

US EPA ARCHIVE DOCUMENT

Attachment 1

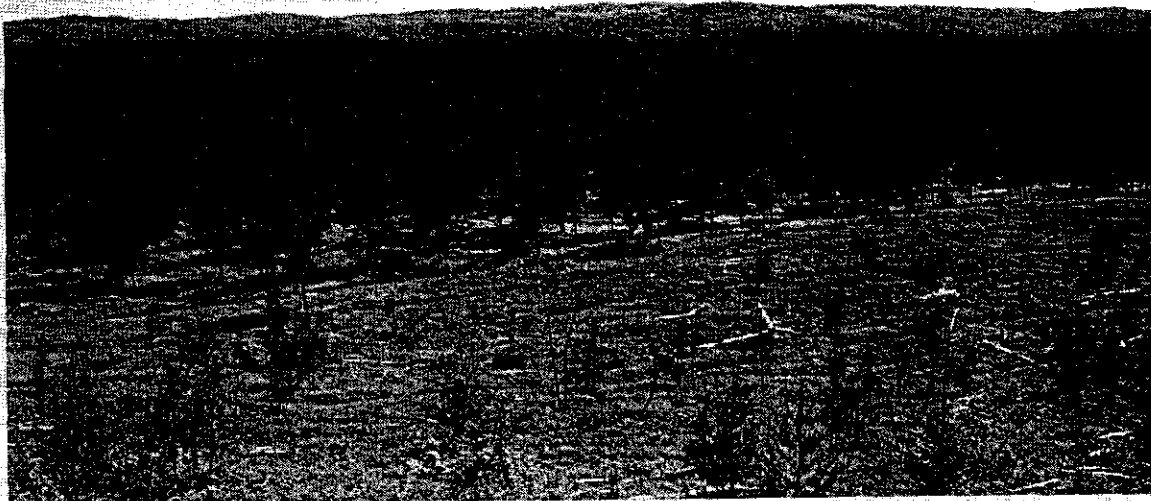
Water Chemistry of Groundwater Samples Collected in Exploration Holes

**2004 Water Quality Data
from Exploration Hole O4EA-54**

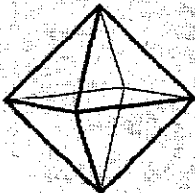
Golder Associates Ltd. April 2005

**Environmental Baseline Study,
Bedrock Hydrogeologic Investigation**

KENNECOTT MINERALS COMPANY
EAGLE PROJECT
ENVIRONMENTAL BASELINE STUDY
BEDROCK HYDROGEOLOGIC INVESTIGATION



Prepared for:
Kennecott Minerals Company and
Golder Associates Inc.



Kennecott
Minerals

Prepared by:
Golder Associates Ltd.



Golder
Associates

April 24, 2005

033-2156

TABLE 6.2

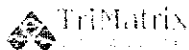
**WATER QUALITY RESULTS FOR SAMPLES COLLECTED IN PREVIOUS STUDIES
COMPARED TO SAMPLES COLLECTED IN THIS STUDY**

