

**IN RESPECT OF THE APPEAL AGAINST THE DECISION OF
HERTFORDSHIRE COUNTY COUNCIL FOR THE DEVELOPMENT
OF
LAND AT HATFIELD AERODROME, OFF HATFIELD ROAD,
HATFIELD, HERTFORDSHIRE**

**PLANNING INSPECTORATE REF: APP/M1900/W/24/3346607
LOCAL PLANNING AUTHORITY REF: PL/0232/21**

**Paper submitted by former Rule 6 parties now third parties
at the request of the Planning Inspector**

Hydrology

Hydrology Background Information

At the last planning inquiry there were a number of concerns surrounding the bromate plume, and the potential impact on the plume caused by the quarrying operation. Discussions at the inquiry resulted in a number of fundamental changes and these were discussed and agreed by the hydrogeology experts present, including the Environment Agency. The Environment Agency responded to the latest planning application and increased the number of conditions from three to six (much more detailed) conditions.

The information below discusses the conditions in more detail and outlines our concerns.

Environment Agency request for more information from Brett Aggregates dated March 2023:

Mr Chay Dempster
Hertfordshire County Council
Minerals & Waste Planning
County Hall Pegs Lane
Hertford
Hertfordshire
SG13 8DN

Our ref: NE/2021/133848/02-L01
Your ref: PL/0232/21
Date: 31 March 2023

Dear Chay

Land at Hatfield Aerodrome, off Hatfield Road

Application for the establishment of a new quarry on land at the former Hatfield aerodrome, including a new access onto the A1057, aggregate processing plant, concrete batching plant and other ancillary facilities, together with the importation of inert fill materials for the restoration of the minerals working.

Thank you for consulting us on the new information and I apologise for the delay in responding. We have reviewed the information submitted and would have no objections to the proposal if the following conditions are applied to the grant of any planning permission. Without these conditions the application would pose a risk to groundwater and we would wish to object.

The conditions we are requesting are those that were developed through the recent public enquiry and were requested at that time with some slight amendments and additions to reflect the proposed changes to the application.

Condition 1

Prior to the commencement of development, the following shall be submitted to and approved in writing by the MPA:

- (i) Details of the construction of the upper and lower infiltration lagoons;
- (ii) Details of the water management during construction and upon restoration of infiltration lagoons;
- (iii) Details of the UML back-drain upon restoration

The development shall be undertaken in accordance with the approved details. Reason: to ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working. The lower mineral lagoon presents a potential pathway for surface contaminants to enter the chalk groundwater. It must be designed and constructed to minimise this risk throughout the lifetime of development, including restoration.

Condition 2

Prior to the commencement of development, a Groundwater and Water Monitoring aManagement Plan (GWMMMP) shall be submitted to and approved in writing by the MPA, having regard to the available data relating to groundwater conditions both within and without the site so far as relevant to the GWMMMP. The GWMMMP shall include:

The locations of surface and groundwater monitoring, the type and nature of monitoring and sampling to be undertaken and the scope of laboratory analysis to be undertaken on the samples obtained, which will include contaminants suspected to be present based on the site history (e.g. PFAS);

(ii) The surface and groundwater monitoring referred to above shall include, but not be limited to, ongoing monitoring for well-head parameters, groundwater level, bromate and bromide concentrations in monitoring wells: BHB, BH104, BH106, BH301, BH303 & BH304 to continue the long term dataset; unless otherwise agreed in writing by the MPA.

(iii) The timetable for the submission of monitoring reports
Provisions which are specific to Phase A including details of phase specific boreholes

(iv) Details of the water management in the lower and upper mineral infiltration lagoons and a mechanism for review.

(v) A method to establish the statistical confidence required for any borehole monitoring results which are relied upon as trigger levels. This would include but would not be limited to:

(vi) Arrangements for validation sampling;

(vii) Evaluation of results below detection limits;

(viii) Arrangements for stakeholder notification, data review and escalation process. The water and groundwater sampling, analysis and reporting of the results shall be in accordance with the approved GWMMP. The development shall be undertaken in accordance with the approved GWMMP.

Reason

To ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working

Condition 3

Prior to the extraction of minerals from the Lower Mineral Horizon in each of Phases B, C, D, E, F and G, a revised GWMMP specific to each phase shall be submitted to and approved in writing by the MPA. This shall include details of ongoing monitoring and all phase specific boreholes to be installed including those needed to characterise and identify the depth of the chalk. The revised GWMMP shall also have regard to any data arising for the site and its surrounds.

The development shall be undertaken in accordance with the revised GWMMP as approved.

Reason

To ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working

Condition 4

In the event that monitoring results indicate that bromate concentrations in the LMH extraction phase exceed the trigger level of $2\mu\text{g/l}$ at the confidence level approved GWMMP, then an action plan (that should detail further assessment of groundwater levels and chemistry) and programme to reduce the levels below $2\mu\text{g/l}$ including a timetable for implementation shall be submitted for approval of the MPA. The action plan shall be implemented as approved.

Reason

To ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working

Condition 5

In the event that monitoring results indicate that bromate concentrations in the current LMH extraction phase exceed the trigger level of $5\mu\text{g/l}$ at the confidence level in the approved GWMMP, then a response plan shall be submitted for the approval of the MPA. Lower Mineral Horizon excavation shall cease until the MPA has approved a response plan. The response plan shall be implemented as approved.

Reason

To ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working

Condition 6

No excavations of the Lower Mineral Horizon shall take place at the base of the quarry within 1m of the chalk aquifer.

