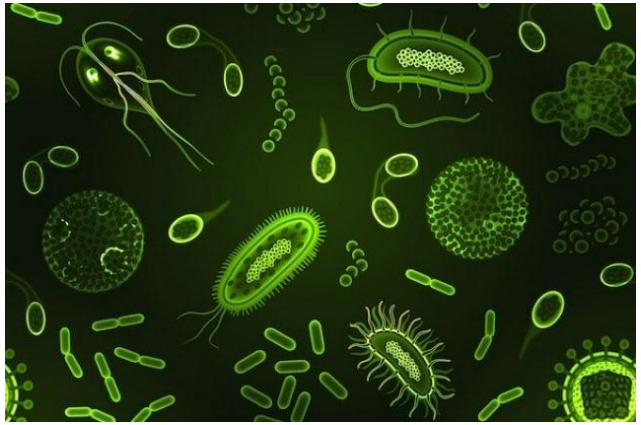
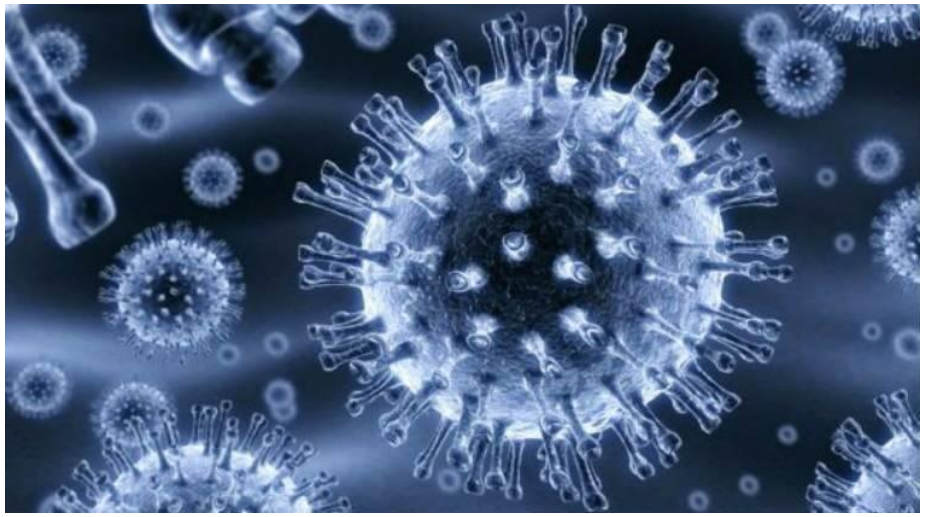
Cam Valley forum

Mike Foley
24th March 2022

Faecal contamination



in our rivers.



Please note that this presentation was intended to provide a view of the

background to the project, and datasets were selected to support key points or issues. Some significant

issues pointed out during the presentation may not be obvious without an in-depth study of the slides.

The Report on Batch 3 sampling (19th January 2022) will be added to the Cam Valley Website shortly.

Please do not publish any data in this presentation, in this form

How ***much*** - or how ***concentrated***?

Flow matters:

Variable flows in rivers and ditch

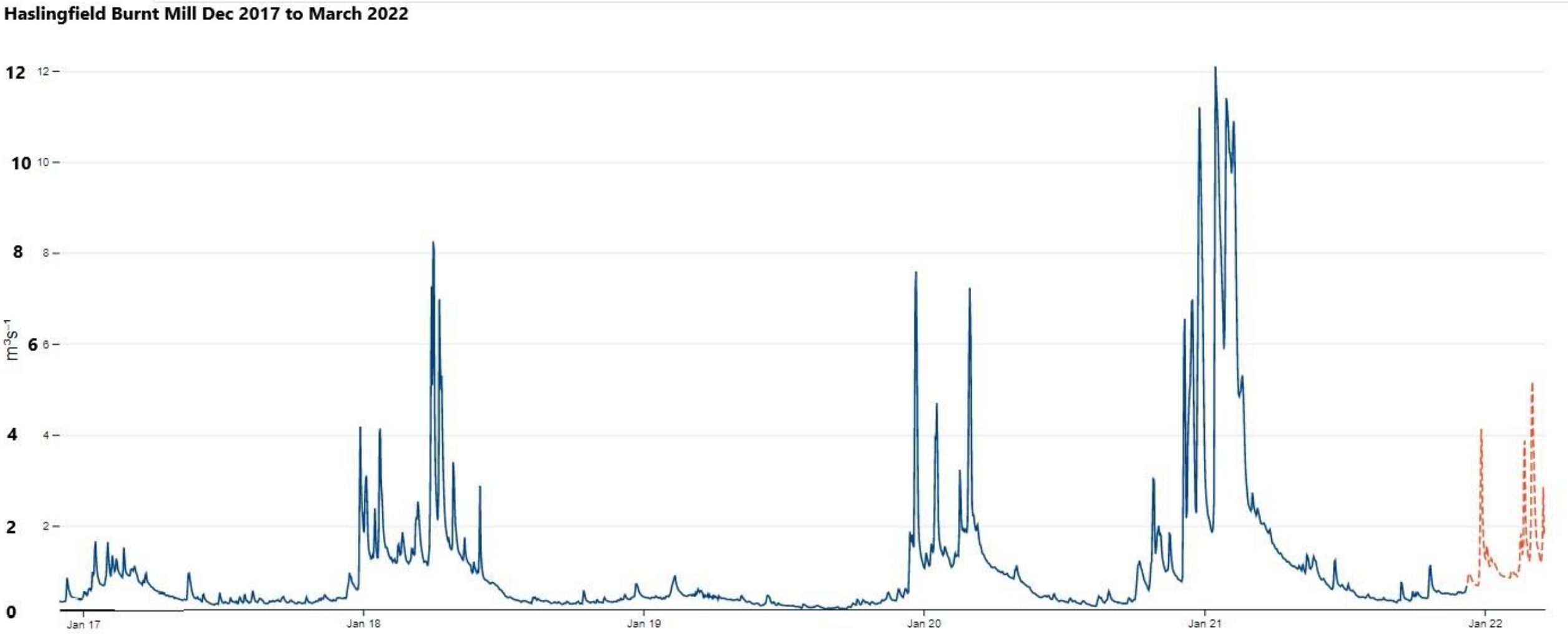
Variable effluent flow from sewage works

