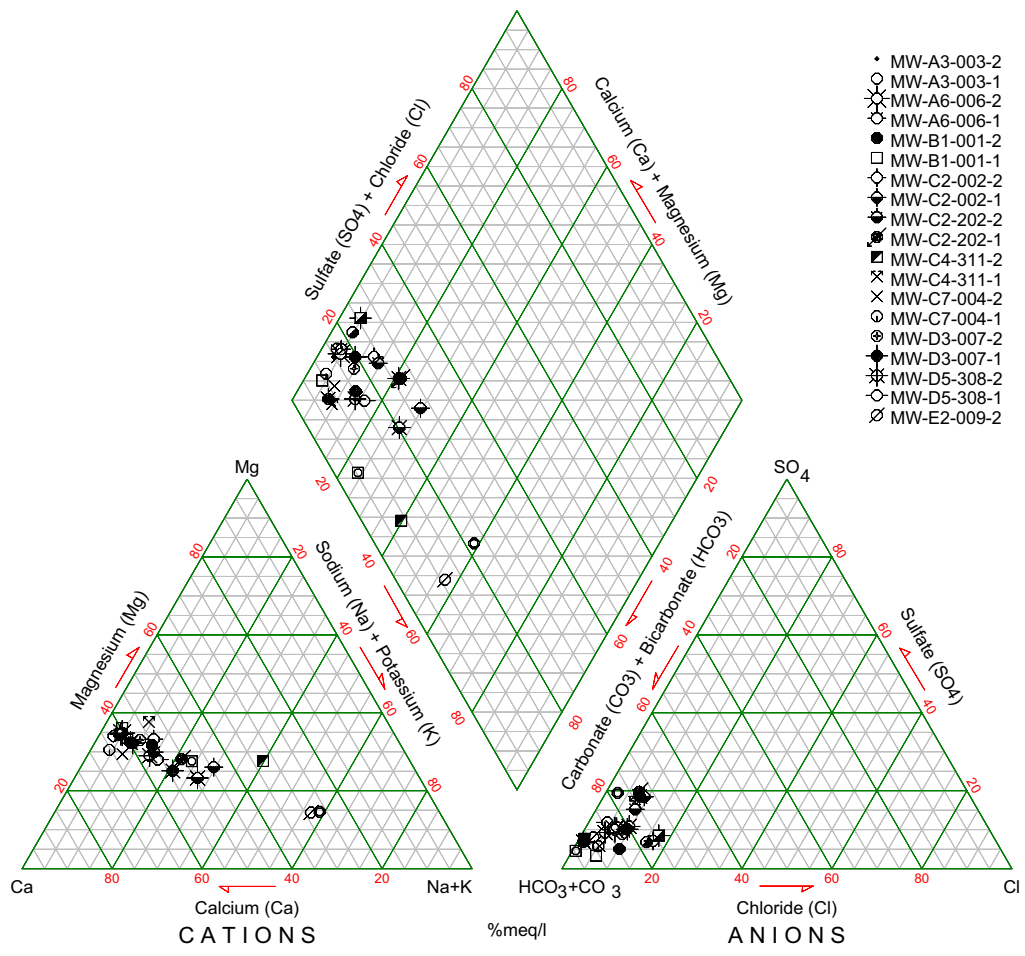


## **Appendix F**

