Representation by Dr Charles Sell FRSC Ref 20049823

[redacted]

Thank you, Sir, for allowing me to express my views at this meeting.

Introduction

I am speaking on my own behalf as one of the many local people who would, were the proposal to be accepted, suffer considerable adverse effects on their lives. Homeowners in the area have already seen the value of their homes fall significantly as a result of the threat of this scheme going ahead.

Traffic

During the construction phase, traffic problems in the area will be horrendous. I believe that the applicant has seriously underestimated the effect this phase will have on local people's lives and I'm frankly amazed that KCC, who are meant to be curious about these things in order to look after our safety, have not demanded road improvements. I'm not convinced that talk of things being finalised at a later stage will ever deliver a satisfactory result. If KCC would only position members of staff along the access route from the A 20 to the site compound for a full day to observe the existing problems on Station Road, by far the most important route into Aldington, they would begin to understand the issues that this huge increase in traffic would cause. Previous experience tells us that the problems on this section of road would displace local traffic onto the singletrack lanes around these villages. This would cause inconvenience to everybody and result in damage to the lanes. The applicant talks about being able to control traffic and stop it from going through the village, but it doesn't explain how it will achieve this. The M 20 seems to be closed more frequently as the years go by and if the displaced traffic from a closure of the M20 were to be added to the increase while the scheme is under construction, the whole area would become log jammed. I'm surprised that there is not a separate Hearing to look at this again and for KCC to explain why it is they seem to be so content with everything the developer wants to do.

Flooding

Much of the proposed solar installation is on land that drains down into the East Stour River, DOWNSTREAM of the flood defences. Run off from solar panels, earth compacted by construction work and concrete areas is greater than run off from agricultural land. Because of climate change, we are seeing more storms and heavier rainfall than previously, and this trend is predicted, by all climate experts, to continue. The flood defence scheme has protected Ashford and Canterbury and villages between, from flooding. For these reasons, I believe that this proposal could result in a return to flooding along the River Stour. I note that the Environment Agency at one point in their recent response to the scheme invites the Examiner to make the decision as to whether the public benefit derived from the scheme in

terms of energy production outweighs the flood risk. Surely it is for the Environment Agency to provide clear recommendations having analysed the proposals.

Battery fires

The proposal includes a large number of enormous batteries. These are prone to ignition. The resulting fires cannot be extinguished and the smoke is toxic. No matter which way the wind is blowing, there will be habitation downwind of a fire. It is not unreasonable to anticipate a fire or fires during the 40-year temporary consent. If the proposal is approved and our worst fears regarding what a fire could do, prove to be well founded, where will the responsibility lie? Who will be held accountable for loss of property, injury, damage to health or indeed loss of life? The number of batteries that stand to be approved here when so little is known about the risks of field scale battery emplacements seems to me extraordinary and unjustified.

Footpaths

Aldington is currently blest with a network of public footpaths. These provide safe routes for villagers and visitors to cross the village, e.g. from Goldwell Lane to Church Lane. That particular footpath and many others are heavily used. The footpaths provide a means of exercise and relaxation. Exercise is important for physical health and walking through green spaces is beneficial for mental health. The footpaths also connect with the national network of footpaths, such as The Saxon Shore Way, and are used by walkers from all over, bringing trade into the village for the local shops and pubs. The rerouting proposed is totally unsatisfactory and anyway, no one enjoys walking between tall wire fences around industrial installations.

Landscape

The East Stour valley is beautiful and the better for being close to and associated with the North Downs AONB where this designated area abuts the village on Roman Road. This important setting will be disfigured by turning the valley into an industrial site. The flora and fauna of the valley would also suffer.

Those of us who care about these things hope Sir that you will decide to recommend refusal of this application.

My additional comments following the open floor meeting of 25th February 2025.

