



WHITNEY & ASSOCIATES

INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

BORING NO. B-01
DATE 05-15-12
W. & A. FILE NO. 5977
SHEET 1 **OF** 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION **LOCATION** Middleton, Iowa
BORING LOCATION See Plot Plan Sheet **DRILLED BY** Fehl
BORING TYPE Hollow Stem Auger **WEATHER CONDITIONS** Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC **SEEPAGE WATER ENCOUNTERED AT ELEVATION** (-)14.5 Ft.
GROUND SURFACE ELEVATION 0.0 **GROUND WATER ELEVATION AT** 24+ **HRS.** (-) 5.6 Ft.
BORING DISCONTINUED AT ELEVATION (-)41.0 Ft. **GROUND WATER ELEVATION AT COMPLETION** (-)11.9 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
Dark Brown SILTY CLAY Organic Topsoil	19'						
Very Stiff, Gray Mottled Brown And Black LEAN CLAY - CL (Silty Clay) - Probable Fill)	04	SS	3	2.4	2.2	97	23
			3				
			4(7)				
Soft, Gray And Orange-Brown Mottled Dark Brown LEAN CLAY - CL (Silty Clay)	08	SS	2	0.5	0.4	92	27
			2				
			2(4)				
Medium, Gray And Orange-Brown LEAN CLAY - CL (Silty Clay)	12	SS	2	0.9	0.8	-	26
			2				
			2(4)				
Stiff, Dark Gray And Gray-Brown FAT CLAY - CH (Clay)	16	SS	2	1.7	1.6	-	26
			4				
			4(8)				
Medium, Gray SANDY LEAN CLAY - CL (Clay Loam)	20	SS	2	1.5	1.3	-	27
			3				
			3(6)				
Stiff, Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	24	SS	2	0.8	0.5	-	26
			2				
			3(5)				
Very Stiff, Gray FAT CLAY - CH (Glacial Till)		SS	5	1.7	1.6	-	19
			6				
			8(14)				
		SS	7	4.0	3.6	-	20
			8				
			10(18)				

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %

BORING LOG

(CONTINUATION)

BORING NO. B-01

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 2 **OF** 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 1 of 19							
Very Stiff, Gray And Light Brown FAT CLAY WITH SAND - CL (Glacial Till)	30	SS	5 6 9(15)	2.5	2.2	-	21
Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	34	SS	6 6 9(15)	1.7	1.5	-	17
	38	SS	6 8 6(14)	2.1	1.9	-	16
EXPLORATORY BORING DISCONTINUED	42						
	46						
	50						
	54						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
 SS - SPLIT SPOON SAMPLE
 ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
 Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
 D_d - NATURAL DRY DENSITY - P.C.F.
 M_c - NATURAL MOISTURE CONTENT - %



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2406 West Nebraska Avenue
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BORING LOG

BORING NO. B-02
DATE 05-15-12
W. & A. FILE NO. 5977
SHEET 3 **OF** 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION **LOCATION** Middleton, Iowa
BORING LOCATION See Plot Plan Sheet **DRILLED BY** Fehl
BORING TYPE Hollow Stem Auger **WEATHER CONDITIONS** Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC **SEEPAGE WATER ENCOUNTERED AT ELEVATION** (-)12.3 Ft.
GROUND SURFACE ELEVATION 0.0 **GROUND WATER ELEVATION AT** 24+ **HRS.** (-) 4.5 Ft.
BORING DISCONTINUED AT ELEVATION (-)81.0 Ft. **GROUND WATER ELEVATION AT COMPLETION** (-)18.6 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Dark Brown SILTY CLAY Organic Topsoil	24"						
Stiff, Dark Brown FAT CLAY - CH (Clay) Possible Fill)	04	SS	2	2.2	2.0	92	28
			3 5(8)				
Medium, Gray And Light Brown LEAN CLAY - CL (Silty Clay)	08	SS	2 2 2(4)	0.6	0.5	91	28
Stiff, Gray And Light Brown LEAN CLAY - CL (Silty Clay)	12	SS	2 3 2(5)	1.5	1.4	95	25
Stiff, Black FAT CLAY - CH (Clay)	16	SS	2 3 3(6)	1.8	1.8	94	26
Stiff, Gray And Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	20	SS	3 4(7)	1.5	1.4	114	20
			2				
Very Stiff, Dark Gray FAT CLAY WITH SAND - CH (Glacial Till)	24	SS	3 4(7)	1.3	1.2	113	21
			2				
			4 6 8(14)	3.5	3.2	113	19

