COMPLIANCE / ENGINEERING / REMEDIATION

NOAV 200123526
Facility ID 119049
Facility ID 107649

LT Environmental Inc.
4600 West 60th Avenue
Arvada, Colorado 80003
T 303.433.9788 / F 303.433.1432

April 10, 2008

01727748

RECEIVED
APR 16 2008
COGCC

Mr. John Axelson
Environmental Protection Specialist
Colorado Oil and Gas Conservation Commission
9203 East 155th Drive
Brighton, Colorado 80602

RE: Additional Surface Water Sampling Results
Jolly 41X-6 Produced Water Pit
Woodrow, Colorado

Dear Mr. Axelson:

Markus Production, Inc. (Markus) contracted LT Environmental, Inc. (LTE) to conduct additional surface water sampling at the Jolly 41X-6 Produced Water Pit (Site), per your request. The intent of this project was to compare the quality of the groundwater and surface water in this area with the goal of demonstrating that Markus activities have not caused an impact to existing conditions.

On March 12, 2008, LTE personnel collected a surface water sample (Jolly SW #1) from Bush Creek approximately 450 feet upgradient of the Site (Figure 1). The location of the surface water sample was chosen due to the location of a weeping spring, which emerges from the same formation that the Site is located in. The sample was collected from a large pond which the spring appears to feed. The point of sample collection was directly below where the spring enters the pond.

The surface water sample was collected in laboratory prepared containers, and placed on ice. The samples were delivered with a completed chain of custody (COC) form to Evergreen Analytical, Inc. of Wheatridge, Colorado. The surface water samples were submitted for analysis of pH, electrical conductivity (EC), total dissolved solids (TDS), carbonate and bicarbonate alkalinity, major cations, and major anions.

Surface Water Analytical Results

Concentrations of magnesium calcium, and sulfate, as well as elevated levels of EC and TDS were detected in the surface water sample. These results indicate that the overall water quality of the spring-fed surface water pond is poor based on comparison to the Colorado Department of Public Health and Environment (CDPHE) secondary standards for drinking water. These standards address aesthetics, taste and odor, and include sulfate and TDS. The surface water and historical groundwater analytical results are summarized in Table 1. The laboratory analytical report is included in Attachment 1.

Groundwater Analytical Results

Analytical results from the January 2008 groundwater sampling indicate that CDPHE Secondary Standards were exceeded for chloride, sulfate, and TDS.

Colorado Oil and Gas Conservation Commission (COGCC) Allowable Concentration Levels in groundwater for TDS, chloride, and sulfate are 1.25 times the background concentrations. Using the COGCC 1.25 times background standard, groundwater from monitoring wells MW-1, MW-2, MW-4 and MW-5 exceeded the chloride and TDS standards, and MW-4 exceeded the sulfate standard.

Stiff Diagram Analysis

Stiff Diagrams were plotted using the AqQA Software Program. Stiff diagrams are a visual comparison tool used to analyze similarities or discrepancies between multiple sets of analytical results. Analytical results are plotted with cation concentrations on the left side of the diagram and anion concentrations on the right side. LTE personnel constructed Stiff Diagrams for each of the five groundwater samples from the initial site investigation on January 22, 2008 (MW-1 through MW-5), as well as the most recent surface water sample (Jolly SW #1). Analysis of the Stiff Diagrams indicated the spring-fed, surface water sample is not the same water type as the groundwater samples. The Stiff Diagrams are included as Attachment 2.

Conclusions and Recommendations

Based on comparison of surface water and groundwater quality to applicable standards, both types of water are of poor quality. Analytical results from the Jolly SW #1 surface water sample indicate elevated levels of sulfate, and TDS. After review of the Stiff Diagrams, the surface water sample does not appear to be the same water type as the groundwater samples collected from the initial site investigation monitoring wells.

Taking into consideration the remoteness of the Site, and the overall poor surface water and groundwater quality of the local shallow aquifer system, the groundwater impacts resulting from percolation of produced water from the pit appear to be minimal, if any.

LTE is requesting, on behalf of Markus, that the COGCC allow Markus to continue operation of the Jolly 41X-6 Production Well and associated produced water pit.

Please call Markus at 303-295-6910 ext. 24 and/or LTE at 303-433-9788 if you have any questions or comments regarding this report.

Sincerely,

LT ENVIRONMENTAL, INC.

Brian Dodek, P.G.
Project Manager

John D. Peterson, P.G.
Senior Geologist

Attachments (2)

Cc: Mark E. Brown, Markus Production, Inc.

FIGURE

SUPPLEMENTAL PRODUCED WATER PIT

COUNTY ROAD 18

MW-3

MW-2

PRODUCED WATER PIT

MW-1

ACCESS ROAD

VAULT

MW-5

HEATER TREATER

AST

MW-4

EPHEMERAL STREAM

STANDING WATER

JOLLY SW #1

LEGEND

MW-1 ⊗ MONITORING WELL LOCATION

JOLLY SW #1 ● SURFACE WATER SAMPLE LOCATION

BERM

0 15 30 60

FEET

FIGURE 1
MONITORING WELL AND SURFACE WATER SAMPLE LOCATIONS
WOODROW, COLORADO
MARKUS PRODUCTION, INC.

LTE

MP1080101 2/08

TABLE

TABLE 1
GROUNDWATER ANALYTICAL RESULTS
JOLLY 41X-6 PRODUCED WATER PIT
WOODROW, COLORADO
MARKUS PRODUCTION, INC.

