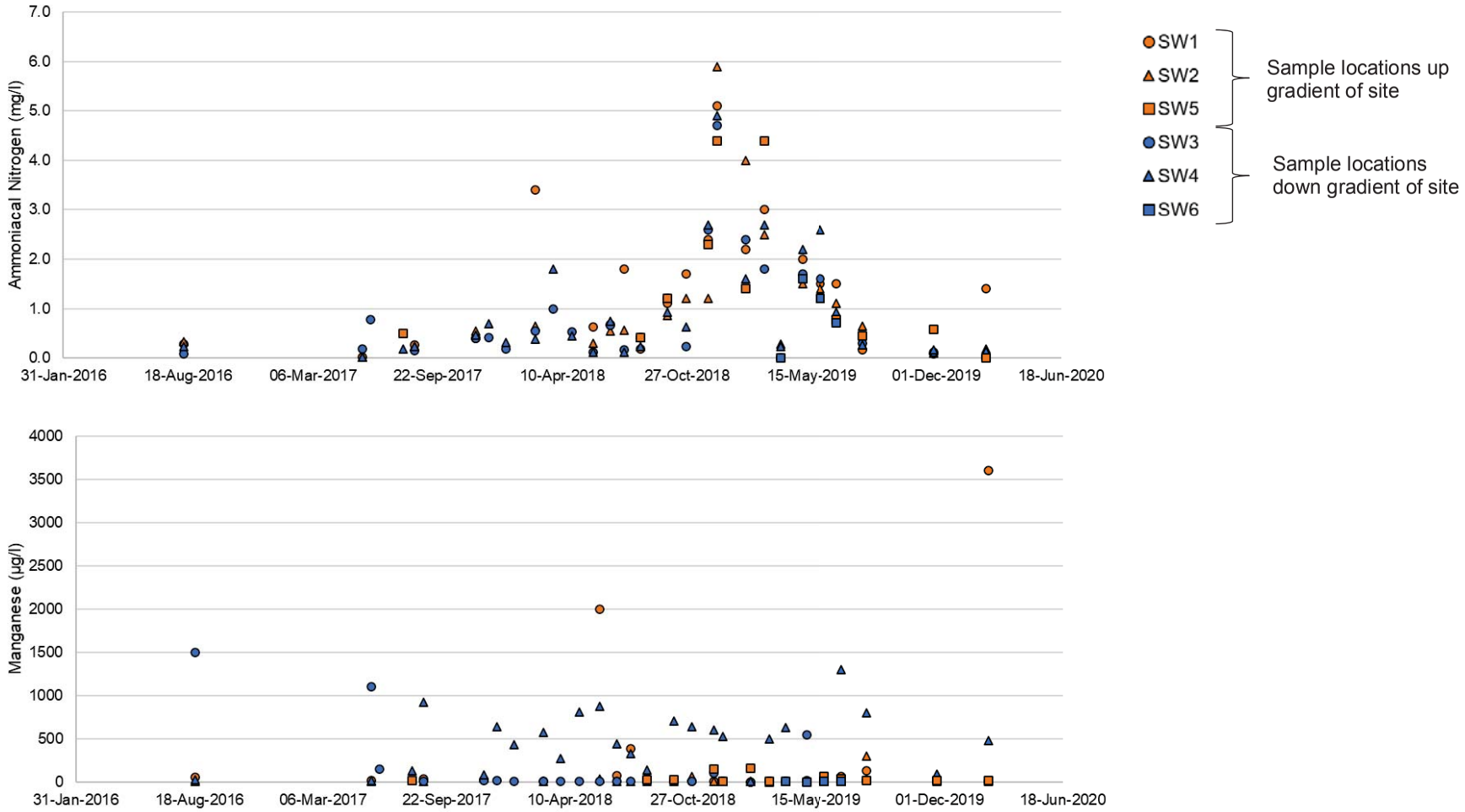
The surface water quality data in Table 12 shows the water concentrations are within the WHO drinking water guidelines. However, the EA has previously raised concerns regarding the levels of manganese and ammoniacal nitrogen.

The plots below present the manganese and ammoniacal nitrogen concentrations within the surface water sample locations upgradient of site (SW1, SW2 & SW5) and the concentrations of sample locations downgradient of site (SW3, SW4 & SW6).

The plots indicate high ammoniacal nitrogen is present in samples both up gradient and down gradient of site.

With the exception of a few anomalous high concentrations at SW1 the plots show manganese concentrations are much higher in SW4 than at other sample locations. SW4 samples are collected from the culvert discharge (see Figure 11). It is thought the increase in manganese between SW5 (culvert inlet) and SW4 (culvert outlet) is related to water within the waste entering the culvert through cracks as reported in the 2017 CCTV survey (Appendix D). The water within the waste contains high manganese due to elevated manganese within the waste as discussed in section 3.1.1.

Surface Water Ammoniacal Nitrogen and Manganese Concentrations



Watercourses of ecological importance include:

- SSSI (Tamar – Tavy Estuary), 143m downstream of site,
- Marine Nature Reserves, 231m downstream of site,
- Special Protection Areas (Tamar Estuaries Complex), 474m downstream of site.

These are included on Figure 4.

3.3 Hydrogeology

A Hydrogeological Risk Assessment (report ref HCE0430.HRA.Rev2) has been carried out by Horizon Consulting Engineers (HCE), the report has been submitted as part of this variation application.

3.3.1 Aquifer Characteristics

The table below summarises the aquifer characteristics of the Torpoint Formation underlying the site.

Table 13: Outline of Aquifer Characteristics

Aquifer Characteristics	Details	Source
Source Protection Zones	511m east: Zone II 760m east: Zone I	Envirocheck® report See Appendix C
Aquifer status and vulnerability	Secondary Aquifer – A High vulnerability	Envirocheck® report See Appendix C Defra's Magic Map (accessed 09/04/20)
Natural geological barrier	Existing landfill waste up to 20.3m thick overlying natural bedrock. Permeability tests of the waste vary from 2.67E-4 m/s to2.75E-10 m/s based on falling head tests carried out in June 2018 and three laboratory constant head tests.	GCE00692/R3
Hydrological parameters	Approximate permeability of 4.45E-6 to 8.78E-6m/s based on falling head test from two perimeter monitoring wells.	GCE00692/R3

Aquifer Characteristics	Details	Source
	Groundwater flow likely dominated by secondary porosity along cleavage fractures.	
Licensed abstractions	163m south-east: General farming and domestic use 263m north-east: General farming and domestic use 464m north-east: General farming and domestic use	Envirocheck® report See Appendix C
Springs	The 2016 OS map of the surround area show several springs in proximity to site. The most notably being 310m east. The springs indicate groundwater is potentially close to the ground level.	Historic Maps See Appendix B

The regional hydrology and hydrogeology features are presented on Figure 10.

3.3.2 Groundwater Flow

Groundwater monitoring has been conducted quarterly since May 2017. Monitoring has included 'in-waste wells' (response zone within the existing waste) and 'perimeter wells' (response zones in underlying natural geology). In February 2020 additional groundwater monitoring wells were installed (see GCE00692/R3).

The Hydrogeological Risk Assessment identifies that groundwater levels in boreholes screened within the bedrock generally show the upper bedrock to be unsaturated, the exception being locations proximal to the valley floor where the piezometric data indicates rest water level in the lowermost parts of the waste. This is believed to be a function of water flow along the former valley course and leakage from the culvert.

The data suggests that the groundwater level roughly mirrors the old valley topography present on site prior to filling. The groundwater levels are highest along the valley edges (along the north and south boundaries) and drop towards the centre of the valley falling towards the north-east.

Monitoring of the ‘in waste wells’ has also indicated some presence of perched water within the waste mass. The presence of perched water is more commonly encountered in the top platform (BH5, BH6, BH13 & BH16). It also more commonly recorded during the winter months (November to March).

As part of the proposed works a basal liner will be constructed along the top of the existing waste. This liner will act a barrier to prevent any movement of subsurface water between the existing waste and the overlying waste mass. The presence of the barrier will reduce the amount of surface water infiltration into the existing waste thus reducing perched water within the existing waste.

A copy of the groundwater depth monitoring data collected to date is presented in Appendix H.

3.3.3 Groundwater Quality

The site has been operated as an inert landfill since 1974. Groundwater quality testing has been carried out on a quarterly basis since May 2017 from the sample locations that were set out in the JGP Closure Report (see Figure 11). Additional testing was also carried out during the February 2020 ground investigation (see GCE00692/R3). The data has been used to produce a Hydrogeological Risk Assessment (produced by HCE, ref HCE0430.HRA.Rev2).

The Hydrogeological Risk Assessment concluded that the principal exceedances of parameters identified in the monitoring assessment criteria were manganese, iron and ammoniacal nitrogen. Two septic tanks are reportedly located towards the west of the site and these are believed to be the source of the ammoniacal nitrogen.

The metals concentrations are thought to be a result of natural mineralisation in the locally sourced soil and rock deposited in the site.

3.4 Man-made Subsurface Pathways

The table below summarises the identified potential man-made pathways of subsurface water in and proximal to the site.

Table 14: Summary of Man-made Subsurface Water Pathways

Watercourses	Comments	Location relative to site
*Culvert	900mm concrete culvert thought to carry surface water run-off from the industrial estate through the site. Discharges into an unnamed stream at the site boundary in the NE corner. CCTV surveys shows the pipe is damaged in places and subsurface water within the surrounding waste flows into the pipe.	Passes through site
SWW combined drain	225mm diameter vitrified clay public – combined pipe runs along the south side of the site, entering near to the south-west corner, running along the South Slope, and exiting just north of the south-east corner. No waste is permitted to be deposited over the pipe	Passes through site
Ditch along north boundary	A ditch runs along the north boundary of site meeting the unnamed stream and culvert issue point in the NE corner of site. A pond is situated on the north boundary of site, receiving water from the ditch to the west and an unnamed stream to the north.	Runs along the north boundary of site.
Monitoring wells	There are currently twenty-three boreholes on-site that have been installed with thirty-three monitoring wells. All installations include a bentonite barrier across the waste/bedrock contact to prevent creation of the pathway between the waste and the underlying bedrock.	Various locations across site.

*Prior to the site accepting waste a new culvert will be constructed. The new culvert route will carry the water from the current inlet location across the west section of site and discharge it into the pond on the north boundary; the outfall ditch system from the pond will be improved as part of these works. See section 2.2.3 for further details.

3.5 Receptors and compliance points

The table below outlines the pathways and receptors relating to the site. It highlights that there are several sensitive receptors (e.g. SSSI, SAC, SPA) down gradient of the proposed landfill. Other receptors include local residents and businesses which lie upgradient.

A H1 Environmental Risk Assessment (ERA) has been undertaken in conjunction with the ESSD report. The ERA assessed the risks posed by the hazards from the operation of an inert waste landfill.

The ERA concludes that assuming risk management measures (outlined in the attached Operational Management Plan) are implemented the potential hazards are not significant.

Table 15: Summary of Site Pathways and Receptors

Site Pathways		
Local geology	Historic inert landfill waste	Typically comprises clayey gravels and gravelly clays ranging in thickness from 2m to 23m. Laboratory constant head tests indicate permeability 4.78E-10 to 2.75E-10 m/s.
	Skinham division of Torpoint Formation	Extremely weak to very weak cleaved extremely closely fractured purple mudstone. Falling head tests suggest permeability of 4.45E-6 to 8.78E-6.
Hydrology	Open ditch along northern boundary	The ditch receives water from sources upstream of site along with some (but minimal) surface run off from Eales Farm Landfill.
	Stream flowing from culvert outlet	The stream receives water from the ditch along northern boundary, the culvert and surface run-off from site.
Hydrogeology	Secondary A aquifer	It is believed most flow is through the rock fractures.
Man-made Pathways	South West Water combined pipe	The combined pipe runs along the southern slope of site. No fill is proposed to be deposited over the pipe.
	Culvert	Industrial Estate feed into culvert.
	Eight on-site boreholes	Bentonite used to seal top of all installations. Where boreholes penetrated the underlying natural rock bentonite layer of 0.5m to 1.0m at the interface was installed to prevent a pathway.

Site Receptors	
Surface water (hydrology)	Unnamed stream flowing from the sites north-east corner flowing into Hole Creek and Kingsmill Lake.
Groundwater (hydrogeology)	Two abstractions 163m SE used for general farming and domestic use
	A spring is situated roughly 310m east of site.
Residents	Residential properties located 70m west and 95m north of site.
Local businesses	Tamar View Industrial Estate is directly south of site.
Local wildlife/environment	Tamar-Tavy Estuary SSSI, the Tamar Estuaries Complex SPA, and the Plymouth Sound, Estuaries SAC and a Protected Species area for fish within 143m.

3.6 Compliance and Monitoring Points

3.6.1 Surface Water Compliance and Monitoring Points

The proposed surface water sample locations include.

- WSL1: Inflow of water into culvert from industrial estate (aka MSW5)
- WSL2: Unnamed stream flowing into pond from the north (aka MSW1)
- WSL3: Culvert outflow into pond
- WSL4: Outflow of containment pond 1
- WSL5: Outflow of containment pond 2
- WSL6: Outflow of perimeter ditch into unnamed stream
- WSL7: Unnamed stream receiving water surface run off from site

Locations of the above points are shown on Figure 12.

The locations identified above are planned to be monitored on a quarterly basis. The samples will be tested for the determinands and compared to the trigger limits as summarised in the table below. Should any of the sample locations exceed any of the compliance limits the following procedure will be followed:

- Advise site management
- Instigate repeat sampling and analysis.
- If trigger still exceeded advise Environment Agency
- Review data against historic monitoring
- Review site management/operations and implement appropriate actions to minimise likelihood of recurrence.
- Review Conceptual Model and Hydrogeological Risk Assessment
- Consult Environment Agency about need for corrective action.

Table 16: Groundwater and Surface Water Quality Compliance Points & Trigger Limits

Receptor	Compliance Locations	Monitoring Frequency	Parameters	Trigger Limits
Surface Water	WSL1 - Upgradient WSL2 - Upgradient WSL3 – On-site WSL4 – On-site WSL5 – On-site WSL6 - downgradient WSL7 - downgradient	Quarterly Monitoring	pH,	6.5 – 8.5
			Electrical Conductivity,	4000µS/cm
			Suspended Solids At 105C,	
			Alkalinity (Total),	
			Chloride,	250mg/l
			Ammoniacal Nitrogen,	1mg/l
			Nitrite,	
			Nitrate,	
			Sulphate,	
			Calcium,	
			Potassium,	
			Magnesium,	
			Sodium,	
			Hardness,	
			Arsenic (Dissolved),	
Groundwater	B19-1 - Upgradient B19-2 - downgradient B19-3 – Upgradient B19-4 – BLM BH2B – BLM BH7B – BLM BH11B - BLM		Boron (Dissolved),	
			Cadmium (Dissolved),	
			Chromium (Dissolved),	
			Copper (Dissolved),	
			Iron (Dissolved),	1000µg/l
			Mercury (Dissolved),	1µg/l
			Manganese (Dissolved),	
			Nickel (Dissolved),	
			Lead (Dissolved),	
			Selenium (Dissolved),	
			Zinc (Dissolved),	
			Chromium (Hexavalent),	
			Total Organic Carbon,	
			Total TPH >C6-C40,	50µg/l
			Total Of 16 PAH's	

BLM = Beneath Landfill Waste Mass

Locations of the compliance locations are presented in Figure 12.