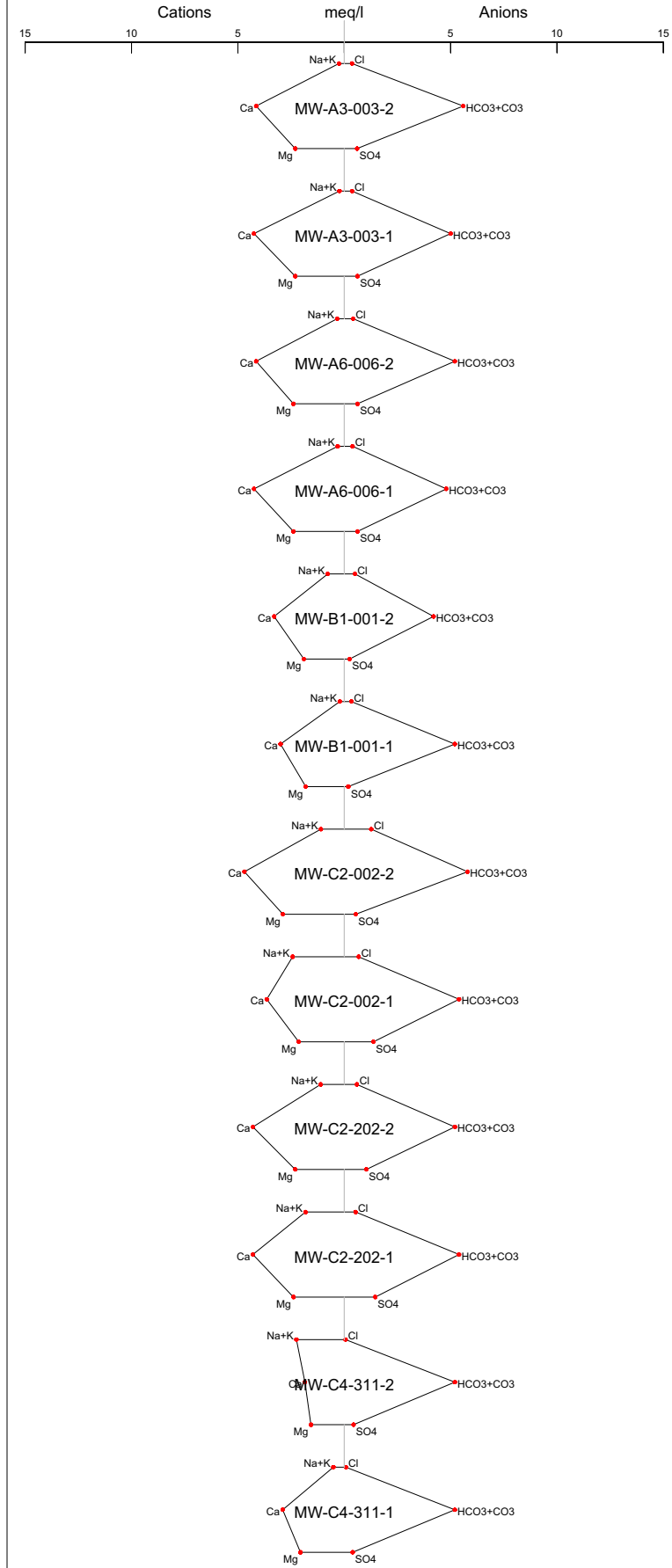
### **Groundwater Stiff and Piper Diagrams**

