

Compliance inspections toolkit

Compliance inspections (Levels A, B and C)

Checklist, on-site record & inspection report

This toolkit is for internal use to assist Environmental Services officers when conducting Level A, B and C site inspections to record general details of the site being inspected, pre-inspection considerations and planning, on-site observations and to document recommendations and obtain approval for compliance/enforcement action. For Levels B and C, refer to addendum sheets also. This document can be used in hard copy and taken with the officer to be completed on site. The soft copy document can be completed upon return to the office.

Part A. General Information

Company name: Queensland Nickel Pty Ltd		Date of inspection: 27.1.2016	Time: 9:30am
Trading as: Queensland Nickel Pty Ltd (in administration) C/o FTI Consulting		EA/DA number (if applicable): EPPR00940913	
Description of business activity/ERAs: 14-(2a) Electricity generation >10MW but <150MW fuel 15-Fuel burning >500kg hr 16-(2b) Extractive >100000t but <1000000t yr 30-(d) Metal smelting&refining >10000t yr 38-(1d) Surface coating >10000t yr anodising etc 55-(2) Regulated waste recycling or reprocessing 60-(1a) Waste disposal <50000t yr (1)(a) 63-(1b)(i) Sewage treatment >100 to 1500EP - IT or IR 7-(6c) Chemical manufacturing >10000t but <100000t yr 8-(2) Chemical storage >50t class 6 8-(3) Chemical storage >500m3 class C1 or C2		File number: 101/0008166	
Street address: Greenvale Street, Yabulu		Real property description (lot on plan): Lot 2 Plan RP725940, Lot 2 Plan RP725941, Lot 2 Plan RP732796, Lot 4 Plan RP704282, Lot 2 Plan RP709243, Lot 3 Plan RP726908, Lot 165 Plan EP1308, Lot 1 Plan RP730220, Lot 3 Plan RP725940, Lot 1 Plan RP726771, Lot 1 Plan RP722352, Lot 1 Plan RP726908, Lot 2 Plan RP726908, Lot 277 Plan CPK124656 and Lot 3 Plan RP709243	
Site representative/s: George Lukacs, Peter Gross, Ross Hultgren (QN) Michael Campbell (Delta Environmental), Kelly-Anne Trenfield (FTI Consulting)	Position/s: Director – Environment and Sustainability, Environmental Scientist, Environmental Technician Director and Principal Environmental Scientist	Contact telephone: George Lukacs – sch4p4(6) Person	
Department's representatives: Chris Wake and Laura Rehn			
Registered business address: 1 Greenvale Street, Yabulu			
Inspection level (check box): Level A ☐ Level B ☐ Level C ☒			

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Part B. Pre-inspection considerations (add or delete lines as necessary)

Environmental risk	Very High
Last inspection date	14 October 2015
General description of location	The Queensland Nickel Yabulu refinery is located approximately 25km North of Townsville adjacent to Halifax Bay. The refinery is surrounded by the residential neighbourhoods of Yabulu, Saunders Beach and Black River.
Outstanding issues and/or non-compliances/enforcement (e.g. environmental protection orders)	<p><u>Court Proceedings</u> Following heavy rain associated with Tropical Cyclone Ita in April 2014, a release from the Tailings Storage Facility (TSF) occurred. EHP formally investigated the release and identified 6 breaches of the Environmental Authority (EA), 2 of which were considered indictable offences. In December 2015, QN were committed to trial for the 2 indictable charges with court proceedings due to occur later in 2016. Refer to Appendix 2 for Current Water Levels.</p> <p><u>Ammonia Odour Complaints Enforcement Response</u> On the evening of 12 July 2015, EHP received 9 complaints to the after-hours pollution hotline concerning an ammonia odour in the residential community of Saunders Beach. A report provided by QN stated that the odour was attributed to malfunction of plant infrastructure that manages ammonia gas. EHP has formally investigated the complaints and is considering an enforcement response in accordance with the departmental enforcement guidelines.</p> <p><u>Saunders Beach Annual Average Non-compliance</u> On 1 December 2015 EHP received written notification from QN that the air quality limit for nickel specified in Table B3 and associated condition B2-3 of the EA, had been exceeded. The notification stated that the annual average for nickel, measured via a High Volume (HIVOL) Sampler for the PM10 particle size over the preceding 11 months, was 0.041ug/m3 at Saunders Beach, which exceeds the air quality limit of 0.02ug/m3 specified in the EA.</p> <p>A follow-up investigation report was submitted by QN on 15 December 2015 in which QN has stated that the 10 business day timeframe prescribed by condition A6-2 for investigating and reporting on an exception has been insufficient to fully investigate this complex issue. EHP is considering an enforcement response, which may include the requirement to undertake an environmental investigation, in accordance with the departmental enforcement guidelines.</p> <p><u>Annual Hazardous Dams Inspection report</u> EHP received the Annual Hazardous Dams Inspection report (the report) from QN on 7 January 2016. Following review of the report, a number of potential non-compliances have been identified:</p> <ul style="list-style-type: none"> • Condition D3-2: <i>Each regulated structure must be maintained and operated in a manner that is consistent with the current design plan, the current operational plan and the associated certified 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.</i> <ul style="list-style-type: none"> ○ Section 5.1.3 of the report states that "it is understood that regular monthly inspections are not being undertaken in

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	<p>accordance with the operational plan".</p> <ul style="list-style-type: none"> Condition D5-2: <i>At each annual inspection, the condition and adequacy of all components of the regulated structure against:</i> g) <i>for the adequacy of the available storage in each regulated structure, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of containment barrier and the level of liquids in the regulated structure (or network of linked containment systems).</i> <ul style="list-style-type: none"> Section 5.1.4 of the report states that evidence of DSA being met was provided by QN on 24 April 2015. This date is before the date stated in condition D5-2 of observations taken after 31 May. Condition D5-5: <i>The holder of this environmental authority must:</i> b) <i>within twenty (20) business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated structure.</i> <ul style="list-style-type: none"> QN advised via email on 9 October 2015 that "the annual dam safety inspection report has not yet been prepared" but that it would be provided in due course. On 7 January 2016 EHP received the inspection report dated May 2015 for an inspection undertaken in April 2015, which QN confirmed is the most current report submitted for the 2015 calendar year. In accordance with condition D5-5 b), QN was required to provide the report and associated recommendations to EHP in June 2015. It is not clear as to why in October 2015 QN stated that the report had not yet been prepared when the submitted report states it was finalised in May 2015. <p>Condition D10-2: <i>Each regulated structure named in column 1 of Table D2 (Basic Details of Regulated Structures), must be consistent with the details noted in columns 2 through to and including column 7 of Table D2.</i></p> <ul style="list-style-type: none"> Column 6 of table D2 specifies Spillway levels for each of the cells of the TSF. Review of the report shows inconsistencies between the Spillway levels of Cell 1 and Cell 4 between those specified in the report and those specified in the EA Cell 1, 25.0 in EA but 30.0 in the report Cell 4, 24.0 in EA but 23.5 in the report.
Sampling Plan	Kits to sample each of the water storages (Tailings storage facility, Brine Pond, Toe Drain) and compliance points (Blind Creek and Alick Creek). Bottles to include phycials, nutrients (Ammonia) total metals and dissolved metals.
Access to Site & Sampling Locations	Access to the site via the Bruce Highway in government cars and escorted around site by QN personnel.
Work Place Health & Safety – consider what appropriate PPE is required for the Industry being inspected	
Safety helmet	Yes ☒ No ☐

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Hearing protection	Yes ☐ No ☒
Eye protection	Yes ☒ No ☐
Protective clothing	Yes ☒ No ☐
Protective footwear	Yes ☒ No ☐
Respiratory protection	Yes ☐ No ☒
Other	Yes ☐ No ☒ If yes, describe PPE:
Arrange safety induction training with occupier of site before any work is done	Yes ☐ No ☒
Vehicle & Equipment Check completed	Yes ☒ No ☐ NOTE: Vehicle safety checklists and call in schedules are still required to be completed separately

Part C1. Conditions for assessment Only Use for Level A and B inspections where a non-compliance or area of concern has been identified (add or delete lines as necessary)

All conditions of the EA were assessed as part of the inspection. No new non-compliances or areas of concern, besides those already identified in Part B of this report, were identified at the time of the inspection.

Part D. On-site observations

Exposed Tailings within TSF

It was noted that a large area of tailings was exposed in Cell 3 of the TSF. It is understood that this is due to the rotating areas of deposition and evaporation of tailings liquor from the cell. EHP has historically received complaints from the community coinciding with time when tailings beaches are exposed. It is recommended that FTI Consulting consider dust suppression measures can be implemented to prevent occurrence of community complaints.

