STATES OF JERSEY

BELLOZANNE SEWAGE TREATMENT WORKS: ODOUR EMISSIONS

Lodged au Greffe on 30th November 2017
by Deputy A.D. Lewis of St. Helier

STATES GREFFE

PROPOSITION

THE STATES are asked to decide whether they are of opinion –

(a) to request the Minister for Treasury and Resources to allocate funds of up to £4.5 million from contingency to the Department of Infrastructure as and when funds are required, to ensure that full attention is given within the proposed new Sewage Treatment Works (STW) project to odour mitigation, include the covering of the primary settlement tanks (PST);

(b) to request the Minster for Infrastructure, in conjunction with Environmental Health, to commission a full independent study into how emissions from the Plant affect local residents and businesses, including full consultation with those most affected; and

(c) to request the Minster for Infrastructure, in conjunction with Environmental Health, to undertake continuous monitoring of odour emissions from the STW site once all approved mitigation measures have been implemented, and to make appropriate provision for the cost of such monitoring in the next and subsequent Medium Term Financial Plans.

DEPUTY A.D. LEWIS OF ST. HELIER

REPORT

History

Prior to the existence of the Bellozanne STW, the valley was a beautiful and peaceful location which provided exceptional quality of life to residents fortunate enough to live there. In the 1950s, the Government built the current STW, promising the concerned residents that there would be NO smell. Many travelled to Jersey to admire the original build as being 'state of the art' and to see just what could be achieved with what was then, ground-breaking technology.

There then followed over the next 6 decades, numerous problems for local residents relating to odour and noise, as the Island sewerage network and site expanded. Much of the complaints related to the often-unbearable smell which would engulf the valley on warm summer days or less windy days. The resultant effect of the smell is that nearby residents have to keep windows and doors closed to prevent a build-up of stench within their homes. Clothes cannot be dried externally for fear of smelling later, and it's no wonder that some local children have been ridiculed because their clothes contain an unpleasant aroma!

According to some residents, the release of odours often occurs at night, which in summertime, when residents often need to sleep with their windows open to alleviate the heat, results in their homes being filled with the stench of sewerage.

Following years of residents' complaints, finally, campaigners forced a debate on the matter in the States Chamber in 2006, when a petition was lodged by former Deputy J.B. Fox of St. Helier (P.34/2006). The result was overwhelming support from States Members to instruct action to be taken and funds allocated. However, the planned "cover and treat techniques" that were to be employed were beyond the later levels of funding. Although some improvements were made, they have now been overwhelmed by the ageing of the current STW and its increased workload.

The application to replace the current outdated system has been welcomed by my constituents. It was hoped that this 'once in a lifetime' opportunity to build a new STW would include every possible piece of technology to mitigate the unpleasant smells and other disturbances caused by the Plant that have blighted the neighborhood for so long.

However, upon greater scrutiny, the proposed new Plant has some fundamental flaws that, far from reducing the disturbances from the current Plant, may well make the situation worse for nearby residents.

Odour modelling

The odour modelling map attached to this proposition clearly indicates a shift of the odour footprint due to the positioning of the replacement PSTs. Note the predicted footprint, which now encompasses a newer area to the right, never before affected by odour, which contains further residential homes likely to be affected. The grey area (*see* **Appendix 1**) indicates the existing perceived footprint.

A study undertaken by Odournet states: "The largest single contributor to odour emissions are the PSTs which account for approximately 40% of the total emission from the site". However, when giving evidence at the Planning Committee meeting, the

consultant from Odournet said that the Primary Settlement Tanks would produce 60% of the odour emissions (*see* **Appendix 2**).

Due to local residents' concerns emanating from DfI's planning application, they decided to commission their own independent experts and legal advisers, at great personal expense, to evaluate the odour issue as it was seen to be too technical to defend as laypersons.

This resulted in 2 specialists of world renown, namely Ove Arup and Partners Ltd. ("Arup") represented by Dr. Michael Bull, a Fellow of the Institute of Air Quality Management ("IAQM") and Netherlands-based Olfasense, a company who were once an integral part of the applications specialist Odournet. Both these consultant organisations deemed elements of the DfI planning application with regard to odour emissions as flawed and not properly addressing neighbours' concerns.