Well Name	Date	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)	pH (su)	EC (umhos/cm)	Total Dissolved Solids (mg/L)	Carbonate Alkalinity (mg/L)	Bicarbonate Alkalinity (mg/L)	Calcium (mg/L)	Iron (mg/L)	Manganese (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Sulfate (mg/L)	Nitrate as N (mg/L)	Nitrite as N (mg/L)
MW-1	1/22/2008	<1.00	<1.00	<1.00	<2.00	7.64	4,800	2,560	7.78	1,900	30	0.623	0.0768	18.9	5.03	<0.03	1,230	549	6.14	284	<0.5	<0.5
MW-2	1/22/2008	<1.00	<1.00	<1.00	<2.00	7.25	3,910	2,920	2.32	1,390	148	0.565	0.133	72.2	10.8	<0.03	778	555	6.28	398	<0.5	<0.5
MW-3	1/22/2008	<1.00	<1.00	<1.00	<2.00	7.58	3,720	2,000	3.64	1,020	199	81.2	1.52	98.8	29.8	<0.03	832	408	3.8	718	1.72	<0.5
MW-4	1/22/2008	<1.00	1.02	<1.00	<2.00	7.5	5,190	3,730	4.06	1,370	230	99.2	0.829	215	34.7	<0.03	1,050	606	5.92	1,600	1.94	<0.5
MW-5	1/22/2008	<1.00	<1.00	<1.00	<2.00	8.16	3,940	2,670	27.5	2,020	18.6	7.56	0.0955	20	8.49	<0.03	1,260	647	5.46	272	2.33	<0.5
Jolly SW #1	3/12/2008	NA	NA	NA	NA	8.46	2,710	2,530	<5.0	144	230	0.19	0.033	150	20	<0.090	270	109	1.41	1,480	0.0572	<0.020
CGWQS Standards		**5**	**1,000**	**700**	**1,400**	**6.5-8.5**	**--**	**500**	**--**	**--**	**--**	**0.3**	**0.05**	**--**	**--**	**--**	**--**	**250**	**--**	**250**	**10**	**1**
COGCC Allowable Conc.		**5**	**1,000**	**700**	**1,400**	**--**	**--**	**2500***	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**510***	**--**	**897***	**--**	**--**

Notes:
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B
pH analyzed by SM4500HB
EC - Electrical conductivity analyzed by EPA Method 120.1
Total dissolved solids analyzed by EPA Method 160.1
Bicarbonate and carbonate alkalinity analyzed by EPA Method SM4500CO2D
All dissolved metals analyzed by EPA Method 6010B
Chloride analyzed by EPA Method 325.2
Bromide, Sulfate, Nitrate as N, and Nitrite as N analyzed by EPA Method 300
ug/L - micrograms per liter
su- standard units
umhos/cm - micromhos per centimeter
mg/L - milligrams per liter
< - less than the stated method detection limit
NA - Not analyzed
CGWQS - Colorado Groundwater Quality Standards
COGCC Allowable Conc.- Colorado Oil and Gas Conservation Commission Allowable Concentration Levels
* - TDS, chloride, and sulfate are 1.25 X background concentrations from monitoring well MW-3

ATTACHMENT 1

LABORATORY ANALYTICAL REPORT

WORK ORDER Summary Evergreen Analytical, Inc. 08-1633

Rpt To: Brian Dodek
LT Environmental
4600 W 60th Ave
Arvada, CO 80003
(303) 433-9788

Email To: bdodek@ltenv.com

3/12/2008 1:30:28 PM

Client Project ID: Jolly 41X-6

QC Level: Level I

Comments:

Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Test Code	Test Name	Hold	MS	Date Due	Hold Time
08-1633-01A	Jolly SW#1	Groundwater	3/12/08 1100	3/12/08	6010_D *	6010: Dissolved Metals	☐	☐	3/26/08	9/08/08
08-1633-01B	Jolly SW#1	Groundwater	3/12/08 1100	3/12/08	ANIONS_W *	300.0: Anions by IC	☐	☐	3/26/08	3/14/08
08-1633-01C	Jolly SW#1	Groundwater	3/12/08 1100	3/12/08	CARB/BICARB_W *	Carbonate and Bicarbonate	☐	☐	3/26/08	3/26/08
08-1633-01C	Jolly SW#1	Groundwater	3/12/08 1100	3/12/08	COND_W	Specific Conductance @ 25°C	☐	☐	3/26/08	4/09/08
08-1633-01C	Jolly SW#1	Groundwater	3/12/08 1100	3/12/08	PH_DW	E150.1 pH	☐	☐	3/26/08	3/13/08
08-1633-01C	Jolly SW#1	Groundwater	3/12/08 1100	3/12/08	TDS_W	Total Dissolved Solids (TDS)	☐	☐	3/26/08	3/19/08

Definitions: * - Test Code has a Select List

CHAIN OF CUSTODY RECORD / ANALYTICAL SERVICES AGREEMENT

Evergreen Analytical Laboratory Inc.

4036 Youngfield St.
Wheat Ridge, Colorado 80033
(303) 425-6021
FAX (303) 425-6854
(877) 737-4521
e-mail info@evergreenanalytical.com

CLIENT INFORMATION

Mail Original Report to: LTE
Attn Brian Dudek
Address 4620 W Cook Ave
City Evergreen State CO Zip 80403
Tel # _____ Fax # _____ E-mail on file

REPORT ALSO BY ☐ FAX ☒ PDF ☐ EDD

REPORT CHROMATOGRAMS ☐ YES

Mail Invoice to: SAA
Attn _____
Address _____
City _____ State _____ Zip _____
Tel # _____ Fax # _____

Project ID# Jolly 4N-6
P.O. MP1-0321 Quote _____
Sampler Scott Fezzuch

NOTE: *Identify Known Hazards Below*

Report Results by: _____ (Date)*
Standard 2 working weeks ☒
UST Analyses per Fee Schedule ☐
* Rush: ☐ less than 24 hrs, 150% ☐ 1 - 2 work days, 100%
☐ 3 - 5 work days, 50% ☐ 6 - 9 work days, 25%
*Subject to surcharge & exceptions noted in fee schedule.

