APPENDIX 2

P.S Elliott The Little Manor 32 Church St., Hauxton Cambridge CB22 5HS (e-mail <u>o-k-s-a-n-a@bk.ru</u>, our other e-mail is currently out of order) The Head of Planning, Planning Services, South Cambridgeshire District Council, South Cambridgeshire Hall, Cambourne, Cambridge CB3 6EA 26th January 2009

<u>Planning Applications S/2307//06/F (Former BayerCropscience site, Hauxton,</u> Cambridgeshire)

As you know, I am the owner on one side and the tenant on the other of land directly affected by the BayerCropscience site. I now enclose our personal comments on the above application, i.e. those of my wife and myself, since my father Mr. C.S. Elliott sadly died earlier this month, which has made preparing this document difficult. You will be receiving or have already received the comments of my consultant Mr. Roger Braithwaite, who has the expertise to deal with the essential legal and technical aspects of the Application, which I cannot.

You will see from the comments below that, much as we, like all residents of Hauxton, dearly want to see the BayerCropscience site safely remediated, we consider the proposals put forward here deeply flawed, with aspects that are best described as opportunistic rather than opportune and geared to avoiding effective control and monitoring, which you will frustrate efforts that you may make in that direction. All this lies beyond our own fears about the effects of the planned procedures on our family health, the security of our business and future potential of our own land – not to say the health and sustainability of the environment which my father and I have striven to maintain and improve as village life has changed. We are certainly not against such change.

We ask members of the Planning Committee to read the arguments that we and Mr Braithwaite have put forward and reject this Application. We do not believe that the Applicants present proposals would stand up to the open scrutiny of a public Planning Inquiry, but with a site so seriously and diversely contaminated and in such an environmentally crucial location as this one, situated close to the village, close to the River Cam, close to agricultural land and to he A10 and M11, that is the proper forum for all the unanswered guestions that remain about this site and its remediation to be put to the test.

We can only move towards this proper process– if the Applicants could countenance it - to ensure all kinds of aspects of public safety by refusing to grant permission at this stage.

I hope that Councillors and yourselves will be convinced that this is the right way to go forward.

Yours sincerely

Peter S. Elliott

Comments of P.S. Elliott, The Little Manor, 32 Church Rd., Cambridge CB22 5HS

Planning Application S/2307//06/F): <u>Former BayerCropscience site, Hauxton</u> <u>Demolition of Factory buildings etc. and remediation of the</u> <u>site.</u>

Because our land and our business lie immediately adjacent to the BayerCropscience site, our submission is necessarily quite a long and detailed one. This is our personal submission, dealing with a range of topics arising from the proposals set out in the Application. A separate submission has been prepared on our behalf by our consultant Mr. Roger Braithwaite, which deals with legal and technical aspects of the Application, which reach beyond the issues addressed here.

Because of its length we summarise here the topics that we address below.

A Our personal background and relationship to the site.

B History of our past difficulties with the agrochemical factory site

C Our particular problems with the current situation and with the proposed remediation strategy of Harrow Estates plc

1) Ongoing contamination of our adjacent farmland, causing us past, present and future financial loss

- 2) Potential planning blight of our adjacent Church Meadow
- 3) Acute health hazards for our 3-year old daughter
- 4) Probable dust contamination of our asparagus crops rendering them unsaleable.

D The dangerous nature of contaminants on the BayerCropscienec site – a historical perspective

E Will the proposed remediation strategies work?

A few comments on a topic covered in detail by Mr. Braithwaite in his submission

F Remediation targets

G Stability of the bentonite wall and contamination of the Riddy brook

H Proposed alterations to the flow of the River Cam

I Groundwater flows beneath the factory site

Appendix 1 relates to the 1973 TBA contamination event when 2,3,6-TBA released into the River Cam from the agrochemical factory site, caused extremely costly damage to tomato crops in Essex.

Appendix 2 Results of chemical analyses carried out by Severn Trent laboratories Ltd. on groundwater leaking through the bentonite wall into the Riddy brook, sampled June 2008.

A

I am Peter Stewart Elliott and, together with my wife and 3-year-old daughter, live at the Little Manor on Church Road, Hauxton not far distant from the former BayerCropscience factory site. I am a farmer, specialising in growing certain high-value, high-quality crops, particularly asparagus in fields within Hauxton parish since 1981, though my father came into occupation in 1971. Over this period we have built up a successful and well-known and well-respected enterprise. In particular I own the land immediately to the east of the factory site, between that and St. Edmunds Church – generally known as Church Meadow, where I have grown asparagus for a number of years. I also own the water meadows on the south side of the River Cam to the north –east and east of the factory site, which are used for hay-production and sometimes for grazing paddocks for my wife's horses. From my deeds (and see also the Applicants' own plan of ownership) I appear to own the riverbanks of the River Cam for some distance downstream of my meadows and between the Applicants' land on the so-called Riddy Island and North Meadow, on either side of the river.

