2022 Compliance Report

Northeast Business Park Project, Queensland
EPBC Approval No. 2006/2912

North Harbour
feel right at home

Document Version Control

VERSION	PREPARED BY	REVIEWED BY	DATE
1.0	M. McErlean	B. Finney M. Hall-Brown	04/08/22

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Introduction

North Harbour Holdings Pty Ltd is currently developing a master planned community, known as "North Harbour". On 12 July 2006, the project was determined to be a controlled action pursuant to s.75 of the *Environmental Protection and Biodiversity Conservation Act 1999* under the controlling provisions of;

- Sections 16 and 17B (Wetlands of international importance)
- Sections 18 and 18A (Listed threatened species and communities)
- Sections 20 and 20A (Listed migratory species)

Following a detailed environmental impact investigation and assessment process, the project was granted approval with conditions on 18 December 2012. Commencement of the action (as defined within the approval) was triggered 12 May 2014. Condition 3 of the approval requires the publication of an annual report, addressing compliance with each of the conditions of approval.

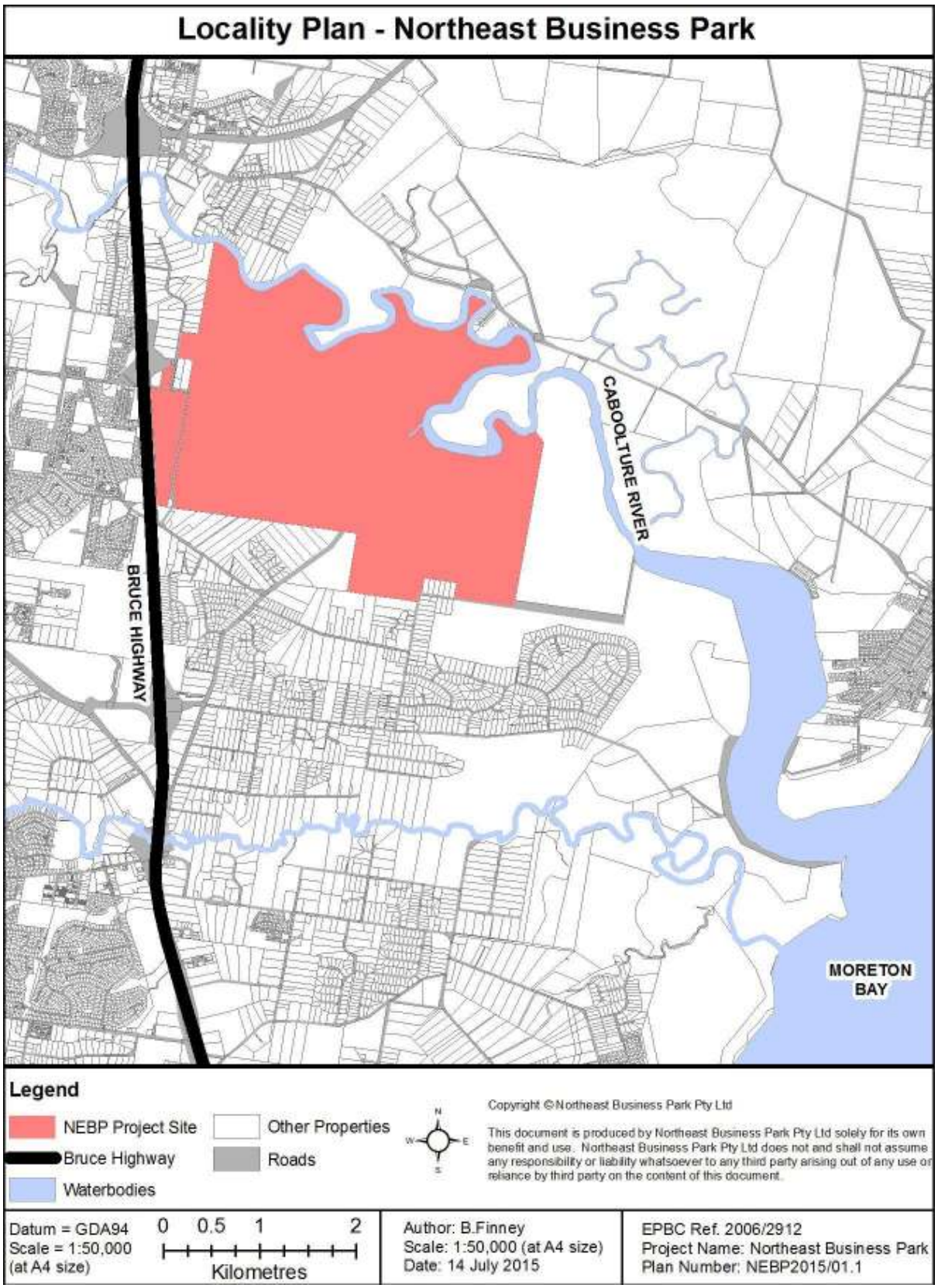
This document is the eighth compliance report, relating to activities undertaken from 13 May 2021 to 12 May 2022. Please note that during the preparation period of this report, subsequent approvals have been acquired. Reporting associated with these approvals and works undertaken after 12 May 2022 will be provided in the 2023 report.

Project Description

EPBC Number:	2006/2912
Project Name:	Northeast Business Park
Approval Holder:	North Harbour Holdings Pty Ltd (ACN: 101 569 457)*
Approved Action:	To develop an approximately 762 hectare site, for an integrated business park, including residential and marina precincts, located to the east of the Bruce Highway, and bounded to the north by the Caboolture River, Caboolture Shire, Queensland.
Project Location:	The project is located in the Moreton Bay region, Queensland. The property address is 34 Nolan Drive, Morayfield. The site is bounded to the west by the Bruce Highway and to the north by the Caboolture River, as shown on the locality plan at figure 1.
Responsible Person:	Malcolm Hall-Brown (Chairman)
Reporting Period:	13 May 2021 – 12 May 2022
Report Preparation:	June to August 2022

* Approval holder previously known as Northeast Business Park Pty Ltd. The ABN / ACN and other business details remain the same.

Figure 1


Locality Plan - Northeast Business Park
BRUCE HIGHWAY
CABOOLTURE RIVER
MORETON BAY
Legend
NEBP Project Site
Other Properties
Bruce Highway
Roads
Waterbodies
N
W
E
S
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Author: B.Finney
Scale: 1:50,000 (at A4 size)
Date: 14 July 2015
EPBC Ref. 2006/2912
Project Name: Northeast Business Park
Plan Number: NEBP2015/01.1

Description of Activities

During the period relevant to this report, the following activities have been undertaken for the project;

Activities undertaken under the LBEMP & sub-plan 1

All activities undertaken under sub-plan 1 were completed in a previous reporting period (2014 – 2015). Please refer to the 2015 compliance report in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 2

All activities undertaken under sub-plan 2 were completed in previous reporting periods (2014 – 2015 and 2015 - 2016). Please refer to the previous compliance reports in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 3

All activities undertaken under sub-plan 3 were completed in previous reporting periods (2015 – 2016 and 2016 - 2017). Please refer to the previous compliance reports in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 4

Sub-plan 4 (approved 17 June 2016) defined the approved works program for;

- Vegetation clearing, bulk earthworks and civil construction of phases 3 - 7 (stages 14 to 45) of the residential development. These works were commenced in the 2017 reporting period and were ongoing at 12 May 2022 (closing date for the 2022 compliance reporting period). These works are expected to be undertaken progressively over the coming year.

Activities undertaken under the LBEMP & sub-plan 5

Sub-plan 5 (approved 3 April 2018) defined the approved works program for;

- Civil construction of the ultimate North East Business Park Sewer Connection. These Subplan 5 works were commenced and completed in the 2018 - 2019 reporting period. Please refer to the previous compliance report in relation to these actions.

Activities undertaken under the LBEMP & sub-plan 6

Sub-plan 6 (approved 4 January 2021) defined the approved works program for;

- Vegetation clearing, bulk earthworks and civil construction of the Mixed Industry and Business development. These works were commenced in April 2021 and were ongoing at 12 May 2022 (closing date for the 2022 compliance reporting period). These works are expected to be undertaken progressively over the coming years.

Activities undertaken under the LBEMP & sub-plan 7

Sub-plan 7 (approved 23 August 2021) defined the approved works program for;

- Vegetation clearing, bulk earthworks and civil construction of the drainage improvement works east of stages 44-45. These works had not yet commenced at the close of this reporting period.

Activities undertaken under the LBEMP

An updated LBEMP was approved 21 December 2021. The changes to the LBEMP do not impact the approved Sub-plans.

Other project related activities

Vegetation rehabilitation of a riparian corridor alongside the Caboolture River (100m wide behind the top of the southern riverbank) has been underway for some time, with various planting and management methodologies being trialled since 2012. Rehabilitation actions in the current reporting period focused on control of weed species within existing replanted areas. Additional planting was undertaken October 2021 within the riparian corridor. Assessment of rehabilitation progress within the riparian corridor has been undertaken as part of the current report (see appendix C).

Instances of Non-Compliance

No instances of non-compliance with the conditions of approval 2001/2912 were identified during the reporting period.

The project site was inspected by officers of the Department of Environment and Energy on 25 September 2018. The inspection was for the purpose of monitoring compliance with the EPBC approval. No instances of non-compliance were identified during the site visit, as confirmed by the follow up letter sent 7 November 2018.

Summary

The long term development of the project has continued in the 2021 - 2022 reporting period, with this report providing information on operations conducted during the eighth 12 month reporting period following commencement of the action.

No compliance issues have been identified during the reporting period.

Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed _____

Full name (please print) Malcolm Hall-Brown

Position (please print) Chairperson

Organisation (please print including ABN/ACN if applicable) North Harbour Holdings Pty Ltd
ACN 101 569 457

Date _____/_____/_____

APPENDICES

APPENDIX A: COMPLIANCE ASSESSMENT REPORTING TABLE

Condition Number / Reference	Condition	Project Compliance	Evidence / Comments
1	Within 20 days after the commencement of the action, the person taking the action must advise the Department in writing of the actual date of commencement of the action.	Not Applicable	Addressed in the 2015 report.
2	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also by publicised through the general media.	Compliant	Accurate records maintained by the proponent and contractors, as demonstrated by the information below and associated documentation attached. This includes the testing summaries for surface water quality monitoring, groundwater quality monitoring and acid sulphate soils at appendix C. Records available for audit by the Department or independent auditor upon request.
3	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	Compliant	The 2021 compliance report was uploaded to the NEBP website 9 August 2021, within 3 months of the commencement date anniversary (12 May 2014). This was confirmed via email to the Department as evidenced at appendix C.
4	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit	Not Applicable	No direction for an independent audit issued by the Minister in the 12 month period applicable to this report.

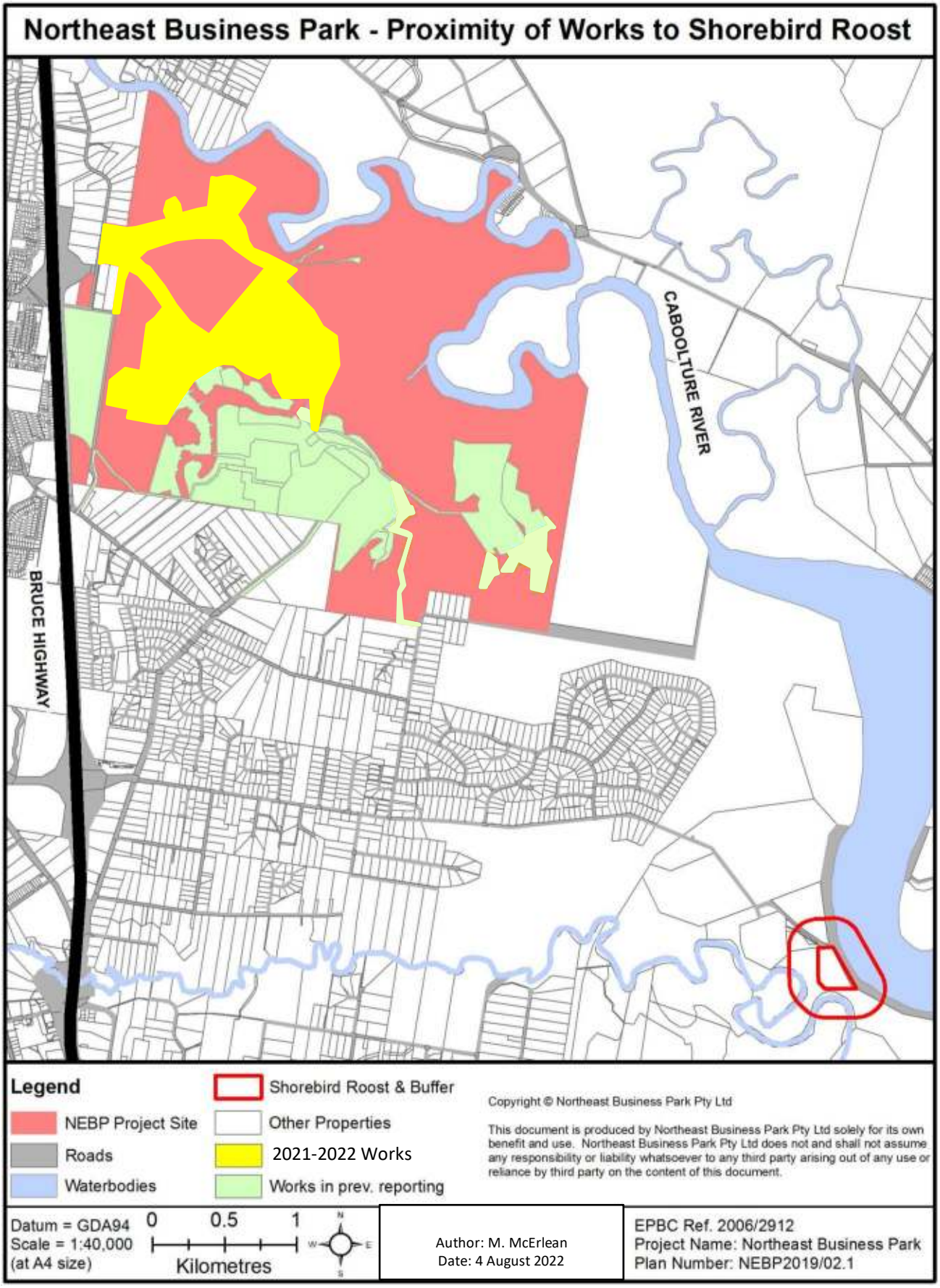
	criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.		
5	If the person taking the action wishes to carry out any activity otherwise than in accordance with the management plan/s as specified in the conditions, the person taking the action must submit to the Department for the Minister's written approval a revised version of that management plan/s. The varied activity shall not commence until the Minister has approved the varied management plan/s in writing. The Minister will not approve a varied management plan/s unless the revised management plan/s would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised management plan/s, that management plan/s must be implemented in place of the management plan's originally approved.	Not Applicable	No activities undertaken otherwise than in accordance with the management plans (approved LBEMP, sub-plan 4 and sub-plan 6) during the 12 month period applicable to this report. Please note activities undertaken under sub-plans 1, 2, 3 and 5 were completed prior to this reporting period. For further detail please refer to the 2015, 2016, 2017, 2018, 2019, 2020 and 2021 compliance reports.
6	If the Minister believes that it is necessary or convenient for the better protection of the Moreton Bay Ramsar site (sections 16 and 17B of thr EPBC Act), listed threatened specied (sections 18 and 18A of the EPBC Act) or migratory shorebirds (sections 20 and 20A of the EPBC Act) to do so, the Minister may request that the person taking the action make specified revisions to the management plan/s specified in the conditions and submit the revised management plan/s for the Minister's written approval. The person taking the action must comply with any such request. The revised approved management plan/s must be implemented. Unless the Minister has approved the revised management plan/s then the person taking the action must continue to implement the management plan/s originally approved, as specified in the conditions.	Not Applicable	No request from the Minister to revise the management plans received in the 12 month period applicable to this report.
7	If, at any time after five years from the date of this approval, the person taking the action has not substantially commenced	Not Applicable	Addressed in the 2015 report.

	the action, then the person taking the action must not substantially commence the action without the written agreement of the Minister.		
8	Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans referred to in these conditions of approval on their website. Each management plan must be published on the website within one month of being approved.	Compliant	Works during the period relate to the LBEMP, sub plan 4 and sub-plan 6, which were both approved in prior reporting periods and addressed in previous compliance reports. During the reporting period, Sub-plan 7 was approved (23 August 2021) and construction is yet to commence. The approved Sub-plan 7 was added to the North Harbour's website on 26 August 2021.
9	The person taking the action must prepare and submit a Land-Based Environmental Management Plan (LBEMP) for the Minister's approval. The LBEMP must include, but not be limited to, the following: a. Measures to minimise impacts on EPBC Act listed threatened species, including measure to care for injured fauna and a vegetation clearing strategy; b. Measures to limit the spread of pests and invasive species; c. Sediment and erosion controls; and d. Measures to implement, monitor, or improve (should deficiencies be identified) the LBEMP The person taking the action must not conduct clearance of native vegetation unless the Minister has approved the LBEMP. The approved LBEMP must be implemented.	Compliant	Works undertaken in this reporting period in the areas addressed by the LBEMP, sub-plan 4 and sub-plan 6. Land Based Environmental Management Plan, sub-plan 4 and sub-plan 6 were prepared and approved prior to commencement of relevant works, including provisions for points a. - d. in condition 9. LBEMP approved 17/02/2014 LBEMP sub-plan 4 approved 17/06/2016 LBEMP sub-plan 6 approved 4/1/2021 An updated LBEMP was approved 21 December 2021. The changes to the LBEMP do not impact the approved Sub-plans. No clearance of native vegetation undertaken in the 2021/2022 reporting period.

10	The person taking the action must not destroy by clearing or any other activity, more than 25 ha of native vegetation on the subject site. a. If clearing more than 25 ha of native vegetation is necessary, the person taking the action must: i. Undertake a pre-clearance survey of additional areas to be cleared; and ii. Submit the pre-clearance survey to the Minister for approval, prior to clearing. The person taking the action must not clear more than 25 ha of native vegetation unless then Minister has provided approval in writing to do so.	Compliant	No clearance of native vegetation undertaken in the 2021/2022 reporting period.
11	No construction activities may occur within 200 m of the critical high tide shorebird roost area at the mouth of the Caboolture River, during the months of September to April (inclusive) of any given year.	Compliant	The shorebird roost area is well removed from the project site owned by North Harbour Holdings Pty Ltd. Only works associated with dredging of the navigation channel in the Caboolture River will occur in the vicinity of the roost area. No dredging or associated works have been undertaken in the reporting period. All construction activities undertaken in the reporting period have been outside the 200m buffer to the critical high tide shorebird roost area, as shown by plan number NEBP2019/02.1 (below).
12	The person taking the action must undertake, maintain and monitor all bank rehabilitation and restoration works detailed in Appendix J of the EIS – Riverbank Erosion Assessment, to prevent unacceptable impacts to wetlands of international importance (section 16 and 17B of the EPBC Act). This must include, but not be limited to: a. Undertaking, maintaining and monitoring the revegetation of riparian area on the referred subject	Compliant	The existing rehabilitation works in riparian areas alongside the Caboolture River have continued to be maintained. Additional planting was undertaken October 2021 within the riparian corridor.

	site; and b. Undertaking, maintaining and monitoring the restoration of wetland area on the referred subject site.		
13	The person taking the action must prepare and submit a Caboolture River Estuary Management Plan (CREMP) for the Minister's approval. a. The CREMP must include, but not be limited to the following: i. Detail all restoration and rehabilitation works that will be undertaken to mitigate impacts on the river bed and banks, including a description of priority works and agreed performance criteria. The strategy must avoid the use of artivicial bank protection structures; ii. Identify corrective actions or alternative options that will be implemented if unexpected adverse impacts on marine and shorebird specied are detected and are attributed to the construction and operation of the action; iii. Specify a schedule of works and/or compensatory actions required to address all potential development related impacts, and measures to implement them; iv. Specify a monitoring program, including requirements for further baseline data that must be collected prior to capital dredging works. Monitoring must include, but not be limited to: 1. Wave energy recorded at the river bank at a minimum of three key locations. Monitoring must also include concurrent measurements of boat traffic and wind velocity. This must be conducted at least once every three months; 2. Water level recording in the mid estuary to determine any changed to the hydrodynamics that may be attributable to dredging. This must be conducted at least once every three months; 3. Annual bank erosion monitoring at fixed locations, including but not limited to, at least	Not Applicable	No works impacting on the Caboolture River were undertaken in the 12 month period applicable to this report. Preparation and Minister's approval of the CREMP to be undertaken at a future date, prior to works impacting the Caboolture River.

	four monitoring points on the northern bank of the Caboolture River, evenly spaced within one kilometre downstream of the marina entrance; 4. Hydrographical surveys of the river bed and banks in the vicinity of the upper one-third of the dredged channel, between three and six months from completion of dredging works. Survey must be undertaken by a qualified hydrographical surveyor and consist of soundings no more than 10 metres apart and within a vertical accuracy of 0.1 metre or better; 5. Shorebird monitoring at a minimum of ten key locations in the lower estuary of the Caboolture River, including the critical high tide shorebird roost area at the mouth of the Caboolture River; and 6. Sampling of benthic invertebrates on shallow banks adjacent to the dredged channel at a minimum of three locations. b. The CREMP must be reviewed annually (within three months of every 12 months anniversary of the commencement of works impacting on the Caboolture River) by the person taking the action, with any revision to be approved by the Minister before implementation of changes. The person taking the action must not commence works impacting on the Caboolture River unless the Minister has approved the CREMP. The approved CREMP must be implemented.		


Northeast Business Park - Proximity of Works to Shorebird Roost
CABOOLTURE RIVER
BRUCE HIGHWAY
Legend
NEBP Project Site
Roads
Waterbodies
Shorebird Roost & Buffer
Other Properties
2021-2022 Works
Works in prev. reporting
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Author: M. McErlean
Date: 4 August 2022
EPBC Ref. 2006/2912
Project Name: Northeast Business Park
Plan Number: NEBP2019/02.1

APPENDIX B: LBEMP RECORDKEEPING SUMMARY TABLES

LBEMP RECORD KEEPING

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
LBEMP section 8 point 1	Retain appropriate records concerning the preparation and implementation of LBEMP Sub Plans, including; - A register of all LBEMPs including all Sub-Plans, along with hard copies of each LBEMP; and - All records that are required by each element of an implemented LBEMP Sub-Plan, including copies of all issue specific management plans each LBEMP Sub-Plan draws from.	Compliant	Register of all LBEMPs in place. As at 12 May 2022, register includes; LBEMP v3 (21 Dec 2021) Sub-Plan 01 v2 (31 Jan 2014) Sub-Plan 02 v1.2 (22 Aug 2014) Sub-Plan 03 (RW6) (28 July 2015) Sub-Plan 04 (RW5) (15 Sept 2017) Sub-Plan 05 (RW1) (28 Mar 2018) Sub-Plan 06 (MIBA) (4 Jan 2021) Sub-Plan 07 (Flood) (23 Aug 2021) Record Keeping required by sub-plans in place. Refer to sub-plan record keeping tables below for further information.
LBEMP section 8 point 2	Review this LBEMP: - As part of the preparation of each LBEMP Sub-Plan; - Following significant environmental incidents involving a MNES; - At the completion of any environmental audit carried out by the CDotE; and - In the instance where the objectives of any element of this LBEMP are not being met.	Compliant	LBEMP reviewed as part of the preparation of sub-plans 1 to 7. No significant environmental incidents involving a MNES have occurred. CDotE inspection of the works identified no issues requiring change to existing procedures. Objectives for all LBEMP elements are considered to be achieved for works in the reporting period.