Parameter	Units	Pump Test Samples (Previous Studies, Provided by North Jackson)				This Study
		04EA-054A	04EA-054B	04EA-054D	04EA-054E	04EA-084
Field Parameters		Bedrock	Bedrock	Bedrock	Bedrock	Bedrock
Temperature	°C	14.6	16.2	12.4	10.8	12.72
Specific Conductance	µmhos/cm @ 25°C	138	194	133	238	1507
pH	SU	9.41	9.71	9.73	10.15	8.72
D.O.	ppm	NM	NM	NM	NM	NM
Ferrous Iron	mg/L	NM	NM	NM	NM	NM
Metals/Inorganics						
Aluminum, Dissolved	µg/L	<100	<100	<100	<100	<100
Lithium, Dissolved	µg/L	<10	14	23	14	49
Antimony, Dissolved	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic, Dissolved	µg/L	<2.0	<2.0	<2.0	<2.0	6.8
Barium, Dissolved	µg/L	27	60	<20	<20	<20
Iron, Dissolved	µg/L	22	<20	130	61	190
Beryllium, Dissolved	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Boron, Dissolved	µg/L	1340	1370	2720	3910	1590
Cadmium, Dissolved	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium, Dissolved	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Cobalt, Dissolved	µg/L	<10	<10	<10	<10	<10
Copper, Dissolved	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Lead, Dissolved	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Manganese, Dissolved	µg/L	<20	<20	<20	<20	220
Molybdenum, Dissolved	µg/L	<10	<10	11	<10	53
Nickel, Dissolved	µg/L	<25	29	<25	<25	59
Selenium, Dissolved	µg/L	<1.0	<1.0	1.1	<1.0	7.3
Silver, Dissolved	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Zinc, Dissolved	µg/L	<10	<10	11	12	88
Mercury, Dissolved	ng/L	0.653	0.428	0.651	4.95	89.1*
Major Anions						
Alkalinity, Bicarbonate	mg/L	80	<2.0	72	<2.0	62
Alkalinity, Carbonate	mg/L	<2.0	2.2	<2.0	15	<2.0
Chloride	mg/L	18	26	64	42	676
Fluoride	mg/L	0.17	0.19	0.14	0.12	0.53
Sulfate	mg/L	5.6	6.3	28	12	<5.0
Major Cations (filtered)						
Calcium, Dissolved	mg/L	8.9	34	25	19	31
Potassium, Dissolved	mg/L	2	8.1	7.1	4.3	12
Magnesium, Dissolved	mg/L	3.6	2.5	4.1	3.8	22
Sodium, Dissolved	mg/L	24	27	41	40	360
General Chemistry						
Hardness, (calculated) as CaCO ₃	mg/L	37	95	79	63	980
Residue, Dissolved @ 180°C	mg/L	124	128	272	210	1590
Tritium	TU	1.32	2.23	7.86	7.02	9.20

* The Hg concentration measured for this study was a total value.

APPENDIX E
WATER QUALITY LABORATORY RESULTS
FOR SAMPLES COLLECTED AT 845.0 TO 854.0 FT
IN BOREHOLE 04EA-84

TRIMATRIX LABORATORIES INC.



ANALYTICAL REPORT

Client: Golder Associates, Inc.
Project: Eagle

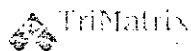
Sampled: 10/08/04 @ 15:20
Sampler: M. Lemon
Received: 10/14/04 @ 08:50

Submittal #: 36730-1
Submittal: October 8, 2004 Sample

Sample ID: 04EA-084 (8.45' - 8.54')
Sample #: 373427
Matrix: Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	Unit	Analysis Date	Chem	Reference Citation
Alkalinity, Bicarbonate	62	2.0	mg/L	10/21/04	VAS	310.1/SM 2320 B
Alkalinity, Carbonate	<2.0	2.0	mg/L	10/21/04	VAS	310.1/SM 2320 B
Chloride	676	10	mg/L	10/18/04	TAM	325.2/4500-CL E
Sulfate	<5.0	5.0	mg/L	10/18/04	TAM	EPA-375.4/9038
Fluoride	0.35	0.10	mg/L	10/22/04	VAS	SM 4500 F-C
Residue, Dissolved @ 180°C	1590	250	mg/L	10/14/04	INR	160.1/SM 2540 C
Calcium, Dissolved	31	0.50	mg/L	10/27/04	KLVM	EPA-200.7/6010B
Magnesium, Dissolved	22	0.50	mg/L	10/27/04	KLVM	EPA-200.7/6010B
Potassium, Dissolved	12	0.50	mg/L	10/27/04	KLVM	EPA-200.7/6010B
Sodium, Dissolved	360	0.50	mg/L	10/29/04	DWJ	EPA-200.7/6010B
Aluminum, Dissolved	<100	100	ug/L	10/27/04	KLVM	EPA-200.7/6010B
Antimony, Dissolved	<5.0	5.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Arsenic, Dissolved	6.8	2.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Barium, Dissolved	<20	20	ug/L	10/27/04	DSC	EPA-200.8/6020
Beryllium, Dissolved	<1.0	1.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Boron, Dissolved	1590	100	ug/L	10/27/04	KLVM	EPA-200.7/6010B
Cadmium, Dissolved	<0.5	0.5	ug/L	10/27/04	DSC	EPA-200.8/6020
Chromium, Dissolved	<5.0	5.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Cobalt, Dissolved	<10	10	ug/L	10/27/04	KLVM	EPA-200.7/6010B
Copper, Dissolved	<5.0	5.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Iron, Dissolved	190	20	ug/L	10/27/04	KLVM	EPA-200.7/6010B
Lithium, Dissolved	49	10	ug/L	10/27/04	KLVM	EPA-200.7/6010B
Manganese, Dissolved	220	20	ug/L	10/27/04	KLVM	EPA-200.7/6010B
Molybdenum, Dissolved	53	10	ug/L	10/27/04	DSC	EPA-200.8/6020
Nickel, Dissolved	59	25	ug/L	10/27/04	DSC	EPA-200.8/6020
Lead, Dissolved	<1.0	1.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Selenium, Dissolved	7.3	1.0	ug/L	10/27/04	DSC	EPA-200.8/6020
Silver, Dissolved	<0.2	0.2	ug/L	10/27/04	DSC	EPA-200.8/6020
Zinc, Dissolved	88	10	ug/L	10/27/04	DSC	EPA-200.8/6020



