APPENDIX E

Field Sampling Report

North Jackson Company
Field Sampling Report

Project Name: Eagle BES

Contact: North Jackson Company
1004 Harbor Hills Drive, Suite 102
Marquette, Michigan 49855
Phone (906) 225-6787

Summary of Sampling Activities

Sampling Date(s): 8/16/05, 8/17/05, 8/24/05

Activities: Collected groundwater samples at QAL004A/D, QAL005A/D, QAL006A/B, QAL008A/D, QAL009A/D and QAL031D.

Collected duplicate, field blank and equipment blank samples.

Measured water elevations on 8/30/05.

Field Report Attachments

Field Analytical Data Summary	yes
Flow Measurement	no
Water Sampling Log	11
Chain of Custody Numbers	109296, 109297, 109298, 0016, 17426B

Laboratory Analysis

Brooks Rand - Mercury
TriMatrix - Metals, major cations & anions, general chemistry

Sampler Name(s): Richard Eagle (RRE) and Andy Maracini (AJM)

North Jackson Company
Groundwater Field Data Summary

Project Name: Eagle BES

Location	Sample ID	KEX ID	Sampling Date	Temp (°C)	Spec Cond (µmhos/cm @ 25°C)	pH (SU)	DO (ppm)	Ferrous Iron (mg/L)
QAL004A	QALM004A	EAG-1001464	8/17/05	7.3	78	8.5	4	<0.1
QAL004D	QALM004D	EAG-1001465	8/17/05	7.5	157	8.4	<0.05	0.2
QAL005A	QALM005A	EAG-1001466	8/17/05	7.4	17	5.5	3	0.3
QAL005D	QALM005D	EAG-1001467	8/17/05	7.9	101	7.7	0.7	1.0
QAL006A	QALM006A	EAG-1001468	8/17/05	8.4	16	4.4	3	<1.0
QAL006B	QALM006B	EAG-1001469	8/17/05	8.4	176	6.9	<0.05	15
QAL008A	QALM008A	EAG-1001470	8/24/05	7.8	62	9.1	NM	<0.1
QAL008D	QALM008D	EAG-1001471	8/24/05	8.5	100	8.6	NM	<0.01
QAL009A	QALM009A	EAG-1001472	8/24/05	8.7	70	8.8	NM	<0.1
QAL009D	QALM009D	EAG-1001473	8/16/05	8.5	136	8.5	0.2	<0.1
QAL031D	QALM031D	EAG-1001474	8/24/05	7.8	87	8.9	NM	<0.1

NM Not measured

North Jackson Company
Water Level Summary

Project Name: Eagle BES

Location	Date	Measuring Point Elevation (ft MSL)	Depth to Water	Total Depth (ft)	Water Elevation (ft MSL)
WLD001	8/30/05	1430.41	2.15	8	1428.26
WLD002	8/30/05	1433.12	2.86	8	1430.26
WLD003	8/30/05	1435.66	3.21	8	1432.45
WLD004	8/30/05	1448.91	3.89	8	1445.02
WLD005	8/30/05	1453.50	3.84	8	1449.66
WLD006	8/30/05	1459.29	5.97	8	1453.32
WLD007	8/30/05	1453.70	4.94	8	1448.76
WLD008	8/30/05	1456.60	4.54	8	1452.06
WLD009	8/30/05	1460.17	4.98	8	1455.19
WLD010	8/30/05	1450.90	5.76	8	1445.14
WLD011	8/30/05	1449.51	5.22	8	1444.29
WLD012	8/30/05	1448.60	4.25	8	1444.35
WLD013	8/30/05	1447.81	5.35	8	1442.46
WLD014	8/30/05	1443.47	3.29	8	1440.18
WLD015	8/30/05	1431.28	3.14	8	1428.14
WLD016	8/30/05	1432.34	4.71	8	1427.63
WLD017	8/30/05	1427.70	5.94	8	1421.76
WLD018	8/30/05	1427.34	6.17	8	1421.17
WLD019	8/30/05	1424.93	6.56	8	1418.37
WLD020	8/30/05	1424.13	6.79	8	1417.34
WLD021	8/30/05	1420.58	6.33	8	1414.25
WLD022	8/30/05	1425.66	3.08	8	1422.58
WLD023	8/30/05	1416.42	3.26	8	1413.16
QAL001A	8/30/05	1462.92	50.95	68	1411.97
QAL001D	8/30/05	1462.81	55.92	88	1406.89
QAL002A	8/30/05	1479.54	45.43	63	1434.11
QAL002D	8/30/05	1479.21	83.76	143	1395.45
QAL003A	8/30/05	1436.95	11.58	33	1425.37
QAL003B	8/30/05	1436.48	24.27	50	1412.21
QAL004A	8/30/05	1451.09	25.90	58	1425.19
QAL004D	8/30/05	1450.94	17.89	148	1433.05
QAL005A	8/30/05	1459.74	7.18	28	1452.56
QAL005D	8/30/05	1459.59	8.07	130	1451.52
QAL006A	8/30/05	1423.92	10.10	28	1413.82
QAL006B	8/30/05	1424.33	24.64	83	1399.69
QAL007A	8/30/05	1479.34	49.95	59	1429.39
QAL007D	8/30/05	1479.45	41.71	183	1437.74
QAL008A	8/30/05	1468.19	78.80	93	1389.39
QAL008D	8/30/05	1467.92	114.00	123	1353.92