DfI insist that the new Plant will only result in an 18% overall reduction on the effect of odour emissions in the greater residential area, and some residents will notice no change at all. This appears to be based on the fact that due to the repositioning of the Plant, the odour map now has a reduced impact on some residents, but an increased impact on a slightly less densely populated area within the affected zone. Therefore, DfI appear to justify the emissions from the new Plant on the basis that the odour nuisance would affect a smaller number of properties.

This is no different an analogy that bullying less people justifies bullying in the first place.

DfI's intention is to limit emissions up to the site boundary to a 5 ou_E/m^3 maximum odour output level, this is viewed by independent experts as high, even for the area at the core of a sewerage treatment works (a level of 3 ou_E/m^3 would be expected). However, DFI's application suggests a footprint almost twice the size of the site, and does not show what the site boundary level actually is. It is suggested that some of the properties closest to the Plant may be experiencing levels in excess of 20 ou_E/m^3 at peak intervals.

In 2009, DfI commissioned Grontmij to produce a Liquid Waste Strategy as part of the Bellozanne Master Plan. Their report, at section 3.1.2 "Odour Issues", states: "*Odour control facilities are generally required in order to avoid public nuisance with a site boundary limit of* 5 ou_E/m^3 *(European Odour Unit per* m^3*). Further measures will be implemented".*

In the Arup report commissioned by my constituents, it is stated that STWs should aim to have no properties within the 3 ou_E/m^3 contour line, and this is the standard suggested by the Environment Agency for moderately offensive odours. Generally, an average person would be able to recognise the source of an odour at about 3 ou_E/m^3, although this can depend on the relative offensiveness of the odour, of which sewage works are considered typically to be a moderately offensive smell.

In the High Court Judgement relating to odour nuisance at Mogden STW (*Thames Water v Dobson* [2009] EWCA Civ 28), where residents claimed damages for odour exposure against Thames Water, the judge concluded that as the odour concentration rises to C_{98}, 1-hour = 5 ou_E/m^3, he considered that this was the area where nuisance from the works would start and "by the time 5 ou_E/m^3 or above is reached nuisance will

certainly be established". If the Environment Agency H4 guidance were applied to a sewage works, it would propose a more stringent benchmark of at least 3 ou_E/m^3. Where the proposal for a new works is considered, it should surely seek to achieve the best environmental standards possible, and not simply a minimum standard to avoid complaints, or a small improvement from an existing and unacceptable situation. In any event, complaints and loss of amenity are not the same thing, and it is accepted that an effect on amenity will occur at lower concentrations.

The Environment Agency H4 Odour Management Document gives Benchmark levels for odour modelled over a year at the site/installation boundary. Typically, a sewage works is considered to emit moderately offensive odours, except where septic effluent or sludge is handled. Therefore, following the H4 guidance, an odour benchmark of 3.0 ou_E/m^3 would be considered to be the maximum acceptable level. However, even the more stringent standard of 1.5 ou_E/m^3 would result in 10% of the exposed population being annoyed by the odours.

Members will be aware that at the September 2017 Planning Committee Hearing, the Panel refused to approve the application for the new STW unless the settlement tanks were capped to reduce odour emissions. The Chief Officer of DfI stated that the cost of undertaking such additional works would be in excess of £4 million – monies that had not thus far been allocated to the budget for the STW project.

The Chief Officer also cited concerns about the challenges involved in the maintenance regimes of capped tanks. However, in their report, Arup confirmed that STWs in the UK at Wigan, Mogden, Nigg (Hull), Deephams, Beckton and Meols, all have covers on their PSTs. Whilst it may be the case that water companies find maintenance of covered Plant more difficult, it is clearly possible and appropriate, as evidenced by their installation at numerous STWs elsewhere.

At the aforementioned Hearing, DfI suggested that they would look to cover the PSTs and take other measures at a later date if adverse odour emissions persisted; this approach has a twofold risk –

1. The officers involved in the project today may not be there in the 5+ years' time when the site works are forecast to be completed and when issues are likely to arise.

2. Further, DfI advised the Planning Committee *during the public meeting in July 2017 that they did not currently have those* or any funds set aside. Furthermore, at the Planning Committee meeting, Committee member, Connétable P.B. Le Sueur of Trinity, expressed concern regarding the uncertainty of the required additional funding. Consequently, he favoured covering the tanks as soon as they have been constructed, to avoid any uncertainty in the future regarding funding.

