

**BHP Billiton Canada Inc.**  
Operator of the EKATI Diamond Mine

BHP Billiton  
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8 November, 2011

Aboriginal Affairs and Northern Development Canada  
South Mackenzie District Field Office  
140 Bristol Avenue  
#16 Yellowknife Airport  
Yellowknife, NT X1A 3T2

Attention: Jason Brennan  
Resource Management Officer III

**RE: 2011 Pumping Summary for King Pond**

Dear Mr. Brennan:

This letter provides the summary of pumping activities for King Pond for the 2011 season.

The information includes:

- a) *measured flow rates;*
- b) *erosional issues encountered and mitigative actions taken (if required);*
- c) *results of water quality monitoring; and*
- d) *a summary of impacts to the environment.*

Pre-discharge water samples were collected from King Pond on 16 August 2011 and submitted to ALS Laboratories for analysis of the pre-approval suite of parameters. Approval was granted on 29 August 2011 and pumping commenced on 30 August 2011.

Pumping from King Pond to Cujo Lake continued until 10 September 2011. During the pumping, discharge samples were collected on 30 August and 10 September 2011. The pump ran continuously between 30 August 2011 and 10 September 2011.

The final elevation of King Pond on 10 September 2011 was 443.80 meters above sea level (masl).

## Pumping Summary

A summary of the pumping rate, volume and discharge conditions is found below:

Inspection Date	Flow Rate (m <sup>3</sup> /hr)	Water Volume (m <sup>3</sup> )	Discharge Observations	Leaks/Spills Y/N	Description of any leaks/spills
31-Aug-11	1024	29,031	Clear, no erosion	Y	Small Leak approximately 5 m upflow of meter at pipe joint
1-Sep-11	1054	52,746	Clear, no erosion	Y	Small Leak approximately 5 m upflow of meter at pipe joint
2-Sep-11	1043	74,306	Clear, no erosion	Y	Small Leak approximately 5 m upflow of meter at pipe joint
3-Sep-11	1024	95,889	Clear, no erosion	Y	Light spray before meter
4-Sep-11	1020	112,753	Clear, no erosion	Y	Light spray before meter
5-Sep-11	1016	143,432	Clear, no erosion	N	NA
6-Sep-11	1000	167,778	Clear, no erosion	N	NA
7-Sep-11	994	191,546	Clear, no erosion	N	NA
8-Sep-11	988	213,180	Clear, no erosion	N	NA
9-Sep-11	969	235,463	Clear, no erosion	N	NA
10-Sep-11	0	265,463*	Not pumping	N	NA
<b>Total Volume Pumped 265,463 m<sup>3</sup></b>					

Note: \* indicates calculated water volume based on the flow rate and run time

### Water Quality Monitoring

Results from the pre-approval and discharge samples indicate there were no impacts on the receiving environment during the pumping interval, as the water samples were below the Water Licence discharge criteria.

Water sampling results are summarized in the table below with laboratory Certificates of Analysis (COAs) attached.

Collect Date		16-AUG-11	30-AUG-11	10-SEP-11	W2009L2-001 Criteria	
Sample No.		L1046941-1	L1054854-1	L1058120-1		
Sample Type		Pre-Approval	Discharge	Discharge	Grab	Average
Air Temperature	Deg C	9.6	12.1	10.4		
Weather		Rain	Sunny	Cloudy		
Wind Direction	Degrees	90	9	300		
Wind Speed	km/h	37	32	39		
Field pH	pH	7.61	7.74	8.24		
Field Conductivity	uS/cm	682	369.5	405.6		
Field Temperature	Deg C	7.61	11.3	9.77		
Hardness (as CaCO <sub>3</sub> )	mg/L	81.7	153	166		
pH	pH	7.68	7.69	7.83	6.0 - 9.0	6.0 - 9.0
Conductivity	uS/cm	214	372	400		
Total Suspended Solids	mg/L	<3.0	6.2	<3.0	25	15
Turbidity	NTU	0.80	2.01	0.88		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	27.3	33.3	33.9		
Ammonia (as N)	mg/L	0.0110	0.0217	0.0105	4	2
Chloride (Cl)	mg/L	4.21	7.00	7.71		
Nitrate and Nitrite (as N)	mg/L	0.0284	0.567	0.605		
Nitrate (as N)	mg/L	0.0284	0.561	0.601		
Nitrite (as N)	mg/L	<0.0010	0.0052	0.0036		
Orthophosphate-Dissolved (as P)	mg/L	<0.0010	<0.0010	<0.0010		
Phosphorus (P)-Total	mg/L	0.0111	0.0130	0.0083		
Sulfate (SO <sub>4</sub> )	mg/L	63.6	133	145		
Total Carbon	mg/L	10.4	11.7	11.2		
Total Organic Carbon	mg/L	5.94	5.75	5.27		
Aluminum (Al)-Total	mg/L	0.0075	0.148	0.0291	2	1
Antimony (Sb)-Total	mg/L	0.00011	0.00020	0.00022		
Arsenic (As)-Total	mg/L	0.00089	0.00116	0.00113	1	0.5
Barium (Ba)-Total	mg/L	0.0129	0.0254	0.0250		
Beryllium (Be)-Total	mg/L	<0.00010	<0.00010	<0.00010		
Bismuth (Bi)-Total	mg/L	<0.00050	<0.00050	<0.00050		
Boron (B)-Total	mg/L	0.014	0.016	0.018		
Cadmium (Cd)-Total	mg/L	<0.000010	<0.000010	0.000011		
Calcium (Ca)-Total	mg/L	11.5	22.3	23.8		
Chromium (Cr)-Total	mg/L	<0.00050	0.00066	<0.00050		
Cobalt (Co)-Total	mg/L	0.00015	0.00029	0.00020		