TSF lift

EHP has been made aware of the requirement for a lift to the TSF wall to increase storage capacity to enable ongoing production. It is understood that this lift was planned for 2016 on Cell 3 of the TSF. EHP should request an update on the current plans regarding this project and potential timeframes around it following appointment of FTI Consultants as administrators for the company.

Hazardous Dams report

Since the inspection, EHP has also reviewed the hazardous dams report submitted by QN in January 2016. A number of potential non-compliances were identified that are outlined in Part B of this report and QN will be invited to provide further information regarding the identified breaches prior to EHP considering any enforcement action.

Plant Air Emissions

During the inspection, EHP observed an elevated level of emissions from the roaster section of the plant. QN representatives stated that the elevated emissions were attributed to a combination of lower grade ore from a number of different sources currently being fed into the plant. It is requested QN outline mitigation measures and suppressant systems that will be implemented to reduce the emissions from the roasters.

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Part E. Pre-Wet Inspections

Did you run through the pre-wet inspection checklist?	Yes ☐ No ☒
Were there any areas of concern?	Yes ☐ No ☐ N/A
If yes to above, describe the issue/s identified.	While the formal pre-wet season checklist was not used for this inspection (as the annual pre-wet inspection was conducted in October 2015), FTI Consulting will be advised of EHP expectations for wet season management in the outcomes letter.

Part F. Closing meeting

Discuss preliminary findings, non-compliances, observations, further items to be provided, timing and any other matters (list names of all persons present).

The following persons were present at the close out meeting: Laura Behn and Chris Wake (EHP), Ross Hultgren, Peter Gross, George Lukacs (QN), Michael Campbell (Delta Environmental), Kelly-Anne Trenfield and Andrew Bantock (FTI Consulting).

Chris Wake stated that the purpose of the inspection was to see the state of the refinery following appointment of administrators and since the pre-wet inspection in October 2015. CW stated that EHP interest was to ensure that monitoring and maintenance continues as per the license conditions and that critical infrastructure such as the seepage recovery system was maintained. CW stated a number of samples were taken during the inspection from water storages (refer to **Appendix 4 Certificate of Analysis from inspection sampling**)

CW also raised and outstanding compliance matters: ammonia complaints from July 2015, exceedance of PM10 nickel limit at Saunders Beach HVOI station, TSF cell lift and timeframe and visible emissions from the plant, specifically the roasters.

FTI consulting plan to operate the refinery as 'business as usual' and intend to continue to trade with processes and systems continuing as per usual.

All items described as non-compliant or areas of concern as recorded in this inspection report were discussed at the close out meeting. See official notebook for details of this meeting.

Part G. Recommendation (NB: Refer to parts C – E where relevant)

Consider previous inspections and any on-going non-compliances when making recommendation, include relevant history here if applicable

Consider appropriate enforcement action to take: Letter to gather additional information

Are follow up inspections required? An inspection may be required if any changes occur in the organisational structure of the company as a result of a decision made by the administrators.

It is recommended that all areas of concern and previously identified non-compliances are outlined in a letter to FTI Consulting to ensure that the administrators are aware of all current actions in relation to the Queensland Nickel Refinery.

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Part H. Natural justice

☒ Did the client provide information relating to any extenuating circumstances that prevented compliance?
 Yes ☐ No ☐

If Yes, describe what information was provided:

The purpose of the letter to QN is to provide the opportunity to provide any further information regarding the areas of concern and outstanding compliance matters.

☐ If the client provided information, have you taken this information into consideration when making your recommendation? Yes ☐ No ☐

If Yes, describe the consideration given and what conclusions have been formed by the department.

To be determined once information has been provided to EHP.

Part I. Ecotrack

Ecotrack case number	CA39126
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Activity	Time (hours)	Comments
Planning	3	
Inspection	10	
Reporting	10	
Total	23	

Part J. Approval

Environmental officer	Reviewing Officer
sch4p4(6) Signature 	
Name: Laura Rehn	Name:
Date: 5/2/2016.	Date:

Delegated decision-maker **Approve / Reject Recommendation (circle one)**

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Reasons for decision

- ☒ I approve this recommendation based upon the information set out in this report.
- ☐ I reject the above recommendation as I consider it more appropriate for the department to take an alternative approach to this breach.

The alternative option/s that should be considered in this case are:

My reasons for this are:

sch4p4(6) Signature

Name: Chris Wake

Date: 08.02.16 .

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Appendix 1 - Compliance Inspection Photos

Photos were taken by Chris Wake.

Edocs reference: 101/0008166 document number 4388068

All photos are saved electronically at the following location –

G:\Environmental Services\Rehn Laura\QN\Yabulu Refinery\Inspections\2016\27.1.2016



DSCN1884. Ore stockpile looking North



DSCN1885. Coal stockpile looking south



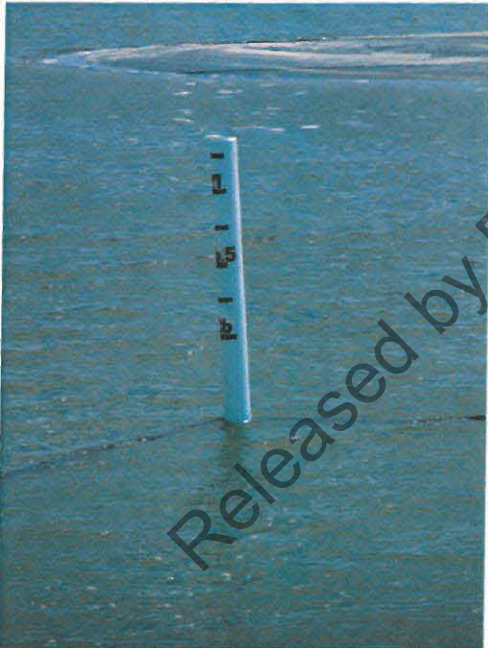
DSCN1891. Pilled sulfur with plant in background. Evidence of spillage from bags.



DSCN1893. Drying kilns adjacent to roasters looking south.



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<p>DSCN1894. IBCs near stockpile area stated to be empty</p>  <p>DSCN1898. Brine Pond Cell 1 looking West</p>	<p>DSCN1896. Inside of Reverse Osmosis plant</p>  <p>DSCN1899. Close up view of level marker in Cell 1</p>
 <p>DSCN1900. Level Marker in Cell 1 of Brine Pond, balloon in liner in background</p>	 <p>DSCN1901. Further afield view of level marker in Cell 1.</p>

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DSCN1902. Sampling of Brine Pond



DSCN1903. Brine Pond spillway with stockpile area in background



DSCN1906. Northwest pond, stockpile area and TSF in background as seen from Brine Pond Crest



DSCN1907. Spillway of North West Pond, reporting to Levee banks



DSCN1909. Exposed tailings in TSF Cell 2.

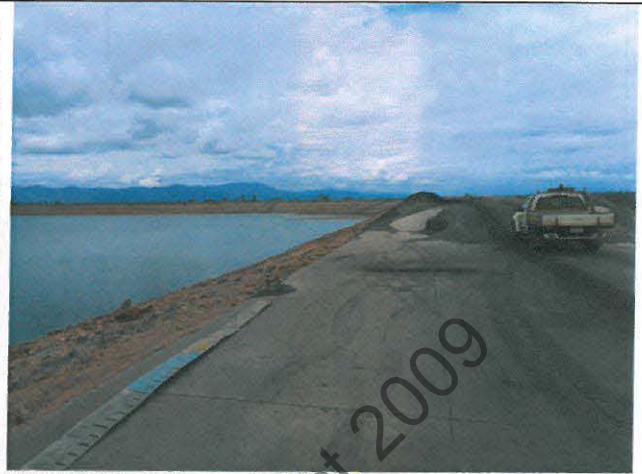


DSCN1914. Sampling from TSF Cell 3.

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DSCN1919. MRL marker at spillway from Cell 3 of TSF



DSCN1923. Spillway of TSF



DSCN1925. Closed off ocean outfall pipe



DSCN1927. Level marker in Toe Drain



DSCN1928. Sampling from Toe Drain



DSCN1930. Levee Bank overflow

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DSCN1933. Levee Bank lagoon area.



DSCN1935. Sampling at Blind Creek compliance location



DSCN1936. Blind Creek compliance point looking to Halifax Bay.



DSCN1939. QN representative sampling at Alick Creek compliance point



DSCN1940. Alick Creek compliance point looking towards Halifax bay.