### Piper Diagram

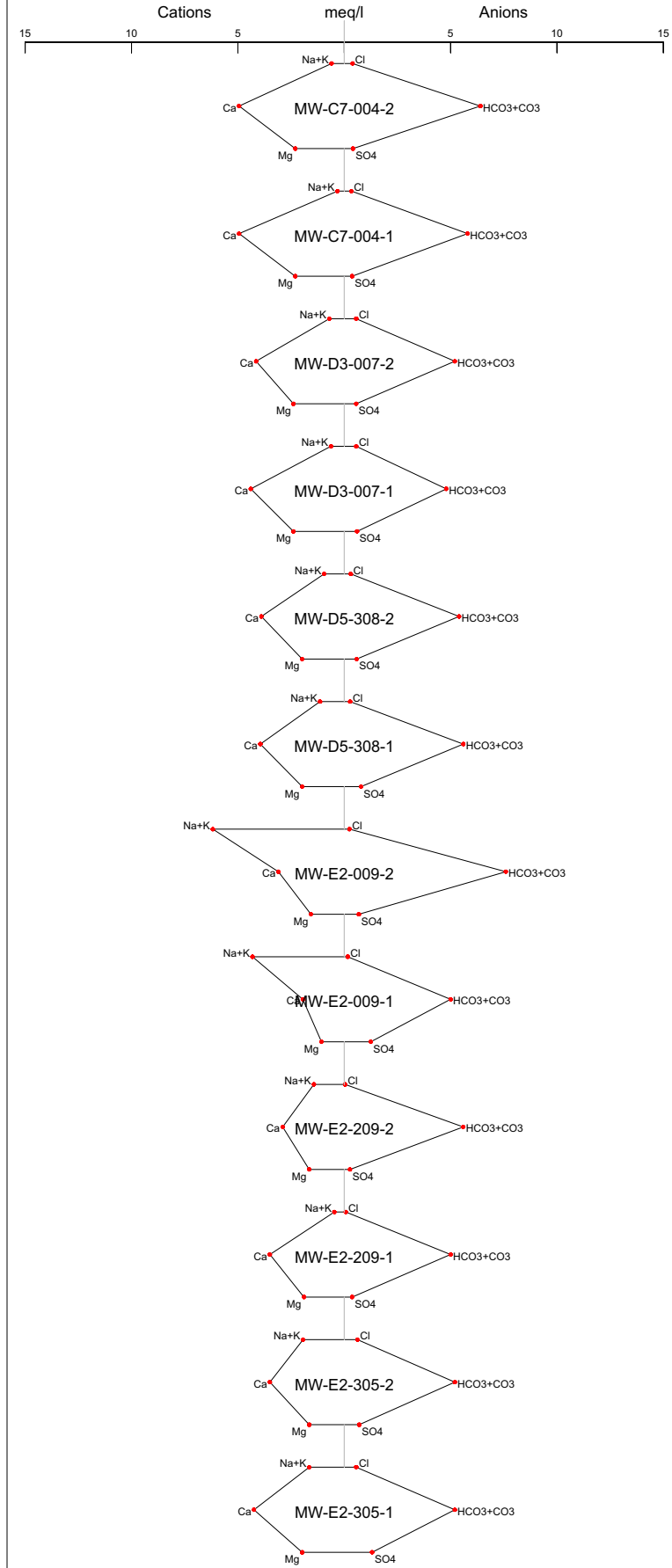


- MW-A3-003-2
- MW-A3-003-1
- ⊗ MW-A6-006-2
- ⊙ MW-A6-006-1
- MW-B1-001-2
- MW-B1-001-1
- ◇ MW-C2-002-2
- ◊ MW-C2-002-1
- ⊕ MW-C2-202-2
- ⊖ MW-C2-202-1
- ⊠ MW-C4-311-2
- ⊞ MW-C4-311-1
- ⊗ MW-C7-004-2
- ⊙ MW-C7-004-1
- ⊕ MW-D3-007-2
- ⊖ MW-D3-007-1
- ⊠ MW-D5-308-2
- ⊞ MW-D5-308-1
- ⊗ MW-E2-009-2
- ⊙ MW-E2-009-1
- ⊕ MW-E2-209-2
- ⊖ MW-E2-209-1
- ⊠ MW-E2-305-2
- ⊞ MW-E2-305-1
- ⊗ MW-E4-010-2
- ⊙ MW-E4-010-1