Reason

To ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working

Advice to applicant

We would like to refer the applicant/enquirer to our groundwater position statements in

"[The Environment Agency's approach to groundwater protection](#)" * available from gov.uk. This publication sets out our position for a wide range of activities and developments, including:

- Waste management
- Discharge of liquid effluents
- Land contamination
- Drainage

Advice

Soils affected by contamination may be encountered at the start of the development (e.g. topsoil removal), owing to the site history as an aerodrome.

Contaminated soil that is (or must be) disposed of is waste. Therefore, its handling, transport, treatment and disposal are subject to waste management legislation, which includes:

- Duty of Care Regulations 1991
- Hazardous Waste (England and Wales) Regulations 2005
- Environmental Permitting (England and Wales) Regulations 2016
- The Waste (England and Wales) Regulations 2011

Developers should ensure that all contaminated materials are adequately characterised both chemically and physically in line with British Standard BS EN 14899:2005

'Characterization of Waste - Sampling of Waste Materials - Framework for the Preparation and Application of a Sampling Plan' and that the permitting status of any proposed treatment or disposal activity is clear. If in doubt, we should be contacted for advice at an early stage to avoid any delays.

If the total quantity of hazardous waste material produced or taken off-site is 500kg or greater in any 12 month period, the developer will need to register with us as a hazardous waste producer. Refer to the [hazardous waste](#) pages on gov.uk for more information.

Advice to applicant

Some activities associated with this development will require an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016, from the Environment Agency, unless an exemption applies. The applicant is advised to contact the Environment Agency on 03708 506 506 for further advice and to discuss the issues likely to be raised. You should be aware that there is no guarantee that a permit will be granted. Additional 'Environmental Permitting Guidance' can be found at: <https://www.gov.uk/environmental-permit-check-if-you-need-one>.

Informative

Flood Risk Activity Permit

The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place:

- on or within 8 metres of a main river (16 metres if tidal)
- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal)
- on or within 16 metres of a sea defence
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert
- in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission.

For further guidance please visit <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or contact our National Customer Contact Centre on 03702 422 549 or by emailing enquiries@environment-agency.gov.uk The applicant should not assume that a permit will automatically be forthcoming once planning permission has been granted, and we advise them to consult with us at the earliest opportunity.

Final comments

Thank you for contacting us regarding the above application. Our comments are based on our available records and the information submitted to us. Please quote our reference number in any future correspondence. Please provide us with a copy of the decision notice for our records. This would be greatly appreciated.

Should you have any queries regarding this response, please contact me. Yours sincerely

Mr Kai Mitchell
Sustainable Places Planning Specialist

Direct e-mail HNL.SustainablePlaces@environment-agency.gov.uk

** The Environment Agency's approach to groundwater protection February 2018 Version 1.2*

Brett Aggregates response

Brett Aggregate response to these the six conditions can be found in "Appellant Draft Groundwater Statement of Common Ground: Hertfordshire County Council & Brett Aggregates"

Hatfield_Draft_Hydro_SoCG_FINAL_for_SUBMISSION June 2024_BRE2319_4_504030491

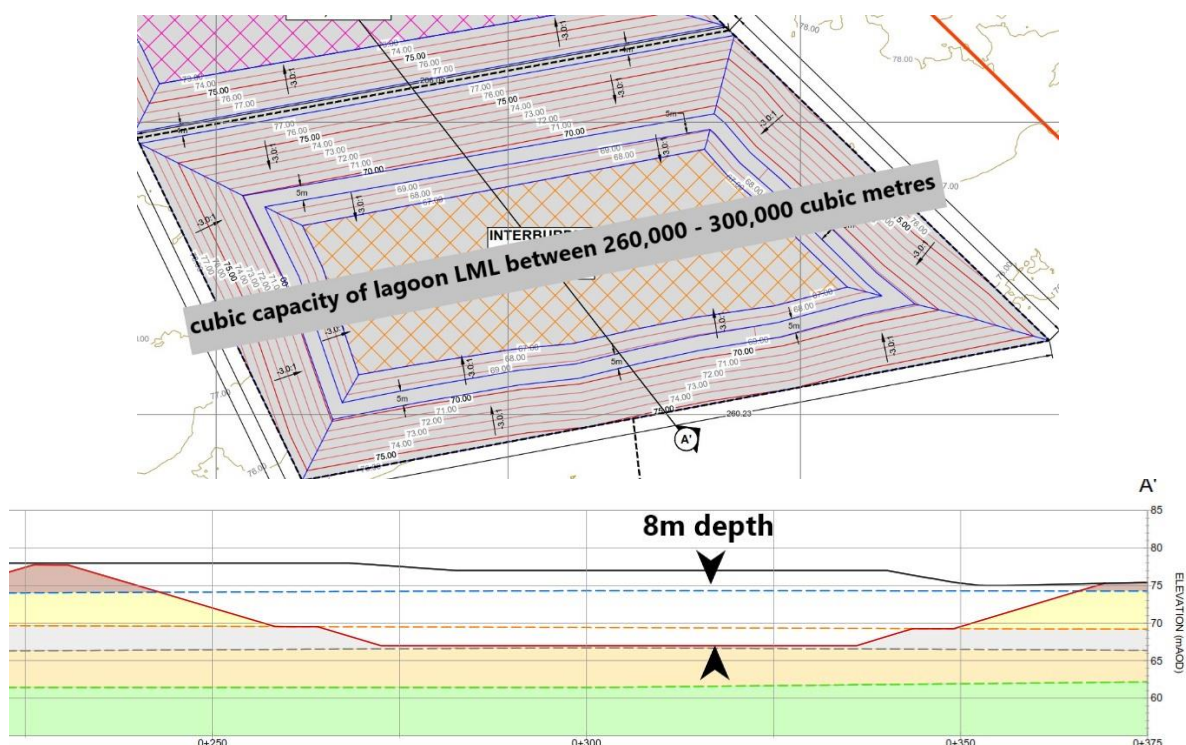
Condition 1: construction of Lagoons, LML and UML, detail of water management, UML back drain.