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QUALITY CONTROL REPORT

Parameter: Alkalinity, Bicarbonate
Method: Alkalinity, Automated-Titrimetric 310.1/SM 2320 B WATER
Units: mg/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/21/04	223374	VAS	<2.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/21/04	223374	VAS	238	235	99	93-105

QUALITY CONTROL REPORT

Parameter: Alkalinity, Carbonate
Method: Alkalinity, Automated-Titrimetric 310.1/SM 2320 B WATER
Units: mg/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/21/04	223374	VAS	<2.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/21/04	223374	VAS	377	377	100	77-110

QUALITY CONTROL REPORT

Parameter: Aluminum, Total

Method: Atomic Emission-ICP

EPA-200.7/6010B WATER

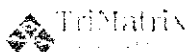
Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<100

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	2500	2521	101	90-110



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QUALITY CONTROL REPORT

Parameter: Antimony, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.9/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<2.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	41.2	103	90-110

QUALITY CONTROL REPORT

Parameter: **Arsenic, Total**

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

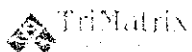
Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	42.2	106	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Barium, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223621	DSC	<10

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223621	DSC	40	42.3	106	90-110

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QUALITY CONTROL REPORT

Parameter: Beryllium, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223620	DSC	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223620	DSC	40	43.2	108	90-110



36730- 1

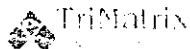
QUALITY CONTROL REPORT

Parameter: Cadmium, Total
Method: Atomic Emission-ICP
Units: ug/L

EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<10



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QUALITY CONTROL REPORT

Parameter: Cadmium, Total

Method: ICP Mass Spectrometry (ICP-MS)

BPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<0.2

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	42.8	107	90-110

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QUALITY CONTROL REPORT

Parameter: Chloride

Method: Colorimetric, Automated Ferricyanide 325.2/4500-CL E WATER

Units: mg/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/18/04	223261	TAM	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/18/04	223261	TAM	78.1	78.97	101	92-109

QUALITY CONTROL REPORT

Parameter: Chromium, Total
Method: Atomic Emission-ICP
Units: ug/L

EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<50

QUALITY CONTROL REPORT

Parameter: Chromium, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

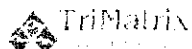
Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	43.3	108	90-110



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QUALITY CONTROL REPORT

Parameter: Cobalt, Total
Method: Atomic Emission-ICP
Units: ug/L

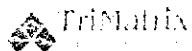
EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<10

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	500	497	99	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Copper, Total

Method: ICP Mass Spectrometry (ICP-MS)

ETA-200.8/6020 WATER

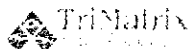
Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	43.2	108	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Fluoride

Method: Potentiometric, Ion Selective Electrode SM 4500 F-C WATER

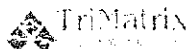
Units: mg/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/22/04	223379	VAS	<0.10

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/22/04	223379	VAS	3.43	3.31	97	88-116