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER
FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

BORING NO. B-02

(CONTINUATION)

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 4 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 3 of 19							
Very Stiff, Gray And Light Brown FAT CLAY WITH SAND - CH (Glacial Till)	30	SS	5 6 8(14)	2.4	2.1	112	20
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	34	SS	4 6 8(14)	2.4	2.1	117	16
	38						
	42	SS	6 8 9(17)	2.4	2.2	117	16
	46	SS	6 9 12(21)	2.8	2.4	118	15
	50	SS	8 10 11(21)	2.8	2.5	118	15
Very Stiff, Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	54	SS	7 11 13(24)	2.9	2.6	118	15

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.

Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.

D_d - NATURAL DRY DENSITY - P.C.F.

M_c - NATURAL MOISTURE CONTENT - %

BORING LOG

(CONTINUATION)

BORING NO. B-02

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 5 **OF** 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 4 of 19							
Stiff, Light Brown And Gray LEAN CLAY WITH SAND - CL (Glacial Till)	60	SS	6 7 9(16)	1.8	1.7	115	17
	64		7 8 9(17)	2.2	1.9	116	16
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	68	SS	8 10 12(22)	2.7	2.4	117	15
	72		14 19 17(36)	3.5	2.8	117	15
Very Stiff, Light Brown SANDY LEAN CLAY - CL (Glacial Till)	76	SS	10 21 23(44)	4.5+	4.1	119	14
	80						
EXPLORATORY BORING DISCONTINUED	84						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %



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BORING LOG

BORING NO. B-03
DATE 05-16-12
W. & A. FILE NO. 5977
SHEET 6 **OF** 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION **LOCATION** Middleton, Iowa

BORING LOCATION See Plot Plan Sheet **DRILLED BY** Fehl

BORING TYPE Hollow Stem Auger **WEATHER CONDITIONS** Partly Cloudy & Mild

SOIL CLASSIFICATION SYSTEM USCS / USBSC **SEEPAGE WATER ENCOUNTERED AT ELEVATION** (-)20.0 Ft.

GROUND SURFACE ELEVATION 0.0 **GROUND WATER ELEVATION AT** - **HRS.** -

BORING DISCONTINUED AT ELEVATION (-)41.0 Ft. **GROUND WATER ELEVATION AT COMPLETION** (-)14.4 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Dark Brown SILTY CLAY Organic Topsoil	24"						
Stiff, Light Brown, Orange-Brown And Gray-Brown LEAN CLAY - CL (Silty Clay)	04	SS	2	1.9	1.8	94	26
			3				
			4(7)				
Stiff, Gray, Orange-Brown And Light Brown LEAN CLAY - CL (Silty Clay)	08	SS	2	1.7	1.5	94	26
			2				
			3(5)				
	12	ST	2	1.6	1.4	93	27
			3				
			3(6)				
	16	SS	2	0.5	0.4	94	27
			2				
			3(5)				
Stiff, Light Brown And Orange-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	20	SS	2	1.5	1.3	114	17
			3				
			5(8)				
Very Stiff, Gray-Brown And Gray FAT CLAY WITH SAND - CH (Glacial Till)	24	SS	4	2.5	2.4	113	17
			5				
			6(11)				

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

(CONTINUATION)