Collect Date		16-AUG-11	30-AUG-11	10-SEP-11	W2009L2-001 Criteria	
Sample No.		L1046941-1	L1054854-1	L1058120-1		
Sample Type		Pre-Approval	Discharge	Discharge	Grab	Average
Copper (Cu)-Total	mg/L	0.00072	0.00093	0.00250	0.2	0.1
Iron (Fe)-Total	mg/L	0.124	0.272	0.141		
Lead (Pb)-Total	mg/L	0.000097	0.000054	0.000145		
Lithium (Li)-Total	mg/L	0.00704	0.0124	0.0102		
Magnesium (Mg)-Total	mg/L	12.8	23.6	26.0		
Manganese (Mn)-Total	mg/L	0.00964	0.0156	0.0171		
Molybdenum (Mo)-Total	mg/L	0.00840	0.0204	0.0216		
Nickel (Ni)-Total	mg/L	0.00266	0.00534	0.00518	0.3	0.15
Phosphorus (P)-Total	mg/L	<0.30	NS	NS		
Potassium (K)-Total	mg/L	7.2	11.9	14.1		
Selenium (Se)-Total	mg/L	0.00011	0.00053	0.00081		
Silicon (Si)-Total	mg/L	0.137	0.930	0.32		
Silver (Ag)-Total	mg/L	<0.000010	<0.000010	<0.000010		
Sodium (Na)-Total	mg/L	5.5	7.7	9.2		
Strontium (Sr)-Total	mg/L	0.130	0.248	0.302		
Thallium (Tl)-Total	mg/L	<0.000010	<0.000010	<0.000010		
Tin (Sn)-Total	mg/L	<0.00010	<0.00010	0.0351		
Titanium (Ti)-Total	mg/L	<0.010	0.013	<0.020		
Uranium (U)-Total	mg/L	0.000890	0.00498	0.00476		
Vanadium (V)-Total	mg/L	<0.0010	<0.0010	<0.0010		
Zinc (Zn)-Total	mg/L	<0.0030	<0.0030	0.0034		
BOD	mg/L	<5.0	NS	NS	-	40
Oil and Grease	mg/L	NS	<5.0	<5.0		
Benzene	mg/L	<0.00050	<0.00050	<0.00050		
Ethylbenzene	mg/L	<0.00050	<0.00050	<0.00050		
Styrene	mg/L	<0.00050	<0.00050	<0.00050		
Toluene	mg/L	<0.00050	<0.00050	<0.00050		
ortho-Xylene	mg/L	<0.00050	<0.00050	<0.00050		
meta- & para-Xylene	mg/L	<0.00050	<0.00050	<0.00050		
Xylenes	mg/L	<0.00075	<0.00075	<0.00075		
TVH (C5-C10)	mg/L	<0.10	<0.10	<0.10		
TEH10-30	mg/L	<0.15	<0.15	<0.15		
TPH5-30	mg/L	<0.25	<0.25	<0.25	5	3
Diethylene Glycol	mg/L		<5.0	<5.0		
Ethylene Glycol	mg/L		<5.0	<5.0		
1,2-Propylene Glycol	mg/L		<5.0	<5.0		

Note: NS – not sampled

King Pond Pumping Summary 2011

BHP Billiton Canada Inc.

8 November 2011

We trust the information meets with your requirements at this time. Please contact the undersigned at 867-880-2232 should there be any questions or concerns with this matter.

Yours truly,

**BHP Billiton Canada Inc.**



*FOR*

**Keith McLean**  
**Environment Superintendent - Operations**  
**EKATI Diamond Mine**

cc: Bruce Hanna – Department of Fisheries and Oceans  
Ryan Fequet – Wek'`eezhii Land and Water Board

Attached: Laboratory Certificates of Analysis



BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 18-AUG-11  
Report Date: 29-AUG-11 20:43 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1046941  
Project P.O. #: BHP2001  
Job Reference: 68606  
C of C Numbers:  
Legal Site Desc: 6200801716

**Comments:** - The vials for BETX/VH analysis for the sample ALS identify as L1046941-2 were half full. BETX/VH are volatile hydrocarbons which could be lost via volatilization in a half full vial. This should be considered when reviewing the data.

Can Dang  
Senior Account Manager

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# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1046941-1	L1046941-2	L1046941-3	L1046941-4
		L1046941-1 WATER 16-AUG-11 10:45 1616- 43_APPROVAL	L1046941-2 WATER 16-AUG-11 10:50 1616-121	L1046941-3 WATER 16-AUG-11 10:53 1616-494	L1046941-4 WATER 16-AUG-11 10:54 1616-343
Grouping	Analyte				
<b>WATER</b>					
<b>Physical Tests</b>	Conductivity (uS/cm)	214	2.5	<2.0	213
	Hardness (as CaCO3) (mg/L)	81.7	<0.50	<0.50	83.4
	pH (pH)	7.68	5.21	5.68	7.85
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	3.1
	Turbidity (NTU)	0.80	0.12	<0.10	1.15
<b>Anions and Nutrients</b>	Alkalinity, Total (as CaCO3) (mg/L)	27.3	<2.0	<2.0	26.5
	Ammonia (as N) (mg/L)	0.0110	0.0145	0.166	0.0138
	Chloride (Cl) (mg/L)	4.21	<0.50	<0.50	4.20
	Nitrate and Nitrite (as N) (mg/L)	0.0284	<0.0051	<0.0051	0.0304
	Nitrate (as N) (mg/L)	0.0284	<0.0050	<0.0050	0.0304
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0111	<0.0020	<0.0020	0.0202
	Sulfate (SO4) (mg/L)	63.6	0.54	<0.50	63.6
<b>Organic / Inorganic Carbon</b>	Total Carbon (mg/L)	10.4	<0.50	<0.50	10.6
	Total Organic Carbon (mg/L)	5.94	<0.50	<0.50	5.51
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0075	<0.0030	<0.0030	0.0571
	Antimony (Sb)-Total (mg/L)	0.00011	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00089	<0.00010	<0.00010	0.00093
	Barium (Ba)-Total (mg/L)	0.0129	<0.000050	<0.000050	0.0142
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	0.014	<0.010	<0.010	0.012
	Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010
	Calcium (Ca)-Total (mg/L)	11.5	<0.050	<0.050	11.7
	Chromium (Cr)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	Cobalt (Co)-Total (mg/L)	0.00015	<0.00010	<0.00010	0.00023
	Copper (Cu)-Total (mg/L)	0.00072	<0.00050	<0.00050	0.00081
	Iron (Fe)-Total (mg/L)	0.124	<0.030	<0.030	0.203
	Lead (Pb)-Total (mg/L)	0.000097	<0.000050	<0.000050	0.000068
	Lithium (Li)-Total (mg/L)	0.00704	<0.00050	<0.00050	0.00627
	Magnesium (Mg)-Total (mg/L)	12.8	<0.10	<0.10	13.2
	Manganese (Mn)-Total (mg/L)	0.00964	<0.000050	<0.000050	0.0150
	Molybdenum (Mo)-Total (mg/L)	0.00840	<0.000050	<0.000050	0.00746
	Nickel (Ni)-Total (mg/L)	0.00266	<0.00050	<0.00050	0.00316
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1046941-1	L1046941-2	L1046941-3	L1046941-4	
Description	WATER	WATER	WATER	WATER	
Sampled Date	16-AUG-11	16-AUG-11	16-AUG-11	16-AUG-11	
Sampled Time	10:45	10:50	10:53	10:54	
Client ID	1616-43_APPROVAL	1616-121	1616-494	1616-343	
Grouping	Analyte				
<b>WATER</b>					
<b>Total Metals</b>	Potassium (K)-Total (mg/L)	7.2	<2.0	<2.0	7.5
	Selenium (Se)-Total (mg/L)	0.00011	<0.00010	<0.00010	0.00012
	Silicon (Si)-Total (mg/L)	0.137	<0.050	<0.050	0.265
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	5.5	<2.0	<2.0	5.7
	Strontium (Sr)-Total (mg/L)	0.130	<0.00010	<0.00010	0.115
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.000890	<0.000010	<0.000010	0.000828
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030
<b>Aggregate Organics</b>	BOD (mg/L)	<5.0	<5.0	<5.0	<5.0
<b>Volatile Organic Compounds</b>	Benzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	Ethylbenzene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	Styrene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	Toluene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	ortho-Xylene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	meta- & para-Xylene (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050
	Xylenes (mg/L)	<0.00075	<0.00075	<0.00075	<0.00075
	Surrogate: 4-Bromofluorobenzene (SS) (%)	106	101	101	97
	Surrogate: 1,4-Difluorobenzene (SS) (%)	101	100	101	100
<b>Hydrocarbons</b>	TVH (C5-C10) (mg/L)	<0.10	<0.10	<0.10	<0.10
	TEH10-30 (mg/L)	<0.15	<0.15	<0.15	<0.15
	TPH5-30 (mg/L)	<0.25	<0.25	<0.25	<0.25