SAMPLE IDENTIFICATION	DATE SAMPLED	TIME	No. of Containers	MATRIX: 1) Drinking Water or 2) Discharge Water or 3) Ground Water (circle one)	MATRIX: Soil / Solid / Air / Gas	MATRIX: Oil / Sludge / Wipe	ANALYSES (check anaylsis): Major Cations	Major Anions	pH/EC	TDS	Carbonates	For Laboratory Use Only
Jolly SW#2	12 MAR 18	1120	3	X			X	X	X	X	X	01
							D.S.S Metals - Ca, Fe, Mn, Mg, K, Se, Na					
							Anions - Cl, SO_4, NO_3-N, NO_2-N, Br					

W.O. # 18-1633
B.O.F. # _____
C/S (O) _____ / _____
C/S (I) _____ / _____
Temp. °C 5.9 / Ice _____
Seals Present Y / N / NA
Samples Intact Y / N / NA
Headspace Y / N / NA
By _____

Does this analysis involve property transfer? ☐ Yes or ☐ No

Sample Fraction

Instructions:

** Important Note: See reverse side hereof for terms and conditions.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
	12 MAR 18 1:20 pm		3/12/18 1:20p				

Evergreen Analytical, Inc.

Date: *26-Mar-08*

Client Project ID: Jolly 41X-6
Lab Order: 08-1633

CASE NARRATIVE

SAMPLE RECEIVING

Sample(s) were hand delivered to the laboratory by the client.
Custody seals were not present.
The temperature of the sample(s) upon arrival was 5.9 °C.
Sample(s) were received in good condition, in the proper container, and within holding times. JD

QUALITY ASSURANCE (QA)

Analyses performed on samples in this work order by EAL meet the requirements of the EAL Quality Assurance Program unless otherwise explained. Analyses of RCRA samples meet the requirements of NELAC and Utah Rule R444-14 unless otherwise explained. CMS

CLIENT SERVICES

There are no anomalies to report. SG

GENERAL CHEMISTRY

Due to a high chloride level requiring a dilution to separate the nitrite peak, the detection limit for nitrite has been raised for this sample. There are no other anomalies to report. JML/CMS

METALS ANALYSIS

There are no anomalies to report. MB

Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Jolly SW#1
Client Project ID: Jolly 41X-6
Date Collected: 3/12/08
Date Received: 3/12/08

Lab Work Order 08-1633
Lab Sample ID: 08-1633-01
Sample Matrix: Groundwater

DISSOLVED METALS

Method: SW6010B **Prep Method: E200.7/SW3010A**

Date Prepared: 3/19/08
Date Analyzed: 3/20/08
Lab File ID: 032008PM
Method Blank: MB-15009
Dilution Factor: 1
Lab Fraction ID: 08-1633-01A

Analytes	CAS Number	Result	LQL	Units
Calcium	7440-70-2	230	0.39	mg/L
Iron	7439-89-6	0.19	0.070	mg/L
Magnesium	7439-95-4	150	0.15	mg/L
Manganese	7439-96-5	0.033	0.0050	mg/L
Potassium	7440-09-7	20	0.34	mg/L
Selenium	7782-49-2	U	0.090	mg/L
Sodium	7440-23-5	270	0.40	mg/L

MB
Analyst

Approved

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
E - Extrapolated value. Value exceeds calibration range
H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 3/21/2008

Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Jolly SW#1
Client Project ID: Jolly 41X-6
Date Collected: 3/12/08 1100
Date Received: 3/12/08

Lab Work Order 08-1633
Lab Sample ID: 08-1633-01
Sample Matrix: Groundwater

ANIONS BY IC

Method: E300.0 **Prep Method:**

Date Prepared: 3/12/08
Date Analyzed: 3/12/08 1843
Method Blank: METHOD BLANK
Dilution Factor: 50
Lab Fraction ID: 08-1633-01B

Analytes	CAS Number	Result	LQL	Units
Sulfate	7778-80-2	1480	25	mg/L

Date Prepared: 3/12/08
Date Analyzed: 3/12/08 1843
Method Blank: METHOD BLANK
Dilution Factor: 5
Lab Fraction ID: 08-1633-01B

Analytes	CAS Number	Result	LQL	Units
Chloride	7647-14-5	109	2.5	mg/L
Nitrite-N		U	0.020	mg/L
Bromide	7647-15-6	1.41	0.25	mg/L
Nitrate-N		0.0572	0.050	mg/L

J. Lange
Analyst

Approved

Qualifiers: B - Analyte detected in the associated Method Blank, value not subtracted from result
E - Extrapolated value. Value exceeds calibration range
H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* - Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions: NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 3/17/08

Evergreen Analytical, Inc.

