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Our Ref: 4397_Surface_Water_RtS_FINAL_V1

8 July 2022

Colin Jackson
Director
Rosebrook Sand and Gravel

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Dear Colin

RE: Dalswinton Sand and Gravel Quarry (SSD-9094) - DPE Water Submissions

This letter has been prepared to address comments and recommendations submitted by the Department of Planning and Environment (DPE) – Water (DPE Water) to DPE in a letter dated 3 March 2022 in relation to the surface water impact assessment (SWIA) prepared by Umwelt (Australia) Pty Ltd (Umwelt) the Rosebrook Sand and Gravel (RSG) Dalswinton Quarry Expansion project (the Project).

Following are the DPE Water recommendations and comments relevant to the *Dalswinton Quarry Expansion, Surface Water Impact Assessment* (Umwelt, 2020) and our response.

DPE Recommendations

1. Water Take and Licensing

Recommendations – Prior to Determination

1.1 The proponent should provide clarification of the maximum groundwater and surface water take, site water demands and the ability to obtain additional water entitlement where required for the project.

Umwelt Response

Following completion of the SWIA the water management system (WMS) proposed for the Project was revised to include a new Water Storage Dam (WSD). **Figures 1** and **2** (attached) present the current proposed WMS plan and schematic drawings respectively. The WSD was included to fulfill the functionality of the existing Northern Pond and has a lower storage volume and significantly lower surface area to volume ratio to limit evaporative losses. The WSD will be the primary water storage for supplying Quarry demands (i.e. sand and gravel processing, dust suppression), capturing runoff from the Process Plant and Stockpile area. The Northern Pond will remain as an environmental protection area but will not receive any inflows from operational areas of the Quarry or be used to supply Quarry water demands.

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The revision of the proposed WMS has required updates to the site water balance and the groundwater model (prepared by hydrogeologist.com.au) to enable a revised estimate of future Quarry alluvial water source groundwater take to be predicted.

The predicted groundwater take has been estimated based on:

- Water balance modelling that calculates the required groundwater import to supplement any predicted shortfall in captured surface water runoff to meet operational water demands.
- Output from the groundwater model which predicts groundwater take based on the difference between evaporative losses from the undisturbed Quarry extraction area and the proposed Quarry extraction area.

The predicted groundwater take is estimated by summing the groundwater import demand calculated by the water balance and the evaporative losses from the extraction area calculated by the groundwater model. **Table 1** presents the revised maximum groundwater take predictions for the Project. The groundwater take predicted by the revised water balance is lower than the groundwater take of 36.2 ML/year presented in the SWIA (Umwelt, 2020) as a consequence of the lower evaporative losses associated with WSD relative to those from the Northern Pond.

There will be no licensable surface water take associated with the Project as all runoff captured within the WMS is to prevent pollution of the downstream receiving environment.

Table 1 Maximum Predicted Groundwater Take

Model	Groundwater Take (ML/year)
Water Balance	32.9
Groundwater	42.5
Total	75.4

<u>DPE Recommendations</u>

Recommendations – Post Approval

1.2 The proponent should ensure that:

a. **sufficient water entitlement is held in a Water Access Licence/s (WAL) to account for the maximum predicted take for each water source prior to take occurring during the project operational period and post closure unless an exemption under the Water Management (General) Regulation 2018 applies.**

b. **relevant nomination of work dealing applications for WALs proposed to account for water take by the project have been completed prior to the water take occurring.**

Table 2 presents the water access licences (WALs) and associated works approvals (WAs) currently held by RSG within the area governed by the Water Sharing Plan (WSP) for the Hunter Unregulated and Alluvial Water Sources.

Table 2 RSG Water Access Licences and Works Approvals

WAL	Associated WA	Water Source	Entitlement (ML)
36474	20WA212819	Hunter Regulated River Alluvial Water Source	20
18372	20WA208468	Lower Goulburn River Water Source	50

A review of the WSP rules for the Hunter Regulated River Alluvial water source indicates that entitlement cannot be traded into the water source. As such, RSG will purchase additional entitlement in the Hunter Regulated River Alluvial water source to cover the maximum predicted groundwater take for the Project (refer to **Table 1**) and complete all required work dealing applications prior to groundwater take exceeding the existing licenced volume (WAL 36474).

