

POLLUTION DISCUSSION PAPER - SAVE CAPEL, 26th APRIL 2021

MAJOR CONCLUSIONS

There is a vast amount of research showing the damaging effects on human health due to pollution from road transport. The scope of this pollution is from tailpipe emissions, noise, light, and dust from roads, tyres and brakes, and also from water runoff. The evidence for the damaging effects from all of these sources of pollution and their impact on human health and the environment is overwhelming (not to mention animal health).

The UK Government is not doing enough to reduce pollution of most types. Many British health bodies are critical of the UK Government and most local authorities for insufficient action to tackle pollution.

Climate change is already the greatest ever challenge to the entire planet. Daily publications and news bulletins show the drastic extent of the problem, and that the science is irrefutable. Due to extensive news coverage, the public is becoming very aware of the issues. It is questionable whether any development is truly sustainable given the facts from recent, up-to-date science. Using existing empty properties in Tunbridge Wells town centre is one strategy to reduce the impacts from excessive pollution due to over-development in the green belt.

- **Sources of traffic-related air pollution surveyed here include tailpipe emissions, noise and light pollution, road dust, dust from tyre wear, brake wear and water runoff from concreted areas. All of these are assessed here, raising serious concerns about the damaging effects of all these key pollutants.**
- **It is hard to understand how any of these pollutants can be truly mitigated by Tunbridge Wells Borough Council's local plans. The plans contain little or no details as to how the council will reduce any of these pollutants (as is their stated goal). It is also not clear how the council will reduce carbon emissions sufficiently to meet their own targets.**
- **The proposals are very likely to increase the level of all the pollutants, and all contribute to ill health. There is no level of air pollutants which can be safely breathed. Quarrying locally for minerals will also contribute to the dust generated.**
- **Many publications and articles in the media are raising public awareness of the severity and damaging impact of pollution on public health. A recent landmark legal case on a child's death blamed in part traffic pollution.**
- **Due to the failure of local authorities to adequately measure and adhere to limits on tailpipe emitted pollutants, litigation and/or class action lawsuits will inevitably result. Limits on pollutants will only become more stringent due to research.**
- **Protection of green spaces and nurturing the environment's biodiversity are key to the care of human health and reduction in levels of human mental stress.**
- **The negative impacts on the environment from excess CO2 emissions could be mitigated by the use of alternative brownfield sites in the town centre.**

1. CLIMATE CHANGE (EN3)

The draft local plan for Tunbridge Wells requires 4,900 houses to be built in Capel. This development will use concrete as a construction material for houses (for the foundations, and also possibly for lintels, pointing, block and beam supports for upper level flooring), and also for road kerbstones and potentially also for roadways.

If the cement industry was a country, it would be the third largest emitter on earth (Ref.: Carbon Brief, J Timperley, 13 September 2018). Concrete is made from cement, which is made by heating limestone to produce “clinker”. (Additionally, other compounds can be present, such as elite and belite). The clinker is ground with a small amount of clay (typically ~5%), resulting in cement, which is then formulated with aggregate into concrete for construction. In the chemical process of heating limestone (the calcination step), carbon dioxide gas (CO₂) is evolved. The amount of carbon dioxide is large, about the same as the amount of clinker produced. Carbon dioxide is the most well-known “greenhouse gas” and the major contributor to global climate change, now the most serious challenge to life on earth.

In 2019, the Climate Change Act was amended to set a legally binding target for reducing UK CO₂ emissions to zero by 2050. In the most recent TWBC draft local plan (3rd of February 2021), it states that TWBC has a target for the entire borough to be carbon neutral by 2030 (Full Council 17 July 2019, Item FC29/19).

A typical 3 bedroom house of dimensions 6 m x 5 m will have approximately 22 linear metres of concrete foundations, made from about 10 m³ of concrete. A typical formulation for 1 m³ of concrete contains 365 kg of cement (as well as 547 kg fine aggregate, and 1,094 kg coarse aggregate and water) (Ref: constructor.org). Using these figures, a 10 m³ concrete foundation for one house will contain 3,650 kg of cement.

According to the most recent survey of the Portland Cement Association (PCA) members, an average of 927 kg of CO₂ are emitted for every 1000 kg of Portland cement produced in the US (https://www.greenconcrete.info/downloads/11_ConcreteCO2.pdf), roughly an equivalent amount; therefore producing 1.0 kg of cement generates roughly the same weight amount of CO₂. Therefore, for the example of the house in question, 10 m³ of concrete containing 3,650 kg cement will have generated about the same amount of CO₂, 3,650 kg. A small amount of clay is added to the clinker to make Portland cement; however, because the amount added is typically only ~5%, the effect on the figures is quite small. The Tudeley Village masterplan states that there will be a range of dwellings, from 1 bedroom to 5 bedroom homes; I could not find a detailed listing of the numbers of different types of dwellings. It is reasonable to assume that a 3 bedroom home would be a typical average.

Therefore, if all of the 4,900 houses in the proposed development were the same 3 bedroom size as the house in the example, each house would involve the production of 3,650 kg of CO₂. **Constructing 4,900 houses of this type will involve the production of almost 17 million kg of CO₂, or 17 thousand metric tonnes.**

This massive figure alone is only the CO₂ burden for the foundations for the houses; this does not include any contribution for fossil fuels to run the heating process to make the clinker, nor for any additional materials based upon cement used in the construction of the houses, shingles, pointing, flooring, etc. Nor does it include any allowance for all of the roadways and parking spaces, nor the commercial buildings, tennis courts, etc. A further 40% of cement emissions come from burning fossil fuels to heat kilns to the high temperatures needed for this calcination process. The last 10% of emissions come from fuels needed to mine and transport the raw materials (Ref.: **Q&A: Why cement emissions matter for climate change**. Carbon Brief - Clear on Climate, J Timperley, 13 September 2018).

Tunbridge Wells Borough Council - Climate Emergency Declaration

TW Borough Council has acknowledged that: “we are facing harmful impacts on our environment, natural habitats and lives in general.” In July 2019 Tunbridge Wells Borough Council declared a Climate Emergency and set a commitment to become carbon neutral by 2030. (<https://tunbridgewells.gov.uk/environment/climate-change>)

“The Council’s total carbon emissions for 2018/19 came to 3,473.4 tonnes of carbon (tCO₂e) per year. [Greenhouse gas emissions are reported in units of carbon dioxide equivalents (CO₂e). This allows the impact of each of the seven main greenhouse gasses to be expressed in terms of the amount of CO₂ that would create the same amount of warming, allowing easy comparison of the impact of different emission types]. This is already an improvement on 2013/14, the last time an assessment was undertaken, when the council reported a total of 6,046 tonnes of carbon (tCO₂e) per year.”