North Jackson Company
Water Level Summary

Project Name: Eagle BES

Location	Date	Measuring Point Elevation (ft MSL)	Depth to Water	Total Depth (ft)	Water Elevation (ft MSL)
QAL009A	8/30/05	1457.41	102.98	113	1354.43
QAL009D	8/30/05	1457.35	102.90	148	1354.45
QAL010A	8/30/05	1444.55	20.63	51	1423.92
QAL015	8/30/05	1296.09	3.60	7	1292.49
QAL016	8/30/05	1275.73	1.41	7	1274.32
QAL017	8/30/05	1255.39	5.00	7	1250.39
QAL018	8/30/05	1253.47	4.34	11	1249.13
QAL019	8/30/05	1288.68	3.50	7	1285.18
QAL020	8/30/05	1338.70	3.38	7	1335.32
QAL021	8/30/05	1392.19	2.98	7	1389.21
QAL022	8/30/05	1300.95	2.61	7	1298.34
QAL023B	8/30/05	1421.39	3.43	35	1417.96
QAL024A	8/30/05	1456.867	37.30	48	1419.57
QAL025A	8/30/05	1454.275	35.03	48	1419.24
QAL026A	8/30/05	1460.837	42.16	47	1418.68
QAL027A	8/30/05	1461.355	45.31	51	1416.05
QAL028A	8/30/05	1463.865	58.81	66	1405.05
QAL029A	8/30/05	1460.095	40.89	50	1419.21
QAL029D	8/30/05	1460.351	51.38	77	1408.97
QAL031D	8/30/05	1467.293	95.90	113	1371.39
QAL041D	8/30/05	1465.472	100.08	108	1365.39
QAL043B	8/30/05	1423.934	6.06	37	1417.87
QAL044B	8/30/05	1430.614	12.75	43	1417.86
YDRM002	8/30/05	1415.12	3.14	NA	1411.98
STRM002	8/30/05	1400.09	0.27	NA	1400.36

NA Not applicable

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Partly cloudy, ~70's F
Location: QAL004A
Sample ID: QALM004A
KEX ID: EAG-1001464

Date: 8/17/05
Sampler(s): AJM/RRE
Sampling time: 1420

Odor: None
Appearance: Silty

Temperature (°C): 7.3
Spec. Cond. (µmhos/cm @ 25°C): 78
Conductivity (µmhos): 51
pH (SU): 8.5
D.O. (ppm): 4
Ferrous Iron (mg/L): <0.1

Description of measuring point: Mark on PVC riser

Total depth: 58 ft
Approx. Depth to water: 26 ft
Water column in well: 32 ft
Volume/foot: 0.16 gal/ft
Well volume: 5 gal

Well diameter (in): 2

Gallons purged prior to sampling: ~53

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: None
Remarks: Pump rate ~1.25 gpm. Well condition excellent

