Project: 4255 Date: 12/9/92 Elevation: Hole No.: 11 Stopped Drilling at 9.0 Feet.

Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
		SP		POORLY GRADED SAND f-c sa, pred. fine sand with trace silt 0-9" - dk. green 9-48" - sl. green below 4' - lt. brn.	Damp - Moist				100	T			X	X				Very Loose	N.P.	None
					Damp													Loose		
10	N			PID = 0.5 ppm														Med. Dense		
					Slightly Damp													Med. Dense		
20	N			PID = 0 ppm																
				Stopped drilling and sampling at 9.0 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: 4255 Date: 12/9/92 Elevation: Hole No.: 12 Stopped Drilling at 9.0 Feet.

Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	% Dist. Cobbles	% Dist. Gravel	% Dist. Sand	% Dist. Silt/Clay	Grad. Well	Grad. Medium	Grad. Poor	Grain Shape Subang.	Grain Shape Angular	Grain Shape Submd.	Grain Shape Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
		SP		POORLY GRADED SAND f-c sa, pred. fine sand with trace silt 0-9" - dk. green 9-36" - sl. green below 3' - lt. brn.	Moist				100	T			X	X				Very Loose	N.P.	None
					Damp													Loose		
10	N			PID = 0 ppm	Slightly Damp													Med. Dense		
18	N			PID = 0 ppm																
				Stopped drilling and sampling at 9.0 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: 4255 Date: 12/9/92 Elevation: Hole No.: 13 Stopped Drilling at 9.0 Feet.

Blow Count	Sample	Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
			SP		POORLY GRADED SAND f-c sa, pred. fine sand with trace silt 0-6" - dk. green 6-24" - sl. green below 23' - lt. brn.	Moist				100	T			X	X				Very Loose	N.P.	None
						Damp													Loose		
9		N			PID = 0.5 ppm	Slightly Damp															
																			Med. Dense		
14		N			PID = 0 ppm																
					Stopped drilling and sampling at 9.0 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: 4255 Date: 12/9/92 Elevation: Hole No.: 14 Stopped Drilling at 9.0 Feet.

Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	% Dist. Cobbles	% Dist. Gravel	% Dist. Sand	% Dist. Silt/Clay	Grad. Well	Grad. Medium	Grad. Poor	Grain Shape Subang.	Grain Shape Angular	Grain Shape Submd.	Grain Shape Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
		SP		POORLY GRADED SAND f-c sa, pred. fine sand with trace silt 0-9" - dk. green 9-54" - sl. green below 54" - lt. brn.	Moist				100	T			X	X				Very Loose	N.P.	None
					Damp													Loose		
10	N			PID = 0 ppm	Slightly Damp													Med. Dense		
13	N			PID = 0 ppm																
				Stopped drilling and sampling at 9.0 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: Date: 8/13/90 Elevation: 200.0 Hole No.: 1 Stopped Drilling at 21.5 Feet.

Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
				ASPHALT 0-4 inches																
				Fill - GRAVELLY SAND gray brown	damp			40	55	5		X		X				M. Dense	N.P	None
		SP		SAND, lt. brown predominately fine (sugar sand) trace clay balls and sandstone gravel 1-5 feet	Damp				100				X	X				Loose	N.P	None
3		N			Moist				100				X	X				Loose	N.P	None
26		N			Moist				100				X	X				M. Dense	N.P	None
35		N																		
25		N		Slight septic odor																
				Stopped drilling and sampling at 21.5 feet																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: Date: 8/13/90 Elevation: 200.0 Hole No.: 2 Stopped Drilling at 21.5 Feet.

Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
				ASPHALT 0-4 inches																
				Fill - GRAVELLY SAND grey brown	Damp			40	55	5		X		X				N. Dense	N.P	None
		SP		SAND lt. brn., predominately fine (sugar sand) Trace sandstone gravel 1-5 feet	Damp				100				X	X				Loose	N.P	None
15		N			Moist				100				X	X				Loose	N.P	None
26		N			Moist				100				X	X				Dense	N.P	None
33		N																		
31		N		Slight septic odor	Moist				95	5			X	X				Dense	N.P	None
				Stopped drilling and sampling at 21.5 feet																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: Date: 8/13/90 Elevation: 200.0 Hole No.: 3 Stopped Drilling at 6.5 feet.

Depth	Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
0			SP		SAND lt. brn, predominately fine dark blue-green staining 0-3.5 feet.	Moist				100				X	X				Loose	N.P	None
1																					
2	12		N																		
3																					
4					Light green staining																
5	23		N		No staining or odors detected	Moist				100				X	X				M. Dense	N.P	None
6																					
					Stopped drilling and sampling at 6.5 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: Date: 8/13/90 Elevation: 200.0 Hole No.:- 4 Stopped Drilling at 6.5 Feet.

Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
		SP	SAND lt. brn., predominately fine	Moist				100				X	X				Loose	N.P	None
			blue-green staining top 1-2 inches																
14	N		with sulfurous odor.	Moist				100				X	X				M. Dense	N.P	None
21	N																		
			Stopped drilling and sampling at 6.5 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: Date: 8/13/90 Elevation: 200.0 Hole No.: 5 Stopped Drilling at 6.5 Feet.

Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
		SP	SAND lt. brn., predominately fine	Moist				100				X	X				Loose	N.P	None
			blue-green staining top 2-3 inches																
19	N		with sulfurous odor.	Moist				100				X	X				M. Dense	N.P	None
24	N																		
			Stopped drilling and sampling at 6.5 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Project: Date: 8/13/90 Elevation: 200.0 Hole No.: 6 Stopped Drilling at 6.5 Feet.

Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
0		SP	SAND lt. brn, predominately fine blue-green staining top 1-2 inches with sulfurous odor.	Moist				100				X	X				Loose	N.P	None
1																			
2																			
3																			
4																			
5	22	N		Moist				100				X	X				M. Dense	N.P	None
6																			
			Stopped drilling and sampling at 6.5 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

Boring Log No. 1

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 12/07/94
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
ASPHALTIC CONCRETE	AC		0			
AGGREGATE BASE COURSE	ABC		1			
SAND, light brown to light tan, damp, 100% sand, well graded angular clasts, loose, nonplastic, no cementation observed.	SW		2, 3, 4, 5, 6		8/9/10	
			7, 8, 9, 10			
sand becomes medium dense			11		9/13/15	
sand becomes damp to moist			12, 13, 14, 15, 16, 17, 18, 19, 20			
sand becomes moist			21		7/11/13	
			22, 23, 24, 25, 26, 27, 28, 29, 30			
sand becomes medium dense to dense			31		10/13/14	
			32, 33, 34, 35, 36, 37, 38, 39, 40			
			41		10/14/22	
			42, 43, 44, 45			

Foree & Vann, Inc.

Geotechnical and Environmental Consulting
Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. 1

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 12/07/94
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
	SW		45			
			46			
			47			
			48			
			49			
			50			
			51		12/12/20	
brown clay, trace silt lense, very stiff and interbedded with sand, approximately two inches in thickness			52			
			53			
			54			
			55			
			56			
			57			
			58			
			59			
			60		50/6"	
sand becomes very dense			61			
			62			
			63			
			64			
			65			
			66			
			67			
			68			
			69			
			70		27/48/	
sand is laminated			71		50/5"	
sand becomes wet						
Ceased advancement of borehole at 71.42 feet.			72			
			73			
			74			
			75			
			76			
			77			
			78			
			79			
			80			
			81			
			82			
			83			
			84			
			85			
			86			
			87			
			88			
			89			
			90			

Foree & Vann, Inc.

Geotechnical and Environmental Consulting
Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. 2

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 12/07/94
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
ASPHALTIC CONCRETE	AC		0			
AGGREGATE BASE COURSE	ABC		1			
SAND, tan, damp, 100% sand, well graded angular clasts, loose, nonplastic, no cementation observed.	SW		2, 3, 4			
sand becomes medium dense			5, 6		9/14/16	
			7, 8, 9			
			10, 11		9/12/16	
brown clay lense, very stiff and interbedded with sand, less than 0.5 inches in thickness			12, 13, 14, 15, 16, 17, 18, 19			
			20, 21		8/12/17	
			22, 23, 24, 25, 26, 27, 28, 29			
sand becomes dense			30, 31		9/14/15	
			32, 33, 34, 35			

Foree & Vann, Inc.

Geotechnical and Environmental Consulting
Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. 2

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 12/07/94
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
	SW		35			
			36			
			37			
			38			
			39			
sand becomes damp to moist			40			
			41		10/15/20	
			42			
sand becomes brown in color			43			
			44			
			45			
			46			
			47			
			48			
			49			
sand becomes moist			50			
			51		9/20/30	
			52			
			53			
			54			
			55			
			56			
			57			
			58			
			59			
			60			
brown clay lense, very stiff and interbedded with yellow-brown sand, less than 0.5 inches in thickness					50/6"	
			61			
Ceased advancement of borehole at 60.5 feet.			62			
			63			
			64			
			65			
			66			
			67			
			68			
			69			
			70			

Foree & Vann, Inc.

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Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. 3

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 1/18/95
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
ASPHALTIC CONCRETE	AC		0			
AGGREGATE BASE COURSE	ABC		1			
SAND, TRACE SILT, brown, damp, 95% sand, 5% silt, medium graded subangular to angular clasts, very loose, nonplastic, no cementation observed.	SW		2, 3, 4, 5, 6, 7, 8, 9	5–6	1/2/2	
sand becomes loose			10, 11, 12, 13, 14	10–11	4/5/7	
sand becomes loose to medium dense			15, 16, 17, 18, 19	15–16	7/10/11	
			20, 21, 22, 23, 24	20–21	7/10/11	
Thin (<0.5" thickness) discontinuous clay lenses between 25 and 30 feet.			25, 26, 27, 28, 29			
sand becomes medium dense			30, 31, 32, 33, 34, 35	30–31	8/12/14	

Foree & Vann, Inc.
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Phoenix, Arizona

Notes:

Project No. 4255

Boring Log No. 3

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 1/18/95
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
	SW		35			
			36			
			37			
			38			
			39			
sand becomes medium dense to dense			40			
			41		11/20/22	
			42			
			43			
			44			
			45			
			46			
			47			
			48			
			49			
			50			
			51		11/20/25	
			52			
			53			
			54			
			55			
			56			
			57			
			58			
			59			
sand becomes very dense			60		45/50/3"	
Ceased advancement of borehole at 60.9 feet.			61			
			62			
			63			
			64			
			65			
			66			
			67			
			68			
			69			
			70			

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Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. 4

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 1/18/95
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
SAND, TRACE SILT, light brown, damp, 95% sand, 5% silt, medium graded subangular to angular clasts, very loose, nonplastic, no cementation observed.	SW		0			
soil is greenish-blue (dye discoloration) below 1', with an organic decay odor.			1			
			2			
			3		1/3/4	
			4			
SAND, WITH GRAVEL, blue-green, damp to moist, 80% sand, 15% gravel, 5% silt, well graded subangular to angular clasts, medium dense to dense, nonplastic, no cementation observed.	SW		5			Leach field
			6			
			7			
			8		10/6/8	
			9			
Ceased advancement of borehole at 9.5 feet.			10			

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Notes:

Project No. 4255

Boring Log No. 5

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 1/18/95
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
SAND, TRACE SILT, gray-brown, moist, 95% sand, 5% silt, medium graded subangular to angular clasts, very loose, nonplastic, no cementation observed.	SW		0			Faint organic odor
			1			
			2			
SAND, TRACE SILT, light brown, moist, 95% sand, 5% silt, medium graded subangular to angular clasts, very loose, nonplastic, no cementation observed.	SW		3		1/1/4	
			4			
			5			
			6			
			7			
soil becomes loose to medium dense below 8 feet.			8		5/7/10	
			9			
Ceased advancement of borehole at 9.5 feet.			10			

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Phoenix, Arizona

Notes:

Project No. 4255

Boring Log No. 6

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 1/18/95
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
SAND, TRACE SILT, light brown, moist, 95% sand, 5% silt, medium graded subangular to angular clasts, loose, nonplastic, no cementation observed.	SW		0			
			1			
			2			
			3		2/3/5	
			4			
			5			
			6			
			7			
soil becomes loose to medium dense below 8 feet.			8		5/10/18	
			9			
Ceased advancement of borehole at 9.5 feet.			10			

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Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. 7

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 1/18/95
HOLE DIA: 7.75 in.
FINAL GW: ft.

GEOLOGIST: W.L. Stefanov
SAMPLER:
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
SAND, TRACE SILT, light brown, moist, 95% sand, 5% silt, medium graded subangular to angular clasts, loose, nonplastic, no cementation observed.	SW		0			
			1			
			2			
soil becomes medium dense below 3 feet.			3		7/7/10	
			4			
			5			
			6			
			7			
			8		5/7/11	
			9			
Ceased advancement of borehole at 9.5 feet.			10			

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Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. HP-1

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 5/22/95-5/23/95
HOLE DIA: 7.75 in.
FINAL GW: 74.36 ft.

GEOLOGIST: W.L. Stefanov
SAMPLER: HydroPunch
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
ASPHALTIC CONCRETE	AC		0			
AGGREGATE BASE COURSE	ABC		1			
SAND, brown, damp to moist, 100% sand, well- to medium-graded angular clasts, very loose to loose, nonplastic, no cementation observed.	SW		2			
sand becomes moist and loose			3			
			4			
			5			
			6			
			7			
			8			
			9			
SAND, SOME SILT, brown, moist, 90% sand 10% silt, well- to medium- graded angular clasts, loose, nonplastic, no cementation observed. Thin (less than 1 foot thick) sandy clay lenses encountered between 25 and 30 feet depths.	SW		10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			
			21			
			22			
			23			
			24			
			25			
			26			
			27			
			28			
			29			
			30			
			31			
			32			
			33			
			34			
			35			
			36			
			37			
			38			
			39			
			40			

Foree & Vann, Inc.

Geotechnical and Environmental Consulting
Phoenix, Arizona

Notes:

Project No.
4255

Boring Log No. HP-1

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 5/22/95-5/23/95
HOLE DIA: 7.75 in.
FINAL GW: 74.36 ft.

GEOLOGIST: W.L. Stefanov
SAMPLER: HydroPunch
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
Sand changes color to red brown, with thin sandy clay lenses encountered from 40 to 55 feet depths	SW		40–80			
Sand changes color to brown						
Gravel lense encountered between depths of 62 and 64 feet						
Sand changes color to red brown, sand concretions present						
Phreatic surface encountered, sand is saturated and dense			74–75	▥		↓ PCE concentration=620 ppb

Foree & Vann, Inc.
Geotechnical and Environmental Consulting
Phoenix, Arizona

Notes:

Project No. 4255

Boring Log No. HP-1

PROJECT: Houston International, Ltd.
DRILL RIG: Hollow Stem Auger
INITIAL GW DEPTH: ft.

DATE: 5/22/95-5/23/95
HOLE DIA: 7.75 in.
FINAL GW: 74.36 ft.