4036 Youngfield Street, Wheat Ridge, Colorado 80033-3862
(303) 425-6021

Client Sample ID: Jolly SW#1
Client Project ID: Jolly 41X-6
Date Collected: 3/12/08 1100
Date Received: 3/12/08

Lab Work Order 08-1633
Lab Sample ID: 08-1633-01
Sample Matrix: Groundwater

CARBONATE AND BICARBONATE

Method: SM2320 B **Prep Method:**

Date Prepared: 3/21/08 **Lab File ID:** 106 **Dilution Factor:** 1
Date Analyzed: 3/21/08 **Method Blank:** MBLK **Lab Fraction ID:** 08-1633-01C

Analytes	CAS Number	Result	LQL	Units
Bicarbonate		144	5.0	mg/L
Carbonate		U	5.0	mg/L

SPECIFIC CONDUCTANCE @ 25°C

Method: SM2510 B **Prep Method:**

Date Prepared: 3/13/08 **Lab File ID:** 11 **Dilution Factor:** 1
Date Analyzed: 3/13/08 **Lab Fraction ID:** 08-1633-01C

Analytes	CAS Number	Result	LQL	Units
Specific Conductance		2710	1.00	µmhos/cm

E150.1 PH

Method: E150.1 **Prep Method:**

Date Prepared: 3/12/08 **Dilution Factor:** 1
Date Analyzed: 3/12/08 1420 **Lab Fraction ID:** 08-1633-01C

Analytes	CAS Number	Result	LQL	Units
pH		8.46	1.00	pH Units

TOTAL DISSOLVED SOLIDS (TDS)

Method: SM 2540C **Prep Method:**

Date Prepared: 3/17/08 **Lab File ID:** 93 **Dilution Factor:** 1
Date Analyzed: 3/17/08 **Method Blank:** MBLK **Lab Fraction ID:** 08-1633-01C

Analytes	CAS Number	Result	LQL	Units
Total Dissolved Solids		2530	10.0	mg/L

Analyst

Approved

Qualifiers:
B - Analyte detected in the associated Method Blank, value not subtracted from result
E - Extrapolated value Value exceeds calibration range
H - Sample analysis exceeded analytical holding time
J - Indicates an estimated value when the compound is detected, but is below the LQL
S - Spike Recovery outside accepted limits
U - Compound analyzed for but not detected
X - See case narrative
* -Value exceeded the Maximum Contamination Level (MCL), TCLP limit, or if compound is undetected, LQL exceeds MCL.

Definitions:
NA - Not Applicable
LQL - Lower Quantitation Limit
Surr - Surrogate

Print Date: 3/24/2008

QUALITY ASSURANCE REPORTS

METHOD BLANKS (MB, MEB)

LABORATORY CONTROL SPIKES (LCS)

MATRIX SPIKES (MS/MSD)*

DUPLICATES (DUP)*

*Only included if requested or if performed on this client's samples.

Evergreen Analytical, Inc.

Date: *21-Mar-08*

Work Order: 08-1633
Client Project ID: Jolly 41X-6

ANALYTICAL QC SUMMARY REPORT

BatchID: 15009

Sample ID: MB-15009	SampType: MBLK	TestCode: 200.7_D	Run ID: ICP-OPTIMA 5300 DV_080320A	Prep Date: 3/19/2008	Units: mg/L
	Batch ID: 15009	TestNo: E200.7, Rev.	FileID: 032008PM	Analysis Date: 3/20/2008	SeqNo: 668730

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	0	0.387									
Iron	0	0.0700									
Magnesium	0	0.150									
Manganese	0	0.00500									
Potassium	0	0.340									
Selenium	0	0.100									
Sodium	0	0.400									

Sample ID: LCS-15009	SampType: LCS	TestCode: 200.7_D	Run ID: ICP-OPTIMA 5300 DV_080320A	Prep Date: 3/19/2008	Units: mg/L
	Batch ID: 15009	TestNo: E200.7, Rev.	FileID: 032008PM	Analysis Date: 3/20/2008	SeqNo: 668731

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	10.01	0.387	10	0	100	74	113	0	0		
Iron	5.091	0.0700	5	0	102	76.6	115	0	0		
Magnesium	10.13	0.150	10	0	101	76.7	114	0	0		
Manganese	1.882	0.00500	2	0	94.1	72.4	109	0	0		
Potassium	9.941	0.340	10	0	99.4	70.9	115	0	0		
Selenium	1.946	0.100	2	0	97.3	69.9	115	0	0		
Sodium	10.23	0.400	10	0	102	80	120	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.
R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Evergreen Analytical, Inc.

Date: *17-Mar-08*

Work Order: 08-1633
Client Project ID: Jolly 41X-6

ANALYTICAL QC SUMMARY REPORT

TestCode: ANIONS_W

Sample ID: METHOD BLANK	SampType: MBLK	TestCode: ANIONS_W	Run ID: IC-DX120_080312A	Prep Date: 3/12/08	Units: mg/L
	Batch ID: R37827	TestNo: E300.0	FileID:	Analysis Date: 3/12/08	SeqNo: 666991

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	U	0.50									
Nitrite-N	U	0.0040									
Bromide	U	0.050									
Nitrate-N	U	0.010									
Sulfate	U	0.50									

Sample ID: LCS Alltech X2 ALLT	SampType: LCS	TestCode: ANIONS_W	Run ID: IC-DX120_080312A	Prep Date: 3/12/08	Units: mg/L
	Batch ID: R37827	TestNo: E300.0	FileID:	Analysis Date: 3/12/08	SeqNo: 666990

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	19.65	1.0	20	0	98.3	90	110	0	0		
Nitrite-N	5.974	0.0080	6.09	0	98.1	90	110	0	0		
Bromide	20.39	0.10	20	0	102	90	110	0	0		
Nitrate-N	4.586	0.020	4.518	0	102	90	110	0	0		
Sulfate	30.51	1.0	30	0	102	90	110	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.
R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Work Order: 08-1633

Client Project ID: Jolly 41X-6

ANALYTICAL QC SUMMARY REPORT

TestCode: CARB/BICARB_W

Sample ID MBLK	SampType: MBLK	TestCode: CARB/BICAR	Run ID: ALK_080321C	Prep Date: 3/21/2008	Units: mg/L
	Batch ID: R37937	TestNo: SM2320 B	FileID: 104	Analysis Date: 3/21/2008	SeqNo: 668912

