

12 August 2016

CES Document Ref:
CES150404-EXC-AJ

Sydney Zoo,
3 Wills Avenue,
Waverley NSW 2024

For the attention of Jake Burgess

Re: Discharge Sampling Protocol, Proposed Sydney Zoo site, Bungarribee Super Park, Doonside NSW.

Dear Sirs,

1 INTRODUCTION

Consulting Earth Scientists Pty Ltd (CES) was previously commissioned by Sydney Zoo to undertake surface water sampling at Bungarribee Super Park, Doonside, at three locations along Eastern Creek, for the purpose of assessing baseline surface water quality. The sampling was carried out on 29 June 2016, and the results were reported by CES in a letter to Sydney Zoo dated 13 July 2016 (Ref. CES150404-EXC-AG).

The purpose of this letter is to provide a protocol for future sampling and analysis of stormwater discharges during and after establishment of the proposed zoo. This protocol also recommends ongoing sampling of Eastern Creek and baseline sampling and analysis of the off-site wetland, to the south east of the site.

2 OBJECTIVE AND PROPOSED SCOPE

The reason for sampling the discharge water from Sydney Zoo is in order to facilitate a water quality assessment of the discharge waters from the site. The assessment of the analytical results will inform decisions relating to possible additional pollutant mass load reduction measures for the animal enclosures or further treatment (such as the construction of additional bio-retention or reed bed ponds) to minimise the adverse impacts to surface water quality off-site.

The scope of works for the off-site discharge sampling will be as follows:

- Sampling of the outlet from the constructed wetland in the north eastern quadrant of the Sydney Zoo site – SAMPLING POINT 1. The exact location will be confirmed post construction of the Zoo;
- Sampling of the off-site wetland on the eastern side of the site – SAMPLING POINT 2. The exact location will be confirmed post construction of the Zoo;
- Sampling of the culvert under the access road on the western boundary of the site – SAMPLING POINT 3. The exact location will be confirmed post construction of the Zoo;
- Sampling of surface water at three locations on Eastern Creek; as follows:
 - 50 m upstream of the proposed discharge point – SAMPLING POINT 4;
 - At the proposed discharge point – SAMPLING POINT 5; and
 - 50 m downstream of the proposed discharge point – SAMPLING POINT 6.
- Carry out field measurement of standard water quality parameters, including dissolved oxygen, pH, electrical conductivity and redox potential at the sampling locations; and
- Laboratory analysis of the samples for a ‘baseline suite’, which includes Biological Oxygen Demand (BOD), Enterococci, pH, Total Suspended Solids (TSS), total phosphorus, total nitrogen, ammonia, and chlorophyll. All analyses to be undertaken in a laboratory holding NATA certification for the tests conducted.

Since off-site discharge at Sampling Points 1 and 3 will generally only occur after rainfall events, it is not possible to design a systematic (regular interval) sampling programme. As such, site-based personnel will collect samples on an ad-hoc basis during discharge events at a frequency of at least once per month (given rainfall and discharge from the relevant sampling points) for the first six months and once every two months in the subsequent six month period. A review will be undertaken after the final monitoring round. Sampling will also be undertaken from the off-site wetland and Eastern Creek (SAMPLING POINTS 2, 4, 5 and 6) on a monthly basis for 12 months for a baseline off-site surface water quality.

3 SAMPLE LOCATIONS

The locations of the surface water sampling points are presented below:

Table 1: Grid references of sampling points

Sampling Point No.	Sampling Point	Eastings	Northings
1	On-Site Wetland Outlet	TBC	TBC
2	Off-site Wetland	TBC	TBC
3	Culvert under Access Road	TBC	TBC
4	South of Western Discharge Point	302156.525	6259044.73
5	Western Discharge Point	302050.439	6259196.627
6	North of Western Discharge Point	302018.32	6259504.157

4 CLOSURE

Results of the sampling and laboratory analyses should be provided to the NSW EPA within 2 weeks of each sampling event. An annual report will be prepared which will document the first nine sampling rounds and review the frequency (if necessary) of any additional monitoring.

If you have any questions or require any further details, please contact the undersigned on

Yours sincerely,