LBEMP SUB-PLAN 1 RECORD KEEPING

Not applicable to this reporting period – refer 2014-2015 Compliance Report

LBEMP SUB-PLAN 2 RECORD KEEPING

Not applicable to this reporting period – refer 2014-2015 and 2015-2016 Compliance Reports

LBEMP SUB-PLAN 3 RECORD KEEPING

Not applicable to this reporting period – refer 2015-2016 and 2016-2017 Compliance Reports

LBEMP SUB-PLAN 4 RECORD KEEPING

Subplan 4 Section 6 Point 6	The post clearance Fauna Management Report as required by section 4.2 of the LBEMP Sub-Plan 04	Not Applicable	No vegetation clearance works were undertaken during this reporting period.
Subplan 4 Section 6 Point 7	Any records required to be kept in for specific environmental management elements as identified in Section 4 of this LBEMP sub plan 04	Compliant	Records relating to compliance with environmental management elements have been maintained, including under associated approved management plans for; - Acid Sulphate Soils MP - Water Quality MP - Stormwater Quality and Site Based Mgt. - Construction Environment MP Records include (but not limited to); - Testing and validation for ASS - Monitoring of ground water and surface water quality - Sediment basin discharge authorisations - Pest hygiene declarations Copies of records can be provided upon request by DotE.
Subplan 4 Section 6 Point 8	All incident reports and corrective action requests generated during the works program	Not Applicable	No incident reports or corrective action requests generated during the reporting period.

LBEMP SUB-PLAN 5 RECORD KEEPING

Not applicable to this reporting period – refer 2018-2019 Compliance Reports

LBEMP SUB-PLAN 6 RECORD KEEPING

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
Subplan 6 Section 6 Point 1	Copies of all relevant permits or approvals relevant to the works the subject of this LBEMP Sub-Plan 06.	Compliant	All relevant permits and approvals obtained for subplan 6 works undertaken in the reporting period, as set out in the schedule below. Copies can be provided upon request by DotE.
Subplan 6 Section 6 Point 2	The name, qualifications and contact details of the suitably qualified ecologist engaged to assist in the preparation of this LBEMP Sub-Plan 06.	Compliant	Sub-Plan 6 prepared by James Warren and Associates (JWA) (Adam McArthur). Qualification and contact details can be provided upon request by DotE.
Subplan 6 Section 6 Point 3	The dates and findings of the preclearance flora and fauna surveys and the name, qualifications and contact details of the ecologist who completed the surveys.	Compliant	A number of Ecological Assessment Reports have been prepared over sub-plan 6 including: • Terrestrial Ecology Assessment Report – Northeast Business Park (Cardno 2007 - John Delaney); • Ecological Assessment Report: NEBP – Residential West RoL (Cardno 2014 - John Delaney); • Wetland Mapping Report: North East Business Park Residential West Area (JWA 2015 - Adam McArthur); • Significant Residual Impact Assessment – Marine Plants, North East Business Park Raff Creek Crossing (JWA 2019a -- Adam McArthur); and • Significant Residual Impact Assessment – Marine Plants, North East Business Park MIBA Bulk Earthworks (JWA 2019b -- Adam McArthur).

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
			Copy of reports and associated information can be provided upon request by DotE.
Subplan 6 Section 6 Point 4	The name, qualifications and contact details of the licensed Fauna Spotter / Catcher engaged to supervise vegetation clearance works.	Not Applicable	No vegetation clearance works were undertaken during this reporting period.
Subplan 6 Section 6 Point 5	The dates and locations of all vegetation clearance works.	Not Applicable	No vegetation clearance works were undertaken during this reporting period.
Subplan 6 Section 6 Point 6	The post-clearance Fauna Management Report as required by SECTIONS 4.2 and 4.3 of this LBEMP Sub-Plan 06.	Not Applicable	No vegetation clearance works were undertaken during this reporting period.
Subplan 6 Section 6 Point 7	Any records required to be kept in for specific environmental management elements as identified in SECTION 4 of this LBEMP Sub-Plan 06.	Compliant	Records relating to compliance with environmental management elements have been maintained, including under associated approved management plans for; - MIBA Bulk Earthworks – Site Stabilisation / Ecological Restoration Plan (Place Design Group 2020) - Pest and Invasive Species Plan (JWA 2020a) - Erosion and Sediment Control Strategy (Design Flow 2019) - Acid Sulphate Soil Investigation and Management Plan (Tectonic Geotechnical 2019) - Fauna Management Plan - Vegetation Management Plan

Reference	Recordkeeping Requirements	Project Compliance	Evidence / Comments
			Records include (but not limited to); - Testing and validation for ASS - Pre- construction Groundwater Monitoring - Monitoring of ground water and surface water quality - Sediment basin discharge authorisations - Baseline Vegetation and Weed Monitoring - Pest hygiene declarations Copies of records can be provided upon request by DotE.
Subplan 6 Section 6 Point 8	All incident reports and corrective action requests generated during the works program.	Not Applicable	No incident reports or corrective action requests generated during the reporting period.

Northeast Business Park - Register of Permits or Approvals relevant to Land Based Environmental Management Plans

LBEMP Sub-Plan 1

Not applicable for 2021-2022 reporting period (All works previously completed). Refer 2014 – 2015 Compliance Report.

LBEMP Sub-Plan 2

Not applicable for 2021-2022 reporting period (All works previously completed). Refer 2014 – 2015 and 2015 – 2016 Compliance Reports.

LBEMP Sub-Plan 3

Not applicable for 2021-2022 reporting period (All works previously completed). Refer 2015 – 2016 and 2016 – 2017 Compliance Reports.

LBEMP Sub-Plan 4

Reference	Approval Date	Description
MCU-2004-1420	28 June 2013	Preliminary approval for the Residential West precinct. Includes State and Local Government conditions and the Residential West Area Plan.
DA/31654/2016/V4E/1	17 November 2016	Operational Works for North Harbour, Phases 3 to 7 & Palm Farm, Earthworks & Prescribed Tidal Work
DA/31654/2016/V3RL	21 December 2016	Reconfiguring a Lot - Development Permit for Subdivision (4 into 1,095 Lots and Balance Lot)
DA/31654/2016/V4LE/2	20 March 2017	Operational Works for Landscaping and Stormwater Management: Wetland D
DA/31654/2016/V4D/4	6 April 2017	Operational Works for North Harbour, Wetland E, Stormwater, Earthworks & Landscaping
DA/31654/2016/V4D/1	6 April 2017	Operational Works for North Harbour, Stage 16, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/2	11 April 2017	Operational Works for North Harbour, Stage 15, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/3	11 April 2017	Operational Works for North Harbour, Stage 14, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/5	25 May 2017	Operational Works for North Harbour Wetland C, Stormwater, Earthworks & Landscaping
DA/31654/2016/V4D/7	8 June 2017	Operational Works for North Harbour, Stage 20, Roadworks Stormwater and Earthworks
DA/31654/2016/V4D/6	2 June 2017	Operational Works for North Harbour, Stage 24, Roadworks and Stormwater Drainage
DA/31654/2016/V4D/8	27 July 2017	Operational Works for North Harbour, Stage 23, Roadworks and Stormwater Drainage
DA/31654/2016/V4D/10	11 August 2017	Operational Works for Roadworks and Drainage
DA/31654/2016/V4D/11	27 September 2017	Operational Works for North Harbour, Stage 17, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/13	17 November 2017	Operational Works for North Harbour, Stage 18, Roadworks, Drainage and Stormwater
DA/31654/2016/V4D/9	20 November 2017	Operational Works for North Harbour, Stage 21, Roadworks, Drainage and Stormwater
DA/31654/2016/V4D/14	20 November 2017	Operational Works for North Harbour, Stage 19, Roadworks, Drainage and Stormwater
DA/31654/2016/V4E/2	4 January 2018	Operational Works for Earthworks
DA/31654/2016/V4D/18	21 February 2018	Operational Works for North Harbour, Stage 37, Roads Stormwater Earthworks, Water and Sewerage
DA/31654/2016/V4D/15	12 March 2018	Operational Works for North Harbour, Stage 34, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/16	12 March 2018	Operational Works for North Harbour, Stage 35, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/17	12 March 2018	Operational Works for North Harbour, Stage 36, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/19	24 April 2018	Operational Works for Wetland B – Stormwater and Landscaping
DA/31654/2016/V4D/12	23 July 2018	Operational Works for North Harbour, Stage 22, Roadworks and Stormwater
DA/31654/2016/V4D/24	2 July 2020	Operational Works for North Harbour, Stage 42B, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/20	22 June 2020	Operational Works for North Harbour, Stage 43, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/22	23 June 2020	Operational Works for North Harbour, Stage 44, Roadworks, Stormwater and Earthworks

DA/31654/2016/V4D/23	2 July 2020	Operational Works for North Harbour, Stage 45, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/25	14 July 2020	Operational Works for North Harbour, Stage 27, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/27	13 August 2020	Operational Works for North Harbour, Stage 26, Roadworks, Stormwater and Earthworks
DA/31654/2016/V4D/28	13 August 2020	Operational Works for North Harbour, Stage 25, Roadworks, Stormwater and Earthworks
DA/2021/3387	9 September 2021	Operational Works for North Harbour, Stage 28, Roadworks, Stormwater and Earthworks
DA/2021/3388	13 September 2021	Operational Works for North Harbour, Stage 29, Roadworks, Stormwater and Earthworks
DA/2021/5246	3 February 2022	Operational Works for North Harbour, Stage 30, Roadworks, Stormwater and Earthworks
DA/2021/5247	15 February 2022	Operational Works for North Harbour, Stage 31, Roadworks, Stormwater and Earthworks
DA/2021/5248	3 February 2022	Operational Works for North Harbour, Stage 32, Roadworks, Stormwater and Earthworks
DA/2021/3386	9 September 2021	Operational Works for North Harbour, Stage 38, Roadworks, Stormwater and Earthworks

Note: Register Current as at 12 May 2022

- Other approvals including operational works for future stages may have been recently approved but are not relevant to the reporting period.

LBEMP Sub-Plan 5

Not applicable for 2021-2022 reporting period (All works previously completed). Refer 2018-2019 Compliance Reports.

LBEMP Sub-Plan 6

Reference	Approval Date	Description
DA/7352/2002/VCHG/3	22 January 2020	Request to Change (Other) for a Material Change of Use, and for variations to the applicable Planning Scheme under s.3.1.6 of the Integrated Planning Act 1997 (QLD) in relation to development for Mixed Industry, Business Area Precincts, Open Space and Related Purposes. (Original approval dated 28 June 2012).
DA/39447/2019/V4D	27 February 2020	Operational Works for MIBA Bulk Earthworks
DA/31654/2016/V4D/29	11 December 2020	Operational Works for North Harbour Boulevard, Roadworks, Stormwater and Earthworks

Note: Register Current as at 12 May 2022

- Other approvals including operational works for future stages may have been recently approved but are not relevant to the reporting period.

APPENDIX C: SUPPORTING DOCUMENTATION

Michael McErlean

From: Michael McErlean
Sent: 9 August, 2021 4:45 PM
To: 'EPBCMonitoring@environment.gov.au'
Cc: Bryan Finney
Subject: RE: 2006-2912 Northeast Business Park 2020 Compliance Report

EPBC Compliance Monitoring Team,

Please be advise the latest annual compliance report for the Northeast Business Park project has been completed and a public access link has been placed on our website.

A direct link to the report is included below.

https://www.northharbour.com.au/wp-content/uploads/2021/08/2021-Northeast-Business-Park-COMPLIANCE-REPORT-2006-2912_v1.0.pdf

Regards,
Michael McErlean
Planning & Approvals Manager

North Harbour
feel right at home

Postal Address PO Box 771, Burpengary Plaza, Burpengary Qld 4505

Physical Address 44 Brook Crescent, Burpengary East Qld 4505

m. 0417 884 155 **ph.** 07 5433 1111 **northharbour.com.au**

27 May 2022 Project No. 19210-015-Rev0

Mr Michael McErlean
North East Business Park Pty Ltd

Email: michael@northharbour.com.au

ENVIRONMENTAL MONITORING SUMMARY – MAY 2021 TO MAY 2022
NORTH HARBOUR DEVELOPMENT

Dear Michael,

1.0 INTRODUCTION

Tectonic was engaged by North Harbour Holdings Pty Ltd (NHH) to prepare this report summarising the acid sulfate soil (ASS) management and associated groundwater monitoring completed between May 2021 to May 2022 related with ongoing land development at *North Harbour.*

1.1 Background

Tectonic has provided ongoing ASS and groundwater management advice on behalf of North Harbour since 2017. Implementation of ASS management strategies during development (including ASS treatment, verification testing and other services pertaining to general site management) are undertaken by the Primary Contractor, Hall Contracting Pty Ltd (Hall) and their various subcontractors, the details of which have been provided to Tectonic for inclusion herein.

Soil and water management pertaining to ASS, for respective development components are completed in general accordance with the following approved management documents:

- North East Business Park - Residential West, *Acid Sulfate Soil Investigation Report and Management Plan (Revision 8)*, prepared by Coffey Geotechnics Pty Ltd (Report No. GEOTKPAR01976AC-D(Rev8), dated 22 December 2015).
- North Harbour Residential West - Balance Phase Residential Earthworks, *Addendum to ASSMP*, prepared by Coffey Geotechnics Pty Ltd (Report No. GEOTKPAR01976AJ-D, dated 22 December 2016).
- *Acid Sulfate Soil Investigation and Management Plan*, North Harbour Mixed Industry and Business Area (MIBA), prepared by Tectonic (Report No. 19210-001-Rev0, dated 8 November 2019).

2.0 SUMMARY OF SITE DEVELOPMENT

Works undertaken during the reporting period (May 2021 to May 2022) include ongoing earthworks and civil works associated with two separable development areas. These being the balance of works at North Harbour *Residential West* and ongoing bulk earthworks for development of North Harbour *Mixed Industry and Business Area (MIBA)*.

Works carried out within each of the major development areas during the summary period included:

North Harbour Residential West

- Bulk Earthworks: Phase 4B(3) – Undertaken between August 2021 to May 2022.
  - Approximately 115,000 m^3 of cut and fill earthworks involving non-ASS material.
- Civil Construction: Completion of Stages 25-28 and 38, and commencement of Stages 29-32.

Works associated with the remaining balance stages of North Harbour Residential West, including that completed throughout the summary period, have been assessed and do not pose significant ASS risk. These works do not require specific soil treatment or groundwater monitoring as part of the ongoing development.

North Harbour Mixed Industry and Business Area (MIBA)

- North South Urban Arterial (NSUA) Road - March 2021 to February 2022.
  - Approximately 79,300 m^3 of cut and fill earthworks from identified non-ASS and acidic non-sulfuric (ANS) soil zones.
- General Bulk Earthworks – March 2021 to present.
  - Approximately 578,140 m^3 of cut to fill from non-ASS zones.
  - Excavation and treatment of approximately 4,500 m^3 containing actual ASS from Wetland 2
  - Excavation and treatment of approximately 15,600 m^3 containing actual ASS from Wetland 3
  - Excavation and treatment of approximately 157,800 m^3 containing actual ASS from the Northern Drainage Corridor (NDC)
  - Excavation and treatment of approximately 2,360 m^3 of high risk alluvial soil containing actual and potential ASS from Moreton Bay Blvd / Urban Arterial Connection (i.e. Raff Creek Bridge).

All excavated materials have been placed as controlled fill within approved MIBA fill zones, following treatment, validation testing and moisture conditioning, where necessary.

2.1 Long-term Site Development

General timing of past and future earthworks phases and civil construction works at North Harbour is summarised in Table 1. Summary reports for previous yearly reporting periods have been prepared and previously submitted to the administering authority.

Table 1: Sequence of Bulk Earthworks and Civil Construction

Area	Residential West							MIBA				
Period/Phase	Bulk Earthworks Phase			Civil Construction Stage				Bulk Earthworks				
Stage No. Works Area	1, 2 & 3	4(1) & 4(2)	4(3)	1-24 & 34-36	37 & 42-45	25-28,38	29-33, 39-41	NSUA & NDC	Wetland 2	Wetland 3	Raff Creek Bridge	Future Development
Pre-2020	■			■								
2020/2021		■			■			■		■		
2021/2022			■			■		■	■		■	
Future Works			■				■				■	■

3.0 GROUNDWATER MONITORING

Past bulk earthworks for *Residential West* Phases 4(1) and 4(2) have involved excavation of fill material from borrow zones situated in the future marina area. These works have previously involved specific ASS management, including soil and water treatment and associated groundwater monitoring and soil validation testing. Excavations from these borrow zones were completed at the end of February 2021, with no further soil treatment or groundwater monitoring required for the balance phase earthworks (i.e. Phase 4(3)) or remaining development associated with North Harbour Residential West.

Bulk earthworks for the *MIBA* commenced at the start of March 2021 and is ongoing. Groundwater monitoring associated with *MIBA* development has been completed by Tectonic on behalf of North Harbour in accordance with the approved ASSMP for the works. Preconstruction monitoring was completed between November 2020 and February 2021, with ongoing construction monitoring being continuously carried out at designated groundwater monitoring locations relevant to ongoing bulk earthworks. Monitoring frequencies and testing regimes have been completed in accordance with the respective ASSMP documents for each package of work.

Results of groundwater monitoring were regularly assessed and have been reported on a monthly basis, at the time, to provide regular updates to NEBP on groundwater quality associated with the works and to note any impacts which may be attributed to disturbance of ASS. A summary of the groundwater monitoring reports completed for the MIBA works phases, is provided in Table 2.

Table 2: Groundwater Quality Monitoring & Respective Monthly Reports

Report No.	Monthly Period	Works Package & Monitoring Phase
19210-003 (Tectonic)	March – May 2021	MIBA - Construction Monitoring
19210-004 (Tectonic)	June 2021	MIBA - Construction Monitoring
19210-005 (Tectonic)	July 2021	MIBA - Construction Monitoring
19210-006 (Tectonic)	August 2021	MIBA - Construction Monitoring
19210-007 (Tectonic)	September 2021	MIBA - Construction Monitoring
19210-008 (Tectonic)	October 2021	MIBA - Construction Monitoring
19210-009 (Tectonic)	November 2021	MIBA - Construction Monitoring
19210-010 (Tectonic)	December 2021	MIBA - Construction Monitoring
19210-011 (Tectonic)	January 2022	MIBA - Construction Monitoring
19210-012 (Tectonic)	February 2022	MIBA - Construction Monitoring
19210-013 (Tectonic)	March 2022	MIBA - Construction Monitoring
19210-014 (Tectonic)	April 2022	MIBA - Construction Monitoring

As per the recommendations of the ASSMP and associated documents, median values of groundwater quality parameters were compared with 80th and 20th percentile baseline values attained during pre-construction monitoring. It is noted that calculated median values in some instances did not fall within the calculated 20th and 80th percentile baseline criteria. In these instances, long term conditions were assessed, and potential issues individually addressed in the relevant reports. These variations were not considered to have constituted any significant environmental impact.

Some monitoring results which exceeded the performance criteria set out in the ASSMP were assessed to have occurred due to natural seasonal variations, including rainfall events and other naturally occurring site conditions. Where the 20th and 80th percentile baseline values were exceeded, Tectonic reviewed these results together with other indicators of performance to assess if there had been any significant environmental impact or issue requiring further investigation or changes in management practices. In most cases, the period of baseline monitoring was not sufficient to include the full range of natural variation and the exceedances could be attributed to natural processes. For some parameters, application of 20th and 80th percentile values were not an appropriate method of assessing results (e.g. chloride:sulfate ratio).

Over the course of monitoring undertaken to date, groundwater conditions are not considered to have been significantly impacted by the construction works. It is noted that, in instances where any single parameter was measured outside of the baseline values, other parameters which may have indicated construction influences had not changed.

4.0 ASS VALIDATION TESTING

Soils identified as containing ASS that were disturbed during bulk earthworks for *MIBA* (i.e. Wetland 2, Wetland 3, Northern Drainage Corridor and Raff Creek Bridge Abutment) are understood to have been treated and managed in accordance with the approved ASSMP, including completion of verification testing, where required. Management of these works was undertaken by Hall, with verification testing provided by their subcontractors, Morrison Geotechnic Pty Ltd (Morrison) and Qualtest Laboratory Pty Ltd (Qualtest).

A summary of ASS verification testing completed between May 2021 and May 2022 is provided in Table 3.

Table 3: Summary of ASS Verification Test Results

Source Area	Approximate Bulk Earthworks Volume	Number of Samples/Tests	
		Passes	Fails
Wetland 2	4,500 m^3	7	0
Wetland 3	15,600 m^3	30	0
Northern Drainage Corridor	157,800 m^3	161	0
		16 *	8 *
Raff Creek Bridge	2,360 m^3	5	0

Note: Validation samples marked with '*' reported some measurable acid neutralising capacity but failed testing based on low pH level and presence of reported existing acidity. These results technically represent a failed test but have been passed where ANC outweighs net acidity by a factor of 1.5. These samples should be considered to present a low risk due to the general absence of oxidizable sulfur and relatively low levels of acidity reported.

It is noted that the volumes of testing completed generally correspond to the bulk earthworks volume estimates provided by Hall at the prescribed rate of 1 test per 500 m^3, except for testing conducted of soil from the Northern Drainage Corridor, which represented a validation test rate closer to 1 test per 1000 m^3. All testing completed generally indicated that the soils had been sufficiently limed to counteract the relative ASS hazard present. Despite the frequency of testing not fully meeting the frequency advised in the

ASSMP, the frequency and outcome of the testing undertaken is considered acceptable to confirm that these soils have been appropriately treated and managed. This fact is also supported by lime use records for the site which indicate that adequate volumes of lime have been used based on the excavation volumes carried out.

It is also noted that a substantial proportion of earthworks were completed during the subject period in areas located above RL 5 m AHD or where ASS was known to be not present. Disturbance of acidic, non-sulfuric materials were also understood to have been treated with agricultural lime in accordance with the ASSMP but do not require validation testing under the approved ASSMP.

4.1 Lime Delivery Records

Lime delivery records provided by Hall indicate a total of 3900 tonne of agricultural lime has been delivered to the North Harbour MIBA site for use between March 2021 and April 2022. Assuming these materials have been applied in accordance with the ASSMP, this volume sufficiently accounts for the treatment of all disturbed materials as described by Hall, at the soil treatment rates defined in the ASSMP, plus an additional 1050 tonne which is expected to have been applied to ANS soils across the site.

5.0 CONCLUSION

The information provided by Hall has been reviewed and indicates that where disturbed, ASS has been effectively treated and managed during ongoing land development at North Harbour.

Consistent completion of groundwater monitoring, ASS verification testing and reporting also indicates that soil and groundwater impacts relating to disturbance of ASS are being appropriately considered and managed. It is generally understood that there have been no major adverse environmental impacts to local soils or groundwater conditions as a result of the construction activities undertaken within the summary period.

These results demonstrate that risks associated with disturbance of ASS during development of *North Harbour Residential West* are being appropriately managed by North Harbour and Hall during works to date.

6.0 LIMITATIONS

Your attention is drawn to the document *Limitations*, which is attached to this letter report. Please contact the undersigned should you wish to discuss any of the above matters.

Yours faithfully

TECTONIC GEOTECHNICAL PTY LTD

Mark Thomson BSc, CPESC 7057
Senior Environmental Scientist

David Pollock BE (Civil) RPEQ 14121
Senior Geotechnical Engineer

Attachments: Limitations

LIMITATIONS

This document has been prepared for the purpose outlined in Tectonic's proposal and no responsibility is accepted for the use of this document, in whole or in part, for any other purpose.

The scope of Tectonic's Services are as described in Tectonic's proposal, and are subject to restrictions and limitations. Tectonic did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the report. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Tectonic in regards to it.

Conditions may exist which were undetectable given that economic and time constraints limit the practical extent of geotechnical investigation. Variations in conditions may occur between investigation locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the document. Where variations exist on site, additional studies and actions may be required.

Tectonic's opinions are based upon information that existed at the time that the work was performed. The passage of time, man-made or natural events, may alter the site conditions. It is understood that the Services undertaken allowed Tectonic to form an opinion of the actual conditions of the site at the time the site was visited and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

Any assessments made in the preparation of this document are based on the conditions indicated from published sources and the findings of the investigation described. Actual subsurface conditions may differ from those indicated in the document (e.g. between boreholes or test pits). No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this document.

Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Tectonic for incomplete or inaccurate data supplied by others.

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JWA PTY LTD
Ecological Consultants
ABN 56 066 448 879

2021 - 2022
SUMMARY OF REVEGETATION WORKS

North East Business Park

A Report Prepared for
North Harbour Holdings Pty Ltd

JUNE 2022

JWA PTY LTD
Suite C, Building 21 Garden City Office Park, 2404 Logan Road, Eight Mile Plains QLD 4113
p 07 3219 9436 • **f** 07 3423 2076 • **e** brisbane@jwaec.com.au

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DOCUMENT CONTROL

Document

Title	Summary of Revegetation Works
Job Number	Q15003
File Reference	\\JWAServer\Data\2015 CLIENTS\Q15003_Northeast Business Park, Morayfield\Reports\EPBC Rehab Summary (2022)
Version and Date	RW2 21/06/22
Client	North Harbour Holdings Pty Ltd

Revision History (office use only)

Issue	Version	Draft/ Final	Date	Distributed To	No. Copies	Media	Delivery Method
1	RW1	DRAFT	15/06/22	JWA	1	Word	Email
2	RW2	FINAL	21/06/22	JWA	1	Word	Email

Client Issue

Version	Date Sent	Author		Approved by	
		Name	Initials	Name	Initials
RW2	21/06/22	Nicole Davies	ND	Adam McArthur	AM

TABLE OF CONTENTS

1 Introduction

This summary report discusses the actions taken by Northeast Business Park Pty Ltd towards revegetation of parts of the company's development site "North Harbour" at Morayfield, Queensland. The project site, which was extensively cleared for pine plantation forestry by previous owners, includes frontage to the southern bank of the Caboolture River. Northeast Business Park Pty Ltd is actively seeking to revegetate a 100 m wide native vegetation "riparian buffer" to the Caboolture River on the majority of the frontage. Northeast Business Park would like to thank the following groups and individuals for their assistance in the planning, preparation and establishment of the revegetation works thus far:

- Jim Pulsford, Sue Davies, Alex Smith, and other volunteers from the Friends of CREEC (Caboolture Region Environmental Education Centre);
- Warwick Halse Jr and the staff and volunteers from the CREEC Nursery;
- Wes Mortensen and Seelan Kulasegaram from Moreton Bay Regional Council;
- Staff from Greening Australia;
- Charlie and Jenny Cope;
- Trainees and staff involved in the 2016 and 2017 Skilling Queenslanders for Work program, provided by the Deception Bay Community Youth Programs (DBCYP) organisation; and
- Clint Howchin.

2 Overview of Revegetation Works to Mid 2022

Monitoring of previously planted sections A, B, C, F and G (**SECTIONS 4 - 7**) has been continued, with maintenance in these areas limited to fencing repairs and track maintenance. Weed diversity and density throughout the revegetation areas was found to be extensive and weed maintenance should be completed as soon as practicable.

Monitoring of natural regeneration trials in section H has continued, with maintenance in this area limited to fencing repairs as required.

Monitoring of natural regeneration elsewhere has been abandoned due to lack of success. Photo monitoring at points 7, 8, 11 and 12 has been discontinued until active planting is undertaken in these areas to establish revegetation.

3 Revegetation Areas Involving Active Planting

Since December 2011, revegetation has been progressively established in a number of locations on the property (upstream end of the project site frontage to the Caboolture River).

Previously, revegetation has been established utilising different methodologies as trials to determine the most effective methodologies for assisted revegetation of the riparian corridor.

Preliminary planning is consistent for all assisted regeneration established thus far because the underlying pre-clearing regional ecosystem is consistent across all areas. Preliminary planning involved:

- Vegetation survey conducted by Sue Davies (Friends of CREEC).
- Revegetation Management Plan prepared by Greening Australia, including documentation of the species planting palette.
- Seed collection and propagation from local sources (including the project site) conducted by the CREEC Nursery.

Based on the observations of seedling survival and growth in previous trial plantings, continuation of planting in section G has been undertaken using the following methods:

- No broadscale soil conditioning / disturbance (as trialled in section A). Limited soil disturbance undertaken to avoid stimulating growth of competing weeds and pasture grasses.
- Ongoing maintenance (through slashing of pasture grasses and weeds, and watering beyond initial establishment) has not been included. Ongoing maintenance undertaken in Section A did not appear to significantly aid the survival and growth of seedlings compared with sections B and C where ongoing maintenance was limited to fencing repairs to exclude grazing by stock.
- Slashing of existing grasses/weeds undertaken just prior to planting (as trialled in sections B and C) has been adopted, providing opportunity for seedlings to establish before being subjected to competition for sunlight.
- Planting palette has been modified to increase the number of seedlings planted from pioneer/hardy species and reduce the number of seedlings planted from secondary species that require protection from the elements via an established upper canopy. Growth rates of secondary species seedlings has been low in area A and B plantings. It is anticipated that secondary species will establish via natural recruitment as fauna species recolonise the revegetated areas. In the event this does not occur, additional planting to introduce these species will be considered once suitable canopy protection has been established.

4 Revegetation Area A

This was the first trial revegetation area planted, in December 2011. Canopy height is estimated to have reached approximately 50%, vegetation is now well established, and bird life and other fauna is returning to this area. It is anticipated this area will return to remnant condition without further intervention. However, recent monitoring has identified additional weed maintenance is required. **PLATES 1 - 5** show aerial photos of the revegetation progress of Areas A, C and F in December 2021 compared to May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area A in June 2022 is shown in **PLATES 6 & 7** compared to June 2021 (**PLATES 8 & 9),** July 2020 (**PLATES 10 & 11**) and July 2018 (**PLATES 12 & 13)**.

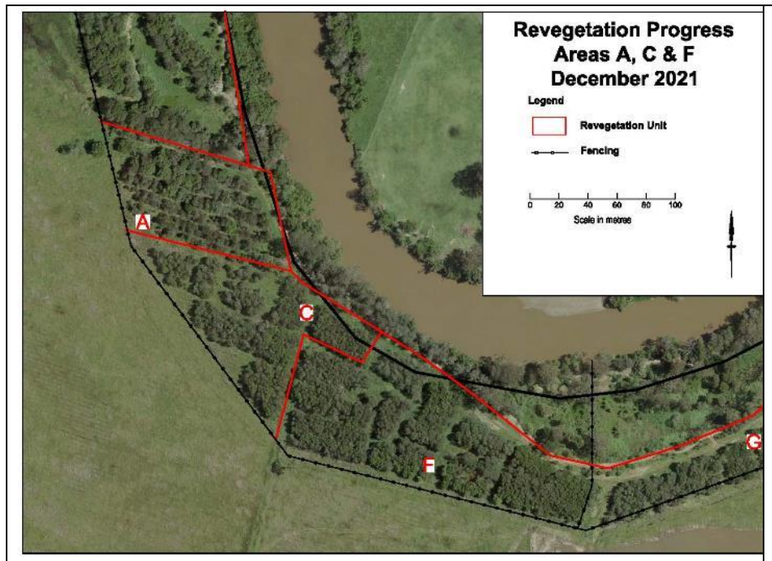


PLATE 1: Aerial of Revegetation progress of Areas A, C and F - December 2021

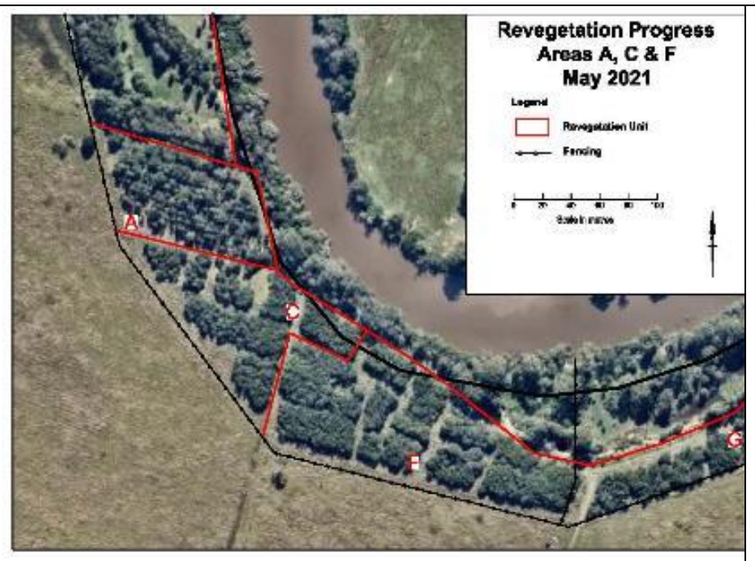


PLATE 2: Aerial of Revegetation progress of Areas A, C and F - May 2021

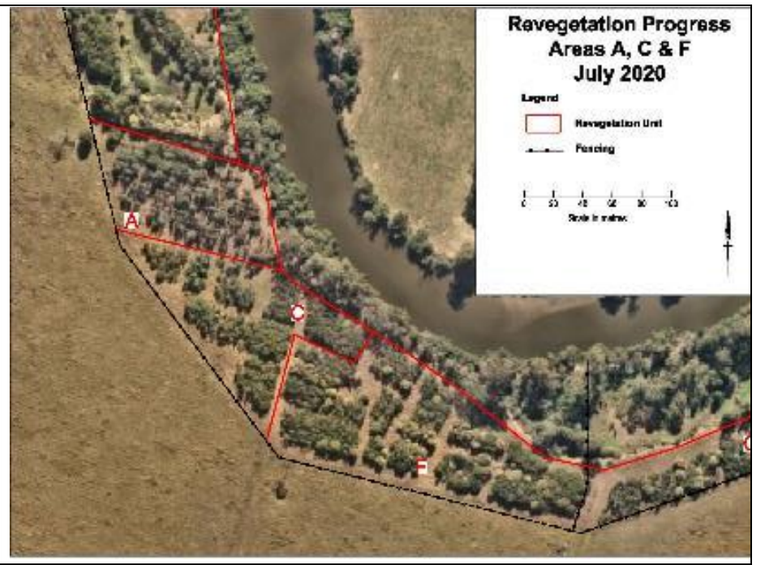


PLATE 3: Aerial of Revegetation progress of Areas A, C and F - July 2020

PLATE 4: Aerial of Revegetation progress of Areas A, C and F - July 2018

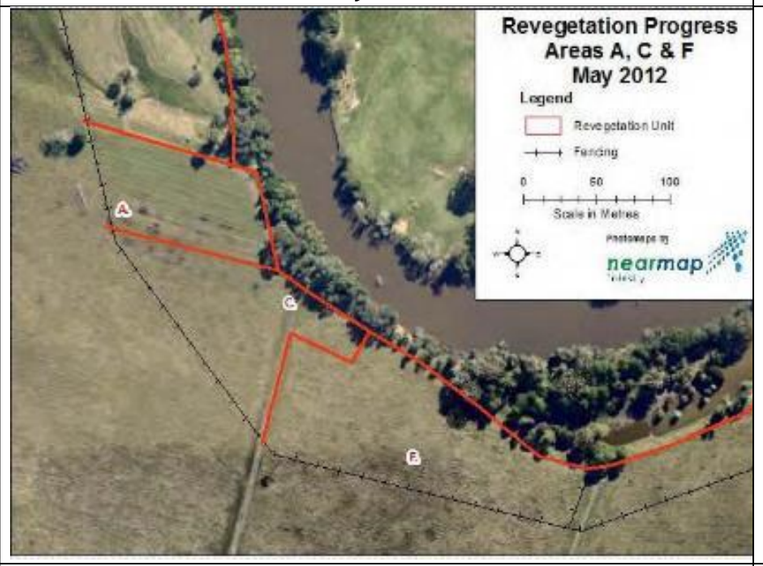


PLATE 5: Aerial of Revegetation progress of Areas A, C and F - May 2012

PLATE 6: Revegetation Area A June 2022

PLATE 7: Revegetation Area A June 2022

PLATE 8: Revegetation Area A June 2021

PLATE 9: Revegetation Area A June 2021

PLATE 10: Revegetation Area A July 2020

PLATE 11: Revegetation Area A July 2020

PLATE 12: Revegetation Area A July 2018

PLATE 13: Revegetation Area A July 2018

5 Revegetation Area C

Revegetation Area C was planted in March – May 2014. Vegetation in area C has again grown significantly in size as demonstrated by the photos below. Vegetation is now well established and expected to return to remnant status with limited additional intervention. Follow-up weed maintenance is required in some parts of Area C. **PLATES 1 - 5** show aerial photos of the revegetation progress of Areas A, C and F in June 2022 compared to May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area C in June 2022 is shown in **PLATE 14** compared to June 2021 (**PLATE 15**), July 2020 (**PLATE 16**) July 2018 (**PLATE 17**) and June 2017 (**PLATE 18**).

PLATE 14: Revegetation Area C June 2022

PLATE 15: Revegetation Area C June 2021

PLATE 16: Revegetation Area C July 2020

PLATE 17: Revegetation Area C July 2018

PLATE 18: Revegetation Area C June 2017

6 Revegetation Area F

Seedlings were planted progressively in area F from late 2015 to May 2016. Seedlings have established well and have significantly increased in size in this reporting period. Significant weed incursion was recorded during the latest monitoring and requires follow-up maintenance. Of particular concern was the presence of Lantana (*Lantana camara*), a Weed of National Significance (WoNS). **PLATES 1 - 5** show aerial photos of the revegetation progress of Areas A, C and F in June 2022 compared to May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area F in June 2022 is shown in **PLATE 19** compared to June 2021 (**PLATE 20**), July 2020 (**PLATE 21),** July 2018 (**PLATE 22**) and June 2017 (**PLATE 23**).

PLATE 19: Revegetation Area F June 2021

PLATE 20: Revegetation Area F June 2021

PLATE 21: Revegetation Area F July 2020

PLATE 22: Revegetation Area F July 2018

	
PLATE 23: Revegetation Area F June 2017	

7 Revegetation Area B

Revegetation area B was planted over a 10-month period from February to November 2013. Much of area B has established well and the canopy height is now around 45%. However, the wetter areas which did not establish well following prolonged inundation shortly after planting are not at the same stage of regeneration. More in-depth monitoring will be undertaken in future to determine if additional action is required to assist regeneration in these wetter areas. Significant weed incursion was recorded during the latest monitoring and requires follow-up maintenance. **PLATES 24 - 28** show aerial photos of the revegetation progress of Area B in December 2021 compared to May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area B in June 2022 (**PLATES 29 & 30**) compared to June 2021 (**PLATES 31 & 32),** July 2020 (**PLATE 33 & 34**) and July 2018 (**PLATES 35 & 36**).

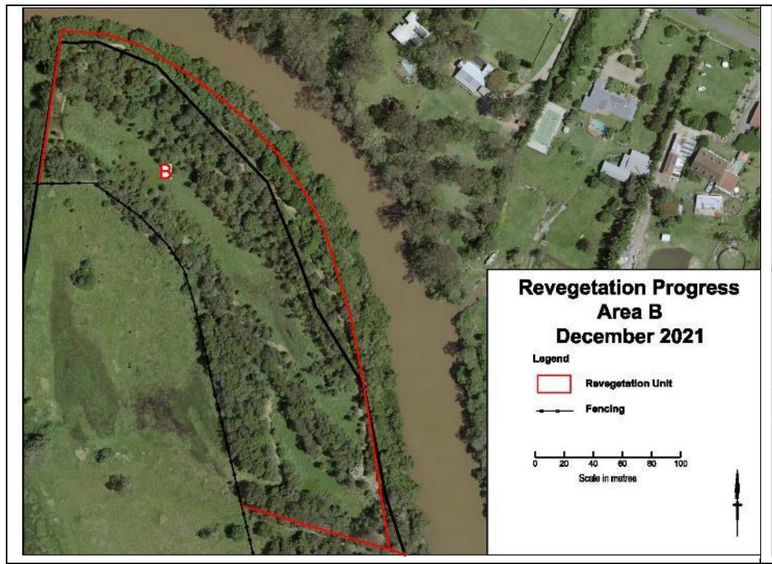


PLATE 24: Aerial of Revegetation progress of Area B – December 2021

PLATE 25: Aerial of Revegetation progress of Area B – May 2021

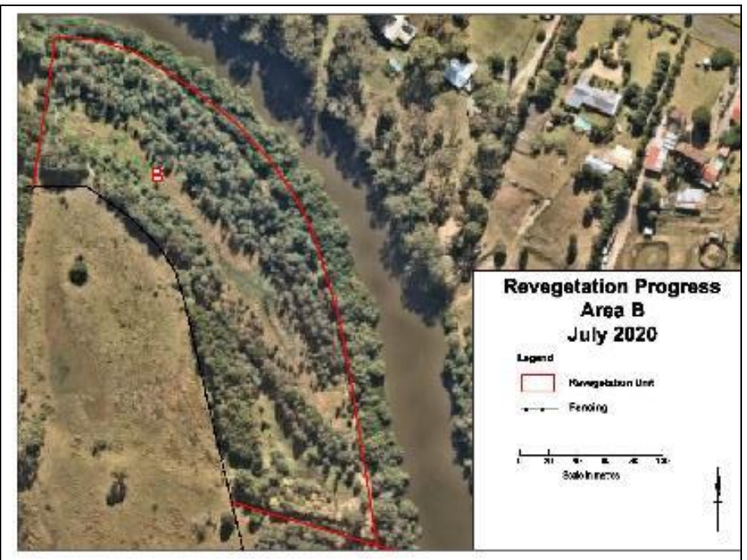


PLATE 26: Aerial of Revegetation progress of Area B – July 2020

PLATE 27: Aerial of Revegetation progress of Area B – July 2018

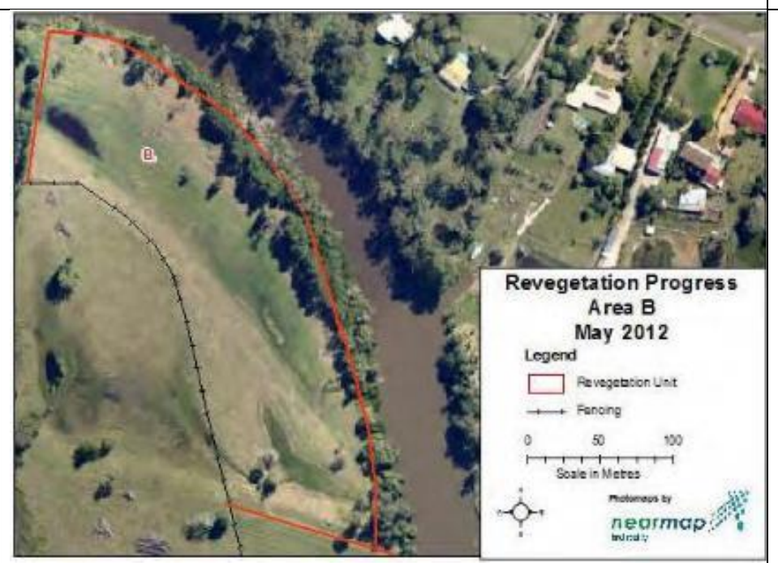


PLATE 28: Aerial of Revegetation progress of Area B – May 2012

PLATE 29: Revegetation Area B June 2022

PLATE 30: Revegetation Area B June 2022

PLATE 31: Revegetation Area B June 2021

PLATE 32: Revegetation Area B June 2021

PLATE 33: Revegetation Area B July 2020

PLATE 34: Revegetation Area B July 2020

PLATE 35: Revegetation Area B July 2018

PLATE 36: Revegetation Area B July 2018

8 Revegetation Area G

Area G was fenced in June 2015. Seedlings have been progressively planted in this large area since June 2015. The last planting in area G was completed by the end of 2018. Seedlings planted in the earlier stages of this area have now established well as shown in the photos below. **PLATES 37 - 41** show aerial photos of the revegetation progress of Area G in June 2022 compared to May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area C in June 2022 (**PLATE 42**) compared to June 2021 (**PLATE 43),** July 2020 (**PLATE 44)**, July 2018 (**PLATE 45**) and June 2017 (**PLATE 46**).

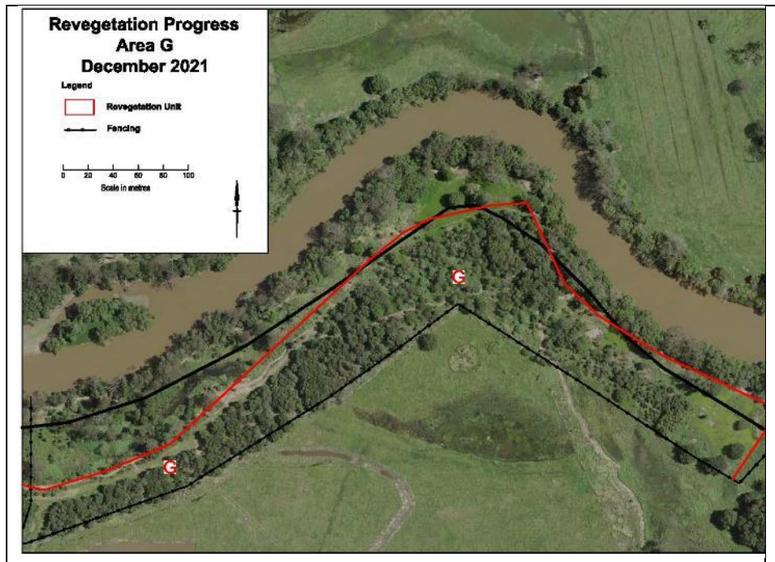


PLATE 37: Aerial of Revegetation progress of Area G – June 2022

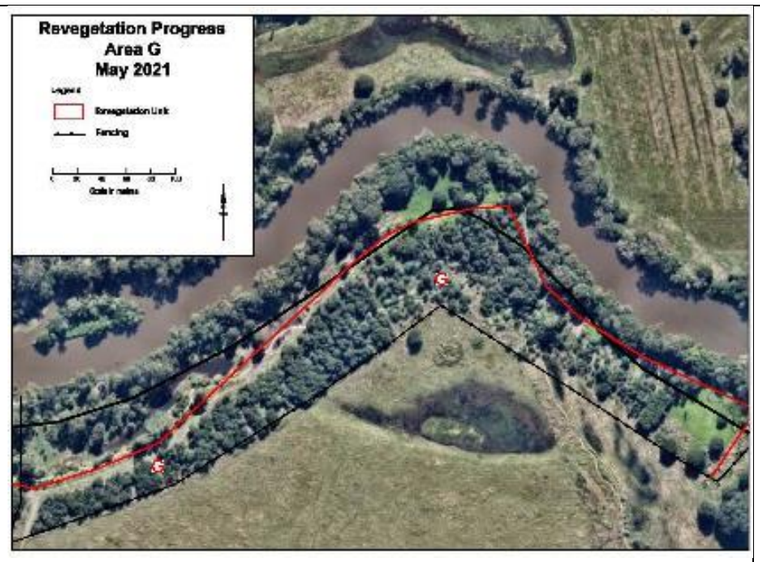


PLATE 38: Aerial of Revegetation progress of Area G – May 2021

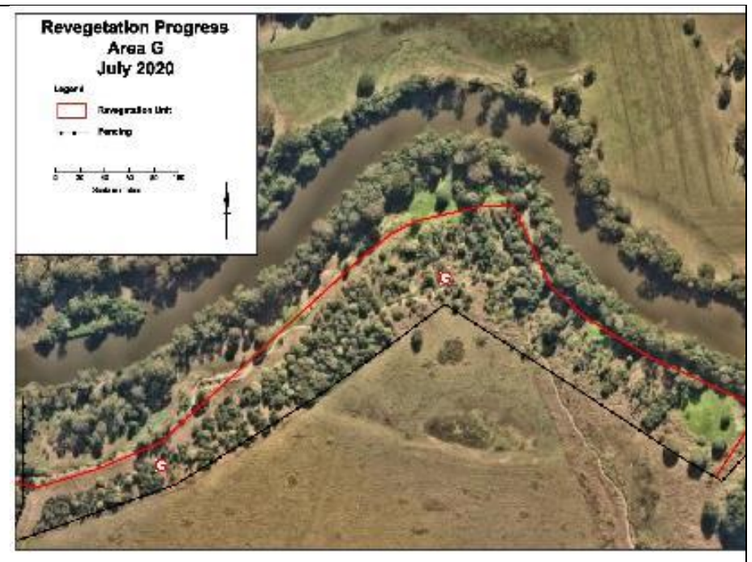


PLATE 39: Aerial of Revegetation progress of Area G – July 2020

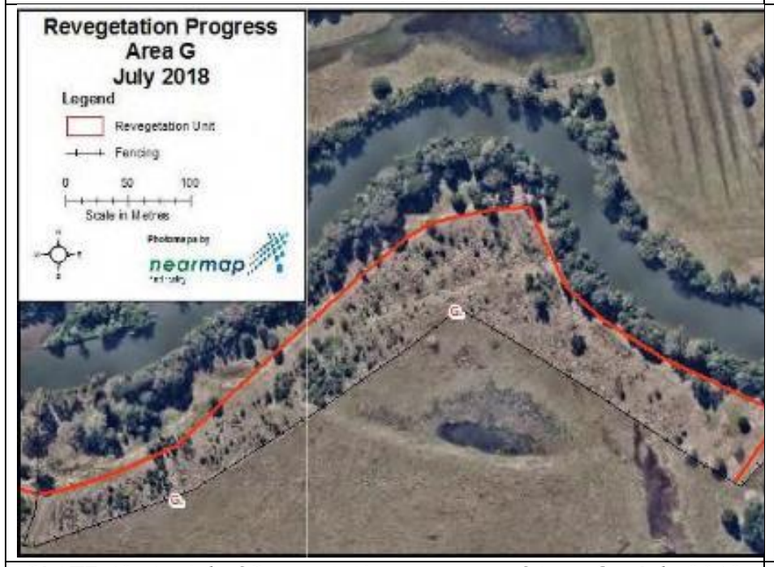


PLATE 40: Aerial of Revegetation progress of Area G – July 2018

PLATE 41: Aerial of Revegetation progress of Area G – May 2012

PLATE 42: Revegetation Area G June 2022

PLATE 43: Revegetation Area G June 2021

PLATE 44: Revegetation Area G July 2020

PLATE 45: Revegetation Area G July 2018

	
PLATE 46: Revegetation Area G June 2017	

9 Trials Involving Site Management Actions (Without Active Tree Planting)

In addition to the assisted regeneration involving active planting of seedlings, natural regeneration of area H has continued in the last 12 months. Initially, 5 areas were established to gauge the opportunity for natural regeneration through largely passive approaches whereby changes to management of the onsite farming operation may allow regeneration to occur without significant active planting and maintenance. These trials are summarised below:

- Area D was partly fenced to exclude stock in some sections of the trial. There has been some isolated natural recruitment of seedlings within the fenced area of the trial, however this has not been sufficiently successful to continuation of the trial. Area D will be included in the active revegetation planting activities in future (to be undertaken in future).
- Area F was fenced to exclude stock from the trial area. There has been some isolated natural recruitment of seedlings within the fenced area of the trial, however this was not sufficiently successful to warrant continuation of the trial. Area F has now been actively replanted with seedlings as part of the 2015 – 2016 revegetation works.
- Area G, which is alongside Area F was left unfenced as a trial for natural recruitment within an area in which stock were allowed continued access. No natural seedling recruitment was observed in this area. It has been fenced as part of the 2015 – 2016 revegetation works and active replanting with seedlings is in progress.
- Area E, which is in close proximity to Area D, was left unfenced as a trial for natural recruitment within an area in which stock were allowed continued access. No natural seedling recruitment was observed in this area. The trial has been abandoned and this area will be fenced and actively replanted as part of future revegetation works.
- Area H is a different vegetation type to the other trials, composed of marine plants being mangrove and salt-water couch species. This trial area was partly fenced to observe the difference in seedling recruitment between areas grazed by stock and areas where stock was excluded. Following the success of this trial, additional fencing was erected in 2016. Since then, natural regeneration of casuarina on the land above highest astronomical tide has also been observed along with additional recruitment of mangrove species fringing the river and improvement in the health of salt couch in the occasionally inundated areas.

10 Revegetation Area H

This area is a trial establishing the natural regeneration capacity of marine plant vegetation units on the property. Commenced in February 2014, following success in the fenced trial area additional fencing was erected in 2016 to exclude stock from all parts of area H. **PLATES 47 - 51** show aerial photos of the revegetation progress of Area H in December 2021 compared to May 2021, July 2020, July 2018, and May 2012. The progress of Revegetation Area H in June 2022 (**PLATES 52 & 53**) compared to June 2021 (**PLATES 54 & 55**), July 2020 (**PLATES 56 & 57**), July 2018 (**PLATES 58 & 59**).

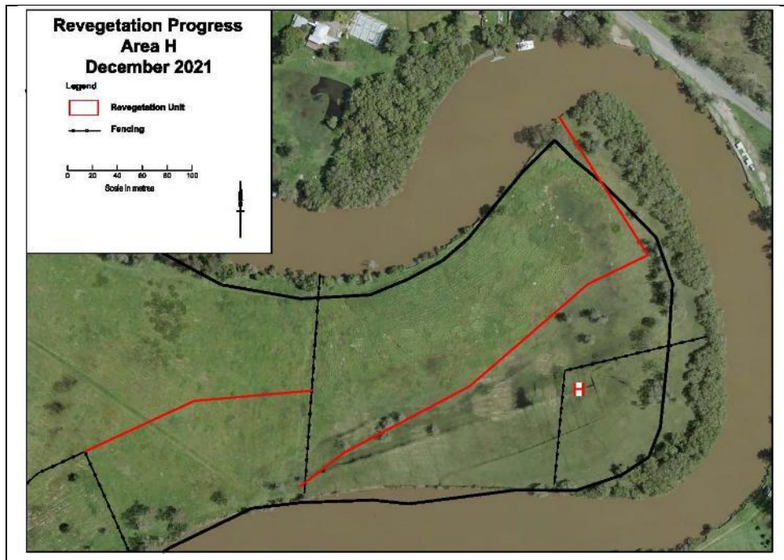


PLATE 47: Aerial of Revegetation progress of Area H – December 2021

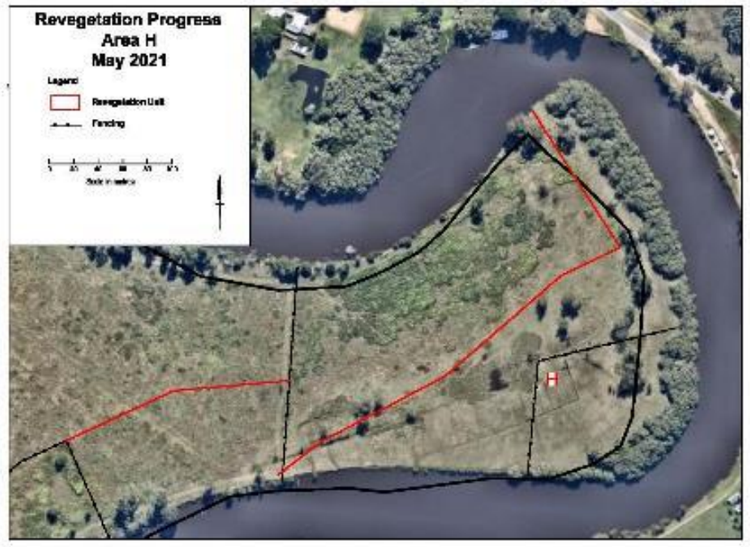


PLATE 48: Aerial of Revegetation progress of Area H – May 2021

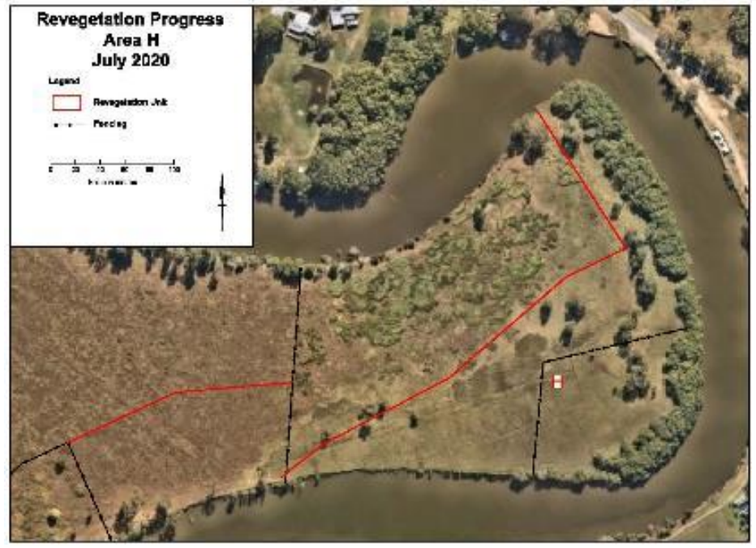


PLATE 49: Aerial of Revegetation progress of Area H – July 2020

PLATE 50: Aerial of Revegetation progress of Area H – July 2018

PLATE 51: Aerial of Revegetation progress of Area H – May 2012

PLATE 52: Revegetation Area H June 2022

PLATE 53: Revegetation Area H June 2022

PLATE 54: Revegetation Area H June 2021

PLATE 55: Revegetation Area H June 2021

PLATE 56: Revegetation Area H July 2020

PLATE 57: Revegetation Area H July 2020

PLATE 58: Revegetation Area H July 2018

PLATE 59: Revegetation Area H July 2018

11 Photo Point Monitoring

Photo Point Monitoring has continued in the 2017 – 2018, 2019 – 2020, 2020 – 2021 and 2021-2022 period. To limit the size of this summary report, only 1 photo from each monitoring point has been included in this section of the report. Should you require further photos or other information, please contact Northeast Business Park Pty Ltd. **PLATE 60** provides a plan showing the location of each Photo Point.

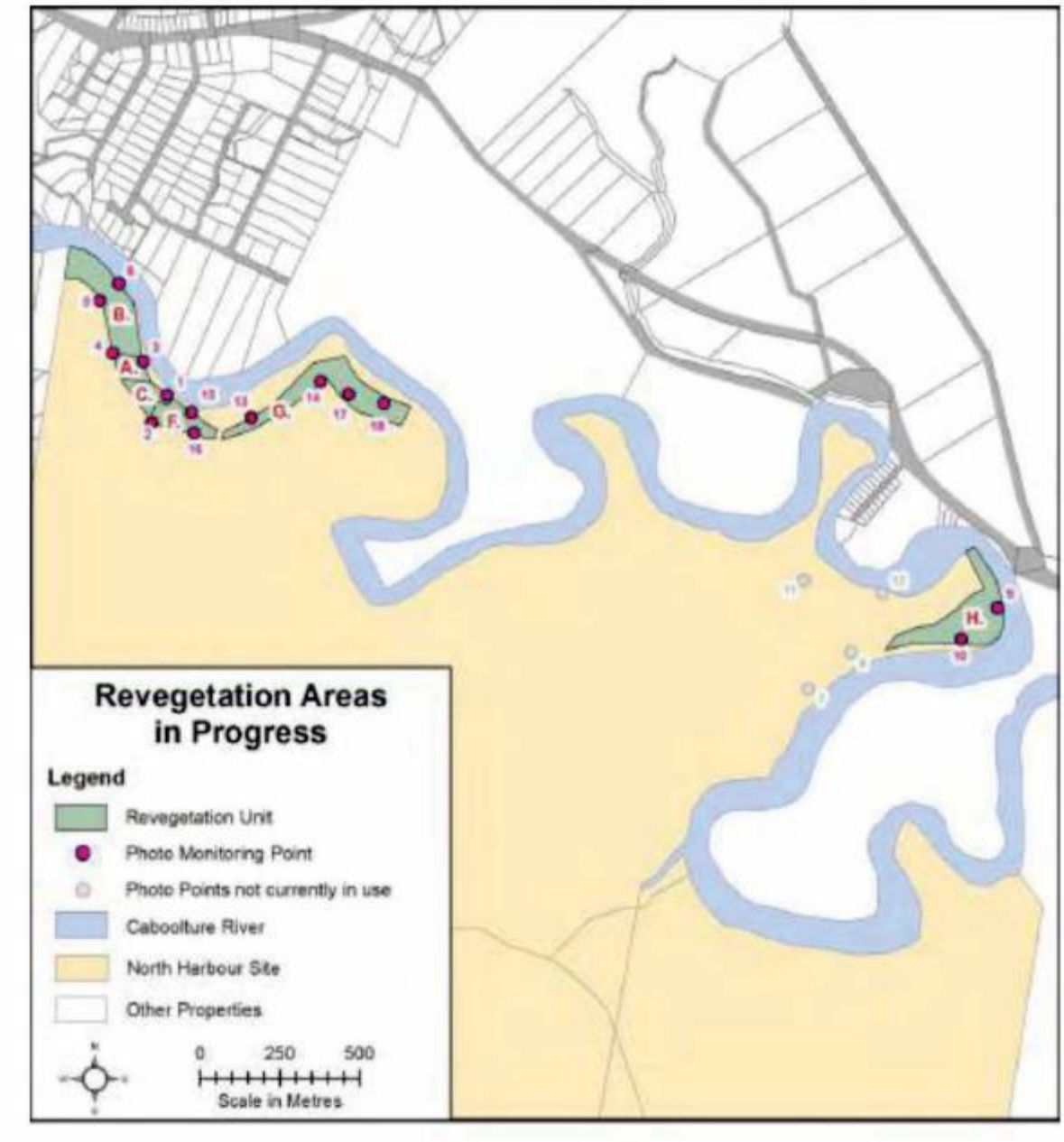


PLATE 60: Revegetation Areas in Progress.

PHOTO POINT 1: Revegetation Area C. Some exotic grasses, Brazilian nightshade (*Solanum seaforthianum*) and Wild tobacco (*Solanum mauritianum*) growing within revegetation area - to be controlled by ongoing weed management.

PHOTO POINT 2: Revegetation Area F. Some exotic grasses, Brazilian nightshade (*Solanum seaforthianum*), Lantana (*Lantana camara*) and Easter cassia (*Senna pendula var. glabrata*) within revegetation area – to be controlled by ongoing weed management.

PHOTO POINT 3: Revegetation Area A. Some exotic grasses, Lantana (*Lantana camara*), Brazilian nightshade (*Solanum seaforthianum*) and Wild tobacco (*Solanum mauritianum*) growing within revegetation area - to be controlled by ongoing weed management.

PHOTO POINT 4: Revegetation Area A. Some exotic grasses, Mile-a-minute (*Ipomoea cairica*), Rattlepod (*Crotalaria lanceolata*) and Devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management.

PHOTO POINT 5: Revegetation Area B. Some exotic grasses, Mile-a-minute (*Ipomoea cairica*), Blue billygoat weed (*Ageratum houstonianum*), Broadleaved pepper tree (*Schinus terebinthifolia*), Easter cassia (*Senna pendula var glabrata*), Rattlepod (*Crotalaria lanceolata*), Wild tobacco (*Solanum mauritianum*), and Devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management.

PHOTO POINT 6: Revegetation Area B. Mile-a-minute (*Ipomoea cairica*), Blue billygoat weed (*Ageratum houstonianum*), Broadleaved pepper tree (*Schinus terebinthifolia*), Easter cassia (*Senna pendula var glabrata*), Wild tobacco (*Solanum mauritianum*), and Devil's fig (*Solanum chrysotrichum*) growing within revegetation area - to be controlled by ongoing weed management.

PHOTO POINT 9: Revegetation Area H.

PHOTO POINT 10: Revegetation Area H.

PHOTO POINT 13: Revegetation Area G. Some pasture grass and Wild tobacco growing within rehab area - to be controlled by ongoing weed management.

PHOTO POINT 14: Revegetation Area G. Some pasture grasses, Wild tobacco (*Solanum mauritianum*), Lantana (*Lantana camara*), Pepper tree (*Schinus terebinthifolius*) growing - to be controlled by ongoing weed management.

PHOTO POINT 15: Revegetation Area F. Some pasture grasses, Lantana (*Lantana camara*), Glycine (*Neonotonia wightii*), Wild tobacco (*Solanum mauritianum*), and Blue billy goat weed (*Ageratum houstonianum*) - to be controlled by ongoing weed management.

PHOTO POINT 16: Revegetation Area F. Some pasture grasses and Blue billy goat weed (*Ageratum houstonianum*) - to be controlled by ongoing weed management.

PHOTO POINT 17: Revegetation Area G. Pasture grasses, Balloon cottonbush, Thistles, Wild tobacco - to be controlled by ongoing weed management.

PHOTO POINT 18: Revegetation Area G. Singapore daisy, Mile-a-minute, Wild tobacco, Lantana throughout area - to be controlled by ongoing weed management.

Project Reference Number: LP140120
2 August 2022

Att: Michael McErlean
Planning & Approvals Manager
North Harbour Holding Pty Ltd
Brooke Crescent, Burpengary East QLD 4505

M: 0417 884 155 E: michael@nebp.com.au

From: James Hall-Brown
Senior Environmental Scientist/Director
Lithaqua Environmental Services
PO Box 136, Peregian Beach, QLD 4573

M: 0401 671 624 E: james@lithaqua.com

Monitoring Summary Report
North Harbour – Surface Water Quality Monitoring Summary – 2021 / 2022 Reporting Period
North Harbour Residential Development, 44 Brooke Crescent, Burpengary East, QLD

Dear Michael,

North Harbour Holdings Pty Ltd (North Harbour) requested that Lithaqua Environmental Services Pty Ltd (Lithaqua) undertake the surface water quality monitoring program at the North Harbour development project located at 44 Brooke Crescent, Burpengary East, Queensland (the site).

The monitoring program was completed in general accordance with the Residential West Water Quality Monitoring Plan Version 7 (Cardno, 03/02/2015). Water quality monitoring has been conducted in general accordance with this document since July 2015. The water quality monitoring program conducted during the 2019 – 2020 reporting period aimed to gather water quality data to monitor the quality of surface water during the construction phase of the North Harbour residential development.

The objectives of this letter report is to succinctly present:

- Monitoring methodology used by Lithaqua to complete this monitoring program;
- Water quality monitoring data;
- Field parameters readings recorded and the analytical results of the water samples collected during this period; and
- Interpretation of the water quality data obtained.

Monthly in-situ and laboratory water quality sampling was conducted at 5 locations on-site (A, C, D, F and G) and 2 locations upstream and downstream of the development site on the Caboolture River (H and I). The locations of the sampling points are presented in Figures 1 and 2 and photographs of each sampling location is presented in Photographs 1-7 of the attached enclosures. The following headings provide a summary of the water quality monitoring program conducted over the reporting period with the aim of achieving the above stated objectives.

Monitoring Methodology

The water quality monitoring was conducted by Lithaqua personnel in general accordance with the NEBP Residential West Water Quality Monitoring Plan (Version 7), the Australian Standard AS5667.1-1998 (Water Quality – Sampling Part 1: Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples), the Australian Standard AS5667.6-1998 (Water Quality – Sampling Part 6: Guidance on the Sampling of Rivers and Streams), and Queensland regulatory requirements.

The following method was utilised by Lithaqua personnel to monitor water quality at each monitoring location:

- Upon arrival at the monitoring location, a visual assessment for potential presence of litter and surface sheen was conducted;
- Field parameters including turbidity, temperature, Dissolved Oxygen (DO), Electrical Conductivity (EC) and pH were measured using adequately calibrated water quality monitoring equipment;
- The analysis of the physico-chemical properties of water from each location was conducted by collecting the samples using a telescopic sampling pole. Appropriately labelled, laboratory supplied sample containers were immersed upside down beneath the water surface then turned right way up to collect the sample. Sample containers were sealed, placed on ice and transferred to a National Association of Testing Authorities (NATA) accredited laboratory - Australian Laboratory Services (ALS) in Stafford, Queensland using proper sample preservation procedures and Chain-of-Custody (CoC) documentation for the analysis of physico-chemical water quality parameters including turbidity, DO), EC and pH.
- An additional water sample for biological analysis was collected at each location using the same methodology for analysis of Chlorophyll-'a' concentrations.

Results

The field measurements and observations obtained from all monitoring locations (A, C, D, F, G, H and I) over the reporting period are summarised in Tables 1-7. Analytical data provided by ALS from samples collected from all monitoring locations over the reporting period are presented in Tables 1-7. Laboratory reports including the Certificate of Analysis (COA), COC and Sample Receipt Notification (SRN) reports are presented in the attachments.

Due to insufficient water depth to immerse the sensors of the water quality monitoring instruments and a lack of water for sample collection/analysis, the availability of data has been limited at locations A and F. Over the reporting period, Location A (upstream Raff Creek) has been recorded as dry on 1 occasion and Location F (upstream Raff Creek tributary) has been recorded dry on 3 occasions. This is consistent with seasonal variations in flow encountered during previous reporting periods and the baseline data collected prior to commencement of construction.

Data Interpretation

Field and laboratory measured parameters including Turbidity, DO, pH and Chlorophyll-a were compared against the Recommended Water Quality Objectives (WQOs) from the Department of Environment and Heritage Protection (EHP) '*Queensland Water Quality Guidelines 2009'* dated July 2013 and the Department of Environment and Resource Management (DERM) *'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part), including all tributaries of Caboolture River*' dated July 2010.

As temperature and conductivity results are consistent with historical monitoring results, further interpretation of these parameters is not considered necessary.

With reference to Tables 1 - 7 and the recommended water quality objective values listed, the following conclusions are drawn with respect to the key water quality parameters (Dissolved Oxygen, Chlorophyll-a, Turbidity and pH).

Dissolved Oxygen

Dissolved oxygen readings recorded during the monthly in-situ sampling events were consistently below the recommended WQOs at all locations except Location I (near the mouth of the Caboolture River). These measurements are consistent with the values recorded in previous reporting periods including pre-construction baseline monitoring.

Chlorophyll-a

During the monthly in-situ sampling events, a sample of water was collected from each location then sent to ALS for analysis of chlorophyll-a concentrations. Concentrations of Chlorophyll-a were consistently reported to be marginally above the recommended water quality objective values at monitoring locations within the overall development site (A, D and F). The concentrations of Chlorophyll-a in water samples collected from freshwater locations upstream of the development (A and F) were in most cases, higher than the concentrations detected from the tidally influenced downstream locations (C and D).

Concentrations of chlorophyll A detected at sampling location A were considerably higher than concentrations detected at the downstream sampling location C in all but one sampling round when they were reported to be of equal concentration. sampling rounds and concentrations of chlorophyll A detected at sampling location F were considerably higher than concentrations detected at the downstream sampling location D in all but one instance when they were both reported to be below the laboratory Limit Of Reporting (LOR).

This suggests that the development activities within the watershed above locations C and D are not contributing to significant nutrient entrainment and upstream activities (external to the site) may be the primary source of nutrient loads responsible for the exceedances detected. This provides evidence that the erosion and sediment control measures and artificial wetlands that have been established at the site are effective in reducing nutrient entrainment into the surface waterways intersecting the site. By limiting the amount of nutrients entering Raff Creek and its tributary, algal blooms and the subsequent deterioration of physico-chemical water quality parameters has been controlled to preserve the condition of the local aquatic ecosystem.

Monitoring locations H and G on the Caboolture River were reported to be above the recommended WQOs for Chlorophyll-a for the majority of sampling events. The concentrations of Chlorophyll-a from this reporting period are consistent with the values recorded in previous reporting periods.