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bicarbonate	U	5.0									
Carbonate	U	5.0									

Sample ID LCS	SampType: LCS	TestCode: CARB/BICAR	Run ID: ALK_080321C	Prep Date: 3/21/2008	Units: mg/L
	Batch ID: R37937	TestNo: SM2320 B	FileID: 105	Analysis Date: 3/21/2008	SeqNo: 668913

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bicarbonate	98.58	5.0	100	0	98.6	90	110	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.
R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Work Order: 08-1633
Client Project ID: Jolly 41X-6

ANALYTICAL QC SUMMARY REPORT

TestCode: COND_W

Sample ID LCS	SampType: LCS	TestCode: COND_W	Run ID: COND_080313A	Prep Date: 3/13/2008	Units: µmhos/cm
	Batch ID: R37745	TestNo: SM2510 B	FileID: 1	Analysis Date: 3/13/2008	SeqNo: 665730

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	106	1.00	100.3	0	106	90	110	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.
R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Work Order: 08-1633
Client Project ID: Jolly 41X-6

ANALYTICAL QC SUMMARY REPORT

TestCode: PH_DW

Sample ID LCS-R37716	SampType: LCS	TestCode: PH_DW	Run ID: PH_080312C	Prep Date: 3/12/2008	Units: pH Units
	Batch ID: R37716	TestNo: E150.1	FileID:	Analysis Date: 3/12/2008	SeqNo: 665256

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.97	1.00	8	0	99.6	99.3	100.7	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.
R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Work Order: 08-1633
Client Project ID: Jolly 41X-6

ANALYTICAL QC SUMMARY REPORT

TestCode: TDS_W

Sample ID MBLK	SampType: MBLK	TestCode: TDS_W	Run ID: ANALYTICAL BALANCE_080317B	Prep Date: 3/17/2008	Units: mg/L
	Batch ID: R37847	TestNo: SM 2540C	FileID: 79	Analysis Date: 3/17/2008	SeqNo: 667276

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	U	10.0									

Sample ID LCS	SampType: LCS	TestCode: TDS_W	Run ID: ANALYTICAL BALANCE_080317B	Prep Date: 3/17/2008	Units: mg/L
	Batch ID: R37847	TestNo: SM 2540C	FileID: 80	Analysis Date: 3/17/2008	SeqNo: 667277

Analyte	Result	LQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids	407	10.0	400	0	102	90	110	0	0		

Qualifiers:

U - Not detected at or above the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside acceptance limits
E - Extrapolated value, value exceeds calibration range.
R - RPD outside acceptance limits
B - Analyte detected in the associated Method Blank
H - Prep or analytical holding time exceeded
X - See case narrative

Evergreen Analytical Laboratory

March 26, 2008

Brian Dodek
LT Environmental
4600 W 60th Ave
Arvada, CO 80003

Lab Work Order: 08-1633
Client Project ID: Jolly 41X-6

Dear Brian Dodek:

Enclosed are the analytical results for the samples shown in the Laboratory Work Order Summary. The invoice is included with this report or has been mailed to another party as indicated on the chain of custody.

The enclosed data for testing performed at Evergreen Analytical Laboratory (EAL) have been reviewed for quality assurance. A case narrative is included to describe any anomalies associated with the samples or data.

EAL will dispose of all samples one month from the date of this letter. If you want samples returned, please advise us by mail or fax as soon as possible.

A copy of this project report and supporting data will be retained for a period of five years unless we are otherwise advised by you. A document retrieval charge will apply.

Thank you for using the services of Evergreen Analytical. If you have any questions concerning the analytical data, please contact me. Please direct other questions to Client Services.

Sincerely,

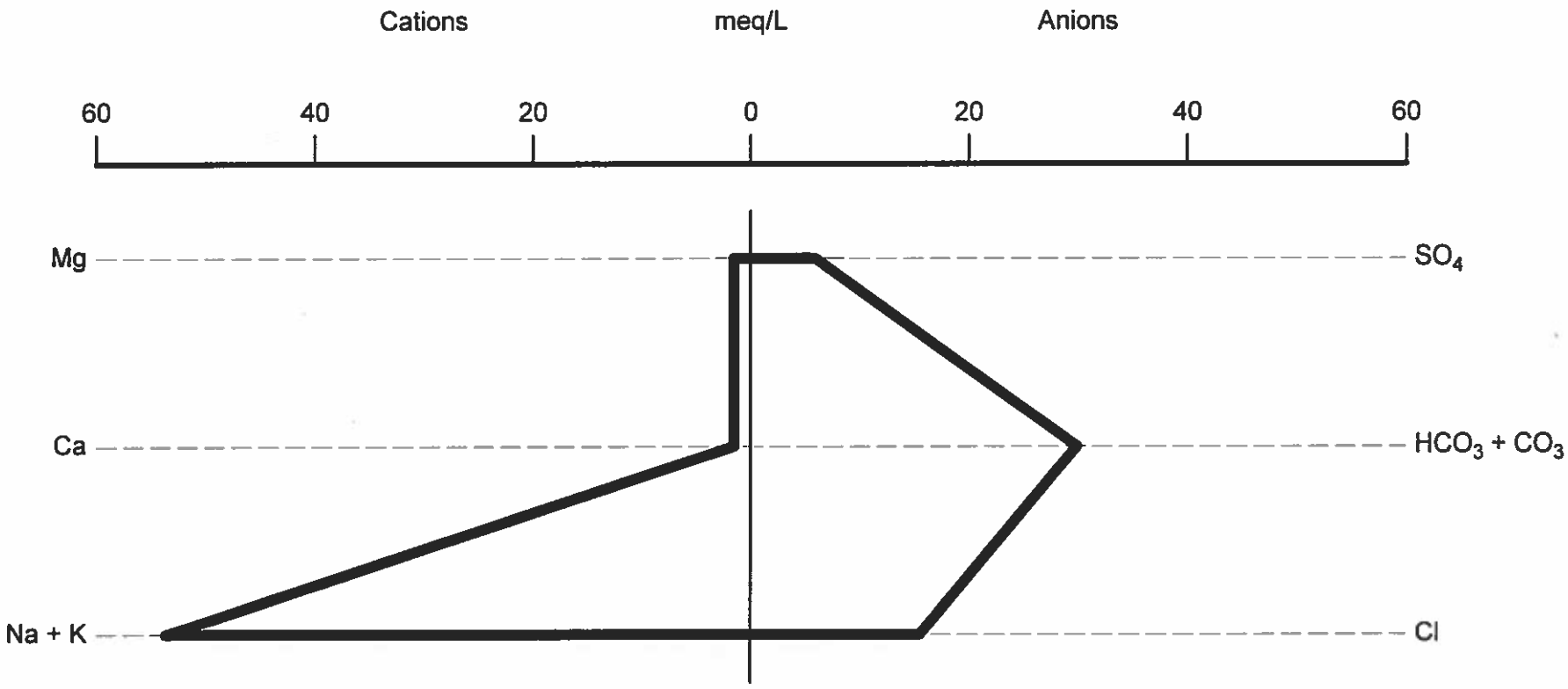
Carl Smits / Kaprie Hollman
Technical Director of Chemical Analysis