GEOLOGIST: W.L. Stefanov
SAMPLER: HydroPunch
HOLE ELEV:

DESCRIPTION	USCS CLASS	GRAPHIC LOG	DEPTH	SAMPLE	PENETRATION RATE	REMARKS
	SW		80			
			81			
			82			PCE concentration=580 ppb
			83			
			84			
			85			PCE concentration=2400 ppb
			86			
			87			
			88			
			89			
			90			
			91			
			92			
			93			
			94			
			95			
			96			PCE concentration=1100 ppb
			97			
			98			
			99			
			100			
Sand changes color to grey			101			
			102			PCE concentration=1200 ppb
			103			
			104			
			105			
Ceased advancement of borehole at 105 feet.			106			
			107			
			108			
			109			
			110			
			111			
			112			
			113			
			114			
			115			
			116			
			117			
			118			
			119			
			120			

Foree & Vann, Inc.
Geotechnical and Environmental Consulting
Phoenix, Arizona

Notes:

Project No.
4255

Site Map	**Project No:** 1303.015.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-1A** **ADWR ID: 55-537043** **Start Date/Time:** 10/22/92 **End Date/Time:** **Logged By:** Foree and Vann
	Drilling Method: Hollow Stem Auger **Borehole Diameter:** MW-1	**Angle from Vertical:**
	Surface Material: Asphalt and AB Fill	**Sampling Method:**

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
0					Ground Surface
1–50					**Poorly Graded Sand** Light brown, fine to coarse sand, predominately fine sand with silt in thin lenses Color change to red-brown

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 1 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.015.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-1A** **Start Date/Time:** 10/22/92 **End Date/Time:** **Logged By:** Foree and Vann
	Drilling Method: Hollow Stem Auger **Borehole Diameter:** MW-1	**Angle from Vertical:**
	Surface Material: Asphalt and AB Fill	**Sampling Method:**

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51					
52					
53					
54					
55					Color change to brown at 54' bgs.
56					
57					
58					
59					Color change to off-white at 58' bgs.
60					
61					
62					
63					
64					
65					
66					
67					Color change to light brown at 65' bgs.
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					Some fine to coarse gravel below 50' bgs.
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 2 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Depth	Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	Boulders	Cobbles	Gravel	Sand	Silt/Clay	Well	Medium	Poor	Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
0				4" AC OVER 14" ABC																
1																				
2			SP	POORLY GRADED SAND lt. brn, f-c sand, pred. fine sand with silt in thin lenses	Slightly Damp				00				X	X				Loose	N.P.	None
3																				
4																				
5																				
6																				
7					Damp				00	T			X	X				Med. Dense	N.P.	None
8																				
9																				
10	20		N	PID = 1.5 ppm																
11																				
12																				
13																				
14																				
15																				
16																				
17																				
18																				
19																				
20	22		N	PID = 30 ppm																
21																				
22																				

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions regarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

	Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
27																				
28																				
29																				
30																				
31																				
32																				
33																				
34																				
35																				
36	25		N	PID = 20 ppm																
37																				
38																				
39																				
40																				
41																				
42																				
43																				
44																				
45					Moist				00				X	X			Med. Dense	N.P.	None
46																				
47																				
48																				
49																				
50	8		N	PID = 30 ppm	Moist				00				X	X			Lse-M. Dns	N.P.	None
51																				
52																				
53																				
54																				

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

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Depth	Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	Boulders	Cobbles	Gravel	Sand	Silt/Clay	Well	Medium	Poor	Shape Subang.	Shape Angular	Shape Subrnd.	Shape Rounded	Relative Density/ Consistenc	Estimated P.I.	Degree of Cementatio
45																				
46				color change to rd. brn	Moist				OO	T			X	X				Med. Dense	N.P.	None
47																				
48																				
49																				
50	23		N	PID = 4 ppm																
51																				
52																				
53					Moist				OO				X	X				Dense	N.P.	None
54				color change to brn																
55																				
56																				
57																				
58				color change to off-white	Moist				OO				X	X				Very Dense	N.P.	Weak-Medium
59																				
60	63		N	PID = 4 ppm																
61	50/3"																			
62																				
63																				
64																				
65				color change to lt. brn																None
66																				

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

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Depth	Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
66																					
67																					
68																					
69																					
70	86		N		PID = 5 ppm																
71																					
72																					
73																					
74					first water encountered at 74'	Saturated				00	T			X	X				M.Dns-Dnse	N.P.	None
75																					
76																					
77																					
78																					
79																					
80					some f-c gravel bel. 80'	Saturated				5	95	T			X	X			M.Dns-Dnse	N.P.	None
81																					
82																					
83																					
84																					
85																					
86																					
87																					
88																					

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

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Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	Boulders	Cobbles	Gravel	Sand	Silt/Clay	Well	Medium	Poor	Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
			Stopped drilling at 95 feet.																

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

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GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-2A
ADWR ID: 55-537614

Start Date/Time: 12/29/92

End Date/Time:

Logged By: Foree and Vann

Drilling Method: Hollow Stem Auger

Angle from Vertical: 0

Borehole Diameter: MW-2

Surface Material: Asphalt

Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–25					**Poorly Graded Sand** Light brown, fine to coarse sand, predominately fine sand with thin lenses of silt, clay and gravel
25–26					**Clay** Six inch clay lense
26–37					**Poorly Graded Sand** As Above
37–38					**Clay** Six inch clay lense
38–50					**Poorly Graded Sand** As Above

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 1 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-2A

Start Date/Time: 12/29/92

End Date/Time:

Logged By: Foree and Vann

Drilling Method: Hollow Stem Auger

Angle from Vertical: 0

Borehole Diameter: MW-2

Surface Material: Asphalt

Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51					**Clay**
52					Six inch clay lense
53					
54					
55					**Poorly Graded Sand**
56					As Above
57					55'-59' bgs. orange-brown color
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 2 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Ject: 4255 Date: 12/29/92 Elevation: Hole No.: MW-2 Stopped Drilling at 95.0 Feet.

Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
	SP		4" Asphaltic Concrete POORLY GRADED SAND lt brn, f-c sand, pred. fine sand with thin lenses of silt, clay, and gravel	Slightly Damp			T	100	T			X	X				Loose	N.P.	None
				Damp															
				Damp			T	100	T			X	X				Med. Dense	N.P.	None

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

ect: 4255 Date: 12/29/92 Elevation: Hole No.: MW-2 Stopped Drilling at 95.0 Feet.

Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation	
																				20
																				21
			cemented nodules 22'- 25'	Damp			T	100	T			X	X				Dense	N.P.	Weak	22
																				23
																				24
			6" clay lens	Damp			T	100	T			X	X				Med. Dense	N.P.	None	25
																				26
																				27
																				28
																				29
																				30
																				31
																				32
																				33
																				34
																				35
																				36
																				37
			6" clay lens	Damp				15	85				X	X			Med. Dense	N.P.	None	38
																				39
																				40

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

oject: 4255 Date: 12/29/92 Elevation: Hole No.: MW-2 Stopped Drilling at 95.0 Feet.

Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation	
				Damp			T	100				X	X				Med. Dense	N.P.	None	40
																				41
																				42
																				43
																				44
																				45
																				46
																				47
																				48
																				49
																				50
			6" clay lens																	51
				Damp			10	90				X	X				Dns-V Dnse	N.P.	None	52
																				53
				Damp			T	100				X	X				Med. Dense	N.P.	None	54
			55'- 59' shows orangish brn color change																	55
																				56
																				57
																				58
																				59
																				60

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Forse & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

oject: 4255 Date: 12/29/92 Elevation: Hole No.: MW-2 Stopped Drilling at 95.0 Feet.

Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation	
																			60
																			61
																			62
																			63
																			64
			Damp			10	90				X					Dns-V Dnse	N.P.	None	65
																			66
																			67
																			68
																			69
			Moist			T	100	T			X					Dense	N.P.	None	70
																			71
																			72
		first water encountered at 73.0'	Saturated			T	100	T			X	X				Med. Dense	N.P.	None	73
																			74
																			75
																			76
																			77
																			78
																			79
																			80

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Fores & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

ject: 4255 Date: 12/29/92 Elevation: Hole No.: MW-2 Stopped Drilling at 95.0 Feet.

Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Subrnd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation	
				Saturated			5	95	T			X	X				Med. Dense	N.P.	None	80
																				81
																				82
																				83
																				84
																				85
																				86
																				87
																				88
																				89
																				90
																				91
																				92
																				93
																				94
			Stopped drilling at 95.0 feet.																	95

=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Fores & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-3A
ADWR ID: 55-537615

Start Date/Time: 3/19/93

End Date/Time:

Logged By: Foree and Vann

Drilling Method: Hollow Stem Auger

Angle from Vertical:

Borehole Diameter: MW-3

Surface Material: Asphalt over AB Fill

Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–40					**Poorly Graded Sand** Light brown, some fine gravel, trace silt
41–50					**Poorly Graded Sand** Light brown, some fine gravel, trace silt, flaserbedded with silty clay

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 1 of 2

GeoTrans, Inc
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GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-3A

Start Date/Time: 3/19/93

End Date/Time:

Logged By: Foree and Vann

Drilling Method: Hollow Stem Auger

Borehole Diameter: MW-3

Angle from Vertical:

Surface Material: Asphalt over AB Fill

Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54					
55–59					
60–64					Yellow-brown color below 59' bgs.
65–69					
70–74					
75–79					
80–84					**Poorly Graded Sand** Light brown, some fine gravel, trace silt, increasing moisture below 80' bgs.
85–87					
88–90					
91–94					
95–99					
100					

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 2 of 2

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Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Blow Count	Sample Type	USCS Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	% Dist. Cobbles	% Dist. Gravel	% Dist. Sand	% Dist. Silt/Clay	Grad. Well	Grad. Medium	Grad. Poor	Grain Shape Subang.	Grain Shape Angular	Grain Shape Subrnd.	Grain Shape Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
			3 1/2" AC over 5" ABC																
		SP	SAND poorly graded, lt brn some fine gravel, trace silt	Slightly Damp			10	90	T			X	X			X	Loose	N.P.	None
			less coarse sand and fine gravel below 20'					5	95	T									
			flaselbedded with SILTY CLAY below 25 feet														Med. Dense		
				Moist															

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

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Project: Date: Elevation: Hole No.: MW-3 Stopped Drilling at 87.0 Feet.

Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	% Dist. Cobbles	% Dist. Gravel	% Dist. Sand	% Dist. Silt/Clay	Grad. Well	Grad. Medium	Grad. Poor	Grain Shape Subang.	Grain Shape Angular	Grain Shape Subrnd.	Grain Shape Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation
				SAND poorly graded, lt brn some fine gravel, trace silt flaserbedded with SILTY CLAY	Moist			5	95	T			X	X		X		Mod. Dense	N.P.	None
				yellowish brn below 59'																
				Increasing moisture below 70'	Wet															
				groundwater encountered at 72 feet	Saturated															

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

	Blow Count	Sample Type	USCS	Symbol	DESCRIPTION	In Situ Moisture	% Dist. Boulders	Cobbles	Gravel	Sand	Silt/Clay	Grad. Well	Medium	Poor	Grain Shape Subang.	Angular	Submd.	Rounded	Relative Density/ Consistency	Estimated P.I.	Degree of Cementation	
80					SAND, poorly graded some fine gravel, trace silt increasing moisture below 80'	Saturated			5	95	T			X	X		X		Med. Dense	N.P.	None	B
																						B
																						B
83																						C
																						E
																						E
																						E
86																						E
7					Broke auger string at 87.0 feet. Terminated boring. Fished out auger and installed well casing to 84.0 feet.																	

B=Block C=Bull Nose D=Dutch Cone G=Grab L=Bulk Disturbed N=SPT P=Push R=Ring

Foree & Vann, Inc. provides this boring data as an addendum to the design recommendations expressed in this report. The boring log represents this firm's interpretation of the subsurface conditions at this location, at the indicated depths, during the time period of the field investigation. Conclusions redarding materials workability and construction techniques are the responsibility of bidding parties and contractors.

GeoTrans, Inc.

Site Map

Project No: 1303.011

Client: ADEQ

Site: 20th and Factor

Borehole No: MW-4A
ADWR ID: 55-201459

Start Date/Time: 04-05-04 (11:40)

End Date/Time: 04-06-04 (8:00)

Logged By: Jason Buhlman

Drilling Method: Hollow Stem Auger

Angle from Vertical: 0

Borehole Diameter: 10

Surface Material: Sandy Desert

Sampling Method: Split Spoon and Cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
0					Ground Surface
1–5	5	11:40			**GRAVEL FILL THEN SAND** No stained soil visible.
6–10	10	11:45	<0.1		**SAND** Yellowish brown, medium sand, loose, slightly moist
11–15	15	11:55	0.1		
16–20	20	12:08	<0.1		**SAND WITH CLAY LENS** Yellowish brown, medium sand, loose, slightly moist; red clay lens
21–25	25	12:13	<0.1		**SAND** Yellowish brown, medium sand, loose, slightly moist
26–30	30	12:37	<0.1		**SAND** Brown, fine to medium sand, slightly moist, loose
31–35	35				
36–40	40		<0.1		
41–45	45				
46–50	50		0.6		

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

Sheet: 1 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

Site Map

Project No: 1303.011

Client: ADEQ

Site: 20th and Factor

Borehole No: MW-4A

Start Date/Time: 04-05-04 (11:40)

End Date/Time: 04-06-04 (8:00)

Logged By: Jason Buhlman

Drilling Method: Hollow Stem Auger

Angle from Vertical: 0

Borehole Diameter: 10

Surface Material: Sandy Desert

Sampling Method: Split Spoon and Cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54	55				
55–59	60		0.6		
60–64	65				**GRAVEL** Rounded, 2 inch diameter
65–69	70		0.6		**SAND WITH CLAY** Brown, fine to medium sand; layer of brown, firm clay at 70 feet, thickness unknown, damp
70–74	75				
75–79	80				**SAND WITH CLAY LENS** Brown fine to medium sand, wet, loose; clay was found in the augers but the location is unknown.
80–84	85				
85–89	90				
90–94	95				
95–99	100				
100					

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

GeoTrans, Inc
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GeoTrans, Inc.

Site Map

Project No: 1303.011

Client: ADEQ

Site: 20th and Factor

Borehole No: MW-4A

Start Date/Time: 04-05-04 (11:40)

End Date/Time: 04-06-04 (8:00)

Logged By: Jason Buhlman

Drilling Method: Hollow Stem Auger

Angle from Vertical: 0

Borehole Diameter: 10

Surface Material: Sandy Desert

Sampling Method: Split Spoon and Cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101	105				
102					
103					
104					
105					
106					
107					
108					
109					
110					
111					
12					
13					
114					
115					
116					
117					
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149					
150					