BORING NO. B-03

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 7 **OF** 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 6 of 19	30	SS	5 6 8(14)	2.8	2.5	114	16
Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	34	SS	5 5 6(11)	1.9	1.7	116	16
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	38	SS	7 9 10(19)	2.6	2.3	119	14
EXPLORATORY BORING DISCONTINUED	42						
	46						
	50						
	54						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER
FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %



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BORING NO. B-04
DATE 05-14-12
W. & A. FILE NO. 5977
SHEET 8 **OF** 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION **LOCATION** Middleton, Iowa
BORING LOCATION See Plot Plan Sheet **DRILLED BY** Fehl
BORING TYPE Hollow Stem Auger **WEATHER CONDITIONS** Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC **SEEPAGE WATER ENCOUNTERED AT ELEVATION** (-)10.0 Ft.
GROUND SURFACE ELEVATION 0.0 **GROUND WATER ELEVATION AT** 24+ **HRS.** (-) 4.1 Ft.
BORING DISCONTINUED AT ELEVATION (-)81.0 Ft. **GROUND WATER ELEVATION AT COMPLETION** (-) 4.8 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
Dark Brown SILTY CLAY Organic Topsoil	20"						
Stiff, Gray-Brown And Dark Gray FAT CLAY - CH (Clay) - Probable Fill)	04	SS	2	2.2	1.8	91	30
3							
4(7)							
Medium, Gray And Orange-Brown Mottled Dark Brown LEAN CLAY - CL (Silty Clay)	08	SS	2	0.8	0.7	94	26
2							
2(4)							
Stiff, Black FAT CLAY - CH (Clay)	12	SS	2	1.0	0.9	94	26
4							
4(8)							
Medium, Gray And Light Brown LEAN CLAY - CL (Silty Clay)	16	SS	2	0.8	0.6	96	25
3							
3(5)							
Medium, Light Brown LEAN CLAY WITH SAND - CL (Clay Loam)	20	SS	2	-	-	-	-
3							
4(7)							
Stiff, Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	24	SS	3	1.5	1.4	116	16
5							
5(10)							
	24	SS	5	1.8	1.6	117	15
6							
6(12)							

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %

BORING NO. B-04

BORING LOG

(CONTINUATION)

DATE 05-14-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 9 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 8 of 19							
Very Stiff, Gray FAT CLAY WITH SAND - CL (Glacial Till)	30	SS	4 6 10(16)	3.8	3.5	115	17
	34		5 6 8(14)				
Very Stiff, Light Brown And Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	38	SS	5 6 7(13)	2.7	2.5	117	16
	42		8 8 11(19)				
Hard, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	50	SS	6 11 16(27)	4.5+	4.1	121	13
	54		6 6 8(14)				
Stiff, Gray FAT CLAY WITH SAND - CH (Glacial Till)		SS	6 6 8(14)	2.1	1.9	112	19

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER
FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.D_d - NATURAL DRY DENSITY - P.C.F.M_c - NATURAL MOISTURE CONTENT - %WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

BORING LOG

BORING NO. B-04

(CONTINUATION)

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 10 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 9 of 19							
Hard, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	60	SS	6 11 13(24)	4.5+	4.2	120	14
	64		6 12 14(26)				
	68						
Hard, Dark Brown LEAN CLAY WITH SAND - CL (Glacial Till)	72	SS	11 16 19(35)	4.5+	4.5	122	13
Very Stiff, Dark Brown LEAN CLAY WITH SAND - CL (Glacial Till)	76	SS	12 12 16(28)	4.0	3.6	120	14
	80		28 28 -				
Very Dense, Gray, Fine- To Medium-Grained SILTY CLAYEY SAND	84						
EXPLORATORY BORING DISCONTINUED							

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER
FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

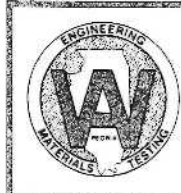
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.

Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.

D_d - NATURAL DRY DENSITY - P.C.F.