Because of the effects, actual and potential, that the presence of a large and active agrochemical factory has had our own and other adjacent properties, you would expect that we would be very enthusiastic about proposals to remediate what everyone agrees is a highly contaminated site – so contaminated that it falls under the national COHMAH (Control of Major Accident Hazards 1999) Regulations. However, we would need to be convinced:

1) That the remediation strategies would actually be able to reduce all the major contaminants to the level of "stringent risk-assessed targets", as was originally intended. This being particularly important (a) since the land is intended to be used for residential housing and (b) eventual decommissioning of the Waste Water Treatment Plant (WWTP) will mean that all run-off from the site will then flow directly into the River cam;

2) That the whole site will be decontaminated – partial or even-phased decommissioning could be disastrous for the vicinity.

3) That the remediation processes will ensure that our adjacent land is also left free from contamination at harmful and unacceptable levels.

4) During decontamination/remediation operations there is no risk to human health, particularly relating to our own land.

B

History

We have always believed in the dictum that 'The polluter should pay'. For many years it has been common knowledge that the factory site itself was heavily contaminated with a variety of noxious chemical substances. There is no doubt that safety standards were very lax in the very early days of the factory with burial and dumping of waste chemicals, as well as spillages and leakages. As ownership passed through a succession of increasingly prestigious international companies, spillages

and leakages continued with occasional further illegal lapses, if local workforce gossip is to be believed.

In the 1990s it became clear that vegetation outside the site, along the banks of the Riddy brook, but more significantly on the so-called Packhouse Field to the west of the A10, was showing signs of damage and die-back. The Packhouse Field, which we rented from the Church Commissioners and where we were growing alpine strawberries and other crops, began to be disastrously affected. Boreholes put down by ourselves and by consultants Enviros confirmed the presence in groundwater of a variety of chemicals that could only have come from the factory site. In some parts of the field high levels of contaminants could clearly be related to leakage from the effluent pipes leading to the WWTP, but elsewhere presence of such chemicals away from the direct influence of groundwater from the river suggested more complex pathways of water movement.

Following a law case in the High Court (P.S. Elliott v Agreevo UK Ltd, 1999) his Honour Judge Havery, although not awarding damages for loss of crops on the ground of insufficient evidence, ruled that the groundwater contamination did emanate from the factory site and rejected the defendants' hydrological model for the factory site and its surroundings (which is essentially the same model again put forward by Entec in this Application) in favour of a groundwater flow model put forward by our expert witness. However, ADAS (the Agricultural Development and Advice Service), then a Government Agency, noted that not only crops but deeprooted weeds such as bindweed and thistles were dying on the site, and after consultation with the Food Standards Agency, decreed that this field should no longer be used for growing food crops. It remains barren to this day and apart from causing us great financial loss, would have forced us to close down, if we had not been able to use other fields at the far end of the village, well away from the factory site.

By the 1990s both the Environment Agency and South Cambs District Council were very aware (as no doubt their predecessors had also been) from the extensive network of borehole groundwater analyses that the factory site was very heavily polluted and that chemical contamination had spread beyond the site (and even beyond the bentonite wall installed in 1973 between the factory site and the Riddy brook to protect the watercourse). In fact despite the COMAH Regulations coming into force in 1999, resulting in this being classified as a Special Site, and SCDC finally designating it as Contaminated Land (but only in 2003!), the Regulatory Authorities took no substantive action to ensure that any sort of clean-up would be initiated. Indeed, the site passed from Schering to Agreevo, to Aventis and finally to Bayer without any serious attempt at control or enforced remediation. Even after 1999, when it became clear that some plan had to be formulated, it took nearly six years before a remediation report was produced for Bayer (Atkins 2006) and then only after chemical manufacturing had ceased. We regard this as a serious neglect or failure of statutory duty by the Environment Agency, the official Regulatory Body, whether as a result of corporate failure or that of individuals within the Brampton office. That may be history, but we incline to the view that the legacy of this history of inaction, whoever was responsible, accounts for an ambiguous, and in our view unsatisfactory attitude and response to the very real problems of remediating this site.

Our particular problems with this application

These are best stated now, before we go into more detailed comment on this Planning Application.

1) As stated above, we own Church Meadow and grow asparagus there. When the present plantings of asparagus were made in 1994 we noticed that there was a significant area immediately adjacent to the eastern boundary of the factory site where the asparagus was growing very poorly. In subsequent years many of the plants in this area have died right back or completely, as have some common weeds. Asparagus and other plants grow perfectly healthily in the main part of the field. Already in 1995 borehole groundwater analyses from this part of Church Meadow showed small amounts of contaminants from the factory site, but since then the symptoms of herbicide damage on both crops and other plants has increased. This is not surprising as the groundwater level here is LOWER than that beneath the factory side, just as the water table below and beside the Riddy is also much LOWER than on the factory site. The subsoil below the affected part of Church Meadow consists of gravel set in a matrix of sand, silt and clay (an alluvial deposit similar to that on which we can grow asparagus well in other areas of Hauxton) Since this gravel layer extends westwards under the factory, as well as south-west where old gravel pits occur to the south of Church Road, it is clear that it is in hydrological connection with the factory site and groundwater will naturally flow downhill from there into this area of Church Meadow. Fortunately the rest of Church Meadow, where crops still grow well, is underlain by relatively impermeable Chalk Marl.

1) This area of our property is actually closer to "centres of contamination", than other areas on the factory site, which are designated for (expensive) remediation.