3.6.2 Groundwater Compliance and Monitoring Points

The following groundwater monitoring locations are proposed:

- B19-1 (Up gradient of Eales Farm Landfill)
- B19-2 (Down gradient of Eales Farm Landfill)
- B19-3 (Up gradient of Eales Farm Landfill)
- B19-4 (Beneath landfill mass)
- BH2B (Beneath landfill mass)
- BH7B (Beneath landfill mass)
- BH11B (Beneath landfill mass)

As discussed in Section 3.3 the groundwater levels generally lie just below the waste/bedrock contact therefore, no 'in-waste waste wells' have been selected as groundwater compliance/monitoring points. However, several groundwater monitoring wells have been installed within the waste and monitoring of these wells will also be carried out every three months. Should the monitoring data suggest groundwater has risen into the existing waste mass the groundwater quality monitoring locations will be reviewed. A summary of the 'in-waste' groundwater monitoring wells are included in the table below.

Nine 'new' wells will be installed within the proposed waste mass that will overlie the existing waste (roughly two within each phase). This meets the minimum frequency of 2 boreholes per hectare set out in the EPR: inert waste guidance. See section 5.1 for detail on the well constructions.

The locations are presented on Figure 12.

The sample locations identified above will be monitored on a quarterly basis. The samples will be tested for the determinands and compared to the trigger limits as summarised in Table 16 above. Should any of the sample locations exceed any of the compliance limits the following procedure will be followed:

- Advise site management
- Instigate repeat sampling and analysis
- If trigger still exceeded advise Environment Agency
- Review data against historic monitoring

- Review site management/operations and implement appropriate actions to minimise likelihood of recurrence.
- Review Conceptual Model and Hydrogeological Risk Assessment
- Consult Environment Agency about need for corrective action.

Table 17: Groundwater Depth Monitoring Wells

Installation	Well ID	Location to landfill	Response Zone (m bgl)
JGP April 2016	BH1A	Beneath existing landfill waste	1.8 – 2.7
	BH1B	Beneath existing landfill waste	7.3 – 10.4
	BH2A	Within existing landfill waste	2.6 – 6.8
	BH2B	Beneath existing landfill waste	11.0 – 26.0
	BH3	Within existing landfill waste	2.7 – 9.85
	BH4	Within existing landfill waste	3.0 – 7.7
	BH5	Within existing landfill waste	2.6 – 13.6
	BH6	Within existing landfill waste	3.0 – 14.65
	BH7A	Within existing landfill waste	2.6 – 4.1
	BH7B	Beneath existing landfill waste	7.3 – 16.8
	BH9	Within existing landfill waste	2.6 – 10.6
	BH10	Within existing landfill waste	2.6 – 14.35
	BH11A	Within existing landfill waste	2.6 – 5.35
	BH11B	Beneath existing landfill waste	8.5 – 15.2
	BH12	Within existing landfill waste	2.6 – 9.0
GCEL Aug 2018	BH13	Within existing landfill waste	1.0 – 6.5
	BH15	Within existing landfill waste	1.9 – 4.9
	BH16	Within existing landfill waste	2.4 – 14.4
GCEL Feb 2020	B19-1	Upgradient of landfill	13.0 – 18.0
	B19-2	Downgradient of landfill	10.0 – 15.0
	B19-3	Upgradient of landfill	9.2 – 15.0
	B19-4	Beneath existing landfill waste	16.6 – 18.6
	B19-5a	Beneath existing landfill waste	27.5 – 28.0
	B19-5b	Within existing landfill waste	13.0 – 13.5
	B19-5c	Within existing landfill waste	8.6 – 9.4
	B19-5d	Within existing landfill waste	3.5 – 4.3
	B19-6	Within existing landfill waste	16.0 – 18.0
	B19-7a	Beneath existing landfill waste	26.3 – 27.0
	B19-7b	Within existing landfill waste	17.7 – 18.5
	B19-7c	Within existing landfill waste	13.0 – 13.7
	B19-7d	Within existing landfill waste	2.0 – 2.7
	B19-8a	Beneath existing landfill waste	11.2 – 13.65
	B19-8b	Within existing landfill waste	3.4 – 4.1
	B19-9a	Beneath existing landfill waste	18.0 – 18.9
	B19-9b	Within existing landfill waste	11.6 – 12.4
	B19-9c	Within existing landfill waste	9.4 – 10.2
	B19-9d	Within existing landfill waste	5.4 – 6.2
Proposed	P1-a	Within 'new' landfill waste	TBC
	P1-b	Within 'new' landfill waste	TBC
	P2-a	Within 'new' landfill waste	TBC
	P2-b	Within 'new' landfill waste	TBC
	P3-a	Within 'new' landfill waste	TBC
	P3-b	Within 'new' landfill waste	TBC

Installation	Well ID	Location to landfill	Response Zone (m bgl)
	P4-a	Within 'new' landfill waste	TBC
	P4-b	Within 'new' landfill waste	TBC
	P5-a	Within 'new' landfill waste	TBC

A schematic showing the different types of monitoring wells is presented in Figure 13.

Locations of the wells are presented in Figure 12.

4.0 POLLUTION CONTROL MEASURES

4.1 Site Engineering

4.1.1 Basal and Side Slope Engineering

The site is underlain by inert waste overlying extremely closely fractured mudstone of the Torpoint Formation. Falling head tests carried out within BH10 and BH12 recorded permeability rates ranging from 7.12 x 10^{-6} m/s to 2.67 x 10^{-4} m/s within the waste. Permeability testing undertaken on the surface across the site has shown variable permeability with infiltration rates ranging from 5.4 x 10^{-6}m/s to < 1 x 10^{-7}m/s. Three laboratory constant head tests of three samples taken from the waste gave a range of 4.78E-10 to 2.75E-10 m/s.

Testing was also carried out to determine if the material currently present on site could be re-engineered to provide a suitable liner. In one location waste material was placed in 225mm layers and rolled 10 times (using a smooth wheeled vibrating roller). A second 225mm layer of waste was then placed and rolled another 10 times. In a second location, the roller passed over the undisturbed site surface 10 times. The permeability of both areas was then tested using the proposed method outlined in Annex 2 of EPR: Inert Guidance. Minimal infiltration had occurred over 24 hours with the water level only dropping by 2 to 4mm. Therefore, it is believed that the waste currently present on site could be re-engineered to create a suitable mineral liner across the site with a permeability no greater than 1 x 10^{-9}m/s.

Locations of the tests are presented in Figure 14.

The permeability test results are included within Appendix J.

Following a conference call with the Environment Agency of the 17th May 2018 it was concluded the most appropriate method would be to import material to be used for the AEGB as opposed to re-engineering the waste currently on-site. The AEGB will therefore be constructed using clean imported material. A design specification and

CQA Plan (GCE00692/2020/AEGB), outlining the construction of the AEGB, has been included as part of this application.

4.1.2 Capping

The near surface cover materials (the top 1.0m of waste) will be limited to subsoils from waste code 17 05 04. Following the placement of the subsoil a 300mm layer of imported clean topsoil will be placed as part of the site's restoration back to agricultural land. The clean topsoil will be imported under a recovery permit (to be submitted following the acceptance of the current permit variation).

4.2 Restoration

As stated in the original planning permission documents (see Appendix A), the site will be restored back to agricultural land following the closure of the landfill.

Table 18: Summary of Site Restoration

Surrounding Topography	The natural slope along the southern edge of site will largely be unaltered. Some minor profiling may be required where the natural slope meets the edge of the waste.
Pre-settlement contours	The proposed final profile of site is presented in Figure 7.
Post settlement contours	Based on the proposed compaction method of the waste and absence of organic material the settlement of the waste following completion of each phase is anticipated to be minimal.
Waste Types and Quantities	The top 1.0m of waste will be restricted to subsoils taken from wastes under code 17 05 04. An estimated volume of 65,000m^3 of subsoil will be required. A 300mm cover of topsoil will be placed over the subsoil requiring approximately 20,000m^3 to restore the site.

The site was not restored back to agricultural land following the closure of the site in 2005. The surface across the site comprises exposed waste with little to no topsoil cover. Exploratory holes carried out across site show no capping system has been installed over the waste material. The site is currently not considered suitable for any beneficial use to the surrounding environment or agricultural industry. The permit

variation, including restoration plan, looks to bring the site up to the profile set out in the planning permission and restore it back to agricultural land.

A Closure & Aftercare Plan report (GCE00692/2020/CAP) has been submitted as part of this application.

4.3 Surface Water Management

During the operation of the Eales Farm Landfill two containment ponds will be constructed. The ponds will be designed to collect the surface run-off across the site during the operational phases (see section 2.2).

A plan showing the proposed surface water management during the operation of the landfill is presented on Figures 5 to 7.

Both containment ponds will be backfilled as part of the site phasing. Following the completion of Phase 3 (Figure 6c), the site topography will direct a majority of surface water into the perimeter ditch along the northern boundary. Another ditch will be situated to the east to catch surface run off from the South Slope. Both ditches will discharge into the unnamed stream just east of site.

The pond on the north boundary will remain and continue to collect water from the stream to the north (off-site), ditch to the west and discharge from the new culvert. Any overflow from the pond will be directed into an open ditch running along the north boundary of site.

During the operation and following the closure the ditches will be kept clear and dredged as and when required.

4.4 Post Closure Controls (Aftercare)

The post closure controls are outlined within the site's Closure & Aftercare Plan (GCE00692/2020/CAP) submitted as part of this application.

5.0 MONITORING

5.1 Gas Monitoring Infrastructure

Due to the existing waste spanning nearly the entire footprint of the site, locations for perimeter wells are very restricted. Several wells were therefore installed within the natural bedrock at locations where landfill waste overlies the bedrock. A bentonite seal was installed across the waste/ bedrock contact to prevent creation of pollution pathway. Three wells were installed as part of the 2020 investigation (B19-1, B19-2 and B19-3) at the available locations within the site boundary that would offer little or no waste cover.

Nine wells are proposed within the 'new' waste across the proposed landfill (roughly two within each phase). This meets the minimum frequency of 2 boreholes per hectare set out in the EPR: inert waste guidance. The wells will be installed as combined ground gas and groundwater monitoring wells.

The proposed wells will be constructed in general accordance with LFTGN03 using an outer 142mm ID HDPE well screen/casing and an inner 50mm well screen/casing. These will be initially installed into a borehole once 1m of waste material has been placed so that the well is essentially stable. The wells will then be extended upwards as waste deposition progresses using internally threaded 1m lengths of inner and outer well screen and temporary bung seals. Permanent bentonite seals will be formed once the recovered material reaches finished level and a security cover installed.

As each phase is constructed, any existing wells within the phase area will be extend through the 'new' waste mass using plain (unslotted) pipe segments and bentonite seal.

The table below summarises the current ground gas monitoring infrastructure currently present across site:

Table 19: Ground gas monitoring wells

Installation	Well ID	Location to landfill
JGP April 2016	BH1A	Beneath existing landfill waste
	BH1B	Beneath existing landfill waste
	BH2A	Within existing landfill waste
	BH2B	Beneath existing landfill waste
	BH3	Within existing landfill waste
	BH4	Within existing landfill waste
	BH5	Within existing landfill waste
	BH6	Within existing landfill waste
	BH7A	Within existing landfill waste
	BH7B	Beneath existing landfill waste
	BH9	Within existing landfill waste
	BH10	Within existing landfill waste
	BH11A	Within existing landfill waste
	BH11B	Beneath existing landfill waste
	BH12	Within existing landfill waste
GCEL Aug 2018	BH13	Within existing landfill waste
	BH15	Within existing landfill waste
	BH16	Within existing landfill waste
GCEL Feb 2020	B19-1	Upgradient of landfill
	B19-2	Downgradient of landfill
	B19-3	Upgradient of landfill
	B19-4	Beneath existing landfill waste
	B19-6	Beneath existing landfill waste
	B19-7a	Beneath existing landfill waste
	B19-8a	Beneath existing landfill waste
Proposed	P1-a	Within ‘new’ landfill waste
	P1-b	Within ‘new’ landfill waste
	P2-a	Within ‘new’ landfill waste
	P2-b	Within ‘new’ landfill waste
	P3-a	Within ‘new’ landfill waste
	P3-b	Within ‘new’ landfill waste
	P4-a	Within ‘new’ landfill waste
	P4-b	Within ‘new’ landfill waste
	P5-a	Within ‘new’ landfill waste

A schematic showing the different types of monitoring wells is presented in Figure 13.

Locations of the wells are presented in Figure 12

5.2 Gas Monitoring

A ground gas risk assessment was carried out as part of this application, see GCE00692/2020/GRA.

The ground gas risk assessment identified the following background ground gas conditions:

Table 20: Background ground gas conditions

Location ID	Type of well	Peak CH4 concentration (%)	Peak CO2 concentration (%)	Peak flow (l/h)
BH1A	Perimeter	< 1	< 5	+4.5 to -7.5
BH1B	Perimeter	< 1	< 5	< ± 0.5
BH2A	In-waste	< 5	< 5	< ± 0.2
BH2B	Perimeter	< 1	< 5	< ± 0.5
BH3	In-waste	< 1	< 5	< ± 0.2
BH4	In-waste	< 1	9 to 15	< ± 0.2
BH5	In-waste	< 2	< 5	< ± 0.2
BH6	In-waste	< 2	< 5	< ± 0.2
BH7A	In-waste	2 to 10	< 5	< ± 0.2
BH7B	Perimeter	< 1	< 5	< ± 0.2
BH9	In-waste	< 1	< 5	< ± 0.2
BH10	In-waste	< 1	< 5	< ± 0.2
BH11A	In-waste	< 1	< 5	< ± 0.2
BH11B	Perimeter	< 1	< 5	< ± 0.2
BH12	In-waste	< 3	< 5	< ± 0.2
BH13	In-waste	< 5	< 9	< ± 0.2
BH15	In-waste	< 1	< 5	< ± 0.2
BH16	In-waste	< 1	< 5	< ± 0.2

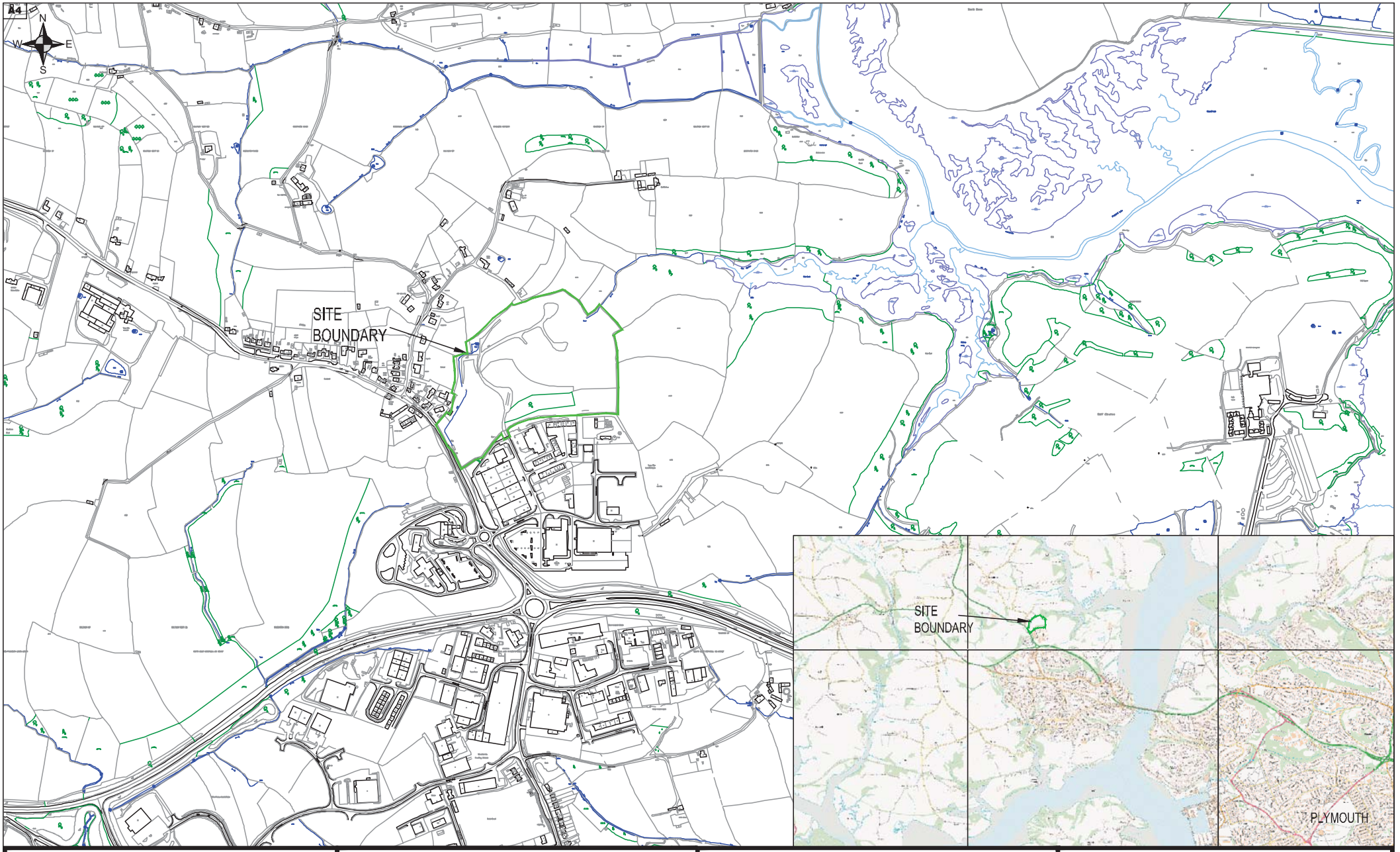
Locations are presented on Figure 12.