Variable potential inputs from agriculture

Environment Agency Bathing Water quality standards
Counts per 100ml

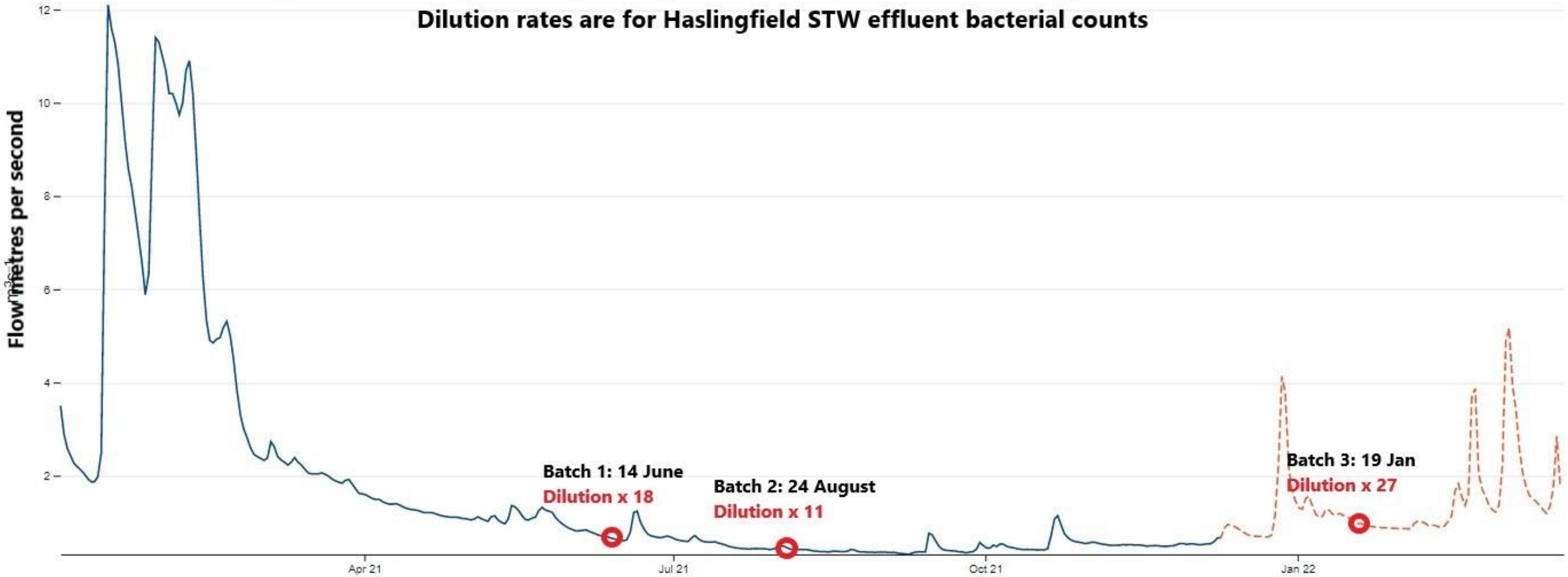
E.coli		
BW status	**Levels**	**Percentile**
Excellent	500	95
Good	1000	95
Sufficient	900	90
Poor	>900	90
Enterococci		
BW status	**Levels**	**Percentile**
Excellent	200	95
Good	400	95
Sufficient	330	90
Poor	>330	90

Daily flow in River Rhee at EA Burnt Mill gauging station, Haslingfield



Dates of samples Batches 1, 2 and 3, during low rainfall periods and sewage works effluent was 100% treated

Dilution rates are for Haslingfield STW effluent bacterial counts



south east water
scientific services

ANALYTICAL REPORT

B.A.Hydro Solutions Limited
3 The Sidings
Station Road
Shepreth-Royston
Hertfordshire
SG8 6PZ
Collected From: CVF CAM BATCH 3
Date Received: 19/01/2022

Certificate Number: 929553-1 Final
Order Number: 21220165
Date Reported: 22/01/2022

Lab Ref.	Sample Details	Method	Test	Result	Units	Limit	Flag
4223118	Desc: RIVER WATER S. MESH Collect From: CVF CAM BATCH 3 Order No: 21220165 Received Date: 19/01/2022 Tested Date: 19/01/2022 Sampling Date: 19/01/2022 09:45 Sample Type: SW Product: SS-PWS	400	E coli	8164	mpn/100ml		
		400	Total coliforms	48840	mpn/100ml		
		390	Enterococci	1300	cfu/100ml		
		270	Phosphorus-SRP	1302.0	µg / l		