## Reference Information

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-COL-VA</b>	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>ANIONS-N+N-CALC-VA</b>	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).			
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
<b>AS-T-CCMS-VA</b>	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>BOD5-VA</b>	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"
This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
<b>BOD5-VA</b>	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
<b>CARBONS-TC-VA</b>	Water	Total carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
<b>EPH-LL-SF-FID-VA</b>	Water	EPH in Waters by GCFID	BCMEOE EPH GCFID
This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Water by GC/FID" (Version 2.1, July 1999). The procedure involves extraction of the entire water sample with dichloromethane. The extract is then solvent exchanged to toluene and analysed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).			
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
<b>MET-T-CCMS-VA</b>	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
<b>MET-TOT-ICP-VA</b>	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

## Reference Information

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**NH3-F-VA**                      Water              Ammonia in Water by Fluorescence                      J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

**P-T-COL-VA**                      Water              Total P in Water by Colour                      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA**                      Water              pH by Meter (Automated)                      APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA**                      Water              pH by Meter (Automated)                      APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA**                      Water              Diss. Orthophosphate in Water by Colour                      APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**SE-T-CCMS-VA**                      Water              Total Selenium in Water by CRC ICPMS                      APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**TSS-VA**                      Water              Total Suspended Solids by Gravimetric                      APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA**                      Water              Turbidity by Meter                      APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA**                      Water              Turbidity by Meter                      APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TVH-HSFID-VA**                      Water              TVH by headspace GC/FID                      EPA 8260B, BCMELP CSR METHOD

This procedure involves the headspace extraction of the sample prior to analysis for Volatile Hydrocarbons (VH) by capillary column gas chromatography with flame-ionization detection (GC/FID). The VH analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Volatile Hydrocarbons in Water by GC/FID" (Version 2.1, July 1999).

**VOC7-HSMS-VA**                      Water              BTEX/MTBE/Styrene by Headspace GCMS                      EPA8260B, 5021

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

**VOC7/VOC-SURR-MS-VA**                      Water              VOC7 and/or VOC Surrogates for Waters                      EPA8260B, 5021

**XYLENES-CALC-VA**                      Water              Sum of Xylene Isomer Concentrations                      CALCULATION

Calculation of Total Xylenes

Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.

---

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

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Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

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## Reference Information

VA

ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

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### Chain of Custody Numbers:

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#### **GLOSSARY OF REPORT TERMS**

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*

*mg/kg - milligrams per kilogram based on dry weight of sample.*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

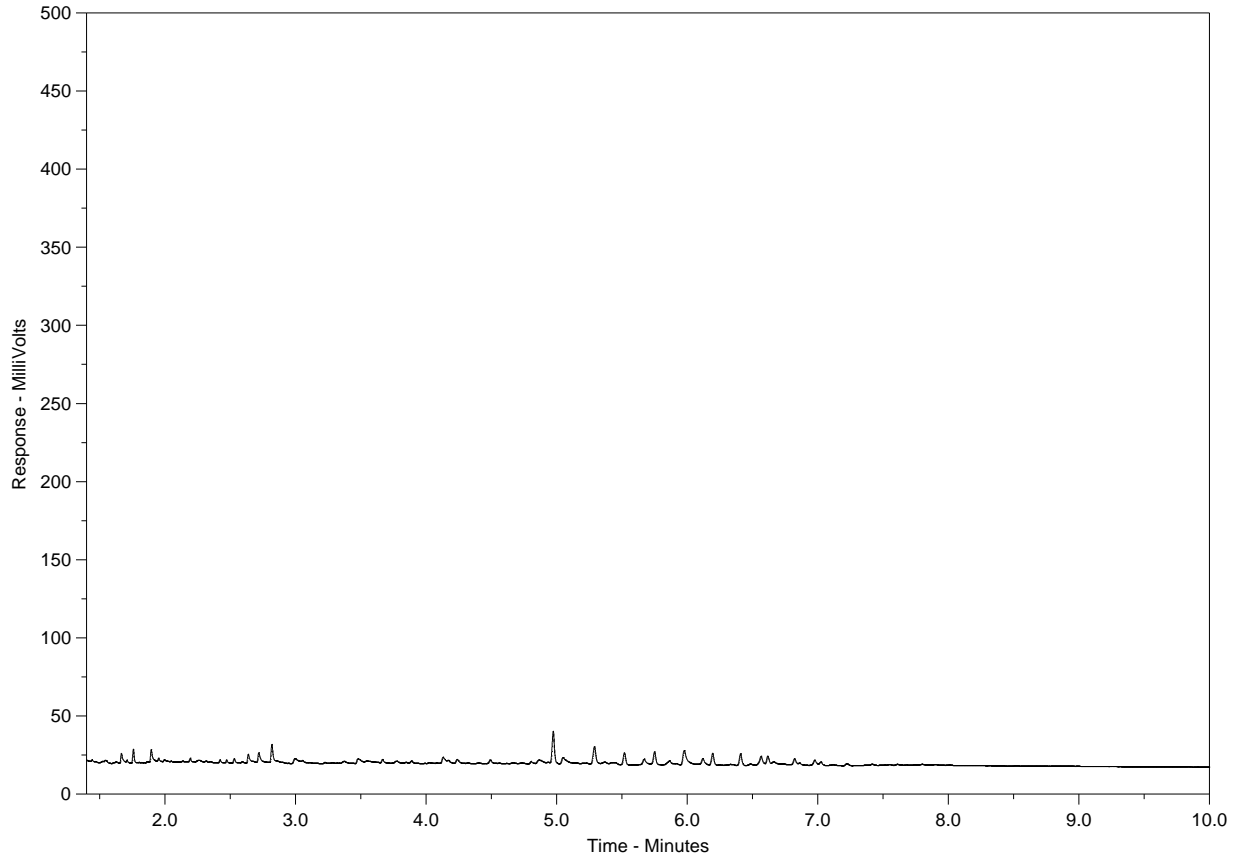
**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

# Hydrocarbon Distribution Report



ALS Sample ID: L1046941-1  
Client Sample ID: 1616-43\_APPROVAL



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on [www.alsglobal.com](http://www.alsglobal.com) or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