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

Sheet: 3 of 3

GeoTrans, Inc
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Phoenix, Arizona 85034
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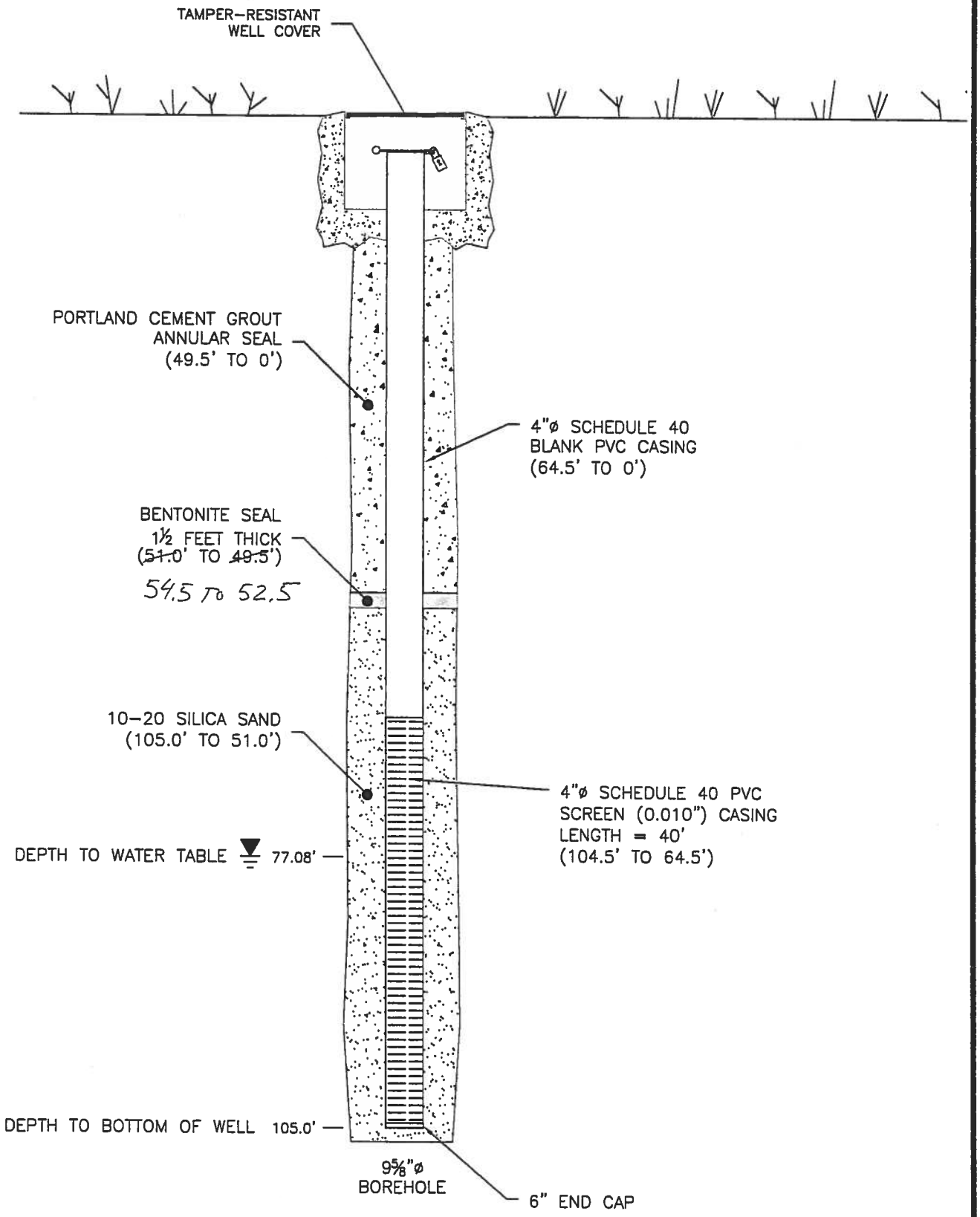
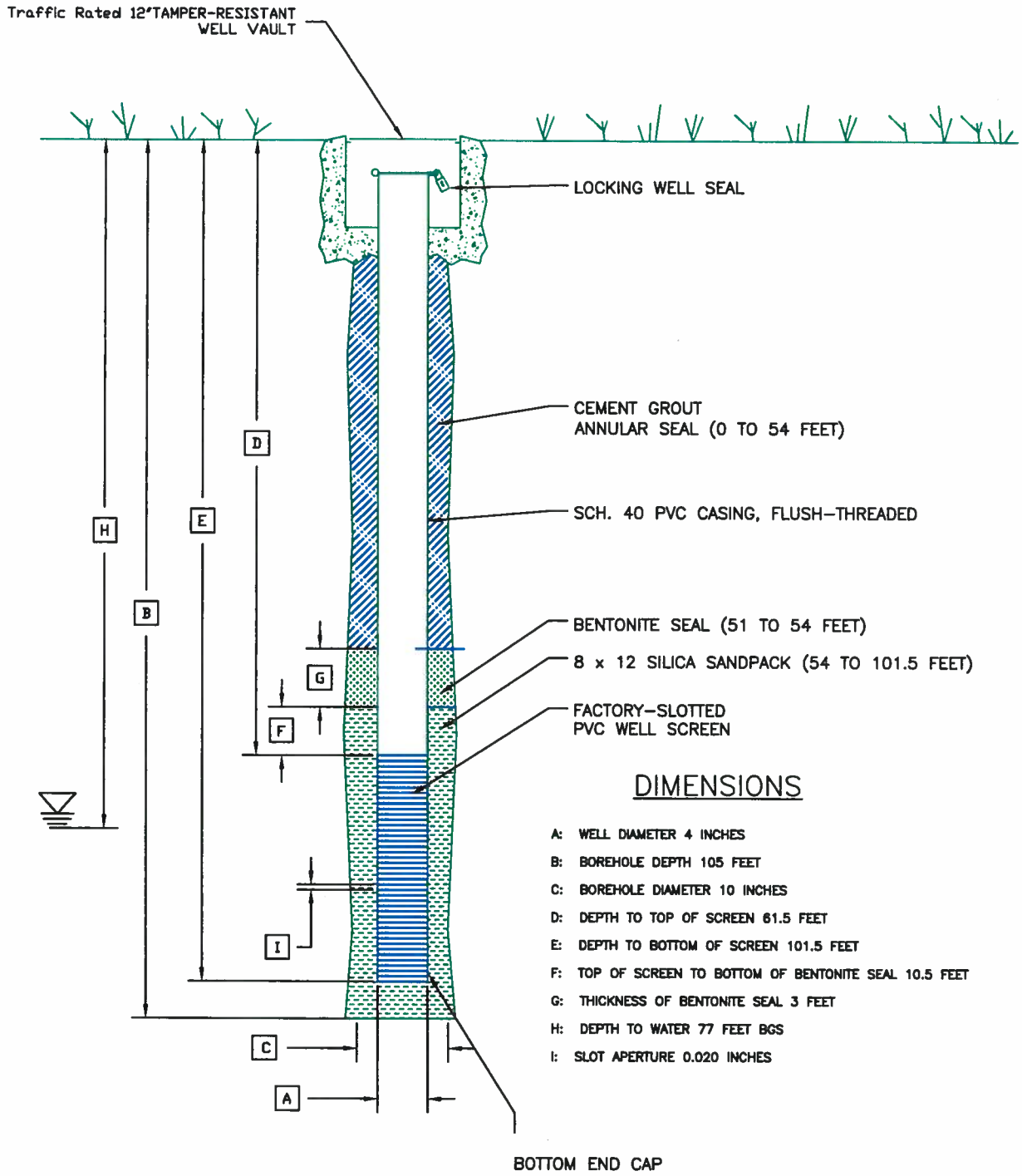


VERTICAL SCALE: 1"=15'
HORIZONTAL SCALE: 1"=15"

TITLE: WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-4			
LOCATION: YUMA - 20TH & FACTOR			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	GB	FIGURE
	DRAFTED	GB	1
	PROJECT		
	DATE	1/26/04	



DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 105 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 61.5 FEET
E: DEPTH TO BOTTOM OF SCREEN 101.5 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 10.5 FEET
G: THICKNESS OF BENTONITE SEAL 3 FEET
H: DEPTH TO WATER 77 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE: MW-4 WELL DIAGRAM
20TH AND FACTOR WQARF SITE

LOCATION: YUMA, ARIZONA

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JZ
DRAFTED	JLB
PROJECT	1303.011
DATE	06/01/04

FIGURE 2

GeoTrans, Inc.	Project No:1303.011	Borehole No: MW-5A ADWR ID: 55-588281
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: End Date/Time: Logged By:
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-5	Angle from Vertical: 0
	Surface Material:	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–45					**Poorly Graded Sand** Very pale brown (10YR 8/3), fine grained, dry
46–50					**Silty Sand with Gravel** Pale brown (10 YR 8/3), fine grained with caliche fragments and silt, moist

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 1 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-5A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: End Date/Time: Logged By:
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-5	Angle from Vertical: 0
	Surface Material:	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–55					**Well Graded Sand with Silt** Very pale brown (10 YR 7/3), fine grained sand with silt and angular gravel-caliche, moist, clay clumps
56–60					**Silty Sand with Gravel** Very pale brown (10 YR 7/3) fine sand, silt and caliche gravel, moist
61–90					**Silty Sand** Very pale brown (10 YR 7/3) fine grained sand, silt, 1% caliche gravel, increased moisture from 60 feet
91–100					**Silty Sand with Gravel** Pale brown (10 YR 6/3), fine sand, silt, 15% small angular frags and caliche, moist, clayey clumps

Drilling Contractor:

Checked By:

Date Checked:

Sheet: 2 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-5A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: End Date/Time: Logged By:
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-5	Angle from Vertical: 0
	Surface Material:	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101					**Clayey Sand** Pale brown (10 YR 6/3), fine grained sand, 40% sticky, soft, clay (cuttings only), wet
102					
103					
104					
105					
106					
107					
108					
109					
110					
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Drilling Contractor:

Checked By:

Date Checked:

Sheet: 3 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-5

Boring No. X-Ref:

Elevation Ground Level:

Top of Casing:

Survey Coords:

Job Number: F184-E034-C30

Drilling Summary:	
Total Depth	
Borehole Diameter	9 5/8" (GUY MEASURED IT)
Casing Stick-Up	
Driller	GEOMECHANICS SOUTHWEST, INC.
Rig	CME 75
Bit(s)	~10"
Drilling Fluid	NONE
Protective Casing	NONE

Comments: NO SAMPLES COLLECTED; ONLY CUTTINGS FOR LOGGING & SCREENING PURPOSES

G.W. DEPTH @ 0918 → 77.08'

T.W.D. = 105'

Construction Time Log:	Start		Finish	
Task	Date	Time	Date	Time
Drilling	1·17·02		1·17·02	
Geophys. Logging				
Casing:	1·17·02		1·17·02	
Casing:				
Sand Pack:	1·17·02	1620	1·17·02	
Filter Placement:				
Cementing:				
Development:	1-18-02	0923	1-18-02	0939

Well Development: REMOVED 16 bails (10' bailer) at ~4 gallons per bail for approx. total of 64 gallons.

Well Design & Specifications

Basis: Geologic Log ✓ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
82.5' to 62.5'	20' (2x10') OF (S1) SCH. 40 screen	
62.5' to 0'	BLANK CASING (C1)	
83.5' to 82.5' 94.5' to 93.5'	2-1' COUPLERS #	
93.5' to 83.5' 104.5' to 94.5'	2-10' SECTIONS OF PRE PACK	
105' to 104.5'	6" END CAP	

Casing:	C1	4" DIA. (62.5' to 0')
	C2	
PRE PACK		5" DIA. (104.5' to 83.5')
Screen:	S1	4" DIA.-0.010 FOR BOTH PrePACK
	S2	& SCH. 40 screen (104.5' to 62.5')
Filter Pack:		COLORADO SILICA 10-20
		(32 bags) → 105' to 51'
Grout ~~Seal:~~		49.5' to 0' (TANNER Companies)
Bentonite		51' to 49.5'

Sheen? → NONE

COLOR? → LT. BRN.

SOLIDS? → H_2O NOT CLEAR, A GREAT DEAL OF SEDIMENT.

1ST BAIL	Time	pH	Sp. Cond.	Temp. °C
INITIAL	0923	7.12	3.12	18.3

Stabilization Test Data:

Time	pH	Spec. Cond. µs/m	Temp (C)
0931	7.19	4.64	~~18.~~ 19.7
0933	7.14	4.46	20.6
0935	7.08	4.66	24.2
0937	7.08	4.17	24.3
0939	7.14	4.04	24.5

Site Name: 20TH & FACTOR - YUMA WQARF

Location: 653 20TH ST., YUMA, AZ Behind Bldg. 4, near SW corner in sand lot

Supervised by: KRISTIE M. DANIELS

Date: 1-16-02 KD 17

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-5

Boring No. X-Ref:

Elevation Ground Level:

Top of Casing:

Survey Coords:

Job Number: E034-C30

Drilling Summary:	
Total Depth	105'
Borehole Diameter	9 5/8" (GUY MEASURED IT)
Casing Stick-Up	NONE
Driller	GEOMECHANICS SOUTHWEST, INC.
Rig	CME 75
Bit(s)	~10"
Drilling Fluid	NONE
Protective Casing	NONE

Comments: NO SAMPLES COLLECTED; ONLY CUTTINGS FOR LOGGING & SCREENING PURPOSES

G.W. DEPTH @ 0918 → 77.08'

T.W.D. = 105'

Construction Time Log:	Start		Finish	
Task	Date	Time	Date	Time
Drilling	1-17-02		1-17-02	
Geophys. Logging				
Casing:	1-17-02		1-17-02	
Casing:				
Sand Pack:	1-17-02	1620	1-17-02	
Filter Placement:				
Cementing:				
Development:	1-18-02	0923	1-18-02	0939

Well Development: REMOVED 16 bails (10' bailer) at ~4 gallons per bail for approx. total of 64 gallons.

Well Design & Specifications

Basis: Geologic Log ✓ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
82.5' to 62.5'	20' (2x10') OF (S1) SCH. 40 ~~CP~~ screen	
62.5' to 0'	BLANK CASING (C1)	
83.5' to 82.5' 94.5' to 93.5'	2-1' COUPLERS *	
93.5' to 83.5' 104.5' to 94.5'	2-10' SECTIONS OF PRE PACK	
105' to 104.5'	6" END CAP	

Casing: C1	4" DIA. (62.5' to 0')
C2	
PRE PACK	5" DIA. (104.5' to 83.5')
Screen: S1	4" DIA. -0.010 FOR BOTH PrePACK
S2	& SCH. 40 screen (104.5' to 62.5')
Filter Pack:	COLORADO SILICA 10-20 (32 bags) → 105' to 51'
Grout ~~Seal:~~	49.5' to 0' (TANNER Companies)
Bentonite	51' to 49.5'

Sheen? → NONE

Color? → LT. BRN.

Solids? → H_2O NOT CLEAR, A GREAT DEAL OF SEDIMENT.

1ST BAIL	Time	pH	Sp. Cond.	Temp. °C
INITIAL	0923	7.12	3.12	18.3

Stabilization Test Data: * DETAILS

Time	pH	Spec. Cond. µs/m	Temp (C)
0931	7.19	4.64	~~18.~~ 19.7
0933	7.14	4.46	20.6
0935	7.08	4.66	24.2
0937	7.08	4.17	24.3
0939	7.14	4.04	24.5

Site Name: 20TH & FACTOR - YUMA WQARF

Location: 653 20TH ST., YUMA, AZ Behind Bldg. 4, near SW corner in sand lot

Supervised By: KRISTIE M. DANIELS

Date: 1-16-02

17

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-5

Boring No. X-Ref:

Elevation Ground Level:

Top of Casing:

Survey Coords:

Job Number: E034-C30

Drilling Summary:	
Total Depth	105'
Borehole Diameter	9 5/8" (GUY MEASURED IT)
Casing Stick-Up	NONE
Driller	GEOMECHANICS SOUTHWEST, INC.
Rig	CME 75
Bit(s)	~10"
Drilling Fluid	NONE
Protective Casing	NONE

Comments: NO SAMPLES COLLECTED; ONLY CUTTINGS FOR LOGGING & SCREENING PURPOSES

G.W. DEPTH @ 0918 → 77.08'

T.W.D. = 105'

Construction Time Log: Start			Finish	
Task	Date	Time	Date	Time
Drilling	1-17-02	1032	1-17-02	1620
~~Geophys. Logging~~				
Casing:	1-17-02	1318	1-17-02	1555
~~Casing:~~				
Sand Pack:	1-17-02	1620	1-17-02	1645
Filter Placement:	~~1-17-02~~		~~1-17-02~~	
Cementing:	1-18-02	0900 ~~0845~~	1-18-02	0915
Development:	1-18-02	0923	1-18-02	0939

Well Development: REMOVED 16 bails (10' bailer) at ~4 gallons per bail for approx. total of 64 gallons.

Well Design & Specifications

Basis: Geologic Log ✓ Geophysical Log

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
82.5' to 62.5'	20' (2x10') OF (S1) SCH. 40 ~~of~~ screen	
62.5' to 0'	BLANK ~~CASING~~ (C1)	
83.5' to 82.5' 94.5' to 93.5'	2-1' COUPLERS *	
93.5' to 83.5' 104.5' to 94.5'	2-10' SECTIONS OF PRE PACK	
105' to 104.5'	6" END CAP	
Casing: C1	4" DIA. (62.5' to 0')	
C2		
PRE PACK	5" DIA. (104.5' to 83.5')	
Screen: S1	4" DIA.-0.010 FOR BOTH PrePACK	
S2	& SCH. 40 screen (104.5' to 62.5')	
Filter Pack:	COLORADO SILICA 10-20 (32 bags) → 105' to 51'	
Grout ~~Seal~~:	49.5' to 0' (TANNER Companies)	
Bentonite	51' to 49.5'	

Sheen? → NONE

Color? → LT. BRN.

Solids? → H_2O NOT CLEAR, A GREAT DEAL OF SEDIMENT.

	Time	pH	Sp. Cond.	Temp. °C
1ST BAIL INITIAL	0923	7.12	3.12	18.3

Stabilization Test Data: * DETAILS

Time	pH	Spec. Cond. µs/m	Temp (C)
0931	7.19	4.64	~~18.~~ 19.7
0933	7.14	4.46	20.6
0935	7.08	4.66	24.2
0937	7.08	4.17	24.3
0939	7.14	4.04	24.5

Site Name: 20TH & FACTOR - YUMA WQARF

Location: 653 20TH ST., YUMA, AZ Behind Bldg. 4, near SW Corner in Sand lot

Supervised By: KRISTIE M. DANIELS

Date: 1-16-02 KMD 17

SOIL BOREHOLE LOG

GeoTrans, Inc.