In summary, the council is claiming that its carbon emissions have been reduced from **6,046 tonne** equivalents of CO₂ in 2013/14 to **3,473 tonne** equivalents in 2018/19. However, constructing as many as 4,900 houses and generating **17,000 metric tonnes** of CO₂ vastly outweighs the current claimed amount of CO₂ emissions. The first phase of building in Tudeley alone (360 dwellings) if assumed to be an average 3 bedroom house will involve the generation of over 1,300 tonnes of CO₂. Constructing 2,800 houses will generate about 10,220 tonnes of CO₂ from the foundations alone.

It is very likely that the CO₂ produced as a byproduct from the production of the cement used in the concrete for construction would be generated outside the borough of Tunbridge Wells. However, the sheer magnitude of these CO₂ emissions involved in the construction of these houses might make it difficult for TWBC to claim “green credentials”. TWBC’s website “Climate Change” (<https://tunbridgewells.gov.uk/environment/climate-change>) stated in July 2019 their goal of “combating climate change by agreeing an ambition to make the Council’s operations carbon neutral by 2030”.

At the time of writing, this leaves only 9 years remains to achieve this goal. Obviously, if the CO₂ from the cement production is generated outside of the borough, TWBC could argue that the CO₂ generated is not a contribution to the greenhouse gas emissions of the borough. However, that is a questionably convenient excuse for TW borough to call themselves “green”. **In any case, TWBC would be directly responsible for generating roughly at least 17 thousand metric tonnes of CO₂ by permitting the proposed housebuilding development to go ahead.**

Following business pressures due to the coronavirus pandemic, TW has many existing, vacant buildings which are brownfield sites. Little extra CO₂ would be generated by converting these buildings for housing, certainly much less environmental impact (especially by using large volumes of concrete) than the proposed new housing development).

TWBC committed itself to “take steps with partners to proactively include young people in the process, ensuring that they have a voice in shaping the future by setting up a Citizen’s Assembly as a way of also involving residents” and businesses in the process as Climate change will have implications for generations to come”. Also, “a cross-party Climate Emergency Advisory Panel (CEAP) was established to conduct an audit of the Council’s current carbon footprint and develop a pathway to reach net zero by 2030. It is not clear whether the CEAP has issued any documents as yet. Importantly, it is also not clear how TWBC will reduce their carbon emissions or how they will employ carbon capture to the point where their carbon footprint will be net zero - especially given that the construction of so many houses will inevitably add so much to the CO₂ burden from the borough, adding heavily to climate change.

TWBC Policy **EN3** uses Energy Calculations as the Indicator for achieving its Climate Change target. However, energy calculations alone do not take account of the additional CO₂ burden contributed by the construction of all the houses, roads and parking spaces in the proposed development, nor the commercial buildings, tennis courts, etc.

Further, the **Tudeley Village Masterplan** states that, for the development: “the use of carbon-based domestic fuels such as natural gas is not envisaged.” However, it does not state that all carbon-based fuels will be prohibited from use. These could include fuels such as coal, coke, wood logs and pellets. If not prohibited, this would increase the CO₂ burden still further.

Bullet Point Summary - Climate Change (EN3)

- **Climate change is the greatest threat to the safety of our planet and therefore to mankind and the entire biosphere (humans, plants and animal kingdom). It is reckless to continue development at the expense of protecting our living environment.**
- **Over-industrialisation, vast over-development, urbanisation, and avoidable damage to landscapes and the environment are already crippling the planet. We must all play our part.**
- Building the foundations alone for 4,900 houses will involve the production of almost an estimated 17 million kg of CO₂ (17 thousand metric tonnes), well-known as the main greenhouse gas contributing to climate change.
- TW Borough Council claims that its carbon emissions have been reduced from **6,046 tonne** equivalents of CO₂ in 2013/14 to **3,473 tonne** equivalents in 2018/19. However, construction of 4,900 houses generating **17,000 metric tonnes** of CO₂ vastly outweighs the current claimed amount of CO₂ emissions.

- The Tudeley Village Masterplan does not state the carbon-based fuels are prohibited from use in the dwellings. If not prohibited, the CO₂ burden could increase still further.
- It is difficult to see how all of this can be reconciled with TWBC's stated intention of being carbon neutral by 2030, less than 9 years away, even although the concrete used for the construction might be made outside the borough.

2. POLLUTION FROM TAILPIPE EMISSIONS (EN21, EN22)

TWBC's Air Quality Topic Paper for the Pre-Submission Local Plan, February 2021 (https://tunbridgewells.gov.uk/_data/assets/pdf_file/0010/388036/Air-Quality-Topic-Paper_2021.pdf) states that: "the causes of poor air quality are multifaceted. In Tunbridge Wells borough, traffic congestion is the predominant source and other sources, including commercial, industrial and domestic sources, make a smaller contribution to the background pollution concentrations."

Section 1.6 says: "The three air pollutants of relevance to the borough are nitrogen dioxide (NO₂), particulate matter with a diameter no greater 10 microns (PM₁₀) and particular matter with a diameter no greater than 2.5 microns (PM_{2.5})". However, no other common pollutants are considered, out of a list of about 10 pollutants in total specified by Kent Air, including SO₂ and ozone. TWBC uses the Kent Air figures to measure its performance against the target. No reason is given by Tunbridge Wells Borough Council for restricting Kent Air's list of 10 pollutants to only 3. This seems a very limited, conservative approach.

Section 1.7 says: "This Topic Paper has been prepared to provide background information and justification for the air quality policies in the emerging Local Plan". However, only two pollutants are tabulated, NO₂ and PM₁₀, with both average and peak exceedences. It is unclear why the third stated pollutant, PM_{2.5}, is not tabulated. This is not trivial, because "it is estimated that in 2017, there were 922 deaths associated with particulate matter (PM_{2.5}) exposure across Kent and Medway".

The Air Quality Topic Paper states that: "3.4 There is currently no monitoring of PM_{2.5} levels (see paragraph 1.23). However, PM_{2.5} monitoring in the neighbouring district of Maidstone suggests that exceedences of the PM_{2.5} objective in Tunbridge Wells are highly unlikely". With 922 deaths per year in Kent and Medway, almost 18 deaths per week attributed to PM_{2.5}s, and given that so many people are dying of a known pollutant, it is surprising that no regular monitoring seems to be carried out or is planned in the borough.