During the operation of Eales Farm Landfill, a suitably qualified person will undertake quarterly gas monitoring of the site. Monitoring will include the monitoring of wells mentioned in Table 19 above.

6 SITE CONDITION REPORT

See attached Site Condition Report at Appendix J.

FIGURES



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Woodbury, Exeter, EX5 1HQ

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W: www.geoconsultingeng.co.uk

Client:
Tamar Valley Projects Ltd

Drawing Status
For Information

Job Title:
Eales Farm Landfill

Dwg Title:
Site Location

Scale 1:10000 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no:
GCE00692/A/Fig1

Rev

A0

This drawing is not to be scaled: work to figured dimensions only.

Any discrepancy on this drawing to be reported immediately to Geo Consulting Engineering Ltd. for clarification.

KEY

EALES FARM LANDFILL

PLANNING PERMISSION FILL AREA

Rev	Date	Revision

Drawing Status: **For Information**

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Job Title: **Eales Farm Landfill**

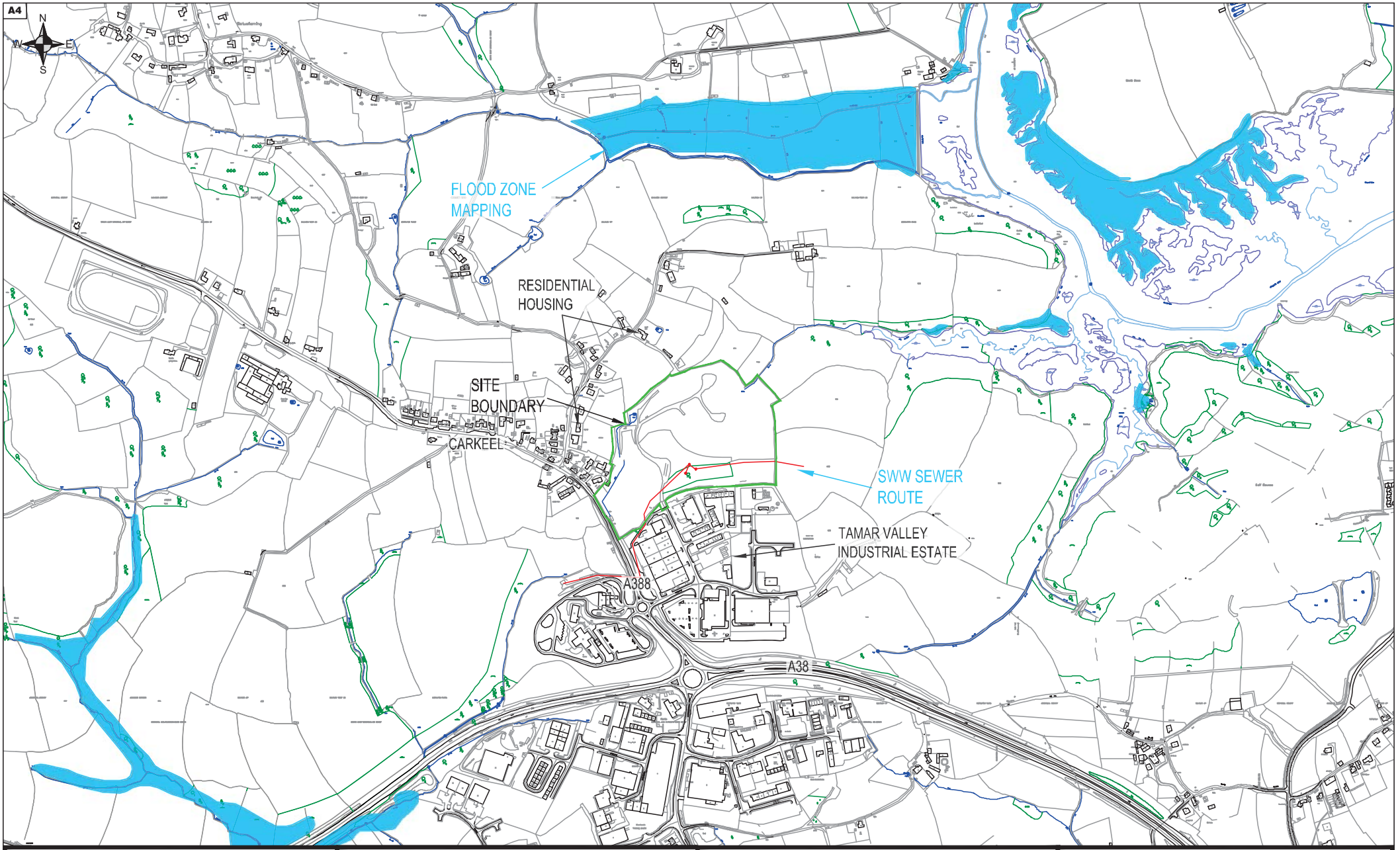
Dwg Title: **Permit Boundary and Site Layout**

Client: **Tamar Valley Projects Ltd**

Scale: 1:500 @ A0 Drawn: RA

Date: Apr 2020 Checked: DLJ

Drawing no: **GCE00692/A/Fig2** Rev: -



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Client:
Tamar Valley Projects Ltd

Drawing Status
For Information

Job Title:
Eales Farm Landfill

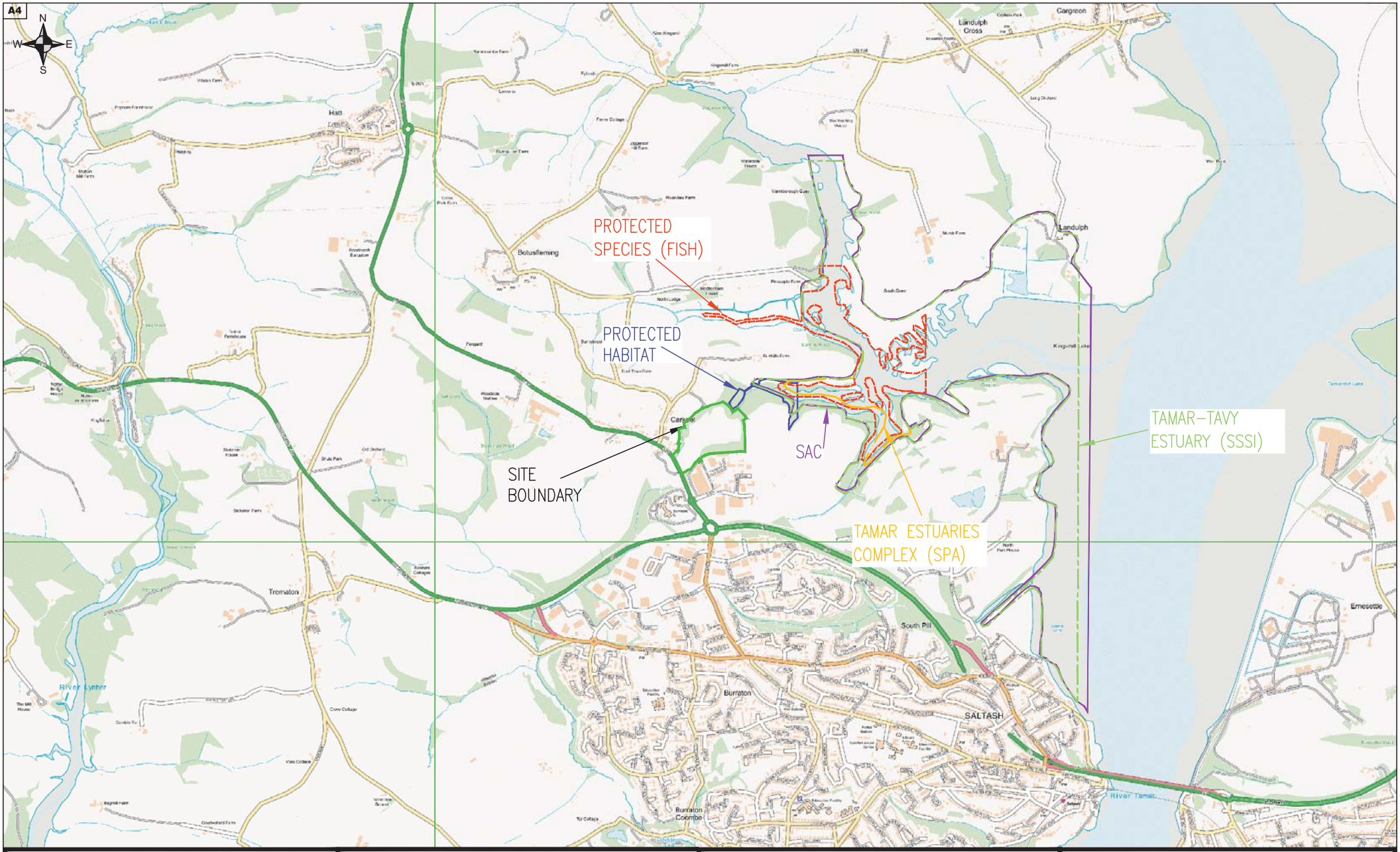
Dwg Title:
Environmental Site Setting

Scale 1:10000 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no:
GCE00692/A/Fig3

Rev



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Client:
Tamar Valley Projects Ltd

Drawing Status
For Information

Job Title:
Eales Farm Landfill

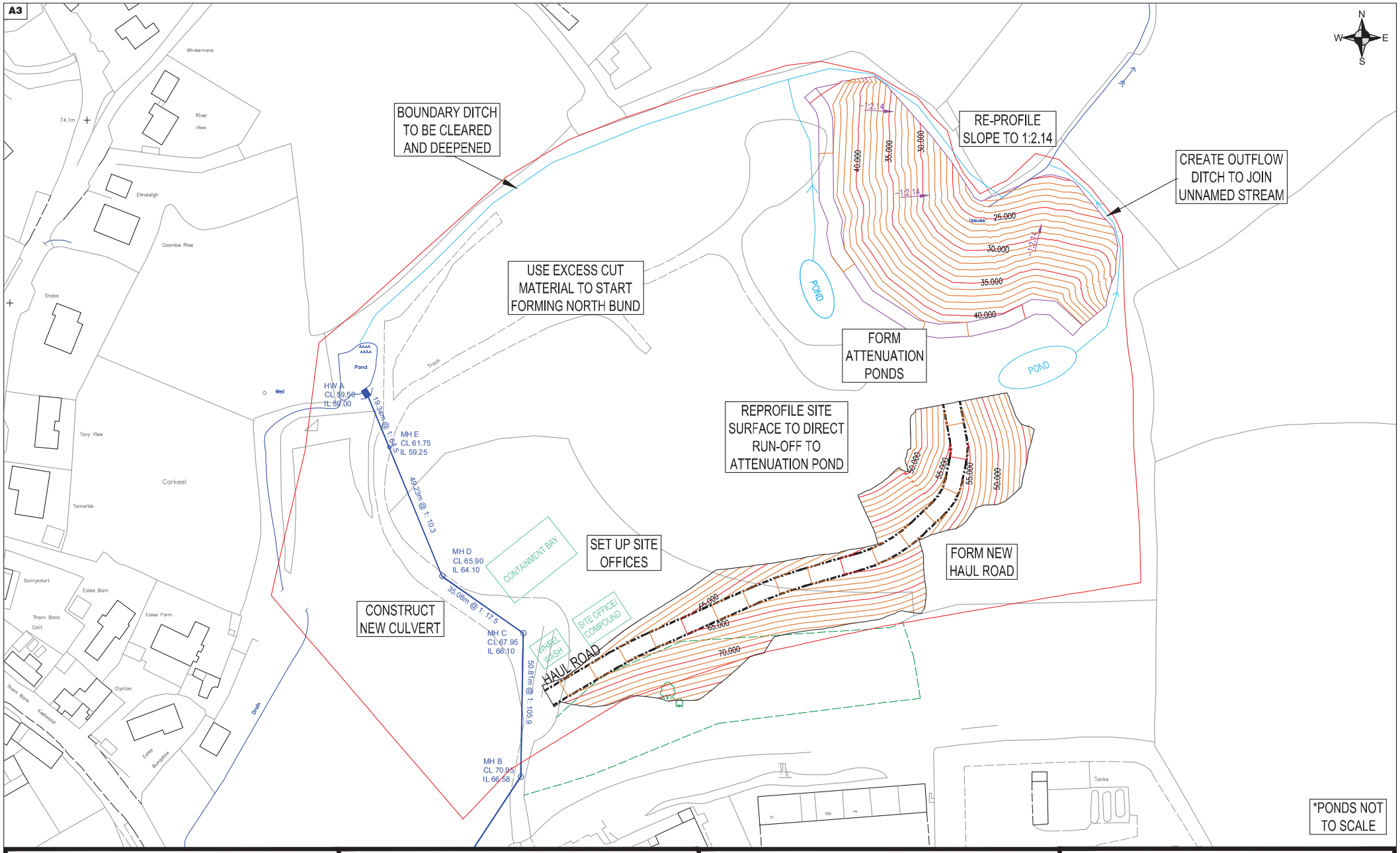
Dwg Title:
Cultural and Natural Heritage

Scale 1:25000 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no:
GCE00692/A/Fig4

Rev



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W: www.geoconsultingeng.co.uk