Turbidity

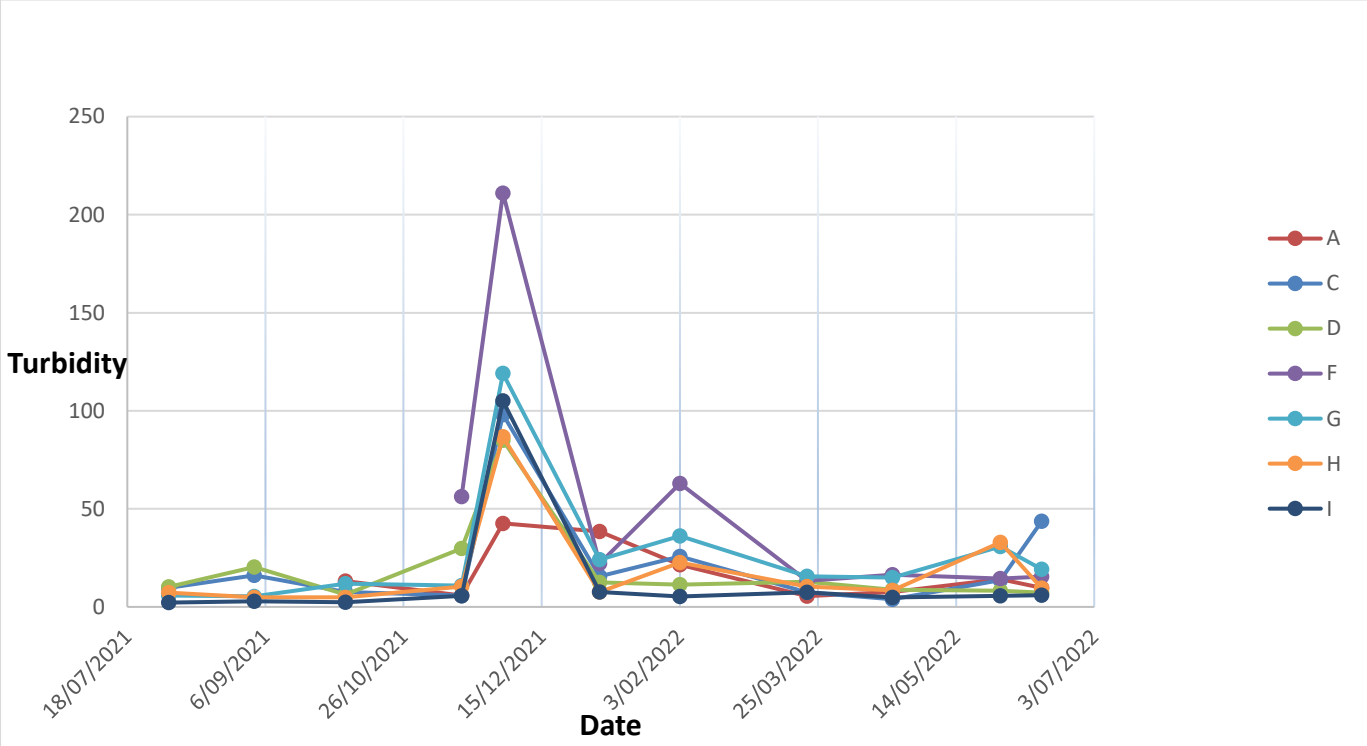
Turbidity readings taken during the 2021-2022 reporting period from the tidally influenced monitoring locations (C, D, G and H) showed consistent exceedances of the recommended WQOs as was observed prior to construction and during previous reporting periods during construction. At the furthermost downstream location (I), turbidity results were consistently below the recommended WQO.

The values recorded at freshwater locations (A and F) during this reporting period were consistent with values obtained for these locations during the pre-construction monitoring and previous reporting periods. Turbidity

readings from freshwater locations upstream of the development (A and F) were comparable to the concentrations detected from the tidally influenced downstream locations (C and D). A spike in turbidity was recorded in December 2021 and to a lesser extent in February 2022.

The results from the current reporting period at locations A, C, D, and F are comparable to the baseline results collected in 2014-2016 from these locations. Graph 1 below presents the turbidity readings for all monitoring locations over the current reporting period.

Graph 1. Turbidity Readings – Locations A, C, D, F, G, H and I



pH

The results from sampling events conducted at upstream freshwater locations (A and F) were within the acceptable range for pH. This is consistent with previous sampling rounds conducted at these locations during and pre-construction monitoring.

The pH values from the three monitoring locations on the Caboolture River (locations G, H and I), were all recorded to be within the acceptable WQOs with exception to locations G and H pH readings in February 2022 which were reported to be marginally below the recommended water quality objectives. This is consistent with data collected during the pre-construction monitoring and the previous reporting periods.

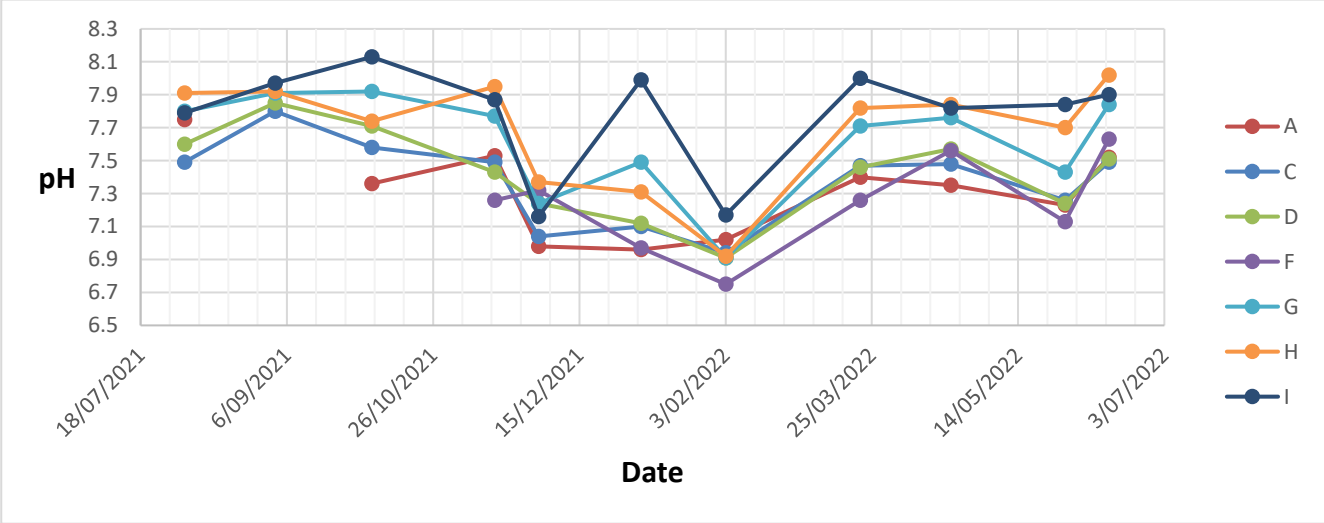
pH values recorded at the tidally influenced monitoring locations on Raff Creek (location C) and the Raff Creek tributary (location D) were recorded to be within the recommended WQOs (pH 7.0 - 8.4) for all but one sampling event in February 2022. The sampling events where pH values were below the WQOs, appeared to be strongly correlated with conductivity values recorded (see Tables 2 and 3). The data suggests that the days where pH was recorded to be below the recommended WQOs, the conductivity values were significantly lower. As surface water flow from rain events significantly decreases the conductivity at locations C and D to levels that

would be encountered in a freshwater environment, the pH decreases to levels within the acceptable range for lowland freshwater locations.

The number of exceedances of the pH WQO at locations C and D during this reporting period appear to be less frequent and to a lesser magnitude when compared to previous reporting periods and the baseline data collected pre-construction. For the upstream freshwater locations (A and F) and the Caboolture River upstream, midstream and downstream tidal locations (H, G and I), the pH data collected over the reporting period is consistent with the values obtained for these locations during the pre-construction monitoring and the previous reporting periods and are not indicative of unacceptable disturbance of Acid Sulphate Soils (ASS) or Potential Acid Sulphate Soils (PASS) resulting from construction activities.

Graph 2 below presents pH readings for each monitoring location over the reporting period.

Graph 2. pH Readings – Locations A, C, D, F, G, H and I.

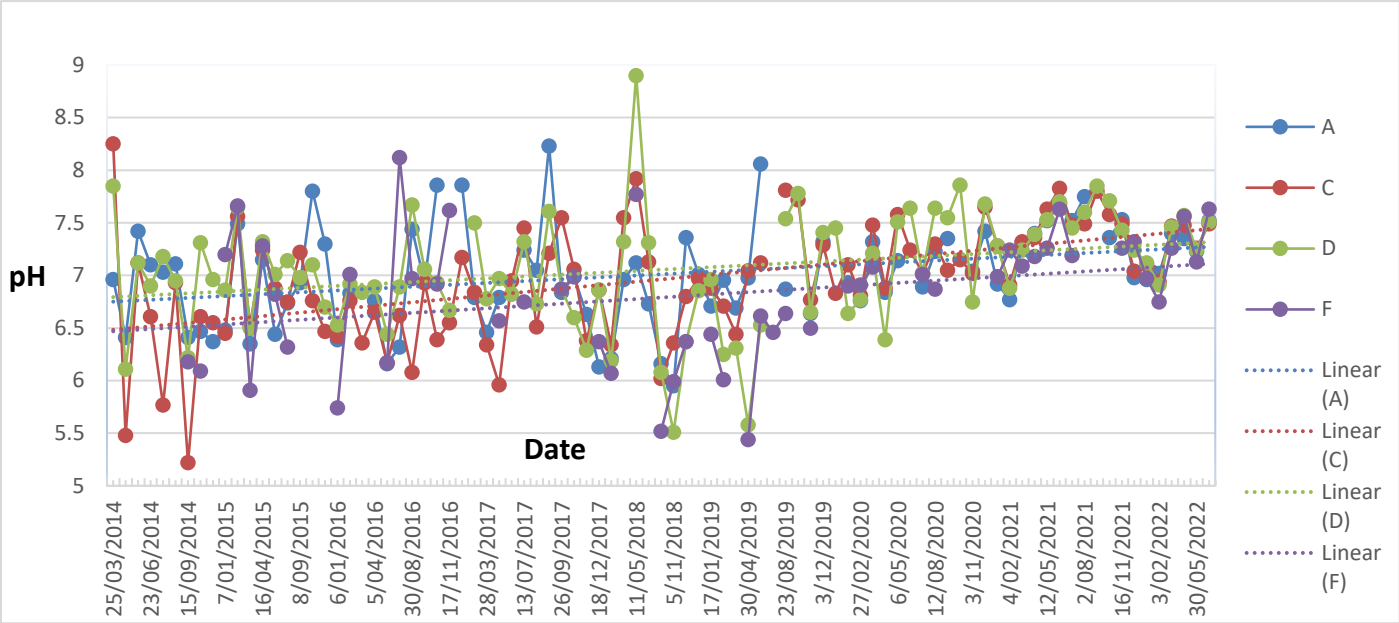


Historical Data Trends

The field and analytical data presented in Tables 1 to 7 indicates that the results from samples collected during the 2021 -2022 reporting period were consistent with the data obtained during previous reporting periods since 2014. The number of exceedances of key WQOs identified at the tidally influenced midstream locations were noted to be less frequent over the current reporting period compared to previous reporting periods before and during construction and were generally consistent with the data obtained upstream of the construction works. The field measurements and analytical results (with water quality objective values highlighted) are presented in Tables 1-7.

Historical pH measurements from sampling locations within the development site (A, C, D and F) have been plotted to show the trend of pH over the total period of the development below in Graph 3.

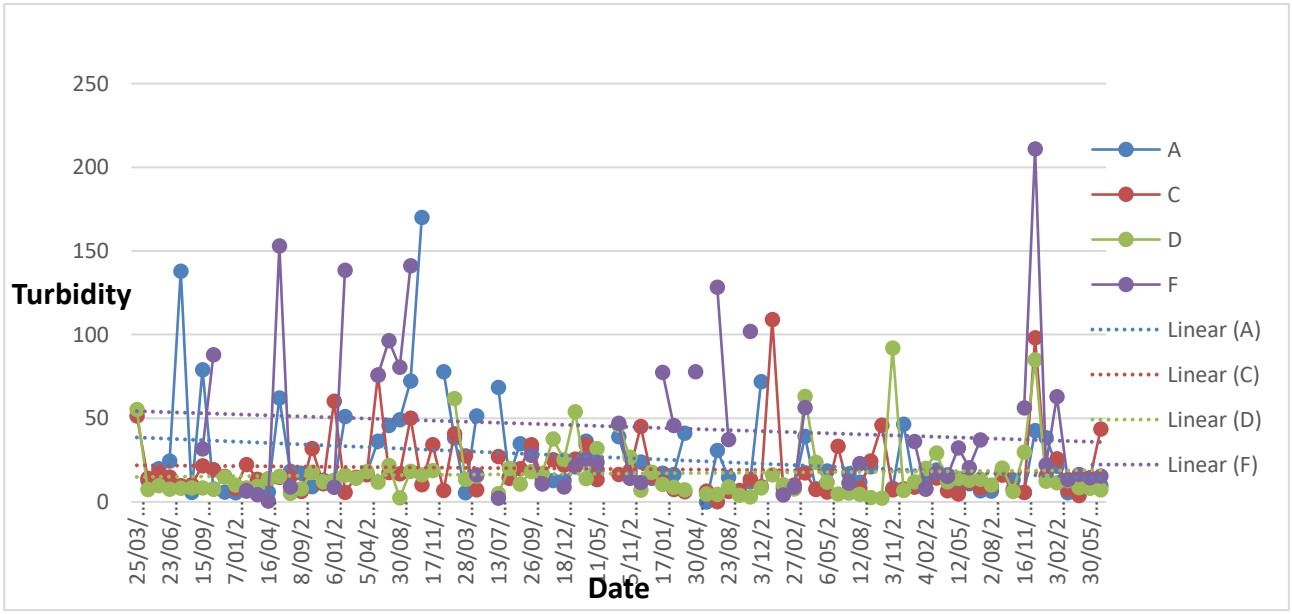
Graph 3. Historical pH Readings and Linear Trend – Locations A, C, D and F



Graph 1 demonstrates the overall trend of increasing pH values in sampling locations A, C, D and F. The trend of increasing pH values in locations C and D provides evidence that if any disturbance of ASS or PASS soils has occurred during the development of the project, it has not impacted the pH of Raff Creek or its tributary. The trend of increasing pH from water samples collected from sampling locations C and D also suggests the management of ASS/PASS at the development site has been successful in mitigating any acidification of Raff Creek and its tributary over the duration of the project development.

Historical turbidity measurements from sampling locations within the development site (A, C, D and F) have been plotted to show the trend of pH over the total period of the development below in Graph 4.

Graph 4. Historical Turbidity Readings and Linear Trend – Locations A, C D and F



Graph 4 demonstrates that turbidity readings that have been taken prior to and during construction from sampling locations within the site (A, C, D and F) have decreased and location D has remained relatively stable. This suggests that the sediment and erosion control measures used during construction have been successful in improving or maintaining water clarity within Raff Creek and its tributary.

Conclusions

Based on the results of this monitoring, it appears that any impact to the quality of the surface water of the site, from past and current construction works has been mitigated and there is little evidence of any significant impact to the water quality since the commencement of construction activities on the site.

The number of exceedances of the pH WQO at locations C and D during this reporting period appear to be less frequent and to a lesser magnitude when compared to previous reporting periods and the baseline data collected pre- construction, suggesting an improvement of this key water quality indicator. The sediment and erosion control measures and the amelioration of any ASS/PASS disturbance employed by the bulk earthworks contractor are deemed satisfactory to minimise impact on surface water quality

Turbidity readings taken prior to and during construction from sampling locations within the site (A, C, D and F) have shown a decreasing trend with location D remaining relatively stable. This suggests that the sediment and erosion control measures used during construction have been successful in reducing sediment entrainment into the local waterways which has improved or at minimum, maintained water clarity within Raff Creek and its tributary.

If you have any questions regarding this letter report, please contact the undersigned on 0401 671 624 or james@lithaqua.com

Yours sincerely,

James Hall-Brown

BSc (Environment)

Senior Environmental Scientist

Enclosures:

Tables

Figures

Photographs

Laboratory Reports

EB2121620
EB2123939
EB2128066
EB2132976
EB2134841
EB2200174
EB2202780
EB2207728
EB2211064
EB2215248
EB2216953

Tables

Table 1
Water Quality Monitoring Data Summary
Location A - Upstream Raff Creek
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
Upstream Raff Creek	A	2/08/2021	**6.5**	**17.8**	**94**	**234**	**7.75**	**No**	**2**
	A	2/09/2021	**Dry - sample not collected**						
	A	5/10/2021	**13.2**	**23.0**	**53**	**277**	**7.36**	**No**	**4**
	A	16/11/2021	**5.8**	**23.8**	**65**	**187**	**7.53**	**No**	**7**
	A	1/12/2021	**42.6**	**24.1**	**56**	**90**	**6.98**	**No**	**3**
	A	5/01/2022	**38.5**	**25.2**	**37**	**176**	**6.96**	**Timber and plastic wrapper**	**33**
	A	3/02/2022	**21.5**	**25.1**	**45**	**166**	**7.02**	**No**	**3**
	A	21/03/2022	**5.5**	**24.6**	**46**	**228**	**7.40**	**Aluminium can**	**8**
	A	21/04/2022	**7.6**	**21.4**	**50**	**203**	**7.35**	**No**	**11**
	A	30/05/2022	**14.2**	**19.3**	**38**	**225**	**7.23**	**No**	<1
	A	14/06/2022	**9.8**	**17.3**	**55**	**226**	**7.52**	**Plastic bottle**	<1

Notes:
- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) '*Queensland Water Quality Guidelines 2009*' dated July 2013 and the Department of Environment and Resource Management (DERM) *'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part),including all tributaries of Caboolture River*' dated July 2010;
- "°" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
"--" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 2
Water Quality Monitoring Data Summary
Location C - Midstream Raff Creek
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS			**Turbidity** (NTU)	**Temperature** (C°)	**Dissolved Oxygen** (% Saturation)	**Conductivity** (µS/cm)	**pH** (-log[H+])	**^Litter** (>5mm)	**Chlorophyll-a** (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
Midstream Raff Creek	C	2/08/2021	**9.7**	**18.5**	**84**	**3090**	**7.49**	**No**	<1
	C	2/09/2021	**16.1**	**21.6**	**90**	**15100**	**7.80**	**No**	<1
	C	5/10/2021	**7.6**	**22.9**	**61**	**32800**	**7.58**	**No**	**2**
	C	16/11/2021	**5.8**	**24.1**	**62**	**456**	**7.49**	**No**	**5**
	C	1/12/2021	**98.1**	**25.8**	**60**	**125**	**7.04**	**No**	<2
	C	5/01/2022	**15.6**	**25.2**	**47**	**850**	**7.10**	**Plastic bottle ad plastic wrapper**	<2
	C	3/02/2022	**25.8**	**25.8**	**56**	**413**	**6.94**	**No**	**3**
	C	21/03/2022	**7.4**	**25.3**	**36**	**886**	**7.47**	**No**	<2
	C	21/04/2022	**3.9**	**22.3**	**57**	**4160**	**7.48**	**No**	<2
	C	30/05/2022	**13.6**	**20.6**	**46**	**358**	**7.26**	**No**	<1
	C	14/06/2022	**43.6**	**19.1**	**81**	**3870**	**7.49**	**No**	<1

Notes:
- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) '*Queensland Water Quality Guidelines 2009'* dated July 2013 and the Department of Environment and Resource Management (DERM) *'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part),including all tributaries of Caboolture River'* dated July 2010;
- "°" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
"--" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
- "^" Litter results are based on a visual assessment of the sampling location on the day of sampling.

Table 3
Water Quality Monitoring Data Summary
Location D - Midstream Raff Creek Tributary
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS			**Turbidity** (NTU)	**Temperature** (C°)	**Dissolved Oxygen** (% Saturation)	**Conductivity** (µS/cm)	**pH** (-log[H+])	**^Litter** (>5mm)	**Chlorophyll-a** (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
Midstream Raff Creek Tributary	D	2/08/2021	**10.2**	**17.6**	**62**	**417**	**7.6**	**Timber**	<1
	D	2/09/2021	**20.3**	**20.8**	**105**	**3570**	**7.85**	**No**	**4**
	D	5/10/2021	**6.3**	**23.9**	**76**	**34400**	**7.71**	**No**	**3**
	D	16/11/2021	**29.8**	**23.7**	**48**	**211**	**7.43**	**No**	**6**
	D	1/12/2021	**85.0**	**25.7**	**55**	**182**	**7.24**	**No**	**3**
	D	5/01/2022	**12.5**	**25.3**	**--**	**189**	**7.12**	**Timber and roofing sheet**	**8**
	D	3/02/2022	**11.4**	**25.4**	**45**	**369**	**6.91**	**No**	**4**
	D	21/03/2022	**12.9**	**24.9**	**48**	**248**	**7.46**	**Foam**	**4**
	D	21/04/2022	**8.7**	**22.2**	**55**	**1250**	**7.57**	**No**	**4**
	D	30/05/2022	**8.2**	**20.1**	**48**	**219**	**7.24**	**No**	<1
	D	14/06/2022	**7.2**	**18.7**	**62**	**552**	**7.51**	**No**	<1

Notes:
- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) '*Queensland Water Quality Guidelines 2009*' dated July 2013 and the Department of Environment and Resource Management (DERM) *'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part),including all tributaries of Caboolture River*' dated July 2010;
- "°" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
- "-" Indicates the value is not applicable;
"--" Indicates the reading was not taken due to equipment failure or error;
- Highlighted values indicate a result in excess of the recommended Water Quality Objectives; and
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Table 4
Water Quality Monitoring Data Summary
Location F - Upstream Raff Creek Tributary
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
Upstream Raff Creek Tributary	F	2/08/2021	**Dry - sample not collected**						
	F	2/09/2021	**Dry - sample not collected**						
	F	5/10/2021	**Dry - sample not collected**						
	F	16/11/2021	**56.2**	**23.8**	**26**	**160**	**7.26**	**No**	**13**
	F	1/12/2021	**211.0**	**24.1**	**56**	**133**	**7.32**	**No**	**6**
	F	5/01/2022	**22.2**	**25.1**	**--**	**149**	**6.97**	**No**	**21**
	F	3/02/2022	**62.9**	**24.9**	**36**	**190**	**6.75**	**Foam box**	**6**
	F	21/03/2022	**13.3**	**24.7**	**41**	**143**	**7.26**	**Plastic bottle**	**76**
	F	21/04/2022	**16.4**	**21.8**	**75**	**222**	**7.56**	**No**	**29**
	F	30/05/2022	**14.5**	**19.8**	**22**	**186**	**7.13**	**Aluminium can**	<1
	F	14/06/2022	**15.5**	**19.3**	**80**	**220**	**7.63**	**No**	**10**

Notes:
- "*" Recommended Water Quality Objectives from the Department of Environment and Heritage Protection (EHP) '*Queensland Water Quality Guidelines 2009'* dated July 2013 and the Department of Environment and Resource Management (DERM) *'Environmental Protection (Water) Policy 2009 Caboolture River environmental values and water quality objectives Basin No. 142 (part),including all tributaries of Caboolture River'* dated July 2010;
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Table 5
Water Quality Monitoring Data Summary
Location G - Caboolture River
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS				Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
Caboolture River	G	2/08/2021	**5.8**	**19.7**	**78**	**26300**	**7.80**	**No**	**3**
	G	2/09/2021	**5.4**	**23.1**	**112**	**38100**	**7.91**	**Glass bottle**	**4**
	G	5/10/2021	**11.8**	**23.7**	**82**	**47100**	**7.92**	**No**	**6**
	G	16/11/2021	**10.9**	**23.9**	**81**	**17900**	**7.77**	**No**	**13**
	G	1/12/2021	**119.0**	**25.1**	**90**	**142**	**7.24**	**No**	<4
	G	5/01/2022	**24.1**	**25.7**	**70**	**18400**	**7.49**	**No**	<2
	G	3/02/2022	**36.1**	**25.8**	**53**	**5640**	**6.91**	**Plastic bottle and aluminium can**	**2**
	G	21/03/2022	**15.6**	**25.4**	**77**	**6150**	**7.71**	**No**	**8**
	G	21/04/2022	**14.9**	**23.1**	**66**	**16700**	**7.76**	**No**	**6**
	G	30/05/2022	**30.7**	**20.1**	**60**	**575**	**7.43**	**No**	<2
	G	14/06/2022	**19.2**	**19.3**	**84**	**5770**	**7.84**	**No**	**7**