# Stiff Diagram



# Stiff Diagram



# Stiff Diagram

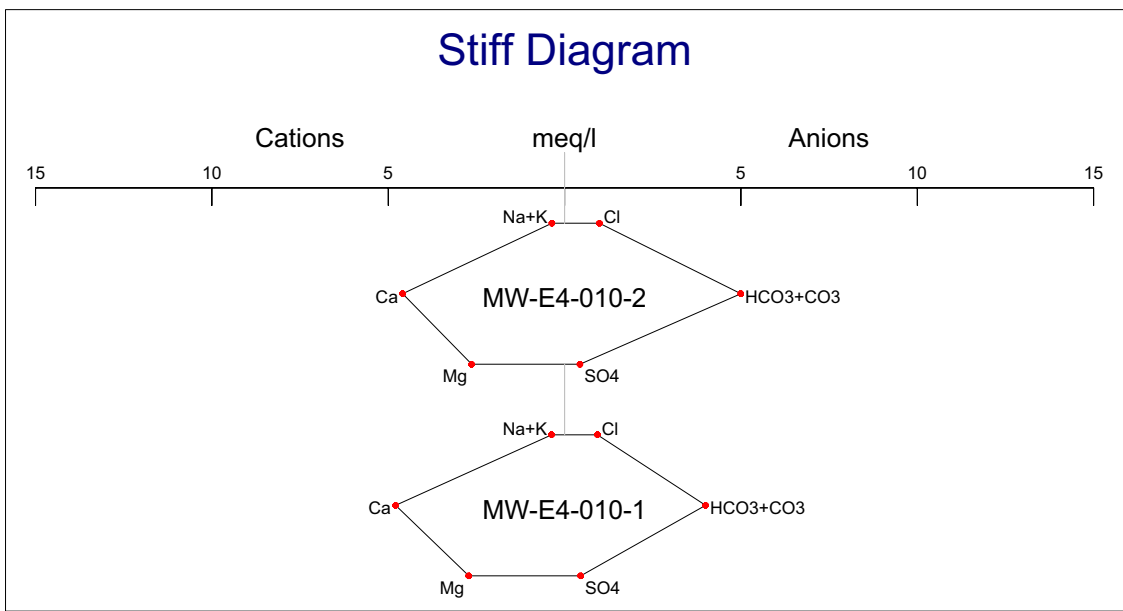


Table F-1  
Alkalinity Conversion to Bicarbonate  
Groundwater Assessment Report  
UMore Mining Area  
Dakota County, Minnesota

Well ID (Event 1)	Sample Date	pH S.U.	Alkalinity, Bicarbonate (as CaCO3) (mg/l)	Calculated Bicarbonate <sup>1</sup> (mg/l)
MW-A3-003	2/12/2009	7.28	250	304.80
MW-A6-006	2/10/2009	7.27	240	292.61
MW-B1-001	2/13/2009	7.35	260	316.99
MW-C2-002	2/9/2009	6.94	270	329.18
MW-C2-202	2/12/2009	7.61	270	329.18
MW-C4-311	2/12/2009	7.20	260	316.99
MW-C7-004	2/13/2009	7.12	290	353.57
MW-C7-004 Dup	2/13/2009	--	260	316.99
MW-D3-007	2/12/2009	7.09	240	292.61
MW-D5-308	2/13/2009	7.24	280	341.38
MW-E2-009	2/10/2009	7.27	250	304.80
MW-E2-209	2/10/2009	7.28	250	304.80
MW-E2-305	2/10/2009	7.01	260	316.99
MW-E4-010	2/12/2009	7.06	200	243.84

Well ID (Event 1)	Sample Date	pH S.U.	Alkalinity, Bicarbonate (as CaCO3) (mg/l)	Calculated Bicarbonate <sup>1</sup> (mg/l)
MW-A3-003	4/14/2009	7.43	280	341.38
MW-A6-006	4/15/2009	7.42	260	316.99
MW-B1-001	4/10/2009	7.70	210	256.03
MW-C2-002	4/10/2009	7.32	290	353.57
MW-C2-202	4/10/2009	7.51	260	316.99
MW-C4-311	4/15/2009	7.55	260	316.99
MW-C7-004	4/15/2009	7.21	320	390.14
MW-C7-004 Dup	4/15/2009	--	310	377.95
MW-D3-007	4/14/2009	7.29	260	316.99
MW-D5-308	4/14/2009	7.43	270	329.18
MW-E2-009	4/13/2009	6.87	380	463.30
MW-E2-209	4/13/2009	6.83	280	341.38
MW-E2-305	4/13/2009	6.51	260	316.99
MW-E4-010	4/13/2009	6.70	250	304.80

<sup>1</sup> Bicarbonate (HCO<sub>3</sub>) values above are calculated by dividing the reported bicarbonate concentration (as CaCO<sub>3</sub>) by the equivalent weight of CaCO<sub>3</sub> (50.044) and then multiply by the equivalent weight of HCO<sub>3</sub> (61.016) (Hounslow, 1995). (HCO<sub>3</sub><sup>-</sup>) = (CaCO<sub>3</sub> / Eq. Wt. of CaCO<sub>3</sub>) \* (Eq. Wt. of HCO<sub>3</sub><sup>-</sup>)