Impact on Tourism and Education

It should be noted that the Westhill Hotel and Haute Vallée School are both located in the predicted relocated odour footprint map, putting both properties at risk of being affected by the odour. When dealing with a fully operational hotel, the risk of bad odours occurring is too damaging to contemplate. Negative reviews from the likes of *Booking.com* or *TripAdvisor* would not only have a huge impact on the hotel, but on the Jersey Tourism product as a whole.

Monitoring

With reference to paragraph (c) of this proposition, there has been mention of possible monitoring of long-term odour, but no specific reference has been made in DfI's application in respect of a robust odour management process, which should involve an unbiased and independent 3rd party utilising monitoring equipment sited at various locations around the perimeter of the site, with particular reference to residential neighbours and with resultant data to be made publicly available. It is therefore important that full consideration is given to paragraph (c) of this proposition.

Conclusion

This modelling exercise undertaken by independent experts has proven that covering the PSTs could reduce the overall odour footprint by up to 50%. In fact, during the public Planning meeting to determine the application, the applicants' consultant who was in attendance, when questioned by the Planning Committee, confirmed that covering the PSTs would eliminate up to 60% of the odour. The result of the PSTs being covered not only mitigates the odour zone by half, it ensures that hundreds of homes, 2 schools and a hotel are certain to be removed from any odour zone, as the attached tables demonstrate (*see* **Appendix 3** and **Appendix 4**). Surely, this is exactly the type of improvement expected of a modern facility rebuild.

Financial and manpower implications

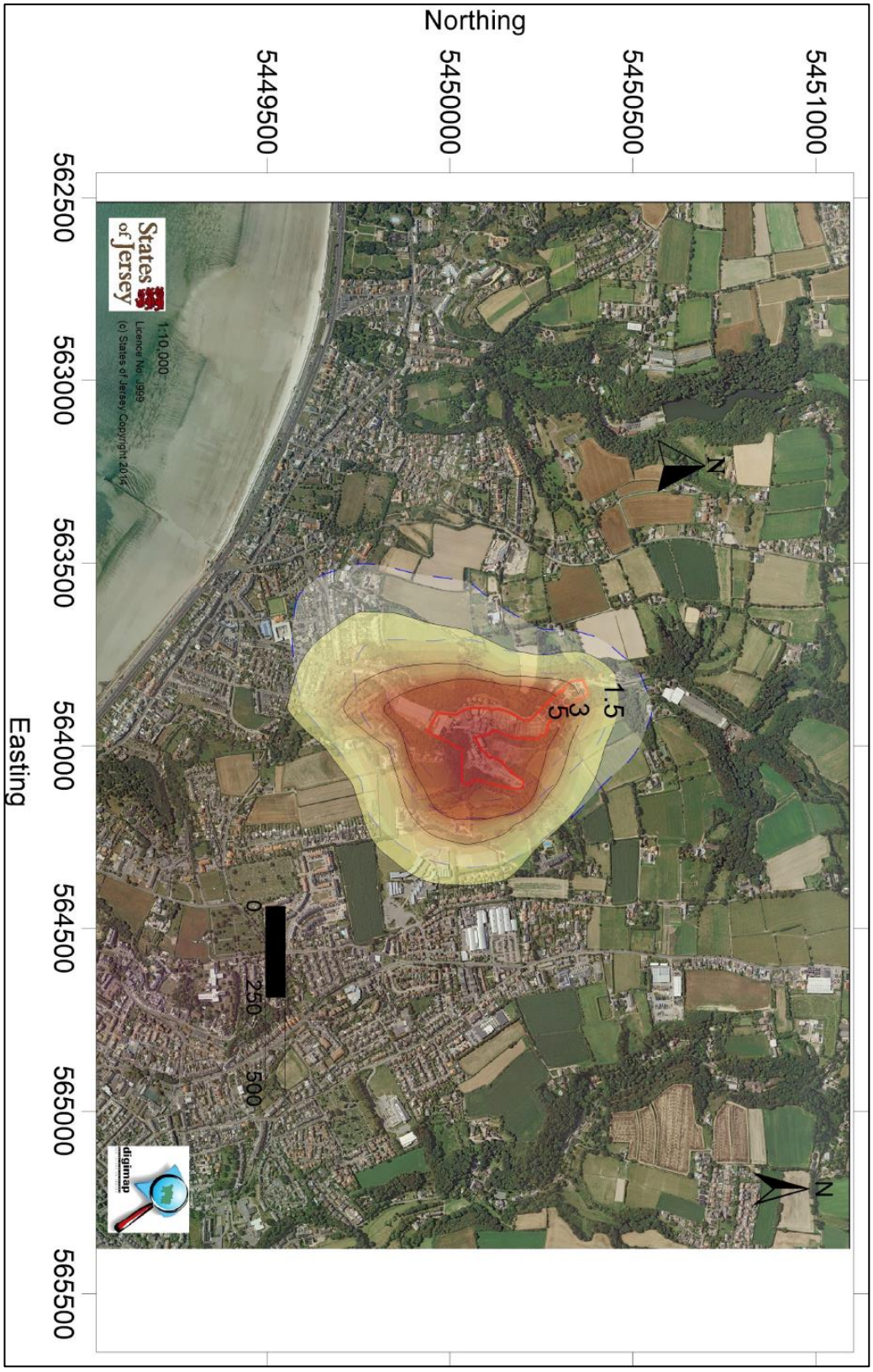
If adopted, £4.5 million from the capital vote would be required, as all available capital funds are now committed to other projects. The funds required should be taken from the Contingency Fund, as this project should be deemed essential works for the betterment of Islanders' lives and general welfare.