Brett Development Description 3

"3.28 For the LML, the same process would follow that described in paragraph 3.29 above, apart from the eastern lagoon boundary being fully sealed down to the upper surface of the interburden, meaning groundwater from the UMH can be dewatered within the perimeter of the LML. The excavation can then continue downward through the interburden until it exposes the surface of the LMH, at which point the excavation would stop. A manually operated high level spill-over would link the two lagoons to allow the flow of UMH groundwater into the LML. At no time would LMH groundwater flow into the UML because the water level in the LMH is over 5m lower than groundwater in the UMH."

File: 2108_HATFIELD_PS_chp03_Development_FINAL

Brett drawing number 009:



Extracted diagrams from LAGOON SITE PLAN & CROSS SECTION 009

File: 004_EARA_Reg25_Appendix02_GWMMP_DWG&APPS_comb

The above diagram taken from drawing 009 defines the depth and size of the LML. From measurements we have calculated the volume of the LML to be between 260,000 and 300,000 cubic metres, this is three times the volume of the UML.

Response to Condition 1

The request for detail on the construction and water management of the lagoons is very limited. The LML is excavated down to the bottom of the interburden and opened up to expose the top of the LMH and lower aquifer, as this is a confined aquifer the base will quickly fill with water forming a lake of water * that is hydrologically connected to the chalk. The unnecessary operation is a risky business as cross contamination could allow the contaminate bromate to leak into the whole water system.

** This is dependent on groundwater elevation, seasonally high in Jan to May in confined conditions could be >2m*

The planning application proposes that there should be two lagoons but now that there should be no pumping of groundwater from the lower mineral horizon as agreed at the last inquiry, it is unclear why there is still a second lagoon in the plan.

The previous Appeal (2021) SoCG states that "no pumping of groundwater from the lower mineral horizon is permitted within any part of the mineral working".

Reason: to ensure protected water sources are not adversely affected by bromate contamination as a result of mineral working."

The first Appeal Conditions and obligations

By John Woolcock decision, 25th January 2022

"95. As set out above a 'no pumping condition' would be necessary, but this could have implications for the size and design of recharge lagoons. The configuration of the recharge lagoons shown on the application drawings would have taken into account the likely potential volume of discharge to the LMH lagoon from groundwater pumped from the LMH. However, **there is no evidence before the Inquiry to indicate what size and configuration for the recharge lagoon** would be necessary for a scheme that included a condition that no pumping of groundwater from the LMH would be permitted within any part of the mineral working."

"96. In the absence of such evidence, it is not possible to determine that the LMH recharge lagoon shown on the application drawings is necessary for mineral extraction. **If a lagoon of that size was not necessary, the scheme would include an element of inappropriate development**, even if the CBP was omitted. If NPPF paragraph 150 did not apply it would be necessary to assess whether the potential harm to the Green Belt by reason of inappropriateness, and any other harm, would be clearly outweighed by other considerations. That is a matter that would need to be decided in granting planning permission and so it would not be reasonable to leave details about the recharge lagoon for subsequent discharge of a planning condition along the lines of that suggested in Condition 25(i)."

Appeal_decision_3278097

Conclusion

This operation is a high-risk strategy, a second lagoon connected to the chalk is not necessary as water from the extraction is channeled back into the same workings. If LML lagoon is proved to be unnecessary it would be classified as being an inappropriate development.

High levels of bromate greater than 5µg/l have been detected on boreholes outside but within 200m metres (BHB & BH201) and the interference to the hydrological regime will cause a drawdown effect bringing contaminated water into the lagoon itself.

Condition 2:

Before development a **Groundwater and Water monitoring Management Plan** (GWMMP) will be approved and submitted by the MPA. The GWMMP shall include location, type, nature of monitoring, samples, past history.

Existing peripheral boreholes monitoring data set for bromide and bromate to be continued;
 Phase A, new boreholes BH303, BH304;
 Phase specific boreholes, depth of chalk, data;
 Water management and data for lagoons;
 LMH extraction trigger 5µg/l, extraction stops, report to MPA;
 A 1m buffer between chalk and LMH;
 Statistical confidence for any borehole relied upon as trigger levels;
 Validation of sampling;
 Trigger level 2µg/l, action plan;
 Evaluation of results below detection limits;
 Notification, data review; and escalation process; Reporting of results according with the approved GWMMP;
 No pumping groundwater from LMH.

"18 The current GWMMP1, prepared by SLR, has adopted the findings and modifications resulting from the 2021 Inquiry and has benefitted from the sharing of monitoring data and technical consultation with Affinity, the EA and HCC, including HCC's hydrogeology advisors Arup. In particular, it incorporates the matters that the Inspector considered could be conditioned and specifically excludes groundwater pumping from the Lower Mineral Aquifer and includes a **100m stand-off** from the southern edge of the bromate plume."