SITE NAME AND LOCATION: 20TH & FACTOR – YUMA WQARF BEHIND BLDG #4 NEAR SW CORNER

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: NOT SAMPLING, BUT COLLECTING CUTTINGS FOR LOGGING PURPOSES

BORING No.: MW-5

SHEET: 1 OF 2

DRILLING START TIME: 1032 DATE: 1-17-02

DRILLING FINISH TIME: 1620 DATE: 1-17-02

WATER LEVEL / TIME / DATE

DATUM: APPROXIMATE ELEVATION: CASING DEPTH:

DRILLING RIG: CME 75 SURFACE CONDITIONS: ASPHALT

ANGLE: 0° HAMMER WEIGHT: NOTE: CUTTINGS ONLY

SAMPLE HAMMER TORQUE:

DRILLING CONTRACTOR: G.S.I.

JOB NUMBER: E034-C30

DEPTH (FEET)	TIME	F.I.D. (ppm)	Group Symbol	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL
0'				
5'	1034	<1	SP	5' 99% FINE ~~TO MED.~~ GRAINED SAND; 1% CALICHE FRAGS (<0.5" DIA.); ~~LT.~~ BROWN 10 YR 8/3 V. PALE; poorly graded; DRY. No Petroleum odor detected.
10'	1036	<1	SP	10' 100% POORLY GRADED, FINE SAND, V. PALE ~~LT.~~ BRN - 10 YR 8/3 DRY. No Petroleum odor.
15'	1038	<1	SP	15' S.A.A. V. PALE BROWN - 10 YR 8/3 DRY. No Petroleum odor.
20'	1041	<1	SP	20' S.AA. w/ sm. amt. caliche frags <0.25" dia. V. PALE BRN - 10 YR 8/3 DRY. No Petroleum odor.
25'	1044	<1	SP	25' 95% fine sand; 5% caliche frags <(0.5" dia.) V. Pale ~~LT.~~ BRN. - 10 YR 8/3; poorly graded; DRY. No Petroleum odor.
30'	1047	<1	SP	30' 98% FINE SAND; 2% caliche frags <0.25" dia. V. Pale ~~LT.~~ BROWN - 10 YR 8/3 DRY. No Petroleum odor.; poorly graded
35'	1049	<1 (0.7)	SP	35' 95% FINE sand; 5% caliche + gravel <0.5" dia. V. Pale ~~LT.~~ BRN - 10 YR 8/3 DRY. No Petroleum odor. ANGULAR; poorly graded
40'	1052	<1	SP	40' G.S.I. SAYS SM. AMT. OF GRAVEL @ 40'. 99% FINE SAND; 1% CALICHE (<0.5" dia.) 10 YR 8/3 No Petroleum Odor. V. Pale ~~LT.~~ Brn. DRY DRY
45'	1055	<1	SP	45' 99% FINE SAND; 1% CALICHE <0.5" dia. V. Pale ~~LT.~~ BRN - 10 YR 7/3 MOIST. No Petroleum odor.
50'	1058	<1	SW-SM w/ gravel	50' 75% FINE sand; 15% GRAVEL + CALICHE <1" dia) 10% SILT - ~~LT.~~ BRN. ANGULAR MOIST. No Petroleum odor. V. Pale 10 YR 6/3
55'	1101	<1	SW-SM	55' 80% FINE sand; 15% SILT; 5% ANGULAR GRAVEL + CALICHE <0.75" dia. V. ~~LT.~~ Pale BRN - 10 YR 8/3 MOIST. No Petroleum odor. CLAY CLUMPS
60'	1105	<1	SM	60' 70% FINE Sand; 20% SILT; 10% GRAVEL + CALICHE <0.75" dia. V. ~~LT.~~ Pale BRN. - 10 YR - 7/3 MOIST. No Petroleum odor.
65'	1108	<1	SM	65' 75% Fine Sand; 24% SILT; 1% CALICHE + GRAVEL <0.5" dia. V. ~~LT.~~ Pale Brn. - 10 YR 7/3 Increased moisture. No Petroleum odor.
70'	1111	<1	SM	70' S.A.A. V. PALE BROWN - 10 YR 7/3 MOIST. No Petroleum odor.

LOGGED BY: K. DANIELS

CHECKED BY:

DATE: 1-17-02

SOIL BOREHOLE LOG

GeoTrans, Inc.

SITE NAME AND LOCATION: 20TH & FACTOR - YUMA WQARF BEHIND BLDG. 4 IN NW CORNER OF ZONE.

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: NO SAMPLING; ONLY COLLECTING CUTTINGS FOR LOGGING PURPOSES

WATER LEVEL

TIME

DATE

CASING DEPTH

BORING No. MW-5

SHEET 2 OF 2

DRILLING

START	FINISH
TIME 1032	TIME 1620
DATE 1-17-02	DATE 1-17-02

DATUM: APPROXIMATE ELEVATION

DRILLING RIG: CME 75

SURFACE CONDITIONS: ASPHALT

ANGLE: 0°

HAMMER WEIGHT

SAMPLE HAMMER TORQUE

DRILLING CONTRACTOR: G.S.I.

JOB NUMBER: E034-C30

DEPTH IN FEET	Soil Graph	Sample Driven / Recovered	Sample No. / Depth	F.ID. (ppm)	GROUP SYMBOL	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL
75'	1113			<1	SM	75' .75% FINE SAND; 24% CA SILT; 1% CALICHE & SUB ANGULAR GRAVEL; LT. BRN. 10YR 7/3 V. PALE MOIST. No Petroleum odor detected. Clay clumps
80'	1136			<1	SM w/gravel	80' 70% FINE SAND; 20% SILT; 10% CALICHE (rounded) & SUB ROUNDED ANGULAR GRAVEL <0.5" dia. 10YR 7/3 V. LT. BRN. No Petroleum odor. PALE MOIST
85'	1153			<1	SM	85' 65% FINE SAND; 30% SILT; 5% CALICHE & GRAVEL <0.5" dia. CLUMPING OBSERVED LT. BRN. No Petroleum odor. MOIST
90'	1200			<1	SM	90' 70% FINE SAND; 25% SILT; 5% ANGULAR GRAVEL + CALICHE; BROWN (PALE) 10YR 6/3 No Petroleum odor. MOIST
95'	1207			<1	SM w/gravel	95' 60% Fine Sand; 25% SILT; 15% Sm. ROCK FRAGS-ANGULAR (<0.25") + CALICHE CLUMPS 10YR 6/3 - Pale Brn. No Petroleum odor. MOIST
100'	1217			<1	SM	100' SILTY SAND S.A.A. Less same clumping of silt 10YR 6/3 No Petroleum odor. Pale Brn. MOIST
105'	1620			<1	SC	105-110' CLAYEY SAND - STICKY, POORLY GRADED SAND; WET; 100% 10YR 6/3 - MED. BRN PALE BROWN

BORING TERMINATED @ 105 FEET

Note: Multiwarn (Dräger), PID, + FID used to monitor ambient air in work zone. O_2 would fluctuate in windy conditions, but all other parameters remained <1 ppm.

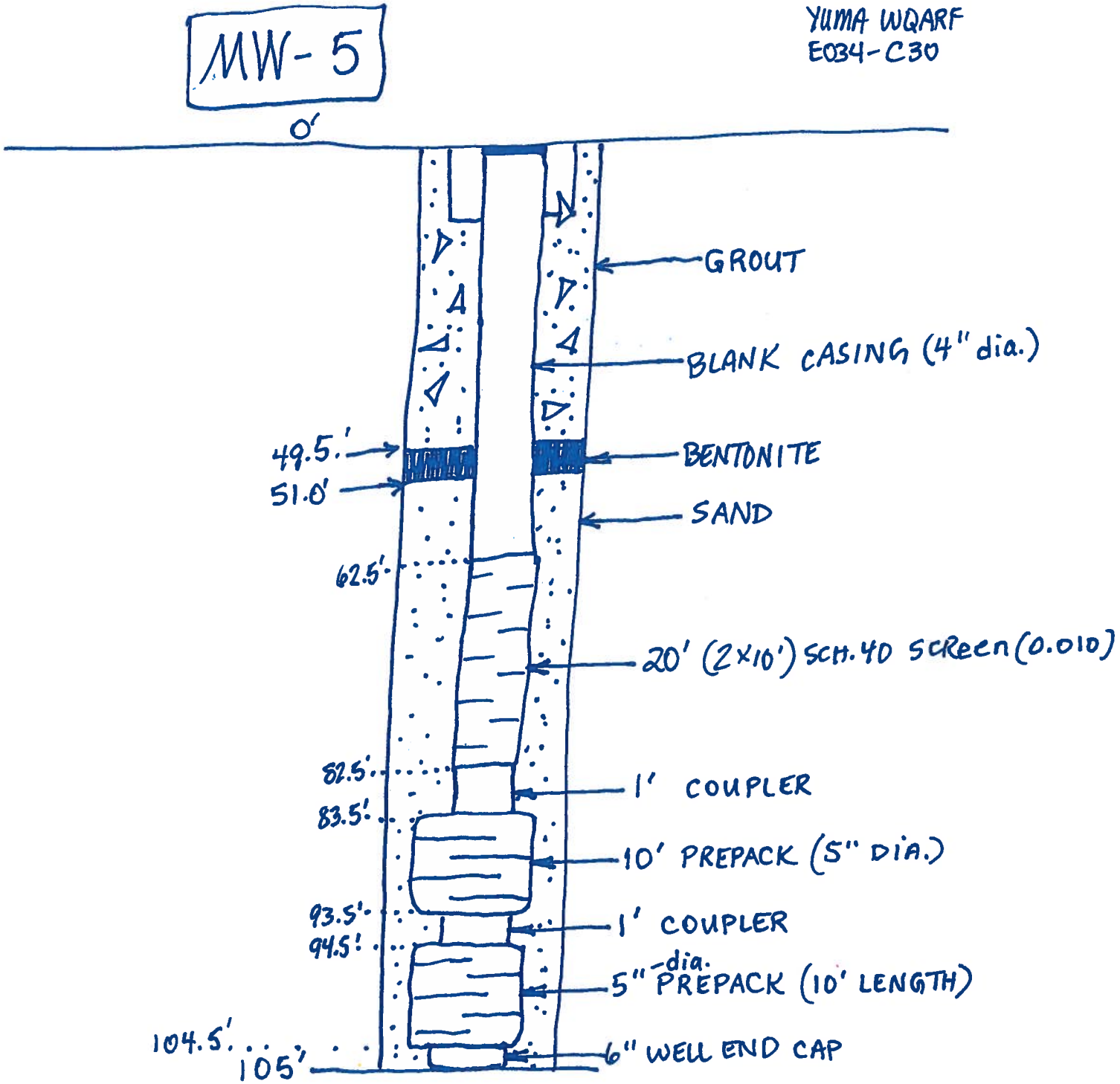
LOGGED BY: K. DANIELS

DATE: 1-17-02

CHECKED BY

WELL CONSTRUCTION DIAGRAM

1-17-02



SOIL BOREHOLE LOG

GeoTrans, Inc.

SITE NAME AND LOCATION: 20TH & FACTOR – YUMA WQARF
BEHIND BLDG #4 NEAR SW CORNER

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: NOT SAMPLING, BUT COLLECTING CUTTINGS FOR LOGGING PURPOSES

WATER LEVEL
TIME
DATE

CASING DEPTH

BORING No.: MW-5

SHEET: 1 OF 2

DRILLING START TIME: 1032 DATE: 1-17-02
DRILLING FINISH TIME: 1620 DATE: 1-17-02

DATUM: APPROXIMATE ELEVATION:

DRILLING RIG: CME 75

SURFACE CONDITIONS: ASPHALT

ANGLE: 0° HAMMER WEIGHT:

NOTE: CUTTINGS ONLY

SAMPLE HAMMER TORQUE:

DEPTH	TIME		F.I.D. (ppm)	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL
0'				
			<1	5' 99% FINE-TO-MED. GRAINED SAND; 1% CALICHE FRAGS (< 0.5" DIA.); LT. BROWN DRY NO Petroleum odor detected.
5'	1034			
			<1	10' 100% POORLY GRADED, FINE SAND, LT. BRN DRY No Petroleum odor.
10'	1036			
			<1	15' S.A.A. DRY No Petroleum odor.
15'	1038			
			<1	20' S.AA. w/ sm. amt. caliche frags <0.25" dia. DRY No Petroleum odor.
20'	1041			
			<1	25' 95% fine sand; 5% caliche frags <(0.5" dia.) LT. BRN. DRY No Petroleum odor.
25'	1044			
			<1	30' 98% FINE SAND; 2% caliche frags <0.25" dia. LT. BROWN DRY No Petroleum odor.
30'	1047			
			<1 (0.7)	35' 95% FINE sand; 5% caliche + gravel < 0.5" dia. LT. BRN DRY No Petroleum odor. ANGULAR
35'	1049			
			<1	40' G.S.I. SAYS SM. AMT. OF GRAVEL @ 40'. 99% FINE sand; 1% CALICHE (< 0.5" dia.) No Petroleum Odor. Lt. Brn. DRY DRY
40'	1052			
			<1	45' 99% FINE SAND; 1% CALICHE <0.5" dia. LT. BRN MOIST No Petroleum odor.
45'	1055			
			<1	50' 75% FINE sand; 15% GRAVEL + CALICHE < 1" dia) 10% SILT – LT. BRN. ANGULAR MOIST No Petroleum odor.
50'	1058			
			<1	55' 80% FINE sand; 15% SILT; 5% ANGULAR GRAVEL + CALICHE < 0.75" dia. LT. BRN MOIST No Petroleum odor. CLAY CLUMPS
55'	1101			
			<1	60' 70% FINE sand; 20% SILT; 10% GRAVEL + CALICHE < 0.75" dia. LT. BRN. MOIST No Petroleum odor.
60'	1105			
			<1	65' 75% Fine Sand; 24% SILT; 1% CALICHE + GRAVEL < 0.5" dia. Lt. Brn. Increased moisture No Petroleum odor.
65'	1108			
			<1	70' S.A.A. No Petroleum odor. MOIST
70'	1111			

DRILLING CONTRACTOR: G.S.I.
BOREHOLE NUMBER: E034-C30
LOGGED BY: K. DANIELS
DATE: 1-17-02
CHECKED BY:

SOIL BOREHOLE LOG

GeoTrans, Inc.

SITE NAME AND LOCATION: 20TH & FACTOR - YUMA WQARF BEHIND BLDG. 4 IN NW CORNER OF ZONE.

DRILLING METHOD: HOLLOW STEM AUGER

SAMPLING METHOD: NO SAMPLING; ONLY COLLECTING CUTTINGS FOR LOGGING PURPOSES

BORING No.: MW-5

SHEET: 2 OF 2

DRILLING	START TIME	FINISH TIME
	1032	1620
	DATE	DATE
	1-17-02	1-17-02

WATER LEVEL
TIME
DATE
CASING DEPTH

DATUM: APPROXIMATE ELEVATION:

DRILLING RIG: CME 75

SURFACE CONDITIONS: ASPHALT

ANGLE: 0°

HAMMER WEIGHT:

SAMPLE HAMMER TORQUE:

DRILLING CONTRACTOR: G.S.I.