Dr Charles Sell FRSC Ref 20049823

[redacted]

I was very pleased when Mr Sojan Joseph MP mentioned the danger at the Smeeth Crossroads. This is the name in common use in the area for the junction where Station Road meets the A20. Available time at the meeting prevented me from expanding on the subject at the meeting. It is, as Mr Joseph MP said, a notorious accident blackspot. There have been very many accidents there and quite a few fatalities. On one occasion an entire family was killed. Recently, in January this year, Station Road was closed because of a serious accident that required attendance of an ambulance, a fire engine and five or six police cars. Heavy construction vehicles would approach the junction via the A20 and will probably have difficulty negotiating the sharp turn. This would cause increased danger and local drivers going about their daily lives would probably become impatient and then take risks. That turn into Station Road would be the first of many sharp bends (some blind) between the Smeeth Crossroads and the access to the construction site, again increasing the risk of accidents. Only last week a car managed to go backwards through a hedge into a field and that without the help of the proposed increase in traffic volume, particularly of heavy vehicles.

As I drove down Church Lane last week, I noticed the severity of the damage to the relatively new road surface at the north end. Before the recent construction work around the Sellindge power installation, that few hundred metres of road was in very good condition. If the traffic volume owing to the relatively smaller project does that to a newish wide section of road, I dread to think what will happen to Station Road if the proposal is allowed.

As a professional chemist, I know the dangers of the contents of the plume emitted from a battery fire. I would not want to see the children in the primary schools suffer as their great-grandfathers did in the gas attacks in the First World War. The children are right in supporting solar power but this is not the right place for such a large installation that requires so many of these dangerous batteries. I recommend reading the article *Toxicology of the Lithium Ion Battery Fire* by Captain Timothy J Vamosi, MSN-RN, EMTP, that can easily be found on the internet and some of which I have copied below. I have handled many dangerous substances in the laboratory but would never dare to handle hydrogen fluoride or hydrofluoric acid. These are exceptionally toxic and corrosive. Hydrofluoric acid will dissolve

glass. Hydrogen fluoride readily penetrates the skin and causes a variety of very unpleasant and potentially fatal effects. In addition to hydrogen fluoride and hydrofluoric acid, the plume from a lithium ion battery fire contains *inter alia*, carbon monoxide, fluorocarbons, phosphorus fluorides and various heavy metals. The heavy metals present a long term environmental hazard in the area and also downstream in water courses, in this case the River Stour. I agree totally with Ms Katie Lamm MP that the battery issue alone would be sufficient to justify refusal of this application.

I felt that the appellant's response at the end of the meeting was dismissive of the genuine concerns of local people. As was the entire consultation process. One serious question that was raised was not addressed at all. The financial and technical competence of the appellant was questioned. How could a small company with assets of £1,300 and no experience of either large scale installation of solar panels or management of such a large project, successfully plan or execute such a project as this. The total lack of response to this question gives me no confidence whatsoever in the appellant. I appreciate that in the present climate many speculators like EPL001 simply obtain a DCO with a view to selling it on. If the application were to be accepted, surely the Inquiry has to consider the possibility that for whatever reason the applicant may decide that it will develop the scheme itself. However unlikely, surely the possibility of this happening exists unless EPL001 have expressly stated somewhere within the voluminous documentation that they will not be constructing the scheme.

Toxicology of the Lithium Ion Battery Fire

Captain Timothy J Vamosi, MSN-RN, EMTPThe

Problem An irreversible thermal event in a lithium-ion battery can be initiated in several ways, by spontaneous internal or external short-circuit, overcharging, external heating or fire, mechanical abuse etc.- The electrolyte in a lithium-ion battery is flammable and generally contains lithium hexafluorophosphate (LiPF6) or other Li-salts containing fluorine. In the event of overheating the electrolyte will evaporate and eventually be vented out from the battery cells. The Problem--The gases may or may not be ignited immediately.This leads to opportunity for exposures and contamination of persons In case the emitted gas is not immediately ignited the risk for a gas explosion at a later stage may be imminent.This leads to thermal burns and exposure burns Li-ion batteries release a various number of toxic substances as well as e.g. CO (an asphyxiant gas) and CO2 (induces anoxia) during heating and fire.This is exposures causing an inability to process oxygen and/or the displacement of

