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Report on the Site Assessment at Wentworth Park, Howrah, Tasmania, undertaken by URS.

Epidemiological Study

In any study about disease and causation it is always important to ensure that a thorough Epidemiological Study is undertaken. It must be established that the cluster of diseases are related to toxic assault at a particular location. This implies that the locational, medical and employment history of all those affected is established.

If it is established that location is a determinant, the particular attributes of that location must be established. Is the effect coming from activities at that location or, say, industrial activities in the general location. Is the location subject to pollution from other sources? The Derwent Valley and River for instance has had a history of pollutive activities. Confounding factors must be identified (and dismissed!?).

Adjoining neighbourhoods and some control neighbourhoods need to be part of the study. Are residents of the Derwent Valley (similar populations) suffering similar diseases at similar rates? If so what is being looked at is a much bigger issue altogether!!!

Assuming a thorough study does show that this location is peculiarly different then the cause must be investigated further.

The report by URS appears to have not identified anything that could have an effect such as Poppy has been observing. Obviously something more has to be done.

It appears that the site would have been subject to high leaching and off-gassing action over the last 40 odd years. The area appears to have a seasonally high watertable and a "swampy" underlying environment that would be highly reactive (biochemically) – these factors would lead to high leaching rates. Much of the leachate would have moved into the Derwent. The potential causes of the problems could have been bio-chemically transformed or have been transported from the site in groundwater. That is, the toxic events may be from historic levels of pollutants which are no longer present today!

Certainly there must be some concern about pesticides that would have been used in the original management of the dump to keep down flies, mosquitoes etc. Herbicide use and application methods in park management would also be of concern. The whole history of the dump is extremely sketchy – but management practices generally used during that era would suggest that neighbours could

have been subject to high levels of toxics. Further, the actual fill material mixed with garbage could have been contaminated. Site history could have been more substantial.

Assessment Methodology

Sampling at residential blocks

- The first obvious area of concern about the methodology of the assessment is the lack of sampling at the dwellings. It would be more probable to find "hotspots" because hard surfaces and garden beds etc could have reduced infiltration, run-off and leaching generally.
  Another thing to look at may be the capping (fill) for the residential blocks. I assume that it may have been different from soil used in the area allocated for the park. Soil (fill) could have come from contaminated sites. This would not be unusual!

- Following the hypothesis about leachates it would be necessary to take (many) samples from soil and groundwater close to the edge of the river. There may be historic leachate effects still present. Sediments in the river close to shore may not reveal much as bed erosion could have occurred – depending on the shape of the meander of the river (if any).
  Efforts in this area are essential to try to recreate the pre-leaching chemical history of the area. Modelling half-life and solubility etc characteristics of chemicals may be possible to assist extrapolation of past chemical history.

- I noted that the map showing the extent of landfill is only a single line. The Eastern, Southern and Western extents are not shown!!!! The area of influence must be identified. This is fundamental.

- Contour maps at minimum 500mm centres of present and pre-landfill soil, and water levels are required to give a picture of the hydrology of the area to determine potential leachate and groundwater flows. Contours of garbage (under capping) must be established. A three dimensional model of the site with these contours shown should be created (digitally). This may be instructive particularly in determining the actual physical relationship of houses and potential pollution.

- The potential of leachates from the service station(s) should be examined.

I recommend that:

1. Poppy's work (which appears considerable already) be augmented with an **epidemiological study** to establish conclusively the locational specifics of this toxic nightmare. This is even more essential considering the unsatisfactory report by URS. It would be unlikely for the Council to take any further action as they have already paid for a report they would consider proves that the garbage dump is not causal. They would require something quite compelling to embark on further studies.

2. Any **further site assessment** should:

a) identify full extents of the landfill (dump) activity
b) establish past and present contour maps of the area
c) establish levels of capping above garbage dump and below houses
d) develop a three dimensional digital model of the site identifying past and present surface, water levels, and capping levels, on the site
e) construct an adequate history of the site
f) identify hotspots in residential areas
g) consider the long term leachate dynamics
h) model bio-chemical history
i) establish if any plumes of pollutants (air, water and land) are emanating from off-site locations (eg from service stations, industrial activity).

Conclusion

On Poppy's evidence there is a matter of great concern. I am unfamiliar with the strategies undertaken to date and what "remedies" are being sort. I assume that the whole neighbourhood would like some action taken. I do not know how well organised any action group is, or how politically connected and successful they would be at gaining financial support required to progress to the next level of activity.

Certainly the next level of activity recommended (epidemiological study) will take time and money. An interim and supporting activity may be to push for monitoring of leachates into the Derwent using mass balance methodologies (ie measuring liquid flow rates to establish actual mass of pollutants entering the river – not the misleading mg/L dilution method).

Good luck

John Craven