File: Hatfield_Draft_Hydro_SoCG_FINAL FOR SUBMISSION June 2024_BRE2319_4_504030491

Response to Condition 2

The Gap

At present the only boreholes monitoring the gap between know bromate contamination in the N.E sector are BH104 and BH106, this leaves a gap of 790 metres. **BH104** data shows bromate detected over **2 µg/l** from 2019 to 2021. **BH106** shows a sporadic **7.4** in August 2019 but classified on SLR drawing as ND = non-detected.

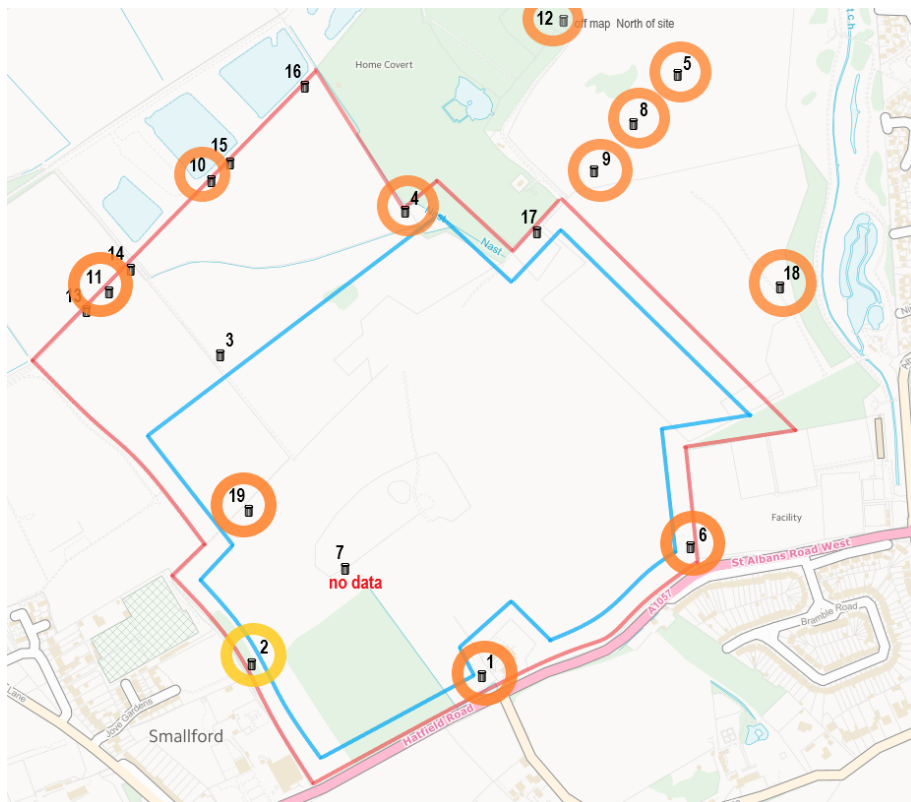
Details of bromate contamination on boreholes on the site:

CHALK	Feb 2019	May 2019	Aug 2019	Nov 2019	Aug 2020	Apr 2021	Shown on SLR Map
103	0.5	0.5	1.4	1	0.3	0.3	ND
104	2.5	2.5	2.7	2.5	2.7	2.5	ND
106	0.5	0.5	7.4	0.5	0.3	0.3	ND
108	227.3	194	196.1	214.9	189.7	178.4	outside ND
301	2.9	0.5	2.4	1.4	1.1	1.0	ND
LMH							
104	0.5	1.1	1.5	1.2	1.7	0.7	ND
107	?	?	?	?	0.3	0.3	No data>2015
108	0.5	18.7	20.9	22.5	28.6	60.9	outside ND
301	0.5	0.5	1.1	0.5	0.3	0.3	ND

Boreholes showing some bromate at times within the site 4,6,1,2,19,11,10 on map below:

Borehole data showing bromate exceeding the stated concentration between 2013-2019

Borehole BH108 is outside the site but shown as ND on SLR map



borehole have levels at or above 0.5 µg/l, for example 19 (BHG in dig site) had 2.4 µg/l in Oct 2015.

x = no data supplied

bromate at or above 2µg/l

value

bromate at or above 0.5µg/l

bromate below 0.5µg/l

<0.5

CHK = chalk. UMH = upper mineral horizon. LMH = lower mineral horizon

Historic Date shows a number of these

No on map	Borehole	geology	bromate
1	BH101	LMH	4.7
2	BH102	CHK	0.5
	BH102	CHK	0.6
3	BH 103	LMH	<0.5
	BH103	CHK	<0.5
4	BH104	LMH	2.1
	BH104	CHK	4.2
6	BH106	LMH	7.4
7	BH107	UMH	x
	BH107	LMH	x
	BH107	CHK	x
10	BH301	LMH	3.3
	BH301	CHK	2.5
11	BH302	LMH	3.5
	BH302	CHK	4.0
13	GMW 103	UMH	<0.5
	GMW103 L	UMH	x
14	GMW105	UMH	x
15	GMW107	UMH	<0.5
16	GMW109	UMH	<0.5
17	BHA	UMH	<0.5
19	BHG	LMH	2.4
20	BH307	UMH	x

Absence of boreholes on the actual dig site.

Brett's response to Dr Rivett's report as provided at the last inquiry:

"Ample boreholes have been installed and monitored in order to enable an understanding of the hydrogeological regime prior to a planning decision. The current groundwater monitoring network confirms the location of the bromate plume east of the site **and its absence on the mineral extraction area.**"

*Response to the Hertfordshire CC consultation on the Groundwater Management Plan
file: brett aggregates response to groundwater management plan received 10th June 2020*

A wide gap exists between BH104 and BH106 and this area is vulnerable to inclusion of a drift into the site. New boreholes BH303 and BH304 have yet to be installed and therefore the argument "bromate plume east of the site and its absence on the mineral extraction area" cannot be proved.