ATTACHMENT 2

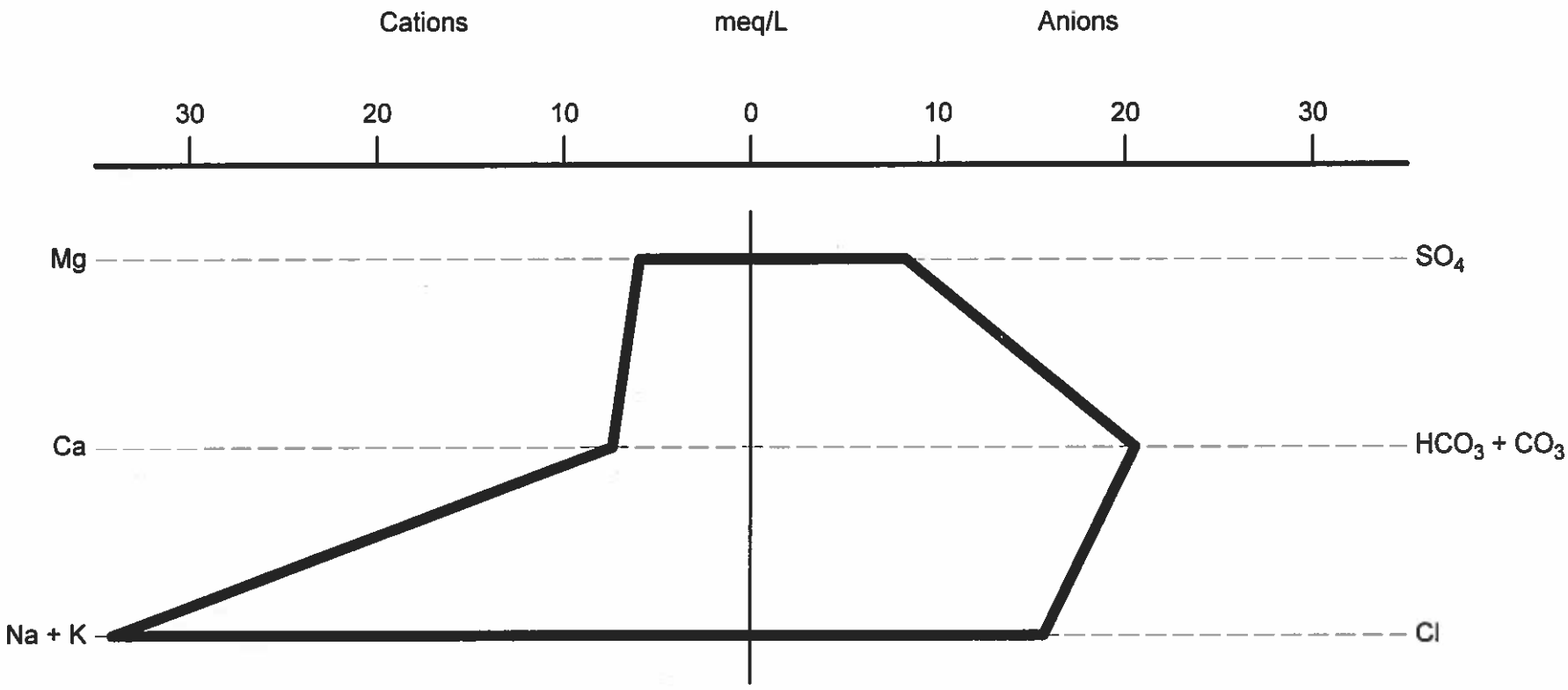
STIFF DIAGRAM PLOTS

Name	Unit	MW-1	MW-2	MW-3	MW-4	MW-5	Jolly SW #1
Sample ID	text	MW-1	MW-2	MW-3	MW-4	MW-5	Jolly SW #1
Date	Date	1/22/2008	1/22/2008	1/22/2008	1/22/2008	1/22/2008	3/12/2008
Calcium	mg/L	30	148	199	230	18.6	230
Magnesium	mg/L	18.9	72.2	98.8	215	20	150
Sodium	mg/L	1230	778	832	1050	1260	270
Potassium	mg/L	5.03	10.8	29.8	34.7	8.49	20
Bicarbonate	mg/L	1900	1390	1020	1370	2020	144
Sulfate	mg/L	284	398	718	1600	272	1480
Chloride	mg/L	549	555	408	606	647	109
Dissolved Solids	mg/L	2560	2920	2000	3730	2670	2530
Conductivity	µmho/cm	4800	3910	3720	5190	3940	2710
pH	pH	7.64	7.25	7.58	7.5	8.16	8.46