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
1335	7.5	78	8.5	0
1347	7.3	78	8.5	15
1402	7.4	78	8.5	34
1417	7.3	78	8.5	53

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Partly cloudy, ~70's F
Location: QAL004D
Sample ID: QALM004D
KEX ID: EAG-1001465

Date: 8/17/05
Sampler(s): AJM/RRE
Sampling time: 1220

Odor: None
Appearance: Clear

Temperature (°C): 7.5
Spec. Cond. (µmhos/cm @ 25°C): 157
Conductivity (µmhos): 105
pH (SU): 8.4
D.O. (ppm): <0.05
Ferrous Iron (mg/L): 0.2

Description of measuring point: Mark on PVC riser

Total depth: 148 ft
Approx. Depth to water: 17 ft
Water column in well: 131 ft
Volume/foot: 0.26 gal/ft
Well volume: 33 gal

Well diameter (in): 2.5

Gallons purged prior to sampling: ~102

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: None
Remarks: Pump rate ~1.7 gpm. Well condition excellent

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
1120	7.5	157	8.4	0
1140	7.5	157	8.4	34
1200	7.6	157	8.4	68
1220	7.5	157	8.4	102

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Cloudy, light rain, ~70°s F
Location: QAL005A
Sample ID: QALM005A
KEX ID: EAG-1001466

Date: 8/17/05
Sampler(s): AJM/RRE
Sampling time: 1520

Odor: Slightly swampy
Appearance: Clear

Temperature (°C): 7.4
Spec. Cond. (µmhos/cm @ 25°C): 17
Conductivity (µmhos): 11
pH (SU): 5.5
D.O. (ppm): 3
Ferrous Iron (mg/L): 0.3

Description of measuring point: Mark on PVC riser

Total depth: 28 ft
Approx. Depth to water: 6 ft 4.731
Water column in well: 22 ft
Volume/foot: 0.16 gal/ft
Well volume: 4 gal

Well diameter (in): 2

Gallons purged prior to sampling: ~63

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: None
Remarks: Pump rate ~2.5 gpm Well condition excellent

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
1505	7.4	18	5.4	25
1510	7.5	17	5.5	38
1515	7.4	17	5.5	50
1520	7.4	17	5.5	63

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Cloudy, light rain, ~70°s F
Location: QAL005D
Sample ID: QALM005D
KEX ID: EAG-1001467

Date: 8/17/05
Sampler(s): AJM/RRE
Sampling time: 1600

Odor: Slightly swampy
Appearance: Clear

Temperature (°C): 7.9
Spec. Cond. (µmhos/cm @ 25°C): 101
Conductivity (µmhos): 68
pH (SU): 7.7
D.O. (ppm): 0.7
Ferrous Iron (mg/L): 1.0

Description of measuring point: Mark on PVC riser

Total depth: 130 ft
Approx. Depth to water: 6 ft
Water column in well: 124 ft
Volume/foot: 0.26 gal/ft
Well volume: 32 gal

Well diameter (in): 2.5

Gallons purged prior to sampling: ~65

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: None
Remarks: Pump rate ~1 gpm. Well condition excellent.

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
1455	7.9	103	7.7	0
1535	7.8	97	7.6	40
1555	7.9	101	7.7	60
1600	7.9	101	7.7	65

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Partly cloudy. ~70°s F
Location: QAL006A
Sample ID: QALM006A
KEX ID: EAG-1001468

Date: 8/17/05
Sampler(s): RRE
Sampling time: 1007

Odor: None
Appearance: Clear

Temperature (°C): 8.4
Spec. Cond. (µmhos/cm @ 25°C): 16
Conductivity (µmhos): 11
pH (SU): 4.4
D.O. (ppm): 3
Ferrous Iron (mg/L): <1.0

Description of measuring point: Mark on PVC riser

Total depth: 28 ft
Approx. Depth to water: 10 ft
Water column in well: 18 ft
Volume/foot: 0.16 gal/ft
Well volume: 3 gal

Well diameter (in): 2

Gallons purged prior to sampling: ~100

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: None
Remarks: Pump rate ~2 gpm. Well condition excellent

