31 October 2010

Mr John Smith

ABC Properties (Australia) Limited

Level 2, 120 Big Street

Melbourne VIC 3000

Reference: 16016 SSTL Review Letter analymised.docx

SUBJECT: Review and cross-check

Dear John

# Introduction

 are pleased to provide this review of the SSTLs (site specific target levels for proposed remediation) provided by for the above site. The review is provided to present the implications of adopting the proposed target levels in relation to the developments understood to be desired by for the site.

Whilst have assessed a range of risk scenarios, it is understood that the scenarios of concern are:

* Residential flats with basement carpark;
* Workers conducting excavation at the site (intrusive workers);
* Roadways (included as open space or intrusive worker scenarios);
* Open space (parks, playgrounds etc)

 have reviewed the site specific target levels and the measured concentrations of contaminants on site with a view to the exposure scenarios listed above. Note that have previously provided comment on the risk assessment calculations used to derive the SSTLs and that discussion is not repeated here. Note that only the compounds identified by as posing a potential risk have been included here.

It is noted that risk posed to occupants of residential flats with basement carparks will be limited to the seepage water off-gassing within the basement. The previous review indicated that these calculations were satisfactory, and this scenario is not assessed further in this review.

Review of the risks has been conducted by entering the exposure and toxicity data into an alternative risk calculation software package (BP Risc) which is well established in the field and comparing the results. Risks were assessed for each scenario for two sets of contaminant concentrations:

* The maximum observed contaminant concentrations for key contaminants on site;
* The total of all SSTL concentrations indicated by .

The process and findings are discussed below.

# Risk Assessment Process

The process of risk assessment is not discussed in detail in this report. Please refer to NEPC (2013)[[1]](#footnote-2) Schedule B(4) and the SSTL calculation report for details of and background to the process.

Risk assessment is conducted in four stages:

1. Data Collection (What is the situation, what are the contaminants, and how much is there?)
2. Toxicity Assessment (details of the toxicity effects of the contaminants, including quantitative measures of toxicity)
3. Exposure Assessment (by what means are the site occupants potentially exposed to the contaminants)
4. Risk Calculation (degree of exposure and toxicity values are combined to provide a quantitative measure of the risk posed to receptors/occupants)

## Data Collection

This review relies on the data reported in the following documents:

* ; and
* .

The contaminants detected in site groundwater, maximum concentrations assessed and SSTLs determined by are summarised in the table below.

Table 1: Summary of Contaminant Concentrations and SSTLs Previously Determined (mg/L)

| **Contaminant** | **Maximum Concentration Reported** **( 2016, sampled 2013)** | **Site Specific Target Level – Open Space** **( 2016)** | **Site Specific Target Level – Intrusive Workers****( 2016)** |
| --- | --- | --- | --- |
| benzene | 0.011 | >1,790 solubility[[2]](#footnote-3) | 30 |
| dichloroethane, 1,1- | 27.200 | >5,040 solubility | 230 |
| dichloroethane, 1,2- | 3.200 | >8,600 solubility2 | 380 |
| dichloroethylene, 1,1- | 193.000 | >2,420 solubility | 260 |
| dichlorodifluoromethane | 0.240 | >280 solubility2 | 1,000 |
| napththalene | 0.054 | >31 solubility | 5 |
| TPH C6-C8 aliphatic | 216.000 | >9.5 solubility2 | 6,500 |
| TPH C>8-C16 aliphatic | 1.140 | >0.22 solubility | 20 |
| TPH C>8-C16 aromatic | n/a (assumed to be limited to naphthalene) | >27.8 solubility2 | 120 |
| TPH C>16-C35 aliphatic | 0.405 | >0.0037 solubility2 | 340 |
| TPH C>16-C35 aromatic | 0.405 | >0.26 solubility2 | 30 |
| trichloroethane, 1,1,1- | 210.000 | >1,290 solubility2 | 7,300 |
| trichloroethane, 1,1,2- | 0.270 | >4,590 solubility2 | 20 |
| trichloroethylene (TCE) | 0.062 | 440 | 2 |
| trichlorofluoromethane | 28.700 | >1,100 solubility2 | 1,400 |
| vinyl chloride | <1.000 | 1,700 | 24 |
| xylenes | 2.060 | >106 solubility2 | 220 |

## Toxicity Assessment

 adopted the toxicity profiles stipulated in NEPC (2013) for the majority of the target compounds. For dichlorodifluoromethane and trichlorofluoromethane, the toxicity data listed in (2016) Table 15 were adopted. Toxicity values are included in the BP Risc output in Appendix A of this report.

## Exposure Assessment

 used the same exposure settings as adopted by (2016) Section 4.

## Risk Calculation

Risks calculation was conducted using BP Risc. Input and output data is presented in Appendix A.

# Findings

## Scenario 1 – Open Space

The open space scenario was modelled for risk firstly using the maximum observed contaminant concentrations (Scenario 1A) and then assuming all contaminant concentrations were at the SSTLs (cleanup levels). Whilst acknowledge that have calculate the SSTLs on the assumption that significant risk contribution is made by no more than five compounds, it remains that cleanup complying with the SSTLs as presented could result in residual impact with more than five compounds at or close to the SSTL. As a conservative measure this scenario has been assessed.

## Scenario 2 – Intrusive Worker

The intrusive worker exposure scenario includes dermal exposure to impacted groundwater and incidental consumption of groundwater at a minimal level (5 mL/day). Skin exposure is for hands, forearms and lower legs, estimated by as 3,800 cm2 for an average adult. Exposure to groundwater in the excavation was assumed by to be 4 hours per day of exposure, with a construction worker body weight of 78kg. These exposure assumptions have been relied upon in this cross check assessment.

Kind Regards

Dave Wally, Other Wally

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1. National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure No 1.* [↑](#footnote-ref-2)
2. Solubility of pure product in water [↑](#footnote-ref-3)