BOREHOLE NUMBER: E034-C30

DEPTH	TIME	SAMPLE NUMBER	SAMPLE TYPE	F.ID. (ppm)	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL
75'	1113			<1	75' .75% FINE SAND; 24% SILT; 1% CALICHE & SUBANGULAR GRAVEL; LT. BRN. MOIST. No Petroleum odor detected.
80'	1136			<1	80' 70% FINE SAND; 20% SILT; 10% CALICHE (rounded) & SUB ~~ROUNDED~~ angular gravel <0.5" dia; LT. BRN. MOIST. No Petroleum odor.
85'	1153			<1	85' 65% FINE Sand; 30% SILT; 5% CALICHE & GRAVEL <0.5" dia. CLUMPING observed LT. BRN. MOIST. No Petroleum odor.
90'	1200			<1	90' 70% FINE SAND; 25% SILT; 5% ANGULAR GRAVEL + CALICHE; BROWN MOIST. No Petroleum odor.
95'	1207			<1	95' 60% Fine Sand; 25% SILT; 15% Sm. ROCK FRAGS-ANGULAR (<0.25") + CALICHE CLUMPS MOIST. No Petroleum odor.
100'	1217			<1	100' SILTY SAND S.A.A. Less MOIST. Some clumping of silt. No Petroleum odor.
105'	1620			<1	105-110' CLAYEY SAND - STICKY, POORLY GRADED SAND; WET; 100% MED. BRN.

* BORING TERMINATED @ 105 FEET *

Note: Multiwarn (Dräger), PID, + FID used to monitor ambient air in work zone. O_2 WOULD FLUCTUATE IN WINDY CONDITIONS, but ALL OTHER PARAMETERS Remained <1 ppm

LOGGED BY: K. DANIELS

DATE: 1-17-02

CHECKED BY:

Site Map	**Project No:** E034-C30 **Client:** ADEQ **Site:** Yuma WQARF-20th & Factor	**Borehole No: MW-5** **Start Date/Time:** 01-17-02 (10:32) **End Date/Time:** 01-17-02 (16:20) **Logged By:** K. Daniels
	Drilling Method: Hollow-Stem Auger **Borehole Diameter:** 9-5/8 Inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** NONE - CUTTINGS ONLY

Depth	Sample Characteristics: DEPTH (FEET)	TIME	FID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
					Asphalt Surface
0	5	10:34	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 8/3); 98% fine grained sand; 1% silt; 1% caliche frags (<0.5"dia.); dry; no odor
5	10	10:36	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 8/3); 99% fine grained sand; 1% silt; dry; no odor
10	15	10:38	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 8/3); 99% fine grained sand; 1% silt; dry; no odor
15	20	10:41	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 8/3); 98% fine grained sand; 1% silt; 1% caliche frags (<0.25"dia.); dry; no odor
20	25	10:44	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 8/3); 95% fine grained sand; 1% silt; 4% caliche frags (<0.5"dia.); dry; no odor
25	30	10:47	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 8/3); 98% fine grained sand; 1% silt; 1% caliche frags (<0.25"dia.); dry; no odor
30	35	10:49	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 8/3); 95% fine grained sand; 4% caliche frags (<0.5"dia.); 1% silt; dry; no odor
35	40	10:52	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 8/3); 98% fine grained sand; 1% silt; 1% caliche frags (<0.5"dia.); dry; no odor. Note: G.S.I.(driller) says he encountered gravel at 40'
40	45	10:55	<1		**POORLY GRADED SAND (SP)** Very pale brown (10Y 7/3); 98% fine grained sand; 1% silt; 1% caliche (<0.5"dia.); moist; no odor
45	50	10:58	<1		**SILTY SAND WITH GRAVEL (SM)** Pale brown (10YR 6/3); 75% fine grained sand; 15% caliche frags (<1.0"dia.); 10% silt; moist; no odor
50					

Drilling Contractor: GeoMechanics Southwest, Inc
Checked By: J.Z. and D.B.
Date Checked: 02-06-02

GeoTrans, Inc.
4665 South Ash Avenue, Suite G-1
Tempe, Arizona 85282
Voice: 480-839-2800 Fax: 480-839-2828

Site Map	**Project No:** E034-C30 **Client:** ADEQ **Site:** Yuma WQARF-20th & Factor	**Borehole No: MW-5** **Start Date/Time:** 01-17-02 (10:32) **End Date/Time:** 01-17-02 (16:20) **Logged By:** K. Daniels
	Drilling Method: Hollow-Stem Auger **Borehole Diameter:** 9-5/8 Inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** NONE - CUTTINGS ONLY

Depth	Sample Characteristics: DEPTH (FEET)	TIME	FID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
	55	11:01	<1		**WELL GRADED SAND WITH SILT (SW-SM)** Very pale brown (10YR 7/3); 80% fine grained sand; 15% silt; 5% angular gravel-caliche (<0.75" dia.); moist; no odor; clay clumps
55	60	11:05	<1		**SILTY SAND WITH GRAVEL (SM)** Very pale brown (10YR 7/3); 70% fine sand; 20% silt; 10% caliche-gravel (<0.75" dia.); moist; no odor
60	65	11:08	<1		**SILTY SAND (SM)** Very pale brown (10YR 7/3); 75% fine grained sand; 24% silt; 1% caliche and gravel (<0.5"dia.); increased moisture from 60'; no odor
65	70	11:11	<1		**SILTY SAND (SM)** Very pale brown (10YR 7/3); 75% fine grained sand; 24% silt; 1% caliche and gravel (<0.5"dia.); increased moisture from 60'; no odor
70	75	11:13	<1		**SILTY SAND (SM)** HIT WATER 75-80': Very pale brown (10YR 7/3); 75% fine grained sand; 24% silt; 1% caliche and sub-angular gravel; wet; no odor
75	80	11:36	<1		**SILTY SAND (SM)** Very pale brown (10YR 7/3); 70% fine grained sand; 20% silt; 10% caliche (rounded) and sub-angular gravel (<0.5"dia.); moist; no odor
80	85	11:53	<1		**SILTY SAND (SM)** Very pale brown (10YR 7/3); 65% fine sand; 30% silt; 5% rounded caliche gravel (<0.5"dia.); moist; no odor; clumping observed
85	90	12:00	<1		**SILTY SAND (SM)** Pale brown (10YR 6/3); 70% fine sand; 25% silt; 5% angular gravel and caliche; moist; no odor
90	95	12:07	<1		**SILTY SAND WITH GRAVEL (SM)** Pale brown (10YR 6/3); 60% fine sand; 25% silt; 15% sm. angular frags and caliche (<0.25"dia.); moist; no odor; clayey clumps
95	100	12:17	<1		
100					

Drilling Contractor: GeoMechanics Southwest, Inc
Checked By: J.Z. and D.B.
Date Checked: 02-06-02

GeoTrans, Inc.
4665 South Ash Avenue, Suite G-1
Tempe, Arizona 85282
Voice: 480-839-2800 Fax: 480-839-2828

Site Map	**Project No:** E034-C30 **Client:** ADEQ **Site:** Yuma WQARF-20th & Factor	**Borehole No: MW-5** **Start Date/Time:** 01-17-02 (10:32) **End Date/Time:** 01-17-02 (16:20) **Logged By:** K. Daniels
	Drilling Method: Hollow-Stem Auger **Borehole Diameter:** 9-5/8 Inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** NONE - CUTTINGS ONLY

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	FID (ppm)	Lithology	Description and Comments
	105	16:20	<1		**CLAYEY SAND (SC)** 105-110': Pale brown (10YR 6/3); 60% fine grained sand; 40% sticky, soft, clay (again, cuttings only); wet; no odor
105					*****BORING TERMINATED AT 105 FEET*****
110					
115					
120					
125					
130					
135					
140					
145					
150					

Drilling Contractor: GeoMechanics Southwest, Inc
Checked By: J.Z. and D.B.
Date Checked: 02-06-02

GeoTrans, Inc.
4665 South Ash Avenue, Suite G-1
Tempe, Arizona 85282
Voice: 480-839-2800 Fax: 480-839-2828

E034-C30 + 80

MW-5

WELL DEVELOPMENT * MW-5

1-18-02

2-minute Int

Bailing Time: START 0923 AM
FINISH 0939 AM

Removed 16 bails @ ~4 GAL. ea. = 64 gallons.

Visual: Sheen? NO
Color? Lt. Brown
Solids? Thick

G.W. @ 77.08 FEET @ 09:18 AM
T.W.D. = 105'

	Time	pH	Spec. Cond.	Temp (°C)
Initial Reading				
BAILER #1	0923	7.12	3.12	18.3
	0931	7.19	4.64	19.7
	0933	7.14	4.46	20.6
	0935	7.08	4.66	24.2
	0937	7.08	4.17	24.3
	0939	7.14	4.04	23.5

~64 GALLONS REMOVED DURING DEVELOPMENT

Bailer #	Time	Bailer #	Time	Bailer #	Time
2nd	0924	7	0930	12	0935
3	0925	8	0931	13	0937
4	0926	9	0932	14	0938
5	0927	10	0933	15	0939
6	0929	11	0934	16	@ Complete

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-5

Boring No. X-Ref: GP-444

Survey Coords: Northing - 9750.526; Easting - 10946.841

Elevation Ground Level: 198.92'

Job Number: E034-C30

Top of Casing: 198.25'

Drilling Summary:	
Total Depth	105'
Borehole Diameter	9-5/8"
Casing Stick-Up	None
Driller	GeoMechanics Southwest, Inc.
Rig	CME 75
Bit(s)	~10"
Drilling Fluid	None
Protective Casing	None

Comments: No samples collected; only cuttings for logging and screening purposes.

G.W. Depth at 09:18 = 77.08'

Construction Time Log:	Start		Finish	
Task	Date	Time	Date	Time
Drilling	1-17-02	10:32	1-17-02	16:20
Geophys. Logging				
Casing:	1-17-02	13:18	1-17-02	15:55
Casing:				
Sand Pack:	1-17-02	16:20	1-17-02	16:45
Filter Placement:				
Cementing:	1-18-02	09:00	1-18-02	09:15
Development:	1-18-02	09:23	1-18-02	09:39

Well Design & Specifications

Basis: Geologic Log __X__ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
82.5' to 62.5'	S1: 20' (2x10') of Sch.40 screen	116.42' to 136.42'
62.5' to 0'	C1: Blank Casing	136.42' to 198.25'
83.5' to 82.5' 94.5' to 93.5'	2-1' Couplers	115.42' to 116.42' 104.42' to 105.42'
93.5' to 83.5' 104.5' to 94.5'	2-10' Sections of PrePack	105.42' to 115.42' 94.42' to 104.42'
105' to 104.5'	6" End Cap	93.92' to 94.42'

Casing: C1	4" dia. (62.5' to 0')
PrePack:	5" dia. (104.5' to 83.5')
Screen: S1	4" dia. - 0.010 for both PrePack and Sch.40 screen
	(104.5' to 62.5')
Filter Pack:	Colorado Silica 10-20 (32 bags) - 105' to 51'
Grout Seal:	49.5' to 0' by Tanner Companies
Seal:	51' to 49.5' (Bentonite)

Well Development: Removed 16 bails. Used 10' bailer at approximately 4 gallons per bail for an approximate total of 64 gallons.

Sheen: None

Color: Light brown

Solids: H20 not clear. A great deal of sediment present.

Stabilization Test Data:

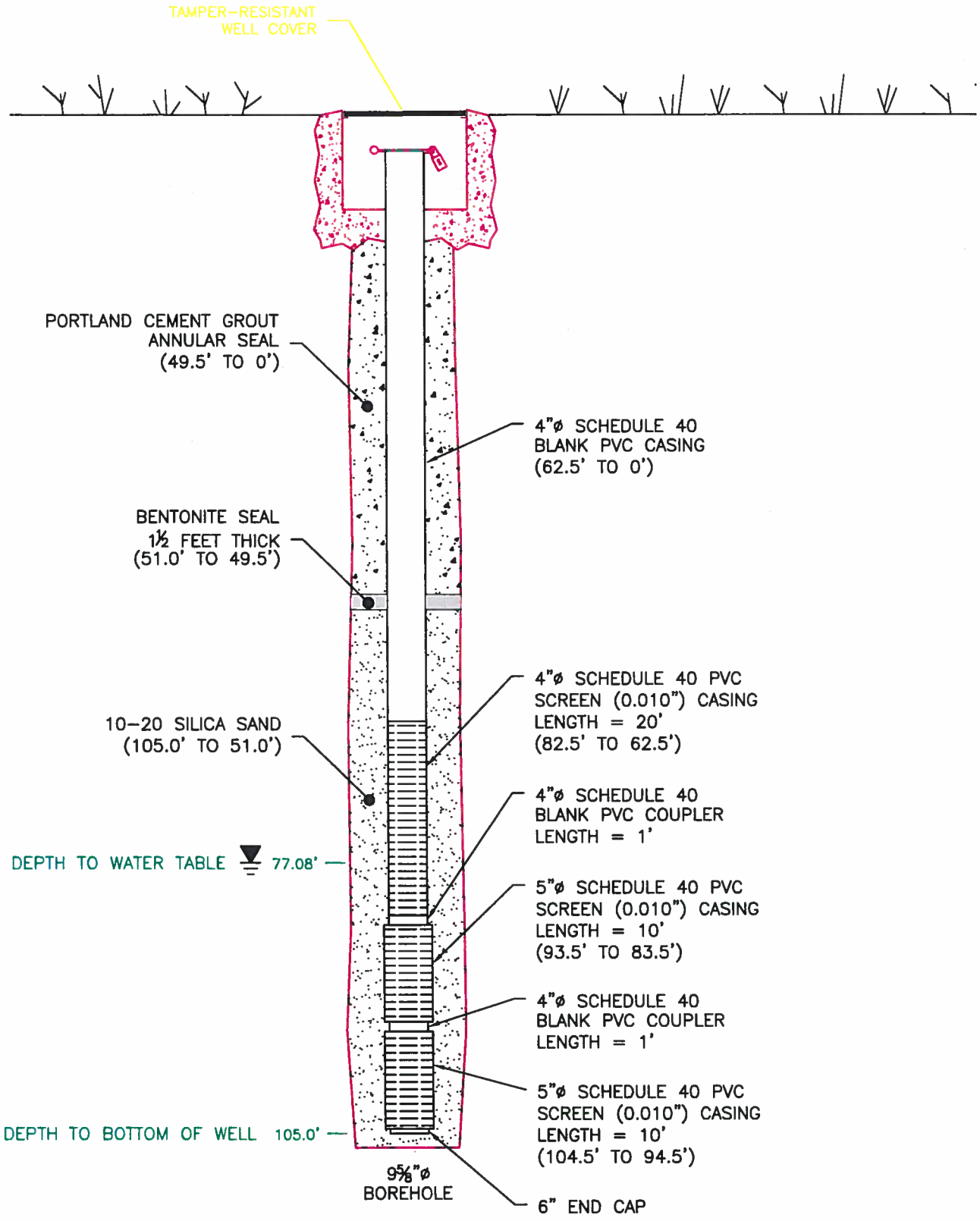
Time	pH	Spec. Cond. µs/m	Temp (C)
09:23	7.12	3.12	18.3
09:31	7.19	4.64	19.7
09:33	7.14	4.46	20.6
09:35	7.08	4.66	24.2
09:37	7.08	4.17	24.3
09:39	7.14	4.04	24.5

Site Name: 20th & Factor - YUMA WQARF

Location: 653 E. 20TH St., Yuma, AZ (Zone 5, near SW corner of Bldg.4)

Supervised By: Kristie M. Daniels

Date: 1-18-02



VERTICAL SCALE: 1"=15'
HORIZONTAL SCALE: 1"=15"

TITLE:	WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-5		
LOCATION:	YUMA - 20TH & FACTOR		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	KD	FIGURE
	DRAFTED	DBS	1
	PROJECT	E034-C30	
	DATE	2/13/01	

GeoTrans, Inc.	Project No: E034-C30	Borehole No: MW-6A ADWR ID: 55-588282
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/16/02 End Date/Time: 1/16/02 Logged By: KD
	Drilling Method: Hollow Stem Auger Borehole Diameter: 9 5/8 inches	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–5					**Silty Sand** Very pale brown (10 YR 8/3), fine grained sand, silt, 1% angular gravel, dry to moist, unknown odor
6–9					**Poorly Graded Sand** Light yellow brown (10 YR 6/4), fine grained sand, 1% silt, 1% sub-rounded gravel, slighlty moist
10–14					**Poorly Graded Sand with Silt** Very pale bown (10 YR 7/3), fine grained sand, 10% sub-rounded gravel, silt, moist, clayey clumps
15–20					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 2% silt, moist
21–25					**Poorly Graded Sand** Very pale brown (10 YR 7/3/), fine grained sand, 2% silt, 1% sub-rounded gravel, moist
26–29					**Poorly Graded Sand** Very pale brown (10 YR 7/3/), fine grained sand, 1% silt, moist
30–35					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand 1% silt, moist
36–40					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, moist
41–45					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 1% silt, increased moisture from 40', driller says small amounts of gravel at 45', clay clumps
46–50					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 1% silt, moist, clayey clumps