Although clearly the groundwater is contaminated, we believe that contaminants (as on the factory site) will have become bound to clay silt and other particles, so that the subsoil itself is likely to be contaminated.

The present Applicants and owners of the Factory Site are in strict denial (i) that any contaminated groundwater passes out of their site (except through the WWTP) and (ii) in buying the site from Bayer they inherited any responsibilities for anything outside the site.

IF remediation activities on-site fail to clean up contamination off-site, which seems to us probable (just from the areal extent of the remediation deemed necessary on site): -

a) We will continue to suffer financial loss (which has now amounted to many thousands of pounds) from the failure of the asparagus (or potentially any other crop) on that part of Church Meadow;

b) We have always assumed that in due course Church Meadow would become adopted for residential development. However, if contamination of the subsoil persists, this area too will require expensive remediation, immediately adjacent to a residential area. In other words it will be blighted. This again threatens us with substantial financial loss.

c) The presence of a directly adjacent field where crops or vegetation are clearly affected by contamination (and where children will be tempted to play) will cause concern to parents in the new proposed development. NB Even after more than 10 years some areas of the Packhouse Field where almost nothing will grow and the soil is bare.

2) My wife and I are both extremely concerned about the health hazards to our 3-year old daughter, to the friends that come to play with her and to the children and parents we see walking across our land and along the public footpath beside the Riddy brook. We note that the remediation process selected by the Applicants – exposure and dewatering – is likely to generate odours and dust and rely to a considerable extent on the release of solvents into the atmosphere as contaminants break down. We note the statement regarding health and safety on page 29, Section 6.28 of the Environmental Statement: Remediation Main Report

"Critical Receptors

6.28

The key receptors with regard to affects on air quality are considered to be members of the public. Generally the critical (*sic*) based on factors such as respiration rates and bodyweight is taken to be that of the standard residential land-use defined in the CLEA model, i.e. the exposure of a young female child between 0-6 years. The nearest properties are two residential houses located immediately to the west, on the opposite side of Cambridge Road (the A10) from the site."

We have a 3-year old daughter, who regularly plays in our Church Meadow and likewise accompanies her mother in the feeding, exercising and riding of her horses in the adjacent meadow, All these within very close proximity of the factory site. We feel that she is being put at risk – are we expected simply to shut her up and also keep her from the horses she loves? Phasing of the development would make this situation even worse, extending the remediation period for perhaps another 2 years.

CS - Removed photo of Mr Elliotts daughter on horse

Our subject of concern

We note the range of procedure likely to produce noxious vapours and consider many of these will be difficult if not impossible to control (Environmental Statement: Remediation Main Report: -

6.31 The following are the key activities considered likely to generate vapours and potentially have a significant effect on air quality in terms of human health risks and odour nuisances:

Breaking open of concrete slabs and release of vapours held within the ground.

Collection of water, discharge in to lagoons and treatment of contaminated water.

Mass excavation of soil, loading on to articulated dump trucks for transportation to processing areas.

Soil processing and screening using one way and finger screens to segregate materials into a number of categories of material.

Soil treatment including principally ex-situ bioremediation and vacuum assisted bioremediation.

3) In early 2008, demolition work began on the site actually before planning conditions had been agreed but apparently with the consent of officers of SCDC, In the first two weeks of March 2008 buildings on the site were torn down during a period of high winds, and our fields, including the grazing paddock and hay meadow were covered with fragments of yellow fine-spun glass insulation material. The horses had to be stabled elsewhere for a period. After complaints via the Environmental

Health Department of SCDC (who commented that it wasn't serious, as it didn't affect *human* health, contact the RSPCA!) men from the demolition team came and gathered up the larger fragments of this material. Again in the third to fourth week in June (several days) during demolition of buildings on the factory site, the woodland strip between the Riddy and the River Cam, our meadows and the Church Meadow asparagus field were covered in fine white dust that blew like snow across the landscape. Again we complained about these clear breaches of the conditions on dust control etc.

CS – Removed photo

Residual dust covering vegetation by Riddy footpath. 26th June 2008

The applicants are anxious to commence work on the remediation of the area immediately adjacent to Church Meadow as soon as possible (i.e. early spring). This, in particular, initially involves 'breaking, lifting and crushing the concrete slabs and ground obstructions' that cover much of the site. The asparagus season runs from March to approximately the end of June. We are aware that even a single breach of dust control, such as has already happened twice during the past year, could simply make quite unsaleable the bulk of the asparagus crop over the whole of Church Meadow. We believe that there would have to be some agreement about how this potential clash of interests can be resolved. It is useless for the Planning Committee and officers to simply recommend conditions, if they are neither obeyed nor enforced.

D

The dangerous nature of contaminants on the Hauxton factory site and their repercussions

At the previous Planning Meeting discussing remediation of this site, at least one councillor queried whether any really hazardous chemicals were actually present. We trust that the list of chemicals present (as well as remediation targets), presented by the Applicants, and the extensive Appendix to the Methods Statement, listing in great detail the properties (and necessary safeguards) relating to all chemicals reported from the site – together with the site's official recognition under the COMAH Regulations will satisfy any doubts about this.