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QUALITY CONTROL REPORT

Parameter: Iron, Total

Method: Atomic Emission-ICP

EPA-200.7/6010B WATER

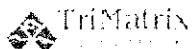
Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<20

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	500	514	103	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Lead, Total

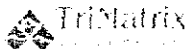
Method: Atomic Emission-ICP

Units: ug/L

EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<50



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QUALITY CONTROL REPORT

Parameter: Lead, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223621	DSC	<1.0

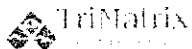
Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223621	DSC	40	40.1	100	90-110

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QUALITY CONTROL REPORT

Parameter: Lithium, Total
Method: Atomic Emission-ICP
Units: ug/L

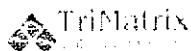
EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<10

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	500	512	102	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Magnesium, Total
Method: Atomic Emission-ICP
Units: mg/L

EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<0.50

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	5.0	5.13	103	90-110

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QUALITY CONTROL REPORT

Parameter: **Manganese, Total**
Method: Atomic Emission-ICP
Units: ug/L

EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<10

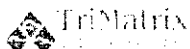
Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	500	511	102	90-110

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QUALITY CONTROL REPORT

Parameter: Nickel, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	42.8	107	90-110

QUALITY CONTROL REPORT

Parameter: Potassium, Total
Method: Atomic Emission-ICP
Units: mg/L

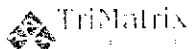
EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<0.20

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223665	KLVM	5.0	5.03	101	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Residue, Dissolved @ 180°C
Method: Residue-Gravimetric, Dried @ 180°C 160.1/SM 2540 C WATER
Units: mg/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/14/04	223088	INR	<2.5

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/14/04	223088	INR	1000.0	1040	104	90-108
10/14/04	223088	INR	1000.0	984	98	90-108

QUALITY CONTROL REPORT

Parameter: **Selenium, Total**

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

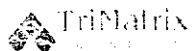
Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<1.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	42.5	106	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Silver, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<0.2

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	43.1	108	90-110

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Individual sample results relate only to the sample tested

5560 Corporate Exchange Court SE • Grand Rapids, MI 49512 • (616) 975-4500 • Fax (616) 942-7463

QUALITY CONTROL REPORT

Parameter: Sodium, Total
Method: Atomic Emission-ICP
Units: mg/L

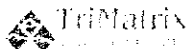
EPA-200.7/6010B WATER

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223665	KLVM	<0.50
10/29/04	223765	DWJ	<0.50

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/29/04	223765	DWJ	5.0	4.86	97	90-110



36730- 1

QUALITY CONTROL REPORT

Parameter: Sulfate

Method: Turbidimetric Method (Manual)

EPA-375.4/9038 WATER

Units: mg/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/18/04	223265	TAM	<5.0

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/18/04	223265	TAM	15.8	16.2	103	85-113

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QUALITY CONTROL REPORT

Parameter: Zinc, Total

Method: ICP Mass Spectrometry (ICP-MS)

EPA-200.8/6020 WATER

Units: ug/L

Instrument Blank

Test Date	Analytical Batch Number	Analyst	Blank Conc
10/27/04	223634	DSC	<10

Laboratory Control Sample

Test Date	Analytical Batch #	Analyst	Spike Qty	Spike Result	Recovery	QC Limits
10/27/04	223634	DSC	40	43.1	108	90-110

STATEMENT OF DATA QUALIFICATIONS

All analyses have been validated and comply with our Quality Control Program. No qualifications required.

Page 1 - End of Statement of Data Qualifications

Note: This document is included as a part of the analytical report for the above referenced project and submittal, and should be retained as a permanent record thereof.

BROOKS RAND



BROOKSRAND
TRACE METALS ANALYSIS & PRODUCTS

October 29, 2004

North Jackson Company
Attn.: Peter Sabee
420 Rail Street
PO Box 30
Negaunee, MI 49866

RE: Brooks Rand Project: NJC002; Tracking #: 04BR762
Lab Services Agreement 101201NJ01; Client Project: Eagle

Dear Mr. Sabee:

This report is for the mercury analysis of one water sample collected on 10/8/04 and received at Brooks Rand on 10/14/04. This sample has have been assigned the BRL tracking number 04BR762.