Client: **Tamar Valley Projects Ltd**

Drawing Status: **For Information**

Job Title: **Eales Farm Landfill**

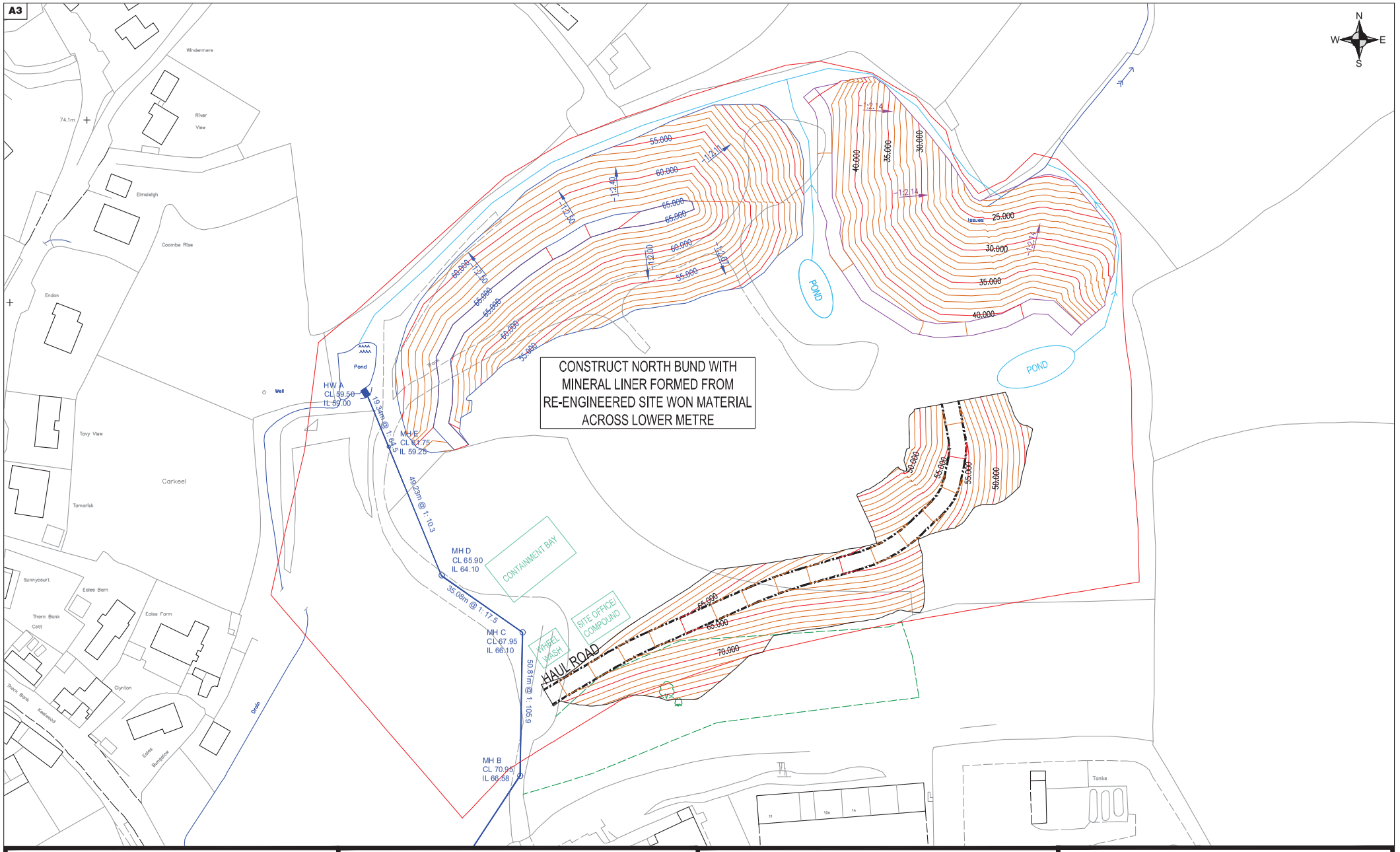
Dwg Title: **Enabling Works**

Scale 1:1250 at A3 Drawn RA

Date Feb 2021 Checked DLJ

Drawing no: **GCE00692-A-Fig5**

Rev -



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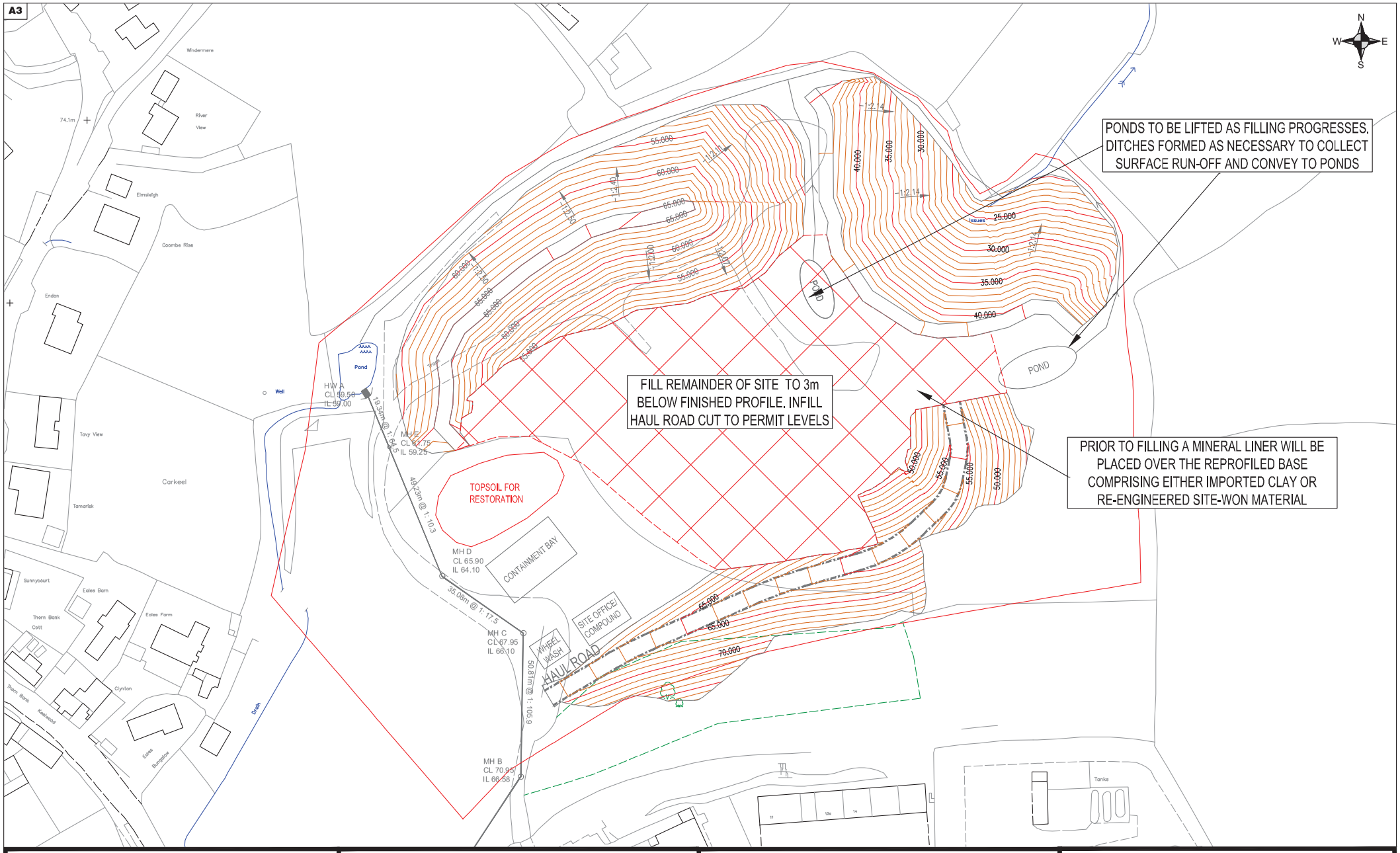
	Job Title: **Eales Farm Landfill**	Dwg Title: **Phase 1 Works**	Scale 1:1250 at A3 Drawn RA Date Feb 2021 Checked DLJ
			Drawing no: **GCE00692-A-Fig6a** Rev -



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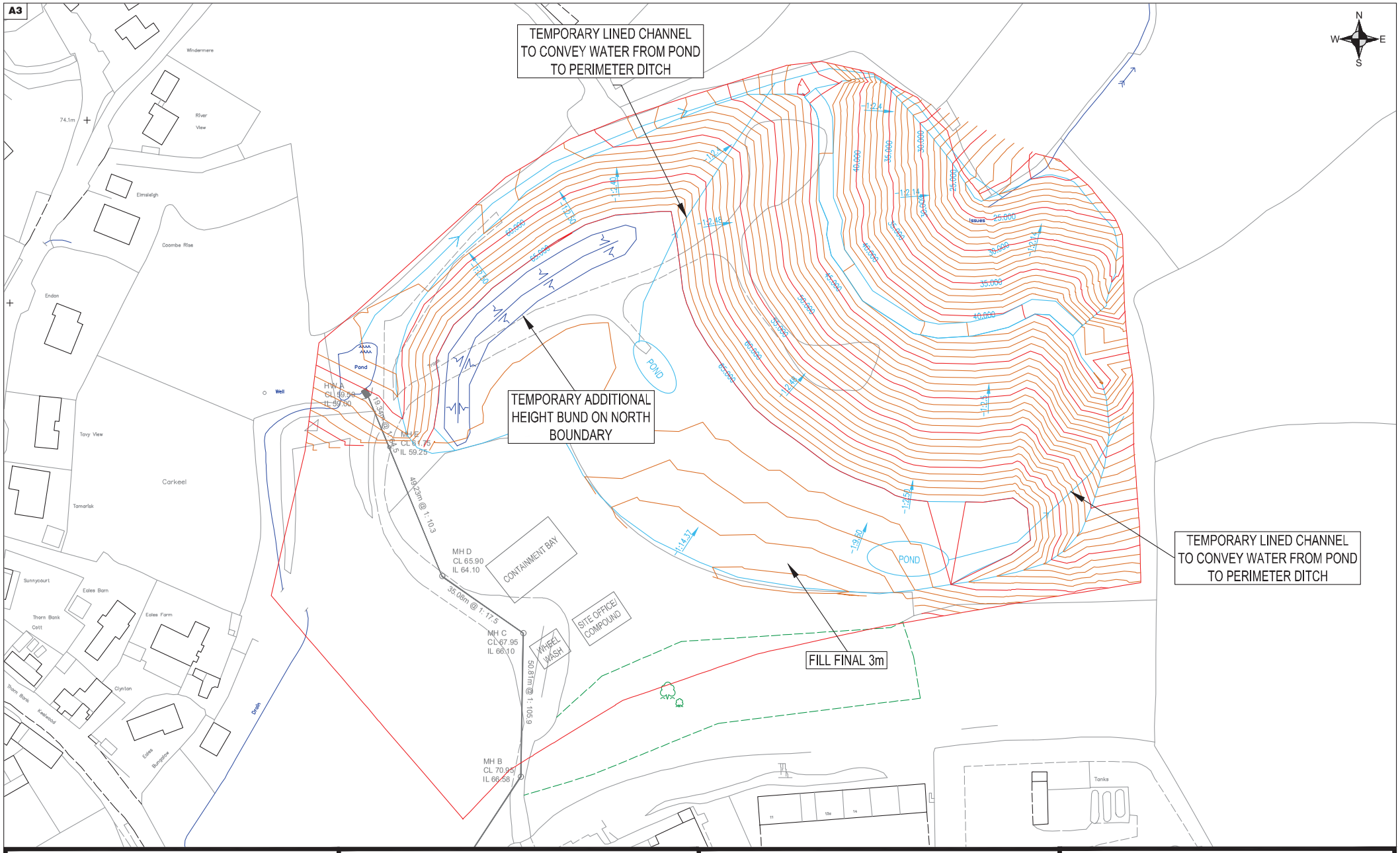
	Job Title: **Eales Farm Landfill**	Dwg Title: **Phase 2 Works**	Scale 1:1250 at A3 Drawn RA Date Feb 2021 Checked DLJ
			Drawing no: **GCE00692-A-Fig6b** Rev -



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	Job Title: **Eales Farm Landfill**	Dwg Title: **Phase 3 Works**	Scale 1:1250 at A3 Drawn RA Date Feb 2021 Checked DLJ
			Drawing no: **GCE00692-A-Fig6c** Rev -

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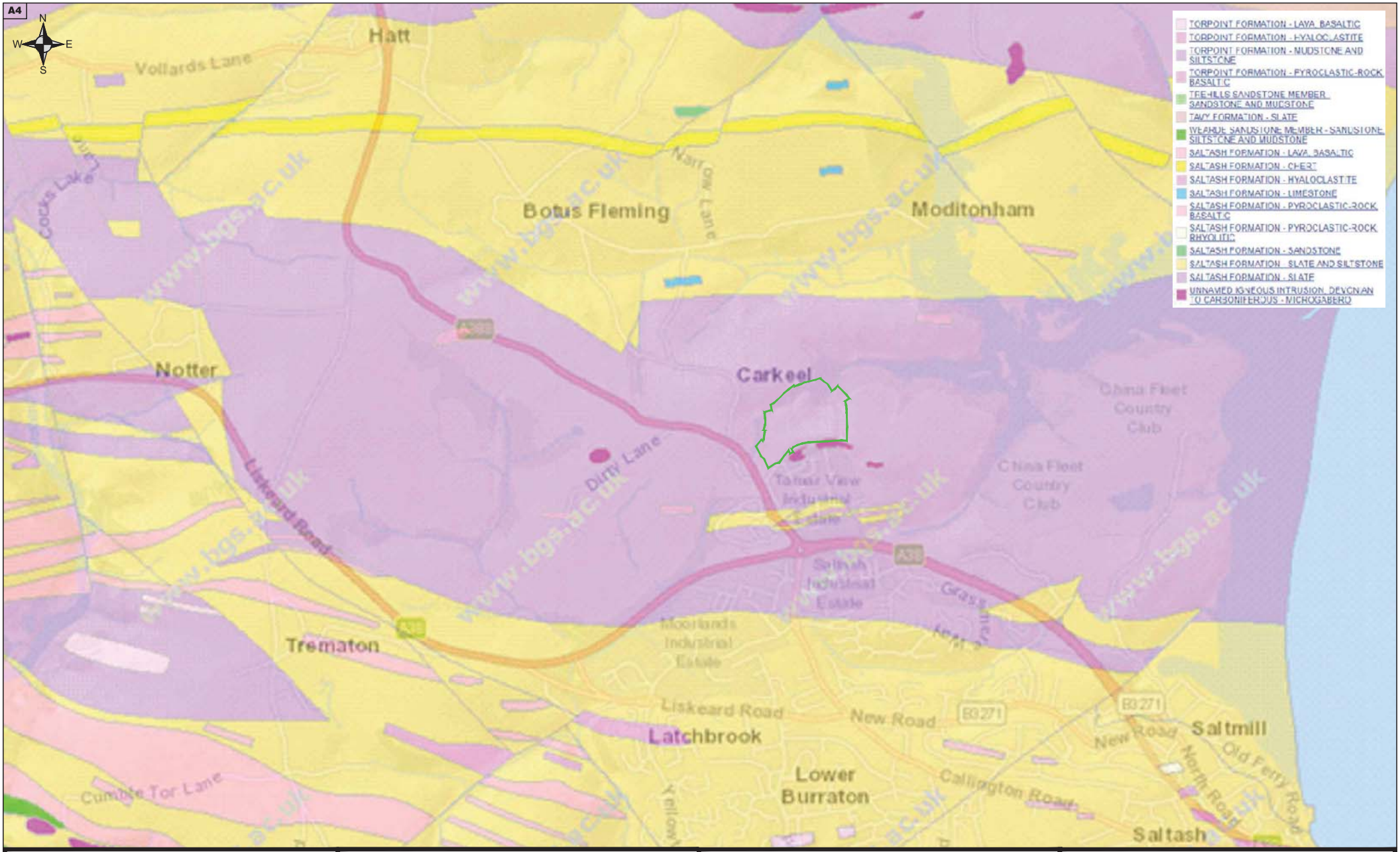
	Job Title: **Eales Farm Landfill**	Dwg Title: **Restoration Profile**	Scale 1:1250 at A3 Drawn RA Date Feb 2021 Checked DLJ Drawing no: **GCE00692-A-Fig7** Rev **-**