We have lived under the shadow of the factory and its operations for over 57 years, so we are very aware of the damage that has been done both to people and to the environment. It is recognised that health and safety safeguards were very lax in the early days of the factory's operation. We are aware of a significant number of people who either worked for the factory or resided adjacent to it who succumbed to cancer of various kinds, particularly to pancreatic cancer. In those days before proper regulation workers found that their agreed conditions of service subsequently prevented them taking legal action against their employers, or indeed disclosing matters that were deemed confidential. Chemicals used or manufactured on the factory site, even up to recent times, were often highly carcinogenetic – their residues remain so.

There have been a long series of leakages of contaminated groundwater from the factory site into either into the Riddy brook or via drains that feed directly into the River Cam or else by malfunction of the Waste Water Treatment Plant. To emphasise

how even very small quantities of such chemicals derived from the Hauxton site (even diluted to almost undetectable levels in the River Cam) have been able to cause serious economic damage, we include as Appendix1 extracts from a scientific paper reporting such a release in 1973. The paper is old, but groundwater analyses have show this herbicide 2,3,6-TBA persisting at high concentrations below the factory site and also in Packhouse Field many years later.

E

Will the proposed remediation strategies work? THE REMEDIATION STRATEGIES PROPOSED IN THIS PLANNING APPLICATION DIFFER FROM THOSE PROPOSED IN 2007.

The 2007 Application proposed 3 principal remediation procedures, apparently backed up by field and laboratory trials, which had originally been put forward in the Atkins Report (2006). These involved: -

1) Excavation and dewatering

2) In situ bioremediation (biosparging)

3) In situ chemical oxidation

Two days before the October 2007 Planning Meeting our friend and colleague Dr. Charles Turner was checking the Application papers at South Cambridgeshire House was surprised to find Minutes of a meeting on 17th July 2007 between representatives of the EA, ACDC and the Applicants discussing a "Groundwater Report". He was then shown this report entitled "Method Statement for the Remediation of Soil and Groundwater. Former Bayer Cropscience Limited Site, Hauxton ()/Ref HE 7406) August 2007, prepared by Biogenie Site Remediation Ltd. for the Applicants, being the consultants who had actually carried out the field and laboratory trials. The document had been submitted to SCDC Environmental Health but was not included in the Planning papers despite clearly being central to the subject of the Planning Application. However, their report made it clear that the proposed remediation procedures had serious defects and either wouldn't work or would not reduce critical contaminants to the necessary "stringent risk-based targets". Their summary table from p.32 of that Report (since declared confidential, with access denied) is given below.

Methods statement for the Remediation of Soil and Groundwater, Former Bayer Cropscience Limited Site, Hauxton (O/Ref HE7406) August 2007

Page 32

Option	Applicable	Advantages	Disadvantages	Taken
Revision of risk assessment to incorporate findings of additional trends	All	Will ensure remediation can be undertaken effectively with lower risks of contaminant rebound to a reasonable timescale and cost	May require time at the commencement of the project to agree with the regulators (EHO and EA)	yes
Barrier implementation	All – containment rather than elimination	Relatively cheap Will allow site remediation to be completed in a reasonable timeframe	Does not remove some areas and long term potential risk to environment Long-term cost of monitoring and	No

Table XVI: Soil/Groundwater Remediation Option Appraisal

			maintenance	
			Investor confidence	
Excavation and	All soluble contaminants	Overcomes barriers to	May not always achieve	Yes, initial step in all
Dewatering		permeability of made	remediation criteria for	areas of impact
		ground which will inhibit	all contaminants to	
		efficiency of treatment	stringent risk-based	
			targets	
		Not inhibited by high		
		metals concentrations or	High level of disruption,	
		high organic loading	it is difficult to	
			implement around live	
		Relatively quick removal of	services	
		gross concentration of		
		soluble contaminants	Odours and VOC's	
			emissions need careful	
		Is easily implemented with	management	
		simple groundwater control		
		due to low permeability of	May well need	
		underlying made ground	complementary	
			technology as a	
		Is effective in reducing	contingency phase	
		contaminant rebound as the		
		majority of contaminants		
		do not partition with soil		
		phase		
Bioremediation (Soil	All But lower	Degrades many	Needs time and space to	Yes for soil,
and Groundwater)	elimination rates for:	contaminants of concern at	be implemented	biosparging is
	- Schradan	site	Has a lower elimination	unlikely to be
	- Dicamba	~	rate for a limited	effective as an in-situ
	- Bis (2-	Can be used to declassify	number of contaminants	treatment option
	chlorethyl)	soils from hazardous to	in both soil and water	
	- Ether in	non-hazardous for off-site	Biosparging will be	
	BH% & BH	disposal where required	difficult to implement	
	7 zone	XX 1	effectively due to low	
	- Ethofumesate	No long-term perception	permeability of cohesive	
	- HEMPA	issues as contamination	made ground	
		eliminated		
		T t	l oxicity is present from	
		Low cost	dissolved metals in	
			groundwater so	
			acentaminanta is limited	
Chamical avidation	All contominants of	Is able to evidice all	Europaine et large coole	Vac as a contingenery
Chemical oxidation	All containinants of	is able to oxidise all	due to high organic	ries, as a contingency
	concern	containinants of concern	ace to high organic	of soil is suitable
			groundwater	or som is suitable
			groundwater	
			Unlikely to be effective	
			on cohesive soils due to	
			ineffective contact	
			hetween oxidant and	
			target compound	

In our view the situation at the time of the October 2007 Planning Meeting was:

1) The Applicants clearly knew that they were seeking permission for a Remediation strategy that their consultants had told them would for the most part not work and would certainly be problematic. There was no other strategy 'on the table".