DSCN1942. Saunders Beach HIVOL sampler

Appendix 2 – Current Water Levels Correspondence

From: "Gross, Peter" <Peter.Gross@qni.com.au>

Date: 21 January 2016 4:44:35 pm AEST

To: "Lukacs, George" <George.Lukacs@qni.com.au>, "Hultgren, Ross" <Ross.Hultgren@qni.com.au>

Subject: RE: Confirming Site Inspection 27 January 2016

George, situation at 18/1/16 was:

TSF

Water stored approximately 3216ML, Total void above tailings is 8612ML, Therefore 37% full.
Cell 3 level is at approximately 19.68m which is approximately 2.32m below MRL of 22.0m.
TSF rainfall holding capacity is approximately 2453mm.

Brine ponds

Water stored approximately 1200ML, Total void is approximately 1949ML, Therefore 62% full.
Cell 2B level is 24.97m which is approximately 1.03m below MRL of 26.0m.
Brine pond rainfall holding capacity is approximately 1827mm.

Cheers

Peter Gross | Environmental Scientist

QUEENSLAND NICKEL PTY LTD

Greenvale Street, Yabulu QLD 4818

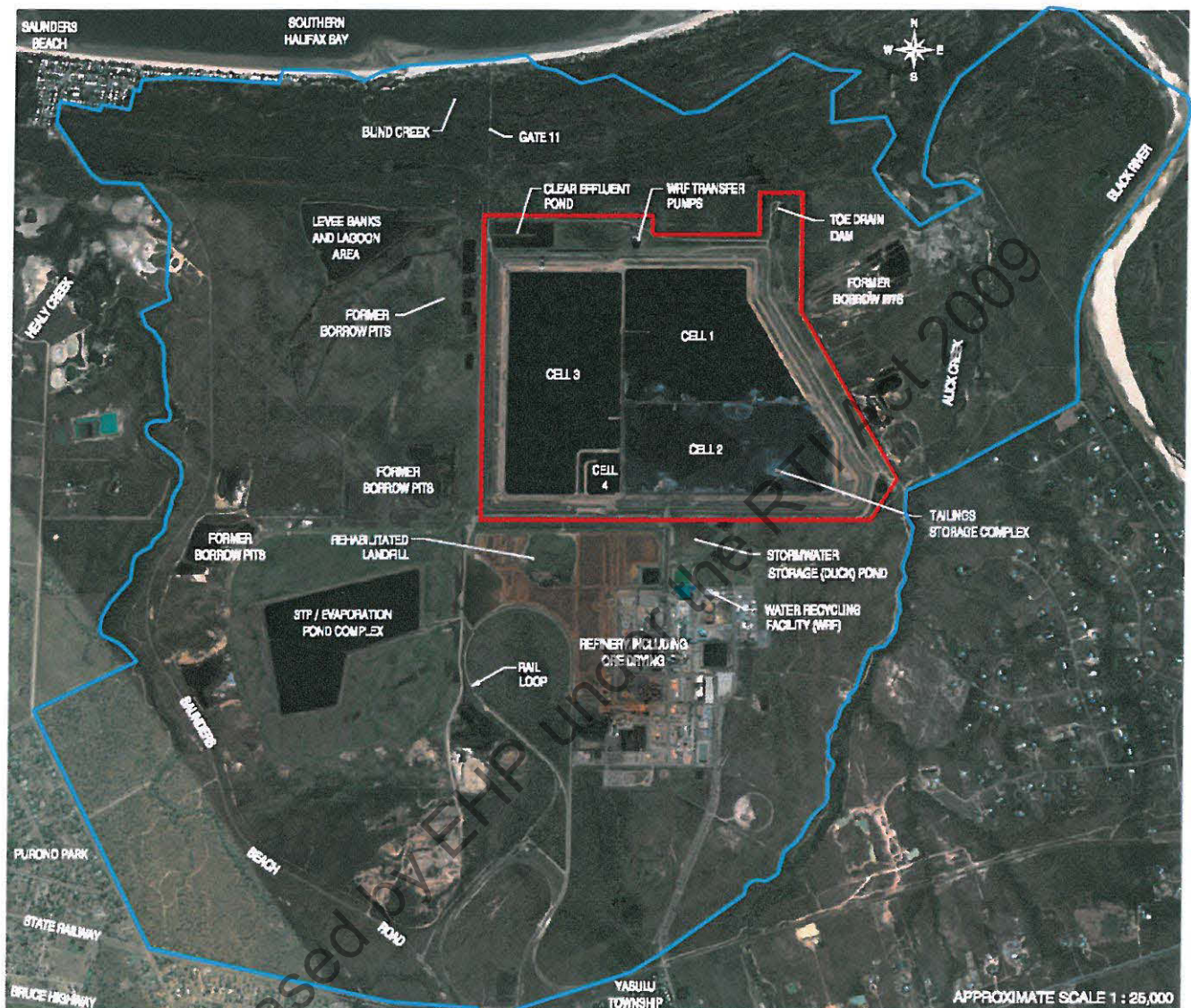
PMB 5 Townsville QLD 4810

P > 07 4720 6783 | M > sch4p4(6) Per

E > Peter.Gross@qni.com.au

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Appendix 3 – Site Layout



Page : 3 of 4
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QNBRINE	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time					[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit		EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	---	0.01	pH Unit		6.15	6.67	7.36	7.97	8.06
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	---	1	µS/cm		46200	13100	10600	56500	56300
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	---	10	mg/L		49100	10600	8930	42600	42300
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	---	5	mg/L		8	<5	<5	<5	5
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L		7	12	72	129	132
Total Alkalinity as CaCO ₃	---	1	mg/L		7	12	72	129	132
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA									
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L		34600	6840	6050	2900	2820
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1170	313	290	21100	20900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		505	123	191	454	479
Magnesium	7439-95-4	1	mg/L		4360	857	888	1440	1480
Sodium	7440-23-5	1	mg/L		1190	251	222	11400	12000
Potassium	7440-09-7	1	mg/L		108	24	30	426	442
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.001	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	0.001	mg/L		0.002	0.014	<0.001	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		0.651	0.092	0.016	<0.005	<0.005
Copper	7440-50-8	0.001	mg/L		0.006	0.004	0.001	<0.005	<0.005
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L		66.2	8.38	9.41	0.033	0.011
Nickel	7440-02-0	0.001	mg/L		5.66	2.28	0.094	<0.005	<0.005
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.003	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	0.001	mg/L		0.004	0.019	<0.001	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		0.713	0.102	0.017	<0.005	<0.005
Copper	7440-50-8	0.001	mg/L		0.004	0.003	<0.001	<0.005	<0.005

Appendix 4. Certificate of Analysis from inspection sampling

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 Work Order : EB1602055
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 Project : QN



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QNBRI	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time					[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit		EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
				Result	Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L	67.8	8.40	9.22	0.044	0.028	0.028
Nickel	7440-02-0	0.001	mg/L	5.93	2.35	0.093	<0.005	<0.005	<0.005
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.21	987	646	0.62	0.16	0.16
EN055: Ionic Balance									
Total Anions	---	0.01	meq/L	754	151	136	658	651	651
Total Cations	---	0.01	meq/L	---	159	140	---	---	---
Total Cations	---	0.01	meq/L	438	---	---	648	679	679
Ionic Balance	---	0.01	%	---	2.44	1.43	---	---	---
Ionic Balance	---	0.01	%	26.4	---	---	0.80	2.10	2.10

Released by EHP under the RTI Act 2009



Department of
**Environment and
Heritage Protection**

Ref 101/0008166

5 February 2016

FTI Consulting (Administrators for)
Queensland Nickel Pty Ltd
1 Greenvale Street
YABULU QLD 4818

c/c FTI Consulting (Administrators for)
Queensland Nickel Pty Ltd
PMB 5
TOWNSVILLE QLD 4810

Attention: John Park, Kelly-Anne Trenfield, Stefan Dopking and Quentin Olde

Dear Sir/Madam

I refer to the inspection of the Queensland Nickel (QN) Yabulu Refinery, undertaken by officers of the Department of Environment and Heritage Protection (EHP) on 27 January 2016. The purpose of the inspection was to assess compliance with the requirements of Environmental Authority EPPR 00940913 (EA) with a particular emphasis on wet season risks.

This letter details the outcomes of the compliance inspection. In addition, and in consideration of the appointment of FTI Consulting as the administrators for Queensland Nickel Pty Ltd, this letter provides a summary of the current compliance and operational matters that are of concern to EHP.