There has been a lack of monitoring since 2021- no data published.

The GWMP is a tool to manage bromate contamination by entering the on-site workings on a day-by-day basis. It is designed to work after all new boreholes are operational and the excavation phase begins.

It cannot be used to evaluate the authenticity and judgement of whether the site is clear or contaminated before work starts, the only way is to update data from the existing boreholes and install N.E boreholes BH303 and BH304.

The Flow

The chalk has a high matrix porosity but low matrix permeability. This means that groundwater flow mainly takes place through fractures and fissures. In this part of Hertfordshire groundwater flow in the chalk is influenced by karstic features aligned west to east that direct groundwater flow towards the Lea Valley.

High pumping at Bishops Rise determines the shape and funneling of this flow dragging the plume towards Bishops Rise.

Statement of Common Ground 2021(part):

"4.1 This has been demonstrated over a number of events throughout autumn 2018, suggesting that HATF is dominant in controlling the location of the southern boundary of the plume. Under low pumping at HATF the southern boundary of the plume moves north, while higher pumping rates cause this boundary to move south. However, even under scenarios where HATF has pumped at or near its maximum licensed volume (9MI/d, in the past between 1995 and 2000 and more recently in 2013/14 and 2018), the southern plume boundary has been shown not to move onto the proposed quarry site."

File: CD 8.2-Water Statement of Common Ground dated 5 November 2021_BRE2319_1_177818354

The above comment clearly shows that the plume is not altogether controlled by Bishops Rise (HATF) rates, but other factors are not proven.

"No bromate beneath the site"

Proof of Evidence of Peter Rowland SLR :

"6.5 The plume extent evidence shows **there is no bromate plume beneath the proposed LMH mineral excavation area** in either high or low groundwater elevations. Time-concentration graphs indicate that that bromate concentrations are stable in the northeast corner of the site with an average concentration of **<1ug/l in BH104L** which is significantly below than the Agency's stated bromate concentration of concern of >2ug/l."

On bromide contamination:

"6.86 Bromide has been detected in groundwater on the application site and bromate and bromide do occur together in the main bromate plume."

On other sources of bromide:

"6.88 The Environment Agency have regional monitoring data for bromate and bromide within the regional bromate plume and outside it and thus are in the best position to consider the relevance of bromide detection at the site. As they state in their letter of 18 December 2019, 'there are many sources of bromide including its natural occurrence in the environment'."

File: Hatfield Quarry Appeal Ref. APP_M1900_W_21_3278097_BAL6_Hydro PoE_Final.pdf_BRE2319_1_177364177

Our argument:

In response to this argument "there is no bromate beneath the proposed LMH mineral excavation" this could be proved by installing **BH303** and **BH304** to plug the gap in the N.E section.

The fact is the levels of bromate have gone up, the 2022 data from the EA wells is that bromate has reached an all-time record of 1163µg/l (2020) over 1000m away from the dig site:

166	80163A23	Hatfield Quarry, WPG16	12/08/2020	1,163.10	1,521.00
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Interpreting the data from BH104 must include data from the mineral layer and data from the chalk layer, both are hydrologically connected together but in different mediums.

BH104 (CHALK), on the edge of the dig site, shows consistent levels of 2.5 to 2.7µg/l of bromate from 2019 to 2021.

Bromide

Bromide is a prerequisite of bromate, due to the two chemical contaminants released from the Steetly factory. It travels faster than the heavier bromate and appears in all the boreholes in and around the site. It is not classified as dangerous until it reaches 500µg/l, it can be found in road salts and sea water, but generally at much lower levels.

The EA Bromate Remediation document took the view that any concentrations at or above 0.5 ug/l bromate are within the plume of pollution. In practice, as agreed for the neighbouring CEMEX Hatfield Quarry extension into Furze field (PL\0820\16, our response reference NE/2016/126121/01), the 2 ug/l limit of detection may be used to define the boundary of the bromate plume. This is below the 10 ug/l UK Drinking Water Standard and

below the 5 ug/l Required Concentration Standard featured in the Remediation Notices dated 2009 and 2019 served on the parties responsible for the pollution.

The document also took the view that any concentrations at or above **125 ug/l bromide** are within the plume of pollution. This is below the 500 ug/l Required Concentration Standard featured in the Remediation Notices dated 2009 and 2019 served on the parties responsible for the pollution. Bromide does not have a UK Drinking Water Standard. It is difficult to define the bromide plume boundary caused by pollution from the Contaminated Land Special Site because bromide occurs naturally in groundwater and in road-grit-salts."

The MPA and EA both reference bromide as a contaminant:

"The Environment Agency states that no mineral is to be extracted from within the existing plume of bromate and **bromide** groundwater pollution. Any activities close to the plume must not change the existing hydrogeological flow regime. Any activities close to the plume must not interfere with the remediation of the bromate and **bromide** pollution."

- 1) Bromide contamination within the site from 2019 to 2021 shows most of the boreholes over 125µg/l bromide, with BH301, 302, 303 reporting levels over 1000µg/l.