Note: What the World Health Organisation says about odour nuisance and related health effects

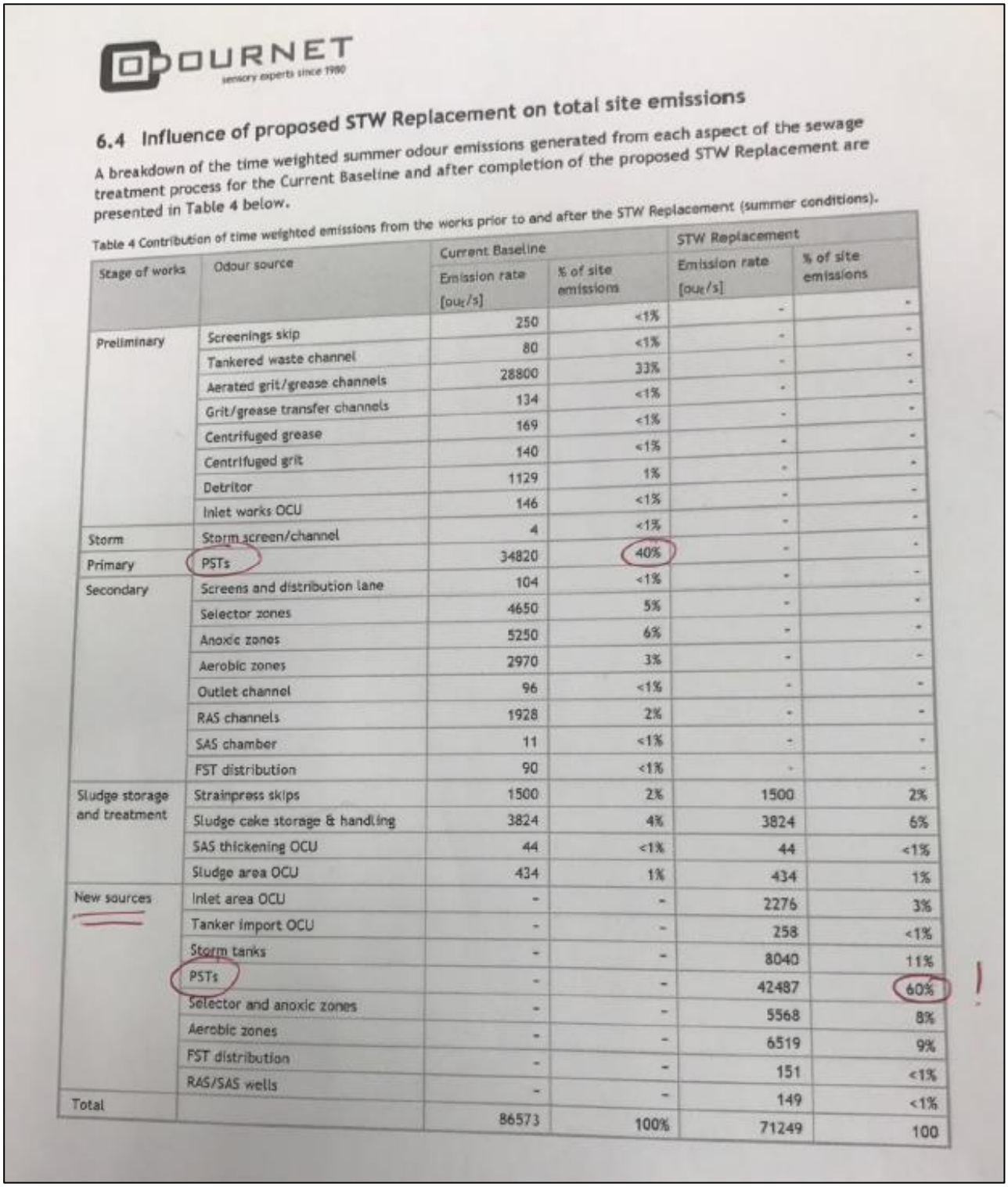
"Odours are becoming a growing concern as cities encroach on plants. They are said to lower citizens' quality of life by cumulative odour exposure that could degenerate in an odour annoyance. As a matter of fact, odours are the main pollution perception vector with dust and noise. In numerous areas they are responsible for 70% of air quality complaints. With urban sprawl plants face the challenge of operating with always closer neighbours that rightfully ask for a good quality of life.