Inspection of the Refinery:

EHP officers conducted the inspection in the presence of representatives of QN, FTI Consulting and Delta Environmental Pty Ltd. A number of environmental samples were taken during the inspection from refinery water storages and at compliance monitoring locations. The analytical results for these samples are attached for your perusal. At the time of the inspection, no matters of immediate concern were identified by EHP officers.

Current Compliance matters:

Court Proceedings

Following heavy rain associated with Tropical Cyclone Ita in April 2014, a release from the Tailings Storage Facility (TSF) occurred. EHP formally investigated the release and subsequently charged QN with breaches of the EA. Court proceedings in relation to these matters are continuing.

Ammonia Release and Odour Complaints

On the evening of 12 July 2015, EHP received 9 complaints to the after-hours pollution hotline concerning an ammonia odour in the residential community of Saunders Beach. A report provided by QN stated that the odour was attributed to malfunction of plant infrastructure that manages ammonia gas. EHP has formally investigated the complaints and is considering an enforcement response in accordance with the departmental enforcement guidelines, which can be found on the following website

<https://www.ehp.qld.gov.au/management/pdf/enforcement-guidelines.pdf>

Level 10, Verde Tower
445 Flinders Street Townsville
PO Box 5391, Townsville
Queensland 4810 Australia
Telephone + 61 7 4722 5353
Facsimile + 61 7 4722 5351
Website www.ehp.qld.gov.au
ABN 46 640 294 485

Saunders Beach Air Quality Non-compliance

On 1 December 2015 EHP received written notification from QN that the air quality limit for nickel specified in Table B3 and associated condition B2-3 of the EA, had been exceeded. The notification stated that the annual average for nickel, measured via a High Volume (HIVOL) Sampler for the PM₁₀ particle size over the preceding 11 months, was 0.041ug/m³ at Saunders Beach, which exceeds the air quality limit of 0.02ug/m³ specified in the EA.

A follow-up investigation report was submitted by QN on 15 December 2015 in which QN has stated that the 10 business day timeframe prescribed by condition A6-2 for investigating and reporting on an exception has been insufficient to fully investigate this complex issue. EHP is considering an enforcement response, which may include the requirement to undertake an environmental investigation, in accordance with the departmental enforcement guidelines.

Annual Hazardous Dams Inspection report

EHP received the Annual Hazardous Dams Inspection report (the report) from QN on 7 January 2016. Following review of the report, a number of potential non-compliances have been identified:

- Condition D3-2: *Each regulated structure must be maintained and operated in a manner that is consistent with the current design plan, the current operational plan and the associated certified 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.*
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 - g) for the adequacy of the available storage in each regulated structure, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of containment barrier and the level of liquids in the regulated structure (or network of linked containment systems).*
 - Section 5.1.4 of the report states that evidence of DSA being met was provided by QN on 24 April 2015. This date is before the date stated in condition D5-2 of observations taken after 31 May.
- Condition D5-5: *The holder of this environmental authority must:*
 - b) within twenty (20) business days of receipt of the annual inspection report, notify the administering authority in writing, of the recommendations of the inspection report and the actions being taken to ensure the integrity of each regulated structure.*
 - QN advised via email on 9 October 2015 that "the annual dam safety inspection report has not yet been prepared" but that it would be provided in due course.
 - On 7 January 2016 EHP received the inspection report dated May 2015 for an inspection undertaken in April 2015, which QN confirmed is the most current report submitted for the 2015 calendar year.

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QN is invited to provide justification or further information regarding the identified potential non-compliances before EHP considers whether an enforcement response is necessary in relation to this matter.

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Should an event occur that causes or threatens serious or material environmental harm, under the conditions of the EA and pursuant to section 320 of the Act, FTI Consulting has a duty to notify the department of such events. Further information on the duty to notify requirements is available on the department's website at www.ehp.qld.gov.au, and should an event occur, please contact EHP's pollution hotline on 1300 130 372.

Should you have any enquiries in relation to this letter, please contact Ms Laura Rehn, Senior Environmental Officer of the department on telephone (07) 4722 5354 or laura.rehn@ehp.qld.gov.au.

Yours sincerely

sch4p4(6) Signature

Christopher Wake
Compliance Delivery Manager

Enc 1 – Analytical results from sampling undertaken by EHP on 27/01/2016



CERTIFICATE OF ANALYSIS

Work Order : EB1602055 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION Contact : MR CHRIS WAKE Address : GPO BOX 5391 TOWNSVILLE MC QLD, AUSTRALIA 4810 E-mail : chris.wake@ehp.qld.gov.au Telephone : +61 07 4722 5371 Facsimile : +61 07 47225351 Project : QN Order number : --- C-O-C number : 131389 Sampler : --- Site : QN Yabulu Quote number : ---	Page : 1 of 4 Laboratory : Environmental Division Brisbane Contact : Customer Services EB Address : 2 Byth Street Stafford QLD Australia 4053 E-mail : ALSEnviro.Brisbane@alsglobal.com Telephone : +61-7-3243 7222 Facsimile : +61-7-3243 7218 QC Level : NEPM 2013 B3 & ALS QC Standard Date Samples Received : 28-Jan-2016 09:30 Date Analysis Commenced : 28-Jan-2016 Issue Date : 03-Feb-2016 16:24 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.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

Signatories

Position

Accreditation Category

Andrew Epps

Senior Inorganic Chemist

Brisbane Inorganics, Stafford, QLD

Kim McCabe

Senior Inorganic Chemist

Brisbane Inorganics, Stafford, QLD

Page : 2 of 4
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



General Comments

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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.

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.

- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) for some samples. However, the difference is within experimental variation of the methods.
- EG020-F and EG020-T (Dissolved Metals and Total Metals by ICP-MS): Limit of reporting raised for some samples due to matrix interference.
- The presence of high SO₄ may bias the EC low.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits for sample QNBRINE due to analytes not quantified in this report.

Released by EHP under the RTI Act 2009

Page : 3 of 4
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				QNBRINE	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time				[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit	EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	---	0.01	pH Unit	6.15	6.67	7.36	7.97	8.06
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	---	1	µS/cm	46200	13100	10600	56500	56300
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	---	10	mg/L	49100	10600	8930	42600	42300
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	---	5	mg/L	8	<5	<5	<5	5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	1	mg/L	7	12	72	129	132
Total Alkalinity as CaCO ₃	---	1	mg/L	7	12	72	129	132
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	34600	6840	6050	2900	2820
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1170	313	290	21100	20900
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	505	123	191	454	479
Magnesium	7439-95-4	1	mg/L	4360	857	888	1440	1480
Sodium	7440-23-5	1	mg/L	1190	251	222	11400	12000
Potassium	7440-09-7	1	mg/L	108	24	30	426	442
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	0.001	mg/L	0.002	0.014	<0.001	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L	0.651	0.092	0.016	<0.005	<0.005
Copper	7440-50-8	0.001	mg/L	0.006	0.004	0.001	<0.005	<0.005
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L	66.2	8.38	9.41	0.033	0.011
Nickel	7440-02-0	0.001	mg/L	5.66	2.28	0.094	<0.005	<0.005
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.003	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	0.001	mg/L	0.004	0.019	<0.001	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L	0.713	0.102	0.017	<0.005	<0.005
Copper	7440-50-8	0.001	mg/L	0.004	0.003	<0.001	<0.005	<0.005

Page : 4 of 4
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



Analytical Results

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

Client sample ID

				QNBRINE	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time				[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit	EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued								
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L	67.8	8.40	9.22	0.044	0.028
Nickel	7440-02-0	0.001	mg/L	5.93	2.35	0.093	<0.005	<0.005
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.21	987	646	0.62	0.16
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	754	151	136	658	651
Total Cations	---	0.01	meq/L	---	159	140	---	---
Total Cations	---	0.01	meq/L	438	---	---	648	679
Ionic Balance	---	0.01	%	---	2.44	1.43	---	---
Ionic Balance	---	0.01	%	26.4	---	---	0.80	2.10

Released by EHP under the RTI Act 2009

From: REHN Laura [Laura.Rehn@ehp.qld.gov.au]
Sent: Monday, 8 February 2016 9:13 AM
To: Lukacs, George (George.Lukacs@qni.com.au)
CC: WAKE Chris; MAKOWSKI Jane; Hultgren, Ross (Ross.Hultgren@qni.com.au)
Subject: Queensland Nickel post inspection correspondence
Attachments: SKMBT_C45216020808540.pdf

Good Morning George

I phoned just then and left a message on your landline and mobile to let you know that the correspondence regarding the 27 January 2016 has been mailed to the administrators today. A copy is also attached for your reference.