References

Health effects of transport-related air pollution: summary for policy makers. M Krzyzanowski, WHO Europe, 2005. (https://www.euro.who.int/_data/assets/pdf_file/0007/74716/e86650sum.pdf) This report contains a very extensive list of authors, contributors and reviewers.

Transport-related air pollution contributes to an increased risk of death, particularly from cardiopulmonary disease and increases the risk of non-allergic respiratory symptoms and disease. Studies suggest an increased incidence of lung cancer in people who have long term exposure to transport-related air pollution. Studies...report a significant increase in

myocardial infarction (heart attack) following exposure. Some studies suggest that it also causes adverse pregnancy outcomes.

Limiting air pollution could prevent 50,000 deaths in Europe. Agence France Presse, 20 January 2021.

WHO estimates that air pollution kills more than 7 million people each year. Sasha Khomenko, co-author of the study, called for more trees and green spaces in urban areas.”

What are the effects on health of transport-related air pollution? WHO Europe. M Kryzanowski et al., 2005. ([https://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/publications/hen-summaries-of-network-members-reports/what-are-the-effects-on-health-of-transport-related-air-pollution#:~:text=Effects%20on%20health%20of%20transport%2Drelated%20air%20pollutants&text=Such%20pollution%20contributes%20to%20an,allergic%20respiratory%20symptoms%20and%20disease\).](https://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/publications/hen-summaries-of-network-members-reports/what-are-the-effects-on-health-of-transport-related-air-pollution#:~:text=Effects%20on%20health%20of%20transport%2Drelated%20air%20pollutants&text=Such%20pollution%20contributes%20to%20an,allergic%20respiratory%20symptoms%20and%20disease).)

The effects on health of transport-related air pollution have become one of the leading concerns about transport. In the next few decades, road transport will remain a significant contributor to air pollution in cities across the European Region, and estimates indicate that 100,000 deaths a year in these cities could be linked to ambient air pollution, shortening life expectancy by an average of a year. A significant fraction of these deaths and a range of other adverse effects on health are attributable to transport-related air pollution.

In 2010, 90% of the urban population in the 15 countries that belonged to the European Union (EU) before 1 May 2004 are expected to be living in areas meeting the EU hourly air-quality limit value for nitrogen dioxide, carbon monoxide, benzene and lead.

EPHA: How much is air pollution costing our health? European Union Network for the Implementation and Enforcement of Environmental Law, 22nd October 2020. (<https://www.impel.eu/epha-how-much-is-air-pollution-costing-our-health/>)

For Europe, the WHO estimate for the number of premature deaths attributed to air pollution is over 500,000 (WHO Europe, 2018). Mortality and morbidity caused by air pollution imposes a significant loss of welfare of European citizens. Globally, air pollution is considered as the fourth highest cause of death among all health risks, exceeded only by high blood pressure, diet and smoking (HEI 2018).

This report quantifies the monetary value of medical treatment, premature death, lost working days and other health costs by the three pollutants causing the most illness and death - particulate matter (PM), ozone (O₃) and nitrogen dioxide (NO₂).

For all 432 cities in our sample (total population: 130 million inhabitants), the social costs quantified were over €166 billion in 2018, or €385 million per city on average, per year. Those living in the biggest cities tend to face the highest costs due to population density, higher earnings and expenses. London has the highest cost, €11.38 billion. In 2018, on average every inhabitant of a European city suffered a welfare loss of over €1,250 a year owing to direct and indirect health losses associated with poor air quality.

Premature mortality is the largest component in social costs. The largest share of this is related to pollution from PM_{2.5}. The development of Chronic Obstructive Pulmonary Disease (COPD) contributes to the largest morbidity related costs from air pollution. The costs calculated in this study are likely to become higher if the costs from Covid-19 are properly included. Poor air quality tends to increase mortality from Covid-19 cases and, therefore, the social costs of poor air quality may be higher than estimated in this research.

Toxic air at the door of the NHS. The British Lung Foundation, October 2018.

Analysis by the British Lung Foundation (BLF) and Cambridge Environmental Research Consultants (CERC) has revealed that more than 2,000 health centres in Great Britain, including major teaching hospitals, children's hospitals, clinics and GP surgeries are in areas which exceed safe air pollution limits. Smaller towns, including Gillingham, also have their main hospital located in an area of unsafe air pollution.

Air pollution is an urgent threat for the twelve million people in the UK who live with a lung condition such as asthma, COPD and bronchiectasis. Exposure to PM_{2.5} has been linked to a plethora of poor health outcomes from diseases including asthma, COPD, coronary heart disease, stroke and lung cancer, with emerging evidence showing impacts on low birth weight, diabetes, and neurodegenerative diseases (i.e. Alzheimer's and Parkinson's).

The UK is currently meeting legal limits for PM_{2.5}. However, this is only because our legal limit is more lenient than the limit recommended by the international health community. Indeed, the legal limit for PM_{2.5}, which is derived from EU regulation, is more than twice as high as the WHO recommendation - 25 micrograms/cubic meter, instead of 10 micrograms/cubic meter for the annual average. PM_{2.5} levels have decreased over recent years, but they have not dropped fast enough. Scientists have not been able to identify a level of PM_{2.5} that is harmless to breathe.

The evidence could not be clearer that air pollution is a clear and present danger to our health, and an immediate risk to the health of the most vulnerable. **This analysis reaffirms the need for strong and ambitious policies at local and national levels that are enforced to protect us all from what is the most immediate threat to public health.**

Air quality. Taskforce for Lung Health. (<https://www.blf.org.uk/taskforce/data-tracker/air-quality/pm25>)

The UK Government has breached legal limits for NO₂ since 2010. In 2015 the Government was taken to court and ordered to publish a national plan to reach legal levels. In July 2017 and February 2018, courts said Government plans were inefficient and should be revised. At each stage of the process, the UK Government told local authorities to come up with plans to bring NO₂ within legal limits, and implement them. There were three waves at each of these stages of planning, firstly 6, then 23, then 33 local authorities, making 62 in total. **Tunbridge Wells is not listed in any of these waves (see below).**

Taskforce for Lung Health

OUR PLAN DATA TRACKER HELPLINES MENU

First wave

- Includes 6 Local Authorities

Birmingham	Leeds
Derby	Nottingham
London	Southampton

Issue Date: December 2015

Deadline: Implement a clean air zone (CAZ) by 2020

- + Status: 40% missed the deadline
- + About the first wave

Second wave

- Includes 23 Local Authorities

Basildon	Newcastle
Bath & North East	North Tyneside
Bolton	Rochford
Bristol	Rotherham
Bury	Rushmoor
Coventry	Salford
Fareham	Sheffield
Gateshead	Stockport
Guildford	Surrey
Manchester	Tameside
Middlesborough	Trafford
New Forest	