All samples were received, stored, prepared and analyzed according to Brooks Rand LLC Standard Operating Procedures and EPA Method 1631E.

Special Note: The COC indicated dissolved analysis and after speaking with the client they stated that they really needed total Hg via EPA Method 1631.

All results were blank corrected, as outlined in the calculations section of EPA Method 1631E. All QA criteria were met and no qualification of the data was required. Brooks Rand certifies that the reported test results meet all requirements of NELAC.

If there are any questions please feel free to contact me.

Sincerely,

Misty D. Mayer
Project Manager
misty@brooksrand

Reported by

Brooks Rand LLC

Contact: Elizabeth Madonick

3958 6th Avenue NW
Seattle, WA 98107

Tel: 206-632-6206 Fax: 206-632-6017

Summary of Results for

North Jackson Company

Contact: Peter Sabee

420 Rail Street
Nagaunee MI 49866
Tel: 906-475-9882

Lab Project # NJC002

Lab Tracking # 04BR762

Lab Services Agreement 101201NJ01

Client Project Eagle

Sample/Sampling/Receiving Info

North Jackson Company

BRL

Sample

Identification

04EA-084(845'-854')

Sampling Date

10/8/2004

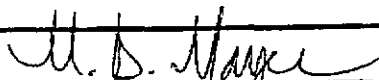
Sample Number

04BR762 - 1

Receiving Date

10/14/2004

Friday, October 29, 2004


Project Manager

Reported by

Brooks Rand LLC

Contact: Elizabeth Madonick

3958 6th Avenue NW

Seattle, WA 98107

Tel: 206-632-6206 Fax: 206-632-6017

Summary of Results for

North Jackson Company

Contact: Peter Sabee

420 Rail Street

Nagaunee MI 49866

Tel: 906-475-9882

Lab Project # NJC002

Lab Tracking # 04BR762

Lab Services Agreement 101201NJ01

Client Project Eagle

Hg

Sample Identification	BRL Number	Preparation date	Analysis date	Batch #	Result	Units	Qualifier (Q)
04EA-084(845-854)	04BR762 - 1	10/25/2004	10/26/2004	04-855	89.100	ng/L	

Friday, October 29, 2004


Project Manager

BRL QA Summary

Batch #: 04-855

Method #: EPA 1631.E

Analyte: Hg

Matrix: Water

BIAS Criteria: Recovery = 79-121%			
Laboratory Control Samples			
LCS ID	Certified Value ng/L	Measured Value ng/L	Recovery %
QCS	10.00	9.32	93.2%

BIAS Criteria: Recovery = 77-123%			
Ongoing Precision and Recovery (OPR)			
LCS ID	Certified Value ng/L	Measured Value ng/L	Recovery %
OPR1	5.00	5.31	106.2%
OPR2	5.00	5.31	106.2%

BIAS Criteria: Recovery = 71-125%, RPD < 24%								
Matrix Spikes/Matrix Spike Duplicates (MS/MSD)								
Sample ID	Sample Value ng/L	Matrix Spike			Matrix Spike Duplicate			Duplicate RPD
		Spiked Value ng/L	Measured Value ng/L	MS Recovery %	Spiked Value ng/L	Measured Value ng/L	MSD Recovery %	
04BR764-1	54.1	40.1	94.0	99.5%	39.4	94.4	102.5%	0.4%
04BR773-1	2.01	36.9	41.2	106.2%	40.1	43.3	103.0%	5.1%

Method Blanks (MB) Criterion: < MB (0.5% BrCl) < 0.5 ng/L								Detection Limits	
MB1		MB2		MB3		MB4		MB MDL	MB PQL
ng/L	BrCl%	ng/L	BrCl%	ng/L	BrCl%	ng/L	BrCl%	ng/L	ng/L
0.213	0.5%	0.249	0.5%	0.405	1.0%	NA	NA	0.10	0.25