Drilling Contractor: GSI

Checked By: JZ

Date Checked: 2/5/02

Sheet: 1 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: E034-C30	Borehole No: MW-6A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/16/02 End Date/Time: 1/16/02 Logged By: KD
	Drilling Method: Hollow Stem Auger Borehole Diameter: 9 5/8 inches	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54 55					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, moist, clayey clumps
56 57 58 59 60					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 5% silt, moist
61 62 63 64 65					**Poorly Graded Sand with Silt** Very pale brown (10 YR 7/3), fine grained sand, 15% silt, moist
66 67 68 69 70					**Silty Sand** Very pale brown (10 YR 7/3), fine grained sand, 24% silt, 1% angular gravel, moist
71 72 73 74 75					**Poorly Graded Sand** Very pale brown (10YR 7/3), fine grained sand, 5% silt, 1% sub-rounded gravel, wet GROUNDWATER 75-80' bgs.
76 77 78 79 80					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 3% silt, wet, clayey clumps
81 82 83 84 85					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 2% silt, 1% coarse grained sand, wet
86 87 88 89 90					**Poorly Graded Sand** Very pale brown (10 YR 6/4), fine grained sand, 2% silt, 2% coarse grained sand, wet
91 92 93 94 95					**Poorly Graded Sand** Light yellow brown (10 YR 6/4), fine grained sand, 3% silt, 3% coarse grained sand, wet
96 97 98 99 100					**Poorly Graded Sand** Light yellow brown (10 YR 6/4), fine grained sand, 3% silt, 1% coarse grained sand, moist to wet

Drilling Contractor: GSI
Checked By: JZ
Date Checked: 2/5/02

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-6

Boring No. X-Ref: -

Survey Coords: Northing - 9964.942: Easting - 10957.911

Elevation Ground Level: 197.95'

Job Number: E034-C30

Top of Casing: 197.63'

Drilling Summary:	
Total Depth	103.5'
Borehole Diameter	9-5/8"
Casing Stick-Up	None
Driller	GeoMechanics Southwest, Inc.
Rig	CME 75
Bit(s)	~10"
Drilling Fluid	None
Protective Casing	None

Comments: No samples collected; only cuttings for logging and screening (i.e., FID) purposes.

G.W. Depth at 15:23 = 76.37'

Construction Time Log:	Start		Finish	
Task	Date	Time	Date	Time
Drilling	1-16-02	10:30	1-16-02	12:50
Geophys. Logging				
Casing:	1-16-02	13:45	1-16-02	15:00
Casing:				
Sand Pack:	1-16-02	15:00	1-16-02	15:35
Filter Placement:				
Cementing:	1-17-02	11:20	1-17-02	11:40
Development:	1-16-02	15:40	1-16-02	16:03

Well Design & Specifications

Basis: Geologic Log X Geophysical Log _____

Casing String(s): C = Casing S = Screen

Well Development: Removed 15 bails. Used 10' bailer at approximately 4 gallons per bail for an approximate total of 60 gallons.

Site Name: 20th & Factor - YUMA WQARF

Location: 653 E. 20TH St., Yuma, AZ (Corner of 20th & Factor)

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
61.0' to 0'	C1: Blank Casing	136.95' to 197.63'
81.0' to 61.0'	S1: 20' (2x10') of Sch.40 screen	116.95' to 136.95'
82.0' to 81.0' 93.0' to 92.0'	2-1' Couplers	115.95' to 116.95' 104.95' to 105.95'
92.0' to 82.0' 103.0' to 93.0'	2-10' Sections of PrePack	105.95' to 115>95' 94.95' to 104.95'
103.5' to 103.0'	6" End Cap	94.45' to 94.95'

Sheen: None

Color: Light brown

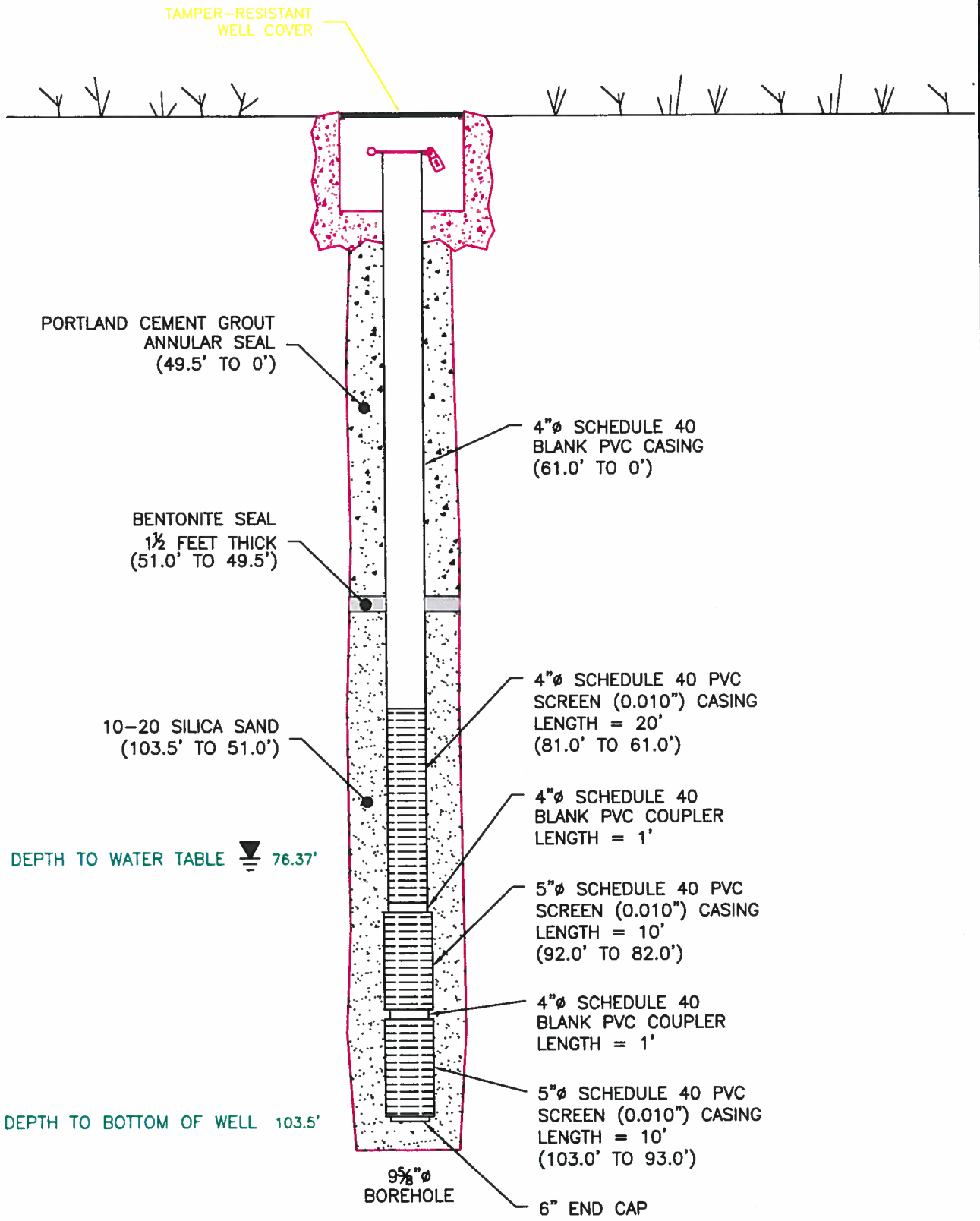
Casing: C1	4" dia. (61.0' to 0')
PrePack:	5" dia. (103.0' to 82.0')
Screen: S1	4" dia. - 0.010 for both PrePack and Sch.40 screen
	(103.0' to 61.0')
Filter Pack:	Colorado Silica 10-20 (30 bags) - 103.5' to 51.0'
Grout Seal:	49.5' to 0' by Tanner Companies
Seal:	51' to 49.5' (Bentonite)

Stabilization Test Data:

Time	pH	Spec. Cond. µs/m	Temp (C)
15:40	6.73	3.43	24.8
15:55	6.98	3.42	23.9
15:57	7.05	3.33	23.8
15:59	7.05	3.21	24.9
16:01	7.04	3.17	24.9
16:03	7.12	3.29	24.5

Supervised By: Kristie M. Daniels

Date: 1-16-02



VERTICAL SCALE: 1"=15'
HORIZONTAL SCALE: 1"=15"

TITLE:	WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-6
LOCATION:	YUMA - 20TH & FACTOR

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	KD	FIGURE
DRAFTED	DBS	2
PROJECT	E034-C30	
DATE	2/21/02	

Site Map	**Project No:** E034-C30 **Client:** ADEQ **Site:** Yuma WQARF-20th & Factor	**Borehole No: MW-6** **Start Date/Time:** 01-16-02 (10:30) **End Date/Time:** 01-16-02 (12:50) **Logged By:** K. Daniels
	Drilling Method: Hollow-Stem Auger **Borehole Diameter:** 9-5/8 Inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** NONE - CUTTINGS ONLY

Depth	Sample Characteristics: DEPTH (FEET)	TIME	FID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
					Asphalt Surface
0	5	10:35	<1		**SILTY SAND (SM)** Very pale brown (10YR 8/3); 75% fine grained sand; 24% silt; 1% angular gravel (<0.5"dia.); dry-to-moist; unknown odor
5	10	10:40	<1		**POORLY GRADED SAND (SP)** Lt yel. brn.(10 YR 6/4); 98% fine sand; 1% silt; 1% sub-rounded gravel (<0.75"dia.); slightly moist; no odor
10	15	10:43	<1		**POORLY GRADED SAND WITH SILT (SP-SM)** Very pale brown (10 YR 7/3); 85% fine grained sand; 10% sub-rounded gravel (<0.75"dia.); 5% silt; moist; no odor; clayey clumps
15	20	10:47	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 7/3); 98% fine grained sand; 2% silt; moist; no odor
20	25	10:50	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 7/3); 98% fine grained sand; 1% silt; 1% sub-rounded gravel (<0.5"dia.); moist; no odor
25	30	10:54	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 7/3); 97% fine grained sand; 2% silt; 1% sub-rounded gravel (<0.5"dia.); moist; unknown odor
30	35	10:56	<1		**POORLY GRADED SAND (SP)** Very pale brown (10 YR 7/3); 99% fine grained sand; 1% silt; moist; no odor
35	40	11:00	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/3); 100% fine grained sand; moist; no odor
40	45	11:02	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/3); 99% fine grained sand; 1% silt; increased moisture from 40'; no odor; G.S.I.(driller), says small amount of gravel at 45'; clay clumps
45	50	11:06	<1		**POORLY GRADED SAND (SP)** Very pale brown (10Y 7/3); 99% fine grained sand; 1% silt; moist; no odor; clayey clumps
50					

Drilling Contractor: GeoMechanics Southwest, Inc
Checked By: J.Z. and D.B.
Date Checked: 02-05-02

GeoTrans, Inc.
4665 South Ash Avenue, Suite G-1
Tempe, Arizona 85282
Voice: 480-839-2800 Fax: 480-839-2828

Site Map	**Project No:** E034-C30 **Client:** ADEQ **Site:** Yuma WQARF-20th & Factor	**Borehole No: MW-6** **Start Date/Time:** 01-16-02 (10:30) **End Date/Time:** 01-16-02 (12:50) **Logged By:** K. Daniels
	Drilling Method: Hollow-Stem Auger **Borehole Diameter:** 9-5/8 Inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** NONE - CUTTINGS ONLY

Depth	Sample Characteristics: DEPTH (FEET)	TIME	FID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
	55	11:09	<1		**POORLY GRADED SAND (SP)** Very pale brown (10Y 7/3); 100% fine grained sand; moist; no odor; clayey clumps
55	60	11:13	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/3); 95% fine sand; 5% silt; moist; no odor
60	65	11:16	<1		**POORLY GRADED SAND WITH SILT (SP-SM)** Very pale brown (10YR 7/3); 85% fine grained sand; 15% silt; moist; no odor
65	70	11:20	<1		**SILTY SAND (SM)** Very pale brown (10YR 7/3); 75% fine grained sand; 24% silt; 1% angular gravel; moist; no odor
70	75	11:27	<1		**POORLY GRADED SAND (SP)** HIT WATER between 75-80' bgs. Very pale brown (10YR 7/3); 94% fine grained sand; 5% silt; 1% sub-rounded gravel (<0.75" dia.); wet; no odor
75	80	11:32	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/3); 97% fine grained sand; 3% silt; wet; no odor; clay clumps
80	85	12:37	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/3); 97% fine grained sand; 2% silt; 1% coarse grained sand; wet; no odor
85	90	12:40	<1		**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/3); 96% fine grained sand; 2% silt; 2% coarse grained sand; wet; no odor
90	95	12:45	<1		**POORLY GRADED SAND (SP)** Light yellow brown (10YR 6/4); 94% fine grained sand; 3% silt; 3% coarse grained sand; wet; no odor
95	100	12:50	<1		**POORLY GRADED SAND (SP)** Light yellow brown (10YR 6/4); 96% fine grained sand; 3% silt; 1% coarse *****BORING TERMINATED AT 103.5 FEET*****
100					

Drilling Contractor: GeoMechanics Southwest, Inc
Checked By: J.Z. and D.B.
Date Checked: 02-05-02

GeoTrans, Inc.
4665 South Ash Avenue, Suite G-1
Tempe, Arizona 85282
Voice: 480-839-2800 Fax: 480-839-2828

SOIL BOREHOLE LOG

GeoTrans, Inc.

SITE NAME AND LOCATION: 20TH & FACTOR - YUMA WQARF

DRILLING METHOD: HOLLOW STEM AUGER

BORING No.: MW-6

SHEET: 1 OF 2

SAMPLING METHOD: No SAMPLES Collected; only cuttings

DRILLING START TIME: 1030 DATE: 1-16-02

DRILLING FINISH TIME: 1250 DATE: 1-16-02

WATER LEVEL

TIME

DATE

CASING DEPTH

DATUM:

APPROXIMATE ELEVATION

DRILLING RIG: CME 75

SURFACE CONDITIONS: ASPHALT

ANGLE: 0°

HAMMER WEIGHT

SAMPLE HAMMER TORQUE

DEPTH (FEET)	Soil Sample	Number Driven / Recovered	Number of Blows / Depth	FID (ppm)	GROUP SYMBOL	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL
0'						
				<1	SM	5' 75 % Fine sand; 24 % SILT; 1% ANGULAR gravel (<0.5" dia); poorly graded; dry-to-moist 10YR 8/3; SOME ODOR DETECTED, NOT SURE WHAT THOUGH.
5'	1035			<1	SP	10' 98 % fine sand; 1 % silt; 1 % subrounded gravel (<0.75" dia); poorly graded, slightly moist 10YR 6/4; NO PETROLEUM ODOR
10'	1040			<1	SP	15' 85 % fine sand; 5 % silt; 10 % subrounded gravel. 10YR 7/3; (<0.75" dia.) NO Petroleum odor; clayey clumps; moist
15	1043			0.6 w/grave		
				<1	SP	20' 98 % fine sand; 2 % silt; poorly graded; NO gravel. 10YR 7/3; NO Petroleum odor; moist
20	1047			<1	SP	25' 98 % fine sand; 1 % silt; 1 % subrounded gravel (<0.5" dia.); NO Petroleum odor 10YR 7/3; moist
25	1050			<1	SP	30' 97 % fine sand; 2 % silt; <1 % subrounded gravel (<0.5" dia.) poorly graded 10YR 7/3; SOME KIND OF ODOR DETECTED - UNSURE
30	1054			<1	SP	35' 100 % fine sand; little to NO silt; no gravel; moist - 10YR 7/3; NO Petroleum odor; poorly grd; ~~to dry~~
35	1056			<1	SP	40' 100 % fine sand; NO % silt; NO GRAVEL. moist; NO Petroleum odor; poorly graded; 10 YR 7/3
40	1100			0.7	SP	45' G.S.I. SAYS SM. AMT OF GRAVEL @ 45' WE DIDN'T SEE GRAVEL 99 % fine sand; 1 % silt; increased moisture; NO Petroleum odor; clay clumps; 10 YR 7/3 → poorly graded
45	1102			<1	SP	50' 99 % Fine Sand; 1 % Silt; NO GRAVEL; moist; poorly graded; 10 YR 7/3; NO Petroleum odor; clayey clumps
50	1106			<1	SP	55' 100 % Fine Sand; NO % Silt; NO gravel; moist; 10 YR 7/3; NO Petroleum odor; clayey clumps
55	1109			0.6		
				<1	SP	60' 95 % Fine Sand; 5 % Silt; NO gravel; moist; poorly graded; NO petroleum odor; 10 YR 7/3
60	1113			0.8		
				<1	SP-SM	65' 85 % fine sand; 15 % silt; NO GRAVEL. moist; NO Petroleum odor; poorly graded; 10 YR 7/3
65	1116			0.8		
				<1	SM	70' 75 % fine sand; 24 % silt; 1 % angular gravel; moist; NO Petroleum odor; ~~poorly~~ med graded; 10 YR 7/3
70'	1120					

DRILLING CONTRACTOR: GEOMECHANICS SOUTHWEST, INC

JOB NUMBER: E034-C30

LOGGED BY: KRISTIE M. DANIELS

CHECKED BY:

DATE: 1-16-02

SOIL BOREHOLE LOG

GeoTrans, Inc.