Issue Date: July 2017

Deadline: Publish feasibility study by December 2018

- + Status: 78% missed the deadline
- + About the second wave

Third wave

- Includes 33 Local Authorities

Ashfield	Peterborough
Basingstoke & Deane	Plymouth
Blaby	Poole
Bolsover	Portsmouth
Bournemouth	Reading
Bradford	Sandwell
Broxbourne	Sefton
Burnley	Solihull
Calderdale	South
Cheltenham	Gloucestershire
Dudley	South Tyneside
Kirklees	Southend
Leicester	Stoke-on-Trent
Liverpool	Sunderland
Newcastle-under-Lyme	Wakefield
Oldham	Walsall
Oxford	Wolverhampton

Issue Date: Feb 2018

Deadline: Submit initial plans by 31 January 2019, and final plans by 31 October 2019

- + Status: Final plans due soon
- + About the third wave

Table 1. Tunbridge Wells seems not listed so far in any wave of local authority

Regarding the levels of PM_{2.5}, these are almost twice as high as the levels recommended by the WHO (see chart below). Even so, there is no safe level of air pollution (Ref.: British Lung Foundation).

Taskforce for Lung Health

OUR PLAN DATA TRACKER HELPLINES MENU

We need far more ambitious legal limits for PM_{2.5} to protect public health

The legal limits for PM_{2.5} in the UK are currently set nearly twice as high as the level that is recommended by the World Health Organization (WHO). We think this is wrong and needs to be addressed.

There's no safe level of air pollution. Even the WHO's recommended limit does not guarantee you suffer no harm. We urgently need the UK Government to set out new clean air laws with legal standards for PM_{2.5} in line with the WHO's limit and commit to meeting them by 2030.

UK limit

worst level in the UK

WHO limit

best level in the UK

safest level

Colour scale bar showing EU and WHO limits

UK legal limits for PM_{2.5} are almost twice as high as those recommended by WHO.

In a landmark case, a coroner ruled in December 2020 for the first time that excessive air pollution contributed to a death, that of a child.

Top court confirms UK has broken air pollution law. Pippa Neill, Air Quality News, 4 March 2021. (<https://airqualitynews.com/2021/03/04/breaking-top-court-confirms-uk-has-broken-air-pollution-law/>)

After years of warnings from The European Commission, the Court of Justice of the European Union (CJEU) has ruled today that the UK has “systematically and persistently” exceeded legal limits for dangerous nitrogen dioxide (NO₂) since 2010. The infringement procedure against the UK began before the UK left the EU. Katie Nield, lawyer at environmental charity ClientEarth said: “The ruling comes from a European court, but Brexit or no Brexit, these pollution limits remain in national law. The UK government is still bound by these rules. It is up to the UK Government to work with local leaders to put these schemes of strong oversight and enforcement in place.”

Air pollution a cause in girl’s death, coroner rules in landmark case. The Guardian, 16 December 2020. (<https://www.theguardian.com/environment/2020/dec/16/girls-death-contributed-to-by-air-pollution-coroner-rules-in-landmark-case>).

Philip Barlow, the inner south London coroner, said Ella Kissi-Debrah’s death in February was caused by acute respiratory failure, severe asthma and air pollution exposure. He said she was exposed to NO₂ and PM pollution in excess of WHO guidelines, the principal source of which were traffic emissions. The ruling is the first of its kind in the UK and is likely to increase pressure on the government to tackle illegal levels of air pollution across the country. Ella had had numerous seizures and been taken to hospital almost 30 times in the three years before her death.

Landmark ruling says air pollution contributed to death of 9-year-old. Adam Vaughn, New Scientist, 16 December 2020. (<https://www.newscientist.com/article/2263165-landmark-ruling-says-air-pollution-contributed-to-death-of-9-year-old/>)

The cause of death was listed as “died of asthma contributed to by exposure to excessive air pollution.” The coroner added that inaction by authorities to reduce levels of NO₂, and a lack of information given to her mother, both “possibly contributed to her death”.

Following this ruling, it is only a matter of time before litigation against local authorities ensues, possibly driven by tighter levels of pollution limits, and fuelled by growing public awareness of the impact of pollution on public health.

TW Borough Council has chosen to use the website of Kent Air as its “Source” for achieving its “Target” of a “Continued reduction in air pollution” through the “Indicators” of: “Pollutant levels at key locations/within Air Quality Management Areas”, and the “Number of biomass scenes permitted”. On accessing the Kent Air website, I have not found it possible to routinely and reliably download any data or graphs in order to give meaningful information about pollutant levels. Therefore, it is not clear how the borough council can even obtain the data they would need to assure themselves of compliance with the required standards.

The TWBC policies **EN21** and **EN22** require measurements to be made of “pollutant levels at key locations” or “within AQMA” using the Kent Air data. However, it appears that only a limited selection of pollutants (PM10, nitrogen dioxide (NO₂), nitric oxide (NO) and NO_x as NO₂) is measured at only one location in the borough (St John’s Road in Tunbridge Wells). This is not a very comprehensive measurement. No local data exists for other pollutants, notably sulphur dioxide (SO₂) and especially PM_{2.5s}, which are at least as harmful. A baseline set of measurements should be taken at the proposed development sites, especially during construction, in order to ensure that there is no breach of limits by developers and constructors.

Bullet Point Summary - Pollution from Tailpipe Emissions (EN21, EN22)

- There is growing public awareness of the serious impact of pollution on public health. A recent landmark case concerning a child’s death blamed in part traffic pollution.
- **Eventually, this will likely result in litigation or class action lawsuits against local authorities for their failure to adequately measure and adhere to limits on tailpipe emitted pollutants. These limits will only become more stringent.**
- Transport-related air pollution results in an increased risk of death (WHO).
- The WHO estimates that 50,000 deaths in Europe could be prevented by improving air pollution emissions. According to the WHO, in 2018, on average every inhabitant of a European city suffered a welfare loss of over €1,250 a year owing to direct and indirect health losses associated with poor air quality.
- Tunbridge Wells Borough Council acknowledges that traffic congestion is the predominant source of air pollution in the borough. Their chosen source for Key Performance Indicators and targets is the Kent Air website. PM_{2.5} particulates are not measured in the borough but are of greater health concern than PM₁₀ particulates.
- Successive court actions against the UK Government for breaches of NO₂ emissions resulted in government pressure on local councils to set up action plans. In three successive waves of the plan, 62 local authorities made plans. Tunbridge Wells does not appear in any of the waves.
- Electric vehicles will contribute to a reduction in air pollution, but will not reduce pollution that they generate from roads, tyres and brakes. They will likely even increase these friction-related pollutants due to the heavier weights of electric cars relative to their conventional counterparts.