Kind regards,

Laura Rehn

Senior Environmental Officer

Environmental Services and Regulation | North Queensland Compliance

Department of Environment and Heritage Protection



P 07 4722 5354

Level 10, Verde Tower, 445 Flinders Street, Townsville QLD 4810

PO Box 5391, Townsville QLD 4810

Released by EHP under the RTI Act 2009



Department of
**Environment and
Heritage Protection**

Ref 101/0008166

5 February 2016

FTI Consulting (Administrators for)
Queensland Nickel Pty Ltd
1 Greenvale Street
YABULU QLD 4818

c/c FTI Consulting (Administrators for)
Queensland Nickel Pty Ltd
PMB 5
TOWNSVILLE QLD 4810

Attention: John Park, Kelly-Anne Trenfield, Stefan Dopking and Quentin Olde

Dear Sir/Madam

I refer to the inspection of the Queensland Nickel (QN) Yabulu Refinery, undertaken by officers of the Department of Environment and Heritage Protection (EHP) on 27 January 2016. The purpose of the inspection was to assess compliance with the requirements of Environmental Authority EPPR 00940913 (EA) with a particular emphasis on wet season risks.

This letter details the outcomes of the compliance inspection. In addition, and in consideration of the appointment of FTI Consulting as the administrators for Queensland Nickel Pty Ltd, this letter provides a summary of the current compliance and operational matters that are of concern to EHP.

Inspection of the Refinery:

EHP officers conducted the inspection in the presence of representatives of QN, FTI Consulting and Delta Environmental Pty Ltd. A number of environmental samples were taken during the inspection from refinery water storages and at compliance monitoring locations. The analytical results for these samples are attached for your perusal. At the time of the inspection, no matters of immediate concern were identified by EHP officers.

Current Compliance matters:

Court Proceedings

Following heavy rain associated with Tropical Cyclone Ita in April 2014, a release from the Tailings Storage Facility (TSF) occurred. EHP formally investigated the release and subsequently charged QN with breaches of the EA. Court proceedings in relation to these matters are continuing.

Ammonia Release and Odour Complaints

On the evening of 12 July 2015, EHP received 9 complaints to the after-hours pollution hotline concerning an ammonia odour in the residential community of Saunders Beach. A report provided by QN stated that the odour was attributed to malfunction of plant infrastructure that manages ammonia gas. EHP has formally investigated the complaints and is considering an enforcement response in accordance with the departmental enforcement guidelines, which can be found on the following website

<https://www.ehp.qld.gov.au/management/pdf/enforcement-guidelines.pdf>

Level 10, Verde Tower
445 Flinders Street Townsville
PO Box 5391, Townsville
Queensland 4810 Australia
Telephone + 61 7 4722 5353
Facsimile + 61 7 4722 5351
Website www.ehp.qld.gov.au
ABN 46 640 294 485

Saunders Beach Air Quality Non-compliance

On 1 December 2015 EHP received written notification from QN that the air quality limit for nickel specified in Table B3 and associated condition B2-3 of the EA, had been exceeded. The notification stated that the annual average for nickel, measured via a High Volume (HIVOL) Sampler for the PM₁₀ particle size over the preceding 11 months, was 0.041ug/m³ at Saunders Beach, which exceeds the air quality limit of 0.02ug/m³ specified in the EA.

A follow-up investigation report was submitted by QN on 15 December 2015 in which QN has stated that the 10 business day timeframe prescribed by condition A6-2 for investigating and reporting on an exception has been insufficient to fully investigate this complex issue. EHP is considering an enforcement response, which may include the requirement to undertake an environmental investigation, in accordance with the departmental enforcement guidelines.

Annual Hazardous Dams Inspection report

EHP received the Annual Hazardous Dams Inspection report (the report) from QN on 7 January 2016. Following review of the report, a number of potential non-compliances have been identified:

- Condition D3-2: *Each regulated structure must be maintained and operated in a manner that is consistent with the current design plan, the current operational plan and the associated certified 'as constructed' drawings for the duration of its operational life until decommissioned and rehabilitated.*
 - Section 5.1.3 of the report states that "it is understood that regular monthly inspections are not being undertaken in accordance with the operational plan".
- Condition D5-2: *At each annual inspection, the condition and adequacy of all components of the regulated structure against:*
 - g) *for the adequacy of the available storage in each regulated structure, based on an actual observation or observations taken after 31 May each year but prior to 1 November of that year, of accumulated sediment, state of containment barrier and the level of liquids in the regulated structure (or network of linked containment systems).*
 - Section 5.1.4 of the report states that evidence of DSA being met was provided by QN on 24 April 2015. This date is before the date stated in condition D5-2 of observations taken after 31 May.
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Yours sincerely

sch4p4(6) Signature

Christopher Wake
Compliance Delivery Manager

Enc 1 – Analytical results from sampling undertaken by EHP on 27/01/2016


Environmental

CERTIFICATE OF ANALYSIS

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Signatories

Position

Accreditation Category

Andrew Epps

Senior Inorganic Chemist

Brisbane Inorganics, Stafford, QLD

Kim McCabe

Senior Inorganic Chemist

Brisbane Inorganics, Stafford, QLD

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 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



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Page : 3 of 4
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QNBRI	QNTSF	QNTOE	QNBC01	QNA001
Client sampling date / time					[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
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EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	---	5	mg/L	8	<5	<5	<5	5	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO ₃	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
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Total Alkalinity as CaCO ₃	---	1	mg/L	7	12	72	129	132	
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ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	505	123	191	454	479	
Magnesium	7439-95-4	1	mg/L	4360	857	888	1440	1480	
Sodium	7440-23-5	1	mg/L	1190	251	222	11400	12000	
Potassium	7440-09-7	1	mg/L	108	24	30	426	442	
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	<0.001	<0.005	<0.005	
Chromium	7440-47-3	0.001	mg/L	0.002	0.014	<0.001	<0.005	<0.005	
Cobalt	7440-48-4	0.001	mg/L	0.651	0.092	0.016	<0.005	<0.005	
Copper	7440-50-8	0.001	mg/L	0.006	0.004	0.001	<0.005	<0.005	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.001	<0.005	<0.005	
Manganese	7439-96-5	0.001	mg/L	66.2	8.38	9.41	0.033	0.011	
Nickel	7440-02-0	0.001	mg/L	5.66	2.28	0.094	<0.005	<0.005	
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L	0.003	<0.001	<0.001	<0.005	<0.005	
Chromium	7440-47-3	0.001	mg/L	0.004	0.019	<0.001	<0.005	<0.005	
Cobalt	7440-48-4	0.001	mg/L	0.713	0.102	0.017	<0.005	<0.005	
Copper	7440-50-8	0.001	mg/L	0.004	0.003	<0.001	<0.005	<0.005	

Page : 4 of 4
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



Analytical Results

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

Client sample ID

				QNBRINE	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time				[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit	EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued								
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L	67.8	8.40	9.22	0.044	0.028
Nickel	7440-02-0	0.001	mg/L	5.93	2.35	0.093	<0.005	<0.005
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.21	987	646	0.62	0.16
EN055: Ionic Balance								
Total Anions	---	0.01	meq/L	754	151	136	658	651
Total Cations	---	0.01	meq/L	---	159	140	---	---
Total Cations	---	0.01	meq/L	438	---	---	648	679
Ionic Balance	---	0.01	%	---	2.44	1.43	---	---
Ionic Balance	---	0.01	%	26.4	---	---	0.80	2.10

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From: WAKE Chris [Chris.Wake@ehp.qld.gov.au]

Sent: Wednesday, 3 February 2016 4:27 PM

To: REHN Laura

Subject: FW: RESULTS & EDD & INVOICE for ALS Workorder : EB1602055 | Your Reference: QN

Attachments: EB1602055_0_COA.pdf; EB1602055_0_XTAB.XLS; EB1602055_0_QC.pdf; EB1602055_0_QCI.pdf; L290006_INV.pdf; EB1602055_COC.pdf

Follow Up Flag: Follow up

Flag Status: Completed

Hi Laura,

Can you please review these results and organise for the invoice to be paid.