Explanation

- **Uncertainty exists as to the predicted groundwater take for the project. The water balance in the surface water assessment notes there will be 131.4ML of pit seepage, but the groundwater assessment notes there will be 14.6ML. Groundwater take in the pit needs to be based on maximum groundwater inflow predictions and the proponent needs to demonstrate the ability to acquire sufficient entitlement to account for the water take.**

A prediction of maximum groundwater take is presented in **Table 1**. The "pit seepage" of 131.4 ML presented in the SWIA (Umwelt, 2020) and referred to by DPE Water relates to estimated outflows from the extraction area to alluvium following high or prolonged rainfall events that result in water accumulation in the extraction area. "Pit seepage" is not an estimate of seepage inflows of alluvial groundwater to the extraction area. Ongoing water quantity monitoring, as detailed in Section 6.2.2 of the SWIA (Umwelt, 2020), will enable the water balance model to be refined to improve estimates of groundwater take associated with the Project.

- **Additional water entitlement has been identified as being required in the Hunter Regulated River Alluvial Water Source to account for an average entitlement exceedance of 1.3ML. It is expected the maximum exceedance would be significantly higher and may vary based on the previous point. Clarification is requested on all water take and site water demands. It should also be noted that entitlements must be held for maximum predicted water take before take occurs. The EIS provides average take from groundwater over the 25 year period rather than the maximum annual take that is required.**

A prediction of maximum groundwater take is presented in **Table 1**. As indicated above, RSG will purchase additional entitlement in the Hunter Regulated River Alluvial water source to cover the maximum predicted groundwater take for the Project.

- **Clarification is also requested as to whether any water take is to occur from the 3rd order watercourse which runs along the northern part of the site. The maximum annual water take from a third order or higher watercourse would need to be quantified and the ability to obtain sufficient entitlement demonstrated.**

There will be no water take from the 3rd order watercourse that runs along the northern part of the site.

DPE Recommendations

3. Surface Water Impact Assessment and Management

Recommendations – Prior to Determination

3.1 The proponent should:

c. **Clarify the flow path of watercourses on site and clarify whether the proposed work area is to cause any impacts to the third order watercourse (that runs along the northern part of the site) and how these would be mitigated.**

d. **Show consideration to the NRAR Guidelines for Controlled Activities including setbacks.**

Explanation

There are two mapped watercourses on site, a 2nd order in the north eastern corner and a 3rd order running the northern part of the site, but the exact flow path of these is unclear. The flow path of the 3rd order watercourse is particularly unclear within the site, and potentially will run through a works zone.

Consideration of the NRAR Guidelines for Controlled Activities is requested (including setbacks), available at: https://www.dpie.nsw.gov.au/nrar/how-to-apply/controlled-activities/guidelines-for-controlled-activities.

Umwelt Response

As shown in **Figure 3.1** of the SWIA (Umwelt) an existing bund wall along the northern part of the site would appear to have previously intercepted the mapped hydroline of the 3rd order watercourse directing flows further to the east along what appears to be an existing drainage depression where it joins the 2nd order watercourse. From here, drainage continues easterly toward the culvert transferring streamflow from the northern side of the unsealed road to the southern side. **Figure 1** (attached) indicates the current flow path of the 2nd and 3rd order watercourses in question. The Project will not result in any impact on or deviation to the current flow paths of the 2nd and 3rd order watercourses.

We trust this information meets with your current requirements. Please do not hesitate to contact the undersigned on 1300 793 267 should you require clarification or further information.