oxygen from the environmentThe Problem-- At elevated temperature the fluorine content of the electrolyte and, to some extent, other parts of the battery such as the polyvinylidene fluoride (PVdF) binder in the electrodes, may form gases such as hydrogen fluoride HF, phosphorus pentafluoride (PF5) and phosphoryl fluoride (POF3). Compounds containing fluorine can also be present as e.g. flame retardants in electrolyte and/or separator, in additives and in the electrode materials, e.g. fluorophosphates, adding additional sources of fluorine.The Problem The decomposition of LiPF6 (lithium hexaflourophosphate) is promoted by the presence of water/humidity according to the following reactions; LiPF6→LiF+PF5 (1) PF5+H2O→POF3+2HF (2) LiPF6+H2O→LiF+POF3+2HF (3)- Of these PF5 (phosphorus pentafluoride) is rather short lived. The toxicity of HF (hydrogen fluoride) and the derivate hydrofluoric acid is well known while there is little toxicity data available for POF3,(phosphoryl fluoride) which is a reactive intermediate that will either react with other organic materials or with water finally generating HF. The Problem-- Commercial lithium-ion batteries can emit considerable amounts of HF during a fire and that the emission rates vary for different types of batteries. The use of water mist as an extinguishing agent may promote the formation of unwanted gases and limited measurements show an increase of HF production rate during the application of water mist, however, no significant difference in the total amount of HF formed with or without the use of water mist.The Problem-- Significant amounts of HF, ranging between 20 and 200 mg/Wh of nominal battery energy capacity, were detected from the burning Li-ion batteries. The measured HF levels, verified using two independent measurement methods, indicate that HF can pose a serious toxic threat, especially for large Li-ion batteries and in confined environments. The Problem--If extrapolated for large battery packs the amounts would be 2–20 kg for a 100 kWh battery system, e.g. an electric vehicle and 20–200 kg for a 1000 kWh battery system, e.g. a small stationary energy storage. The immediate dangerous to life or health (IDLH) level for HF is 0.025 g/m3 (30 ppm) and the lethal 10 minutes HF toxicity value (AEGL-3) is 0.0139 g/m3 (170 ppm). The release of hydrogen fluoride from a Li-ion battery fire can therefore be a severe risk and an even greater risk in confined or semi-confined spaces.Hydrogen Fluoride-- Hydrogen fluoride mixes readily with water forming hydrofluoric acid. For all practical purposes, they are considered the same chemical. It has a strong irritating odor; however, odor should not be depended on to provide sufficient warning of exposure. It is considered a weak acid but is still extremely harmful due to its ability to penetrate tissue.Hydrogen Fluoride--Hydrogen fluoride/hydrofluoric acid can be absorbed systemically into the body by ingestion, inhalation, or skin or eye contact. Eye exposure to hydrogen fluoride/hydrofluoric acid is highly unlikely to result in systemic toxicity. Inhalation is an important route of exposure. Hydrogen Fluoride--There are two primary mechanisms through which HF acid causes tissue destruction. The first occurs due to the activity of corrosive hydrogen ion when using a high concentration of this acid (>50%) and is associated with cutaneous and ocular lesions, as well as digestive and respiratory mucous membrane damage. Corrosive burns are similar to those provoked by other acids: they occur immediately, with visible tissue destruction, grey areas, ulceration or necrosis, followed by intense painHydrogen Fluoride----