M_c - NATURAL MOISTURE CONTENT - %



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BORING LOG

BORING NO. B-05

DATE 05-14-12

W. & A. FILE NO. 5977

SHEET 11 OF 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION

LOCATION Middleton, Iowa

BORING LOCATION See Plot Plan Sheet

DRILLED BY Fehl

BORING TYPE Hollow Stem Auger

WEATHER CONDITIONS Partly Cloudy & Mild

SOIL CLASSIFICATION SYSTEM USCS / USBSC

SEEPAGE WATER ENCOUNTERED AT ELEVATION (-)10.0 Ft.

GROUND SURFACE ELEVATION 0.0

GROUND WATER ELEVATION AT 24+ HRS. (-) 4.2 Ft.

BORING DISCONTINUED AT ELEVATION (-)41.0 Ft.

GROUND WATER ELEVATION AT COMPLETION (-) 8.3 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
Dark Brown SILTY CLAY Organic Topsoil	19"						
Stiff, Gray-Brown And Orange-Brown Mottled Dark Gray LEAN CLAY - CL (Silty Clay) - Possible Fill)	04	SS	3	2.2	1.9	95	26
			4				
			6(10)				
Medium, Gray Mottled Light Brown LEAN CLAY - CL (Silty Clay)		SS	1	0.8	0.7	93	27
			2				
			2(4)				
Stiff, Gray And Gray-Brown FAT CLAY - CH (Clay)	08	SS	2	1.8	1.6	92	27
			3				
			3(6)				
Stiff, Gray-Brown And Light Brown LEAN CLAY - CL (Silty Clay)	12	SS	2	1.2	1.1	94	26
			2				
			3(5)				
			4	1.6	1.5	95	25
			5				
			5(10)				
Medium-Density, Light Brown, Fine- To Coarse-Grained GRAVEL With Considerable Silty Clay - SM	16	SS	4	-	-	-	12
			8				
			4(12)				
Stiff, Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	20	SS	4	1.3	1.2	114	17
			4				
			5(9)				
	24	ST	-	-	-	-	-

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.

Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.

D_d - NATURAL DRY DENSITY - P.C.F.

M_c - NATURAL MOISTURE CONTENT - %

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PEORIA, ILLINOIS

BORING LOG

BORING NO. B-05

(CONTINUATION)

DATE 05-14-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 12 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 11 of 19							
Very Stiff, Gray-Brown And Gray LEAN CLAY WITH SAND - CL (Glacial Till)	30	SS	4	2.7	2.5	118	15
			6				
			8(14)				
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	34	SS	5	3.5	3.3	120	14
			7				
			8(15)				
EXPLORATORY BORING DISCONTINUED	38	SS	5	3.0	2.7	118	15
			7				
			7(14)				
	42						
	46						
	50						
	54						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER
FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %



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BORING NO. B-06
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SHEET 13 **OF** 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION **LOCATION** Middleton, Iowa
BORING LOCATION See Plot Plan Sheet **DRILLED BY** Fehl
BORING TYPE Hollow Stem Auger **WEATHER CONDITIONS** Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC **SEEPAGE WATER ENCOUNTERED AT ELEVATION** (-)12.0 Ft.
GROUND SURFACE ELEVATION 0.0 **GROUND WATER ELEVATION AT** 24+ **HRS.** (-) 4.3 Ft.
BORING DISCONTINUED AT ELEVATION (-)41.0 Ft. **GROUND WATER ELEVATION AT COMPLETION** (-) 6.8 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Dark Brown SILTY CLAY Organic Topsoil	18"						
Stiff, Gray-Brown And Light Brown LEAN CLAY - CL (Silty Clay)	04	SS	2	1.8	1.6	96	24
			3 3(6)				
Medium, Gray And Orange-Brown LEAN CLAY - CL (Silty Clay)	08	SS	2	0.9	0.8	92	27
			2 2(4)				
Medium, Dark Gray FAT CLAY - CH (Clay)	12	SS	2	1.0	0.9	90	28
			2 3(5)				
Medium, Gray And Gray-Brown SANDY LEAN CLAY - CL (Sandy Clay)	16	SS	-	0.9	0.6	101	18
			2 3 4(7)				
Very Loose, Brown, Fine- To Medium-Grained SAND With Some Silty Clay - SM	20	SS	2	-	-	-	13
			1 1(2)				
Very Stiff, Gray FAT CLAY WITH SAND - CH (Glacial Till)	24	SS	2	2.5	2.1	112	21
			6 7 9(16)				