2) Officers both from the Environment Agency and the SCDC Environmental Health Department were also aware of the deficiencies of the proposed remediation strategy. It is unclear whether the Planning Officer in charge of this application (Mr. Wayne Campbell) was aware of the contents of the report, though he certainly knew of its existence. He has since left SCDC.
3) Members of the Planning Committee were not made aware that there were any serious problems with the proposed strategy (which they then passed subject to conditions). Councillors who asked for further information about the remediation processes were told that none was available.

Our view was that this was an unsatisfactory way for members of the Planning Committee to be able to make decisions on a highly contaminated and potentially hazardous site.

We recite this BECAUSE it has relevance to the present Application. Biogenie were replaced by Vertase who prepared a new Method Statement for the remediation of the site, the latest version of which forms part of the present Application. In essence this new Method Statement echoes the exact problems that Biogenie foresaw with

F

Remediation Targets

The Remediation Method Statement refers to 'Atkins targets'. The Atkins Report (2006) refers to targets that in 2006 were to be agreed with 'the appropriate regulatory bodies'. We assume, therefore that these are the targets set out as a Table (now labelled *Preliminary* Remedial Targets) as Section 6.7 on page 16 of the Vertase Method Statement. It must be assumed that these were the targets agreed the Environment Agency as the "Enforcing Agent" under the Environmental Protection Act 1990, taking into account EC regulations and the special circumstances of the site and potential end usage (i.e. for residential development).

However, reading through the Statement, we note: -

Page 12, Section 5.9

a) Following description and details of the geological units for the different Zones (areas) of the site that "All zones and soils will be assessed on an individual basis during the works" – which suggests that they still lack sufficient data to devise a comprehensive strategy;

Page 13, Section 6.1

b) "It is the intention to work towards these (i.e. Atkins) targets, wherever possible during the remediation – however it is likely that many of these targets are beyond the capability of treatment technologies ..."

Page 60, Section 18.1

c) "The recommended targets produced by Atkins are certainly protective of all identified receptors However, for the avoidance of doubt we do not believe these targets are achievable through the use of readily available and commercially viable remediation technologies or without significant export of contaminated materials off site."

Page 13, Section 6.3

d) "An important part of the approach ... will be to collect further information. It is our intention that this information will be used to further develop the site model to re-evaluate the remediation targets."

Page 14, Section 6.4

e) "It does mean that some material will be replaced at the site that does not meet the present generic criteria ..."

We conclude from the above extracts that: -

- a) Vertase are still uncertain about what techniques will work or can be applied;
- b) They do not believe that the remediation targets originally agreed between the Environment Agency and Atkins are likely to be either technologically achievable or commercially viable– i.e. it is impossible for Harrow to remediate the site for residential usage to the standards originally demanded;
- c) They are proposing to try and move the goal posts and find reasons to lower the targets set. By referring to these as 'Atkins targets or preliminary targets', they obscure the nature and purpose of these targets;
- d) Despite what has been said previously, reliance on capping material to isolate poorly decontaminated material is part of the strategy and is indeed listed as Option D following the other Remediation Options in Section 3.39, page 13 of the Environmental Statement – Remediation Main Report document.

Whereas a clean cover to prepare land for residential development is obviously acceptable, the use of capping material as a stated Remediation Option, presumably to cover material that "will be replaced at the site that does not meet the present generic criteria", is surely not acceptable! Firstly the contaminated layer is shallow – only up to 4 m in depth, with impermeable strata below (i.e. within rooting depth) and secondly buried incompletely remediated material is simply going to carry on contaminating groundwater and affect surrounding areas as well as the site itself.

The role of the Environment Agency is critical in this remediation process. We have been in correspondence with Andrew Lansley MP about our problems with this site, and he, in turn, with the Area Manager of the Environment Agency at Brampton. Their reply to Andrew Lansley contained the following statement: -

"The Environment Agency will not allow any material which does not meet remediation targets to remain on site. It is possible that the remediation targets will be modified by further risk assessment if the parameters used in the original assessment are altered by the remediation process. Whether a remediation is economically viable is not our concern, compliance with the statutory regime is what we regulate. The quicker the planning permission is approved and the contractors start work the better."