According to the World Health Organization: *Odour annoyance affects the quality of life, therefore the social well-being dimension of the health; Health is not only an absence of disease but a full state of complete state of physical, mental and social well-being*."

APPENDIX 1



Current Proposal: Odour Footprint



ODOURNET
sensory experts since 1980

6.4 Influence of proposed STW Replacement on total site emissions

A breakdown of the time weighted summer odour emissions generated from each aspect of the sewage treatment process for the Current Baseline and after completion of the proposed STW Replacement are presented in Table 4 below.

Table 4 Contribution of time weighted emissions from the works prior to and after the STW Replacement (summer conditions).

Stage of works	Odour source	Current Baseline		STW Replacement	
		Emission rate [ou$_E$/s]	% of site emissions	Emission rate [ou$_E$/s]	% of site emissions
Preliminary	Screenings skip	250	<1%	-	-
	Tankered waste channel	80	<1%	-	-
	Aerated grit/grease channels	28800	33%	-	-
	Grit/grease transfer channels	134	<1%	-	-
	Centrifuged grease	169	<1%	-	-
	Centrifuged grit	140	<1%	-	-
	Detritor	1129	1%	-	-
	Inlet works OCU	146	<1%	-	-
Storm	Storm screen/channel	4	<1%	-	-
Primary	PSTs	34820	40%	-	-
Secondary	Screens and distribution lane	104	<1%	-	-
	Selector zones	4650	5%	-	-
	Anoxic zones	5250	6%	-	-
	Aerobic zones	2970	3%	-	-
	Outlet channel	96	<1%	-	-
	RAS channels	1928	2%	-	-
	SAS chamber	11	<1%	-	-
	FST distribution	90	<1%	-	-
Sludge storage and treatment	Strainpress skips	1500	2%	1500	2%
	Sludge cake storage & handling	3824	4%	3824	6%
	SAS thickening OCU	44	<1%	44	<1%
	Sludge area OCU	434	1%	434	1%
New sources	Inlet area OCU	-	-	2276	3%
	Tanker import OCU	-	-	258	<1%
	Storm tanks	-	-	8040	11%
	PSTs	-	-	42487	60%
	Selector and anoxic zones	-	-	5568	8%
	Aerobic zones	-	-	6519	9%
	FST distribution	-	-	151	<1%
	RAS/SAS wells	-	-	149	<1%
Total		86573	100%	71249	100

Current Proposed Outputs

APPENDIX 3

Table 1 below presents the area of land and number of properties (presented for illustrative purposes only) encompassed within each odour exposure band for the revised STW replacement scheme and the reduction that is achieved in comparison to the current baseline.