10/29/2004


Project Manager

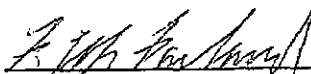
QUALITY ASSURANCE REPORT

Batch: 04-855
Analysis: Mercury by EPA 1631.E (CVAFS)
Tracking: 04BR760, 04BR762, 04BR764, 04BR773, 04BR782, 04BR816,
04BR817, & 04BR818
Project: USG003, NJC002, H2M002, LOV001, MEL002, ADS001, &
BCT001
Matrix: Water
Batch Size: 17 Samples
Analysis Date: October 26, 2004
Calibration Date: October 26, 2004

- 1 **SAMPLE PREPARATION** – Acceptable
- 2 **CALIBRATION** – Acceptable
- 3 **CALIBRATION VERIFICATION** – Acceptable
- 4 **QUALITY CONTROL SAMPLES (QCS)** – Acceptable
- 5 **BLANKS** – Acceptable
- 6 **METHOD DUPLICATE ANALYSIS** – Not Applicable
- 7 **SPIKE / SPIKE DUPLICATE ANALYSIS** – Acceptable
- 8 **LIMITS OF DETECTION** – Acceptable
- 9 **OVERALL DATA QUALITY** – Acceptable

No qualification of the data was required based on this review.

I certify that, to the best of my knowledge and belief, the data are reported as true and accurate.
The Laboratory Director, or his designee, has authorized release of data contained in this Quality
Assurance Report as verified by the following signature(s).

 10/29/04
Frank McFarland
Quality Assurance Manager

Hg Analysis Results
Batch #04-855(1631E), Tracking #04BR760,762,764,773,782,816,817,818

Analyst: ETS			Date: 10/26/2004			Matrix: Water			Analysis: Hg		
Projects: ADS001, BCT001, H2M002, LOV001, MEL002, NJC002, USG003											
SAMPLE CALCULATIONS 0.5% BrCl											
			Sample	Dilution	Analyzed	Uncorrected			MB corrected		
			Volume	Volume	Vol.	Result			Result		
Run	Tracking #	ID #	(mL)	(mL)	(mL)	PA	pg	ng/L	ng/L		
15	04BR773	1	150	150.30	84.42	2835	188	2.24	2.01		
16	04BR773	1MS	54.21	54.51	37.61	23274	1548	41.4	41.2		
17	04BR773	1MSD	49.82	50.12	37.54	24437	1626	43.6	43.3		
18	04BR782	1	250	250.50	85.23	42227	2810	33.0	32.8		
19	04BR817	2	250	250.50	82.50	131	8.53	0.104	-0.127		
20	04BR818	1	250	250.50	85.98	5419	360	4.20	3.97		
Method Blank 0.5% BrCl											
			Sample	Dilution	Analyzed						
			Volume	Volume	Volume	Measured	Total	Result			
Run	(mL)	(mL)	(mL)	PA	pg	pg	ng/L				
12	204.19	205.59	87.63	281	18.5	43.4	0.213				
13	201.49	202.89	92.30	346	22.8	50.2	0.249				
Average:					20.7	46.8	0.231				
StDev:					3.06	4.79	0.026				
SAMPLE CALCULATIONS 1.0% BrCl											
			Sample	Dilution	Analyzed	Uncorrected			MB corrected		
			Volume	Volume	Vol.	Result			Result		
Run	Tracking #	ID #	(mL)	(mL)	(mL)	PA	pg	ng/L	ng/L		
21	04BR764	1	150	151.35	28.93	23479	1562	54.5	54.1		
22	04BR764	1MS	49.82	50.47	21.79	30526	2031	94.4	94.0		
23	04BR764	1MSD	50.81	51.46	15.04	21169	1408	94.8	94.4		
24	04BR760	17	30	30.33	9.00	53773	3578	402	402		
25*	04BR760	18	53	53.48	19.28	587335	39082	2045	2045 *		
26	04BR760	19	16	16.16	9.90	148684	9893	1009	1009		
27	04BR760	20	10	10.16	10.08	12631	840	84.7	84.3		
28	04BR760	21	50	50.70	25.35	127139	8480	338	338		
30	04BR760	23	55	55.80	5.00	3884	258	52.4	52.0		
31	04BR760	24	25	25.35	5.00	6249	416	84.3	83.9		
32	04BR760	25	55	55.80	5.00	29032	1932	392	392		
33	04BR762	1	250	252.25	5.00	6668	444	89.5	89.1		
34	04BR816	1	250	252.25	5.00	27494	1829	369	369		
35	04BR817	1	150	151.35	5.00	3546	236	47.6	47.2		
36	04BR760	22	35	35.55	5.00	7425	494	100	99.9		
37	04BR760	18	53	53.48	0.100	8636	574	5797	5796		
* Over calibration.											
Method Blank 1.0% BrCl											
			Sample	Dilution	Analyzed						
			Volume	Volume	Volume	Measured	Total	Result			
Run	(mL)	(mL)	(mL)	PA	pg	pg	ng/L				
14	205.42	208.22	82.87	500	33.1	83.1	0.405				

