

## Summary of Badgerys Creek EIS submission on Risk

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### About Myself:

I have forty years experience in dispersed explosion and fire research and forensic investigation of accidents and deliberate fire and explosion events in society. I also have about twenty five years experience in Risk Management and Emergency Planning, having undertaken lecturing and research in these areas while at the University of New South Wales. Since 2010 I have been pioneering microsimulation applications, at the University of Wollongong, to complex societal risks involving human behaviour within the population, including disease spread, chemical and biological warfare and terrorism.

In 1997, Fairfield City Council requested that I prepare a report on the Hazard and Risks Technical Paper 10 published as part of the 1997 EIS for the location of the second Sydney Airport at Badgerys Creek. Technical Paper No 10 was primarily intended as a quantification of the risk of aircraft crashes to the people of Sydney to demonstrate that the siting of a new airport at Badgerys Creek was within acceptable criteria for the land use surrounding the site and that there were no other more suitable sites available that carry less risk. In particular I was asked to comment on the adequacy of the assessment and how any deficiencies would have potential impact on the City of Fairfield and other Councils within the Greater Western Sydney Area. As with the current EIS there was a failure by Government to consider known risks of loss.

### Contact with Me:

I am open to being contacted about the background, logic and methods used to draw the conclusions I've come to regarding Badgerys Creek Airport. The best method of contact is probably through email [tgreen@uow.edu.au](mailto:tgreen@uow.edu.au).

### Risk Objections to Building Badgerys Creek:

- Five of the ten critical infrastructures considered a high national security risk by the Federal Government – Defence, Electricity, Water, Gas and Communications - converge in this area. The airport introduces risks for these critical facilities that were not examined in the EIS.
- The economic loss from a sudden catastrophic event on this infrastructure can be higher than \$4 trillion. This is three times the National GDP and can be compared with the \$500 billion of the Fukushima nuclear power disaster, Japan.
- These catastrophic losses can only occur with an airport sited at Badgerys Creek, not at other places within the State.
- The EIS did not differentiate between commercial passenger and Cargo services. The two types of services have different risk profiles and hence different potential impacts on this critical infrastructure.
- Warragamba Dam:
  - The highest risk is from a terrorist attack or pilot suicide on the dam wall using a cargo plane from overseas.
  - Flown at maximum speed from 10km from the dam wall (the approximate landing path from the south into Badgerys Creek) will take less than 1 minute to impact.

- This is less than the reaction time of Air Traffic Control and Flight time for Williamstown jet fighters to intercept a deviation from the controlled flight path.
- The energy and momentum in modern aircraft is sufficient to break the dam wall and can be enhanced by the cargo.
- This type of event can drown 300,000 to 350,000 people in the Nepean, Hawksbury and Hills districts of Sydney based on current population (This will rise towards 600,000 people if the population doubles and more building occurs on the edges of the flood plain area that will be affected). The estimates are based on the difference between dam wall collapse and a 200 year flood event.
- Sydney will lose its water supply for seven years, the estimated time to rebuild the dam.
- The economic cost through loss of GDP, the clean up, the loss of jobs, moving industry because of lack of water and compensation will be in excess of \$4 trillion over 7 years.
- Eastern Creek Electricity Substation:
  - This risk can occur from an aircraft crash on takeoff as it is less than 2 degrees from the flight path, within normal error on takeoff.
  - It can also occur from a terrorist attack or pilot suicide.
  - The problem is that this substation has multiple transformers, each of which is bespoke and therefore take time to replace. The estimated replace time for all transformers on site is two years.
  - The close proximity of the water supply line between Warragamba and Prospect to Eastern Creek Electrical Distribution Centre means that both can be affected in the same incident.
  - Sydney can lose 25% of its electricity supply for 2 years and at the same time lose the water supply between Warragamba and Prospect reservoirs
  - The economic cost estimated at about \$360 billion but this does not take account of loss of jobs and impact on families.
- Lucas Heights Nuclear Reactor and Medium level storage Facility:
  - The reactor was not designed to withstand modern aircraft impacting at near their maximum speed from a terrorist cargo plane attack from overseas.
  - Impact on the storage facility rather than the reactor would still disperse radioactive elements into the atmosphere.
  - Flown at maximum speed from the approach path, approx. 48km) would take approximately 4.7 minutes. It might be possible to intercept in this time depending on how quickly ATC responds to the deviation.
  - The dispersion of medium levels of radiation across Sydney will increase Cancer within the population and potentially sterilising the use of current housing estates around the Lucas heights area for at least seven years depending on wind direction and air stability at the time.
- Bushfire in the Blue Mountains:
  - An aircraft impact (accident or deliberate) into the upper Blue Mountains area during an increasingly lengthy bushfire season, due to climate change, will produce a major bushfire.
  - Any Major bushfire across the Blue Mountains threatens 80000 lives and associated property
  - The economic cost of these bushfires is typically about \$10 billion.