3. POLLUTION FROM NOISE (EN27)

One in three Europeans suffers from noise pollution. Traffic noise is linked to 50,000 premature deaths every year in Europe (<https://www.transportenvironment.org/what-we-do/vehicle-noise>).

More than 200 million European citizens (one in three) are regularly exposed to traffic noise levels that put their health at risk. One in five are negatively impacted by vehicle noise at night. Although often forgotten by policymakers, traffic noise is the most harmful environmental problem after air pollution in the European Union. According to the latest

report by the WHO, noise can cause hearing damage, cardiovascular disease, learning impairment in children and sleep disturbance. A report carried out for T&E in 2008 linked noise pollution to 50,000 fatal heart attacks every year and 5% of strokes in Europe.

References:

1. **European Environment Agency, good practice guide on noise (2011)**. “Noise creates stress to which our body reacts, for example, with an increase in heart rate and blood pressure. These bodily reactions are not something that we can control or adapt to because we may not even be consciously aware of them. For example, the frequency of body movements during sleep increases at instantaneous sound levels as low as 33 decibels, even though the noise might not wake us up”.
2. **European Heart Journal: Study on road traffic noise and stroke (2011)**. “Exposure to residential road traffic noise increases the risk of stroke among people over 64 years of age. Increasing noise from traffic occurs in parallel with urbanisation”.
3. **CE Delft study on Traffic Noise Reduction in Europe (2007)**. “At present, some 210 million Europeans are regularly exposed to road traffic noise levels exceeding 55 decibels and 35 million are exposed to similar levels of rail noise, according to recent studies. Around 50,000 people in the EU die prematurely each year from heart attacks caused by traffic noise. An additional 200,000 suffer from all types of cardiovascular disease linked to traffic noise. For people living in streets with average noise levels above 65-70Db(A), the average risk of heart disease is 20% higher than for people living in quieter streets. While perceptions of noise problems can get better as people feel they are getting used to them, noise-related cardiovascular problems show no signs of improving with time”.
4. **Hyena: Hypertension and Exposure to Noise near Airports (2006)**. “Exposure to 24-hour road traffic noise also increases blood pressure, particularly in men”.
5. **RANCH: Road traffic and Aircraft Noise Exposure and Children’s Cognition and Health (2001)**. “Research in the UK and Spain found a clear link between traffic noise and effects on reading, comprehension and memory.”
6. **WHO report: Burden of disease from environmental noise (2011)**. “The environmental impact on health by noise is second only to that from air pollution. The health impacts of environmental noise are a growing concern. At least one million “healthy life years” are lost every year as a result of traffic-related noise in western Europe. Noise causes or contributes to annoyance and sleep disturbance and also heart attacks, learning disabilities and tinnitus. A study in Germany showed that each year traffic noise causes 1,629 non-fatal heart attacks. In the city of Berlin, 1.1% of all heart attacks are attributable to road traffic noise. In The Netherlands, nearly 2 million people are “highly disturbed” during sleep by road traffic noise. This estimate is based on surveys in which the population was asked about which sources impacted on their sleep.
7. **Expert support for stricter vehicle noise emissions standards (2012)**. “A group of noise experts has written to the European Parliament in order to encourage it to take tighter measures traffic noise levels, especially vehicle noise, which have severe health impacts. They stressed the importance of having stricter standards on noise emissions in a very short time, as well as the rapidity with which vehicle manufacturers can comply in quite a short time”. The WHO Night Noise Guidelines (2009) confirm that night-time noise

levels above 55 dB are “increasingly dangerous for public health” and cause adverse health effects. Cautious extrapolations to the whole of the EU...arrives at a total of over 100 million exposed to high levels of right noise. This illustrates the worrying extent of public exposure to noise.”

8. EPA letters to Commission and Parliament (2011-2012). “The European Network of Heads of Environment Protection Agencies has written to the European Commission and to the Parliament, calling for an ambitious revision of the vehicle Noise Directive and, more specifically, for stricter noise emissions’ standards for all vehicles and for measure to cut noise levels at source”.

9. Scientists letter to the European Commission (2011). In 2011, twenty prominent European noise experts wrote to the European Commission warning about the negative impact of vehicle noise on the quality of life of hundreds of millions of Europeans if no serious action is taken.

Policy **EN27** requires the borough to measure its performance against noise maps from the Department of Agriculture, Environment and Rural Affairs (DEFRA). (<https://www.daera-ni.gov.uk/services/noise-maps>). To date, only a part of Northern Ireland has featured in these maps, so it is not clear how TWBC could measure its performance because there seems to be no baseline. Tranquillity maps by CPRE (<https://www.cpre.org.uk/wp-content/uploads/2019/11/saving-tranquil-places-report-1.pdf>).

CPRE surveys have helped define what makes up tranquillity; natural landscape, birdsong, peace and quiet, natural looking woodland, night stars, streams, the sea and natural sounds. Impacts on tranquillity include constant noise from cars, lorries and motorbikes, seeing and hearing lots of people, urban development, overhead light pollution, power lines, seeing and hearing aircraft.

CPRE points out that tranquil spots are not empty. Tranquillity is not the absence of all noise, activity and buildings. Their research has found that many rural activities, such as farming and hiking, and many natural noises, such as birdsong, the wind moving through trees and cows lowing, are compatible with and enhance people’s experience of tranquillity. Tranquillity can be measured (Ref. CPRE).

It is hard to see how this proposed development is compatible with protecting tranquillity. Compulsory purchase of fields in the parish to build houses and to lay roads will have a negative impact on tranquillity, and will result in the removal of farm animals which are cherished in the parish.

Bullet Point Summary - Pollution From Noise (EN27)

- In Europe, one in three of the population suffers from noise pollution. The health consequences of noise to humans can be severe, ranging from cardiovascular disease to strokes, and reduced learning ability in children.
- Based on research from many bodies over a long period, expert groups have called for stringent laws to control increasing emissions of traffic noise across Europe to limit negative impacts on human health.

again in 2016, the interactive map shows how light pollution from Tonbridge and Paddock Wood could become a major issue if the proposed development enables a band of light pollution once the conurbation stretches between these two centres. The area affected north of Tonbridge extends as far as Hadlow.

