Enclosure 10

Letter from Conroy Steward Spagnolo Solicitors on Owners consent for Stormwater Legal Point of Discharge and Easement

Conroy Stewart Spagnolo solicitors

ABN 19 097 125 347

Principal Mark Damien Spagnolo

Solicitor Loren R Gimbert

Solicitor Oliver W Quinell

Our Ref: LG:21/0171

Your Ref:

19 May 2022

The General Manager
Clarence Valley Council
Locked Bag 23
GRAFTON NSW 2460

Dear Sir/Madam

Re: SUB2021/0042- 332 lot subdivision
Property: Lot 104 James Creek Road, James Creek NSW 2463

We advise that we have been instructed to act on behalf of MPD Investments Pty Ltd, the applicants of SUB2021/0042, to assist our clients with complying with the additional information required by Clarence Valley Council as per your correspondence dated 8 March, 2022.

We refer specifically to points 12 and 13 of your letter dated 8 March, 2022 stating that written evidence of owners' consent for a 'Legal Point of Discharge' must be submitted.

We understand that our clients have engaged GeoLINK who have undertaken an assessment, modelling and design for the stormwater management strategy to support the development and GeoLINK have recommended bioretention basins as the most effective systems to support the development.

We refer to the letter from GeoLINK dated 19 May, 2022 (enclosed) which concludes that the proposed strategy to detain and treat stormwater is designed to mimic the existing conditions in terms of where the stormwater leaves the site, how much water leaves the site, and the water quality of the runoff from the site. Therefore, GeoLINK have concluded that no increase in stormwater flows leaving the site is expected when compared with the existing scenario where bioretention systems are utilised.

As full maintenance access and best practice engineered stormwater drainage design will be implemented by our clients, we do not agree that owners' consent by downstream landowners, nor a stormwater easement over the adjoining land is necessary as the stormwater management design proposed by our clients will cause no change to the existing stormwater regime.

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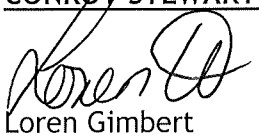
Yours faithfully
CONROY STEWART SPAGNOLO



Loren Gimbert
Solicitor

Please note, our physical address has changed to 3 Stanley Street, Maclean.

19th May 2022
Ref No: 3204-1103

MPD Investments Pty Ltd
C/o Mike Willoughby
mikewmd@bigpond.com

Dear Mike

James Creek Road Subdivision – Stormwater Management Strategy

GeoLINK has undertaken assessment, modelling and design of the stormwater management strategy to support the proposed ~330 lot subdivision at James Creek. Our design meets the criteria specified within the *Clarence Valley Council Residential Zones Development Control Plan (DCP) 2011 – Part H – Sustainable Water Controls*. In our professional opinion, Council's design aligns with best practice management principals in relation to peak flow attenuation and water quality.

The stormwater management strategy we have adopted is outlined below:

The development of the site will result in an increase in the impervious area, which will lead to increases in the peak flow of stormwater emanating from the site. To ensure that the proposed stormwater system meets the peak flow attenuation target, hydrologic and hydraulic calculations have been undertaken using a model developed with the DRAINS software.

The proposed land use changes and associated increase in impervious areas will also result in higher loads of water-borne contaminants. Compliance with the stormwater quality targets will, by default, require the vast majority of stormwater runoff from the site to be routed through treatment devices (such as bioretention systems) before discharging to the receiving waterway. This will ensure the hydraulic 'disconnection' of runoff from impervious surfaces, thus significantly attenuating the impact of frequent flows on the ecological health of receiving waterways. A stormwater treatment model was developed using the MUSIC software and this model was used to ensure that the stormwater system meets the stormwater quality targets.

The logical design response to the James Creek Road site is to manage stormwater in four catchments, with the four discharge locations being located at the four corners of the site.

Bioretention basins are an effective method of providing peak flow attenuation and treatment of stormwater and are widely utilised throughout Australia. The intention is to provide a bioretention basin located in a drainage reserve adjacent to the outlet of each catchment. Each basin will perform the dual function of peak flow attenuation and treatment of stormwater. During smaller rainfall events, stormwater will temporarily pond on the surface of the basin and infiltrate through the filter media (sandy loam soil). In larger rainfall events, stormwater will fill the basin to a greater depth (maximum depth approximately 1.2 m) and there will be outflow via low flow pipe outlets and a high flow weir, designed to discharge stormwater as sheet flow as opposed to concentrated flow. Once the rainfall ceases, the depth of water in the basin will drop to 200 mm within minutes. Assuming there is no additional inflow to the basin, the remaining 200 mm of water will drain via infiltration within several hours.