It is extremely difficult to believe that Harrow Estates/Bridgemere plc. would embark on this expensive remediation and redevelopment project, unless they already had a clear understanding with the Regulator, the Environment Agency, that they would be allowed to carry the project through. At the same time, it is made clear that there is no certainty that the job could be carried out to standards that guarantee human health and safety. We find that there is a paradox here which is frankly not satisfactory, particularly to those living adjacent to the site who would bear the brunt of any partial remediation. The Environment Agency, having failed to make the large international agrochemical companies, who could well afford to do so (following closure Bayer are reputed to have reclaimed and sold specialised equipment on site to subsidiaries in Israel and Australia worth many millions of pounds) they are now somewhat desperately supporting a remediation programme which, with the best will in the world, can only be described as a gamble. We appreciate that by now – following this indefensible delay - it had become extremely difficult to see how funding for remediation of such a contaminated site could be raised. Nevertheless the haste and acceptance of uncertainties might be interpreted as indications that the condition and stability of the site have been or are in danger of deteriorating much more seriously than has been publicly admitted (which would lead to equally serious questions for the EA).

G

Stability of the bentonite wall and contamination of the Riddy brook

In 1973 a barrier composed of bentonite was implanted down to the level of the impermeable Gault Clay along the boundary that separates the main factory site and the Riddy brook. The purpose of this was to impound contaminated groundwater and prevent it entering the Riddy brook and thus the River Cam. The Enviros Report (2005) commissioned by Bayer reported, "However, given the age of the wall (come 32 years) it may be beyond the typical design life considered for barrier walls. Possible evidence of break-through, particularly of solvents is present. Hence its continued reliability for the longer term is uncertain". Leakage of contaminants through the wall is evidenced by borehole data. "In Area 3, between the main Site and the Riddy, contamination of groundwater is recorded with concentrations of the same parameters present on both sides of the wall. This is shown diagrammatically in plan 5 and indicates Area 3 concentrations of TCE of over 30 mg/l, toluene of 3.8 mg/l and MCPA at 0.47 mg/l." (Enviros Report 2005, page 43, Section 7.5).

The boreholes on the Riddy side of the bentonite wall still exist but have been locked up after the EA were asked why they had not been sampled in any of the recent surveys. No data from groundwater analysis for this critical area has been released in any report since 2005.

My late father Mr. Courtenay Elliott compiled an extensive dossier of minor leaks and seepages through the bentonite wall into the Riddy brook, which were reported routinely to the Environment Agency but with little action. In 2002 a Cambridge University student Miss Lauren Tinker wrote a dissertation "Aquatic pollution – a persistent problem in Britain: Industrial Agrochemical Pollution over time in ground and surface waters, Hauxton, Cambridgeshire", which included analyses of

contaminated groundwater from a seepage in wall of the downstream section of the Riddy brook, as well as pH and Electrical Conductivity surveys of the stream along the course of the Riddy, which indicated seepage at various sites along its course.

Copies of her dissertation were sent both to the Environment Agency and to the Environmental Health Department of SCDC. It is worth quoting one of her conclusions:

"The continued presence of List I and List II substances in the groundwater (table A1) is a direct contravention of European and British law. Despite the introduction of the new Groundwater Regulations, the lack of successful action to guarantee the prevention of further pollution suggests the regulative powers are insufficient."

We highlighted problems with the bentonite wall and contamination of the Riddy brook in our submission for the October 2007 Planning Meeting. A serious breakdown of the bentonite wall during remediation activities could have an enormous impact on the River Cam (and even affect tourist activities in the City of Cambridge).

In the various versions and revisions of Vertase's Remediation Method statement (including that submitted with this Application) it is stated: "no contamination at present is impacting on the nearby receptor of the Riddy Brook".

In June we noticed that in area of the bank of the Riddy, directly abutting the bentonite wall and the factory security fence, and where there had been signs of small seepages, water was beginning to flow out more freely.

 We notified the Environmental Health Department of SCDC, but when officers came out they declared that they could see nothing but didn't cross the brook to inspect closely), Ms. Young from the Environment Agency also came at the same time.
 Our consultant, Mr. Roger Braithwaite, then took samples of the groundwater flowing freely out of the bank and submitted these to Severn-Trent for analysis. This confirmed the presence of contaminated groundwater entering the Riddy (see Appendix 2 for these analyses).

3) On reporting that we had these results, officers from the Environment Agency at Brampton and Ely immediately came out and sampled one of the leakage points – more than a seepage, because they were able to collect more than 7 litres of water in less than 2 minutes!

4) Despite promises and requests on three separate occasions we have not been sent the results of these analyses, even though the site is within 6 metres of our own property (adjacent to the public footpath and much further upstream than Miss Tinker's site).

In writing to Andrew Lansley MP the Regional manager of the Environment Agency Dr. Geoff Brightly included completely contradictory comments on the situation (prepared by his staff): 1) We agree the bentonite wall is of great importance, there is no clear evidence it is leaking; 2) Mr. Elliott reported seepage from the Riddy bank to the Environment Agency on 18 July and two Environment Agency officers met him there and took samples on the same day....Some chemicals detected in the discharge were above the EQS but these were not found to have caused the Riddy Brook to fail EQS targets. 3) As a result emergency works were undertaken to remedy the situation.

We conclude:

A) That it was and is quite untrue that there is no clear evidence of leakage through the bentonite wall. We are shocked that the EA can still repeat this fiction when their own officers have seen and sampled leakages. What purpose can such a position serve?

B) We believe that if we had not monitored that leakage, which clear was getting more vigorous over the time we observed it, there would have been a major 'incident'. As we have learnt from the EA "emergency works" were necessary to curtail the leakage at this point on the Riddy.