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Client: **Tamar Valley Projects Ltd**

Drawing Status: **For Information**

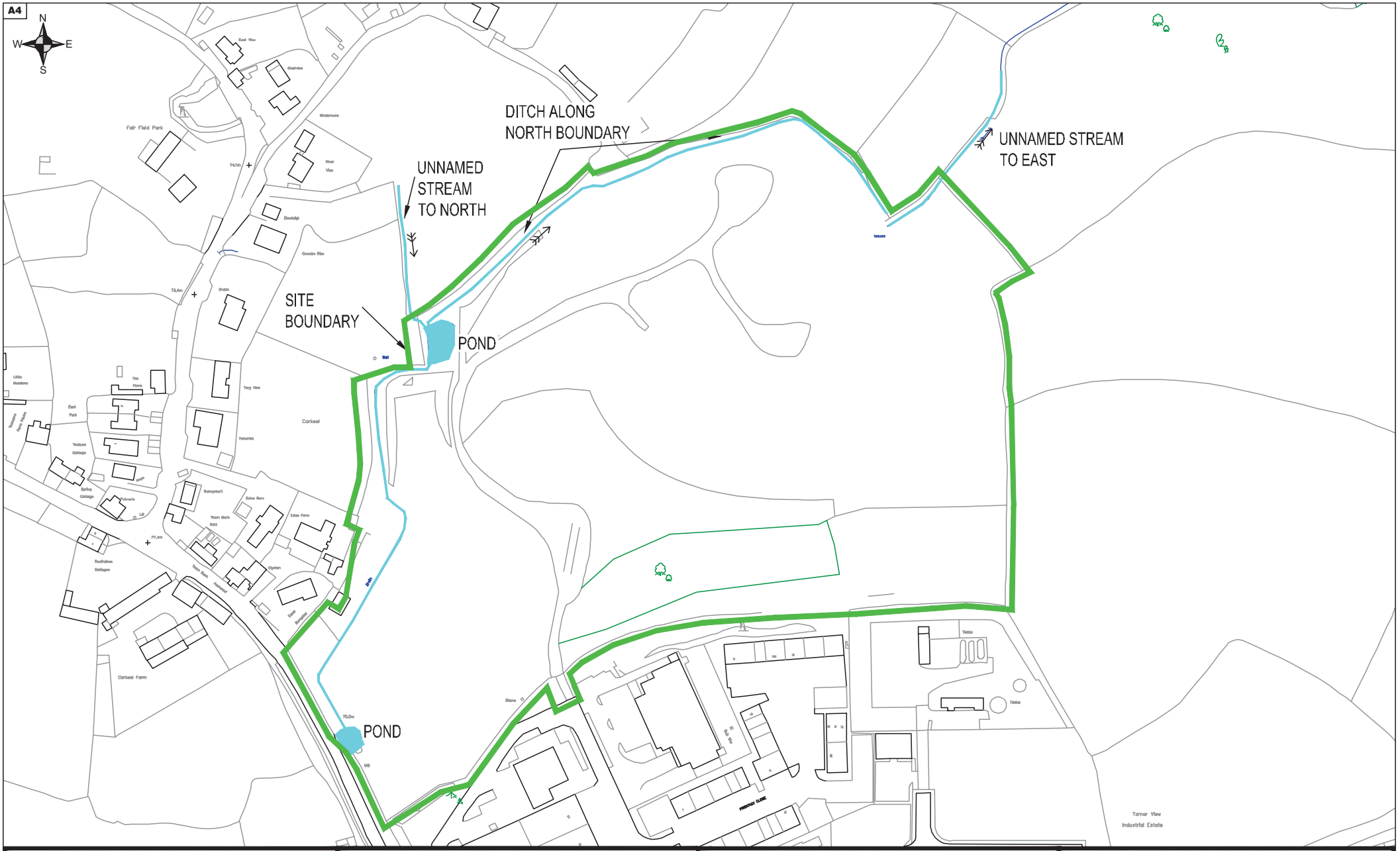
Job Title: **Eales Farm Landfill**

Dwg Title: **Regional Geology**

Scale 1:20000 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no: **GCE00692/A/Fig8** Rev



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Client:
Tamar Valley Projects Ltd

Drawing Status
For Information

Job Title:
Eales Farm Landfill

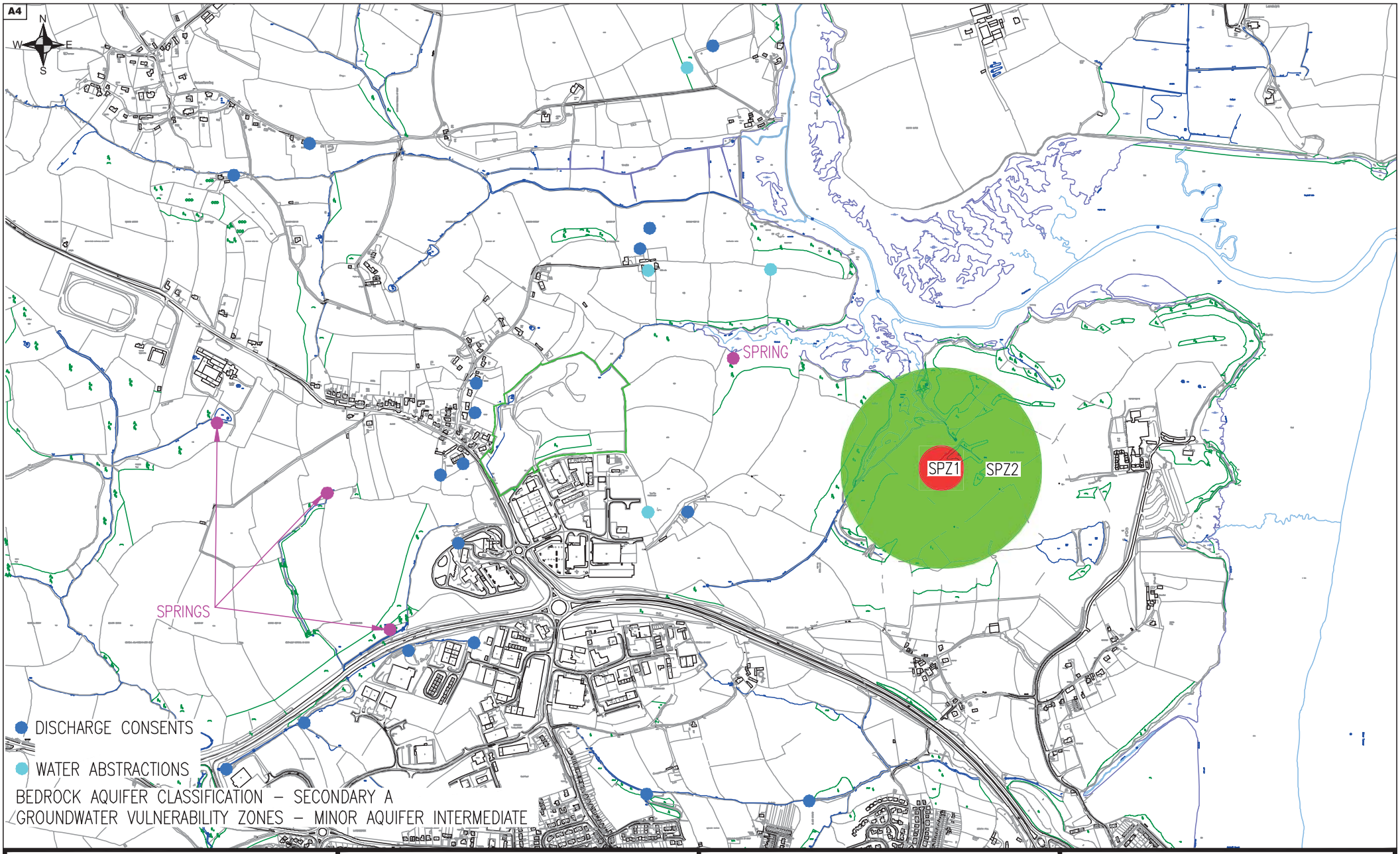
Dwg Title:
Water Courses

Scale 1:2500 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no:
GCE00692/A/Fig9

Rev



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W: www.geoconsultingeng.co.uk

Client:
Tamar Valley Projects Ltd

Drawing Status
For Information

Job Title:
Eales Farm Landfill

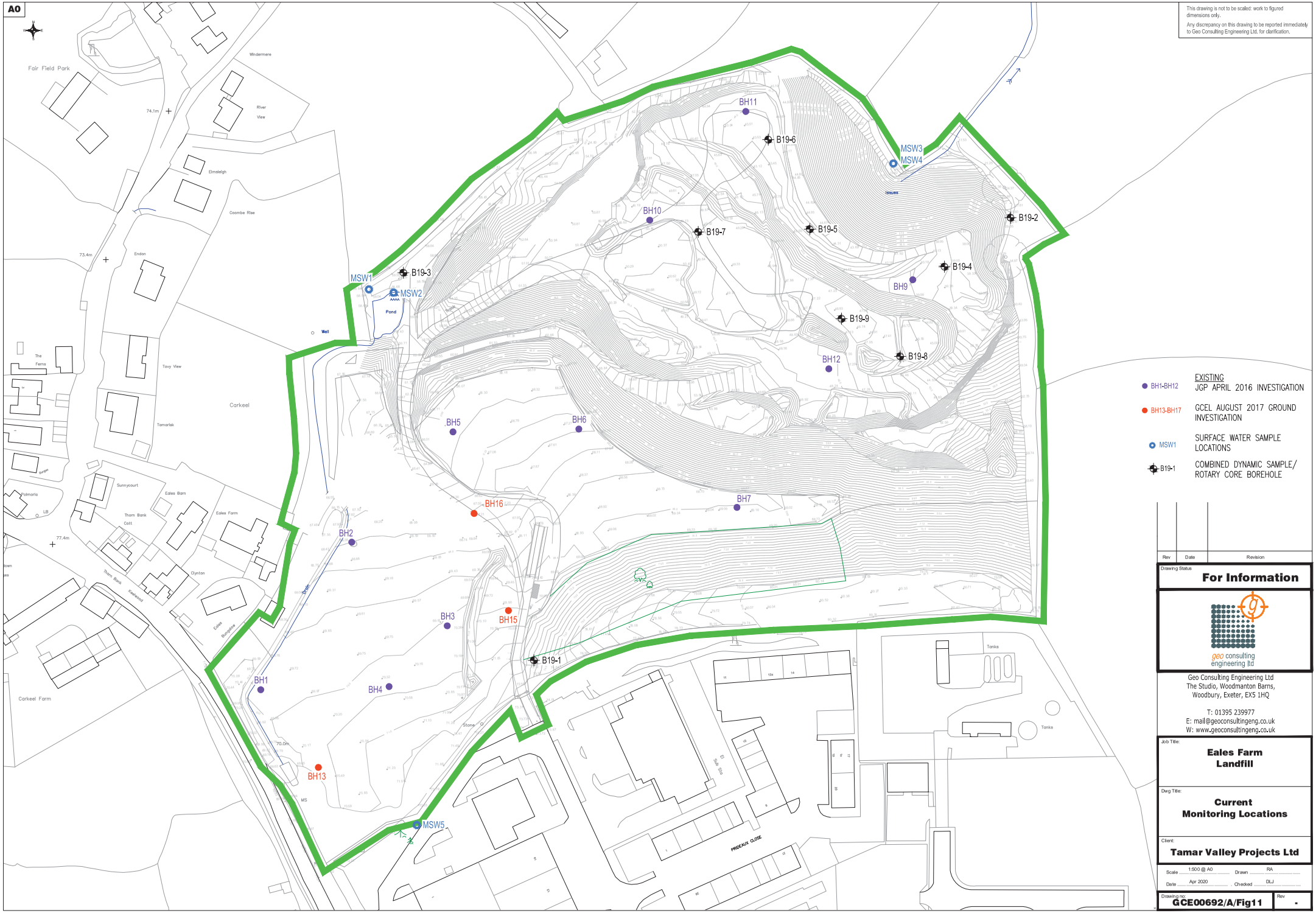
Dwg Title:
Regional Hydrology and Hydrogeology

Scale 1:12500 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no:
GCE00692/A/Fig10