Cheers,

C

Christopher Wake

Compliance Delivery Manager – North Queensland Compliance

Environmental Services and Regulation

Department of Environment and Heritage Protection

P 07 4722 5371

Level 10, 445 Flinders Street, Townsville QLD 4810

PO Box 5391, Townsville QLD 4810



From: angel-no-reply@alsglobal.com [mailto:angel-no-reply@alsglobal.com]

Sent: Wednesday, 3 February 2016 4:25 PM

To: WAKE Chris

Subject: RESULTS & EDD & INVOICE for ALS Workorder : EB1602055 | Your Reference: QN



Deliverables for ALS Workorder EB1602055

Project: QN

Dear CHRIS WAKE,

Please find enclosed the following deliverables for **EB1602055**:

- EB1602055_0_COA.pdf
- EB1602055_0_XTAB.XLS
- EB1602055_0_QC.pdf
- EB1602055_0_QCI.pdf
- L290006_INV.pdf
- EB1602055_COC.pdf

Report Recipients

- CHRIS WAKE
 - EB1602055_0_COA.pdf (Email)
 - EB1602055_0_XTAB.XLS (Email)
 - EB1602055_0_QC.pdf (Email)
 - EB1602055_0_QCI.pdf (Email)
 - L290006_INV.pdf (Email)
 - EB1602055_COC.pdf (Email)

www.alsglobal.com

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CERTIFICATE OF ANALYSIS

Work Order	: EB1602055	Page	: 1 of 4
Client	: QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS WAKE	Contact	: Customer Services EB
Address	: GPO BOX 5391 TOWNSVILLE MC QLD, AUSTRALIA 4810	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: chris.wake@ehp.qld.gov.au	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 4722 5371	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 47225351	Facsimile	: +61-7-3243 7218
Project	: QN	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 28-Jan-2016 09:30
C-O-C number	: 131389	Date Analysis Commenced	: 28-Jan-2016
Sampler	: ----	Issue Date	: 03-Feb-2016 16:24
Site	: QN Yabulu	No. of samples received	: 5
Quote number	: ----	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

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.

- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) for some samples. However, the difference is within experimental variation of the methods.
- EG020-F and EG020-T (Dissolved Metals and Total Metals by ICP-MS): Limit of reporting raised for some samples due to matrix interference.
- The presence of high SO₄ may bias the EC low.
- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- Ionic Balance out of acceptable limits for sample QNBRINE due to analytes not quantified in this report.

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Analytical Results

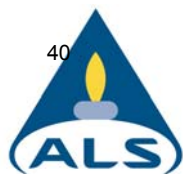
Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QNBRINE	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time					[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit		EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		6.15	6.67	7.36	7.97	8.06
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		46200	13100	10600	56500	56300
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		49100	10600	8930	42600	42300
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		8	<5	<5	<5	5
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		7	12	72	129	132
Total Alkalinity as CaCO3	----	1	mg/L		7	12	72	129	132
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		34600	6840	6050	2900	2820
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		1170	313	290	21100	20900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		505	123	191	454	479
Magnesium	7439-95-4	1	mg/L		4360	857	888	1440	1480
Sodium	7440-23-5	1	mg/L		1190	251	222	11400	12000
Potassium	7440-09-7	1	mg/L		108	24	30	426	442
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.001	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	0.001	mg/L		0.002	0.014	<0.001	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		0.651	0.092	0.016	<0.005	<0.005
Copper	7440-50-8	0.001	mg/L		0.006	0.004	0.001	<0.005	<0.005
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L		66.2	8.38	9.41	0.033	0.011
Nickel	7440-02-0	0.001	mg/L		5.66	2.28	0.094	<0.005	<0.005
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.003	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	0.001	mg/L		0.004	0.019	<0.001	<0.005	<0.005
Cobalt	7440-48-4	0.001	mg/L		0.713	0.102	0.017	<0.005	<0.005
Copper 15-253	7440-50-8	0.001	mg/L		0.004	0.003	<0.001	<0.005	<0.005



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QNBRINE	QNTSF	QNTOE	QNBC01	QNAC01
Client sampling date / time					[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]	[27-Jan-2016]
Compound	CAS Number	LOR	Unit		EB1602055-001	EB1602055-002	EB1602055-003	EB1602055-004	EB1602055-005
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.005	<0.005
Manganese	7439-96-5	0.001	mg/L		67.8	8.40	9.22	0.044	0.028
Nickel	7440-02-0	0.001	mg/L		5.93	2.35	0.093	<0.005	<0.005
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.21	987	646	0.62	0.16
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		754	151	136	658	651
Total Cations	----	0.01	meq/L		----	159	140	----	----
Total Cations	----	0.01	meq/L		438	----	----	648	679
Ionic Balance	----	0.01	%		----	2.44	1.43	----	----
Ionic Balance	----	0.01	%		26.4	----	----	0.80	2.10

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QUALITY CONTROL REPORT

Work Order	: EB1602055	Page	: 1 of 7
Client	: QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS WAKE	Contact	: Customer Services EB
Address	: GPO BOX 5391 TOWNSVILLE MC QLD, AUSTRALIA 4810	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: chris.wake@ehp.qld.gov.au	E-mail	: ALSEnviro.Brisbane@alsglobal.com
Telephone	: +61 07 4722 5371	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 47225351	Facsimile	: +61-7-3243 7218
Project	: QN	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 28-Jan-2016
C-O-C number	: 131389	Date Analysis Commenced	: 28-Jan-2016
Sampler	: ----	Issue Date	: 03-Feb-2016
Site	: QN Yabulu	No. of samples received	: 5
Quote number	: ----	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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



NATA Accredited
Laboratory 825

Accredited for
compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Andrew Epps	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

Page : 2 of 7
Work Order : EB1602055
Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
Project : QN



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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

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Page : 3 of 7
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



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**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA005P: pH by PC Titrator (QC Lot: 345566)									
EB1602055-001	QNBRINE	EA005-P: pH Value	----	0.01	pH Unit	6.15	5.97	2.97	0% - 20%
EB1602053-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.20	8.26	0.729	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 345565)									
EB1602055-001	QNBRINE	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	46200	45900	0.647	0% - 20%
EB1602053-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	11500	11600	0.441	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 345285)									
EB1602053-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	9460	9590	1.32	0% - 20%
EB1602053-010	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	2590	2570	0.968	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 345280)									
EB1601841-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.00	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 345567)									
EB1602055-001	QNBRINE	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	7	10	32.9	0% - 50%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	7	10	32.9	0% - 50%
EB1602053-001	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	647	657	1.44	0% - 20%
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	647	657	1.44	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 343572)									
EB1602001-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 343573)									
EB1602001-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7430	7410	0.159	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 343624)									
EB1601923-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.00	No Limit
EB1602053-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	14	15	0.00	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	55	56	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	97	97	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	557	559	0.459	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 343625)									
EB1601923-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Page : 4 of 7
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 343625) - continued									
EB1601923-001	Anonymous	EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
EB1602053-008	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.002	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.005	0.004	29.6	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.216	0.216	0.00	0% - 20%
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
EG020T: Total Metals by ICP-MS (QC Lot: 343640)									
EB1602053-001	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.164	0.166	1.07	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	No Limit
EB1602053-010	Anonymous	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.052	0.051	0.00	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.017	0.017	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.063	0.062	1.74	0% - 20%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.332	0.356	6.94	0% - 20%
EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	No Limit		
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 343797)									
EB1602053-007	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.02	0.00	No Limit
EB1602053-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.02	51.7	No Limit

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Method Blank (MB) and Laboratory Control Spike (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			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
							Low	High
EA005P: pH by PC Titrator (QCLot: 345566)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98	102
				----	7 pH Unit	99.8	98	102
EA010P: Conductivity by PC Titrator (QCLot: 345565)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	4000 µS/cm	103	91	107
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 345285)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	97.2	88	112
				<10	2000 mg/L	101	88	112
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 345280)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	100	88	112
				<5	1000 mg/L	98.7	88	112
ED037P: Alkalinity by PC Titrator (QCLot: 345567)								
ED037-P: Total Alkalinity as CaCO ₃	----	----	mg/L	----	200 mg/L	102	87	112
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA (QCLot: 343572)								
ED041G: Sulfate as SO ₄ - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	85	118
				<1	100 mg/L	102	85	118
ED045G: Chloride by Discrete Analyser (QCLot: 343573)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	90	115
				<1	1000 mg/L	107	90	115
ED093F: Dissolved Major Cations (QCLot: 343624)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	----	----	----	----
ED093F: Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
ED093F: Potassium	7440-09-7	1	mg/L	<1	----	----	----	----
ED093F: Sodium	7440-23-5	1	mg/L	<1	----	----	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 343625)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	90.5	88	116
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	88.8	87	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	90.4	86	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.2 mg/L	91.3	88	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.3	89	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	90.8	89	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	92.0	89	113
EG020T: Total Metals by ICP-MS (QCLot: 343640)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.8	88	112

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Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
CAS Number	LOR	Unit	Result			LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 343640) - continued								
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.1	89	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	93.7	89	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.2 mg/L	94.9	88	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.8	89	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	88.2	88	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.5	88	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 343797)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	86	112