Notes:
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- "°" Water Quality Parameters as recommended in the Northeast Business Park -Residential West Water Quality Plan (V7) prepared by Cardino, 3 February 2015);
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Table 6
Water Quality Monitoring Data Summary
Location H - Caboolture River
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
Caboolture River	H	2/08/2021	**7.2**	**19.9**	**68**	**3260**	**7.91**	**Plastic bottles and broken glass**	**11**
	H	2/09/2021	**4.9**	**21.2**	**95**	**12300**	**7.92**	**No**	**5**
	H	5/10/2021	**4.9**	**24.1**	**50**	**21800**	**7.74**	**Broken glass**	**5**
	H	16/11/2021	**10.3**	**24.6**	**55**	**611**	**7.95**	**Plastic bottles and broken glass**	**4**
	H	1/12/2021	**86.7**	**25.6**	**95**	**108**	**7.37**	**Broken glass**	<2
	H	5/01/2022	**7.6**	**25.7**	**65**	**267**	**7.31**	**No**	**4**
	H	3/02/2022	**22.7**	**25.2**	**44**	**279**	**6.92**	**Glass bottles**	**4**
	H	21/03/2022	**10.4**	**24.6**	**60**	**526**	**7.82**	**No**	**5**
	H	21/04/2022	**8.5**	**21.3**	**46**	**478**	**7.84**	**No**	**9**
	H	30/05/2022	**32.9**	**19.9**	**80**	**322**	**7.7**	**No**	<1
	H	14/06/2022	**9.6**	**18.8**	**86**	**446**	**8.02**	**Plastic wrappers and newspaper**	**7**

Notes:
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Table 7
Water Quality Monitoring Data Summary
Location I - Caboolture River
North Harbour - Water Quality Monitoring - 2021/2022 Reporting Period
North Harbour, 44 Brook Cresent, Burpengary East QLD

°WATER QUALITY PARAMETERS			Turbidity (NTU)	Temperature (C°)	Dissolved Oxygen (% Saturation)	Conductivity (µS/cm)	pH (-log[H+])	^Litter (>5mm)	Chlorophyll-a (mg/m³)
Laboratory Limit of Reporting (LOR)			0.1	-	0.1	1	0.01	-	1 mg/m³
*RECOMMENDED WATER QUALITY OBJECTIVES		Lowland Freshwater	**<50 NTU**	-	**85-110%**	-	**6.5-8.0**	-	**5**
		Middle Estuary	**<8NTU**	-	**85-105%**	-	**7.0 - 8.4**	-	**4**
Location	Sample ID	Date							
	I	2/08/2021	**2.2**	**20.6**	**86**	**38500**	**7.79**	**Bait packet**	**3**
	I	2/09/2021	**2.8**	**21.5**	**111**	**46600**	**7.97**	**No**	**4**
	I	5/10/2021	**2.3**	**23.8**	**88**	**52400**	**8.13**	**Plastic wrapper**	**1**
	I	16/11/2021	**5.6**	**24.9**	**77**	**30100**	**7.87**	**No**	**8**
	I	1/12/2021	**105.0**	**26.2**	**66**	**1160**	**7.16**	**Plastic wrapper**	<5
	I	5/01/2022	**7.6**	**25.9**	**85**	**42200**	**7.99**	**Bait packet and newspaper**	**3**
	I	3/02/2022	**5.3**	**26.2**	**62**	**45800**	**7.17**	**No**	**4**
	I	21/03/2022	**7.4**	**25.8**	**91**	**32200**	**8.00**	**No**	**5**
	I	21/04/2022	**4.9**	**23.3**	**68**	**33700**	**7.82**	**Bait packets**	**5**
	I	30/05/2022	**5.7**	**20.4**	**79**	**29100**	**7.84**	**No**	**4**
	I	14/06/2022	**6.0**	**19.4**	**99**	**31800**	**7.90**	**Glass bottle**	**3**

Notes:
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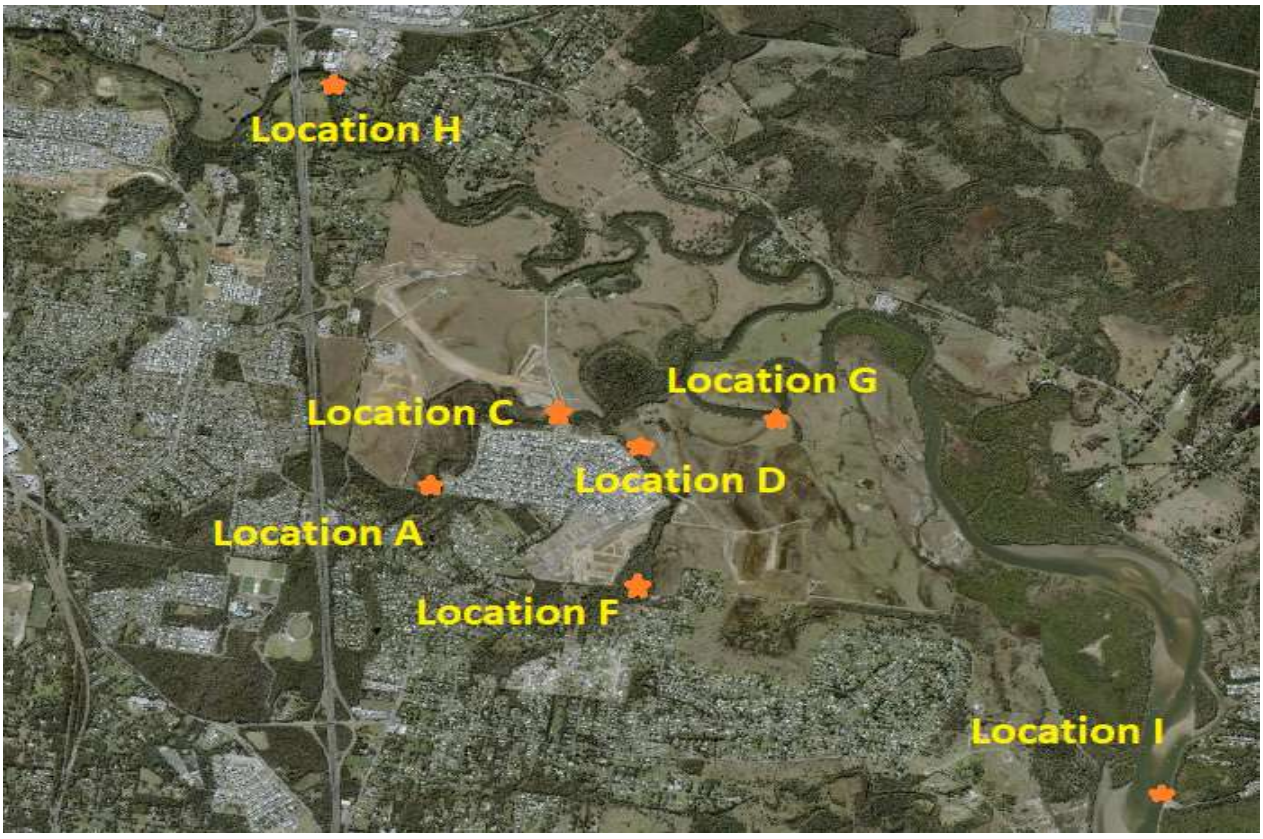
Figures

Figure 1: Site Water Quality Monitoring Locations

Figure 2: External and Site Water Quality Monitoring Locations



Photographs

Photograph 1: A photograph of Location A in September 2021.

Photograph 2: Location A after flooding in March 2022.

Photograph 3: A photograph of Location C in August 2021.

Photograph 4: Location C in March 2022 after flooding and repairs to the culvert.

Photograph 5: A photograph of Location D taken in January 2022.

Photograph 6: This photograph was taken from Location H in August 2022.

Photograph 7: Location H after flooding of the Caboolture River in March 2022.

Photograph 8: This photograph was taken in August 2021 showing Location I.

Laboratory Reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2121620**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 02-Aug-2021 13:55
Order number	: ----	Date Analysis Commenced	: 02-Aug-2021
C-O-C number	: ----	Issue Date	: 06-Aug-2021 15:45
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	A	C	D	I	G
				Sampling date / time	02-Aug-2021 00:00	02-Aug-2021 00:00	02-Aug-2021 00:00	02-Aug-2021 00:00	02-Aug-2021 00:00
					EB2121620-001	EB2121620-002	EB2121620-003	EB2121620-004	EB2121620-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.75**	**7.49**	**7.60**	**7.79**	**7.80**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**234**	**3090**	**417**	**38500**	**26300**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**6.5**	**9.7**	**10.2**	**2.2**	**5.8**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		**2**	<1	<1	**3**	**3**
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**94.0**	**84.0**	**62.0**	**86.0**	**78.0**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	**H**	----	----	----	----
				Sampling date / time	02-Aug-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2121620-006**	--------	--------	--------	--------
					Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.91**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**3260**	----	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU		**7.2**	----	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		**11**	----	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**68.0**	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2121620**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 02-Aug-2021
Order number	: ----	Date Analysis Commenced	: 02-Aug-2021
C-O-C number	: ----	Issue Date	: 06-Aug-2021
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 3827978)									
EB2121484-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	4.43	4.56	2.9	0% - 20%
EB2121582-006	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.63	7.65	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 3827976)									
EB2120262-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	907	901	0.7	0% - 20%
EB2121444-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1280	1280	0.2	0% - 20%
EA045: Turbidity (QC Lot: 3825862)									
EB2121558-001	Anonymous	EA045: Turbidity	----	0.1	NTU	0.1	0.1	0.0	No Limit
EB2121565-001	Anonymous	EA045: Turbidity	----	0.1	NTU	3.2	3.1	0.0	0% - 20%
EA045: Turbidity (QC Lot: 3825863)									
EB2121620-006	H	EA045: Turbidity	----	0.1	NTU	7.2	7.2	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 3827978)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 3827976)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.2	91.0	107
				<1	12890 µS/cm	98.2	91.0	107
EA045: Turbidity (QCLot: 3825862)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	99.5	90.0	110
EA045: Turbidity (QCLot: 3825863)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	99.5	90.0	110
EP008: Chlorophyll (QCLot: 3826501)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	95.0	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2121620**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 02-Aug-2021
Site	: ----	Issue Date	: 06-Aug-2021
Sampler	: JAMES HALL-BROWN	No. of samples received	: 6
Order number	: ----	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, I, G, H	----	----	----	04-Aug-2021	02-Aug-2021	**2**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, I, G, H	**02-Aug-2021**	**----**	----	----	**04-Aug-2021**	02-Aug-2021	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, I, G, H	**02-Aug-2021**	**----**	----	----	**04-Aug-2021**	30-Aug-2021	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, I, G, H	**02-Aug-2021**	**----**	----	----	**03-Aug-2021**	04-Aug-2021	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, I, G, H	**02-Aug-2021**	**----**	----	----	**03-Aug-2021**	04-Aug-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, I, G, H	**02-Aug-2021**	**----**	----	----	**02-Aug-2021**	02-Aug-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	30	**20.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2121620**		
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 NHH-WQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 02-Aug-2021 13:55	Issue Date	: 03-Aug-2021
Client Requested Due Date	: 09-Aug-2021	Scheduled Reporting Date	: **09-Aug-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.6°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised, sample marked as "I" on containers received has been allocated as sample "F" as per chain of custody. If this is incorrect please contact Client Services at ALSEnviro.Brisbane@alsglobal.com.**
- ***SRN Reissued 03/08/2021: Change to Identification for ALS Sample #003 from F to I, requested by client 03/08/2021***
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidty	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2121620-001	02-Aug-2021 00:00	A	✓	✓	✓	✓	✓
EB2121620-002	02-Aug-2021 00:00	C	✓	✓	✓	✓	✓
EB2121620-003	02-Aug-2021 00:00	D	✓	✓	✓	✓	✓
EB2121620-004	02-Aug-2021 00:00	I	✓	✓	✓	✓	✓
EB2121620-005	02-Aug-2021 00:00	G	✓	✓	✓	✓	✓
EB2121620-006	02-Aug-2021 00:00	H	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: LITTAQUA PTY LTD

OFFICE: PEREGIAN BEACH

PROJECT: NHH - WQM

PROJECT NO.: LP14612B

ORDER NUMBER:

PURCHASE ORDER NO.:

PROJECT MANAGER: JAMES HALL-BROWN

CONTACT PH: 0401674624

SAMPLER:

SAMPLER MOBILE:

COC Emailed to ALS? (YES / NO)

EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are listed): james@littaqua.com

Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

☒ Standard TAT (List due date):

☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)

coc: 8 2 3 4 5 6 7

of: 1 2 3 4 5 6 7

RELINQUISHED BY: JAMES HALL-BROWN

DATE/TIME: 2/8/21 13:55

RECEIVED BY: [illegible] 2/8/21

DATE/TIME: 1355

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

Free ice / frozen ice bricks present upon receipt? Yes No N/A

Random Sample Temperature on Receipt:

Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	CHLOROPHYLL-A	PH	E.C.	DO (% SAT)	TURBIDITY	Additional Information
1	A	2/8/21	W	P	2	X	X	X	X	X	
2	C	"	"	"	"	X	X	X	X	X	
3	D	"	"	"	"	X	X	X	X	X	
4	E	"	"	"	"	X	X	X	X	X	
5	G	"	"	"	"	X	X	X	X	X	
6	H	"	"	"	"	X	X	X	X	X	

Lined near Spit #42

F missing, I [illegible]

TOTAL

HT

Environmental Division Brisbane
Work Order Reference
EB2121620

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2124939**	Page	: 1 of 2
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 02-Sep-2021 15:00
Order number	: ----	Date Analysis Commenced	: 03-Sep-2021
C-O-C number	: ----	Issue Date	: 19-Oct-2021 09:26
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 5		
No. of samples analysed	: 5		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Sample ID	C	D	G	H	I
			Sampling date / time	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00	02-Sep-2021 00:00
Compound	*CAS Number*	*LOR*	*Unit*	**EB2124939-001**	**EB2124939-002**	**EB2124939-003**	**EB2124939-004**	**EB2124939-005**
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.80**	**7.85**	**7.91**	**7.92**	**7.97**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**15100**	**3570**	**38100**	**12300**	**46600**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**16.1**	**20.3**	**5.4**	**4.9**	**2.8**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	**4**	**4**	**5**	**4**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**90.0**	**105**	**112**	**95.0**	**111**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2124939**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 02-Sep-2021
Order number	: ----	Date Analysis Commenced	: 03-Sep-2021
C-O-C number	: ----	Issue Date	: 19-Oct-2021
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 3888790)									
EB2124716-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.66	7.72	0.8	0% - 20%
ET2103193-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.96	8.03	0.9	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 3888789)									
EB2124716-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2740	2700	1.5	0% - 20%
ET2103193-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	289	288	0.4	0% - 20%
EA045: Turbidity (QC Lot: 3883035)									
EB2124929-013	Anonymous	EA045: Turbidity	----	0.1	NTU	1.1	1.1	0.0	0% - 50%
EB2124939-004	H	EA045: Turbidity	----	0.1	NTU	4.9	4.9	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 3888790)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 3888789)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	96.9	91.0	107
				<1	24800 µS/cm	99.0	91.0	107
EA045: Turbidity (QCLot: 3883035)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	99.0	90.0	110
				<0.1	400 NTU	98.2	90.0	110
EP008: Chlorophyll (QCLot: 3882958)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	105	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2124939**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 02-Sep-2021
Site	: ----	Issue Date	: 19-Oct-2021
Sampler	: JAMES HALL-BROWN	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
C, D, G, H, I	----	----	----	08-Sep-2021	03-Sep-2021	**5**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
C, D, G, H, I	**02-Sep-2021**	**----**	----	----	**08-Sep-2021**	03-Sep-2021	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
C, D, G, H, I	**02-Sep-2021**	**----**	----	----	**08-Sep-2021**	30-Sep-2021	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
C, D, G, H, I	**02-Sep-2021**	**----**	----	----	**03-Sep-2021**	04-Sep-2021	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
C, D, G, H, I	**02-Sep-2021**	**----**	----	----	**03-Sep-2021**	04-Sep-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
C, D, G, H, I	**02-Sep-2021**	**----**	----	----	**03-Sep-2021**	03-Sep-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	18	**16.67**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2124939**

Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 NHH-WQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 02-Sep-2021 15:00	Issue Date	: 02-Sep-2021
Client Requested Due Date	: 10-Sep-2021	Scheduled Reporting Date	: **10-Sep-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 9.1°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 5 / 5

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2124939-001	02-Sep-2021 00:00	C	✓	✓	✓	✓	✓
EB2124939-002	02-Sep-2021 00:00	D	✓	✓	✓	✓	✓
EB2124939-003	02-Sep-2021 00:00	G	✓	✓	✓	✓	✓
EB2124939-004	02-Sep-2021 00:00	H	✓	✓	✓	✓	✓
EB2124939-005	02-Sep-2021 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

CLIENT: LITHAQUA PTY LTD
OFFICE: [illegible]
PROJECT: NHH water
PROJECT NO: [illegible]
ORDER NUMBER:
PURCHASE ORDER NO.:
PROJECT MANAGER: JAMES HALL-BROWN
CONTACT PH: [illegible]
SAMPLER:
SAMPLER MOBILE:
COC Emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to: james@lithaqua.com
Email Invoice to:

TURNAROUND REQUIREMENTS: Standard TAT
ALS QUOTE NO.:
COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 8 / OF: 1

FOR LABORATORY USE ONLY (Circle)

HT

RELINQUISHED BY: James Hall-Brown — DATE/TIME: 2/9/21 15:50
RECEIVED BY: Chaos [illegible] — DATE/TIME: 2/9/21 1500
RELINQUISHED BY: DATE/TIME:
RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

Environmental Division
Brisbane
Work Order Reference
EB2124939

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL BOTTLES	pH	E.C.	D.O. (Conc)	TURBIDITY	CHLOROPHYLL A
1	C	2/9/21	W	P	2	X	X	X	X	X
2	D	2/9/21	W	P	2	X	X	X	X	X
3	G	2/9/21	W	P	2	X	X	X	X	X
4	H	2/9/21	W	P	2	X	X	X	X	X
5	I	2/9/21	W	P	2	X	X	X	X	X
	A	DRY – NO SAMPLES								
	E	DRY – NO SAMPLES								

TOTAL

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; [illegible]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2128066**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHHWQM	Date Samples Received	: 05-Oct-2021 12:48
Order number	: ----	Date Analysis Commenced	: 05-Oct-2021
C-O-C number	: ----	Issue Date	: 19-Oct-2021 09:26
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	A	C	D	G	H
				Sampling date / time	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
					EB2128066-001	EB2128066-002	EB2128066-003	EB2128066-005	EB2128066-006
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.36**	**7.58**	**7.71**	**7.92**	**7.74**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**277**	**32800**	**34400**	**47100**	**21800**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**13.2**	**7.6**	**6.3**	**11.8**	**4.9**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		**4**	**2**	**3**	**6**	**5**
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**53.0**	**61.0**	**76.0**	**82.0**	**50.0**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Sample ID	I	----	----	----	----
				Sampling date / time	05-Oct-2021 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB2128066-007**	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	**8.13**	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	**52400**	----	----	----	----
EA045: Turbidity									
Turbidity	----	0.1	NTU	**2.3**	----	----	----	----
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³	**1**	----	----	----	----
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**88.0**	----	----	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2128066**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHHWQM	Date Samples Received	: 05-Oct-2021
Order number	: ----	Date Analysis Commenced	: 05-Oct-2021
C-O-C number	: ----	Issue Date	: 19-Oct-2021
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 6		
No. of samples analysed	: 6		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 3942292)									
EB2128010-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.95	8.03	1.0	0% - 20%
EB2128038-004	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.22	8.21	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 3942293)									
EB2128010-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	755	754	0.0	0% - 20%
EB2128038-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	227	228	0.0	0% - 20%
EA045: Turbidity (QC Lot: 3938826)									
EB2128066-001	A	EA045: Turbidity	----	0.1	NTU	13.2	13.1	0.8	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 3942292)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	101	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 3942293)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	91.0	107
				<1	12890 µS/cm	98.2	91.0	107
EA045: Turbidity (QCLot: 3938826)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	99.8	90.0	110
				<0.1	400 NTU	99.0	90.0	110
EP008: Chlorophyll (QCLot: 3940685)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	90.0	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2128066**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHHWQM	Date Samples Received	: 05-Oct-2021
Site	: ----	Issue Date	: 19-Oct-2021
Sampler	: JAMES HALL-BROWN	No. of samples received	: 6
Order number	: ----	No. of samples analysed	: 6

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, G, H, I	----	----	----	07-Oct-2021	05-Oct-2021	**2**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, G, H, I	**05-Oct-2021**	**----**	----	----	**07-Oct-2021**	05-Oct-2021	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, G, H, I	**05-Oct-2021**	**----**	----	----	**07-Oct-2021**	02-Nov-2021	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, G, H, I	**05-Oct-2021**	**----**	----	----	**05-Oct-2021**	07-Oct-2021	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, G, H, I	**05-Oct-2021**	**----**	----	----	**06-Oct-2021**	07-Oct-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, G, H, I	**05-Oct-2021**	**----**	----	----	**05-Oct-2021**	05-Oct-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	8	**37.50**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2128066**		
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHHWQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 05-Oct-2021 12:48	Issue Date	: 05-Oct-2021
Client Requested Due Date	: 11-Oct-2021	Scheduled Reporting Date	: **11-Oct-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 16.3°C - Ice present
Receipt Detail	: MEDIUM HARD ESKY	No. of samples received / analysed	: 6 / 6

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2128066-001	05-Oct-2021 00:00	A	✓	✓	✓	✓	✓
EB2128066-002	05-Oct-2021 00:00	C	✓	✓	✓	✓	✓
EB2128066-003	05-Oct-2021 00:00	D	✓	✓	✓	✓	✓
EB2128066-005	05-Oct-2021 00:00	G	✓	✓	✓	✓	✓
EB2128066-006	05-Oct-2021 00:00	H	✓	✓	✓	✓	✓
EB2128066-007	05-Oct-2021 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: LITHADUA PTY LTD
OFFICE: [illegible] BEACH
PROJECT: NHH WQM — PROJECT NO.: LP140120
ORDER NUMBER: — PURCHASE ORDER NO.:
PROJECT MANAGER: JAMES HALL-BROWN — CONTACT PH: 0401 591624
SAMPLER: " — SAMPLER MOBILE: "
COC Emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed):
Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
ALS QUOTE NO.:
COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 8 2 3 4 5 6 7 — OF: 8 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt: °C; Other comment:

RELINQUISHED BY: JAMES HALL-BROWN — DATE/TIME: 5/10/21 12:45
RECEIVED BY: DANEIA — DATE/TIME: 12:48 5/10/21
RELINQUISHED BY: — DATE/TIME:
RECEIVED BY: — DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL BOTTLES	pH	E.C.	DO (% only)	TURBIDITY	CHLOROPHYLL-A	Additional Information
	A	5/10/21	W		2	X	X	X	X	X	
	C	"	"		"	X	X	X	X	X	
	D	"	"		"	X	X	X	X	X	
	E	"	"		DRY - NO SAMPLE collected						
	G	"	"		X	X	X	X	X	X	
	H	"	"		X	X	X	X	X	X	
	I	"	"		"	X	X	X	X	X	
				TOTAL							

ALS USE ONLY — SAMPLE DETAILS MATRIX: Solid(S) Water(W) — CONTAINER INFORMATION — ANALYSIS REQUIRED including SUITES

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Environmental Division
Brisbane
Work Order Reference
EB2128066