Bromide within the site in µg/l

Borehole	Feb2019	May2019	Aug2019	Nov2019	Aug2020	April2021
CHALK						
BH101	149	135	137	157	X	145
BH102	62	61	379	61	X	65
BH103	411	408	54	442	396	407
BH104	354	346	340	381	302	275
BH106	36	41	52	40	184	486
BH107	X	X	X	X	X	X
BHG	X	X	X	X	X	X
BH301	660	310	434	578	396	388
BH302	1898	1717	1658	1716	1891	1759
LMH						
BH101	102	85	84	80	X	163
BH102	165	153	139	133	X	166
BH103	1049	1058	1003	987	X	1056
BH104	122	191	225	242	265	248
BH106	309	240	221	295	37	175
BH107	X	X	X	X	X	X
BHG	130	143	179	187	X	80
BH301	215	160	188	283	287	215
BH302	2280	2223	2052	1994	1373	1283

File: Hatfield Aerodrome_ES_Appendix_6-5_GW Chemistry Data_Combined_rev2

Levels in seawater are only 0.066 to 0.068 mg/l

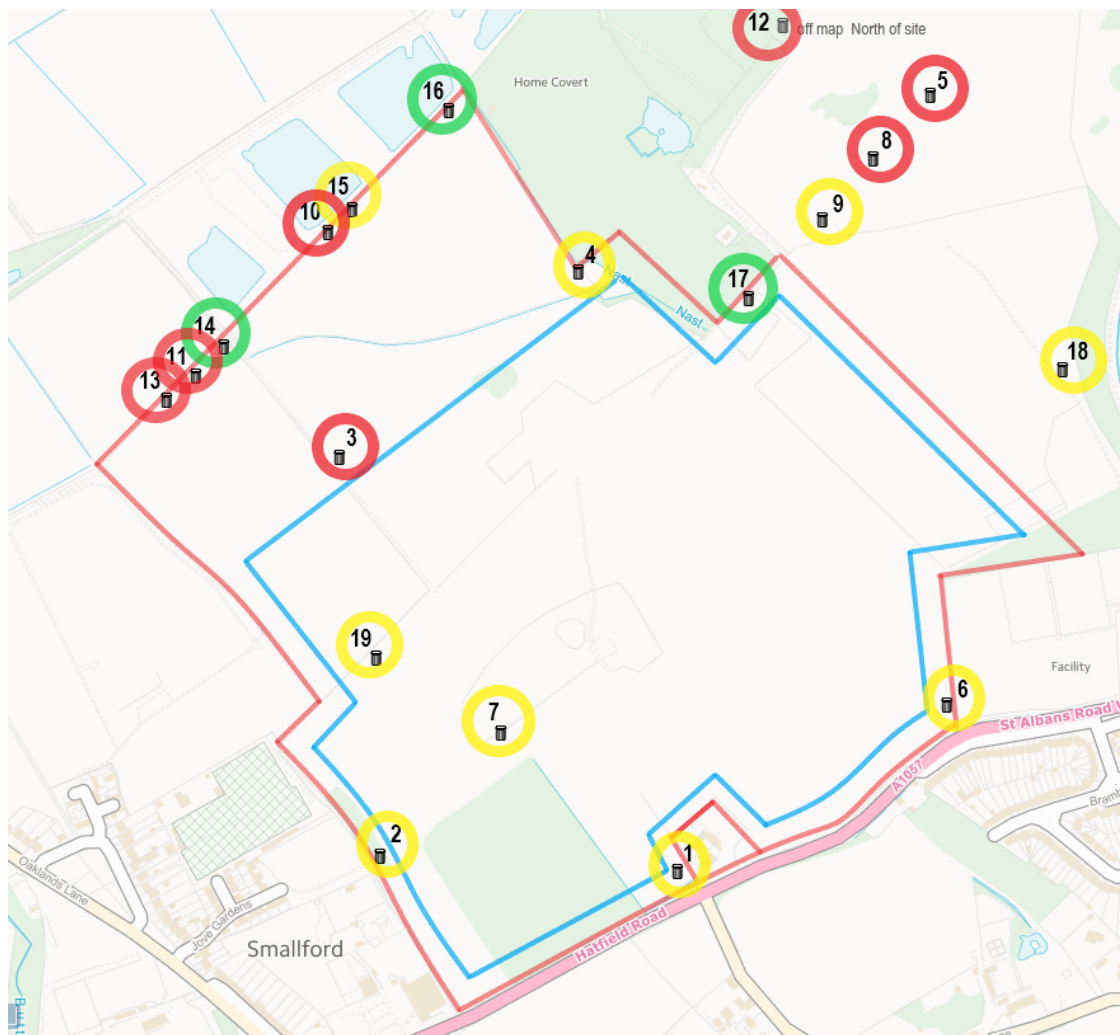
- 2) Bromide chart and borehole location.

Borehole Data showing Bromide exceeding the stated concentration

The map clearly shows that the bromide readings are above the recommended planning inspector levels (above 125µg/l) ON THE ACTUAL DIG SITE (within the blue line) see boreholes 7 and 19

The map also shows that the levels are astronomical around the dig site and within the perimeter of the quarry site, in particular Borehole 3 (right on the dig site perimeter) is 1049µg/l and borehole 11 is a massive 2280µg/l.

The data available shows that bromide is actually present in concerning levels on the dig site and that therefore given the correlation between bromide and bromate there is a strong argument to say that bromate is also present. There are clearly insufficient boreholes and associated data on the actual dig site to prove that there is no bromate present. This is a high-risk strategy.