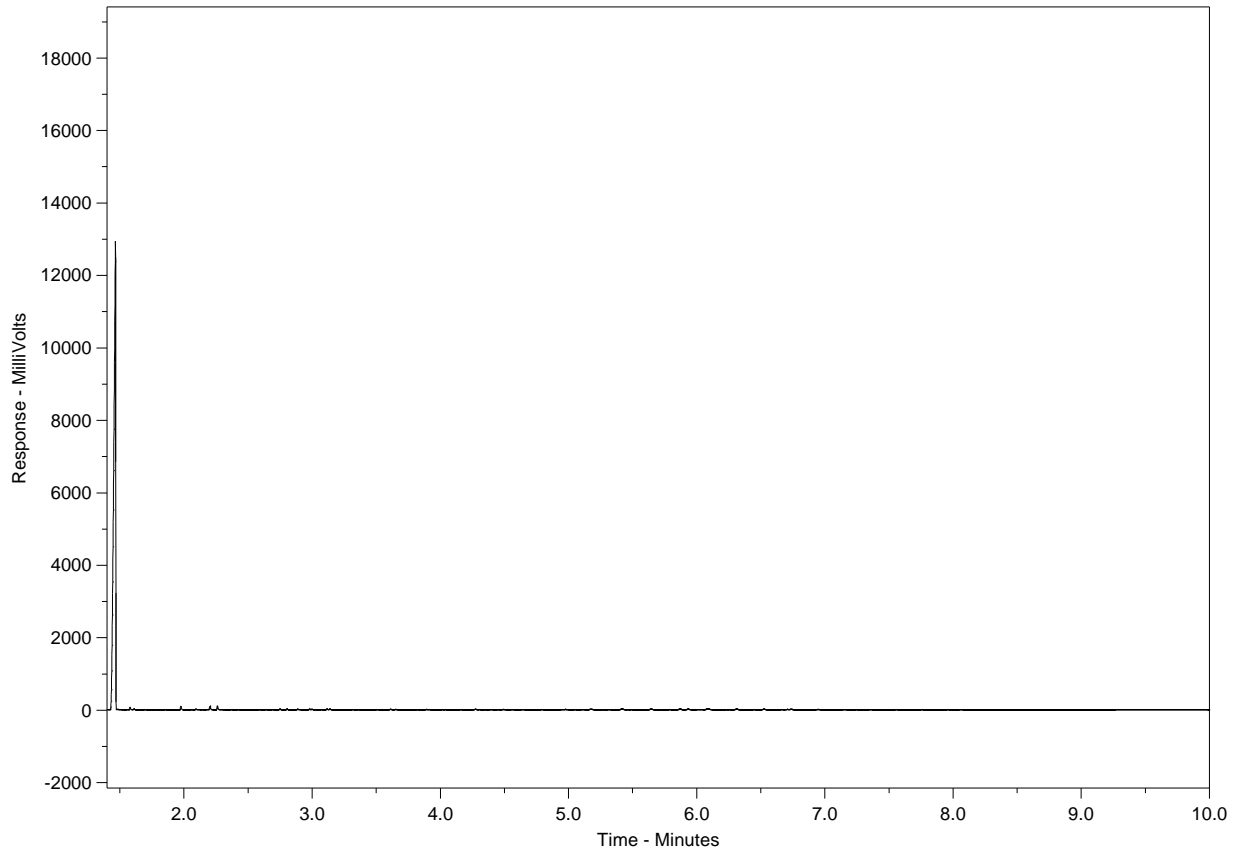
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

# Hydrocarbon Distribution Report



ALS Sample ID: L1046941-2  
Client Sample ID: 1616-121



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on [www.alsglobal.com](http://www.alsglobal.com) or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

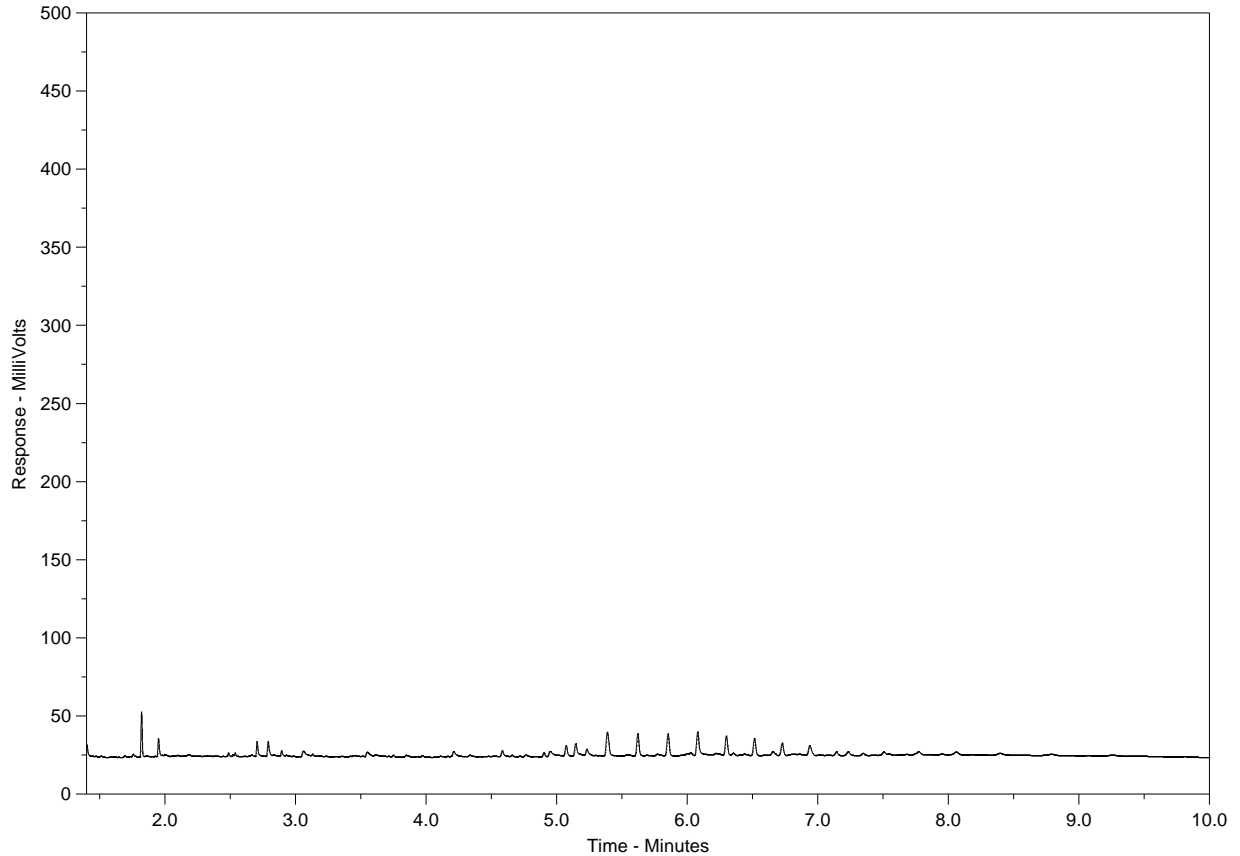
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

# Hydrocarbon Distribution Report



ALS Sample ID: L1046941-3  
Client Sample ID: 1616-494



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on [www.alsglobal.com](http://www.alsglobal.com) or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