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.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 343572)							
EB1602001-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	125	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 343573)							
EB1602001-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 343625)							
EB1602053-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.1 mg/L	89.4	70	130
		EG020A-F: Chromium	7440-47-3	0.1 mg/L	78.0	70	130
		EG020A-F: Cobalt	7440-48-4	0.1 mg/L	78.2	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	77.4	70	130
		EG020A-F: Lead	7439-92-1	0.1 mg/L	81.0	70	130
		EG020A-F: Manganese	7439-96-5	0.1 mg/L	# Not Determined	70	130
		EG020A-F: Nickel	7440-02-0	0.1 mg/L	75.8	70	130
EG020T: Total Metals by ICP-MS (QCLot: 343640)							
EB1602053-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	101	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	96.1	70	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	94.8	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	96.9	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	99.6	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	96.3	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	87.9	70	130
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Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID		Client sample ID		Spike	SpikeRecovery(%)	Recovery Limits (%)	
		Method: Compound	CAS Number	Concentration	MS	Low	High
EK055G: Ammonia as N by Discrete Analyser (QCLot: 343797)							
EB1602053-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	93.7	70	130

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QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1602055	Page	: 1 of 8
Client	: QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION	Laboratory	: Environmental Division Brisbane
Contact	: MR CHRIS WAKE	Telephone	: +61-7-3243 7222
Project	: QN	Date Samples Received	: 28-Jan-2016
Site	: QN Yabulu	Issue Date	: 03-Feb-2016
Sampler	: ----	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.
- Matrix Spike outliers exist - please see following pages for full details.
- 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.

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Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED045G: Chloride by Discrete Analyser	EB1602001--001	Anonymous	Chloride	16887-00-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG020F: Dissolved Metals by ICP-MS	EB1602053--002	Anonymous	Manganese	7439-96-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural QNBRINE, QNTOE, QNAC01		QNTSF, QNBC01,	----	----	----	02-Feb-2016 27-Jan-2016	5

Analysis Holding Time Compliance

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		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)	QNTSF, QNBC01,	27-Jan-2016	----	----	----	02-Feb-2016	27-Jan-2016	✘
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P)	QNTSF, QNBC01,	27-Jan-2016	----	----	----	02-Feb-2016	24-Feb-2016	✔



Matrix: **WATER** Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Clear Plastic Bottle - Natural (EA015H)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	01-Feb-2016	03-Feb-2016	✓
QNTOE,	QNBC01,							
QNAC01								
EA025: Total Suspended Solids dried at 104 ± 2 °C								
Clear Plastic Bottle - Natural (EA025H)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	01-Feb-2016	03-Feb-2016	✓
QNTOE,	QNBC01,							
QNAC01								
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	02-Feb-2016	10-Feb-2016	✓
QNTOE,	QNBC01,							
QNAC01								
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	28-Jan-2016	24-Feb-2016	✓
QNTOE,	QNBC01,							
QNAC01								
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	28-Jan-2016	24-Feb-2016	✓
QNTOE,	QNBC01,							
QNAC01								
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Filtered; Lab-acidified (ED093F)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	29-Jan-2016	24-Feb-2016	✓
QNTOE,	QNBC01,							
QNAC01								
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Filtered; Lab-acidified (EG020A-F)								
QNBRIE,	QNTSF,	27-Jan-2016	----	----	----	29-Jan-2016	25-Jul-2016	✓
QNTOE,	QNBC01,							
QNAC01								
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Unfiltered; Lab-acidified (EG020A-T)								
QNBRIE,	QNTSF,	27-Jan-2016	01-Feb-2016	25-Jul-2016	✓	01-Feb-2016	25-Jul-2016	✓
QNTOE,	QNBC01,							
QNAC01								

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Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G)								
QNBRINE,	QNTSF,	27-Jan-2016	---		---	29-Jan-2016	24-Feb-2016	✔
QNTOE,	QNBC01,							
QNAC01								

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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)							
Alkalinity by PC Titrator	ED037-P	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	9	22.22	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	9	22.22	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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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	
Matrix Spikes (MS) - Continued							
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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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 (2013) 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 (2013) Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of 'filterable' residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (2013) Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of 'non-filterable' residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

Page : 8 of 8
 Work Order : EB1602055
 Client : QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTION
 Project : QN



Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

Released by EHP under the PTI Act 2009

Matrix: WATER
Workgroup: EB1602055
Project name/number: QN

Sample Type: REG REG REG REG REG
ALS Sample number: EB1602055001 EB1602055002 EB1602055003 EB1602055004 EB1602055005
Sample date: 27/01/2016 27/01/2016 27/01/2016 27/01/2016 27/01/2016
Client sample ID (1st): QNBRINE QNTSF QNTOE QNBC01 QNAC01
Client sample ID (2nd):
Depth Type:
Depth (m):
Site: QN Yabulu QN Yabulu QN Yabulu QN Yabulu QN Yabulu
Purchase Order:

Analyte grouping/Analyte	CAS Number	Units	LOR					
EA005P: pH by PC Titrator								
pH Value		pH Unit	0.01	6.15	6.67	7.36	7.97	8.06
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C		µS/cm	1	46200	13100	10600	56500	56300
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C		mg/L	10	49100	10600	8930	42600	42300
EA025: Total Suspended Solids dried at 104 ± 2 °C								
Suspended Solids (SS)		mg/L	5	8	<5	<5	<5	5
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	mg/L	1	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6	mg/L	1	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	mg/L	1	7	12	72	128	132
Total Alkalinity as CaCO ₃		mg/L	1	7	12	72	129	132
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA								
Sulfate as SO ₄ - Turbidimetric	14808-79-8	mg/L	1	34600	6840	6050	2900	2820
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	mg/L	1	1170	313	290	21100	20900
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	mg/L	1	505	123	191	454	479
Magnesium	7439-95-4	mg/L	1	4360	857	888	1440	1480
Sodium	7440-23-5	mg/L	1	1190	251	222	11400	12000
Potassium	7440-09-7	mg/L	1	108	24	30	426	442
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	mg/L	0.001	0.001	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	mg/L	0.001	0.002	0.014	<0.001	<0.005	<0.005
Cobalt	7440-48-4	mg/L	0.001	0.651	0.092	0.016	<0.005	<0.005
Copper	7440-50-8	mg/L	0.001	0.006	0.004	0.001	<0.005	<0.005
Lead	7439-92-1	mg/L	0.001	<0.001	<0.001	0.001	<0.005	<0.005
Manganese	7439-96-5	mg/L	0.001	66.2	8.38	9.41	0.033	0.011
Nickel	7440-02-0	mg/L	0.001	5.66	2.28	0.094	<0.005	<0.005
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	mg/L	0.001	0.003	<0.001	<0.001	<0.005	<0.005
Chromium	7440-47-3	mg/L	0.001	0.004	0.019	<0.001	<0.005	<0.005
Cobalt	7440-48-4	mg/L	0.001	0.713	0.102	0.017	<0.005	<0.005
Copper	7440-50-8	mg/L	0.001	0.004	0.003	<0.001	<0.005	<0.005
Lead	7439-92-1	mg/L	0.001	<0.001	<0.001	<0.001	<0.005	<0.005
Manganese	7439-96-5	mg/L	0.001	67.8	8.40	9.22	0.044	0.028
Nickel	7440-02-0	mg/L	0.001	5.93	2.35	0.093	<0.005	<0.005
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	mg/L	0.01	0.21	987	646	0.62	0.16
EN055: Ionic Balance								
Total Anions		meq/L	0.01	754	151	136	658	651
Total Cations		meq/L	0.01	438	159	140	648	679
Ionic Balance		%	0.01	26.4	2.44	1.43	0.80	2.10

CHAIN OF CUSTODY DOCUMENTATION

131389

CLIENT: **EHP**
 ADDRESS / OFFICE: **475 Flinders St Townsville 4810**
 PROJECT MANAGER (PM): **CHARL WAKE**
 PROJECT ID: **Q**
 SITE: **Q/Yabulu** P.O. NO.:
 RESULTS REQUIRED (Date): QUOTE NO.: **BW137/14**

SAMPLER:
 MOBILE:
 PHONE:
 EMAIL REPORT TO:
 EMAIL INVOICE TO: (if different to report)
 ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite price)

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

SAMPLE TEMPERATURE

CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water)

CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
1	QNBRIE	W	27/01/16		P	4
2	QNTSF	W	27/01/16		P	4
3	QNTOE	W	27/01/16		P	4
4	QNBEOI	W	27/01/16		P	4
5	QNBEOI	W	27/01/16		P	4

Total Metals	As	Cr	Cu	Pb	Ni	Mn	Dissolved Metals	Ag	C	Co	Ca	Pd	Ni	Mn	sulphate	pH	EC	TDS	Total ammonia	NT-1	NI2	TSS
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



Environmental Division
 Brisbane
 Work Order Reference
EB1602055



Telephone: +61-7-3243 7222

High TSS expected

URGENT

RELINQUISHED BY:

Name: **CHRIS WAKE**Date: **27/01/16**Of: **EHP**Time: **2:25 pm**Name: **Joy Morgan**Date: **27/1/16**Of: **ALS**Time: **2:25**

sch4p4(6) Signature

RECEIVED BY:

Name:

Date: **27/1/16**Of: **ALS**Time: **2:25**Name: **ALS**Date: **28/1/16**Of: **ALS**Time: **9:30**

METHOD OF SHIPMENT

Con' Note No:

Transport Co:

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;

V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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.