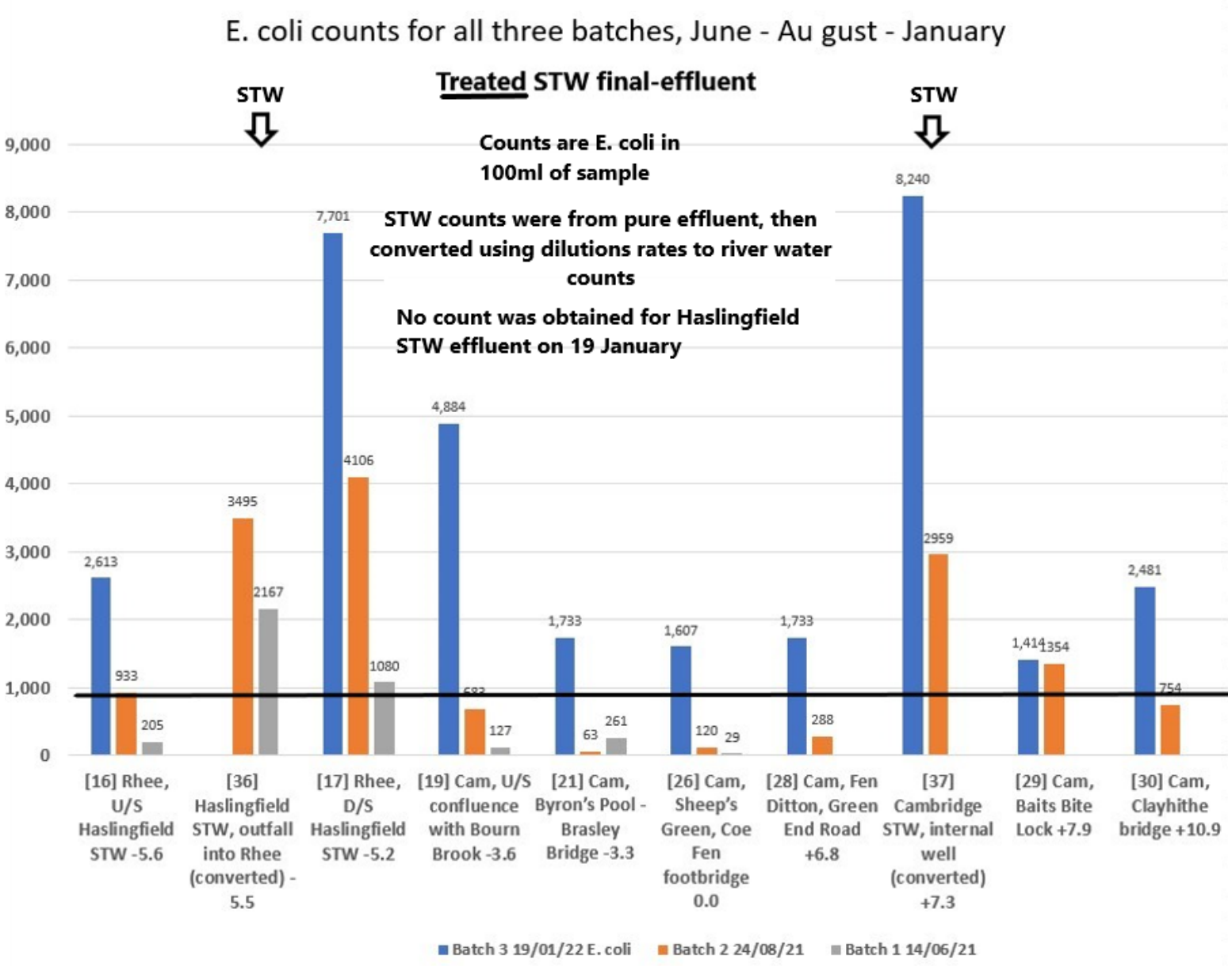
Richard Brown
Laboratory Manager

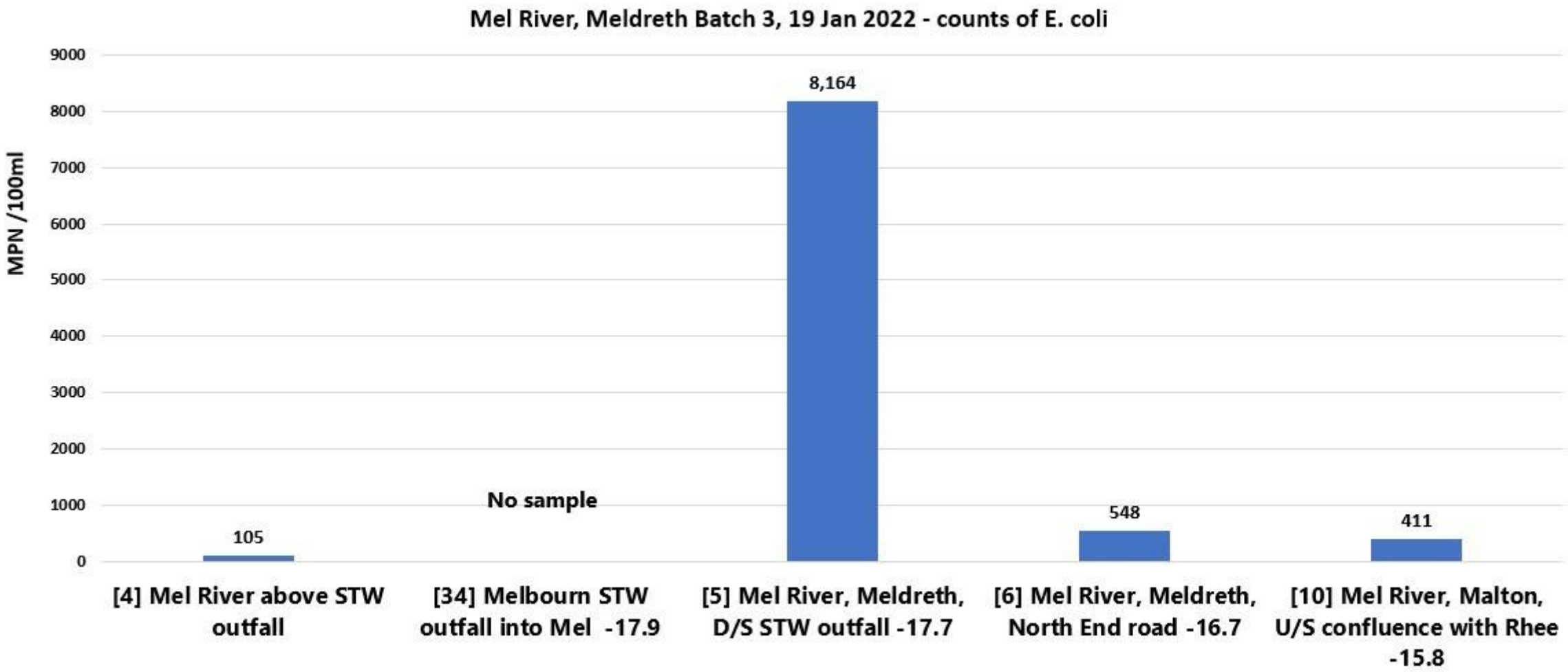
Disclaimers:

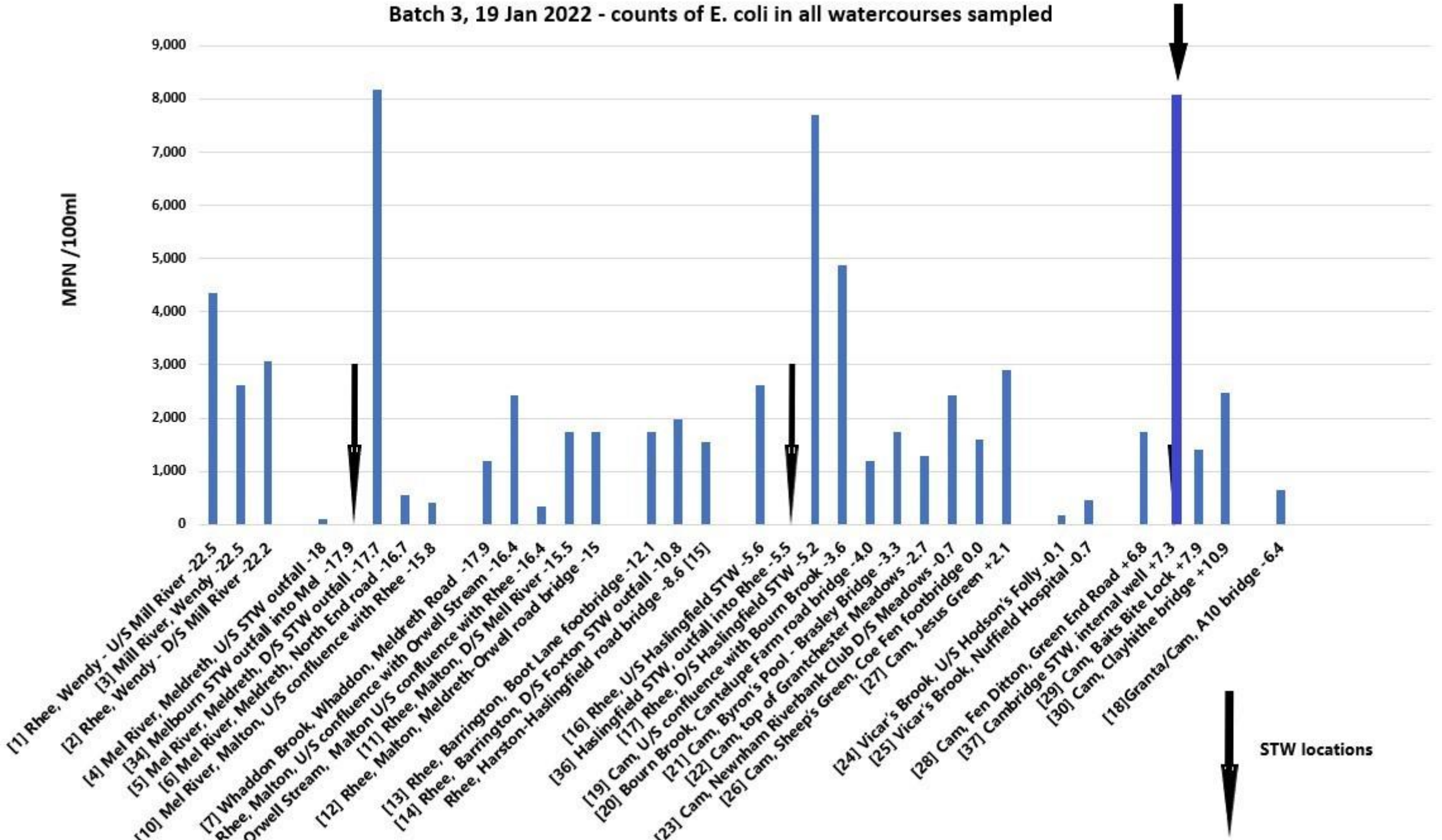
Unless otherwise stated, all results apply to the sample as received. Information provided by the customer (includes Date, Time, Sample Matrix & Sample Description) can affect the validity of the result.
Opinions and interpretations expressed in this report are outside the scope of UKAS accreditation.
Details of Uncertainty of Measurement and Analytical Quality Control are available on request.
Where a statement of conformity to a Regulatory Standard or customer limit is provided, the uncertainty of measurement is not taken into account unless shown on the certificate.
*** - denotes non UKAS accredited method**
F - Result Exceeds The Maximum Pcv As Defined In The Private Water Supply Regulations (England)(Amendment) 2018