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

BORING LOG

BORING NO. B-06

(CONTINUATION)

DATE 05-14-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 14 OF 19

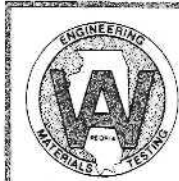
LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 13 of 19							
	30	SS	5 6 8(14)	2.6	2.4	113	20
	34						
Very Stiff, Light Brown And Gray FAT CLAY WITH SAND - CH (Glacial)		SS	6 7 9(16)	3.7	3.4	115	18
	38						
		SS	9 10 15(25)	4.2	3.9	116	17
EXPLORATORY BORING DISCONTINUED	42						
	46						
	50						
	54						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
 SS - SPLIT SPOON SAMPLE
 ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
 Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
 D_d - NATURAL DRY DENSITY - P.C.F.
 M_c - NATURAL MOISTURE CONTENT - %



WHITNEY & ASSOCIATES

INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

BORING NO. B-07

DATE 05-15-12

W. & A. FILE NO. 5977

SHEET 15 OF 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION

LOCATION Middleton, Iowa

BORING LOCATION See Plot Plan Sheet

DRILLED BY Fehl

BORING TYPE Hollow Stem Auger

WEATHER CONDITIONS Partly Cloudy & Mild

SOIL CLASSIFICATION SYSTEM USCS / USBSC

SEEPAGE WATER ENCOUNTERED AT ELEVATION (-)19.5 Ft.

GROUND SURFACE ELEVATION 0.0

GROUND WATER ELEVATION AT 24+ HRS. (-) 4.8 Ft.

BORING DISCONTINUED AT ELEVATION (-)41.0 Ft.

GROUND WATER ELEVATION AT COMPLETION (-)14.2 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Dark Brown SILTY CLAY Organic Topsoil	19"						
Stiff, Dark Brown, Gray-Brown And Light Brown LEAN CLAY - CL (Silty Clay) - Possible Fill)	04	SS	2	1.8	1.7	94	26
			3 3(6)				
		ST	-	-	-	-	-
Stiff, Gray, Orange-Brown And Brown LEAN CLAY - CL (Silty Clay)	08	SS	2 2 3(5)	1.5	1.3	94	25
Stiff, Brown LEAN CLAY WITH SAND - CL (Glacial Till)	12	SS	2 3 3(6)	1.9	1.6	114	19
			4 5 6(11)				
	16	SS	2 3 4(7)	1.3	1.1	112	21
Stiff, Light Brown LEAN CLAY WITH SAND And Some LIMESTONE FRAGMENTS - CL (Glacial Till)	20	SS	8 6 7(13)	2.1	1.9	118	16
	24	SS	5 6 8(14)	3.0	2.5	110	21
Very Stiff, Dark Gray FAT CLAY - CH (Glacial Till)							

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.

Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.

Dd - NATURAL DRY DENSITY - P.C.F.