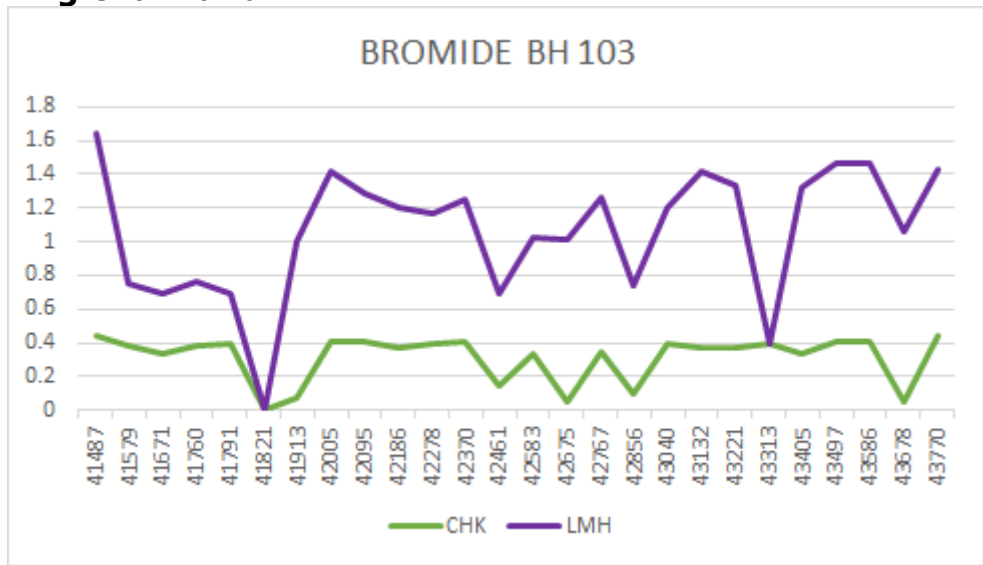
No on map	Borehole	Zone	Latest figures
1	BH101	CHK	149
2	BH102	UMH	126
	BH102	LMH	165
3	BH 103	LMH	1049
	BH103	CHK	411
4	BH104	LMH	122
	BH104	CHK	354
5	BH105	UMH	88
	BH105	LMH	794
	BH105	CHK	665
6	BH106	LMH	309
7	BH107	UMH	162
	BH107	LMH	189
	BH107	CHK	142
8	BH108	UMH	DRY
	BH108	LMH	168
	BH108	CHK	766
9	BH201 L(s)	LMH	499
	BH201(L D)	CHK	371
10	BH301	LMH	215
	BH301	CHK	660
11	BH302	LMH	2280
	BH302	CHK	1898
12	BH305	LMH	1397
	BH305	CHK	1178
13	GMW 103	UMH	1400
	GMW10 3L	UMH	138
14	GMW10 5	UMH	116
15	GMW10 7	UMH	162
16	GMW10 9	UMH	74
17	BHA	UMH	84
18	BHB	LMH	263
19	BHG	LMH	130

less than 125µg/l =green
 125 to 500µg/l =yellow
 over 500µg/l =red

Zone
 CHK – chalk

UMH – upper mineral horizon
LMH – lower mineral horizon

BH103 showing chalk and LMH:



BH103 is on the borders of the plant site and dig area, it is not near any road salts or effluent from the Cemex workings but shows significant high levels of bromide – we can only assume from the original spillage in Sandridge.

Pumping Tests in 2018

Bromide has been found in the southwest on the dig site area at recent pump trials in 2018.

HATFIELD ROAD QUARRY

Pumping Test Assessment Report
DRAFT

Prepared for: Robert Brett & Sons Ltd
Client Ref:402.01009.00226.01



Robert Brett & Sons Ltd
Hatfield Road Quarry
Pumping Test Assessment Report (DRAFT)

SLR Ref:
402.01009.00226.002_V2
September 2018

5.2 Bromate Results

Seven samples were taken from each well during their respective Constant Rate Test and submitted to Affinity Water laboratories for analysis of Bromate and Bromide. Bromate was not detected at concentrations above method detection limits in any of the samples.

Bromide concentrations were lower in the UMA than the LMA which is consistent with historical findings in groundwater concentrations elsewhere on site. Results are available in Table 5-2 and Table 5-3. Certificates of analysis are included in **Appendix 07**.

UMA

Table 5-2
Bromate and Bromide Results PW1

Well	DWS	(mg/L)	05/06/2018		06/06/2018		07/06/2018		08/06/2018
PW1	-	Bromide	0.093	0.088	0.088	0.091	0.092	0.092	0.092
	0.01	Bromate	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

LMA

Table 5-3
Bromate and Bromide Results PW2

Well		DWS	(mg/L)	13/06/2018	14/06/2018	15/06/2018	16/06/2018		
PW2	-	Bromide	0.191	0.206	0.204	0.183	0.205	0.117	0.106
	0.01	Bromate	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

bromide 0.206mg/L = 206 micrograms/L

At the trials, bromide levels in boreholes PW1 (UMA) and PW2 (LMA) were shown to be between 106µg/l to 206µg/l in the lower mineral aquifer over 4-day period - bromate was not detected but this proves that some contamination is under the proposed quarry site.

Condition 3:

Prior to extraction of minerals in LMH a revised GWMMP for each phase to be submitted.

No response to Condition 3

Condition 4:

If during the extraction phase samples indicate bromate exceeds trigger level of **2µg/l** the action is to inform the MPA.

This is a measure where it is a high-risk strategy to continue work in the LMH whilst investigations are undertaken.

Condition 5:

If during the extraction phase samples indicate bromate exceeds trigger level of **5µg/l** the action is to inform the MPA, and extraction shall cease.