ALS Laboratory Group

WHITE - LAB COPY
 YELLOW - CUSTOMER COPY
 PINK - BOOK COPY

COC Page ___ of ___

TAX INVOICE: L290006

QLD DEPT OF ENVIRONMENT & HERITAGE PROTECTIO
MR CHRIS WAKE
GPO BOX 5391
TOWNSVILLE MC
QLD, AUSTRALIA 4810

Page : 1 of 1

Work Order	Project / Overall Description	Site	Order number	C-O-C number	Contact
EB1602055	QN / ----	QN Yabulu	----	131389	MR CHRIS WAKE

Issue Date : 03-FEB-2016 **Taxable value : AUD\$ 715.00**
Due Date : 04-MAR-2016 **Tax Incurred (GST) : AUD\$ 71.50**
Amount Payable : AUD\$ 786.50

Work Order Breakdown

Method	Sale Item Descriptions	Quantity	Unit Value (AUD\$)	Value (AUD\$)	GST (AUD\$)	Line Total (AUD\$)
Work Order: EB1602055		Quote number: BNBO/082/15		Submatrix summary: 5 WATERS		
*Misc	Workorder Admin Fee	1	40.00	40.00	4.00	44.00
EA005P	pH (PC)	5	5.00	25.00	2.50	27.50
EA010P	Conductivity (PC)	5	5.00	25.00	2.50	27.50
EA015H	Total Dissolved Solids - High Level	5	10.00	50.00	5.00	55.00
EA025H	Suspended Solids (High Level)	5	10.00	50.00	5.00	55.00
EG020F	Dissolved Metals by ICPMS (7 Analytes)	5	27.00	135.00	13.50	148.50
EG020T	Total Recoverable Metals by ICPMS (including digestion) (7 Analytes)	5	32.00	160.00	16.00	176.00
EK055G	Ammonia as N By Discrete Analyser	5	14.00	70.00	7.00	77.00
NT-01 & 02	Ca, Mg, Na, K, Cl, SO4, Alkalinity	5	32.00	160.00	16.00	176.00

* denotes non-deductible item

• Please direct all queries to Environmental Division Brisbane on +61-7-3243 7222.

REMITTANCE ADVICE

POST TO: Australian Laboratory Services Pty Ltd
P.O. Box 66 Everton Park
QLD 4053 Australia

EMAIL TO: remittances@alsglobal.com

Vendor bank details

Bank: Commonwealth Bank
BSB: 064 000
Account: 12672843
Swift Code: CTBAAU2S

or **Cheque**

Payable to Australian Laboratory Services Pty Ltd

or **Credit Card**

Visa
Mastercard

Amount Payable
AUD\$ 786.50
ALS Client Reference
ENVPRO
TAX INVOICE
L290006

From: WAKE Chris [Chris.Wake@ehp.qld.gov.au]
Sent: Friday, 12 February 2016 10:57 AM
To: REHN Laura
Subject: FW: Confirming Site Inspection 27 January 2016
Attachments: image002.png

FYI

Christopher Wake

Compliance Delivery Manager – North Queensland Compliance

Environmental Services and Regulation

Department of Environment and Heritage Protection



P 07 4722 5371

Level 10, 445 Flinders Street, Townsville QLD 4810

PO Box 5391, Townsville QLD 4810

From: Lukacs, George [mailto:George.Lukacs@qni.com.au]
Sent: Wednesday, 27 January 2016 10:34 AM
To: WAKE Chris
Subject: Fwd: Confirming Site Inspection 27 January 2016

Chris,

As discussed.

Regards
 George

Sent from my iPhone
 Ph: +61 (0) 438193462

Begin forwarded message:

From: "Gross, Peter" <Peter.Gross@qni.com.au>
Date: 21 January 2016 4:44:35 pm AEST
To: "Lukacs, George" <George.Lukacs@qni.com.au>, "Hultgren, Ross" <Ross.Hultgren@qni.com.au>
Subject: RE: Confirming Site Inspection 27 January 2016

George, situation at 18/1/16 was:

TSF

Water stored approximately 3216ML, Total void above tailings is 8612ML, Therefore 37% full.
 Cell 3 level is at approximately 19.68m which is approximately 2.32m below MRL of 22.0m.
 TSF rainfall holding capacity is approximately 2453mm.

Brine ponds

Water stored approximately 1200ML, Total void is approximately 1949ML, Therefore 62% full.
 Cell 2B level is 24.97m which is approximately 1.03m below MRL of 26.0m.
 Brine pond rainfall holding capacity is approximately 1827mm.

Cheers

Peter Gross | Environmental Scientist

QUEENSLAND NICKEL PTY LTD

Greenvale Street, Yabulu QLD 4818

PMB 5 Townsville QLD 4810

P > 07 4720 6783 | M > sch4p4(6) Person

E > Peter.Gross@qni.com.au

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From: Lukacs, George

Sent: Thursday, 21 January 2016 4:23 PM

To: Gross, Peter; Hultgren, Ross

Subject: FW: Confirming Site Inspection 27 January 2016

FYI

George Lukacs | Director – Environment and Sustainability

QUEENSLAND NICKEL PTY LTD

Greenvale Street, Yabulu QLD 4818

P > +61 7 4720 6422 | F > +61 7 4751 1208 | M > sch4p4(6) Person

E > George.Lukacs@qni.com.au

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From: WAKE Chris [<mailto:Chris.Wake@ehp.qld.gov.au>]

Sent: Thursday, 21 January 2016 4:22 PM

To: Lukacs, George

Subject: Confirming Site Inspection 27 January 2016

Hi George,

As discussed earlier today, EHP would like to undertake a site inspection at the Yabulu Refinery on Wednesday 27 January 2016. We are proposing to carry out this site inspection as a joint inspection with the Hazardous Industries and Chemicals Branch (HICB).

Representatives from EHP will be myself and Laura Rehn. At this stage I understand the representatives from HICB will be Darren Brown and John Finn. If there are any changes to these details I will endeavour to let you know as soon as possible.

I anticipate that we will arrive on site at approximately 9:30am. From EHP's perspective, we would like to inspect the following areas whilst on site:

- The plant area
- The solar drying area and north west pond
- The brine ponds
- The stormwater system (duck pond, stormwater drains, levee banks etc)

- The seepage system (CEP, toe drain dam, western seepage trench etc)
- The TSF
- Blind Cr and Alick Cr

We will likely take some samples while on site and would also like to establish the current capacity in the on-site regulated structures. In November 2015 we were provided the information below:

- *TSF was 39% full on 16/10/2015 and is now approx. 43% (with transfer of water from the Brine Ponds to the TSF).*
- *Brine Ponds were 74% full on 16/10/2015 and is now approx. 56% (with transfer of water from the Brine Ponds to the TSF).*
- *On 16/10/2015 there was sufficient capacity in the TSF to accommodate 2355mm of rain. This is now 2196mm of rain (with transfer of water from the Brine Ponds to the TSF).*
- *On 16/10/2015 there was sufficient capacity in the Brine Ponds to accommodate 1229mm of rain. This is now 2082mm of rain (with transfer of water from the Brine Ponds to the TSF).*

If you could provide an update on these figures as part of the inspection that would be appreciated.

If you have any queries or concerns in relation to this matter, please do not hesitate to contact me.

Kind regards,
Chris

Christopher Wake

A/Manager (Assessment) Minerals



Environmental Services and Regulation

Department of Environment and Heritage Protection

P 07 4722 5371

Level 10, 445 Flinders Street, Townsville QLD 4810

PO Box 5391, Townsville QLD 4810

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