

## **Informal comments re environmental investigation program at Bicentennial Park, Willoughby**

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I have read the report by Consulting Earth Sciences (CES) "Environmental Site Investigation Bicentennial Reserve, Small Street, Willoughby", dated 11 January 2022, which addressed contamination issues at the Bicentennial Reserve, Willoughby, which had a limited scope of work to address data gaps in previous investigations, as required by NSW EPA.

Please note I have not reviewed the CES report in the detail as would be required by a Site Auditor or by NSW EPA. This opinion provides a brief summary of significant issues that remain to be addressed in an addendum to the CES report.

The limited scope of the CES report does not meet requirements for a Detailed Site Investigation (DSI) in accordance with guidelines made by and endorsed by NSW EPA. To undertake a DSI would require investigation to be completed across the site in which sampling of environmental media (fill materials, soil and groundwater) from many more locations across the site and their chemical analysis for all chemicals of potential concern to satisfy the requirements of guidelines made by or endorsed by NSW EPA.

The CES report stated the Sampling, Analytical and Quality Plan (SAQP) for the relevant abbreviated scope of work was reviewed by the EPA and was evidently endorsed by this authority.

Given the heterogeneous nature of the land filling, the number of sampling locations is insufficient to reliably characterise the environmental condition of the full extent of fill materials, but maybe sufficient to meet the requirements of the EPA.

The CES report provides broad understanding of the environmental condition of the site, with the exception of the issues listed below.

One important failure of the CES report is the omission of a statement of the expertise of the persons sampling fill materials, groundwater and surface water. The CES report did not identify whether the report was prepared by or reviewed by a consultant certified by ANZ Certified Environmental Practitioner (Site Contamination Scheme) or the similar scheme administered by Soil Science Australia. The report should have been prepared and/or reviewed by a person holding current endorsement by one of these bodies.

The SAQP and other parts of the CES report did not identify protocols for collection samples for chemical analysis of PFAS compounds for which rigorous procedures are required to be implemented to prevent contamination of environmental samples by sampling equipment and personal protective equipment. Given the low concentrations of PFAS compounds reported, this omissions may not be relevant.

Despite the abbreviated sampling plan and with respect to the environmental condition of the fill materials, given that the landfill has been covered and the surface is maintained, the concentrations of chemicals of concerned identified in the fill materials are not of concern as users of the sporting fields would have no exposure to the fill materials and there appears to be no identified significant sources of volatile chemical that could impact users of the site.

However, with respect to persons who may contact the fill materials in undertaking intrusive maintenance work so as to disturb the fill materials, the health of these workers and the environment are required to be protected by implementation of a long-term environmental management plan.

The most important aspect of the site is the ability of groundwater becoming contaminated by leachate within the fill materials and to migrate from the site so as to pollute the waters of Long Bay. In this respect, the CES report is remiss by not identifying all chemicals of concern that would undoubtedly

have migrated from the former Hallstrom site, which was located adjacent to Willoughby Road, up-gradient from Bicentennial Reserve. Historical documents not referred to in the CES report indicate that both solid and liquid wastes from the Hallstrom site were placed into the landfill and it is likely that liquid chemicals used on the Hallstrom site have migrated into the landfill.

The CES report did not identify the complete suite of chemicals of potential concern from the Hallstrom site, in particular chlorinated hydrocarbons, such as di-, tri- and tetra-trichloroethene, which are used widely for cleaning metal surfaces during manufacturing processes. These compounds have a low ability to be detected by a photoionisation detector (PID) as was used by CES. These compounds should have been adopted as chemicals of potential concern. This issue should be addressed in an addendum to the report.

In addition, the CES report did not address the likelihood of dioxins and furans being present in the fill materials, which are known to result from incineration of waste containing plastics and chlorinated hydrocarbons. Whilst the dioxins and furans may not contaminate groundwater, the CES report should have addressed this issue so that these chemicals of potential concern could be addressed in the long-term environmental management plan so as to protect the environment and the health of workers involved in intrusive earthworks.

Sampling of groundwater was undertaken commonly within sandstone bedrock. However, the permeability of the sandstone at the former weathered surface may be reduced by fractures and joints in the bedrock becoming unfilled by fine-grained material derived from the landfill so that contaminated leachate generated within the fill materials may migrate preferentially along the surface of the sandstone bedrock in the sandy soils that were identified in the bore logs to be moist (i.e. to contain water). Inspection of bore logs, indicated that sandy materials, sometimes contained gravel. These strata may have higher permeability and to have higher concentrations of chemicals of concern than identified within the sandstone bedrock. This issue should be addressed in an addendum to the CES report.

With respect to migration of groundwater from the site, the CES report stated "Contaminant migration may be assisted by preferential pathways such as underground drainage networks", but the report did not assess the significance of these migration pathways. This issue is critical to the understanding of the nature and extent of contaminated groundwater migrating from the site and should be addressed in an addendum to the CES report.

Some of the field data sheets relating to collection of groundwater samples were incomplete. This issue should be addressed in an addendum to the CES report.

Council or the EPA, or both, should require the CES report and any addenda be reviewed by a Site Auditor accredited by the EPA to provide confidence that the results reported by CES are sufficiently reliable and comprehensive to achieve the purpose of the assessment program and satisfy the requirements of relevant guidelines made by or endorsed by the EPA.