UKAS
1579

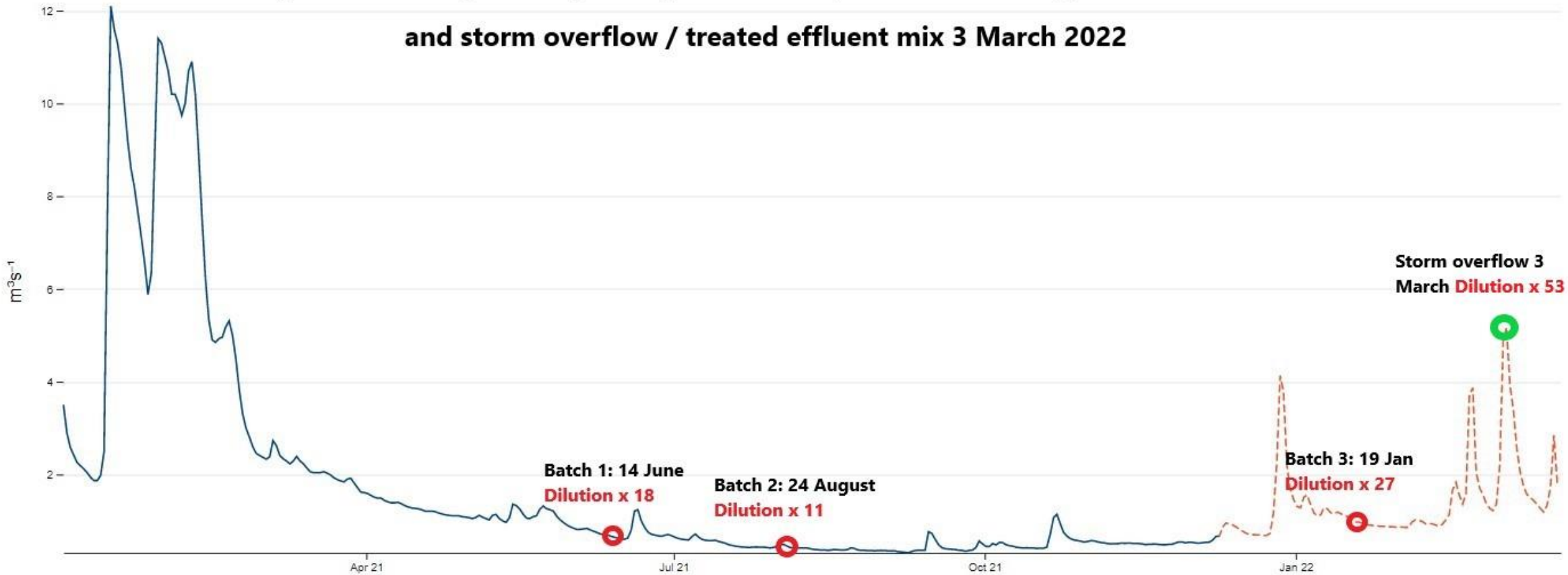
South East Water Ltd. Registered in England, No.2679874. Registered Office: Rodfort Road, Snodland, Kent ME6 5AH.