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
0937	8.4	16	4.2	40
0947	8.4	16	4.3	60
0957	8.4	16	4.4	80
1007	8.4	16	4.4	100

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Partly cloudy, ~70°s F
Location: QAL006B
Sample ID: QALM006B
KEX ID: EAG-1001469

Date: 8/17/05
Sampler(s): RRE
Sampling time: 1030

Odor: Slight hydrogen sulfide
Appearance: Yellow cast

Temperature (°C): 8.4
Spec. Cond. (µmhos/cm @ 25°C): 176
Conductivity (µmhos): 120
pH (SU): 6.9
D.O. (ppm): <0.05
Ferrous Iron (mg/L): 15

Description of measuring point: Mark on PVC riser

Total depth: 83 ft
Approx. Depth to water: 24 ft
Water column in well: 59 ft
Volume/foot: 0.26 gal/ft
Well volume: 15 gal

Well diameter (in): 2.5

Gallons purged prior to sampling: ~91

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: None
Remarks: Pump rate ~1.2 gpm. Well condition excellent.

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
0945	8.2	174	6.9	43
1005	8.3	174	6.9	67
1015	8.4	175	6.9	79
1025	8.4	176	6.9	91

North Jackson Company
Groundwater Sampling Log

Proj. Name: Eagle BES
Weather: Sunny, ~60°s F
Location: QAL008A
Sample ID: QALM008A
KEX ID: EAG-1001470

Date: 8/24/05
Sampler(s): AJM/RRE
Sampling time: 1228

Odor: None
Appearance: Clear

Temperature (°C): 7.8
Spec. Cond. (µmhos/cm @ 25°C): 62
Conductivity (µmhos): 42
pH (SU): 9.1
D.O. (ppm): NM
Ferrous Iron (mg/L): <0.1

Description of measuring point: Mark on PVC riser

Total depth: 93 ft
Approx. Depth to water: 78 ft
Water column in well: 15 ft
Volume/foot: 0.16 gal/ft
Well volume: 2 gal

Well diameter (in): 2

Gallons purged prior to sampling: ~36

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: Yes
Remarks: Pump rate ~2 gpm. Well condition excellent.

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
1219	9.2	62	7.7	18
1222	9.1	62	7.8	24
1225	9.1	62	7.8	30
1228	9.1	62	7.8	36

North Jackson Company
Groundwater Sampling Log

Proj. Name:	Eagle BES	**Date:**	8/24/05
Weather:	Sunny, ~70's F	**Sampler(s):**	AJM/RRE
Location:	QAL008D	**Sampling time:**	1150
Sample ID:	QALM008D		
KEX ID:	EAG-1001471		

Odor:	None	Temperature (°C):	8.5
Appearance:	Slight turbidity	Spec. Cond. (µmhos/cm @ 25°C):	100
		Conductivity (µmhos):	69
		pH (SU):	8.6
		D.O. (ppm):	NM
		Ferrous Iron (mg/L):	<0.01

Description of measuring point: Mark on PVC riser

Total depth:	123	ft	Well diameter (in):	2.5
Approx. Depth to water:	114	ft		
Water column in well:	9	ft	Gallons purged	
Volume/foot:	0.26	gal/ft	prior to sampling:	~36
Well volume:	2	gal		

Evacuation method: Dedicated submersible pump with dedicated tubing

Tag	# Collected	Bottle	Preservative	Parameter
Green	1	1000 ml plastic	Ice	Various
Red stripe	1	500 ml plastic	HNO3	Filtered metals
None	1	250 ml Teflon	None	Filtered Hg
Green	1	500 ml amber glass	NaOH/ZnAC	Sulfide
Dark blue	1	500 ml plastic	H2SO4	Nutrients

Photographs: Yes

Remarks: Pump rate ~1.2 gpm. Well condition excellent

Stabilization Record:

Time	Temp (°C)	Spec. Cond. (µmhos/cm @ 25°C)	pH (SU)	Volume Removed (gal)
1135	8.6	100	8.5	18
1140	8.7	100	8.5	24
1145	8.5	100	8.5	30
1150	8.5	100	8.6	36