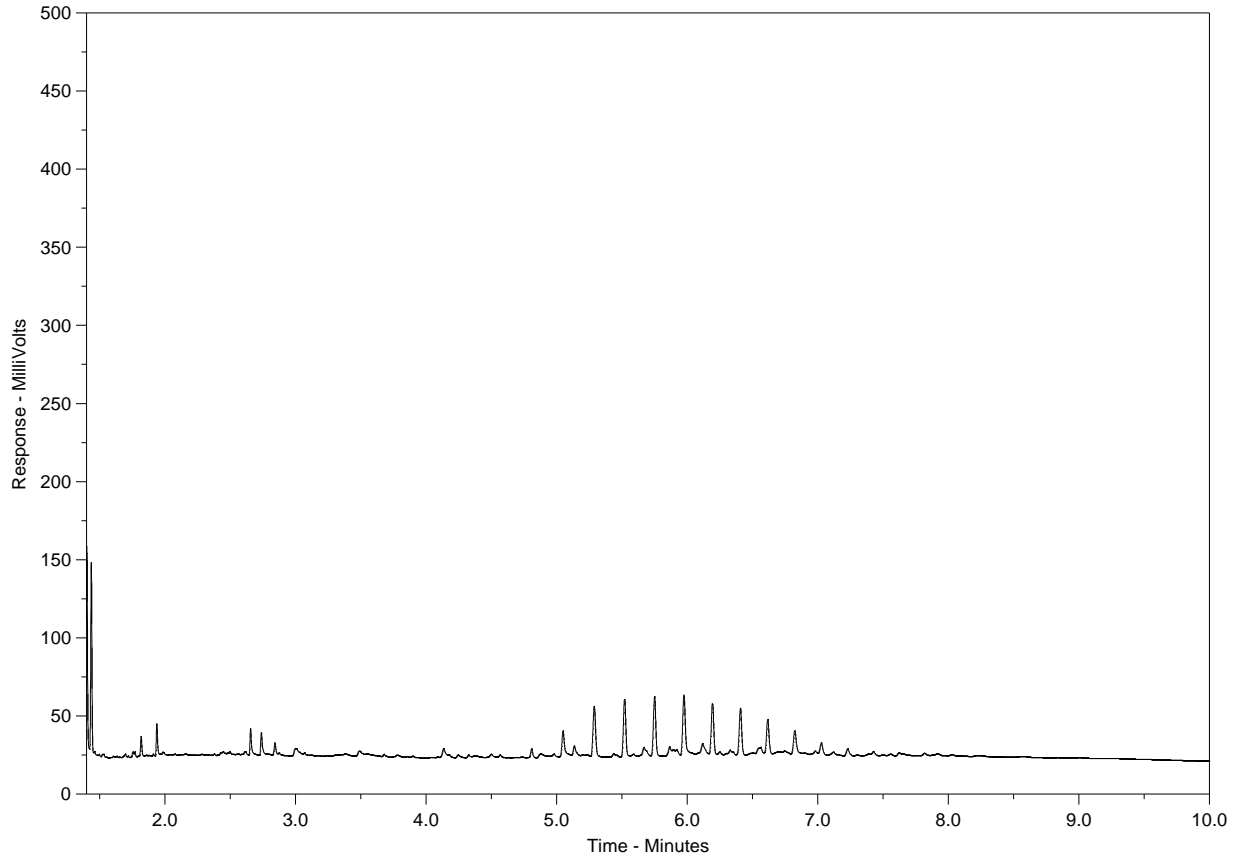
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

# Hydrocarbon Distribution Report



ALS Sample ID: L1046941-4  
Client Sample ID: 1616-343



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on [www.alsglobal.com](http://www.alsglobal.com) or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.



38259



8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
ALS Contact: Can Dang

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlerDavid

## CHAIN OF CUSTODY FORM

L1046941

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	As, Se By CCMS	BOD5	BTEX	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	Total Ammonia	Total Organic Carbon	TPH	TSS	
1616-43_Approval	Water	16-Aug-2011	10:45 AM	JP	1	1	1	1	1	1	1	1	1	1	1	BHP20
1616-121	Water	16-Aug-2011	10:50 AM	JP	1	1	1	1	1	1	1	1	1	1	1	BHP20
1616-494	Water	16-Aug-2011	10:53 AM	JP	1	1	1	1	1	1	1	1	1	1	1	BHP20
1616-343	Water	16-Aug-2011	10:54 AM	JP	1	1	1	1	1	1	1	1	1	1	1	BHP20



Turn around Required: Please Rush Results Analysis - 1 week turnaround

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2001

Relinquished by:	Date	Received by:	Date
	Time		Time
Relinquished by:	Date	Received by: <i>RAW</i>	Date: <i>Aug 18</i>
	Time		Time

**FOR LAB USE ONLY**

Cooler seal intact upon receipt?  Yes  No  N/A

Sample temperature upon receipt: *8 c.*

Frozen?  Yes  No

Send Analytical Results to:

compliance.team@bhpbilliton.com;





BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 06-SEP-11  
Report Date: 16-SEP-11 17:19 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1054854  
Project P.O. #: BHP2001  
Job Reference: 68638  
C of C Numbers: 68638  
Legal Site Desc: 6200801716

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID			
	L1054854-1 WATER 30-AUG-11 12:05 1616- 43_DISCHARGE	L1054854-2 WATER 30-AUG-11 12:10 1616-342		
Grouping	Analyte			
<b>WATER</b>				
<b>Physical Tests</b>	Conductivity (uS/cm)	372	373	
	Hardness (as CaCO3) (mg/L)	153	151	
	pH (pH)	7.69	7.71	
	Total Suspended Solids (mg/L)	6.2	<3.0	
	Turbidity (NTU)	2.01	0.91	
<b>Anions and Nutrients</b>	Alkalinity, Total (as CaCO3) (mg/L)	33.3	33.1	
	Ammonia (as N) (mg/L)	0.0217	0.0130	
	Chloride (Cl) (mg/L)	7.00	6.96	
	Nitrate and Nitrite (as N) (mg/L)	0.567	0.560	
	Nitrate (as N) (mg/L)	0.561	0.555	
	Nitrite (as N) (mg/L)	0.0052	0.0055	
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010	<0.0010	
	Phosphorus (P)-Total (mg/L)	0.0130	0.0105	
	Sulfate (SO4) (mg/L)	133	133	
<b>Organic / Inorganic Carbon</b>	Total Carbon (mg/L)	11.7	11.8	
	Total Organic Carbon (mg/L)	5.75	5.82	
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.148	0.0361	
	Antimony (Sb)-Total (mg/L)	0.00020	0.00021	
	Arsenic (As)-Total (mg/L)	0.00116	0.00109	
	Barium (Ba)-Total (mg/L)	0.0254	0.0250	
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	
	Boron (B)-Total (mg/L)	0.016	0.017	
	Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010	
	Calcium (Ca)-Total (mg/L)	22.3	21.7	
	Chromium (Cr)-Total (mg/L)	0.00066	<0.00050	
	Cobalt (Co)-Total (mg/L)	0.00029	0.00024	
	Copper (Cu)-Total (mg/L)	0.00093	0.00377	
	Iron (Fe)-Total (mg/L)	0.272	0.155	
	Lead (Pb)-Total (mg/L)	0.000054	0.000222	
	Lithium (Li)-Total (mg/L)	0.0124	0.0123	
	Magnesium (Mg)-Total (mg/L)	23.6	23.6	
	Manganese (Mn)-Total (mg/L)	0.0156	0.0142	
	Molybdenum (Mo)-Total (mg/L)	0.0204	0.0211	
	Nickel (Ni)-Total (mg/L)	0.00534	0.00513	
	Potassium (K)-Total (mg/L)	11.9	11.4	