Rev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This drawing is not to be scaled: work to figured dimensions only.
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BH11
B19-6
MSW3
MSW4
BH10
B19-7
B19-5
B19-2
B19-4
BH9
B19-9
B19-8
BH12
MSW1
B19-3
MSW2
Pond
Well
BH5
BH6
BH16
BH7
BH2
BH15
BH3
B19-1
BH1
BH4
BH13
MSW5
Fair Field Park
Windermere
River View
Elmsleigh
Coombe Rise
Endon
Tavy View
Carkeel
Tamarisk
Sunnycourt
Eales Barn
Eales Farm
Thorn Bank
Clynton
Carkeel Farm
Tanks
PRIDEAUX CLOSE
BH1-BH12
EXISTING
JGP APRIL 2016 INVESTIGATION
BH13-BH17
GCEL AUGUST 2017 GROUND INVESTIGATION
MSW1
SURFACE WATER SAMPLE LOCATIONS
B19-1
COMBINED DYNAMIC SAMPLE/ ROTARY CORE BOREHOLE
Rev
Date
Revision
Drawing Status
For Information
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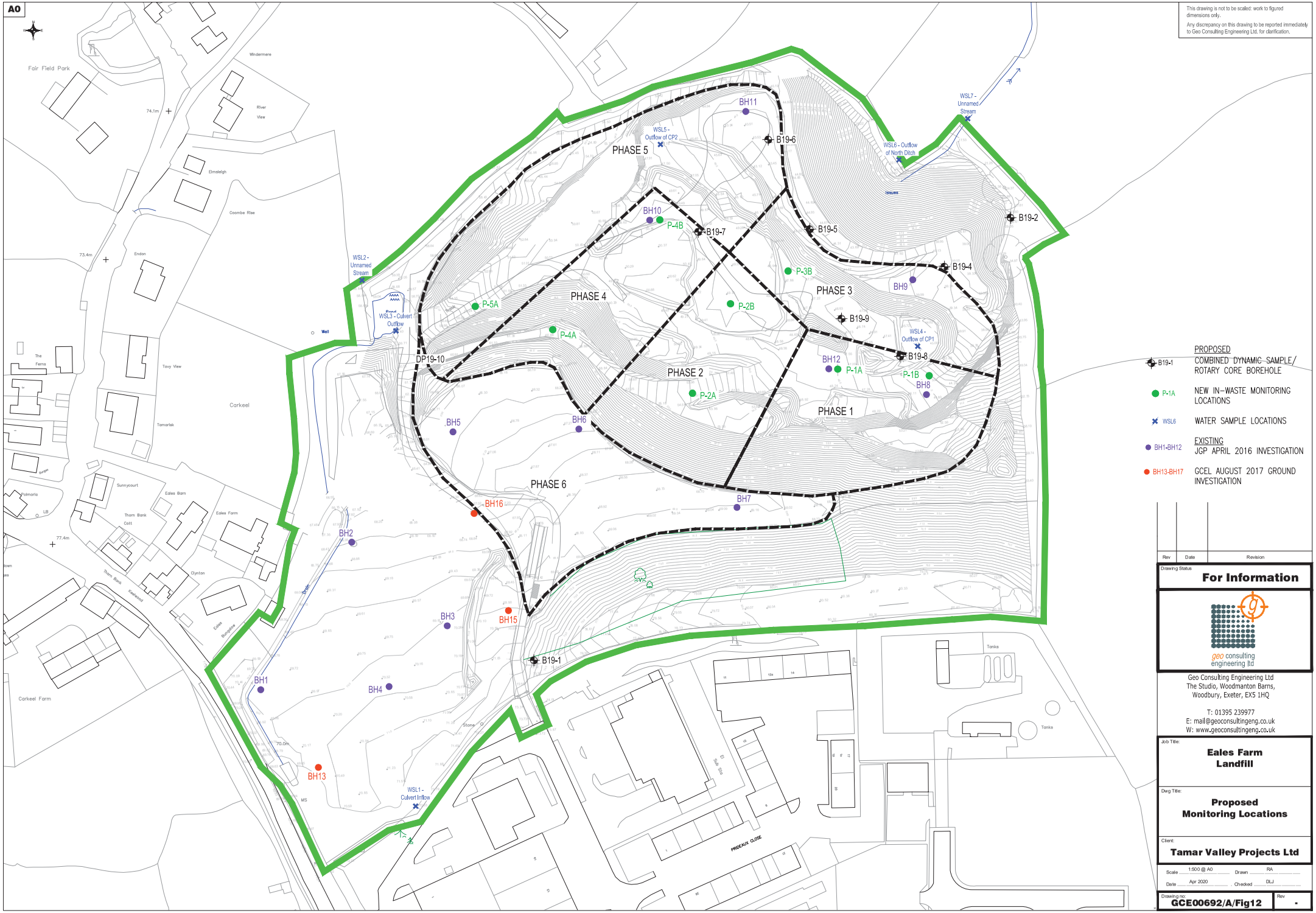
W: www.geoconsultingeng.co.uk
Job Title:
Eales Farm Landfill
Dwg Title:
Current Monitoring Locations
Client:
Tamar Valley Projects Ltd
Scale 1:500 @ A0
Drawn RA
Date Apr 2020
Checked DLJ
Drawing no. GCE00692/A/Fig11
Rev -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This drawing is not to be scaled: work to figured dimensions only.
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Fair Field Park
Windermere
River View
Elmsleigh
Coombe Rise
Endon
Tavy View
Carkeel
Tamarisk
Sunnycourt
Eales Barn
Eales Farm
Thorn Bank Cott
Clynton
Thorn Bank
Kenwood
Eales Bungalow
Carkeel Farm
Tolmoria
The Ferns
PHASE 1
PHASE 2
PHASE 3
PHASE 4
PHASE 5
PHASE 6
BH1
BH2
BH3
BH4
BH5
BH6
BH7
BH8
BH9
BH10
BH11
BH12
BH13
BH15
BH16
B19-1
B19-2
B19-4
B19-5
B19-6
B19-7
B19-8
B19-9
P-1A
P-1B
P-2A
P-2B
P-3B
P-4A
P-4B
P-5A
DP19-10
WSL1 - Culvert Inflow
WSL2 - Unnamed Stream
WSL3 - Culvert Outflow
WSL4 - Outflow of CP1
WSL5 - Outflow of CP2
WSL6 - Outflow of North Ditch
WSL7 - Unnamed Stream
Pond
Well
Stone
Tanks
PRIDEAUX CLOSE
PROPOSED
B19-1 COMBINED DYNAMIC SAMPLE/ ROTARY CORE BOREHOLE
P-1A NEW IN-WASTE MONITORING LOCATIONS
WSL6 WATER SAMPLE LOCATIONS
EXISTING
BH1-BH12 JGP APRIL 2016 INVESTIGATION
BH13-BH17 GCEL AUGUST 2017 GROUND INVESTIGATION
Rev
Date
Revision
Drawing Status
For Information
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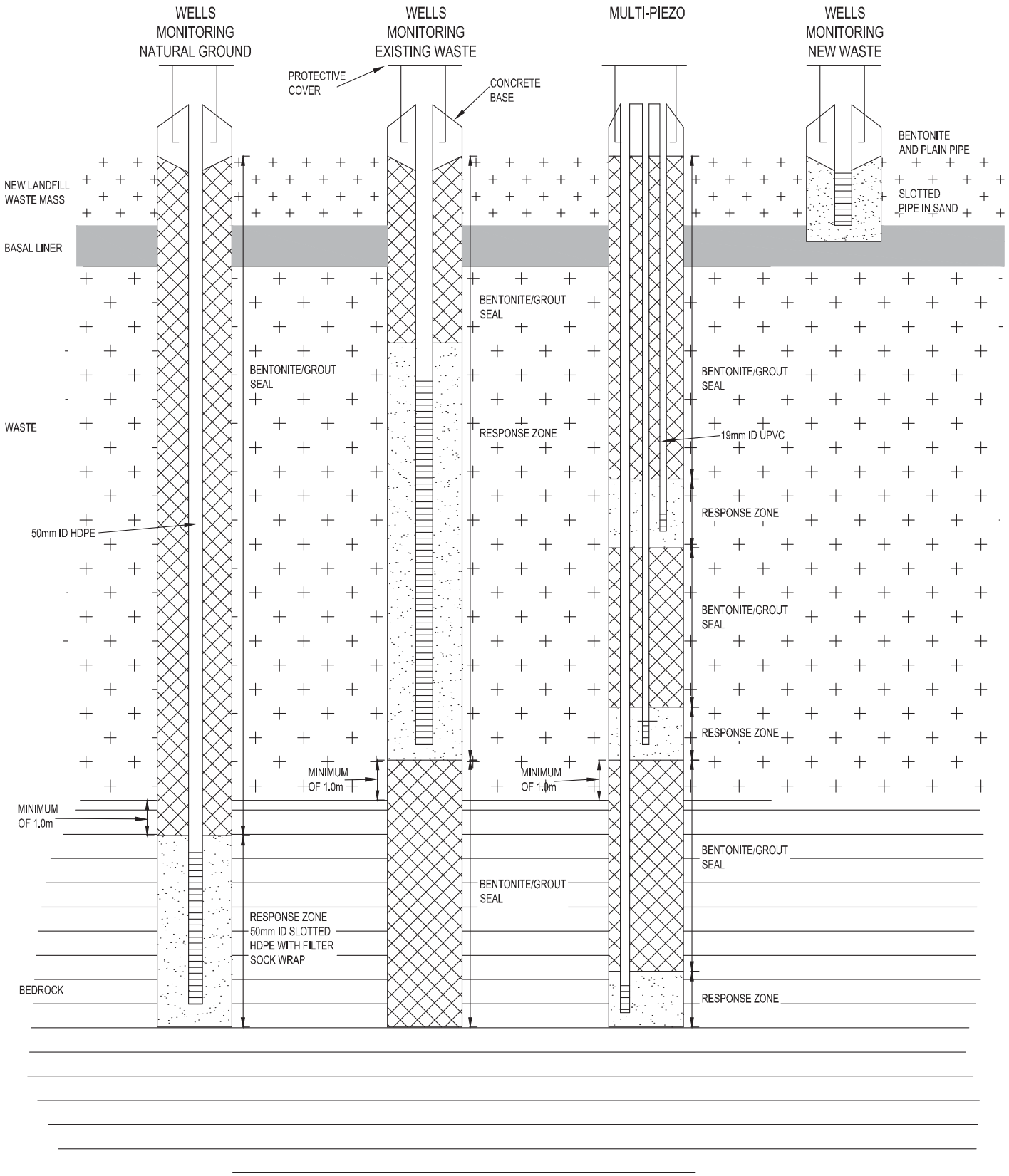
Woodbury, Exeter, EX5 1HQ
T: 01395 239977
E: mail@geoconsultingeng.co.uk
W: www.geoconsultingeng.co.uk
Job Title:
Eales Farm Landfill
Dwg Title:
Proposed Monitoring Locations
Client:
Tamar Valley Projects Ltd
Scale 1:500 @ A0
Drawn RA
Date Apr 2020
Checked DLJ
Drawing no. GCE00692/A/Fig12
Rev -

A3



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Job Title: **Eales Farm Landfill**

Dwg Title: **Monitoring Well Installation Designs**

Client: **Tamar Valley Projects Ltd**

Scale NTS Drawn RA

Date Jan 2020 Checked DLJ

Drawing no: **GCE00692-Fig2** Rev .

Rev	Date	Revision

Drawing Status: **For Information**

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W: www.geoconsultingeng.co.uk

Client:
Tamar Valley Projects Ltd

Drawing Status
For Information

Job Title:
Eales Farm Landfill

Dwg Title:
Permeability Test Locations

Scale 1:2500 @ A4 Drawn RA

Date Apr 2020 Checked DLJ

Drawing no:
GCE00692/A/Fig14

Rev

APPENDICES

Appendix A Planning Permission
Appendix B Historic Maps
Appendix C Envirocheck® Datasheet
Appendix D Culvert CCTV Survey
Appendix E Surface Water Runoff Calculations
Appendix F New Culvert Drawings
Appendix G Site Cross-Sections
Appendix H Groundwater Monitoring Data
Appendix I Permeability Test Data
Appendix J Site Condition Report

Appendix A Planning Permission

CORNWALL
COUNTY COUNCIL

Chief Executive & Clerk's Department
County Hall Truro TR1 3AY

Tel Truro (0872) 74282
Telex 45491 CWLLCC
Fax Truro (0872) 70340

1ST

Foot & Bowden
Solicitors
70/76 North Hill
Plymouth
Devon

Your ref: WJ/203/JC
My ref: VR
Extn: 2130

21st November 1991

Dear Sirs

Re: Landfill Site near Tamar View Industrial Estate

I refer to recent correspondence and telephone conversations concerning the above matter.

The County Council has now obtained Counsel's advice and as a result of that advice will be proceeding on the basis that the permitted tipping levels are as shown by the upper limits of the hatched area on the 1975 planning consent rather than the lower level represented by the dotted lines on the approved plan.

At its meeting on the 20th November the Council's Planning and Economic Development Committee decided to defer consideration of the company's proposals for a recycling compound and site accommodation, to enable discussions to take place with the company on the actual tipping levels and the need for a revised landscape scheme. The County Planning Officer will be in touch with you about this in the very near future.

Yours faithfully

V Rutherford

Mrs V Rutherford
for County Solicitor

CARADON DISTRICT COUNCIL
LOCAL PLANNING AUTHORITY
APPROVED
subject to conditions if any, specified in
Decision Notice No. 5/74/1136
Signed .....
Chief Executive Officer.
Date 6.1.75

PROJECT RIVER FILL SECOND PHASE.

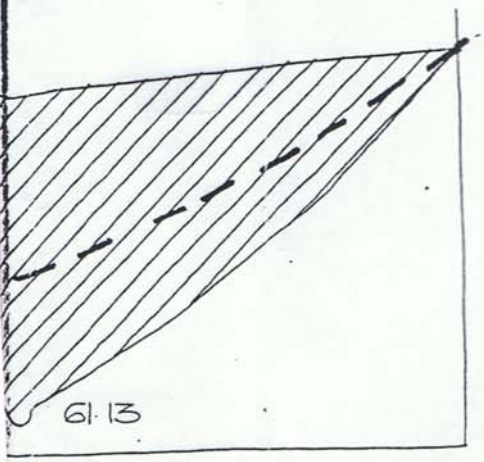
DRG. TITLE LOCATION

SCALE 1 2500
DATE february 74
DRAWN baker

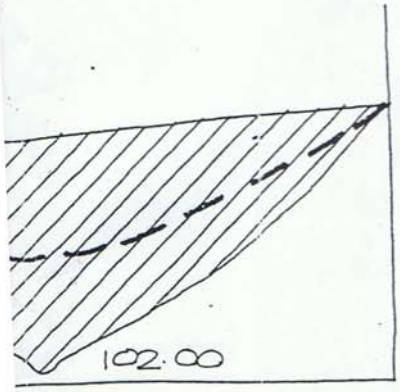
DWG No. 504•1 A

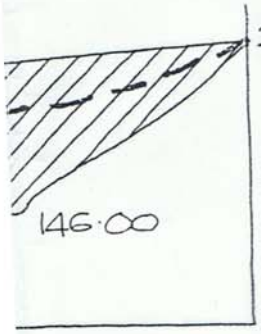
thorne barton and associates chartered architects
16 MAYFIELD ROAD BIRMINGHAM 13. B13 9HJ TEL. 021-449 1509

REVISIONS 'A' Sewer line added 22/11/74



All levels of fill shown are below foul sewer level.