Yours sincerely

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Principal Engineer – Water, Process and Risk

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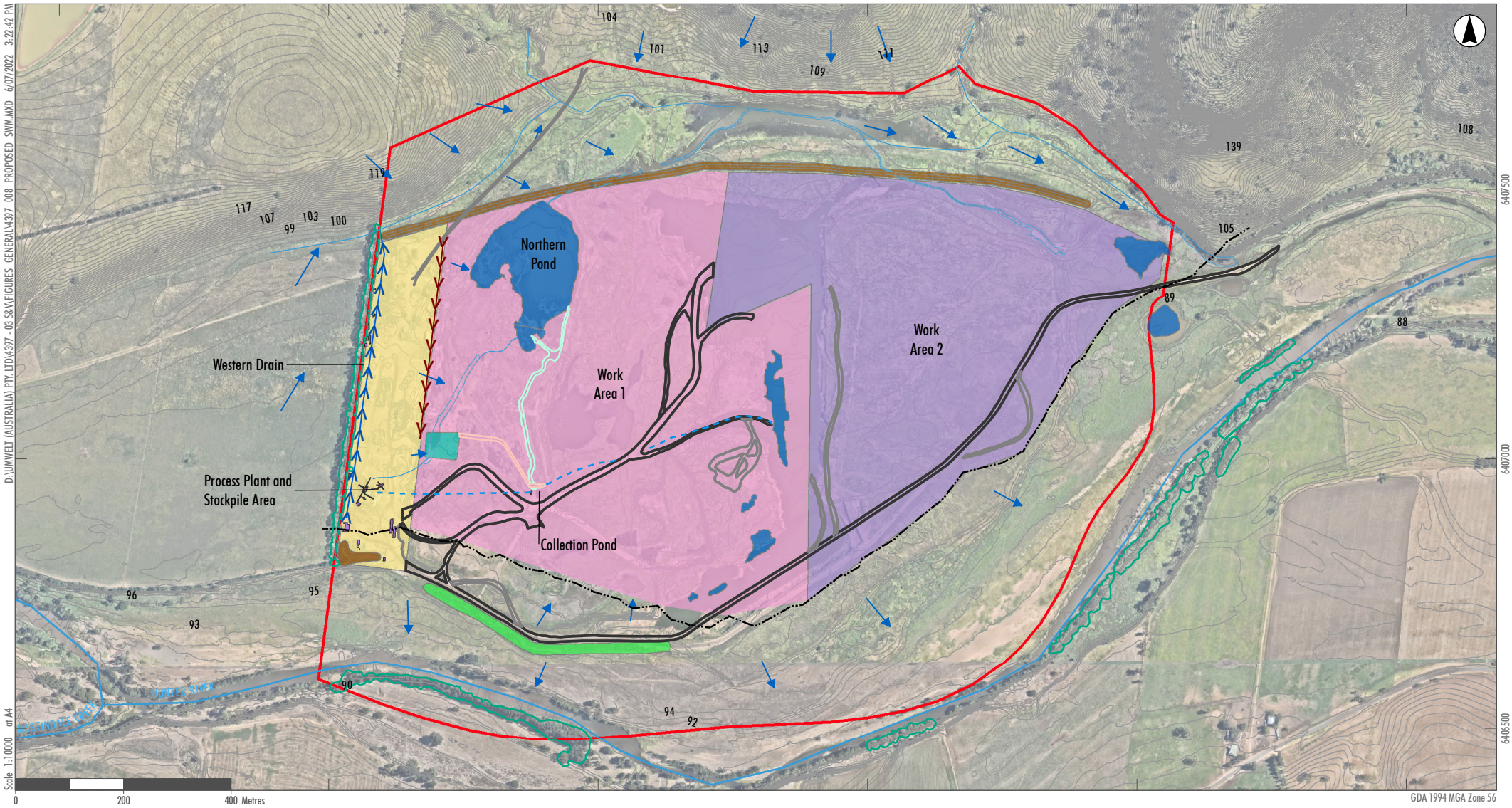

Legend

- Project Area
- Earth Bund
- Flood Levee
- Pond
- Water Storage Pond
- Processing Area
- Work Area 1
- Work Area 2
- Buildings, Plant, Pumps, Tanks and Weighbridge
- Streamline
- Drainage Line
- Pipeline
- Clean Drain
- Dirty Drain
- Flow Direction
- Stockpile area
- Pond
- Road
- Unpaved Road
- Tree Cluster
- 200m VRZ