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1054854-1	L1054854-2		
Description	WATER	WATER		
Sampled Date	30-AUG-11	30-AUG-11		
Sampled Time	12:05	12:10		
Client ID	1616-43_DISCHARGE	1616-342		
Grouping	Analyte			
<b>WATER</b>				
<b>Total Metals</b>	Selenium (Se)-Total (mg/L)	0.00053	0.00056	
	Silicon (Si)-Total (mg/L)	0.930	0.708	
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	
	Sodium (Na)-Total (mg/L)	7.7	7.6	
	Strontium (Sr)-Total (mg/L)	0.248	0.253	
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	
	Tin (Sn)-Total (mg/L)	<0.00010	0.00028	
	Titanium (Ti)-Total (mg/L)	0.013	<0.010	
	Uranium (U)-Total (mg/L)	0.00498	0.00513	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	
<b>Aggregate Organics</b>	Oil and Grease (mg/L)	<5.0	<5.0	
<b>Volatile Organic Compounds</b>	Benzene (mg/L)	<0.00050	<0.00050	
	Ethylbenzene (mg/L)	<0.00050	<0.00050	
	Styrene (mg/L)	<0.00050	<0.00050	
	Toluene (mg/L)	<0.00050	<0.00050	
	ortho-Xylene (mg/L)	<0.00050	<0.00050	
	meta- & para-Xylene (mg/L)	<0.00050	<0.00050	
	Xylenes (mg/L)	<0.00075	<0.00075	
	Surrogate: 4-Bromofluorobenzene (SS) (%)	98	100	
	Surrogate: 1,4-Difluorobenzene (SS) (%)	100	100	
<b>Hydrocarbons</b>	TVH (C5-C10) (mg/L)	<0.10	<0.10	
	TEH10-30 (mg/L)	<0.15	<0.15	
	TPH5-30 (mg/L)	<0.25	<0.25	
<b>Glycols</b>	Diethylene Glycol (mg/L)	<5.0	<5.0	
	Ethylene Glycol (mg/L)	<5.0	<5.0	
	1,2-Propylene Glycol (mg/L)	<5.0	<5.0	

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	1,2-Propylene Glycol	LCS-ND	L1054854-1, -2
Laboratory Control Sample	Diethylene Glycol	LCS-ND	L1054854-1, -2
Laboratory Control Sample	Ethylene Glycol	LCS-ND	L1054854-1, -2
Method Blank	Barium (Ba)-Total	MB-LOR	L1054854-1, -2

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
MB-LOR	Method Blank exceeds ALS DQO. LORs adjusted for samples with positive hits below 5 times blank level. Please contact ALS if re-analysis is required.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-COL-VA</b>	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2
		This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.	
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
<b>ANIONS-N+N-CALC-VA</b>	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
		Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).	
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
		This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.	
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
		This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.	
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
<b>AS-T-CCMS-VA</b>	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
		This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).	
<b>CARBONS-TC-VA</b>	Water	Total carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
		This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".	
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
		This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".	
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
		This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.	
<b>EPH-LL-SF-FID-VA</b>	Water	EPH in Waters by GCFID	BCMOE EPH GCFID
		This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Water by GC/FID" (Version 2.1, July 1999). The procedure involves extraction of the entire water sample with dichloromethane. The extract is then solvent exchanged to toluene and analysed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).	
<b>GLY-WAT-FID-VA</b>	Water	Glycols in Water by GCFID	SW-846, METHOD 8015B, EPA
		This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8015B, published by the United States Environmental Protection Agency (EPA). The procedure involves treatment of the sample with a strong base (NaOH) and benzoyl chloride to form the corresponding benzoate esters. The benzoate esters are then extracted with iso-octane and the extract is analyzed by capillary column gas chromatography with flame ionization detection (FID).	
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B

## Reference Information

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO<sub>3</sub> equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

**MET-T-CCMS-VA** Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-TOT-ICP-VA** Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**NH3-F-VA** Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

**OGG-SF-VA** Water Oil & Grease by Gravimetric BCMOE (2010), EPA1664A

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

**P-T-COL-VA** Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA** Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**SE-T-CCMS-VA** Water Total Selenium in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**TSS-VA** Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA** Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA** Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TVH-HSFID-VA** Water TVH by headspace GCFID EPA 8260B, BCMELP CSR METHOD

This procedure involves the headspace extraction of the sample prior to analysis for Volatile Hydrocarbons (VH) by capillary column gas chromatography with flame-ionization detection (GC/FID). The VH analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Volatile Hydrocarbons in Water by GC/FID" (Version 2.1, July 1999).

**VOC7-HSMS-VA** Water BTEX/MTBE/Styrene by Headspace GCMS EPA8260B, 5021

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph.

## Reference Information

Target compound concentrations are measured using mass spectrometry detection.

<b>VOC7/VOC-SURR-MS-VA</b>	Water	VOC7 and/or VOC Surrogates for Waters	EPA8260B, 5021
<b>XYLENES-CALC-VA</b>	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Calculation of Total Xylenes			

Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

### Chain of Custody Numbers:

68638

### GLOSSARY OF REPORT TERMS

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*

*mg/kg - milligrams per kilogram based on dry weight of sample.*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



-253-6700

L1054854

Form 68638



BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlerDavid

# CHAIN OF CUSTODY FORM

As, Se By CCMS	BTEX-TVH	Glycols	Oil and Grease	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	Total Ammonia	Total Organic Carbon	TPH	TSS						
----------------	----------	---------	----------------	---------------------	--------------------	------------------------------	-----------------------	---------------	----------------------	-----	-----	--	--	--	--	--	--

FOR LAB USE ONLY

Station ID	Matrix	Date	Time	Init	As, Se By CCMS	BTEX-TVH	Glycols	Oil and Grease	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	Total Ammonia	Total Organic Carbon	TPH	TSS					
1616-43_Discharge	Water	30-Aug-2011	12:05 PM	LC	1	1	1	1	1	1	1	1	1	1	1	1					BHP2
1616-342	Water	30-Aug-2011	12:10 PM	LC	1	1	1	1	1	1	1	1	1	1	1	1					BHP2

Turn around Required: \_\_\_\_\_

Special Instructions (Billing details, QC reporting, etc): \_\_\_\_\_

Billing Code: **BHP2001**

Relinquished by:	Date	Received by:	Date
	Time		Time
Relinquished by:	Date	Received by: <i>Ryx</i>	Date <i>8-30-11</i>
	Time		Time <i>12:47</i>

**FOR LAB USE ONLY**

Cooler seal intact upon receipt?  Yes  No  N/A

Sample temperature upon receipt: *5°C*

Frozen?  Yes  No

Send Analytical Results to:

compliance.team@bhpbilliton.com;



BHP BILLITON CANADA INC..  
ATTN: David G. Bruce / Richard Ehler David  
# 1102 - 4920 52nd Street  
Yellowknife NT X1A 3T1