Night Blight: Mapping England's light pollution and dark skies. The Campaign to Protect Rural England

Apart from the impact on people's experience of the countryside, there is an increasing awareness of the effect that light pollution can have on wildlife, by interrupting natural rhythms including migration, reproduction and feeding patterns. A 2010 survey by CPRE found that light pollution can cause a great deal of distress to humans too, including disrupted sleep, and in some cases has driven people to move house.

Studies suggest that exposure to light at night can disrupt the body's production of melatonin, a brain hormone best known for its daily role in resetting the body's biological clock. Light spilling up into the night sky is also a waste of money and energy: local councils were estimated to spend £613 million on street lighting in 2014-15 – and the lights can account for between 15-30% of a council's carbon emissions.

Limiting the Impact of Light Pollution on Human Health, Environment and Stellar Visibility. F Falchi et al., (<https://doi.org/10.1016/j.jenvman.2011.06.029>)

Light pollution is one of the most rapidly increasing types of environmental degradation. Its levels have been growing exponentially over the natural nocturnal lighting levels provided by starlight and moonlight. Most polluting are the lamps with a strong blue emission, like Metal Halide and white LEDs.

Migration from the now widely used sodium lamps to white lamps (MH and LEDs) would produce an increase of pollution in the scotopic and melatonin suppression bands of more than five times the present levels, supposing the same photopic installed flux. This increase will exacerbate known and possible unknown effects of light pollution on human health, environment and on visual perception of the Universe by humans.

With few exceptions, everything we build is lit at night. This includes streets, roads, bridges, airports, commercial and industrial buildings, parking lots, sport centres and homes. Outdoor lighting continues to expand as more infrastructure is built.

Detailed impacts upon biodiversity have probably already been covered by the Biodiversity Group.

Bullet Point Summary - Pollution from Light (EN8)

- Light pollution is one of the most rapidly increasing types of environmental degradation. Light pollution maps enable the tracking of changes in light pollution across the country.
- With few exceptions, everything we build is lit at night, including homes, streets and roads, bridges, commercial buildings, parking lots, etc.

- Sky glow, glare and light spillage can disrupt the behaviour of flora and fauna. Year on year, artificial lighting is increasing by about 6%.
- This increase will exacerbate known and possible unknown effects of light pollution on human health, environment and on the visual perception of the Universe by humans.
- Lights can account for between 15-30% of a council's carbon emissions.
- The borough council's development proposals must take account of the consequences of light pollution on the health and wellbeing of the public and the biosphere due to the location, intensity, and wavelength of the emitted light at night.
- TWBC's strategy **EN8** is to "maintain current level of lighting in rural areas." The target is "no deterioration in dark skies mapping outside allocated areas." The implication of this is that lighting levels will not be reduced with the new development, so the density of lighting could remain the same per area of construction, but as the area grows, it could spread the light pollution more widely.

5. POLLUTION FROM ROAD DUST (EN3, EN21, EN22, EN28)

Road dust and its effect on human health: a literature review. R K Khan and M A Strand, Published online 2018 Apr 10. doi: [10.4178/epih.e2018013](https://doi.org/10.4178/epih.e2018013).

Industrialisation of society requires an extension of the road traffic system and urbanisation. The production of road dust in urban areas is a consequence of industrialisation. Road dust consists of solid particles that are generated by any mechanical processing of materials, including crushing, grinding, rapid impact, handling, detonation, and decrepitation of organic and inorganic materials such as rock, ore, and metal. When this dust becomes airborne, primarily by the friction of tyres moving on unpaved dirt roads and dust-covered paved roads, it is referred to as road dust.

The reviewed studies were conducted in multiple countries on 3 continents. A total of 13 studies were carried out in the US, 7 were conducted in the UK, and 7 were carried out in China. One study each was conducted in Germany, Hong Kong, Hungary, Iran, Italy, Japan, Korea, and Switzerland. A total of 46 references were extracted and selected for review after the primary screening of 949 articles.

The respiratory system was found to be the most affected system in the human body. Lead, platinum-group elements (platinum and rhodium), aluminium, zinc, vanadium, and polycyclic aromatic hydrocarbons were the components of road dust that were most frequently referenced in the articles reviewed. Road dust was found to have harmful effects on the human body, especially on the respiratory system.

This review concludes that: "long-term studies to determine the direct relationship between road dust exposure and chronic health effects, as well as mortality, should be undertaken.Researchers should....seek to identify genetic alterations due to long-term exposure to road dust. There is a lack of research on the effects of road dust during pregnancy, meaning that elucidating the possible teratogenic effects of dust particles on pregnant women is a promising area of research".

Fugitive Road Dust PM_{2.5} Emissions and Their Potential Health Impacts. S Chen et al., Environ. Sci. Technol. 2019, 53, 14, 8455–8465.

Fugitive road dust particles emitted by traffic-generated turbulence are an important contributor to urban ambient fine particulate matter (PM_{2.5}). Sources of these particles include surrounding soils, mud carried by vehicles, demolition and construction, fly ash from asphalt, bioclastics (fossil-based limestones), natural dust deposition, and other processes. Especially in urban areas of developing countries, fugitive road dust PM_{2.5} emissions are a serious threat to air quality and public health. The article concludes that high emissions occurred over areas with smaller particle sizes, larger traffic intensities and more frequent construction activities.

Bullet Point Summary - Pollution From Road Dust (EN3, EN21, EN22, EN28)

- Pollution due to road dust results from industrialisation. This dust becomes airborne, primarily by the friction of tyres moving on unpaved dirt roads and dust-covered paved roads.
- Fugitive road dust particles emitted by traffic-generated turbulence are an important contributor to urban ambient fine particulate matter (PM_{2.5}).
- PM_{2.5} road dust emissions are a serious threat to air quality and public health. The respiratory system in humans was found to be most affected.
- There are concerns about human genetic alterations due to long-term exposure to road dust, and the possible teratogenic effects of dust particles on pregnant women. Teratogens are substances that cause birth defects on an embryo or foetus.
- More frequent construction activities are also blamed. This will include housing and roadbuilding.
- Notably, **quarrying** will also play a role due to the dust generated in retrieving the raw minerals. Quarrying for the proposed development could well be carried out at the quarry sites within or close to Capel Parish. This is outside the scope of this Save Capel discussion paper.