C) We note the EA's failure to reveal their analyses (but we have our own). Groundwater contamination on the factory site is highly stratified with the denser and more hazardous solutions at depth. The leak we (and the EA) sampled was about 50-60 cm above the surface of the stream; leaks at or below stream level are likely to be more highly contaminated.

D) We believe that a detailed investigation of the both the integrity of the bentonite wall and the of-site migration of contaminants should have formed an ESSENTIAL part of any Environmental Impact Assessment. The Enviros Report (2005) commissioned by Bayer reported on page 15 Section 3.5.1, "Environment Agency data indicated that the contaminants have migrated offsite", and Section 3.5.2 that Benazolin-ethyl, TBA (organohalogen compounds), Benfuresate and Ethofumesate (substances which constitute poisonous, noxious or polluting matter) are entering surface waters (Riddy Brook) via groundwater". The Applicants simply deny that this is happening (though it is hard to believe that they have not sampled the critical boreholes) and the Environment Agency prefers not to acknowledge their own data.

H

Proposed alterations to the flow of the River Cam

The breaching of the levee upstream of the weir will affect our property. Firstly, it should be noted that we are riverine owners both upstream and downstream of the proposed works. No consultation has taken place.

Under the heading "The key features of the flood relief channel" (page 19 of the ENTEC Hauxton Flood Risk Assessment Report, Section 4.4). There are contradictory statements: -

a) It is stated that the spillway construction "will also ensure upstream storage is maintained within the River cam and associated flood plain, which includes a number of water meadows".

b) "Controlled breaching of the levee and constructing an engineered hydraulic structure would enable the weir to function as normal, but would limit the upstream water level by allowing excess flow to be stored within the field."

Basically, if this structure is constructed, it will reduce the water levels upstream and this can only lead to less seasonal flooding and further drying out of the water meadows upstream, accelerating their degradation and loss of biodiversity.

We cannot see that if ground levels and finished floor levels are raised on the site, that the construction of the flood relief channel is really necessary. We still suspect that a major purpose of the excavation is to provide "fill" for raising ground levels cheaply and conveniently.

I

Groundwater flows beneath the factory site

We consider that there is also a significant gap in the Environmental Assessment material provided with regard to this topic. For many years, and long after closure of the factory, the Waste Water Treatment Plant has been treating contaminated groundwater and pumping it out into the River Cam. Nowhere has the source(s) of this groundwater been satisfactorily addressed. The ENTEC Flood Risk Assessment report barely addresses this topic. Since the main remediation method proposed is dewatering the site, one would assume that the natural inputs of water onto the site were of great importance, but this has been given scant attention in the Environmental Statement, possibly because any detailed explanation of water flows would immediately substantiate the responsibility of the Applicants for off-site contamination from their site.

At the hearing of P.S. Elliott v. Agreevo Ltd UK in 1999 the Defendants (again advised by ENTEC) claimed that it was impossible for any of our land to be affected by groundwater flow from the factory site, as all flow simply was directed downstream, east to west along the present valley of the River Cam. On the same principles the present Applicants have continued to deny that there is any possibility of groundwater from their site entering our land (Minutes of a meeting on 17/7/2007 quoted earlier, and also direct denial by the Managing Director of Harrow Estates plc at a meeting with our solicitor) (i.e. Church Meadow is "upstream" of the site). This is clearly nonsense because it is well recorded that water levels below the factory site are much higher than those on and below the River Cam floodplain, and indeed we (and the EA) have seen groundwater flowing out of the Riddy Bank and down into the Riddy. In no way, therefore can the groundwater be flowing westwards along the Cam Valley and then up into the factory site!

The correct interpretation of groundwater sources and flow directions in the vicinity of the BayerCropscience site has been provided by our colleague Dr. Charles Turner, who has been a University Lecturer in the Department of Earth Sciences at the Open University and also at the University of Cambridge for over 30 years.

There are two potential sources of groundwater, both of which probably play a significant role. The geology of the site is fairly clear. The "solid" geology below the site, at a depth of about 4 metres, consists of the West Melbury Marly Chalk Formation (WMCk) or the underlying, very impermeable Gault Clay. Although most of the WMCk has reduced permeability, its basal beds, the so-called Cambridge Greensand, is more sandy and heterogeneous, so that the boundary between that and the Gault Clay forms a spring-line along which deep groundwater is expelled.

Originally the top 3 to 4 metres Quaternary ('Drift") alluvial deposits consisting of sands and gravel, with occasional thin channel infills of clay or silt. These were ancient river deposits, probably dating from the Devensian Stage of the Quaternary Ice Age, laid down not by the forerunner of the present east to west flowing River Granta (as that branch of the R. Cam is called), but by a south to north flowing branch of the River Rhee (the other branch of the R. Cam) which joined the River Granta

Geological map of the Hauxton area (extracted from the BGS Saffron Walden sheet 205)

Key

Grey: Holocene (post-glacial) alluvium Pale pink: Late Pleistocene river terrace deposits Dark and light green: White Chalk Group Yellow Green: West Melbury Marly Chalk Formation Blue: Gault Formation



Present course of the River Cam

Ancient course of the River Cam

Factory Site



very close to the factory site, as can be seen from the Geological Survey map of the area, and then flowed northwards across the Shelfords and Trumpington. The gravels laid down by this river have been exploited in the pits, now converted into a private nature reserve, on the south side of Church Road, opposite the factory site. Perhaps 15-20,000 years ago the River Rhee was diverted to its present course further to the west, so that it now joins the Granta branch at Hauxton Junction upstream of Byron's Pool. However, the highly permeable sand and gravel-filled channel of this former course of the River Rhee continues to act as a conduit for groundwater, again being fed by springs emanating locally from the base of the Chalk.