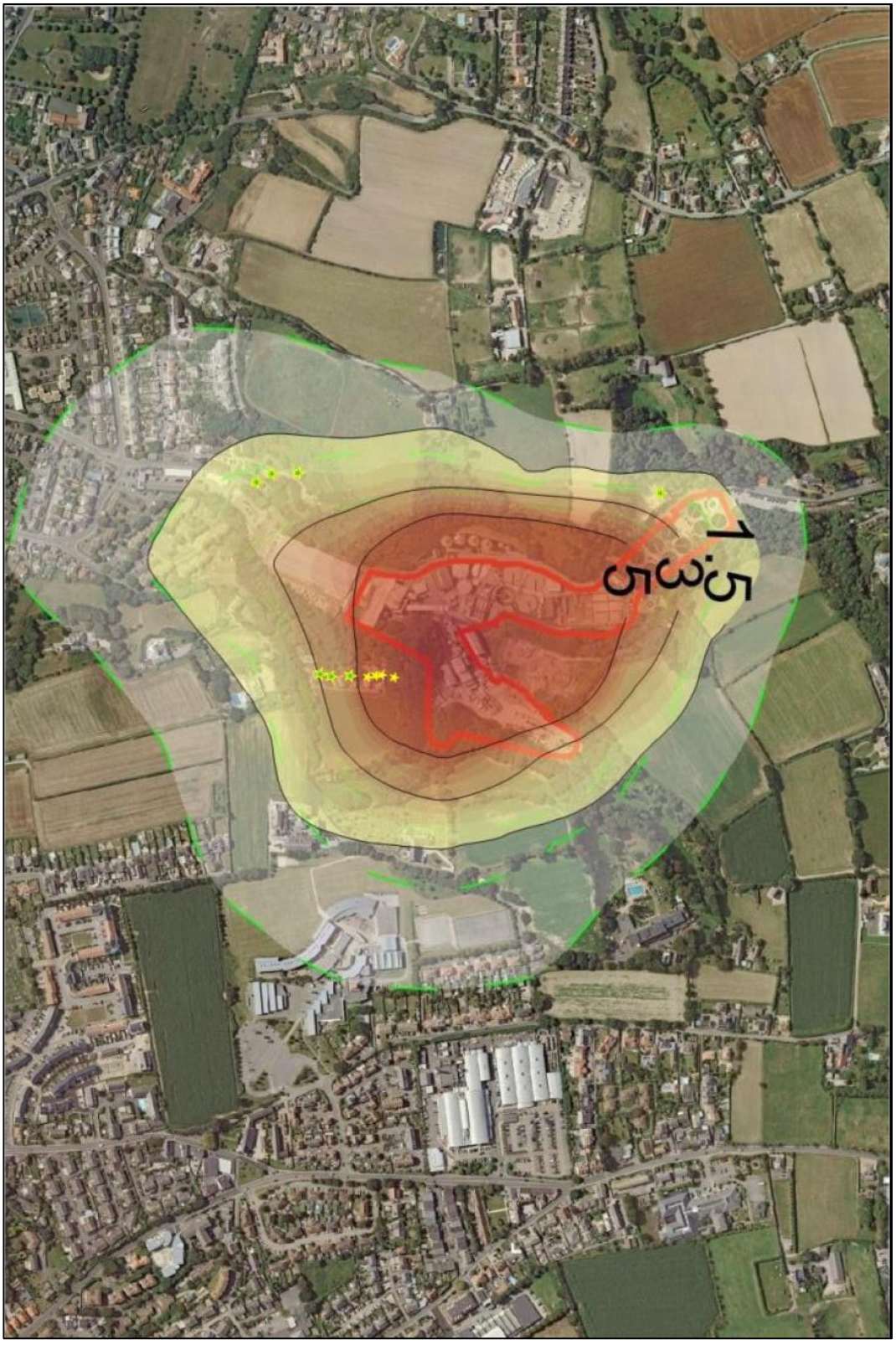
Table 1: Analysis of area of land exposed to $C_{98\ 1\text{-hour}}$ > 1.5, 3 and 5 ou_E/m^3 (revised STW replacement scheme)

Exposure level	Current baseline		Revised STW replacement		% reduction	
	Area (km^2)	**Properties**	**Area (km^2)**	**Properties**	**Area**	**Properties**
$C_{98\ 1\ hour}$ > 1.5 ou_E/m^3	0.6	336	0.2	82	67%	76%
$C_{98\ 1\ hour}$ > 3 ou_E/m^3	0.3	60	0.1	7	67%	88%
$C_{98\ 1\ hour}$ >5 ou_E/m^3	0.2	10	0.1	4	50%	60%
		406		**93**		

(with PSTs covered)

Current Proposals	406 homes affected
With Lids fitted	93 homes affected
	313 homes "saved"

APPENDIX 4



Odour Footprint: Proposal with Lids fitted