- There is also significant community disruption over a two year period following such fires and the psychological impacts can last much longer.
- Gas Supply to Sydney and Newcastle:
  - A deliberate aircraft impact on the gas metering station Horsley Park
  - This can disrupt the gas supply to Sydney and to Newcastle
  - The formation of a vapour cloud following impact and its subsequent ignition can affect the electricity substation at Eastern creek and the water pipelines
  - This causes disruption to the electricity for Sydney.
  - This causes disruption of water supply for Sydney.
  - The economic cost depends on how quickly work arounds can occur for these losses but is likely to be at least \$100 billion.
- Prospect Reservoir:
  - The risk arises from aircraft impact on the dam wall either deliberately or from an accident
  - It will result in the loss of water supply to Sydney for a few years
  - The incident may also cause loss of the chlorination facility for Sydney
  - The cost of this will depend on how quickly a work around from Warragamba can occur, but is likely to an appreciable proportion of one year of Sydney GDP (\$360 billion)
- There was and has not been any assessment of these risks from the use of modern aircraft for terrorism, Pilot suicide and International high jacking of aircraft via satellite communication systems In the EIS. Any studies done are now over 20 years old and were confined to “*normal aircraft crashes*” and did not include deliberate acts flying at maximum speeds.
- There was no distinction made in the EIS between risks involving passenger and cargo airflights. The airport is meant to be a 24hr operation and cargo flights, particularly international flights, have a totally different risk profile to passenger flights. Typical human factors at play increase the likelihood that the manifest is actually not the one passed to Australian authorities, especially with the rise of ISIS and affiliates across the Middle East.
- These catastrophic risks are unacceptable for the population of Western Sydney and the Blue Mountains as there is no economic or social benefit in the proposal to this group of the population because substantial social disruption and loss can occur.
- The risk assessment in the EIS was clearly token to pass a Government requirement and did not address the real risks involved in this project.
- The risk assessment from a professional perspective reads as only done for benefit of the investors in mind and not the size of potential loss of and to the population.
- The catastrophic impacts are societally unacceptable and cannot be avoided or easily ameliorated. Good risk management practice would dictate that the Airport is built outside the Sydney basin or not at all.
- The assessment of risk is inadequate and does not meet current international guidelines in ISO 35000.
- Note that if the risk assessment process follows State Government Guidelines as indicated in the EIS then transport infrastructure projects, such as WestConnex, the second harbour tunnel, the north and south west rail projects and others, have not been assessed properly for their impacts on the community only in how the profit can be maximised to investors – a corrupt risk management practice.