The second is caused by cytotoxic fluoride anion responsible for local and systemic toxicity when HF acid products with high, as well as with low concentrations have been used. The fluoride ion is very small and diffuses readily in the aqueous media. Absorbed into the bloodstream, it is carried to all body organs in proportion to their vascularity and fluoride concentration in the blood. When reacting with cellular calcium and magnesium, forms insoluble chelates, CaF2 and MgF2, thus provoking local calcium depletion and inhibition of Na+K+ ATP-ase pump.Hydrogen Fluoride--Subsequently, the cell membrane's permeability to potassium is increased resulting in local hyperkalemia. High lipid affinity induces liquefaction necrosis and cellular death, thus destructing the nerve and blood vessels, tendons, bone structures and all other tissues. These effects are due to the presence of fluoride ion and differ from other acids, in which the feature of the free hydrogen cations to provoke coagulative necrosis, which slows the further penetration into the tissues, is expressed.Hydrogen Fluoride Eye Exposure ● Mild: Rapid onset of irritation and reversible clouding (opacification) of the surface of the eye (cornea). ● Severe (e.g., with exposure to liquid hydrogen fluoride/hydrofluoric acid): Rapid onset of pain, redness and damage to the surface of the eye (cornea), sloughing of the cornea, swelling, and progressive damage and scarring leading to permanent clouding (opacification) of the cornea, which may occur immediately or be delayed for several days after exposure. ● Permanent visual defects are more likely with severe exposures. ● Eye exposure to vapor may cause delayed findings of eye and mucous membrane irritation; more serious eye injury is possible following exposure to concentrated vapor.Inhalation Exposure Hydrogen Fluoride ● Mild: Irritation of the moist linings of the nose and throat (mucous membranes), possible burns, cough, narrowing of the large airways (bronchoconstriction), and difficulty breathing or shortness of breath (dyspnea). ● Severe: Immediate narrowing and swelling of the throat, upper airway obstruction, accumulation of fluid in the lungs (pulmonary edema), and partial or complete lung collapse. ● Whole-body (systemic) effects are likely, including low blood levels of calcium and magnesium (hypocalcemia and hypomagnesemia), high blood levels of potassium (hyperkalemia), low blood pressure (hypotension), abnormal or disordered heart rhythms (dysrhythmias), accumulation of acid in blood and tissues (metabolic acidosis), involuntary muscle contractions, seizures, and death.Hydrogen Fluoride Dermal Exposure ● Concentrations < 20%: Redness (erythema), pain, and serious injury (possibly delayed for 24 hours and often reported after significant tissue injury has occurred). ● Concentrations 20-50%: Redness (erythema), pain, and serious injury (possibly delayed for 24 hours and often reported after significant tissue injury has occurred). ● Concentrations > 50%: Immediate redness (erythema) and severe, throbbing pain; rapid tissue destruction (whitish discoloration followed by blistering (vesication)); and acute whole-body (systemic) effects (including lung damage). ● Exposure of more than 1% of the body's surface area may lead to systemic toxicity.Hydrogen Fluoride---- Initial treatment is primarily supportive. It includes monitoring of signs and symptoms of whole-body (systemic) toxicity, which can be fatal. Rapid decontamination and use of a fluoride binding agent are critical. Treatment is a continuum of care: removal from site, followed by rapid decontamination, followed by rapid

treatment with a fluoride binding agent.Implications for FireFighting/Rescue Tactics-- Due to the severity of the toxins released firefighting must be completed with exposure and contamination in mind I.E. - Full PPE and SCBA in place at all times; distance tactics and First Responder Decon Rescues of persons exposed to off gassing or by-products of combustion may require decontamination; speciality care facilities; interaction with receiving hospitalsThermal Burns--This burn pattern was caused by the thermal runaway of two 18650 cells in the patient's pocket. The patient reached cross-body and was able to remove the fiery device from his left pocket, burning his right hand in the process. These thermal burns have been found in reviews of vape and cell phone incidents to be often a mixture of partial and full thickness burns, commonly requiring intensive and definitive treatment in the hospital.Thermal Burns Initial assessment of injuries should accompany the Advanced Trauma Life Support guidelines; serum levels of lithium, cobalt, and manganese should be checked and elevated levels should be monitored; patients should be monitored for signs of metal toxicity; wound should be extensively debrided and irrigated to remove any residual materials; and litmus test should be performed to check for alkali pH prior to irrigation with water or other aqueous solutions. Thermal Burns ● CRITICAL BURNS ○ If < 20 minutes by ground, transport to a level 1 or 2 trauma center (level 1 or 2 pediatric trauma center for pediatrics). ○ If < 20 minutes by ground from a level 3 trauma center and no level 1 or 2 (level 1 or 2 pediatric trauma center for pediatrics) within 20 minutes, transport to a level 3 and/or consider air ambulance, if available. ○ If > 20 minutes by ground to a level 1, 2 or 3 trauma center, activate air ambulance, if available.Pediatric Consideration Between 1999 and 2019, the United States National Poison Data System reported a 66.7% increase in yearly ingestion of button batteries (6.98 to 10.46 per million population) and a 10fold increase in complications (0.77% [n = 76] to 7.53% [n = 551]).--Button batteries can cause substantial tissue damage within 2 hours of ingestion. Lithium batteries (given their high voltage) and those 20 mm or larger (which are likely to become lodged in the esophagus) are most dangerous, especially in children younger than 6 years. Complications include gastrointestinal perforation, aortoesophageal fistulas and strictures.Honey should be administered before the patient reaches the hospital, and sucralfate Pediatric Consideration when in hospital within 12 hours of battery ingestion, to mitigate tissue injury while awaiting possible definitive management. Animal studies have shown that these treatments result in fewer full-thickness injuries and less extension of injury. Honey can be given at 10 mL every 10 minutes for children older than 1 year (up to 6 doses) and sucralfate can be given at 1 g every 10 minutes (up to 3 doses). Injuries from button battery ingestion can occur despite removal of the battery; injuries such as strictures and fistulas have been reported weeks to months after removal. Caregivers should monitor for symptoms including gastrointestinal bleeding and vomiting.Hydrogen Fluoride ● Hydrogen Fluoride ○ Hydrogen fluoride goes easily and quickly through the skin and into the tissues in the body. There it damages the cells and causes them to not work properly. ○ The seriousness of poisoning caused by hydrogen fluoride depends on the amount, route, and length of time of exposure, as well as the age and pre existing medical condition of the person exposed. ○ Breathing hydrogen