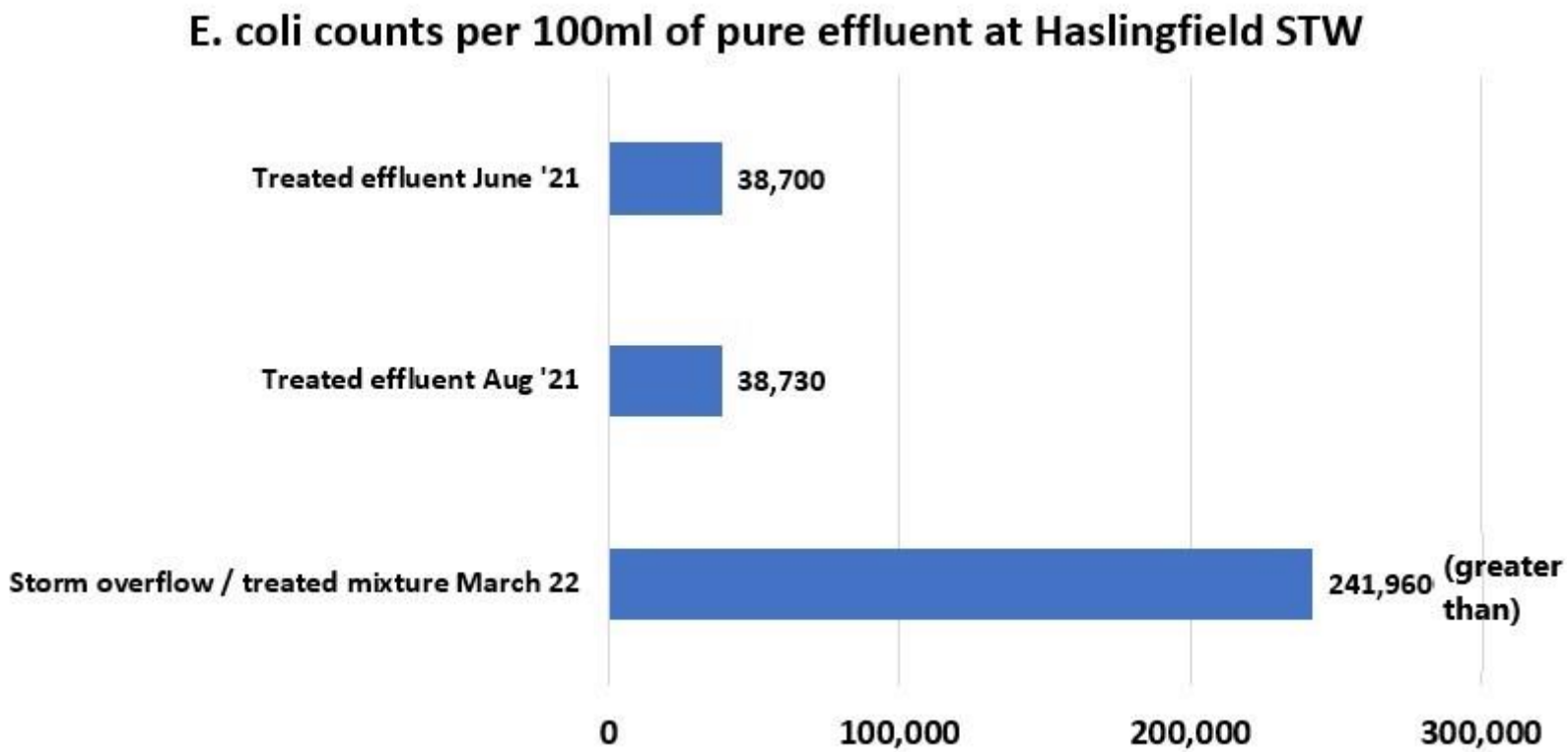

E. coli counts for all three batches, June - Au gust - January
Treated STW final-effluent
STW
STW
Counts are E. coli in 100ml of sample
STW counts were from pure effluent, then converted using dilutions rates to river water counts
No count was obtained for Haslingfield STW effluent on 19 January
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2,613
933
205
3495
2167
7,701
4106
1080
4,884
683
127
1,733
63
261
1,607
120
29
1,733
288
8,240
2959
1,414
1354
2,481
754
[16] Rhee, U/S Haslingfield STW -5.6
[36] Haslingfield STW, outfall into Rhee (converted) -5.5
[17] Rhee, D/S Haslingfield STW -5.2
[19] Cam, U/S confluence with Bourn Brook -3.6
[21] Cam, Byron's Pool - Brasley Bridge -3.3
[26] Cam, Sheep's Green, Coe Fen footbridge 0.0
[28] Cam, Fen Ditton, Green End Road +6.8
[37] Cambridge STW, internal well (converted) +7.3
[29] Cam, Baits Bite Lock +7.9
[30] Cam, Clayhithe bridge +10.9
Batch 3 19/01/22 E. coli
Batch 2 24/08/21
Batch 1 14/06/21


Mel River, Meldreth Batch 3, 19 Jan 2022 - counts of E. coli
MPN /100ml
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
105
No sample
8,164
548
411
[4] Mel River above STW outfall
[34] Melbourn STW outfall into Mel -17.9
[5] Mel River, Meldreth, D/S STW outfall -17.7
[6] Mel River, Meldreth, North End road -16.7
[10] Mel River, Malton, U/S confluence with Rhee -15.8


Batch 3, 19 Jan 2022 - counts of E. coli in all watercourses sampled
MPN /100ml
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
[1] Rhee, Wendy - U/S Mill River -22.5
[3] Mill River, Wendy -22.5
[2] Rhee, Wendy - D/S Mill River -22.2
[4] Mel River, Meldreth, U/S STW outfall -18
[34] Melbourn STW outfall into Mel -17.9
[5] Mel River, Meldreth, D/S STW outfall -17.7
[6] Mel River, Meldreth, North End road -16.7
[10] Mel River, Malton, U/S confluence with Rhee -15.8
[7] Whaddon Brook, Whaddon, Meldreth Road -17.9
[9] Rhee, Malton, U/S confluence with Orwell Stream -16.4
[8] Orwell Stream, Malton U/S confluence with Rhee -16.4
[11] Rhee, Malton, D/S Mell River -15.5
[12] Rhee, Malton, Meldreth-Orwell road bridge -15
[13] Rhee, Barrington, Boot Lane footbridge -12.1
[14] Rhee, Barrington, D/S Foxton STW outfall -10.8
Rhee, Harston-Haslingfield road bridge -8.6 [15]
[16] Rhee, U/S Haslingfield STW -5.6
[36] Haslingfield STW, outfall into Rhee -5.5
[17] Rhee, D/S Haslingfield STW -5.2
[19] Cam, U/S confluence with Bourn Brook -3.6
[20] Bourn Brook, Cantelupe Farm road bridge -4.0
[21] Cam, Byron's Pool - Brasley Bridge -3.3
[22] Cam, top of Grantchester Meadows -2.7
[23] Cam, Newnham Riverbank Club D/S Meadows -0.7
[26] Cam, Sheep's Green, Coe Fen footbridge 0.0
[27] Cam, Jesus Green +2.1
[24] Vicar's Brook, U/S Hodson's Folly -0.1
[25] Vicar's Brook, Nuffield Hospital -0.7
[28] Cam, Fen Ditton, Green End Road +6.8
[37] Cambridge STW, internal well +7.3
[29] Cam, Baits Bite Lock +7.9
[30] Cam, Clayhithe bridge +10.9
[18]Granta/Cam, A10 bridge -6.4
STW locations