Date Received: 14-SEP-11  
Report Date: 29-SEP-11 18:40 (MT)  
Version: FINAL

Client Phone: 867-880-2157

## Certificate of Analysis

**Lab Work Order #:** L1058120  
Project P.O. #: BHP2001  
Job Reference: 68659  
C of C Numbers: 68659  
Legal Site Desc: 6200801716

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



# ALS ENVIRONMENTAL ANALYTICAL REPORT

	<b>Sample ID</b> <b>Description</b> <b>Sampled Date</b> <b>Sampled Time</b> <b>Client ID</b>	L1058120-1 WATER 10-SEP-11 15:30 1616- 43_DISCHARGE			
Grouping	Analyte				
<b>WATER</b>					
<b>Physical Tests</b>	Conductivity (uS/cm)	400			
	Hardness (as CaCO3) (mg/L)	166			
	pH (pH)	7.83			
	Total Suspended Solids (mg/L)	<3.0			
	Turbidity (NTU)	0.88			
<b>Anions and Nutrients</b>	Alkalinity, Total (as CaCO3) (mg/L)	33.9			
	Ammonia (as N) (mg/L)	0.0105			
	Chloride (Cl) (mg/L)	7.71			
	Nitrate and Nitrite (as N) (mg/L)	0.605			
	Nitrate (as N) (mg/L)	0.601			
	Nitrite (as N) (mg/L)	0.0036			
	Orthophosphate-Dissolved (as P) (mg/L)	<0.0010			
	Phosphorus (P)-Total (mg/L)	0.0083			
	Sulfate (SO4) (mg/L)	145			
<b>Organic / Inorganic Carbon</b>	Total Carbon (mg/L)	11.2			
	Total Organic Carbon (mg/L)	5.27			
<b>Total Metals</b>	Aluminum (Al)-Total (mg/L)	0.0291			
	Antimony (Sb)-Total (mg/L)	0.00022			
	Arsenic (As)-Total (mg/L)	0.00113			
	Barium (Ba)-Total (mg/L)	0.0250			
	Beryllium (Be)-Total (mg/L)	<0.00010			
	Bismuth (Bi)-Total (mg/L)	<0.00050			
	Boron (B)-Total (mg/L)	0.018			
	Cadmium (Cd)-Total (mg/L)	0.000011			
	Calcium (Ca)-Total (mg/L)	23.8			
	Chromium (Cr)-Total (mg/L)	<0.00050			
	Cobalt (Co)-Total (mg/L)	0.00020			
	Copper (Cu)-Total (mg/L)	0.00250			
	Iron (Fe)-Total (mg/L)	0.141			
	Lead (Pb)-Total (mg/L)	0.000145			
	Lithium (Li)-Total (mg/L)	0.0102			
	Magnesium (Mg)-Total (mg/L)	26.0			
	Manganese (Mn)-Total (mg/L)	0.0171			
	Molybdenum (Mo)-Total (mg/L)	0.0216			
	Nickel (Ni)-Total (mg/L)	0.00518			
	Potassium (K)-Total (mg/L)	14.1			

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

	<b>Sample ID</b> <b>Description</b> <b>Sampled Date</b> <b>Sampled Time</b> <b>Client ID</b>	L1058120-1 WATER 10-SEP-11 15:30 1616- 43_DISCHARGE			
Grouping	Analyte				
<b>WATER</b>					
<b>Total Metals</b>	Selenium (Se)-Total (mg/L)	0.00081			
	Silicon (Si)-Total (mg/L)	0.32			
	Silver (Ag)-Total (mg/L)	<0.000010			
	Sodium (Na)-Total (mg/L)	9.2			
	Strontium (Sr)-Total (mg/L)	0.302			
	Thallium (Tl)-Total (mg/L)	<0.000010			
	Tin (Sn)-Total (mg/L)	0.0351			
	Titanium (Ti)-Total (mg/L)	<0.020			
	Uranium (U)-Total (mg/L)	0.00476			
	Vanadium (V)-Total (mg/L)	<0.0010			
	Zinc (Zn)-Total (mg/L)	0.0034			
<b>Aggregate Organics</b>	Oil and Grease (mg/L)	<5.0			
<b>Volatile Organic Compounds</b>	Benzene (mg/L)	<0.00050			
	Ethylbenzene (mg/L)	<0.00050			
	Styrene (mg/L)	<0.00050			
	Toluene (mg/L)	<0.00050			
	ortho-Xylene (mg/L)	<0.00050			
	meta- & para-Xylene (mg/L)	<0.00050			
	Xylenes (mg/L)	<0.00075			
	Surrogate: 4-Bromofluorobenzene (SS) (%)	95			
	Surrogate: 1,4-Difluorobenzene (SS) (%)	99			
<b>Hydrocarbons</b>	TVH (C5-C10) (mg/L)	<0.10			
	TEH10-30 (mg/L)	<0.15			
	TPH5-30 (mg/L)	<0.25			
<b>Glycols</b>	Diethylene Glycol (mg/L)	<5.0			
	Ethylene Glycol (mg/L)	<5.0			
	1,2-Propylene Glycol (mg/L)	<5.0			

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	Diethylene Glycol	LCS-H	L1058120-1
Matrix Spike	Nitrate (as N)	MS-B	L1058120-1
Matrix Spike	Total Organic Carbon	MS-B	L1058120-1

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>ALK-COL-VA</b>	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2
		This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.	
<b>ANIONS-CL-IC-VA</b>	Water	Chloride by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
<b>ANIONS-N+N-CALC-VA</b>	Water	Nitrite & Nitrate in Water (Calculation)	EPA 300.0
		Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).	
<b>ANIONS-NO2-IC-VA</b>	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
		This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.	
<b>ANIONS-NO3-IC-VA</b>	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
		This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.	
<b>ANIONS-SO4-IC-VA</b>	Water	Sulfate by Ion Chromatography	APHA 4110 B.
		This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".	
<b>AS-T-CCMS-VA</b>	Water	Total Arsenic in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
		This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).	
<b>CARBONS-TC-VA</b>	Water	Total carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
		This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".	
<b>CARBONS-TOC-VA</b>	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
		This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".	
<b>EC-PCT-VA</b>	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
		This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.	
<b>EPH-LL-SF-FID-VA</b>	Water	EPH in Waters by GCFID	BCMOE EPH GCFID
		This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Water by GC/FID" (Version 2.1, July 1999). The procedure involves extraction of the entire water sample with dichloromethane. The extract is then solvent exchanged to toluene and analysed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).	
<b>GLY-WAT-FID-VA</b>	Water	Glycols in Water by GCFID	SW-846, METHOD 8015B, EPA
		This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8015B, published by the United States Environmental Protection Agency (EPA). The procedure involves treatment of the sample with a strong base (NaOH) and benzoyl chloride to form the corresponding benzoate esters. The benzoate esters are then extracted with iso-octane and the extract is analyzed by capillary column gas chromatography with flame ionization detection (FID).	
<b>HARDNESS-CALC-VA</b>	Water	Hardness	APHA 2340B

## Reference Information

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO<sub>3</sub> equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

**MET-T-CCMS-VA** Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**MET-TOT-ICP-VA** Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

**NH3-F-VA** Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

**OGG-SF-VA** Water Oil & Grease by Gravimetric BCMOE (2010), EPA1664A

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

**P-T-COL-VA** Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PH-PCT-VA** Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

**PO4-DO-COL-VA** Water Diss. Orthophosphate in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

**SE-T-CCMS-VA** Water Total Selenium in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

**TSS-VA** Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

**TURBIDITY-VA** Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TURBIDITY-VA** Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**TVH-HSFID-VA** Water TVH by headspace GCFID EPA 8260B, BCMELP CSR METHOD

This procedure involves the headspace extraction of the sample prior to analysis for Volatile Hydrocarbons (VH) by capillary column gas chromatography with flame-ionization detection (GC/FID). The VH analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Volatile Hydrocarbons in Water by GC/FID" (Version 2.1, July 1999).