### **Economic Objections to Building Badgerys Creek Airport:**

- The economic arguments have been done in isolation from the transport needed for this State and for Eastern Australia for 2100.
- This is a complex problem involving the economy, population growth, jobs availability, alternative land use, transport options, energy and water usage, and climate change.
- The need for a new airport is highly dependent on what is envisioned for the years between 2060 and 2100 and the natural changes to the environment in that time:
  - How population growth across NSW and where it occurs impact on the need for an airport?
  - How are sustainable jobs going to be created and where will they be?
  - What will the transport needs for this population be if the economy is to grow?
  - Will the economy actually grow or will it stagnate?
  - How will sustainable food, water and electricity be supplied given that climate change impacts will occur over this time period?
  - How are shocks caused by feedback between different systems in the environment be avoided or mitigated?
  - Would alternative and integrated transport systems provide better and less costly options while maximising economic growth and the Australian International commitments on Climate Change following the Paris Summit?
- Studies undertaken do not address these in a manner consistent with its complexity. The decisions arrived at are therefore invalid and flawed. The basis for any decision must be of benefit to all and not just to investors.
- The NSW and Federal Government 2012 report, *the joint Study on Aviation Capacity in the Sydney Region*, considered only sites within 100km of Central Sydney and ignoring sites further away that could connect to Central Sydney by Ultrahigh Speed Rail.
- All passenger numbers, aircraft movements and employment figures are overstated as they are based on unrestrained projections.
- The study did not assess the effect of building a high speed rail down the eastern seaboard and the benefit it brings:
  - The travel times between centres will be similar or less than current air travel times (about 2.5 hrs similar to the current time) using fourth generation trains at speeds in excess of 400km/hr.
  - It would reduce the need of 42% of air traffic that currently services the eastern seaboard, pushing the need for a new airport for Sydney to 2040 at the earliest.
  - About 80% of journeys would be by train under these circumstances based on experience across the world.
  - A significant proportion of fast freight can be integrated into this rail network. This reduces major road freight and the damage it causes on the road infrastructure which is a significant on-going cost as well as reducing air freight between Australian seaboard Centres.
  - The building of the train track requires specialised steel products for the track and the catenary wires. This provides an opportunity to revitalise steel making in Western Sydney through local firms using Australian Iron ore or recycled steel and iron (It does not have to go to China and back).
  - It can kick start a solar power industry in Australia using all Australian minerals and Australian expertise in this area.

- Using the rail corridor to generate solar power would currently produce approximately 200MW between Sydney and Melbourne and a similar amount between Sydney and Brisbane if only one row was placed along the rail corridor. Four rows of panels is probably the maximum number of panels that would easily fit along the rail easement and would supply power back to the grid equivalent to half of Mount Piper Coal Fired power Station assuming 90 trains per day operate.
- The development of such a solar power industry in this country has the benefit of moving to a low carbon economy and has the potential for high exports while maintaining high employment. It also accords with Australian Government commitments agreed to at the recent Paris summit on climate change.
- Centres such as Goulburn, Albury Wodonga and Queanbeyan would become viable growth centres relieving some of the pressure on Sydney and Melbourne.
- Solar power can also be used to generate fresh water from brackish and salty water while generating electricity to support land communities.
- Parallel development of ultrafast Optical fibre links can build computer and communication based industries in these growth centres.
- There will be no need for new infrastructure that is fundamentally detrimental to the planet for the immediate future.
- Effects such as venting of aircraft fuel onto the blue gum stands in the Blue Mountains can be avoided as can oil spills which affect the water supply to Sydney.
- The reduction in air travel while only slight, helps to move to a low carbon economy.
- Similarly the noise impacts will not be present.
- The economics of this proposal do not take account of CO<sub>2</sub> which is considered a pollutant and is not costed into any market economic model. This lack of basic accounting principles leaves the public to pick up the cost of damage rather than the investors and corporations who cause it.
- A well chosen airport location should have multiple flight path options.
  - This is important for safety reasons, growth potential, noise sharing, etc.
  - The current location offers or studies in the EIS only one flight path which is already quite exotic (270 deg. turn at low altitude with the mountains limiting the pilots options).
  - This in itself poses a risk for failure of the project and/or catastrophe during operations.
  - Alternative flight paths will have increased noise and other implications and effects on national parks, and communities.
- The studies did not assess combining an existing airport with High Speed Rail as an alternative.
  - If Canberra is taken as an example, the distance to Sydney is 250km.
  - An Ultra high speed rail service can cover this in 40 minutes at 400km/hr.
  - This is within the one hour normally taken as the limit for airport to city services.
  - This compares with 30 minute for London, Beijing and Hong Kong.
  - Canberra airport already exists and could easily be extended at much less cost.
  - The economic loss to Badgerys Creek in the EIS ignores the growth of Canberra (and to a lesser extent Newcastle) as an International Airport over the next two decades. The impact of this is loss of passenger and freight into Badgerys Creek making it less viable.