If this condition is breached, then bromate contamination has reached the LMH and been drawn in from the main plume. All work must stop in the LMH region.

Condition 6:

No excavations of the Lower Mineral Horizon shall take place at the base of the quarry within 1m of the chalk aquifer.

This condition is to protect the chalk aquifer. For example, in BH104 bromate exists in the chalk from 2019 to 2021 so this condition must be closely monitored to ensure that bromate does not spread.

Additional conditions as a result of the previous planning Inquiry

SoCG Condition (pumping):

No pumping of groundwater from the lower mineral horizon is permitted within any part of the mineral working.

This condition is a result of the Statement of Common Ground and suggested by Jenny Lightfoot, Hydrologist and contamination expert, having proved that the drawdown will occur if high levels of pumping are used to dewater the LMH workings.

Conclusion:

The complexities of quarrying so close to the bromate plume have been highlighted as the applications to quarry on this site have evolved, with more scrutiny of the plans.

The conditions associated with the management of the plume and the quarry application have also evolved, highlighting the complex nature of this application

The original EA remediation plan failed to deal with the bromate plume and the view is now that the plume will take hundreds of years to be dealt with rather than the initial 10 years outlined in the first remediation plan.

The impact of the bromate plume spreading and the likelihood of this occurring are both high, and consequently the risk is high, regardless of any mitigation plans or conditions.

There are insufficient boreholes actually on the dig site, so the presence of bromate cannot be proved or disproved.

No up-to-date data from Brett Aggregates has been supplied with this application.

A zero-risk approach should be taken to manage the plume. No quarrying should take place on this site until the bromate is eradicated.

The Future

The plume is relatively stable at present but in the future the cost of pumping and controlling the plumes position may become too expensive. After 20 years there is little change to the level of bromate at Bishops Rise.

The latest 2024 bromate data from the Environment Agency supplied under FoI shows:

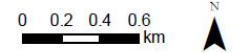
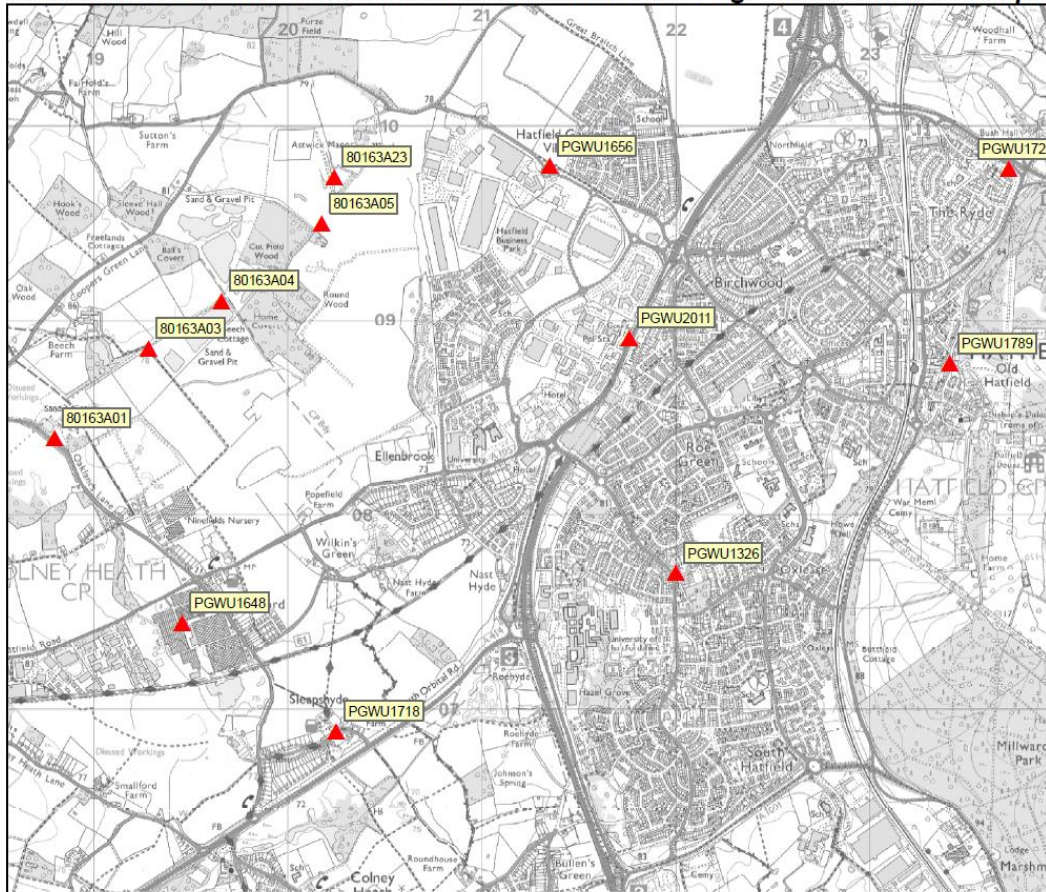
	2021	2022	2023	2024
PGWU1326 Bishops Rise	278	265	248	None supplied
PGWU2011 Comet Way	560	594	452	421
80163A04 Cemex quarry	91	104	96	98

*Bromate in µg/l average
2024-02-21 EA Updated Monitoring database (2021-2024) data request*

Water companies are already engaging in finding alternative supplies that are free of contamination by installing piped water from other sources.

If pumping slows down or ceases at Bishops Rise, then the plume may change its orientation and its spread.

Locations around the former Hatfield Aerodrome where groundwater was sampled in 2017



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