**VOC7-HSMS-VA** Water BTEX/MTBE/Styrene by Headspace GCMS EPA8260B, 5021

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph.

## Reference Information

Target compound concentrations are measured using mass spectrometry detection.

<b>VOC7/VOC-SURR-MS-VA</b>	Water	VOC7 and/or VOC Surrogates for Waters	EPA8260B, 5021
<b>XYLENES-CALC-VA</b>	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Calculation of Total Xylenes

Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.

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*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BC, CANADA

### Chain of Custody Numbers:

68659

### GLOSSARY OF REPORT TERMS

*Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.*

*mg/kg - milligrams per kilogram based on dry weight of sample.*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample.*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.*

*mg/L - milligrams per litre.*

*< - Less than.*

*D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

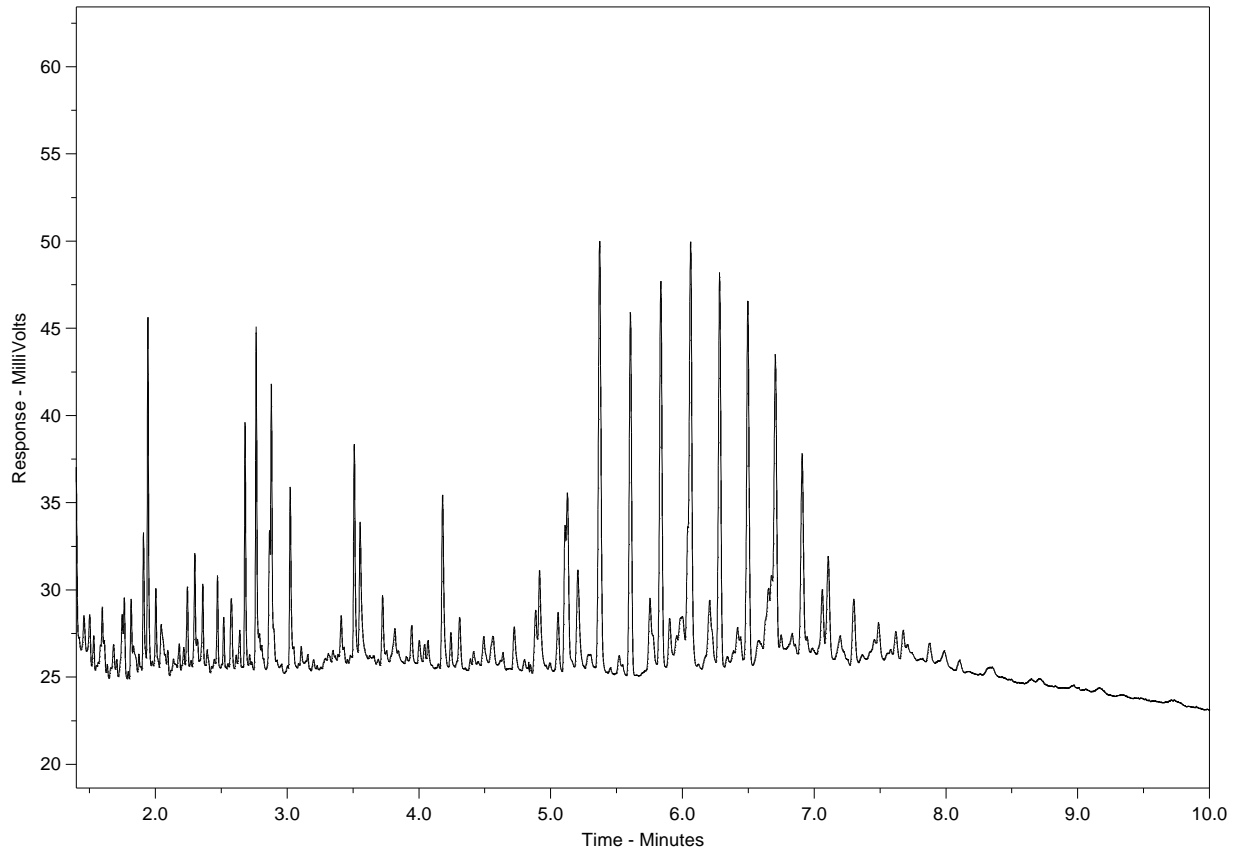
**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

# Hydrocarbon Distribution Report



ALS Sample ID: L1058120-1  
Client Sample ID: 1616-43\_DISCHARGE



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on [www.alsglobal.com](http://www.alsglobal.com) or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.



8081 Lougheed Highway • Suite 100 • Burnaby,  
Tel: 604-253-4188 Toll Free: 1-800-665-0243 FAX: 604-253-6700  
ALS Contact: Can Dang

SN# 40086

L1058120

Form 68659



bhpbilliton

BHP Billiton Diamonds Inc.  
# 1102 4920 52nd Street, Yellowknife, NT X1A 3T1  
Tel: 867-880-2157 Fax: 867-880-4012  
BHP Contacts: David Bruce/ Richard EhlertDavid

# CHAIN OF CUSTODY FORM

As, Se By CCMS	BTEX-TVH	Glycols	Oil and Grease	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	Total Ammonia	Total Organic Carbon	TPH	TSS								
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For Lab Use

Station ID	Matrix	Date	Time	Init	As, Se By CCMS	BTEX-TVH	Glycols	Oil and Grease	SNP-0013 Major Ions	SNP-0013 Nutrients	SNP-0013 Physical Parameters	SNP-0013 Total Metals	Total Ammonia	Total Organic Carbon	TPH	TSS					
1616-43_Discharge	Water	10-Sep-2011	03:30 PM	CK	1	1	1	1	1	1	1	1	1	1	1	1					BHP2



FOR LAB USE ONLY

Turn around Required: 1 week RUSH TAT please

Special Instructions (Billing details, QC reporting, etc):

Billing Code: BHP2001

Relinquished by: PE	Date: 11 SEPT 2011	Received by: BHT	Date: Sept. 14
	Time: 14:10hrs		Time: 10:15
Relinquished by:	Date:	Received by:	Date:
	Time:		Time:

**FOR LAB USE ONLY**

Cooler seal intact upon receipt?  Yes  No  N/A

Sample temperature upon receipt: 15 C

Frozen?  Yes  No

Send Analytical Results to: [compliance.team@bhpbilliton.com](mailto:compliance.team@bhpbilliton.com);