

11 September 2014

Director - Infrastructure Projects  
 Department of Planning and Environment  
 Number: SSI 13\_6136  
 Major Projects Assessment  
 GPO Box 39  
 SYDNEY NSW 2001

Via online form:

[http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=6136](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6136)

**NorthConnex Application Number: SSI 13\_6136**

Please find below my submission in response to the exhibition of the EIS for NorthConnex.

Firstly I would like to state I **object** to the project as described in the EIS.

In summary we have huge concern regarding the following issues and request that these be considered by the Department of Planning and that NorthConnex look to redesign the tunnel to mitigate the existing design flaws.

**1. Particulate Matter is a Health danger and a Carcinogenic**

Particulate Matter, emitted from vehicles, are shown through medical research, to lead to; increased risk of infant mortality, children developing autism spectrum disorder, developing asthma and allergies, impaired lung function and lung development in children and adolescents, increased risk of heart disease and lung cancer<sup>[1]</sup>. These studies also confirm air pollutants have prothrombotic and inflammatory effects on humans.

Secondly, Diesel emissions have been classified as carcinogenic by the World Health Organisation in June 2012<sup>[2]</sup> and also contain a larger number of fine particles which penetrate deep into lung tissue and remain there causing inflammation

Thirdly, recent epidemiological research suggests that there is no threshold at which these health effects do not occur<sup>[3]</sup>.

On this evidence the basis for safety and burden of proof is on NorthConnex to show that the pollution ventilation systems will not impact the local communities through the expulsion of concentrated particulate matter and other pollutants through only two pollutant stacks.

This evidence leads to point two, the design's location of the northern pollutant stack.

### **2. Location of a Pollutant Stack in a residential area, an educational zone and a valley**

The placement of the northern ventilation stack will be in the centre a densely populated residential area in Wahroonga with 16,726 residents<sup>[4]</sup>.

Wahroonga and its neighbouring suburbs is a dense education zone with approximately 9,300 children (Kindergarten to Year 12) who attend thirteen schools. Two of these schools are for special needs children (St. Lucy's and St. Edmunds) including children who are immunocompromised.

In addition there are several pre-schools, several aged care facilities and two hospitals.

Furthermore, the placement of the northern ventilation stack is in a valley in Wahroonga where there are low wind speeds, particularly from early evening to early morning.

Inversion layers also occur in this valley. Inversion layers are significant to meteorology because they block atmospheric flow which causes the air to become stable. Inversion layers with heavy pollution are prone to unhealthy air and an increase in smog when an inversion is present because they trap pollutants at ground level instead of circulating them away<sup>[5]</sup>.

Due to the heavy population density, including young children who are more susceptible to the pollutants, the placement of a pollution stack within this area is both dangerous and reckless. NorthConnex must prove categorically that the design has no flaws and that there is no long term impact in exposure to these pollutants.

NorthConnex has to provide irrefutable evidence that this location is 'bullet proof' which leads us to point 3 and 4.

### **3. Environmental Impact Statement – Pollutants exceeding standards**

The EIS shows that there are exceedances above standards for pollutants such as NO<sub>2</sub> and haze being developed from Particulate Matter toward the ends of the tunnel<sup>[6]</sup>. This pollutant, at these levels, will be expelled at the pollutant stack at the end of the tunnel.

This is even with flawed modelling as explained in the next point, four.

### 4. The NorthConnex Environmental Impact Statement flaws

There are multiple flaws in the air quality modelling of the northern stack in the EIS. These include:

- a) extrapolation of meteorological data from other weather stations which do not reflect the local meteorology, local topography, and the valley location.

The EIS uses meteorological data from Terrey Hills which is 10.86km<sup>[7]</sup> away from the location of the Northern Pollution Stack. Further data has been used from Sydney Airport which is 24.87km<sup>[7]</sup> from the Northern Pollution Stack.

Neither data reflects the necessary accurate data required to make such a critical decision upon which major health impacts will result to over 25,000 people.

- b) The use of a coarse topographical model

The source for the terrain models used in the EIS is satellite data. This type of data has a high degree of error of up to 6 metres in height. There are further potential sources for error as the Wahroonga area is heavily treed with established houses and apartment dwellings in the landscape.

This data source is too inaccurate for the pollution stack modelling especially given the pollution stack heights are only 15 metres with the Northern pollution stack located in a valley as previously stated.

More accurate and available elevation data should have been used.

- c) The failure to consider polluted intake air from the Pennant Hills/M2 interchange as part of the project contribution to air quality at Wahroonga with the use of the background air quality being based on air quality at Lindfield and Prospect.

***The single biggest flaw of the model.*** The air quality used as the input to the modelling is taken from two air quality stations.

Prospect (Picture 1) is 13.28km<sup>[7]</sup> from the M2 / Pennant Hills Road intersection

Lindfield (Picture 2) is 9.8km<sup>[7]</sup> from the M2 / Pennant Hills Road intersection

Both locations bear no relationship to the air quality of the M2 near Pennant Hills Road. The Prospect location is a park where the Prospect United Soccer Club plays in the middle of Sydney suburbia. The Linfield location is a CSIRO facility which develops and builds sensor to detect trace organic pollutants in sea water.