FIGURE 1

Proposed Water Management System Plan

Image Source: Nearmap (May 2022) Data source: DFSI (2020)

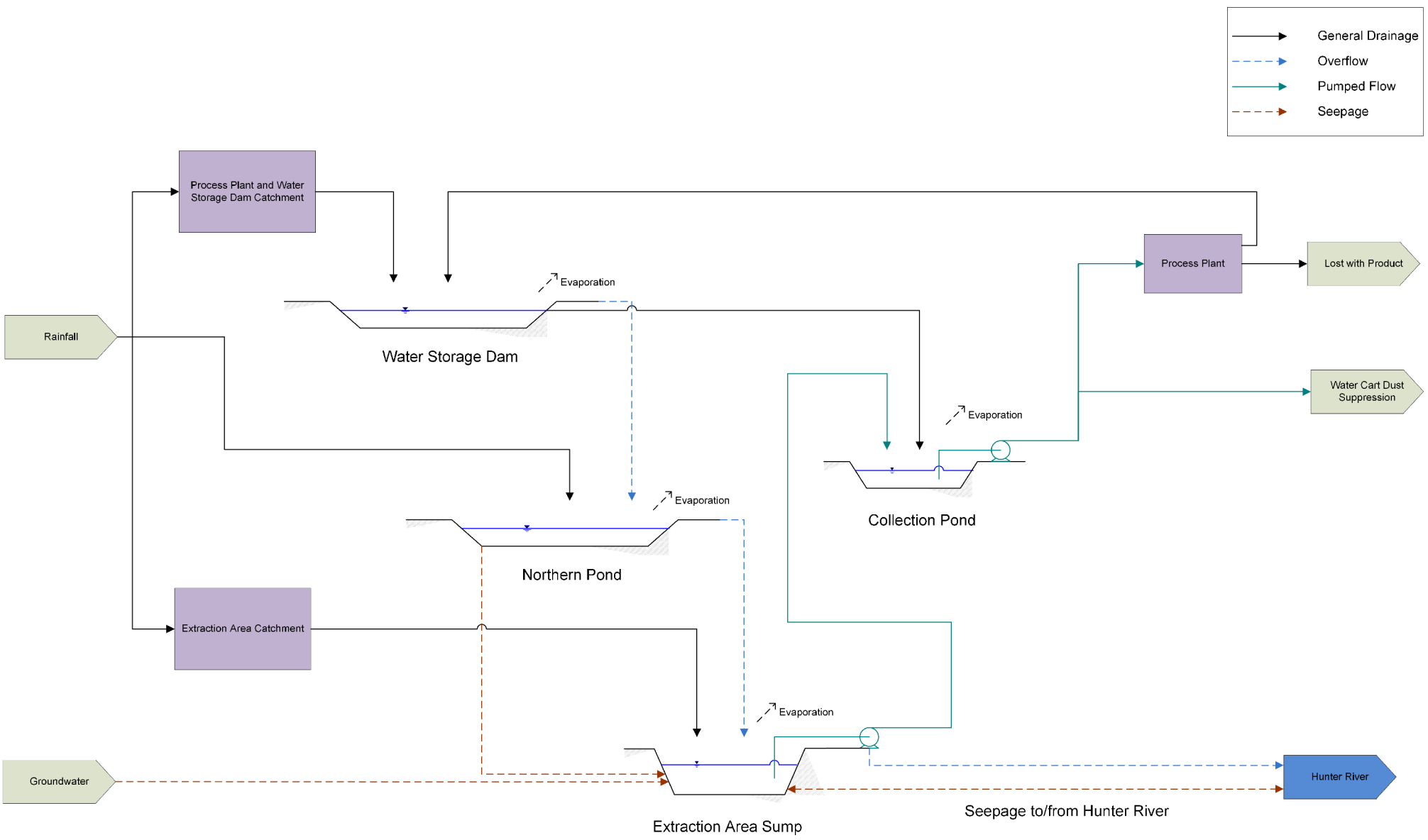

FIGURE 2

Existing Water Management System Schematic