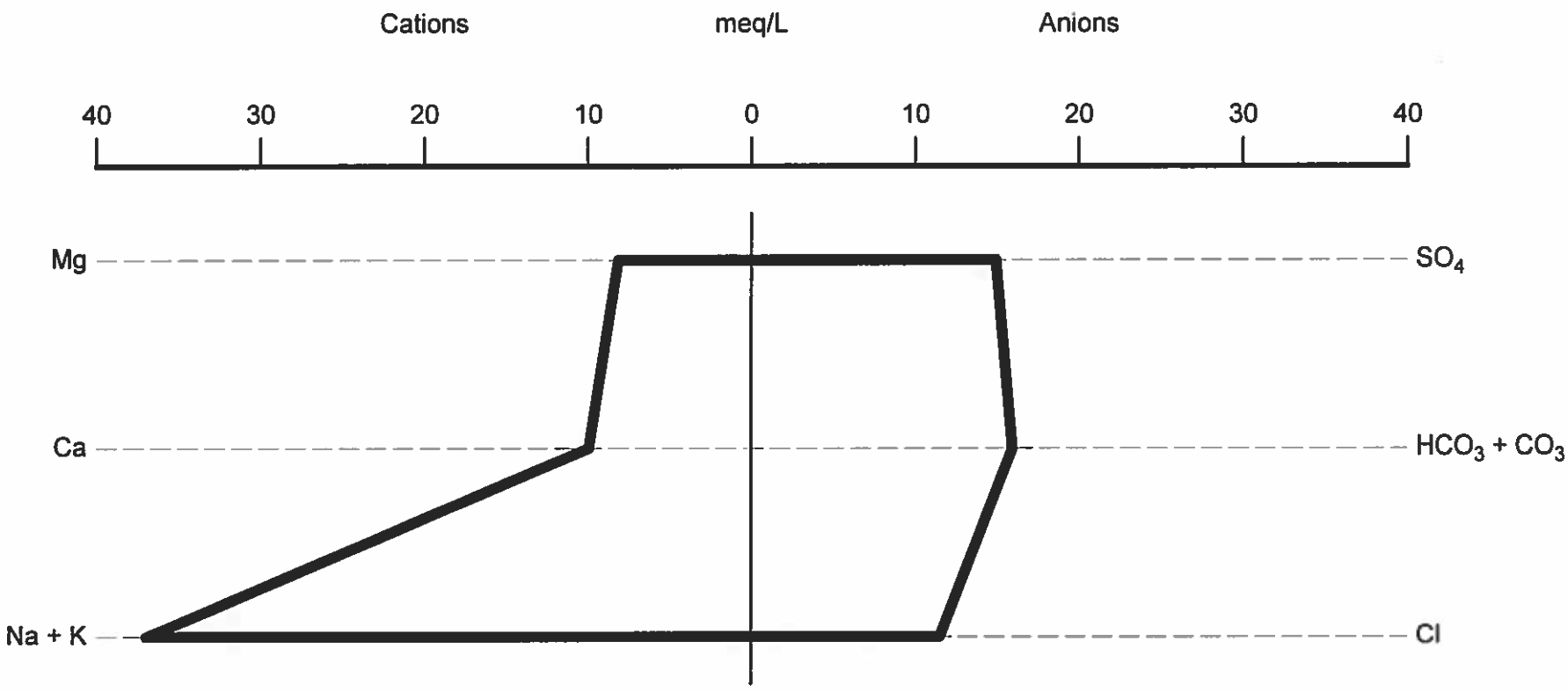
MW-1 Stiff Diagram



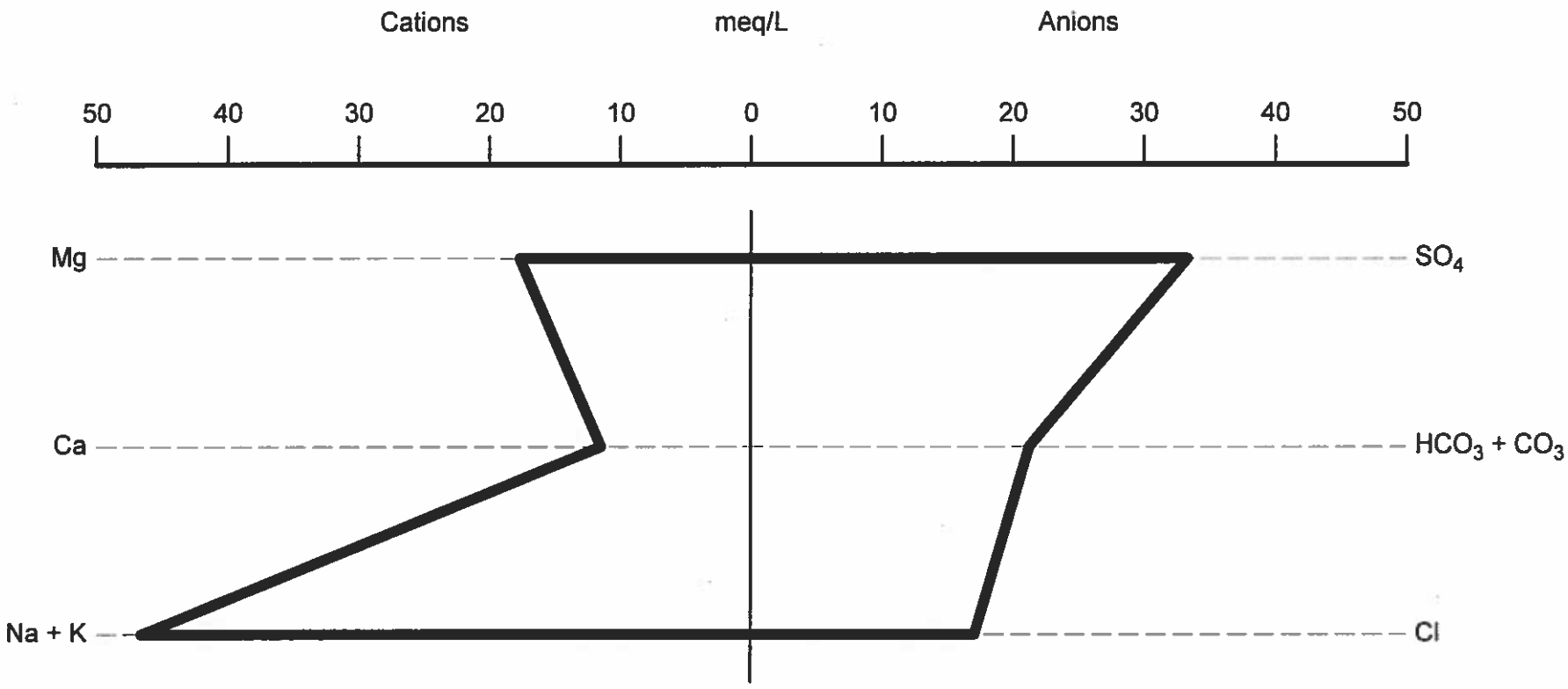
MW-2 Stiff Diagram