fluoride can damage lung tissue and cause swelling and fluid accumulation in the lungs (pulmonary edema). ○ Skin contact with hydrogen fluoride may cause severe burns that develop after several hours and form skin ulcers. ○ Hydrogen Fluoride diluted in water becomes Hydrofluoric Acid.Considerations--As we saw earlier there are many other byproducts of combustion and off gassing that should be considered when a response to LIB fires is required More research is needed to continue on the potential risks of exposure from these types of fires and their impact on the fire service and the community More research is needed on the consequences of LIB fires impact on PPE, PPE and personnel decon, industrial deconReferences National Research Council (US) Committee on Emergency and Continuous Exposure Guidance Levels for Selected Submarine Contaminants. Emergency and Continuous Exposure Guidance Levels for Selected Submarine Contaminants: Volume 3. Washington (DC): National Academies Press (US); 2009. 4, Hydrogen Fluoride. Available from: https://www.ncbi.nlm.nih.gov/books/NBK219903/ Larsson, F., Andersson, P., Blomqvist, P. et al. Toxic fluoride gas emissions from lithium-ion battery fires. Sci Rep 7, 10018 (2017). https://doi.org/10.1038/s41598-017-09784-z Hydrogen Fluoride/Hydrofluoric Acid: Systemic Agent, https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750030.html , Last Reviewed: May 12, 2011 World J Clin Cases. Oct 26, 2019; 7(20): 3341-3346 Published online Oct 26, 2019. doi: 10.12998/wjcc.v7.i20.3341,Fang H, Wang GY, Wang X, He F, Su JD. Potentially fatal electrolyte imbalance caused by severe hydrofluoric acid burns combined with inhalation injury: A case report. World J Clin Cases 2019; 7(20): 3341-3346 [PMID: 31667189 10.12998/wjcc.v7.i20.3341] DOI: Maraqa T, Mohamed MAT, Salib M, Morris S, Mercer L, Sachwani-Daswani GR. Too Hot for Your Pocket! Burns From E-Cigarette Lithium Battery Explosions: A Case Series. J Burn Care Res. 2018 Oct 23;39(6):1043-1047. doi: 10.1093/jbcr/irx015. PMID: 29931215. Daniel Martin, BS, NRP , Quaternary Blast Injuries in Lithium-Ion Battery Explosions, explosions/ https://www.jems.com/exclusives/quaternary-blast-injuries-in-lithium-batteryZipursky AR, Ratnapalan S. Button battery ingestions in children. CMAJ. 2021 Sep 27;193(38):E1498. doi: 10.1503/cmaj.210572. PMID: 34580143; PMCID: PMC8486471. Marcel Held, Martin Tuchschmid, Markus Zennegg, Renato Figi, Claudia Schreiner, Lars Derek Mellert, Urs Welte, Michael Kompatscher, Michael Hermann, Léa Nachef,Thermal runaway and fire of electric vehicle lithium-ion battery and contamination of infrastructure facility,Renewable and Sustainable Energy Reviews,Volume 165, 2022,112474,ISSN 1364-0