6. POLLUTION FROM TYRE WEAR (EN3, EN21, EN22, EN28)

Pollution From Tyre Wear 1,000 Times Worse Than Exhaust Emissions. Emission Analytics Press Release, Oxford, 6th March 2020.

Harmful particle matter from tyres — and also brakes (see later) — is a very serious and growing environmental problem. This is being exacerbated by the increasing popularity of large, heavy vehicles such as SUVs, and growing demand for electric vehicles, which are heavier than standard cars because of their batteries.

Vehicle tyre wear pollution is completely unregulated, unlike exhaust emissions which have been rapidly reduced by car makers thanks to the pressure placed on them by European emissions standards.

Non-exhaust emissions (NEE) are particles released into the air from brake wear, tyre, road surface wear and resuspension of road dust during on-road vehicle usage. No legislation is in place to limit or reduce NEE, but they cause a great deal of concern for air quality.

Emissions Analytics performed some initial tyre wear testing. “Using a popular family hatchback running on brand new, correctly inflated tyres, we found that the car emitted 5.8 grams per kilometre of particles”. Compared with regulated exhaust emission limits of 4.5 milligrams per kilometre, the completely unregulated tyre wear emission is higher by a factor of over 1,000. Emission Analytics noted that this could be even higher if the vehicle had tyres which were under-inflated, or the road surfaces for the test were rougher, or the tyres used were from a budget range - all very recognisable scenarios in :”real world” motoring.

Pollution warning over car tyre and brake dust. Roger Harrabin, BBC Environment Analyst, BBC, published 11 July 2019.

Dust from car brakes and tyres will still pollute air even when the vehicle fleet has gone all-electric, a report has warned. Fragments of micro plastics from tyres, road surfaces and brakes will also flow into rivers, and ultimately into the sea, government advisers say.

The government’s Air Quality Expert Group said particles from brake wear, tyre wear and road surface wear directly contribute to well over half of particle pollution from road transport. Prof Jillian Able, joint author of a report, said that: “For many years, ministers have adopted the principle of trying to meet demand by increasing road space. They need to reduce demand instead”. The UK Transport said it was spending £6bn on buses, walking and cycling - and £50bn on roads”.

This is why electric cars won’t stop air pollution. Dr Jody Muelaner, The Institution of Mechanical Engineers, 4 November 2019.

The erosion of tyres and brake pads, as well as road dust, is also a major source of particulate matter (PM). Changing from internal combustion engines to electric motors will not reduce these sources of particulates.

The UK government’s Committee on the Medical Effects of Air Pollutants estimates that between 28,000 and 36,000 deaths are caused by air pollution each year in the UK.

Tyres contain 1-2% zinc by mass and it is this zinc in tyre dust that has been associated with much of the toxic effect when inhaled. Vaporisation of organic compounds in tyres may also release highly carcinogenic volatile compounds such as polycyclic aromatic hydrocarbons.

Professor Frank Kelly of King’s College London, chair of the UK government’s Committee on the Medical Effects of Air Pollutants said: “Due to the uncertainties about the emission factors for each source, it is difficult to state how many deaths are caused by non-tailpipe particulate matter (PM). As a very rough estimate, road transport is responsible for 50% of PM emissions in cities and the latest research is showing that non-exhaust emissions are now responsible for between 7,000 and 8,000 premature deaths a year.”

The rapid development of electric vehicles can give the impression that road transport is becoming sustainable. Electric cars are sometimes seen as a panacea for the environmental impact of transport. They are not.

Bullet Point Summary - Pollution from Tyre Wear (EN3, EN21, EN22, EN28)

- Harmful particle matter pollution from tyres is a very serious and growing environmental problem. Vehicle tyre wear pollution is completely unregulated as yet. Tyre wear emissions are higher than regulated exhaust emissions by a factor of over 1,000.
- Changing from internal combustion engines to electric motors will not reduce these sources of harmful particulates.
- Non-tailpipe particulate matter is responsible for between 7,00 and 8,000 premature deaths a year.
- It is incorrect to conclude that electric vehicle transport is becoming sustainable.

7. POLLUTION FROM BRAKE DUST (EN3, EN21, EN22, EN28)

Brake dust damages lungs as much as diesel exhaust fumes. Chemistry World, Katie Morrey, 20 January 2020.

Brake dust in urban areas currently makes up around 21% of traffic air particulates, but this is set to rise as regulations on diesel vehicles comes into effect. With this information, a team led by Ian Mudway from King's College London collects brake dust, produced under conditions representative of modern life, to investigate its effects on the immune function of human lungs. The team exposed lung cells to both diesel exhaust and brake dust particles to compare the toxicity of each. Their data showed that both pollutions sources increased inflammation markers and impaired the ability of immune cells to ingest bacteria (called phagocytosis) which is the body's primary mechanism for protecting the lungs against infection.

The study highlights how exposure to vehicle-derived pollution decreases the lungs' ability to prevent infection and may be why such infections are more common in urban environments.

Brake dust and brown carbon: How can we crack the challenge of air pollution?

Quest, Sustainable Environments, University of Birmingham. (<https://www.birmingham.ac.uk/research/quest/sustainable-environments/brake-dust-and-brown-carbon.aspx>)

Professor Roy Harrison OBE is a member of the UK Government's Air Quality Expert Group (AQEG) and contributed to a recent study which notes that particles from brake wear, tyre wear and road surface wear currently constitute 60% and 73% by mass, respectively, of primary PM_{2.5} and PM₁₀ emissions from road transport, and will become more dominant in the future. Non-exhaust particles from road traffic are certainly a bigger source of pollution in the UK than tailpipe emissions.

Brake dust may be as harmful as diesel fumes, warn scientists. RAC Drive, 13 January 2020. (<https://www.rac.co.uk/drive/news/motoring-news/brake-dust-as-harmful-as-diesel-fumes-warn-scientists/>)

New research suggests brake dust could be just as toxic as emissions from diesel engine exhausts. Brake dust contains components, such as metals from mechanical abrasion. Metal-particle dust created by scraping brake pads accounts for a fifth of all tiny particle pollution on the roads, according to researchers.

According to the Royal College of Physicians, air pollution causes an estimated 40,000 early deaths a year in the UK. Around three-quarters of these are due to particulate pollution. There is no such thing as a zero-emission vehicle, and as regulations to reduce exhaust emissions kick in, the contribution from these sources is likely to become more significant.