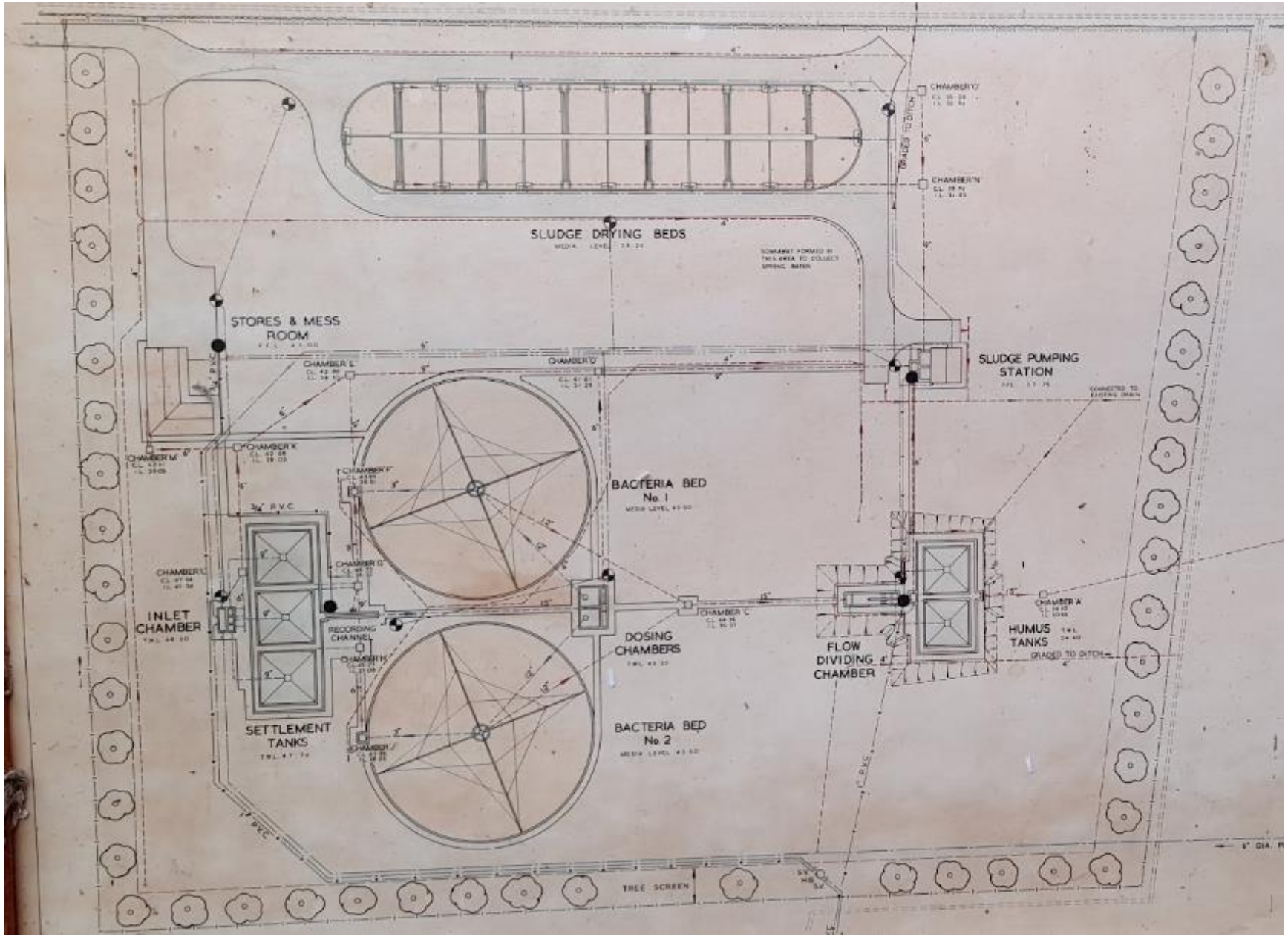
Dates of samples Batches 1, 2 and 3, during low rainfall periods and sewage works effluent was 100% treated and storm overflow / treated effluent mix 3 March 2022





Estimated E. coli count in river after dilution (x 53): greater than 4,500 / 100ml