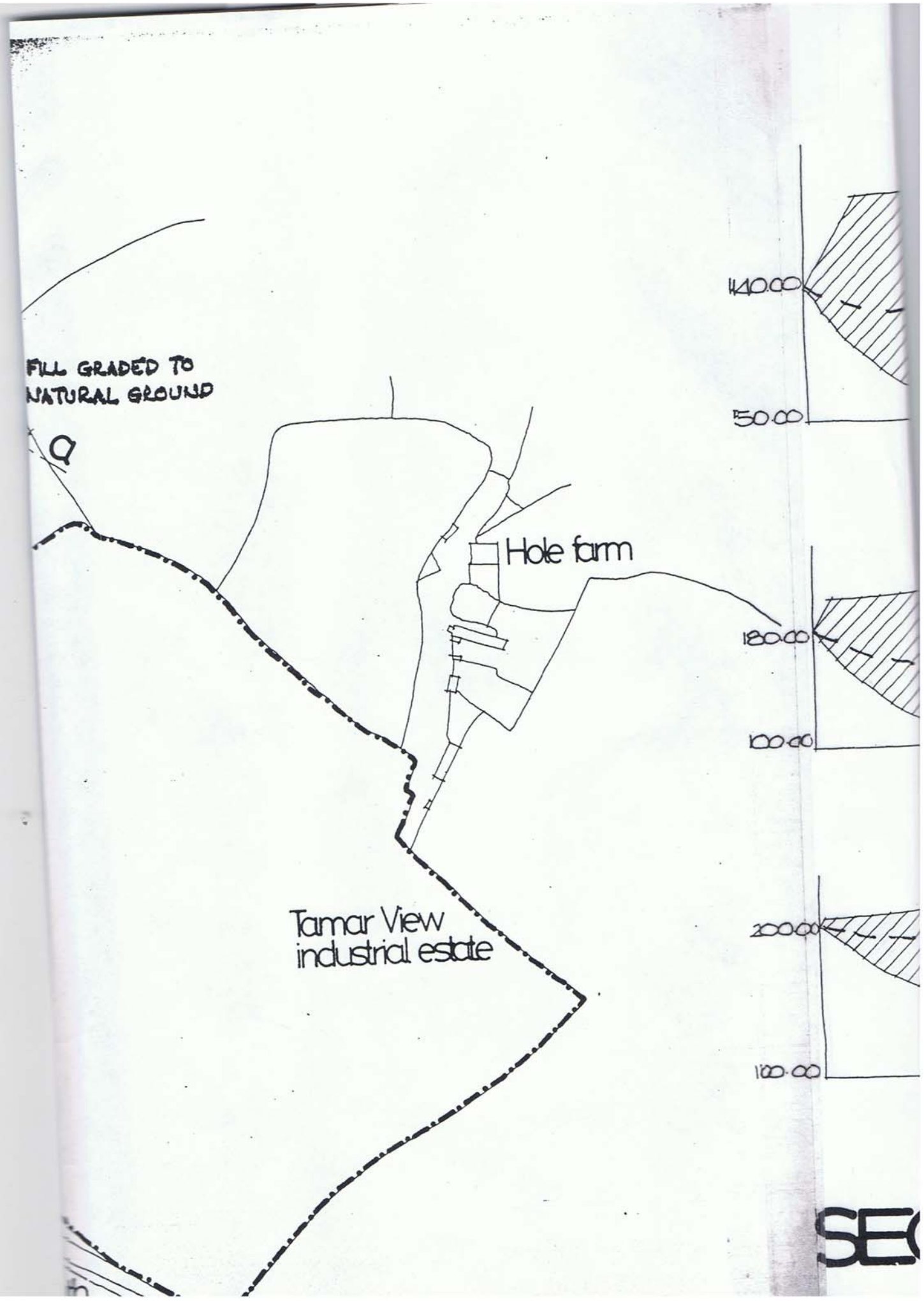


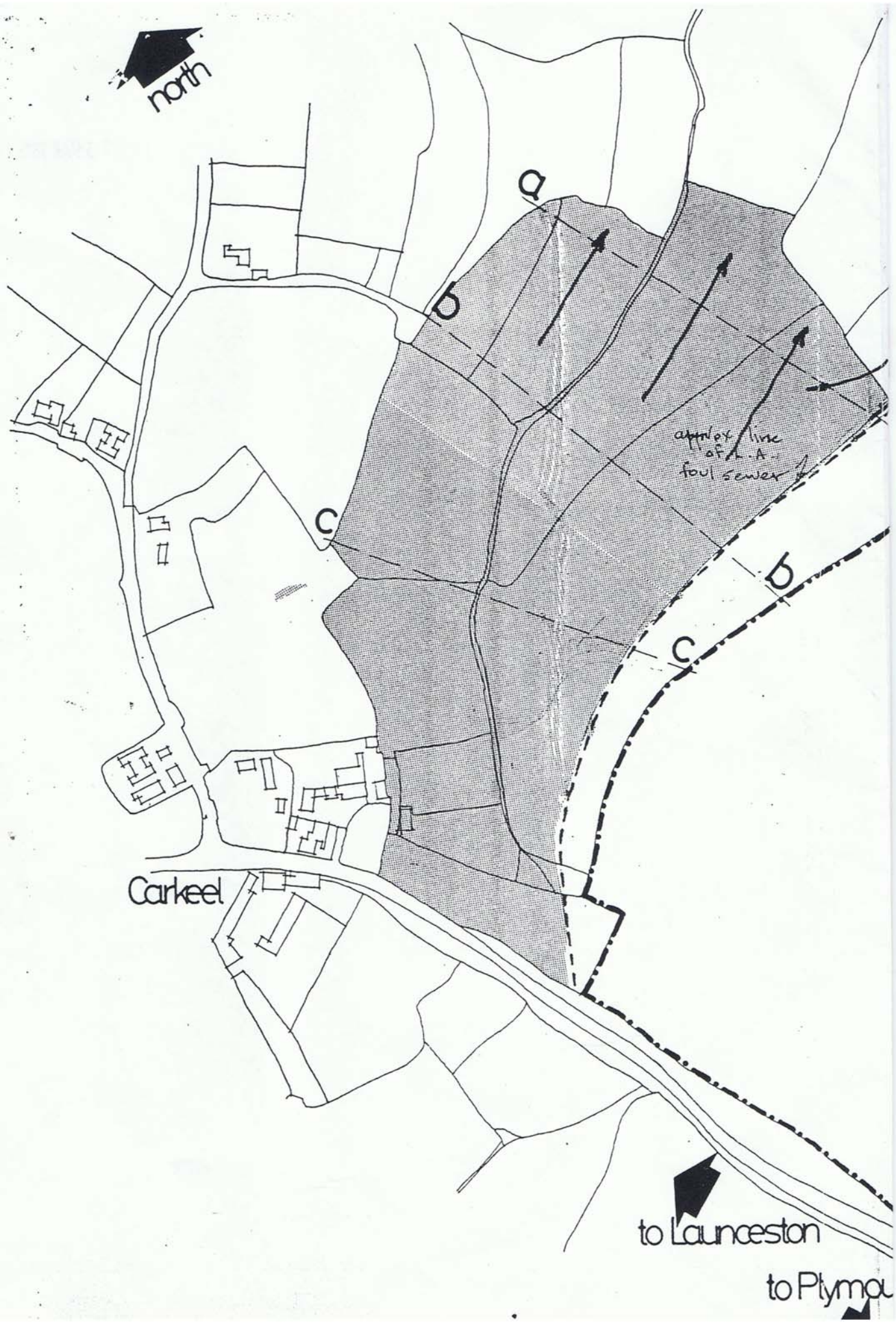
222·00 immediately below foul sewer invert level

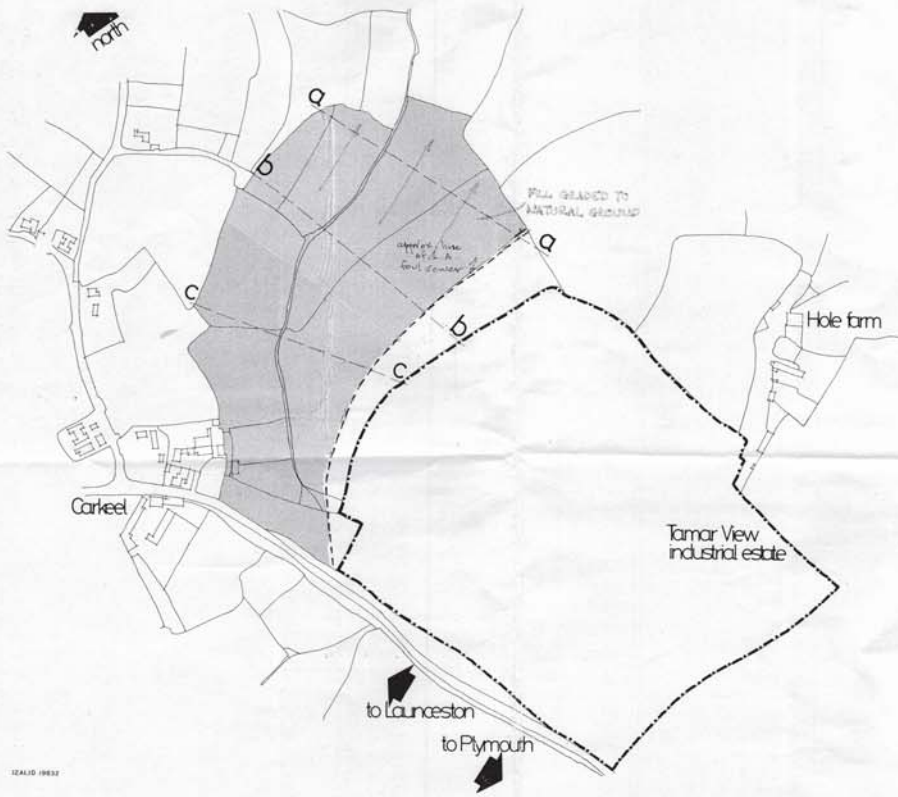
vertical scale 1/8" to 10'0"
horizontal 1.2500

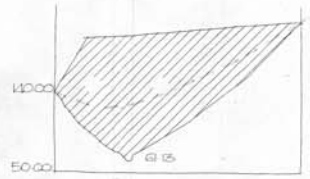
top slope 1 in 40 maximum 30° slope
side slope 30° to boundary.
stream to be culverted under fill.
proposed fill shaded on plan—hatched in section

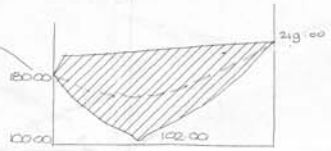
TIONS

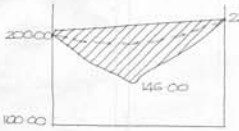

FILL GRADED TO
NATURAL GROUND
Hole farm
Tamar View
industrial estate
140.00
50.00
180.00
100.00
200.00
100.00


north
a
b
c
approx line of L.A. foul sewer
b
c
Carkeel
to Launceston
to Plymou









All levels of fill shown are below foul sewer level

222.00 immediately below foul sewer invert level

vertical scale 1/8" to 10'-0"
horizontal 1:2500

top slope 1in 40 maximum 50° slope
side slope 30° to boundary
stream to be culverted under fill
proposed fill shaded on plan — hatched in section

SECTIONS

IZALID 19832

CARADON DISTRICT COUNCIL
LOCAL PLANNING AUTHORITY
APPROVED
subject to conditions if any, specified in
Decision Notice No. 5/74/1126
Signed .....
Chief Executive Officer.
Date 6.1.75

PROJECT **RIVER FILL** SECOND PHASE.

DRG TITLE **LOCATION**

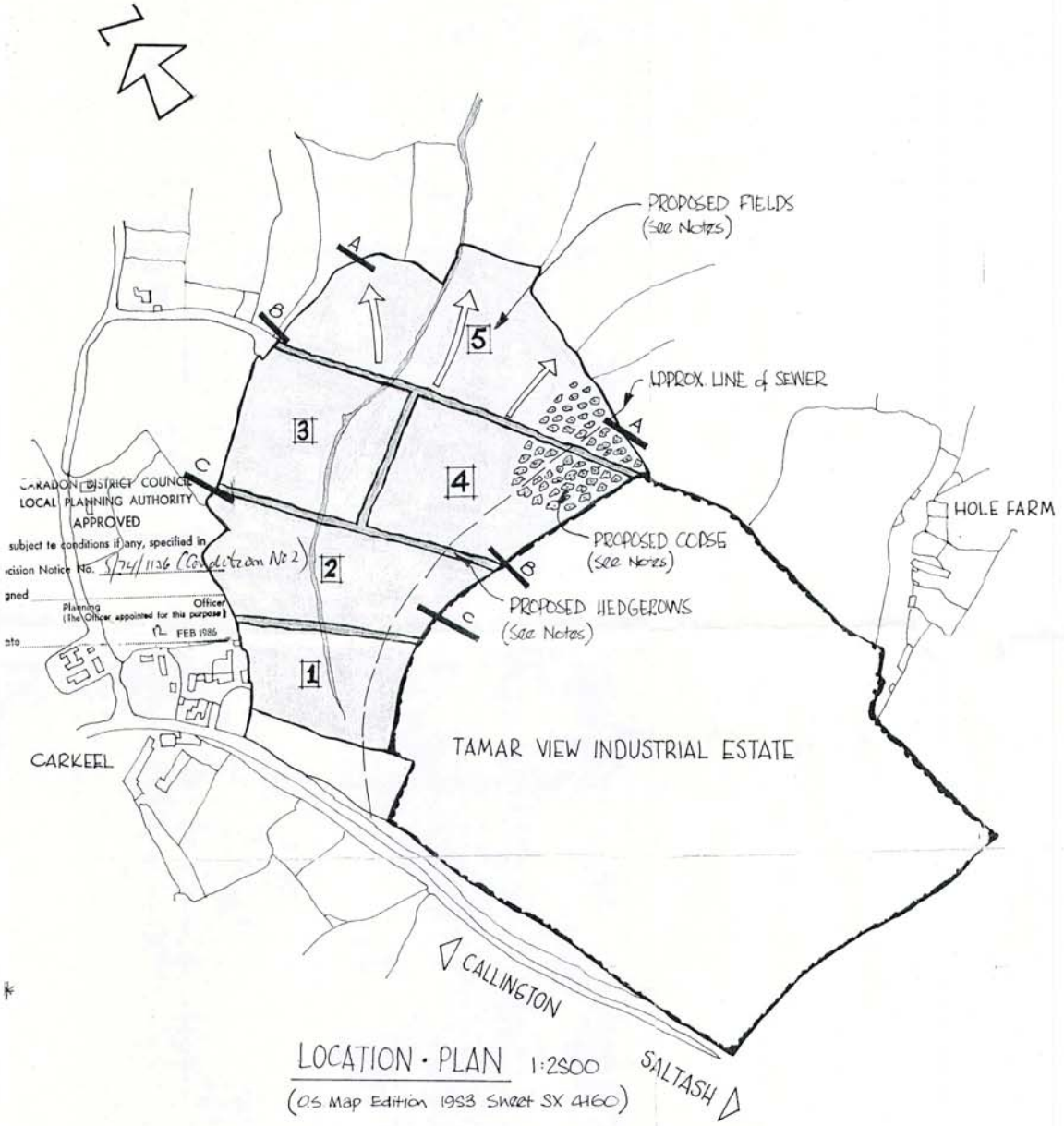
SCALE 1:2500
DATE february 74
DRAWN baker

DWG No. 504•1 A

thorne barton and associates chartered architects
16 MAYFIELD ROAD BIRMINGHAM 13. B13 9HJ TEL. 021-449 1509

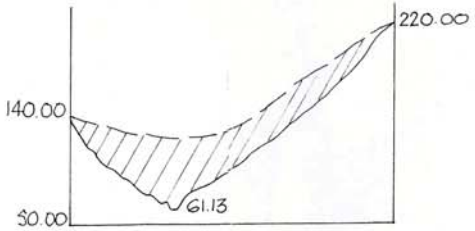
REVISIONS 'A' Sewer line added 12/74

POR B

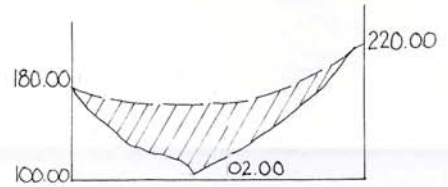


LOCATION · PLAN 1:2500
(OS Map Edition 1953 Sheet SX 4160)

SECTIONS



A - A



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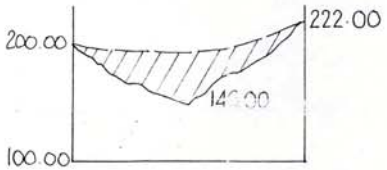


C - C

SECTION NOTES

Vertical Scale 1/8" to 10'0"
Top slope 1:40 Max 30° slope
Side slope 30° to boundary
Stream to be culverted under fill
Fill shown hatched

NOTES:

1. This drawing to be read in conjunction with existing Planning Consents:
   Nº S/74/0235 (2.12.74)
   Nº S/74/1136 (1.1.75)
2. After filling to levels and compaction (natural) areas will be fine cultivated, fertilized and seeded and returned to Agricultural Use. (See note 5.)
3. Hedgerows to be formed to comprise of stockproof fence with Hawthorn/Blackthorn Whips at 3 Nº/Metre, staggered with Sycamore Standards at 10.00 Metre intervals. Proposed hedgerow locations shown are approximate. The exact location will be determined on site.
4. The Copse will be to the shown steep slopes and comprise mixed Whips at 2.00 m centres protected with rabbit guards. The mix will be: 30% Maple, 30% Alder; 30% Pine; 10% Oak.
5. The Reconstruction will be phased as follows:
   Field **1**: During 1986/1987 planting season.
   Fields **2-5**: As and when filled. The reconstruction to take place during the next planting season following adequate natural compaction and no longer than 6 months after same. *