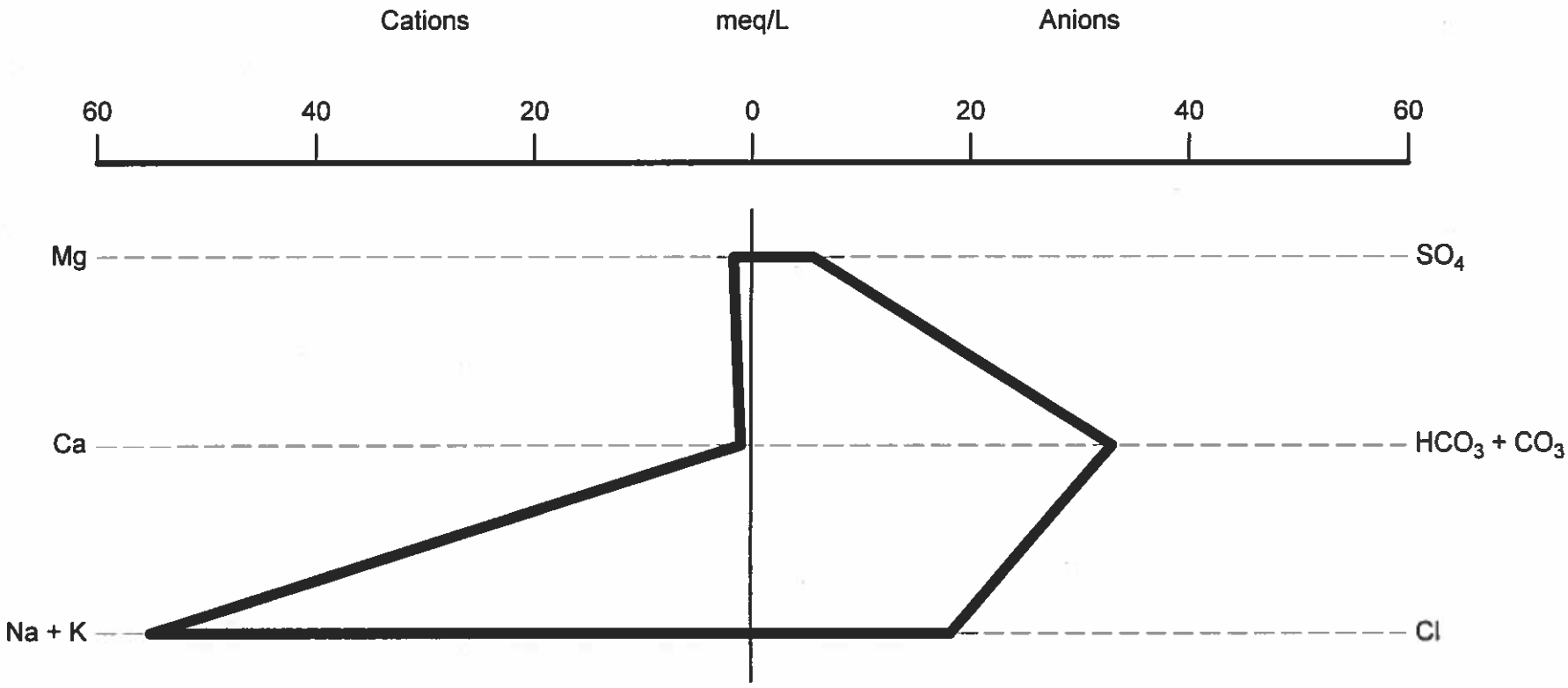
MW-3 Stiff Diagram



MW-4 Stiff Diagram



MW-5 Stiff Diagram



Jolly SW #1 Stiff Diagram