Brake dust is a major source of air pollution and can weaken the immune system, study finds. Tom Bawden, i, January 9 2020. (<https://inews.co.uk/news/environment/brake-dust-major-source-air-pollution-study-finds-383233>)

Tail pipe fumes only make up seven per cent of the tiny particles found in roadside air – with the rest coming from sources such as wear and tear on tyres, clutch scrapings and general road dust.

“Diesel fumes and brake dust appear to be as bad as each other in terms of toxicity. Immune cells protect the lung from microbes and infections and regulate inflammation, but we found that when they’re exposed to brake dust they can no longer take up and destroy bacteria,” said Liza Selley, of the University of Cambridge.

Bullet Point Summary - Pollution from Brake Dust (EN3, EN21, EN22, EN28)

- Brake dust in urban areas currently makes up around 21% of traffic air particulates. Metal particles, PM2.5 and PM10 emissions are released on braking.
- A research study highlighted how exposure to vehicle-derived pollution decreases the lungs’ ability to prevent infection and may be why such infections are more common in urban environments.
- Brake dust is a major source of air pollution and can weaken the immune system.
- There is no such thing as a zero-emission vehicle.

8. POLLUTION FROM URBAN WATER RUNOFF FROM CONCRETE (EN28)

Surface runoff, when water runs off impervious surfaces such as non-porous concrete, can cause severe soil erosion and flooding. This runoff is a major source of flooding and water pollution in urban communities worldwide. Urban runoff tends to collect petroleum, motor oil, heavy metals, rubbish and other pollutants from pavements, roadways and parking spaces. Without attenuation, the impervious cover in a typical urban area limits groundwater percolation and causes five times the amount of runoff generated by a typical woodland of the same size.

2021 River Basin Management Plans. The Environment Agency, October 2019. (https://consult.environment-agency.gov.uk/++preview++/environment-and-business/challenges-and-choices/user_uploads/pollution-from-towns--cities-and-transport-challenge-rbmp-2021.pdf).

In 2015, about 11 per cent of water bodies were identified as being damaged by pollution from towns, cities and transport. As of March 2019 this figure had risen to 18 per cent of water bodies in England numbering 879 out of a total of 4950 water bodies. This increase could be partly due to a combination of improved data accuracy and categorisation. However, it is clear that pressure on the water environment in towns and cities and from transport is increasing. Principal sources of pollutants entering the water environment are drainage misconnections and urban runoff.

Rain water that runs off roads, car parks, industrial areas, contaminated land, pavements and roofs carries pollutants into the water environment. These pollutants include a variety of chemicals, metals, plastics (micro and litter), oils and lubricants, sediment, nutrients and pathogens. 'First flush' events can have a significant effect on water quality. This is when intense rainfall following an extended dry period washes a large amount of contaminants from hard standing areas into local water bodies.

Road runoff pollution damages London's rivers, study finds. Fiona Harvey, The Guardian, 23 December 2019.

The popular press is increasing its coverage of environmental issues....

Road runoff pollution in rivers and canals comes from spills of oil, diesel and petrol, and from the wearing of tyres and braking systems, which are left as residues that are then washed off the roads by rain and flushed into waterways. Road runoff pollution is one of the biggest sources of damage to London's dozens of waterways, of which only one – the Carshalton Arm, source of the River Wandle – is classed as "good" under EU standards.

Hundreds of pollutants, including heavy metals, are routinely found in road runoff, and they can kill fish or other aquatic life and cause long-term damage to rivers. There is also a potential risk to human health, as these can affect drinking water sources, which must be extensively tested and expensively cleaned up if pollutants are found to be present.

However, by improving drainage before water treatment is needed, and providing natural barriers and filters, some of the road runoff pollution can be prevented from reaching the waterways in the first place. Planting suitable vegetation near waterways can filter out some of the pollution, as can creating or expanding natural wetlands. These also provide homes for wildlife and can help clear air pollution from road traffic.

Rob Shore, the head of UK programmes at the Wildfowl and Wetlands Trust charity, which manages some of London's remaining wetland areas, said the problem was not confined to London. "It is clear that road runoff is a major source of river pollution across the UK, especially in our urban areas, killing aquatic life and making our towns and cities less hospitable for people," he said.

The magnitude of toxic surface runoff. (<https://hydrorocksolutions.com/surfacing-the-issues-of-toxic-rainwater-runoff-the-natural-filter/>)

With climate change, increased rainfall and urbanisation in full force, the ‘unspoken’ pollution and toxicity of highway rainwater runoff is coming to surface. Toxic and poisonous pollutants such as PAHs (Polycyclic Aromatic Hydrocarbons) and metals which are emitted from vehicle exhaust, tyres, brakes and more are very harmful to not only the environment, but also our health. With the increased rainwater, these toxins are polluting the rainwater surface runoff from roads and highways which inevitably enters the soil and the environment.

Until recently, toxic surface runoff caused by pollutants was mistakenly considered a natural occurrence as it is caused by rainfall. Essentially, this means that very little has been done to prevent and monitor toxic surface runoff from entering the environment and no action is being taken to reduce the pollution. However, in light of climate change, an attitude shift to greener behaviours and recent studies, the importance of addressing the toxic surface runoff is now considered paramount.

Recent research has found that some surface runoff water from highways is way above the legal limits for copper, zinc and lead and is entering the soil without any consideration. In 2018, there were 533 serious cases of toxic surface rainwater runoff reported, and this is only expected to rise with increased rainfall expected to come.

TWBCs policy **EN28** is “Land Contamination”. The Target is “proper regard to land contamination”. Not only is the Indicator unclear, there is no definition or clarification as to what constitutes “proper regard”. If it cannot be measured, it cannot be shown to be improved.

Bullet Point Summary - Pollution from Urban Water Runoff from Concrete (EN28)

- Awareness is rapidly growing about pollution due to rainwater runoff from concrete surfaces. The pollutants are due to traffic on concrete surfaces.
- This runoff is a major source of flooding and water pollution in urban communities worldwide.
- Urban runoff tends to collect petroleum, motor oil, heavy metals, rubbish and other pollutants from pavements, roadways and parking spaces.
- In 2018, there were 533 serious cases of toxic surface rainwater runoff reported, and this is only likely to rise with the expected increase in rainfall. As of March 2019, 18 per cent of water bodies in England numbering 879 out of a total of 4,950 water bodies were identified as being damaged by pollution from towns, cities and transport.
- It does not appear to be possible to measure correctly “proper regard to land contamination”.
- The proposed development by TW Borough Council is large and close to the River Medway. One can speculate about the eventual pollution of this major waterway, critical to the local biosphere/ecosystem.

Dr John A Nimmo FRSC