SCALE : 1:2500 LOCATION PLAN
1/8" - 10'0" VERTICAL SECTIONS

DATE : JANUARY 1986

DRG Nº : 504·2

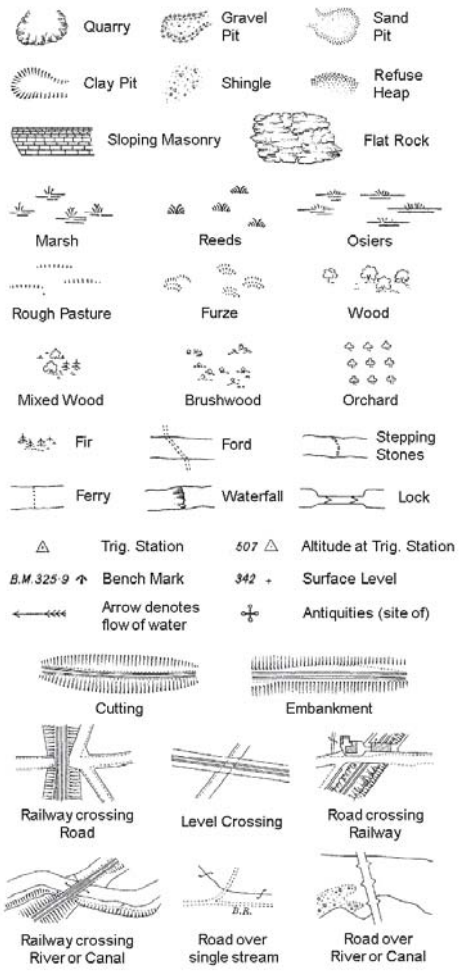
RIVER FILL PHASED RECONSTRUCTION SCHEME
at
TAMAR VIEW INDUSTRIAL ESTATE · SALTASH

JOHN GARRETT & SON LTD.,
STATION ROAD,
TAMERTON FOLIOT,
PLYMOUTH. Telephone 0752-703068

Appendix B Historic Maps

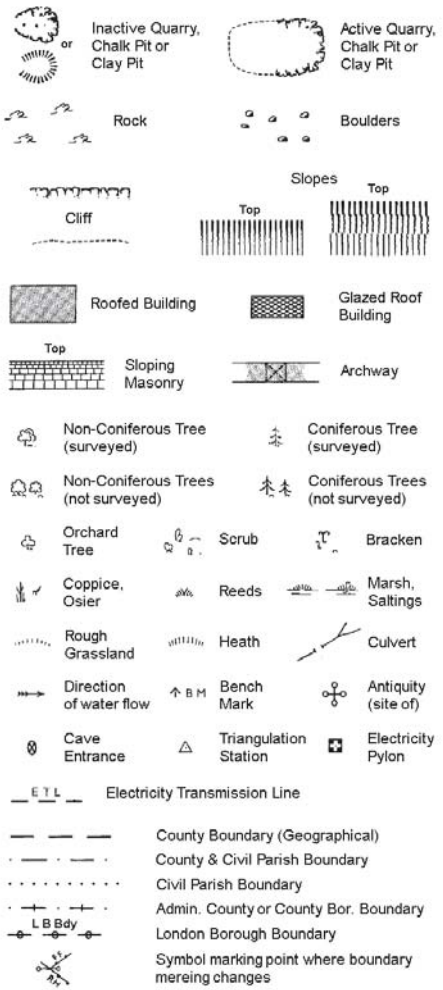
Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



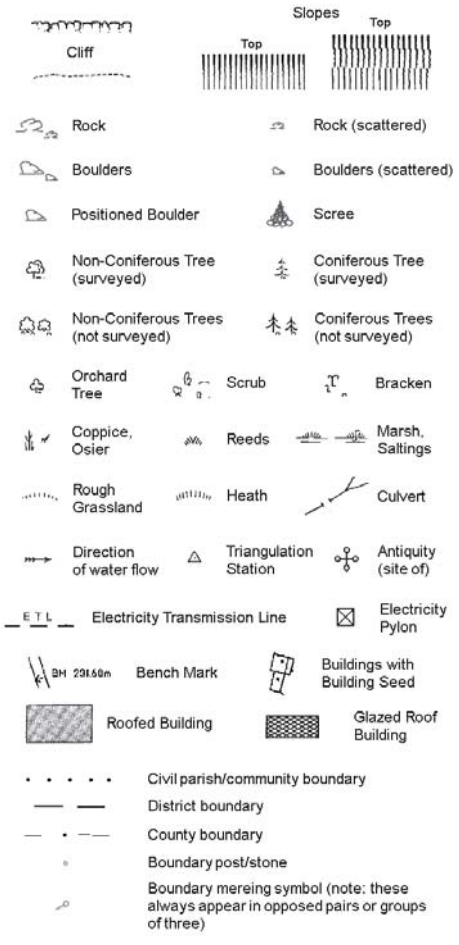
B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

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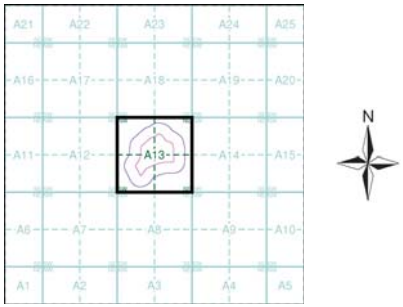
Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Cornwall & Isles Of Scilly	1:2,500	1883 - 1895	2
Cornwall & Isles Of Scilly	1:2,500	1906 - 1907	3
Cornwall & Isles Of Scilly	1:2,500	1914	4
Ordnance Survey Plan	1:2,500	1953	5
Ordnance Survey Plan	1:2,500	1968	6
Additional SIMs	1:2,500	1986	7
Additional SIMs	1:2,500	1989	8
Additional SIMs	1:2,500	1991	9
Large-Scale National Grid Data	1:2,500	1993	10

Historical Map - Segment A13



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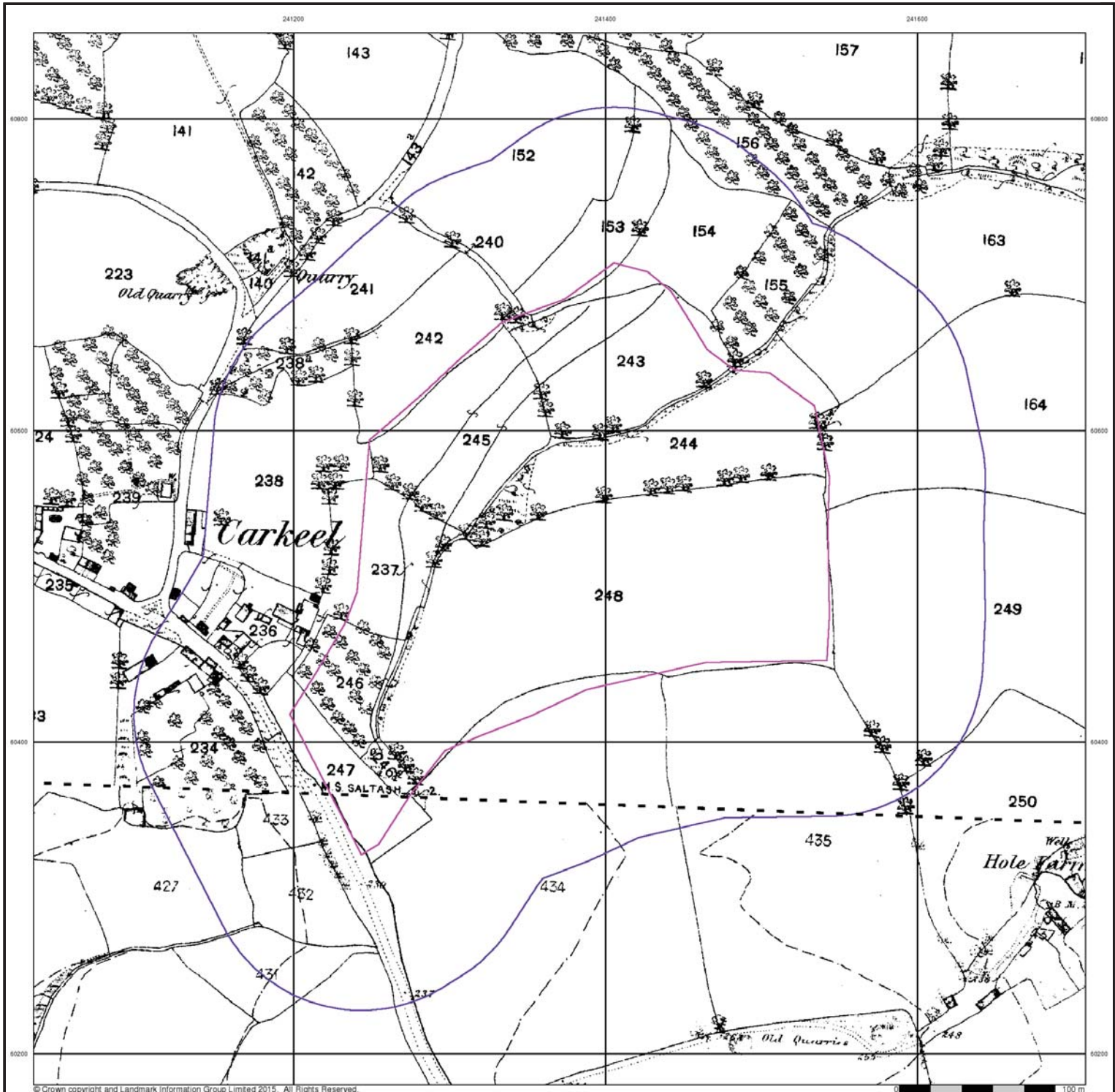
National Grid Reference: 241370, 60510
Slice: A
Site Area (Ha): 7.38
Search Buffer (m): 100

Site Details

Certini Bicycle Co, Tamar View Industrial Estate, SALTASH, Cornwall, PL12 6LD

Landmark® Information Group

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Envirocheck®

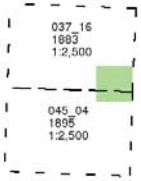
Cornwall & Isles Of Scilly

Published 1883 - 1895

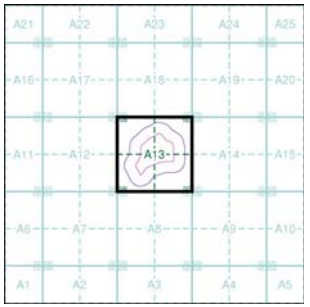
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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Slice:	A
Site Area (Ha):	7.38
Search Buffer (m):	100

Site Details

Certini Bicycle Co, Tamar View Industrial Estate, SALTASH, Cornwall, PL12 6LD

Landmark® Information Group

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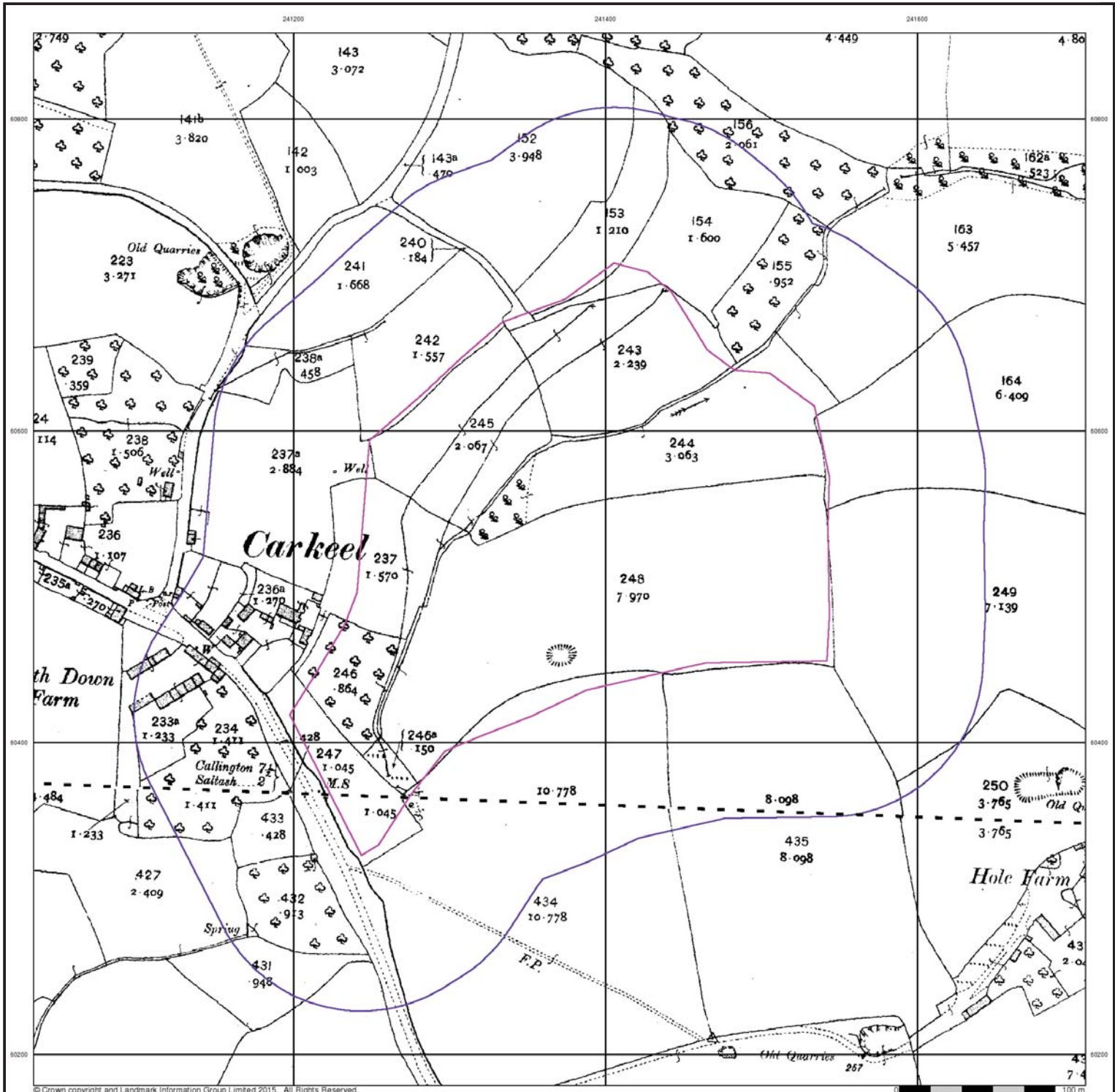

Envirocheck®

Cornwall & Isles Of Scilly

Published 1906 - 1907

Source map scale - 1:2,500

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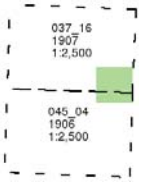
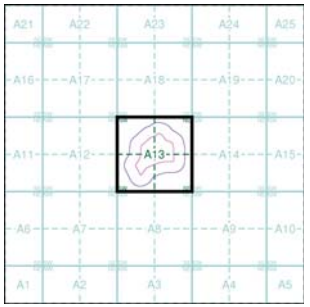
Map Name(s) and Date(s)



Historical Map - Segment A13



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National Grid Reference:	241370, 60510
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Site Area (Ha):	7.38
Search Buffer (m):	100

Site Details

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