This groundwater is channelled down towards Hauxton village and the factory site, being augmented by the subsurface springs referred to above. Until the 19th century this water would simply have merged with the underground flow travelling westwards within he alluvium of the River Granta. Several things have happened to disturb and divert this flow: -

1) In the late 19th century coprolite diggers stripped and recycled alluvial and Lower Chalk strata that overlay the Cambridge Greensand, which was the source of phosphate rich nodules ("coprolites") mined for processing as fertilizer. Coprolite digging probably extended over at least part of the land recently occupied by the factory and the backfilling of the "overburden" probably contributed to the inhomogeneity of the sediments, which has made in-situ biosparging and chemical oxidation treatments more or less unviable.

2) Further disturbance and barriers were caused by the pits, sumps and foundations, associated with the factory.

3) Finally in 1973, probably partly as a result of the TBA pollution disaster, it was decided to install the bentonite wall, down to the level of the impermeable Gault Clay, together with a system of sumps and pumps to carry the contaminated groundwater on site, which was now backing up against the bentonite wall and causing a general rise in the water table beneath the site, to a newly constructed Waste Water Treatment Plant to prevent this groundwater accessing the Riddy brook and so the River Cam.

The problem for us, as neighbouring landowners or occupiers both to the east and west of the factory site is that what was described at the 1999 judicial hearing as the "mounding" of the groundwater below the factory site, is that, although it is mostly carried away to the WWTP, this also sets up a radial flow, so that contaminated groundwater is also able to flow along a downhill hydraulic gradient to the east where it enters our Church Meadow and to the west, across the A10, where it was found by Judge Havery, reviewing the borehole evidence, to have contaminated the groundwater below Mr Hurrell's field, opposite the junction of Church Road and the A10, and then impinged onto our Packhouse Field. It is clear that Packhouse Field is still, after 10 years fallow, badly affected by this contamination (as well as from former broken effluent pipes leading to the WWTP}.

The evidence from boreholes sampled below the factory site is that many of the more noxious contaminants have not been reduced in concentration despite being there for many years. It is clear that off-site spread of contaminants via groundwater is still taking place. Our concern is that this contamination is of such long standing that by now the subsoil as well as the groundwater are thoroughly affected. The EA and SCDC are unwilling to investigate this matter, even though it may have a long-term effect on any development that does take place on the factory site, if successfully remediated.

Appendix 1

GROWTH REGULATOR INJURY TO TOMATOES IN ESSEX, ENGLAND

J. H. WILLIAMS,* H. G. KINGHAM, B. J. COOPER & D. J. EAGLE

Agricultural Development and Advisory Service, Block C, Government Buildings, Brooklands Avenue, Cambridge CB2 2DR, Great Britain

ABSTRACT

Severe growth regulator injury to commercial glasshouse tomato crops occurred at fifty holdings in Essex. Using biological assay and chromatographic techniques the source of the injury was traced to the domestic water supply. Effluent from a factory near Cambridge had resulted in contamination of river water with the herbicide 2,3,6-TBA. Water from the Cambridgeshire river system had been pumped into the Essex rivers via a recently completed pumping system.

INTRODUCTION

In March 1973 advisers of the Agricultural Development and Advisory Service (ADAS) were asked to examine distorted tomato crops on a number of commercial glasshouse holdings in south-east Essex. The crops were found to exhibit symptoms consistent with injury by a herbicide of the growth regulator type (*see* Fig. 1). Young leaves failed to expand normally, exhibited distinct parallel venation, slight inrolling of leaf margins and mucronate leaf edges with tips of leaflets drawn to a fine point. Davison (1961) described similar symptoms for a range of herbicides. He found the symptoms produced by 2,4-D and 2,3,6-TBA to be significantly different from MCPA, 2,4,5-T and CMPP. However, at the level of expression found in this incident it was not possible to pinpoint any specific herbicide as the most likely contaminant. In some glasshouses, fruits also showed deformation typical of growth regulator injury (*see* Fig. 2). The occurrence was unusual in that all plants were affected in each of the glasshouses concerned. The symptoms described were uniform in their severity, unlike most cases previously encountered involving spray drift or soil contamination. The only feature common to all cases

* Present address: ADAS, 'Woodthorne', Wolverhampton, Great Britain.

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Compensation paid was well over £1 million at today's prices



Appendix 2

Results of chemical analyses carried out by Severn Trent laboratories Ltd. on groundwater leaking through the bentonite wall into the Riddy brook, sampled June 2008.

See separate file on disc "Riddy Water Analyses, June 2008"