Mc - NATURAL MOISTURE CONTENT - %

BORING NO. B-07

BORING LOG

(CONTINUATION)

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 16 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 15 of 19	30	ST	-	-	-	-	-
Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	34	SS	5	2.0	1.4	115	17
			5				
	38	SS	6	2.0	1.5	116	16
			5				
EXPLORATORY BORING DISCONTINUED	42						
	46						
	50						
	54						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
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WHITNEY & ASSOCIATES

INCORPORATED

2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

BORING NO. B-08

DATE 05-15-12

W. & A. FILE NO. 5977

SHEET 17 OF 19

PROJECT IOWA FERTILIZER COMPANY SITE INVESTIGATION

LOCATION Middleton, Iowa

BORING LOCATION See Plot Plan Sheet

DRILLED BY Fehl

BORING TYPE Hollow Stem Auger

WEATHER CONDITIONS Partly Cloudy & Mild

SOIL CLASSIFICATION SYSTEM USCS / USBSC

SEEPAGE WATER ENCOUNTERED AT ELEVATION (-)19.0 Ft.

GROUND SURFACE ELEVATION 0.0

GROUND WATER ELEVATION AT 24+ HRS. (-) 4.1 Ft.

BORING DISCONTINUED AT ELEVATION (-)74.0 Ft.

GROUND WATER ELEVATION AT COMPLETION (-) 8.1 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
Dark Brown SILTY CLAY Organic Topsoil	24"						
Stiff, Dark Brown LEAN CLAY - CL (Silty Clay)							
	04	SS	2 2 2(4)	1.5	1.4	94	26
		ST	-	-	-	-	-
	08	ST	-	-	-	-	-
Very Soft, Light Brown And Gray LEAN CLAY WITH SAND - CL (Clay Loam)							
	12	SS	1 1 2(3)	0.3	0.2	92	28
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)							
		SS	4 5 7(12)	2.5	2.4	117	16
Stiff, Light Brown And Gray-Brown LEAN CLAY WITH SAND - CL (Glacial Till)							
	16	SS	4 5 6(11)	2.0	1.7	115	17
Very Stiff, Gray LEAN CLAY WITH SAND - CL (Glacial Till)							
	20	SS	5 6 7(13)	2.3	2.2	117	15
	24	SS	7 8 9(17)	2.9	2.7	118	14

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.

Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.

D_d - NATURAL DRY DENSITY - P.C.F.

M_c - NATURAL MOISTURE CONTENT - %

BORING LOG

(CONTINUATION)

BORING NO. B-08

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 18 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 17 of 19							
	30		7				
		SS	8 9(17)	3.2	2.7	119	14
Very Stiff, Light Brown And Gray LEAN CLAY WITH SAND - CL (Glacial Till)	34		8				
		SS	10 11(21)	4.2	3.8	120	13
	38		11				
		SS	12 14(26)	2.8	2.4	118	14
Stiff, Light Brown FAT CLAY WITH SAND - CL (Glacial Till)	46		4 4 7(12)	2.0	1.7	112	21
Very Stiff, Light Brown And Orange-Brown LEAN CLAY WITH SAND - CL (Glacial Till)	50		5 7 8(15)	2.8	2.7	118	15
Hard, Light Brown SANDY LEAN CLAY - CL (Glacial Till)	54		10 18 36(54)	4.5+	4.6	121	13

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE

ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.

Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.

D_d - NATURAL DRY DENSITY - P.C.F.

M_c - NATURAL MOISTURE CONTENT - %

BORING LOG

BORING NO. B-08

(CONTINUATION)

DATE 05-15-12

PROJECT Iowa Fertilizer Company Site Investigation

SHEET 19 OF 19

LOCATION Middleton, Iowa

W. & A. FILE NO. 5977

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q _p	Q _u	D _d	M _c
See Sheet 18 of 19							
	60	SS	15 17 20(37)	4.5+	5.5	123	12
Very Stiff, Light Brown And Gray SANDY LEAN CLAY - CL (Glacial Till)	64	SS	12 15 17(32)	4.0	3.5	120	14
	68						
Very Dense, Light Brown And Gray, Weathered LIMESTONE FRAGMENTS With Lean Clay	72	SS	77/3*	-	-	-	11
AUGER REFUSAL AT (-) 74.0 FEET							
EXPLORATORY BORING DISCONTINUED	76						
	80						
	84						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES

SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %