PROCESS POND WATER TREATMENT & RELEASE

Broken Head Quarry

Leadshine Pty Ltd t/a Broken Head Quarry

PO Box 165, Byron Bay, NSW 2481

August 2020

ENV Solutions Pty Ltd
PO Box 248
Ballina NSW 2478
0435 857 751

18th August 2020
Stuart Dixon-Smith

Dear Stuart,

Re: Process Pond Water Treatment & release (August 2020)

ENV Solutions Pty Ltd (ENV) were engaged by Leadshine Pty Ltd (Leadshine) to treat release surface waters collected in the western 'process pond' at the Broken Head Quarry (the 'site'). The site is located in Suffolk Park, NSW (Lot 1, DP184443 and Lot 1, DP123302), a plan outlining relative location is presented in Figure 1 (**Attachment 1**) where relative position of the process pond is presented in Figure 2 (**Attachment 1**).

Following receipt of approximately 97.6mm precipitation over period between 24th of July 2020 – 1st August 2020, initial system checks on the 3rd of August found process pond water quality to be described as being slightly below neutral and of a low clarity (Process Pond Baseline; pH = 6.14, Turbidity (estimate) = 300 NTU). The process pond level indication marker was shown to be at 17 (equating to approximately 3534.3m³). Jar tests were conducted to determine quantity of flocculant required to settle the suspended solids with 20mg/L deemed the appropriate dosage, requiring the addition of approximately 70 litres of flocculant.

On this basis, treatment commenced on the afternoon of the 3rd of August and again on the morning of the 4th of August. pH dosing using 50% Caustic (50% NaOH) and suspended solids treatment using 0.25% neat Poly Aluminium Chloride (PACH) was added. Treating for a period of approximately 12 hours total, handheld pH checks showed pH to have increased to 7.18 (within EPL 4860 discharge threshold 6.5 – 8.5) and turbidity appeared to be significantly reduced (when compared to baseline).

As a result, a pre-discharge validation sample was collected on the 5th of August 2020. The sample was placed into an '*esky*', '*iced*' and sent to NATA accredited Environmental Analysis Laboratory (EAL) in Lismore NSW. Here, all samples have been analysed for *pH* and *Total Suspended Solids* (TSS) where results are presented in **Attachment 2**.

Presented in table 1, process pond results (post treatment) were shown to be compliant when compared discharge criteria specified in the Environmental Protection Licence (Table 1). A s result, water was deemed suitable for discharge and released on the 6th of August (to the sediment boundary zone). Post treatment waters are presented in **Attachment 3.**

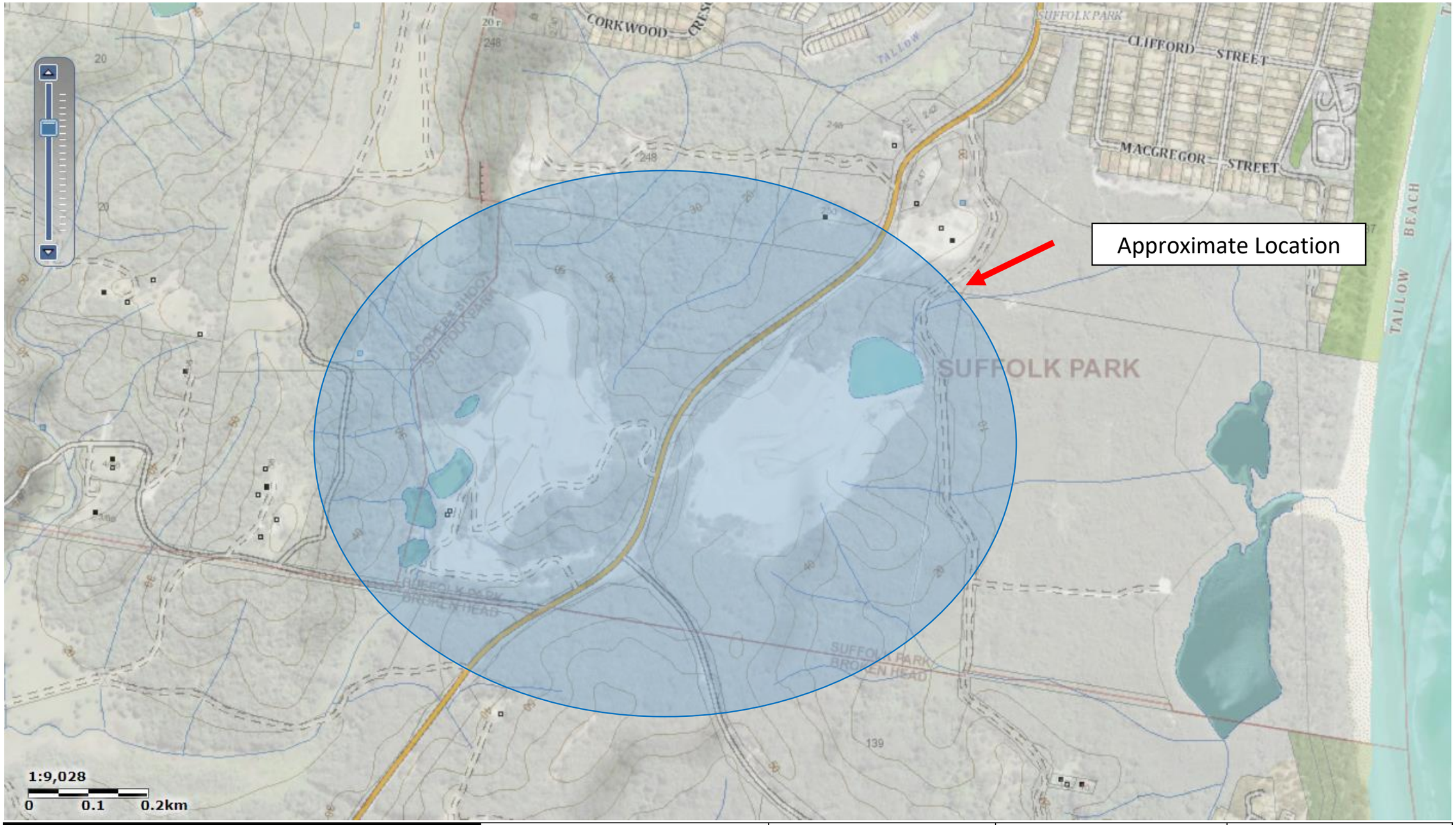
Table 1: Process Pond (Post Treatment) against EPL 4860

Analyte	Process Pond (Post Treatment)	EPL 4860
pH	7.01	6.5 – 8.5
Total Suspended Solids	31	<50

Should you have any queries please don't hesitate to contact me directly.

Yours faithfully,

Adam Buller
Environmental Consultant
ENV Solutions Pty Ltd



ENV Solutions Environmental Engineering Solutions	pH: 0448 110 070 Email: rob@envsolutions.com.au Mail: PO Box 248 Ballina, NSW 2478 Job No.: 18080 Project: WQ Statement of Compliance	**Figure 1 (Attachment 1) – Site Location Plan**	Client: Leadshine Pty Ltd Date: 10/04/2019 By: Robert Mitchell	Legend Reproduced from Six Maps (Accessed, 2019)

ENV Solutions Environmental Engineering Solutions	pH: 0448 110 070 Email: rob@envsolutions.com.au Mail: PO Box 248 Ballina, NSW 2478 Job No.: 18080 Project: WQ Statement of Compliance	**Figure 2 (Attachment 1) – Sample Locations**	Client: Leadshine Pty Ltd Date: 17/05/2019 By: Robert Mitchell	Legend Reproduced from Six Maps (Accessed, 2019)

RESULTS OF WATER ANALYSIS

2 samples supplied by Env Solutions Pty Ltd on 5/08/2020 . Lab Job No. J6804.

Samples submitted by Adam Buller. Your Job: 18080 BHQ

PO Box 248 BALLINA NSW 2478

Parameter	Methods reference	Sample 1 P2 East 5/8/20	Sample 2 P1 West 5/8/20
	Job No.	*J6804/1*	*J6804/2*
pH	APHA 4500-H^+-B	6.55	7.01
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	14	31
Turbidity (NTU)	APHA 2130	13	56

Notes:

1. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
2. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
3. Analysis conducted between sample arrival date and reporting date.
4. ** NATA accreditation does not cover the performance of this service.
5. .. Denotes not requested.
6. This report is not to be reproduced except in full.
7. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer scu.edu.au/eal or on request).
8. Results relate only to the samples tested.
9. This report was issued on 05/08/2020.

NATA
WORLD RECOGNISED ACCREDITATION
Accreditation No. 14960
Accredited for compliance with ISO/IEC 17025 - Testing

checked: .....
Graham Lancaster
Laboratory Manager

Attachment 3