The M2 has average vehicles daily (AVD) of 82,200<sup>[8]</sup> with a 14% annual increase in AVD to June 30, 2014<sup>[9]</sup>.



Picture 1 : Myrtle Street, Prospect.



Picture 2 : CSIRO, Bradfield Road, Lindfield

The EIS shows that air quality at locations in close proximity to Pennant Hills Road is significantly influenced by traffic however the EIS has totally ignored this in the modelling for the tunnel.

When combined with Pennant Hills Road traffic, the AVD are over 160,000 a day and the planned pollution stack for southbound tunnel is also located in close proximity to the entrance, potentially creating a circularity effect.

The air entering the tunnel will be of a quality produced by these massive traffic volumes, which are not accounted for in the EIS. See Picture 3

Polluted air from 160,000 vehicle movements will be further polluted with 9km of emissions from vehicles in the tunnel and then discharged in Wahroonga.

The current modelling appears to significantly under-estimate the pollutant concentrations discharged.



**Picture 3 : M2 / Pennant Hills Road Intersection**

Despite this flaw, point three has shown that the pollution levels of NO<sub>2</sub> are above standards within the tunnel and there is haze developing toward the end of the tunnel. Remodeling with proper air quality inputs would likely produce outputs that are above World Health Organisation standards for allowable pollutants. This has the real potential for another M5 East tunnel disaster.

d) the lack of any actual data on PM<sub>2.5</sub>

“Particulate matter that’s less than 2.5 microns in diameter (PM<sub>2.5</sub>) can remain in the air for days to weeks. It can penetrate deep into our lungs, collecting in tiny air sacs (alveoli) where oxygen enters the bloodstream. Health problems begin when the body starts to react to these foreign invaders. Another danger is that PM<sub>2.5</sub> contains a number of harmful substances, such as cancer-causing chemicals<sup>[10]</sup>”

Despite the fact the PM 2.5 is the most deadly pollutant neither of the air quality stations (Prospect and Lindfield) measure PM 2.5. Instead, for a large scale infrastructure project, that places large scale particulate matter within a residential community with many schools, NorthConnex have taken an approximation of what the PM 2.5 “may be”.

This project lives on “maybes”:

- no measurement of local wind within 10km;
- no measurement of local temperature within 10km;
- no measurement of PM 2.5 at all;
- no measurement of air quality within a 10km radius; and

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- overall a poor, poor input-based model on the biggest pollution-based infrastructure program in the history of NSW.

### **5. Portal Emissions**

I reject any provisions for portal emissions in densely populated areas, which will result in emissions remaining at ground level, and exposing the local population to health-threatening pollutants.

Furthermore, I am also concerned that NorthConnex's claim that there will no portal emissions from current proposal cannot be verified. They state the design will provide no portal emissions but this is based on jet fans installed 300 metres from the portal. Will portal emission stop at the exit because the design says so? No!

Portal emissions are dangerous, very dangerous and there is little or no information in the EIS that states that portal emissions will not occur.

### **6. Why the current design of the Northern Stack / Portal can be relocated or filtrated**

Was a full and transparent options assessment process undertaken to assess alternative designs for the project? No it was not.

Unlike other tunnel projects in Sydney there are alternatives for locating the northern pollutant stack and portals in non-residential areas.

As stated by Dr Gerda Kuschel, who was the independent air quality expert for NorthConnex at their Air Quality Forum, "One of the great advantages of road tunnels is the opportunity to deliberately site portals (or stacks) away from sensitive receptors so the road transport emissions may be removed from dense residential areas improving local air quality."[11]

### **Summary of the Issues**

1. Particulate Matter and Pollutants effects health, shortens life span and kills;
2. The placement of the pollution stack is next to greater than 25,000 people - the population of Wahroonga, schools and other facilities;
3. The modelling of the EIS is flawed making points 1 and 2 even more significant;
4. Potential Portal Emissions increase this danger to levels that would cause significant health harm to the 25,000+ community; and
5. There are no geographical or other constraints preventing the northern pollution stack and the portals from being relocated to a safer location further north along the M1.

**What needs to be done**

***An independent options assessment process should be undertaken to assess alternative locations for the ventilation stack and portals.***

In addition:

1. The air quality and human health impact assessment need to be revised to address the issues raised in this submission;
2. Undertake a Life Cycle Analysis and assessment for the provision of filtration;
3. A long term health study on children and residents in areas impacted by stack discharges be included as part of the conditions of approval for any stack location;
4. A comprehensive air quality monitoring program is developed and implemented for the full life of any tunnel built;
5. An independent review of the ventilation system is undertaken to ensure that NorthConnex's claim of no portal emissions is justified;
6. All Portal emissions from NorthConnex in the future are banned;
7. The Submissions Report/Preferred Project be exhibited to allow the community to respond to the revised information contained in the report; and
8. The Department does not approve the project in its current form as it clearly does not meet the principles of Ecologically Sustainable Development as required by the Environmental Planning and Assessment Act.



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Many other tunnel designs are constrained in design – this is not the case for the Northern Portal and its pollution ventilation stack.

On the basis that I know the pollutants are bad - why is this project adopting the position of being safe until proven otherwise? Rather this project should be considered unsafe until proven safe.

Thank You.

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## References

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