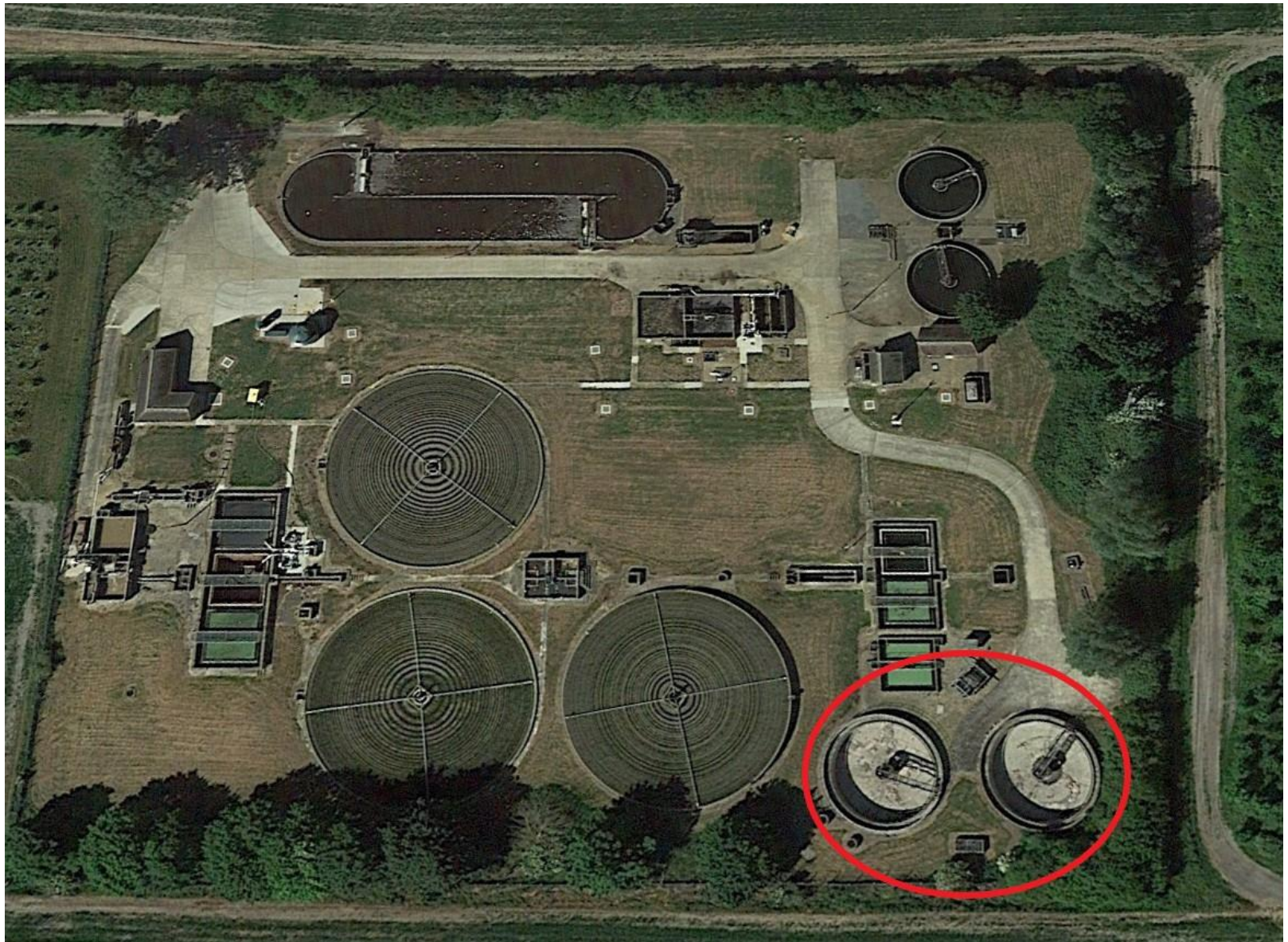
1967


SLUDGE DRYING BEDS
STORES & MESS ROOM
SLUDGE PUMPING STATION
BACTERIA BED No. 1
INLET CHAMBER
SETTLEMENT TANKS
DOSING CHAMBERS
FLOW DIVIDING CHAMBER
HUMUS TANKS
BACTERIA BED No 2
TREE SCREEN

Monitoring both treated sewage effluent and ‘settled’ storm overspills

Changes at Haslingfield since 1967: one more trickle filter bed, activated sludge tank and two storm overflow tanks

2022



Thank you to these sponsors

The Penchant Foundation

The Technology Partnership

Newnham Riverbank Club.

Other anonymous donors

WAITROSE & PARTNERS

David Hartland

love every drop. anglianwater

Slow Swim

And to non-CVF volunteer samplers: River Mel Restoration Group, David Hartland, Eleanor Bradley

Conclusions

1. Flows do matter, but storm overflows at any time will result in higher concentrations of faecal indicator bacteria

2. Haslingfield STW Storm Overflow / partially treated effluent contains greater than x 6 *E. coli* than in treated effluent (one sample so far)

3. Counts decline variably downstream of Haslingfield STW, a combination of:
   - dilution by Essex Cam+Granta/ Bourn Brook
   - bacterial sedimentation
   - die-off – ultra-violet radiation, predation, shock

4. Higher winter counts despite higher dilutions possibly caused by less die-off (low UV, low temps, low predator activity).

   and by additional bacterial exports from STW storm overflows

   and / or possibly: River bed resuspension
   Faecal matter in ditches running into river
   Broken sewer pipes in wet soils allow faecal escape
   Agricultural sources accessing watercourses > river