BLUE MOUNTAINS
Geological and Environmental Services Pty. Ltd.
ACN 069 994 056

20 Fifth Avenue, Katoomba 2780
Phone (02) 4782 5981
Fax (02) 4782 5074

29th August 2018

Mr. J. Dick
72 Wicks Road
NORTH RYDE NSW 2113

RE: EFFLUENT MANAGEMENT AT LOT 40 DP 28908, No. 9 MINKARA ROAD, BAYVIEW

Dear Josh,

Further to my recent liaison with Mr. S. Crosby, I am pleased to provide the following details in relation to on-site effluent management at the above address in Bayview. Reference is specifically made to the amendment to the report for on-site effluent management dated 6th July 2018 and associated plan, Figure 1A, that was submitted to Northern Beaches Council. The amendment and plan related to the use of a proposed aerated wastewater treatment system **(AWTS)** for the dwelling and subsurface dispersal area at 39m x 22m = 858m^2 with allowance for six bedrooms and reticulated town water supply. This superseded the original proposal for the Ecomax amended soil mound for land application as detailed in the effluent management report from April 2017 and associated plan, Figure 1.

Mr. Crosby has indicated that the Development Application for the proposed dwelling and associated features has been withdrawn and will be re-lodged to reflect changes in the nature of the development. However, there is no change to the allowance for 6 bedrooms in the proposed dwelling that is positioned at the same location. Therefore, there is no increase in the maximum design effluent volume of 1500 litres/day based on allowance for 10 full-time occupants. Furthermore, there is no change in the location of the proposed subsurface dispersal area and size at 858m^2 detailed in the amendment from 6th July 2018 and shown in

Figure 1A. So there are the same outcomes for effluent management for the new development design and associated Application to Council.

Trusting that this submission is to the satisfaction of Council. However, do not hesitate to contact me if I can be of further assistance.

Yours faithfully,

GRANT AUSTIN
Engineering Geologist
Member Australian Institute of Geoscientists
Affiliate Institution of Engineers Australia

BLUE MOUNTAINS
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20 Fifth Avenue, Katoomba 2780
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6th July 2018

Mr. J. Dick
72 Wicks Road
NORTH RYDE NSW 2113

RE: AMENDMENT TO EFFLUENT MANAGEMENT REPORT AT LOT 40 DP 28908, No. 9 MINKARA ROAD, BAYVIEW

Dear Josh,

Further to our recent liaison and mine with Mr. S. Crosby, I am pleased to provide this amendment to the report for on-site effluent management from April 2017. The effluent management report addressed the proposed use of an aerated wastewater treatment system **(AWTS)** and Ecomax amended soil mound for land application from what was the proposed five bedrooms dwelling. This amendment will be submitted to Northern Beaches Council.

This amendment relates to the following:

- The much larger area covered by the proposed dwelling and associated change in floor plan.
- Allowance for six bedrooms in the dwelling with addition of the office as a potential bedroom.
- The change from an Ecomax mound for land application to a subsurface dispersal area after treatment in an aerated system.

Reference to AS/NZS 1547 (2012) shows that a six bedroom dwelling has a population equivalent of 9 - 10 persons. For the reticulated town water supply, the design effluent volume would be 1350 litres/day for nine full-time occupants and 1500 litres/day for ten full-

time occupants. Note that the dwelling will be initially occupied by only three persons, which results in a design effluent volume of 450 litres/day.

Reference to the accompanying plan, Figure 1A, shows the amended location and size of the proposed dwelling. This is in the same general position as the smaller dwelling originally proposed and shown in Figure 1 of the effluent management report.

To the north of the dwelling, a gently sloping area has been prepared by generally filling with sand-based soil. This area was inspected together on 5/2/18 and is to be retained with sandstone flagging around the perimeter and above the top of rock ledge to the east and north shown in Figure 1A. The typical depth of loamy sand and clayey sand soils that overlie sandy clay loam across this area prior to earthworks was approximately 0.5m. The most-limiting in-situ soil above sandstone is sandy clay loam with a moderate structure in category 4 from AS/NZS 1547 (2012).

Observations on 5/2/18 show that the following approximate additional soil depths have been achieved around the edge of the near-level area that has been created:

- + 0.5m at the eastern side.
- + 0.3 - 0.5m at the northeastern side.
- + 1m at the north to northwestern side.

As we have discussed, it would be prudent to add an extra 0.3m of sand-based soil across the near-level area to enhance the overall depth above weathered sandstone. In addition, 50mm of commercially supplied turf underlay soil can be added to facilitate establishment of a grass lawn cover by turfing – for example with 'Sir Walter' or 'Matilda' buffalo which are well-suited to effluent application areas because they are understood to have high water and nutrient uptake rates and a tolerance to salt. Furthermore, the subsurface dispersal lines at a typical depth of 0.15m below the final finished surface that will have an overall grade in a north-northeasterly direction (i.e. mimics existing slope), can be selectively placed to fit with the addition of the 0.3m of soil, turf underlay and turf grass.

As delineated by Mr. Crosby, Figure 1A shows the proposed subsurface dispersal area at 39m x 22m = 858m^2 to the north of the dwelling. It is understood that this comprises the near-level

area that has been created which is wholly available for subsurface dispersal and will be retained at the outer edges by sandstone flagging. The proposed subsurface dispersal area and retaining walls will be inside the top of the rocky ledge to the east and north, beyond which the land fall away steeply into the bush interface. The subsurface dispersal area at 858m^2 also maintains appropriate clearance from the proposed dwelling, the nearest elevated tiled terrace, pathway, carport and driveway, whilst also being well-set away from the nearest intermittent and perennial watercourses in the flow path – i.e. greater than the minimum requirements of 40m and 100m respectively.

The nominated location of a single or dual tank AWTS off the eastern side of the dwelling, pending exact final confirmation, is shown in Figure 1. Any upslope runoff should also be diverted away from the subsurface dispersal area, whilst grass should be mown regularly with the cuttings harvested and removed to prevent nutrient recycling.

With the subsurface dispersal area at 858m^2 and maximum design effluent volume of 1500 litres/day from the dwelling with allowance for ten full-time occupants, there is a wastewater application rate of only 1.75 litres/m^2/day – i.e. design irrigation rate**(DIR)** of 1.75mm/day. This is a low value that is even less than the 2mm/day DIR for the most-limiting medium to heavy clays in category 6 of AS/NZS 1547 (2012). Note that the DIR for subsurface dispersal and the most-limiting sandy clay loam soil in category 4 is 3mm/day, which equates with an area requirement of 500m^2 based on the maximum design effluent volume of 1500 litres/day from the proposed dwelling. Furthermore, for the three persons in your family who will initially occupy the dwelling and associated design effluent volume of 450 litres/day, the subsurface dispersal area at 858m^2 results in a minimal wastewater application rate of only 0.53 litres/m^2/day (i.e. DIR of 0.53mm/day). Do not hesitate to contact me if I can be of further assistance.

Yours faithfully,

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