Telephone: + 61-7 3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2132976**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: NHH LP140120	Date Samples Received	: 16-Nov-2021 14:00
Order number	: ----	Date Analysis Commenced	: 16-Nov-2021
C-O-C number	: ----	Issue Date	: 26-Nov-2021 09:05
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	16-Nov-2021 00:00	16-Nov-2021 00:00	16-Nov-2021 00:00	16-Nov-2021 00:00	16-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	EB2132976-001	EB2132976-002	EB2132976-003	EB2132976-004	EB2132976-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.53**	**7.49**	**7.43**	**7.26**	**7.77**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**187**	**456**	**211**	**160**	**17900**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**5.8**	**5.8**	**29.8**	**56.2**	**10.9**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**7**	**5**	**6**	**13**	**13**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**65.0**	**62.0**	**48.0**	**26.0**	**81.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	16-Nov-2021 00:00	16-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2132976-006	EB2132976-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.95**	**7.87**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**611**	**30100**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**10.3**	**5.6**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**4**	**8**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**55.0**	**77.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2132976**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: NHH LP140120	Date Samples Received	: 16-Nov-2021
Order number	: ----	Date Analysis Commenced	: 16-Nov-2021
C-O-C number	: ----	Issue Date	: 26-Nov-2021
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4023720)									
EB2129506-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.24	8.24	0.0	0% - 20%
EB2132776-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.16	6.14	0.3	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4023721)									
EB2132983-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	3	97.7	No Limit
EB2132776-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	0.0	No Limit
EA045: Turbidity (QC Lot: 4018294)									
EB2132828-001	Anonymous	EA045: Turbidity	----	0.1	NTU	<0.1	<0.1	0.0	No Limit
EB2132942-002	Anonymous	EA045: Turbidity	----	0.1	NTU	28.2	28.1	0.4	0% - 20%
EA045: Turbidity (QC Lot: 4018295)									
EB2132976-003	D	EA045: Turbidity	----	0.1	NTU	29.8	29.7	0.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4023720)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	98.8	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4023721)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	97.9	91.0	107
				<1	12890 µS/cm	96.5	91.0	107
EA045: Turbidity (QCLot: 4018294)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	98.8	90.0	110
				<0.1	400 NTU	98.2	90.0	110
EA045: Turbidity (QCLot: 4018295)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	98.8	90.0	110
				<0.1	400 NTU	98.2	90.0	110
EP008: Chlorophyll (QCLot: 4023197)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	95.0	85.0	123
EP008: Chlorophyll (QCLot: 4023198)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	95.0	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2132976**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: NHH LP140120	Date Samples Received	: 16-Nov-2021
Site	: ----	Issue Date	: 26-Nov-2021
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, F, G, H, I	----	----	----	20-Nov-2021	16-Nov-2021	**4**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**16-Nov-2021**	**----**	----	----	**20-Nov-2021**	16-Nov-2021	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**16-Nov-2021**	**----**	----	----	**20-Nov-2021**	14-Dec-2021	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**16-Nov-2021**	**----**	----	----	**16-Nov-2021**	18-Nov-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**16-Nov-2021**	**----**	----	----	**18-Nov-2021**	18-Nov-2021	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**16-Nov-2021**	**----**	----	----	**16-Nov-2021**	16-Nov-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	25	**24.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	25	**8.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2132976**

Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: ----	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: NHH LP140120	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 16-Nov-2021 14:00	Issue Date	: 16-Nov-2021
Client Requested Due Date	: 23-Nov-2021	Scheduled Reporting Date	: **23-Nov-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 2.0°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2132976-001	16-Nov-2021 00:00	A	✓	✓	✓	✓	✓
EB2132976-002	16-Nov-2021 00:00	C	✓	✓	✓	✓	✓
EB2132976-003	16-Nov-2021 00:00	D	✓	✓	✓	✓	✓
EB2132976-004	16-Nov-2021 00:00	F	✓	✓	✓	✓	✓
EB2132976-005	16-Nov-2021 00:00	G	✓	✓	✓	✓	✓
EB2132976-006	16-Nov-2021 00:00	H	✓	✓	✓	✓	✓
EB2132976-007	16-Nov-2021 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division
Brisbane
Work Order Reference
EB2132976

Telephone: 61-7-3243 7222

CLIENT:	LITMAQUA
OFFICE:	PEREGIAN BEACH
PROJECT:	AWH LPI6012C
PROJECT NO.:	
ORDER NUMBER:	
PURCHASE ORDER NO.:	
PROJECT MANAGER:	JAMES HALL-BROWN
CONTACT PH:	[illegible]
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@litmaqua.com
Email Invoice to (will default to PM if no other addresses are listed):	" "

TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
JAMES HALL-BROWN	[signature]	
DATE/TIME: 16/11/21 14:00	DATE/TIME: 16/11/21 1400	DATE/TIME:

FOR LABORATORY USE ONLY: Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	DO (% only)	TURBIDITY	CHLOROPHYLL-A	Additional Information
1	A	16/11/21	W	P x 2	2	X	X	X	X	X	
2	C	"	"	"	"	X	X	X	X	X	
3	D	"	"	"	"	X	X	X	X	X	
4	E	"	"	"	"	X	X	X	X	X	
5	G	"	"	"	"	X	X	X	X	X	
6	H	"	"	"	"	X	X	X	X	X	
7	I	"	"	"	"	X	X	X	X	X	
				TOTAL							

SAMPLE DETAILS MATRIX: Solid(S) Water(W)

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)

Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

HT

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2134841**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH LP140120	Date Samples Received	: 01-Dec-2021 13:30
Order number	: ----	Date Analysis Commenced	: 01-Dec-2021
C-O-C number	: ----	Issue Date	: 09-Feb-2022 08:42
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP008 (Chlorophyll a): For particular samples less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00	01-Dec-2021 00:00
Compound	CAS Number	LOR	Unit	EB2134841-001	EB2134841-002	EB2134841-003	EB2134841-004	EB2134841-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.98**	**7.04**	**7.24**	**7.32**	**7.24**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**90**	**125**	**182**	**133**	**142**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**42.6**	**98.1**	**85.0**	**211**	**119**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**3**	<2	**3**	**6**	<4
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**56.0**	**60.0**	**55.0**	**56.0**	**90.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	01-Dec-2021 00:00	01-Dec-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2134841-006	EB2134841-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.37**	**7.16**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**108**	**1160**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**86.7**	**105**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<2	<5	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**95.0**	**66.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2134841**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH LP140120	Date Samples Received	: 01-Dec-2021
Order number	: ----	Date Analysis Commenced	: 01-Dec-2021
C-O-C number	: ----	Issue Date	: 09-Feb-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4060171)									
EB2134840-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.97	7.00	0.4	0% - 20%
EB2134840-011	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.82	6.84	0.3	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 4060172)									
EB2134841-002	C	EA005-P: pH Value	----	0.01	pH Unit	7.04	7.06	0.3	0% - 20%
EB2134926-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.13	7.09	0.6	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4060170)									
EB2134840-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	456	454	0.4	0% - 20%
EB2134840-011	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2380	2360	0.9	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4060173)									
EB2134841-002	C	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	125	124	0.0	0% - 20%
EB2134926-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	151	150	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4049487)									
EB2134685-001	Anonymous	EA045: Turbidity	----	0.1	NTU	1.0	1.0	0.0	No Limit
EB2134823-001	Anonymous	EA045: Turbidity	----	0.1	NTU	3.5	3.5	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4049488)									
EB2134841-006	H	EA045: Turbidity	----	0.1	NTU	86.7	86.6	0.1	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4060171)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA005P: pH by PC Titrator (QCLot: 4060172)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4060170)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	99.1	91.0	107
				<1	12890 µS/cm	95.2	91.0	107
EA010P: Conductivity by PC Titrator (QCLot: 4060173)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	104	91.0	107
				<1	24800 µS/cm	97.0	91.0	107
EA045: Turbidity (QCLot: 4049487)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	99.0	90.0	110
				<0.1	400 NTU	98.2	90.0	110
EA045: Turbidity (QCLot: 4049488)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	99.0	90.0	110
				<0.1	400 NTU	98.2	90.0	110
EP008: Chlorophyll (QCLot: 4054459)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	85.0	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2134841**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: NHH LP140120	Date Samples Received	: 01-Dec-2021
Site	: ----	Issue Date	: 09-Feb-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, F, G, H, I	----	----	----	07-Dec-2021	02-Dec-2021	**5**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**01-Dec-2021**	**----**	----	----	**07-Dec-2021**	02-Dec-2021	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**01-Dec-2021**	**----**	----	----	**07-Dec-2021**	29-Dec-2021	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**01-Dec-2021**	**----**	----	----	**01-Dec-2021**	03-Dec-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**01-Dec-2021**	**----**	----	----	**03-Dec-2021**	03-Dec-2021	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, G, H, I	**01-Dec-2021**	**----**	----	----	**01-Dec-2021**	02-Dec-2021	✓
White Plastic Bottle - Unpreserved (EP025)							
F	**01-Dec-2021**	**----**	----	----	**01-Dec-2021**	02-Dec-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	22	**13.64**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	22	**27.27**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	22	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2134841**

Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: NHH LP140120	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 01-Dec-2021 13:30	Issue Date	: 01-Dec-2021
Client Requested Due Date	: 08-Dec-2021	Scheduled Reporting Date	: **08-Dec-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 3.5°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2134841-001	01-Dec-2021 00:00	A	✓	✓	✓	✓	✓
EB2134841-002	01-Dec-2021 00:00	C	✓	✓	✓	✓	✓
EB2134841-003	01-Dec-2021 00:00	D	✓	✓	✓	✓	✓
EB2134841-004	01-Dec-2021 00:00	F	✓	✓	✓	✓	✓
EB2134841-005	01-Dec-2021 00:00	G	✓	✓	✓	✓	✓
EB2134841-006	01-Dec-2021 00:00	H	✓	✓	✓	✓	✓
EB2134841-007	01-Dec-2021 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division
Brisbane
Work Order Reference
EB2134841

Telephone: +61-7-3243 7222

CLIENT: Lithaqua
OFFICE: Portsmouth Beach
PROJECT: NMH - LP160120 PROJECT NO.:
ORDER NUMBER: PURCHASE ORDER NO.:
PROJECT MANAGER: James Holloway CONTACT PH: 0401671626
SAMPLER: " SAMPLER MOBILE: "
COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): james@lithaqua.com
Email Invoice to (will default to PM if no other addresses are listed): "

TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
(Standard TAT may be longer for some tests e.g. Ultra Trace Organics)

ALS QUOTE NO.:
COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7 / OF: 1 2 3 4 5 6 7

RELINQUISHED BY: James Holloway DATE/TIME: 1/12/21 13:30
RECEIVED BY: Martin DATE/TIME: 1/12/21 13:30
RELINQUISHED BY: DATE/TIME:

FOR LABORATORY USE ONLY: Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	DA (T only)	TURBIDITY	CHLOROPHYLL-A	Additional Information
1	A	1/12/21	W	P	2	X	X	X	X	X	
2	C	"	"	"	"	X	X	X	X	X	
3	D	"	"	"	"	X	X	X	X	X	
4	F	"	"	"	"	X	X	X	X	X	
5	G	"	"	"	"	X	X	X	X	X	
6	H	"	"	"	"	X	X	X	X	X	
7	I	"	"	"	"	X	X	X	X	X	
				TOTAL							

ALS USE ONLY; SAMPLE DETAILS MATRIX: Solid(S) Water(W); CONTAINER INFORMATION; ANALYSIS REQUIRED including SUITES; Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

HT

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2200174**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: 3 SHALDON ST THE GAP QLD 4061	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 05-Jan-2022 18:30
Order number	: ----	Date Analysis Commenced	: 06-Jan-2022
C-O-C number	: ----	Issue Date	: 09-Feb-2022 08:30
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP008 (Chlorophyll a): For particular samples less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	A	C	D	F	G
				Sampling date / time	05-Jan-2022 00:00	05-Jan-2022 00:00	05-Jan-2022 00:00	05-Jan-2022 00:00	05-Jan-2022 00:00
					EB2200174-001	EB2200174-002	EB2200174-003	EB2200174-004	EB2200174-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**6.96**	**7.10**	**7.12**	**6.97**	**7.49**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**176**	**850**	**189**	**149**	**18400**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**38.5**	**15.6**	**12.5**	**22.2**	**24.1**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		**33**	<2	**8**	**21**	<2
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**37.0**	**47.0**	**----**	**----**	**70.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	05-Jan-2022 00:00	05-Jan-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2200174-006	EB2200174-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.31**	**7.99**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**267**	**42200**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**33.5**	**7.6**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**4**	**3**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**65.0**	**85.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2200174**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: 3 SHALDON ST THE GAP QLD 4061	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 05-Jan-2022
Order number	: ----	Date Analysis Commenced	: 06-Jan-2022
C-O-C number	: ----	Issue Date	: 09-Feb-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4109778)									
EB2200097-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.03	7.98	0.6	0% - 20%
EB2200174-001	A	EA005-P: pH Value	----	0.01	pH Unit	6.96	6.96	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4109777)									
EB2200097-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	362	365	1.0	0% - 20%
EB2200174-001	A	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	176	174	1.3	0% - 20%
EA045: Turbidity (QC Lot: 4109525)									
EB2200151-006	Anonymous	EA045: Turbidity	----	0.1	NTU	4.2	4.2	0.0	0% - 20%
EB2200155-003	Anonymous	EA045: Turbidity	----	0.1	NTU	4.1	4.0	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4109526)									
EB2200174-005	G	EA045: Turbidity	----	0.1	NTU	24.1	23.8	1.3	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4109778)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.5	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4109777)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	95.6	91.0	107
				<1	12890 µS/cm	95.6	91.0	107
EA045: Turbidity (QCLot: 4109525)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	96.8	90.0	110
				<0.1	400 NTU	98.0	90.0	110
EA045: Turbidity (QCLot: 4109526)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	96.8	90.0	110
				<0.1	400 NTU	98.0	90.0	110
EP008: Chlorophyll (QCLot: 4109490)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	90.0	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2200174**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 NHH-WQM	Date Samples Received	: 05-Jan-2022
Site	: ----	Issue Date	: 09-Feb-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, G, H, I	----	----	----	06-Jan-2022	05-Jan-2022	**1**
White Plastic Bottle - Unpreserved						
D, F	----	----	----	06-Jan-2022	05-Jan-2022	**1**
EP025: Oxygen - Dissolved (DO)						
Clear Plastic Bottle - Natural						
A, C, G, H, I	----	----	----	06-Jan-2022	05-Jan-2022	**1**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, G, H, I	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	05-Jan-2022	×
White Plastic Bottle - Unpreserved (EA005-P)							
D, F	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	05-Jan-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, G, H, I	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	02-Feb-2022	✓
White Plastic Bottle - Unpreserved (EA010-P)							
D, F	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	02-Feb-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, G, H, I	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	07-Jan-2022	✓
White Plastic Bottle - Unpreserved (EA045)							
D, F	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	07-Jan-2022	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	07-Jan-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, G, H, I	**05-Jan-2022**	**----**	----	----	**06-Jan-2022**	05-Jan-2022	×

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	29	**10.34**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	29	**20.69**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	29	**6.90**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2200174**

Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: 3 SHALDON ST THE GAP QLD 4061	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 NHH-WQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 05-Jan-2022 18:30	Issue Date	: 06-Jan-2022
Client Requested Due Date	: 13-Jan-2022	Scheduled Reporting Date	: **13-Jan-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not intact.
No. of coolers/boxes	: 1	Temperature	: 11.3°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised, that as per telehone confirmation from James Hall-Brown on 06/01/2021 at 9.22am, No "DO" % - EP025 testing has been assigned to samples ID "D" and "H" and pH, Electrical Conductivity and Turbidity testing will prioritised over Chlorophyll a testing for those samples. If this is incorrect or if you have any further questions, please contact Client Services at ALSEnviro.Brisbane@alsglobal.com**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2200174-001	05-Jan-2022 00:00	A	✓	✓	✓	✓	✓
EB2200174-002	05-Jan-2022 00:00	C	✓	✓	✓	✓	✓
EB2200174-003	05-Jan-2022 00:00	D	✓	✓	✓	✓	
EB2200174-004	05-Jan-2022 00:00	F	✓	✓	✓	✓	
EB2200174-005	05-Jan-2022 00:00	G	✓	✓	✓	✓	✓
EB2200174-006	05-Jan-2022 00:00	H	✓	✓	✓	✓	✓
EB2200174-007	05-Jan-2022 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division Brisbane
Work Order Reference
EB2200174

Telephone: +61 7 3243 7222

CLIENT:	LITH AQUA
OFFICE:	PEREGIAN BEACH
PROJECT:	NHH - WQM
PROJECT NO.:	LP1451 20
ORDER NUMBER:	
PURCHASE ORDER NO.:	
PROJECT MANAGER:	JAMES HALLAHAN
CONTACT PH:	0401671624
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	NO
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@lithaqua.com
Email Invoice to (will default to PM if no other addresses are listed):	"

TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7 (8 written); OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY: Custody Seal Intact? Free ice / frozen ice bricks present upon receipt? Random Sample Temperature on Receipt: Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:
JAMES HALLAHAN	[signature]	
DATE/TIME: 5/1/22 18:30	DATE/TIME: 5/1/22 1830	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY: LAB ID	SAMPLE DETAILS MATRIX: Solid(S) Water(W): SAMPLE ID	DATE / TIME	MATRIX	CONTAINER INFORMATION: TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	pH	E.C.	D.O. (Conc)	TURBIDITY	CHLOROPHYLL A		
1	A	5/1/22	W	P	2	X	X	X	X	X		
2	C	"	"		2	X	X	X	X	X		
3	D	"	"		2	X	X	X	X	X		
4	F	"	"		1	X	X	X	X	X		
5	G	"	"		2	X	X	X	X	X		
6	H	"	"		2	X	X	X	X	X		
7	I	"	"		2	X	X	X	X	X		
				TOTAL								

ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

HT

*ONLY CHLOROPHYLL A BOTTLE - PLEASE PORTION SAMPLE FOR OTHER ANALYSIS IF POSSIBLE. PLEASE PRIORITISE pH, EC, & TURBIDITY IF NOT ALL ANALYSIS COMPLETE

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2202780**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 03-Feb-2022 16:00
Order number	: ----	Date Analysis Commenced	: 04-Feb-2022
C-O-C number	: ----	Issue Date	: 10-Feb-2022 17:37
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	03-Feb-2022 00:00	03-Feb-2022 00:00	03-Feb-2022 00:00	03-Feb-2022 00:00	03-Feb-2022 00:00
Compound	CAS Number	LOR	Unit	EB2202780-001	EB2202780-002	EB2202780-003	EB2202780-004	EB2202780-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.02**	**6.94**	**6.91**	**6.75**	**6.91**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**166**	**413**	**369**	**190**	**5640**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**21.5**	**25.8**	**11.4**	**62.9**	**36.1**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**3**	**3**	**4**	**6**	**2**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**45.0**	**56.0**	**45.0**	**36.0**	**53.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	03-Feb-2022 00:00	03-Feb-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2202780-006	EB2202780-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**6.92**	**7.17**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**279**	**45800**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**22.7**	**5.3**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**4**	**4**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**44.0**	**62.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2202780**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 03-Feb-2022
Order number	: ----	Date Analysis Commenced	: 04-Feb-2022
C-O-C number	: ----	Issue Date	: 10-Feb-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4155771)									
EB2202743-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.56	7.14	5.7	0% - 20%
EB2202780-004	F	EA005-P: pH Value	----	0.01	pH Unit	6.75	6.69	0.9	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4155770)									
EB2202743-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	276	277	0.4	0% - 20%
EB2202780-004	F	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	190	190	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4155221)									
EB2201858-003	Anonymous	EA045: Turbidity	----	0.1	NTU	49.2	49.1	0.2	0% - 20%
EB2202775-001	Anonymous	EA045: Turbidity	----	0.1	NTU	0.1	<0.1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4155771)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.2	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4155770)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	96.9	91.0	107
				<1	24800 µS/cm	104	91.0	107
EA045: Turbidity (QCLot: 4155221)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	99.0	90.0	110
				<0.1	400 NTU	97.8	90.0	110
EP008: Chlorophyll (QCLot: 4155452)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	100	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2202780**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 03-Feb-2022
Site	: ----	Issue Date	: 10-Feb-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**03-Feb-2022**	**----**	----	----	**04-Feb-2022**	04-Feb-2022	✓
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**03-Feb-2022**	**----**	----	----	**04-Feb-2022**	03-Mar-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**03-Feb-2022**	**----**	----	----	**04-Feb-2022**	05-Feb-2022	✓
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**03-Feb-2022**	**----**	----	----	**04-Feb-2022**	05-Feb-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**03-Feb-2022**	**----**	----	----	**04-Feb-2022**	04-Feb-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2202780**

Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH WQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 03-Feb-2022 16:00	Issue Date	: 03-Feb-2022
Client Requested Due Date	: 11-Feb-2022	Scheduled Reporting Date	: **11-Feb-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 14.4°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2202780-001	03-Feb-2022 00:00	A	✓	✓	✓	✓	✓
EB2202780-002	03-Feb-2022 00:00	C	✓	✓	✓	✓	✓
EB2202780-003	03-Feb-2022 00:00	D	✓	✓	✓	✓	✓
EB2202780-004	03-Feb-2022 00:00	F	✓	✓	✓	✓	✓
EB2202780-005	03-Feb-2022 00:00	G	✓	✓	✓	✓	✓
EB2202780-006	03-Feb-2022 00:00	H	✓	✓	✓	✓	✓
EB2202780-007	03-Feb-2022 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS

Environmental Division
Brisbane
Work Order Reference
EB2202780

CLIENT: LITRAQUA
OFFICE: PEREGIAN BEACH
PROJECT: NHH WQM
PROJECT NO.: LP140
ALS QUOTE NO.:
ORDER NUMBER:
PURCHASE ORDER NO.:
COUNTRY OF ORIGIN:
PROJECT MANAGER: JAMES HALL-BROWN
CONTACT PH: 0401 671644
SAMPLER:
SAMPLER MOBILE:
COC Emailed to ALS? (YES / NO)
EDD FORMAT (or default):
Email Reports to (will default to PM if no other addresses are listed): james@litraqua.com
Email Invoice to (will default to PM if no other addresses are listed):

TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

COC SEQUENCE NUMBER (Circle): COC: 8 · OF: 1

RELINQUISHED BY: JAMES HALL-BROWN · DATE/TIME: 3/2/22 16:00
RECEIVED BY: [signature] · DATE/TIME: 3/2/22 1600
RELINQUISHED BY: · DATE/TIME:

FOR LABORATORY: Custody Seal Intact? · Free ice / frozen ice bricks present upon receipt? · Random Sample Temperature on Receipt · Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES

HT

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL BOTTLES	pH	EC	DO (% and)	TURBIDITY	CHLOROPHYLL-A
1	A	3/2/22	W	P	2	X	X	X	X	X
2	C	"	"	"	"	X	X	X	X	X
3	D	"	"	"	"	X	X	X	X	X
4	E	"	"	"	"	X	X	X	X	X
5	G	"	"	"	"	X	X	X	X	X
6	H	"	"	"	"	X	X	X	X	X
7	I	"	"	"	"	X	X	X	X	X
					TOTAL					