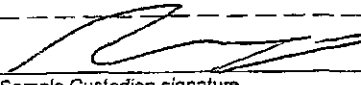
Hg Analysis Results
Batch #04-855(1631E), Tracking #04BR760,762,764,773,782,816,817,818

QC CALCULATIONS									
Calibration Results									
Instrument Calibration (10/26/04)					Calibration Blanks				
Run	pg	PA	Calibration Coefficient	Average:	2.75	PA	Run	PA	pg
5	25	360	0.06998	95.1%	recovery		1	11	0.732
6	100	1535	0.06526				2	0	0.000
7	500	7254	0.06895				3	0	0.000
8	2500	38777	0.06448				4	0	0.000
9	10000	156168	0.06403				Average:	2.75	0.183
R:	1.0000	Average:	0.06654				StDev:	5.50	0.366
		RSD:	4.1%						
Calibration Checks					Blank tests				
Quality Control Standard									
	pg	PA	pg measured	% recovery		Run	PA	pg	
	pg	PA	measured	recovery		29	22	1.46	
11	1000	14016	932	93.2%					
Ongoing Precision Recovery									
Run	pg	PA	pg measured	% recovery					
10	500	7983	531.0	106.2%					
38	500	7986	531.2	106.2%					
Bias									
Summary of Matrix Spike Recoveries									
			spike +						
			Spike sample	sample	spike				
			Conc. measured	measured	measured	%			
Run	Tracking #	ID #	ng/L	ng/L	ng/L	Rec.	RPD%		
16	04BR773	1MS	36.89	41.17	2.01	39.16	106.2%		
17	04BR773	1MSD	40.14	43.34	2.01	41.33	103.0%	5.1	
22	04BR764	1MS	40.14	94.02	54.08	39.94	99.5%		
23	04BR764	1MSD	39.36	94.44	54.08	40.36	102.5%	0.4	

Brooks Rand LLC Sample Receiving Log

Tracking # 04BR762 Customer: North Jackson Company Contact: Peter Sabee Project Ref. #: NJC002 Collection Date 10/8/2004 QA Level Standard Sample Condition Intact Shipping container intact? Yes Shipping container type: cooler Shipping container temp: 0.7°C Shipping container coolant: Ice Sample preservation: 0.5% BrCl Acid lab # 04-279 Hg Concentration: Sample storage area: Hg Lab Bin 1 Sample Turnaround Time: Contract Turnaround Time: 28 days Comments: See non-conformance form.	Due Date: 11/11/2004 Receiving Date: 10/14/2004 Receiving Time: 9:00 AM Logged-in by: Margaret Langley Log-in Date: 10/14/2004 Log-in Time: 4:00 PM Airbill present? Yes Airbill #: 847861861598 Carrier: Fed EX Custody seal present? Yes Custody seal intact? Yes COC Present? Yes COC Number: N/A Case #: SDG #: Analysis request form? No COC/Sample log agree? Yes
---	--

Lab ID:	Sample Tag #	Container #	Size:	pH	Matrix/Sub-Matrix	Comments:
1	04EA-084(845-854)	04-259	250 mL Bottle	<2		
Analysis / Method:		Hg	EPA 1631			


 Sample Custodian signature

10-14-04
 Date

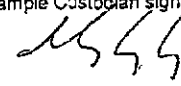

10/14/07

Exhibit A

Initiation of Form

Initiated by: Annie

Date of Occurrence: 10-14-04

Affected Samples: 04EA-084(845'-857') Matrix
04BR762-1

Matrix/Analyte: Water

Description of Non-Conformance

Symptom Observed: COC mistake

Detailed Description of Problem: The COC said "Mercury-Dissolved" under "Analyses Required". Elizabeth contacted customer for further clarification and the customer only wanted total mercury (1631). No Filtration was ~~was~~ done.