Peak Flow Attenuation

The DCP states that post-development peak flows are not to exceed pre-development peak flows specified within Council policy and design standards. The stormwater peak flow attenuation target that has been adopted is to ensure that the peak flow from the proposed development does not exceed the existing peak flow from the site for the 5, 10, 20, 50 and 100 year ARI events.

The peak flows for the pre-development and post-development situations are presented in the following tables.

Table 1 Peak Flows – Basins 1 and 2

Design Storm Event (ARI)	Basin 1 Peak Flows (m^3/s)		Basin 2 Peak Flows (m^3/s)	
	Pre-Development	Post-Development	Pre-Development	Post-Development
5	0.79	0.75	1.53	1.45
10	1.16	1.04	2.38	2.10
20	1.42	1.38	2.88	2.61
50	1.96	1.86	3.81	3.38
100	2.21	2.15	4.30	3.85

Table 2 Peak Flows – Basins 3 and 4

Design Storm Event (ARI)	Basin 3 Peak Flows (m^3/s)		Basin 4 Peak Flows (m^3/s)	
	Pre-Development	Post-Development	Pre-Development	Post-Development
5	1.78	1.78	0.52	0.51
10	2.80	2.53	0.80	0.71
20	3.40	3.19	0.95	0.91
50	4.57	4.15	1.27	1.19
100	5.17	4.75	1.45	1.42

It is evident from the results presented in **Tables 1** and **2** that the basins provide sufficient stormwater peak flow attenuation for all of the design storm events.

Water Quality

The DCP also outlines the requirements for treatment of stormwater and the applicable water quality targets. Council has a MUSIC-link template for use with the MUSIC stormwater modelling software. The MUSIC-link template has different targets to those listed in the DCP. For our assessment, we have adopted the higher (more conservative) targets in each case.

In each bioretention basin, stormwater runoff will be retained within a defined extended detention depth and then infiltrate down through the filter layer. Excess water that drains to the bottom of the filter layer will be collected in slotted under-drainage pipes and conveyed to the discharge location. The surface of the bioretention basin will be densely planted with locally occurring native ground cover species.

Treatment of the stormwater occurs both on the surface of the bioretention system and within the filter layer. When storm inflows cause temporary ponding on the surface of the system, pollutants are removed from the stormwater through sedimentation and particulate adhesion onto the stems and leaves of the vegetation. The agitation of the surface layer of the soil caused by movement of the vegetation and the root systems prevents the accreted sediments clogging the filter layer. As stormwater percolates through the filter layer, fine particulates and some soluble pollutants are removed through processes such as adhesion onto the surface of the soil particles, biological transformation of pollutants by biofilms growing on the surface of the soil particles, and biomass uptake of nutrients and metals through the root systems of the vegetation.

The MUSIC model was used to quantify the pollutant removal provided by the bioretention basins and rainwater tanks. The results are summarised in **Table 3** below, which demonstrates that the load reductions are greater than the targets for each pollutant.

Table 3 Stormwater Pollutant Load Reductions

Pollutant	Post-Dev. Load No treatment (kg/yr)	Post-Dev. Load With treatment (kg/yr)	Target Load Reduction (%)	Modelled Load Reduction (%)
Total suspended solids	41,000	5,030	85	88
Total phosphorus	79	28.4	60	64
Total nitrogen	549	238	50	57
Gross pollutants	4,860	0	90	100

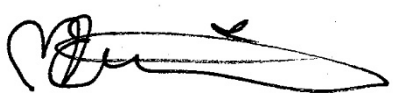
In summary, the proposed strategy to detain and treat stormwater is designed to mimic the existing conditions in terms of where the stormwater leaves the site, how much water leaves the site, and the water quality of the runoff from the site. This means that there will be no increase in stormwater flows leaving the site up to a 100-year ARI storm event when compared to the existing scenario. Pollutants will increase, however the treatment provided by the proposed bioretention basins is expected to remove contaminants to meet the prescribed best practice targets.

I trust this letter adequately establishes that the stormwater management strategy proposed for the James Creek Road subdivision exceeds the targets associated with best practice management.

If you have any queries, please contact me on 02 6687 7666.

Yours sincerely

GeoLINK



Michelle Erwin
Senior Civil Engineer