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial; SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2207728**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH	Date Samples Received	: 21-Mar-2022 14:05
Order number	: ----	Date Analysis Commenced	: 21-Mar-2022
C-O-C number	: ----	Issue Date	: 07-Jun-2022 16:32
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP008 (Chlorophyll a): For sample C (EB2207728-002) less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	21-Mar-2022 00:00	21-Mar-2022 00:00	21-Mar-2022 00:00	21-Mar-2022 00:00	21-Mar-2022 00:00
Compound	CAS Number	LOR	Unit	EB2207728-001	EB2207728-002	EB2207728-003	EB2207728-004	EB2207728-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.40**	**7.47**	**7.46**	**7.26**	**7.71**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**228**	**886**	**248**	**143**	**6150**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**5.5**	**7.4**	**12.9**	**13.3**	**15.6**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**8**	<2	**4**	**76**	**8**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**46.0**	**36.0**	**48.0**	**41.0**	**77.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	21-Mar-2022 00:00	21-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2207728-006	EB2207728-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.82**	**8.00**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**526**	**32200**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**10.4**	**7.4**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**5**	**5**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**60.0**	**91.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2207728**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH	Date Samples Received	: 21-Mar-2022
Order number	: ----	Date Analysis Commenced	: 21-Mar-2022
C-O-C number	: ----	Issue Date	: 07-Jun-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4249226)									
EB2207728-004	F	EA005-P: pH Value	----	0.01	pH Unit	7.26	7.23	0.4	0% - 20%
EB2207719-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.11	7.06	0.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4249225)									
EB2207710-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	42400	42300	0.2	0% - 20%
EB2207728-004	F	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	143	142	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4240166)									
EB2207728-001	A	EA045: Turbidity	----	0.1	NTU	5.5	5.5	0.0	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4249226)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4249225)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	103	95.0	105
				<1	12890 µS/cm	101	95.0	105
EA045: Turbidity (QCLot: 4240166)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.8	90.0	110
				<0.1	40 NTU	99.8	90.0	110
				<0.1	400 NTU	98.8	90.0	110
EP008: Chlorophyll (QCLot: 4242104)								
EP008: Chlorophyll a	----	1	mg/m³	<1	18 mg/m³	94.4	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2207728**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: NHH	Date Samples Received	: 21-Mar-2022
Site	: ----	Issue Date	: 07-Jun-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, F, G, H, I	----	----	----	25-Mar-2022	21-Mar-2022	**4**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**21-Mar-2022**	**----**	----	----	**25-Mar-2022**	21-Mar-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**21-Mar-2022**	**----**	----	----	**25-Mar-2022**	18-Apr-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**21-Mar-2022**	**----**	----	----	**21-Mar-2022**	23-Mar-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**21-Mar-2022**	**----**	----	----	**22-Mar-2022**	23-Mar-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**21-Mar-2022**	**----**	----	----	**21-Mar-2022**	21-Mar-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	7	**42.86**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

CHAIN OF CUSTODY

ALS Laboratory: please look →

CLIENT: LITHGOW	TURNAROUND REQUIREMENTS: ☒ Standard TAT (Use date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: PORT HEDLAND	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or Urgent TAT (List due date):	Custody Seal Intact?	Yes / No / N/A
PROJECT: NHH PROJECT NO.:	ALS QUOTE NO.:	Free ice / frozen ice bricks present upon receipt?	Yes / No / N/A
ORDER NUMBER: PURCHASE ORDER NO.:	COUNTRY OF ORIGIN:	Random Sample Temperature on Receipt	°C
PROJECT MANAGER: JAMES HALL-BROWN CONTACT PH: 0401671621	COC SEQUENCE NUMBER (Circle) FOR: (1) 2 3 4 5 6 7 OR: (1) 2 3 4 5 6 7	Other comments:	
SAMPLER: SAMPLER MOBILE: "			
COC Emailed to ALS? (YES / NO) COD FORMAT (or default):	RELINQUISHED BY: JAMES HALL-BROWN	RECEIVED BY:	RELINQUISHED BY: / RECEIVED BY:
Email Reports to (will default to PM if no other addresses are listed): james@lithgow.com	DATE/TIME: 21/3/22 14:05	DATE/TIME: 21/3/22 1405	DATE/TIME: / DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): "			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Soil(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price)					Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	CHLOROPHYLL A	pH	E.C.	DO (Conc)	TURBIDITY	
1	A	21/3/22	W	P	2	X	X	X	X	X	
2	C	"	"	"	"	X	X	X	X	X	
3	D	"	"	"	"	X	X	X	X	X	
4	E	"	"	"	"	X	X	X	X	X	
5	G	"	"	"	"	X	X	X	X	X	
6	H	"	"	"	"	X	X	X	X	X	
7	I	"	"	"	"	X	X	X	X	X	
					TOTAL						

Environmental Division
Brisbane
Work Order Reference
EB2207728

Telephone : +61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide Preserved Plastic; S = Sulfuric Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserving; VS = VOA Vial Sodium Bisulphate Preserved; VA = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; ST = Sterile Bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; B = Sodium Borate; ASS = Plastic Bag for Acid Sulphate Soils; F = Unpreserved Plastic; FBF = Fluoride Preserved Bottle; SUT = Sterile Sulfur Thiosulfate Preserved Bottle.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2211064**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 21-Apr-2022 12:40
Order number	: ----	Date Analysis Commenced	: 21-Apr-2022
C-O-C number	: ----	Issue Date	: 07-Jun-2022 16:30
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

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Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP008 (Chlorophyll a): For sample C (EB2211064-2) less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	21-Apr-2022 00:00	21-Apr-2022 00:00	21-Apr-2022 00:00	21-Apr-2022 00:00	21-Apr-2022 00:00
Compound	CAS Number	LOR	Unit	EB2211064-001	EB2211064-002	EB2211064-003	EB2211064-004	EB2211064-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.35**	**7.48**	**7.57**	**7.56**	**7.76**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**203**	**4160**	**1250**	**222**	**16700**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**7.6**	**3.9**	**8.7**	**16.4**	**14.9**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**11**	<2	**4**	**29**	**6**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**50.0**	**57.0**	**55.0**	**75.0**	**66.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	21-Apr-2022 00:00	21-Apr-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2211064-006	EB2211064-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.84**	**7.82**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**478**	**33700**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**8.5**	**4.9**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**9**	**5**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**46.0**	**68.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2211064**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 21-Apr-2022
Order number	: ----	Date Analysis Commenced	: 21-Apr-2022
C-O-C number	: ----	Issue Date	: 07-Jun-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

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- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4303737)									
EB2211061-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.51	7.56	0.7	0% - 20%
EB2211092-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.74	7.80	0.8	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4303736)									
EB2210973-004	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	686	686	0.0	0% - 20%
EB2211028-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	0.0	No Limit
EA045: Turbidity (QC Lot: 4297850)									
EB2210842-001	Anonymous	EA045: Turbidity	----	0.1	NTU	16.9	16.8	0.6	0% - 20%
EB2211060-002	Anonymous	EA045: Turbidity	----	0.1	NTU	0.1	0.1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4303737)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	99.8	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4303736)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	102	90.0	106
				<1	12890 µS/cm	102	90.0	106
EA045: Turbidity (QCLot: 4297850)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	99.2	90.0	110
				<0.1	40 NTU	98.8	90.0	110
				<0.1	400 NTU	99.5	90.0	110
EP008: Chlorophyll (QCLot: 4300132)								
EP008: Chlorophyll a	----	1	mg/m³	<1	18 mg/m³	94.4	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2211064**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 21-Apr-2022
Site	: ----	Issue Date	: 07-Jun-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, F, G, H, I	----	----	----	26-Apr-2022	22-Apr-2022	**4**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**21-Apr-2022**	**----**	----	----	**26-Apr-2022**	22-Apr-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**21-Apr-2022**	**----**	----	----	**26-Apr-2022**	19-May-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**21-Apr-2022**	**----**	----	----	**21-Apr-2022**	23-Apr-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**21-Apr-2022**	**----**	----	----	**22-Apr-2022**	23-Apr-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**21-Apr-2022**	**----**	----	----	**21-Apr-2022**	22-Apr-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	20	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2211064**		
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH WQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 21-Apr-2022 12:40	Issue Date	: 21-Apr-2022
Client Requested Due Date	: 03-May-2022	Scheduled Reporting Date	: **03-May-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 9.7°C - Ice present
Receipt Detail	: MEDIUM HARD ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (PCT)	WATER - EA010P Electrical Conductivity (PCT)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2211064-001	21-Apr-2022 00:00	A	✓	✓	✓	✓	✓
EB2211064-002	21-Apr-2022 00:00	C	✓	✓	✓	✓	✓
EB2211064-003	21-Apr-2022 00:00	D	✓	✓	✓	✓	✓
EB2211064-004	21-Apr-2022 00:00	F	✓	✓	✓	✓	✓
EB2211064-005	21-Apr-2022 00:00	G	✓	✓	✓	✓	✓
EB2211064-006	21-Apr-2022 00:00	H	✓	✓	✓	✓	✓
EB2211064-007	21-Apr-2022 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS Laboratory: please tick →

Environmental Division
Brisbane
Work Order Reference
EB2211064

CLIENT:	LITTAQUA
OFFICE:	PEREGIAN BEACH
PROJECT:	NHH WQM
PROJECT NO.:	LP140120
ORDER NUMBER:	
PURCHASE ORDER NO.:	
PROJECT MANAGER:	JAMES HALL-BROWN
CONTACT PH:	0401 671622
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)	NO
EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed):	james@littaqua.com
Email Invoice to (will default to PM if no other addresses are listed):	"

TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.:

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7 — OF: 1 2 3 4 5 6 7

RELINQUISHED BY: JAMES HALL-BROWN — DATE/TIME: 21/4/22 12:40

RECEIVED BY: J. Hilliard — DATE/TIME: 21/4/22 13:40

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL BOTTLES	PH	E.C.	D.O. (CONT)	TURBIDITY	CHLOROPHYLL A	Additional Information
	A	21/4/22	W	P	2	X	X	X	X	X	
	C	"		"	"	X	X	X	X	X	
	D	"		"	"	X	X	X	X	X	
	F	"		"	"	X	X	X	X	X	
	G	"		"	"	X	X	X	X	X	
	H	"		"	"	X	X	X	X	X	
	I	"		"	"	X	X	X	X	X	
				TOTAL	14	7	7	7	7	7	

ANALYSIS REQUIRED including SUITES

Additional Information: Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ... S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; ... Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ... T = Thiosulfate Preserved Bottles.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2215248**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 30-May-2022 12:30
Order number	: ----	Date Analysis Commenced	: 30-May-2022
C-O-C number	: ----	Issue Date	: 07-Jun-2022 16:33
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP008 (Chlorophyll a): For sample "G" (EB2215248-005), less volume was filtered due to matrix interference (Suspended Material). LOR adjusted accordingly.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	A	C	D	F	G
			Sampling date / time	30-May-2022 00:00	30-May-2022 00:00	30-May-2022 00:00	30-May-2022 00:00	30-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2215248-001	EB2215248-002	EB2215248-003	EB2215248-004	EB2215248-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.23**	**7.26**	**7.24**	**7.13**	**7.43**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**225**	**358**	**219**	**186**	**575**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**14.2**	**13.6**	**8.2**	**14.5**	**30.7**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	<1	<1	<1	<2
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**38.0**	**46.0**	**48.0**	**22.0**	**60.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	30-May-2022 00:00	30-May-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2215248-006	EB2215248-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.70**	**7.84**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**322**	**29100**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**32.9**	**5.7**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	<1	**4**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**80.0**	**79.0**	**----**	**----**	**----**

QUALITY CONTROL REPORT

Work Order	: **EB2215248**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 30-May-2022
Order number	: ----	Date Analysis Commenced	: 30-May-2022
C-O-C number	: ----	Issue Date	: 07-Jun-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4372579)									
EB2215139-002	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.51	7.46	0.7	0% - 20%
EB2215248-005	G	EA005-P: pH Value	----	0.01	pH Unit	7.43	7.47	0.5	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4372574)									
EB2215090-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	75	76	0.0	0% - 20%
EB2215103-010	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	938	937	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4372580)									
EB2215248-005	G	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	575	576	0.2	0% - 20%
EA045: Turbidity (QC Lot: 4369560)									
EB2215248-001	A	EA045: Turbidity	----	0.1	NTU	14.2	14.1	0.7	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4372579)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4372574)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	98.6	90.0	106
				<1	24800 µS/cm	97.8	90.0	106
EA010P: Conductivity by PC Titrator (QCLot: 4372580)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	98.6	90.0	106
				<1	12890 µS/cm	100	90.0	106
EA045: Turbidity (QCLot: 4369560)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	101	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	99.0	90.0	110
EP008: Chlorophyll (QCLot: 4371389)								
EP008: Chlorophyll a	----	1	mg/m³	<1	20 mg/m³	95.0	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2215248**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: LP140120 - NHH WQM	Date Samples Received	: 30-May-2022
Site	: ----	Issue Date	: 07-Jun-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, F, G, H, I	----	----	----	01-Jun-2022	31-May-2022	**1**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**30-May-2022**	**----**	----	----	**01-Jun-2022**	31-May-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**30-May-2022**	**----**	----	----	**01-Jun-2022**	27-Jun-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**30-May-2022**	**----**	----	----	**30-May-2022**	01-Jun-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**30-May-2022**	**----**	----	----	**31-May-2022**	01-Jun-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**30-May-2022**	**----**	----	----	**30-May-2022**	31-May-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	23	**17.39**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	3	7	**42.86**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2215248**		
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	:	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: LP140120 - NHH WQM	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 30-May-2022 12:30	Issue Date	: 30-May-2022
Client Requested Due Date	: 08-Jun-2022	Scheduled Reporting Date	: **08-Jun-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 2.5°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please be advised, where the sampling date "30/05/2022" is listed on the Chain of Custody for sample "A", the 500ml plastic unpreserved container for this sample was received labelled as "27/05/2022". ALS has reported the sampling date as per the Chain of Custody (30/05/2022). If this is incorrect, please contact client services at ALSEnviro.Brisbane@alsglobal.com**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2215248-001	30-May-2022 00:00	A	✓	✓	✓	✓	✓
EB2215248-002	30-May-2022 00:00	C	✓	✓	✓	✓	✓
EB2215248-003	30-May-2022 00:00	D	✓	✓	✓	✓	✓
EB2215248-004	30-May-2022 00:00	F	✓	✓	✓	✓	✓
EB2215248-005	30-May-2022 00:00	G	✓	✓	✓	✓	✓
EB2215248-006	30-May-2022 00:00	H	✓	✓	✓	✓	✓
EB2215248-007	30-May-2022 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

ALS

CLIENT:	LITHAQUA
OFFICE:	PEREGIAN BEACH
PROJECT:	NHH WQM
PROJECT NO:	LP14612
ORDER NUMBER:	
PURCHASE ORDER NO.:	
COUNTRY OF ORIGIN:	
PROJECT MANAGER:	JAMES HALL-BROWN
CONTACT PH:	0461671624
SAMPLER:	"
SAMPLER MOBILE:	"
COC Emailed to ALS?	YES / NO (circled NO)
Email Reports to:	james@lithaqua.com
Email Invoice to:	"

TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7 (1 circled); OF: 1 2 3 4 5 6 7 (1 circled)

FOR LABORATORY USE ONLY (Circle): Custody Seal Intact? Yes No N/A; Free ice / frozen ice bricks present upon receipt? Yes No N/A; Random Sample Temperature on Receipt: °C; Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
JAMES HALLBROWN	[signature] 30/5/22		
DATE/TIME: 30/5/22 12:25	DATE/TIME: 1230	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL BOTTLES	CHLOROPHYLL-A	PH	E.C.	D.O. (% sat)	TURBIDITY	Additional Information
1	A	30/5/22	W	P	2	X	X	X	X	X	
2	C	"	"	"		X	X	X	X	X	
3	D	"	"	"		X	X	X	X	X	
4	E	"	"	"		X	X	X	X	X	
5	G	"	"	"		X	X	X	X	X	
6	H	"	"	"		X	X	X	X	X	
7	I	"	"	"		X	X	X	X	X	
					TOTAL						

Environmental Division
Brisbane
Work Order Reference
EB2215248

Telephone: +61-7-3243 7222

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2216953**	Page	: 1 of 4
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH WQM LP14012B	Date Samples Received	: 14-Jun-2022 14:10
Order number	: ----	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 22-Jun-2022 16:57
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	A	C	D	F	G
				Sampling date / time	14-Jun-2022 00:00	14-Jun-2022 00:00	14-Jun-2022 00:00	14-Jun-2022 00:00	14-Jun-2022 00:00
					EB2216953-001	EB2216953-002	EB2216953-003	EB2216953-004	EB2216953-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		**7.52**	**7.49**	**7.51**	**7.63**	**7.84**
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		**226**	**3870**	**552**	**220**	**5770**
EA045: Turbidity									
Turbidity	----	0.1	NTU		**9.8**	**43.6**	**7.2**	**15.5**	**19.2**
EP008: Chlorophyll a & Pheophytin a									
Chlorophyll a	----	1	mg/m³		<1	<1	<1	**10**	**7**
EP025: Oxygen - Dissolved (DO)									
Dissolved Oxygen - % Saturation	----	0.1	% saturation		**55.0**	**81.0**	**62.0**	**80.0**	**84.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	H	I	----	----	----
			Sampling date / time	14-Jun-2022 00:00	14-Jun-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB2216953-006	EB2216953-007	--------	--------	--------
				Result	Result	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.02**	**7.90**	**----**	**----**	**----**
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**446**	**31800**	**----**	**----**	**----**
EA045: Turbidity								
Turbidity	----	0.1	NTU	**9.6**	**6.0**	**----**	**----**	**----**
EP008: Chlorophyll a & Pheophytin a								
Chlorophyll a	----	1	mg/m³	**7**	**3**	**----**	**----**	**----**
EP025: Oxygen - Dissolved (DO)								
Dissolved Oxygen - % Saturation	----	0.1	% saturation	**86.0**	**99.0**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2216953**	Page	: 1 of 3
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Project	: NHH WQM LP14012B	Date Samples Received	: 14-Jun-2022
Order number	: ----	Date Analysis Commenced	: 14-Jun-2022
C-O-C number	: ----	Issue Date	: 22-Jun-2022
Sampler	: JAMES HALL-BROWN		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	WB Water Lab Brisbane, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 4403304)									
EB2216820-009	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.26	8.27	0.1	0% - 20%
EB2216820-019	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.99	7.98	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 4403303)									
EB2216820-009	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1280	1280	0.2	0% - 20%
EB2216820-019	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3130	3140	0.3	0% - 20%
EA045: Turbidity (QC Lot: 4400202)									
EB2216816-007	Anonymous	EA045: Turbidity	----	0.1	NTU	1480	1480	0.3	0% - 20%
EB2216816-017	Anonymous	EA045: Turbidity	----	0.1	NTU	2.2	2.1	0.0	0% - 20%
EA045: Turbidity (QC Lot: 4400203)									
EB2216953-005	G	EA045: Turbidity	----	0.1	NTU	19.2	19.6	2.1	0% - 20%
EB2216967-012	Anonymous	EA045: Turbidity	----	0.1	NTU	1.9	1.9	0.0	0% - 50%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 4403304)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.0	102
				----	7 pH Unit	100	98.0	102
EA010P: Conductivity by PC Titrator (QCLot: 4403303)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	100	90.0	106
				<1	24800 µS/cm	98.3	90.0	106
EA045: Turbidity (QCLot: 4400202)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	100	90.0	110
EA045: Turbidity (QCLot: 4400203)								
EA045: Turbidity	----	0.1	NTU	<0.1	4 NTU	100	90.0	110
				<0.1	40 NTU	100	90.0	110
				<0.1	400 NTU	100	90.0	110
EP008: Chlorophyll (QCLot: 4402612)								
EP008: Chlorophyll a	----	1	mg/m³	<1	18 mg/m³	100	85.0	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2216953**	Page	: 1 of 5
Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Telephone	: +61-7-3243 7222
Project	: NHH WQM LP14012B	Date Samples Received	: 14-Jun-2022
Site	: ----	Issue Date	: 22-Jun-2022
Sampler	: JAMES HALL-BROWN	No. of samples received	: 7
Order number	: ----	No. of samples analysed	: 7

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural						
A, C, D, F, G, H, I	----	----	----	16-Jun-2022	14-Jun-2022	**2**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**16-Jun-2022**	14-Jun-2022	×
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**16-Jun-2022**	12-Jul-2022	✓
EA045: Turbidity							
Clear Plastic Bottle - Natural (EA045)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**15-Jun-2022**	16-Jun-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP008: Chlorophyll a & Pheophytin a							
White Plastic Bottle - Unpreserved (EP008)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**16-Jun-2022**	16-Jun-2022	✓
EP025: Oxygen - Dissolved (DO)							
Clear Plastic Bottle - Natural (EP025)							
A, C, D, F, G, H, I	**14-Jun-2022**	**----**	----	----	**14-Jun-2022**	14-Jun-2022	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity by Auto Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chlorophyll a and Pheophytin a	EP008	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	6	40	**15.00**	**15.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chlorophyll a and Pheophytin a	EP008	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Turbidity	EA045	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Turbidity	EA045	WATER	In house: Referenced to APHA 2130 B. This method is compliant with NEPM Schedule B(3)
Chlorophyll a and Pheophytin a	EP008	WATER	In house: Referenced to APHA 10200 H. The pigments are extracted into aqueous acetone. The optical density of the extract before and after acidification at both 664 nm and 665 nm is determined spectrometrically.
Oxygen - Dissolved	EP025	WATER	In house: Referenced to APHA 4500-O G. Dissolved Oxygen Probe. This method is compliant with NEPM Schedule B(3)

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2216953**

Client	: **LITHAQUA ENVIRONMENTAL SERVICES**	Laboratory	: Environmental Division Brisbane
Contact	: MR JAMES HALL-BROWN	Contact	: Customer Services EB
Address	: PEREGIAN BEACH	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: james@lithaqua.com	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: 07 3191 9038	Telephone	: +61-7-3243 7222
Facsimile	: ----	Facsimile	: +61-7-3243 7218
Project	: NHH WQM LP14012B	Page	: 1 of 2
Order number	: ----	Quote number	: EB2017LITENV0001 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JAMES HALL-BROWN		

Dates

Date Samples Received	: 14-Jun-2022 14:10	Issue Date	: 14-Jun-2022
Client Requested Due Date	: 22-Jun-2022	Scheduled Reporting Date	: **22-Jun-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 4.3°C - Ice present
Receipt Detail	: MEDIUM HARD ESKY	No. of samples received / analysed	: 7 / 7

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA045 Turbidity	WATER - EP008 Chlorophyll a	WATER - EP025 DO and Saturation% DO and DO Saturation%
EB2216953-001	14-Jun-2022 00:00	A	✓	✓	✓	✓	✓
EB2216953-002	14-Jun-2022 00:00	C	✓	✓	✓	✓	✓
EB2216953-003	14-Jun-2022 00:00	D	✓	✓	✓	✓	✓
EB2216953-004	14-Jun-2022 00:00	F	✓	✓	✓	✓	✓
EB2216953-005	14-Jun-2022 00:00	G	✓	✓	✓	✓	✓
EB2216953-006	14-Jun-2022 00:00	H	✓	✓	✓	✓	✓
EB2216953-007	14-Jun-2022 00:00	I	✓	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

JAMES HALL-BROWN

- *AU Certificate of Analysis - NATA (COA)	Email	james@lithaqua.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	james@lithaqua.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	james@lithaqua.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	james@lithaqua.com
- A4 - AU Tax Invoice (INV)	Email	james@lithaqua.com
- Chain of Custody (CoC) (COC)	Email	james@lithaqua.com
- EDI Format - XTab (XTAB)	Email	james@lithaqua.com

CHAIN OF CUSTODY

Environmental Division
Brisbane
Work Order Reference
EB2216953

CLIENT:	LITHAQUA PTY LTD	TURNAROUND REQUIREMENTS:	
OFFICE:	PEREGIAN BEACH		
PROJECT:	NHWGM LP140126	PROJECT NO.:	ALS QUOTE NO.:
ORDER NUMBER:		PURCHASE ORDER NO.:	COUNTRY OF ORIGIN:
PROJECT MANAGER:	JAMES HALL-BROWN	CONTACT PH:	0461571624
SAMPLER:	"	SAMPLER MOBILE:	"
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or default):	
Email Reports to:	james@lithaqua.com		

RELINQUISHED BY: James Hall-Brown
DATE/TIME: 14/6/22 14:10

RECEIVED BY: [illegible]
DATE/TIME: 14/6/22 1410

RELINQUISHED BY:
DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE	TOTAL BOTTLES	pH	E.C.	D.O. (% only)	TURBIDITY	CHLOROPHYLL-A
1	A	14/6/22	W	P	2	X	X	X	X	X
2	C	"	"	"	"	X	X	X	X	X
3	D	"	"	"	"	X	X	X	X	X
4	E	"	"	"	"	X	X	X	X	X
5	G	"	"	"	"	X	X	X	X	X
6	H	"	"	"	"	X	X	X	X	X
7	I	"	"	"	"	X	X	X	X	X
				TOTAL	14					

HT