Communication and Discussion of Problem

Lab Manager Notified: [Y/N]

Meeting Held: [Y/N]

Project Manager Notified: [Y/N]

Client Notified: [Y/N]

Date: _____ Names of Attendees: _____

Summary of Discussion and Action to be taken:

Action Taken

Name/Date/Description of Action and Findings:

Preventative Measures:

Resolution Approval

Initiator.

(signature/date)

Manager

(signature)

Brooks Rand LLC Chain Of Custody Record

Page 1 of 1

Client: <u>GOLDER ASSOCIATES</u>		Email address: <u>smiller@golder.com</u>		Ship to: Brooks Rand LLC										
Contact: <u>SCOTT MILLER</u>		PO #: <u>033-2651</u>		3958 6 th Avenue NW										
Address: <u>44 UNION BLVD. STE 300</u> <u>LAKEWOOD, CO 80228</u>		Sampler's signatures: <u>[Signature]</u>		Seattle, WA 98107										
Phone #: <u>303-980-0540</u>		Fax COC for receipt confirmation? (Y/N) <u>(Y)</u>		Phone: 206-632-6206										
Fax #: <u>303-985-2080</u>		Client project ID: <u>033-2651</u>		Fax: 206-632-6017										
		BRL project ID: <u>15C002</u>		Email: <u>brl@brooksrnd.com</u>										
				www.brooksrnd.com										
For BRL use only:		Cooler temp (°C): <u>0.70</u>		Custody seals present? (Y/N) <u>(Y)</u>										
				Custody seals intact? (Y/N) <u>(Y)</u>										
				Date: <u>10-14-04</u>										
				Initials: <u>K</u>										
Sample ID	Collection		Miscellaneous			Field Preservation				Analyses required				Comments
	Date	Time	Sampler (initials)	Matrix type	# of containers	Sample field filtered, Y/N	Unpreserved or ice only	HNO ₃	HCl	BrCl	Other (specify)	Mercury - Dissolved	EPA-1631	
1 <u>04EA-084(845'-854')</u>	<u>10-8-02</u>	<u>1520</u>	<u>MSL</u>	<u>W</u>	<u>1</u>	<u>N</u>	<u>X</u>							
2														
3														
4														
5														
6														
7														
8														
9														
10														
Shipping carrier: <u>FED Ex</u>														# of coolers: <u>1</u>
Relinquished by: <u>[Signature]</u>		Date: <u>10-13-04</u>		Time: <u>1430</u>		Received by:				Date:		Time:		
Relinquished by:		Date:		Time:		Received at BRL: <u>[Signature]</u>				Date: <u>10-14-04</u>		Time: <u>9:00</u>		

White: LAB COPY

Yellow: CUSTOMER COPY

ILLINOIS GEOLOGICAL SURVEY



Illinois State Geological Survey

Natural Resources Building, 615 East Peabody Drive,
Champaign, Illinois 61820-6964
217/333-4747 • FAX 217/244-7004 • TTY 217/244-6577



Isotope Analysis Report

TO:	Scott Miller Golder Associates 44 Union Blvd., STE 300 Lakewood, CO 80228	FROM:	Keith C. Hackley, PhD. Illinois State Geological Survey 615 E. Peabody Champaign, IL 61820
-----	--	-------	---

Date: 11/5/04

Sample ID	ISGS #	³ H (TU)*	Std Dev (TU)
04EA084	1426	9.20	±0.22

* TU = Tritium Unit. One TU is defined as one tritium atom per 10¹⁸ hydrogen atoms, or 7.088 dpm/ kg H₂O, or 3.193 pCi/ kg H₂O.

Isotope Geochemistry Section

Printed on Recycled Paper

Smiller@golder.com

Working w/ Dan Wiffila
(send to Scott Miller)