SITE NAME AND LOCATION: 20th & FACTOR - YUMA WQARF

DRILLING METHOD: HOLLOW STEM AUGER

BORING No.: MW-6

SHEET: 2 OF 2

SAMPLING METHOD: No Samples Collected; only cuttings

DRILLING START TIME: 1030 DATE: 1-16-02

DRILLING FINISH TIME: 1250 DATE: 1-16-02

WATER LEVEL / TIME / DATE

CASING DEPTH

DATUM: APPROXIMATE ELEVATION:

DRILLING RIG: CME 75

SURFACE CONDITIONS: ASPHALT

ANGLE: 0°

HAMMER WEIGHT:

AUGERS ARE 9 5/8" O.D. / 6 1/4" I.D.

SAMPLE HAMMER TORQUE:

DEPTH IN FEET	Soil Graph.	Sample Driven	Sample Recovered	Sample No. Date	FID (ppm)	GROUP SYMBOL	SAMPLE NUMBER AND DESCRIPTION OF MATERIAL
					<1	SP	75' 94% Fine sand; 5% silt; 10 YR 7/3; 1% subrounded gravel (<0.75" dia.); poorly graded; WET No petroleum odor - Hit water 75-80'!
75'	1127				<1	SP	80' 97% Fine sand; 3% silt; No gravel; wet 10 YR 7/3; No Petroleum odor; clay clumps; poorly graded
80'	1132				<1	SP	85' 97% FINE SAND; 2% SILT; 1% coarse sand; wet 10 YR 7/3; No Petroleum odor; poorly graded
85'	1237				<1	SP	90' 96% Fine Sand; 2% silt; 2% coarse sand; wet 10 YR 7/3; NO Petroleum odor; poorly graded
90'	1240				<1	SP	95' 94% fine sand; 3% silt; 3% coarse sand; wet 10 YR 6/4; NO PETROLEUM ODOR; poorly graded;
95'	1245				<1	SP	100' 96% fine sand; 3% SILT; 1% coarse sand; moist-to-wet 10 YR 6/4 No petroleum odor; poorly graded;
100'	1250						~~105'~~ KO
~~105'~~ 103.5'							*BORING TERMINATED @ 103.5'*

NOTE: Ambient Air - Multiwarn, FID + PID all <1 ppm entire length of well

DRILLING CONTRACTOR: GEOMECHANICS SOUTHWEST, INC.

JOB NUMBER: E034-C30

LOGGED BY: KRISTIE M. DANIELS

CHECKED BY:

DATE: 1-16-02

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-6

Boring No. X-Ref:

Elevation Ground Level:

Top of Casing:

Survey Coords:

Job Number: E034-C30

Drilling Summary:	
Total Depth	103.5'
Borehole Diameter	10" (GUY MEASURED IT)
Casing Stick-Up	NONE
Driller	GEOMECHANICS SOUTHWEST, INC.
Rig	CME 75
Bit(s)	10"
Drilling Fluid	NONE
Protective Casing	NONE

Comments: NO SAMPLES COLLECTED; ONLY CUTTINGS FOR LOGGING & SCREENING (F.I.D.)

G.W. DEPTH @ 1523 → 76.37'

T.W.D. = 103.5'

Construction Time Log:	Start		Finish	
Task	Date	Time	Date	Time
Drilling	1-16-02	1030	1-16-02	1250
Geophys. Logging				
Casing:	1-16-02		1-16-02	1500
Casing:				
Sand Pack:	1-16-02	1500	1-16-02	1535
Filter Placement:				
Cementing:	1-17-02	AM		
Development:	1-16-02	1540	1-16-02	1603

Well Development: REMOVED 15 BAILS (10' BAILER) APPROX'LY 4 GALS. PER BAIL = 60 GALS. TOTAL BAILED

Well Design & Specifications

Basis: Geologic Log ✓ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
61.0' to 0'	C1	
81.0' to 61.0'	20' (2x10') SCH. 40 S1 OF screen	
82.0' to 81.0' 93.0' to 92.0'	2-1' COUPLERS *	
92.0' to 82.0' 103.0' to 93.0'	PRE PACK	
103.5' to 103.0'	6" END CAP	

Casing: C1	4" DIA.	
C2		
PRE PACK	5" DIA.	
Screen: S1	4" DIA. - 0.010 FOR BOTH PREPACK	
S2	& SCH. 40 SCREEN	
Filter Pack:	COLORADO SILICA 10-20 (30 BAGS)	
	(52.5' THICK) 103.5' to 51'	
Grout Seal:	49.5' - 0'	
Seal:	51.0' - 49.5'	

	Time	pH	Cond.	Temp. °C
INITIAL	1540	6.73	3.43	24.8

Stabilization Test Data: * DETAILS

Time	pH	Spec. Cond. µs/m	Temp (C)
1555	6.98	3.42	23.9
1557	7.05	3.33	23.8
1559	7.05	3.21	24.9
1601	7.04	3.17	24.9
1603	7.12	3.29	24.5

Site Name: 20TH & FACTOR - YUMA WQARF

Location: 453 20TH ST., YUMA, AZ NEAR NW CORNER OF BLDG. 4

Supervised By: KRISTIE M. DANIELS

Date: 1-16-02

* 1' COUPLERS ABOVE BOTH PREPACKS

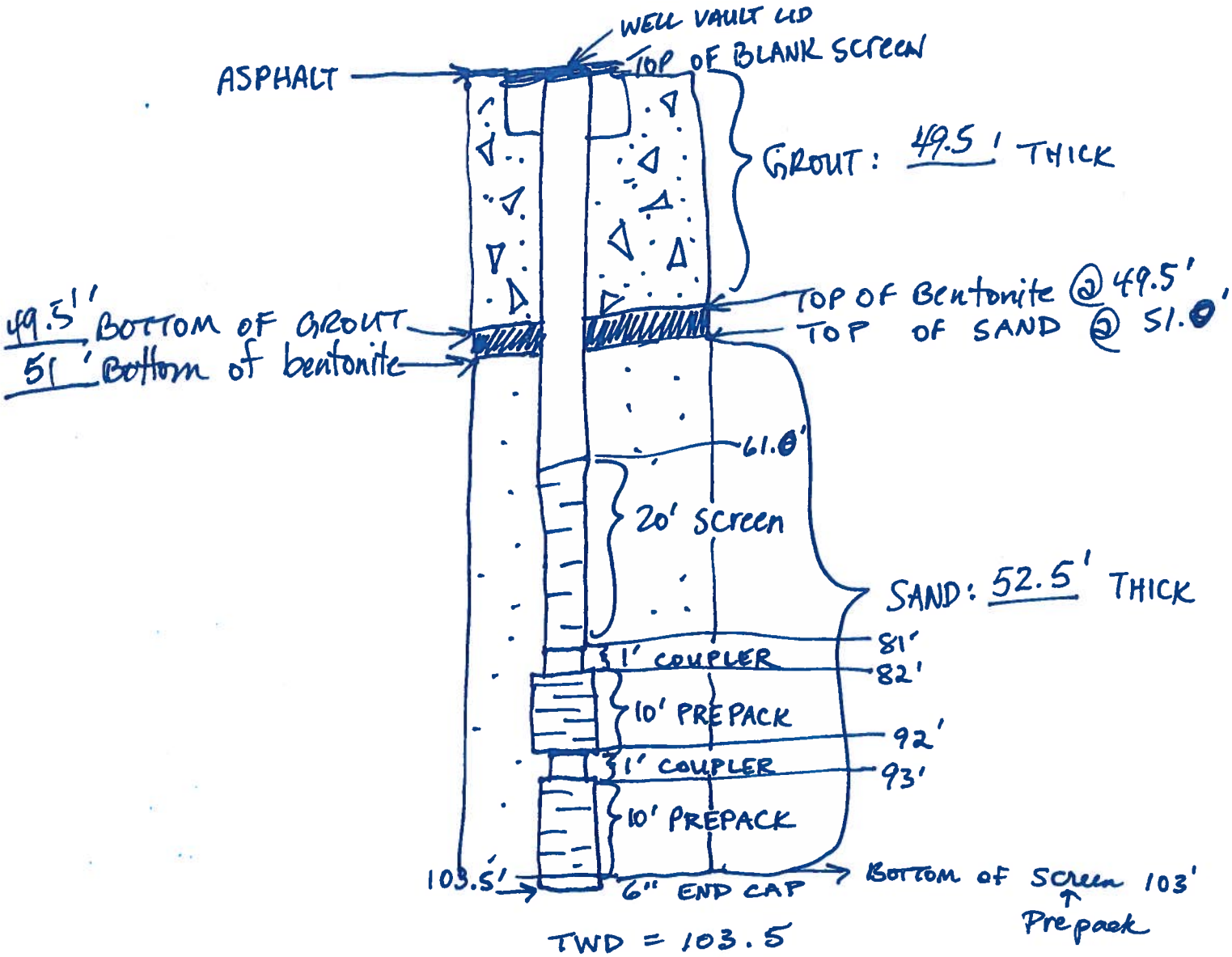
YUMA WQARF
E034-C30

MW-6

WELL CONSTRUCTION DIAGRAM

MW-6

1-16-02



YUMA WQARF
E034-C30

MW-6

* MW-6

MW-6

WELL DEVELOPMENT

1-16-02

Record Bailing Time: Start → 1540 PM / Finish → 1603 PM

Visual: (sheen: NO, color: yes light brn, solids: NO?)

Initial Readings:

Time	pH	Cond.	Temp
1540	6.73	3.43 mS 1999 µS	24.8°C

2-minute Intervals:

Time	pH	Specific Conductivity µS/m	Temp. (C)	
1555	6.98	3.42 mS 1999 µS	23.9	11TH Bailer full
1557	7.05	3.33 mS 1999 µS	23.8	12TH "
1559	7.05	3.21 1999	24.9	13TH "
1601	7.04	3.17 1999	24.9	14TH "
1603	7.12	3.29 1999	24.5	15TH

* Removed ~60 gals. total. *

G.W. @ 76.37' at 1523.

Using 10' bailer (JUST FITS IN A 4" dia. well):
1542 - 2nd Bail
1544 - 3rd Bail
1545 - 4TH Bail
1547 - 5TH "
1548 - 6TH "
1549 - 7TH "
1550 - 8TH "
1551 - 9TH "
1553 - 10TH
~4 gals./bailer

GeoTrans, Inc.	Project No:1303.011	Borehole No: MW-7A ADWR ID: 55-588279
Site Map	Client: ADEQ Site: 20th and Factor WQARF Site	Start Date/Time: End Date/Time: Logged By:
	Drilling Method: Hollow Stem Auger Borehole Diameter: 9 5/8 inches	Angle from Vertical: 0
	Surface Material: Grass	Sampling Method: Split Spoon

1/14/02

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments (1/15/02, KD)
0					Ground Surface
1–5					**Poorly Graded Sand** Light yellow brown (10YR 6/4) fine grained sand, 2% silt, dry to moist
6–9					**Poorly Graded Sand** Light yellow brown (10 YR 6/4) fine grained sand, 2% silt, moist
10–14					**Silty Sand** Pale brown (10 YR 6/3) fine grained sand, 25% silt, dry to moist
15–19					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 3% silt, slightly moist
20–24					**Poorly Graded Sand** Very pale brown (10 YR 8/3), fine grained sand, 1% silt, slightly moist
25–29					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 1% silt, slightly moist
30–34					**Poorly Graded Sand** Very pale brown (10 YR 6/3), fine grained sand, 1% silt, slightly moist
35–39					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 1% silt, slightly moist
40–44					**Poorly Graded Sand** Very pale brown (10 YR 7/3), fine grained sand, 2% silt, dry to moist
45–50					**Poorly Graded Sand with Silt** Light yellow brown (2.5 YR 6/3), fine grained sand, 12% silt, dry to moist, at 50' bgs. gravel (caliche) with some clay observed

Drilling Contractor: GSI
Checked By: JZ
Date Checked: 2/5/02

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No:1303.011	Borehole No: MW-7A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: End Date/Time: Logged By:
	Drilling Method: Hollow Stem Auger Borehole Diameter: 9 5/8 inches	Angle from Vertical:
	Surface Material: Grass	Sampling Method:

1/14/02

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments (KD, 0)
51-54					**Poorly Graded Sand-Silty Sand** Pale yellow (5 YR 7/3) fine grained sand, 10% silt, dry to moist Split Spoon
55-59					**Well Graded Sand with Silt** Pale yellow (5 YR 8/2) fien grained sand, 13% silt, 2% sub-rounded gravel-caliche, moist to dry
60-64					**Well Graded Sand with Silt** Very pale brown (10 YR 7/3) fine sand, 10% silt, 2 % caliche-gravel, moist to dry
65-69					**Poorly Graded Sand with Silt** Bown yellow (10 YR 6/6/) fine grained sand, 8 % silt, moist to dry
70-74					**No Recovery**
75-79					**Well Graded Sand with Silt** Brown (10 YR 5/3), fine to medium sand, 11% silt, 5% sub-rounded gravel, wet, strong diesel odor GROUNDWATER
80-84					**Poorly Graded Sand with Silt** Brown (10 YR 5/3), fine grained sand, 14% silt, wet, petroleum odor
85-89					**Poorly Graded Sand with Silt** Brown (10 YR 5/3), fine grained sand, 25% silt, wet, petroleum odor
90-94					**Poorly Graded Sand with Silt** Brown (10 YR 5/3), fine grained sand, 10% silt, wet, petroleum odor
95-99					**Poorly Graded Sand with Silt** Brown (10 YR 5/3), fine grained sand, 15% silt, wet, petroleum odor
100					

Drilling Contractor: GSI
Checked By: JZ
Date Checked: 2/5/02
Sheet: 2 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-7A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: End Date/Time: Logged By:
	Drilling Method: Hollow Stem Auger Borehole Diameter: 9 5/8 inches	Angle from Vertical:
	Surface Material: Grass	Sampling Method:

1/14/02

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments (1/15/02, KD, 0)
101					**Poorly Graded Sand with Silt** Brown (10 YR 5/3), fine grained sand, 10% silt, less wet than 100' bgs, petroleum odor Split Spoon
102					
103					
104					
105					**Poorly Graded Sand with Silt** Brown (10 YR 5/3), fine grained sand, 25% silt, wet, slight petroleum odor
106					
107					
108					
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113					
114					
115					
116					
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Drilling Contractor: GSI

Checked By: JZ

Date Checked: 2/5/02

Sheet: 3 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-7

Boring No. X-Ref: -

Survey Coords: Northing - 9964.079; Easting - 11189.090

Elevation Ground Level: 197.86'

Job Number: E034-C30

Top of Casing: 197.42'

Drilling Summary:	
Total Depth	110'
Borehole Diameter	9-5/8"
Casing Stick-Up	None
Driller	GeoMechanics Southwest, Inc.
Rig	CME 75
Bit(s)	~10"
Drilling Fluid	None
Protective Casing	None

Comments: During drilling, soil samples were collected at 5', 10', and at 80' (split spoon).

Depth-to-product = 75.44'

G.W. Depth at 10:53 = 77.69'

Product Thickness = 2.25'

Construction Time Log:	Start		Finish	
Task	Date	Time	Date	Time
Drilling	1-14-02	15:10	1-14-02	16:45
	1-15-02	07:40	1-15-02	09:08
Geophys. Logging				
Casing:	1-15-02	14:00	1-15-02	16:30
Casing:				
Sand Pack:	1-15-02	16:31	1-15-02	16:50
Filter Placement:				
Cementing:	1-17-02	08:05	1-17-02	08:20
Development:	-		-	

Well Development: Did not perform, due to the presence of liquid phase hydrocarbons.

Well Design & Specifications

Basis: Geologic Log __X__ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
62.5' to 0'	C1: Blank Casing	135.36' to 197.42'
82.5' to 62.5'	S1: 20' (2x10') of Sch.40 screen	115.36' to 135.36'
93.5' to 92.5'	1-1' Couplers	104.36' to 105.36'
103.5' to 93.5' 92.5' to 82.5'	2-10' Sections of PrePack	94.36' to 104.36' 105.36' to 115.36'
104.0' to 103.5'	6" End Cap	93.86' to 94.36'

Casing: C1	4" dia. (62.5' to 0')
PrePack:	5" dia. (103.5' to 82.5')
Screen: S1	4" dia. - 0.010 for both PrePack and Sch.40 screen
	(82.5' to 62.5')
Filter Pack:	Colorado Silica 10-20 (30 bags) - 104.0' to 59.0'
Grout Seal:	57.5' to 0' by Tanner Companies
Seal:	59.0' to 57.5' (Bentonite)

Sheen: Yes, with 2.25' of product (likely diesel)

Color: Dark brown

Stabilization Test Data:

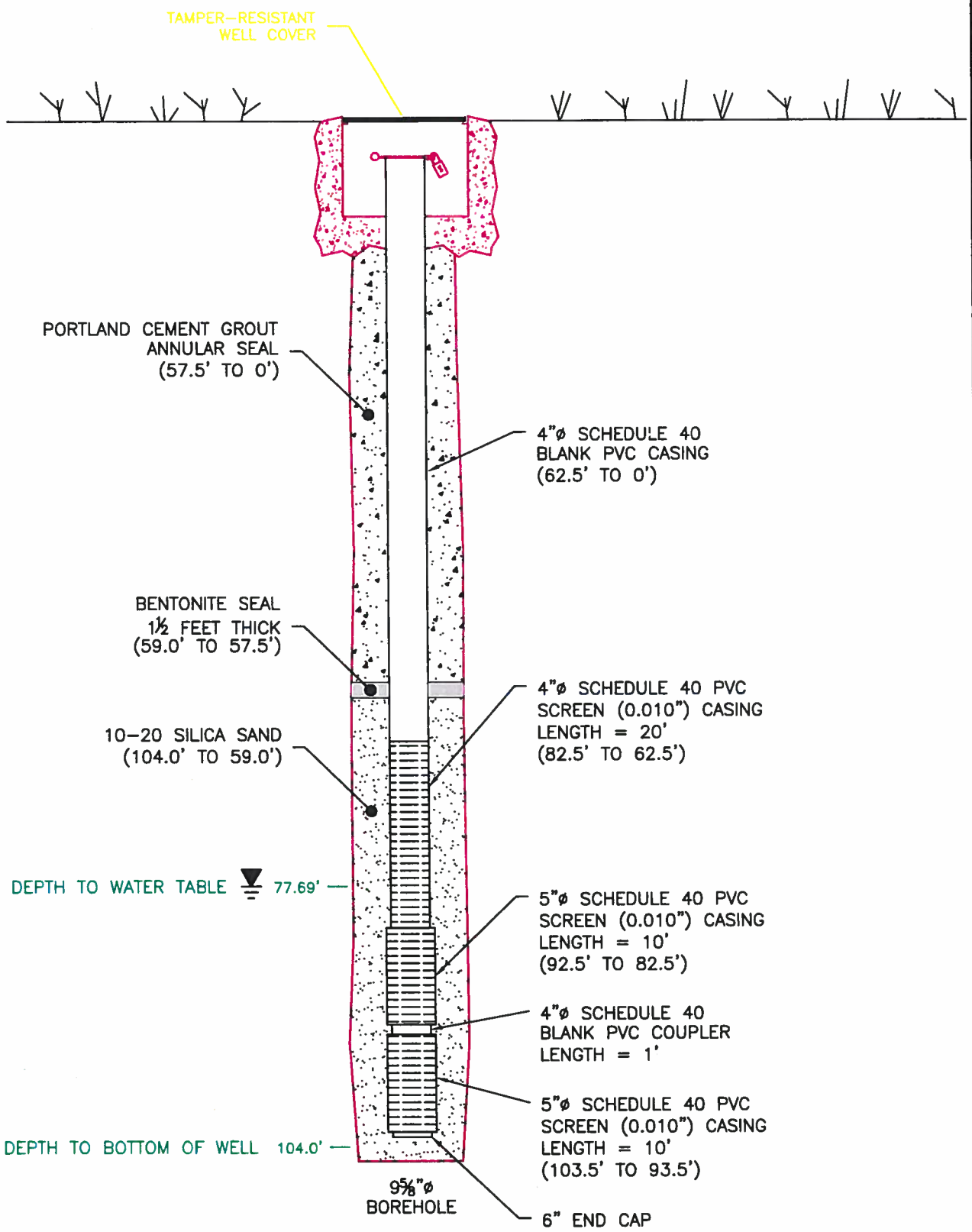
Time	pH	Spec. Cond. µs/m	Temp (C)

Site Name: 20th & Factor - YUMA WQARF

Location: 653 E. 20TH St., Yuma, AZ (In grass, near NE corner of Zone 7)

Supervised By: Kristie M. Daniels

Date: 1-15-02



VERTICAL SCALE: 1"=15'
HORIZONTAL SCALE: 1"=15"

TITLE:	WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-7		
LOCATION:	YUMA - 20TH & FACTOR		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	KD	FIGURE
	DRAFTED	DBS	3
	PROJECT	E034-C30	
	DATE	2/21/02	

GeoTrans, Inc.	Project No: 1303.15.03	Borehole No: MW-8A ADWR ID: 55-203693
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/26/05 End Date/Time: 1/27/05 Logged By: JLB
	Drilling Method: Hollow Stem Auger Borehole Diameter: 6.75 inches	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–5					**Poorly Graded Sand** Brown, fine to medium sand, slighlty moist, trace fine gravel
5–10					**Poorly Graded Sand** As above
10–15					**Poorly Graded Sand** As above with trace of light brown dry clay nodules
15–20					**Poorly Graded Sand** Yellow brown, fine to medium sand, poorly sorted, dry
20–25					**Poorly Graded Sand** As above
25–30					**Poorly Graded Sand** As above
30–35					**Poorly Graded Sand** As above
35–40					**Poorly Graded Sand** As above with trace of soft clay - likey thin clay lense
40–45					**Poorly Graded Sand** As above with weakly cemented sand nodules, no clay and trace of fine gravels
45–50					**Poorly Graded Sand** As above, moist with trace clay - likely thin clay lense

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 1 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.15.03	Borehole No: MW-8A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/26/05 End Date/Time: 1/27/05 Logged By: JLB
	Drilling Method: Hollow Stem Auger Borehole Diameter: 6.75 inches	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51 52 53 54 55					**Poorly Graded Sand** Yellow brown, fine to medium sand, slightly moist
56 57 58 59 60					**Poorly Graded Sand** As above
61 62 63 64 65					**Poorly Graded Sand** As above
66 67 68 69 70					**Poorly Graded Sand** As above
71 72 73 74 75					**Poorly Graded Sand** As above, slightly moist with trace fine gravels.
76 77 78 79 80					**Poorly Graded Sand** As above with trace fine gravels.
81 82 83 84 85					**Poorly Graded Sand** As above - moist
86 87 88 89 90					**Poorly Graded Sand** Brown, very moist, trace fine gravels
91 92 93 94 95					**Poorly Graded Sand** As above
96 97 98 99 100					**Sandy Clay** As above with trace clay.

Drilling Contractor: Yellow Jacket Drilling

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Sheet: 2 of 3

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GeoTrans, Inc.	Project No: 1303.15.03	Borehole No: MW-8A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/26/05 End Date/Time: 1/27/05 Logged By: JLB
	Drilling Method: Hollow Stem Auger Borehole Diameter: 6.75 inches	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					Gray-brown, very soft clay with sand and trace fine gravels
102					
103					
104					
105					
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Drilling Contractor: Yellow Jacket Drilling

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Date Checked:

Sheet: 3 of 3

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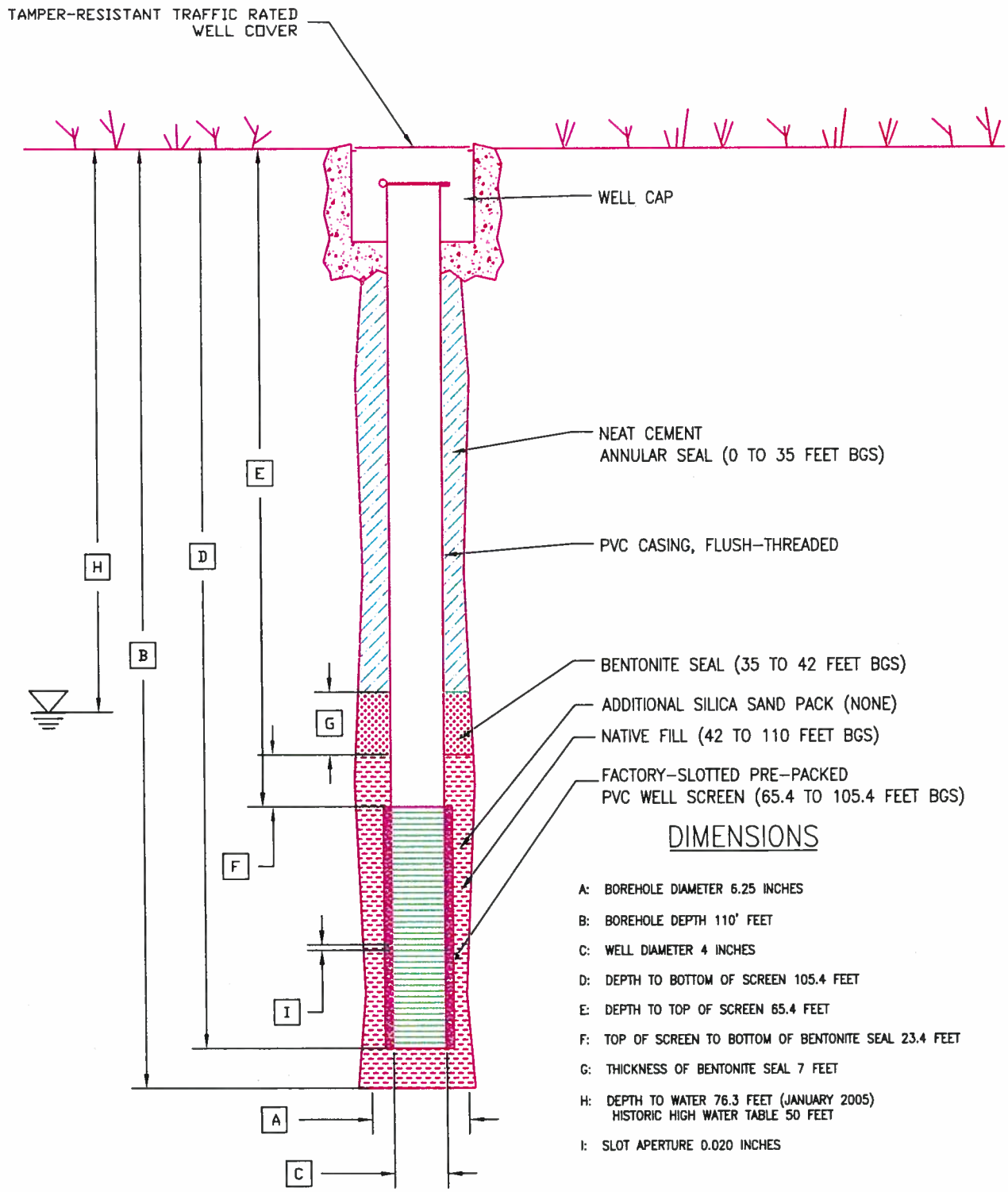

DIMENSIONS

A: BOREHOLE DIAMETER 6.25 INCHES

B: BOREHOLE DEPTH 110' FEET

C: WELL DIAMETER 4 INCHES

D: DEPTH TO BOTTOM OF SCREEN 105.4 FEET

E: DEPTH TO TOP OF SCREEN 65.4 FEET

F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 23.4 FEET

G: THICKNESS OF BENTONITE SEAL 7 FEET

H: DEPTH TO WATER 76.3 FEET (JANUARY 2005)
HISTORIC HIGH WATER TABLE 50 FEET

I: SLOT APERTURE 0.020 INCHES

TITLE: MONITOR WELL COMPLETION DIAGRAM MW-8			
LOCATION: 20th AND FACTOR, YUMA			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED		FIGURE
	DRAFTED	JLB	1
	PROJECT	1303.015.03	
	DATE	2/14/05	

GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-9A ADWR ID: 55-203692
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/24/05 End Date/Time: 1/25/05 Logged By: JLB
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-9	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5					**Poorly Graded Sand** Brown, fine to medium, medium dense, moist
6 7 8 9 10					**Poorly Graded Sand** Brown, fine to medium sand, loose, dry
11 12 13 14 15					**Poorly Graded Sand** Brown, fine to medium sand, loose, dry
16 17 18 19 20					**Poorly Graded Sand** Brown, fine to medium sand, slighlty moist with ~1% fine, sub-rounded gravel
21 22 23 24 25					**Poorly Graded Sand** Brown, fine to medium sand, slightly moist with 1% fine, sub-rounded gravel
26 27 28 29 30					**Poorly Graded Sand** Brown, fine to medium sand, slightly moist with 1% fine, sub-rounded gravel
31 32 33 34 35					**Poorly Graded Sand** Brown, fine to medium sand, slightly moist with 1% fine, sub-rounded gravel
36 37 38 39 40					**Poorly Graded Sand wih Gravels** Brown, fine to medium coarse sand, 20% fine sub-rounded gravels, moist
41 42 43 44 45					**Sandy Clay** Light brown clay, very soft with brown, fine to medium sand and trace fine gravel
46 47 48 49 50					**Clay** Light brown, soft, trace sand and fine gravel

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 1 of 3

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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-9A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/24/05 End Date/Time: 1/25/05 Logged By: JLB
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-9	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–55					**Sand, Clay and Gravels** Brown, 40% sub-angular fine gravels, 35% fine to medium sand, 25% soft clay
56–60					**Poorly Graded Sand** Brown, fine to medium sand, moist, with trace fine gravel and clay
61–65					**Clayey Sand** Brown, 78% fine to medium sand, moist, 20% soft, brown clay, 2% fine, sub-rounded gravel
66–70					**Sand with Clay** Brown, 94% fine sand, moist, 5% soft clay, 1% fine gravel
71–75					**Poorly Graded Sand** Brown, fine to medium sand, moist, no clay
76–80					**Poorly Graded Sand** Brown, medium sand, very moist
81–85					**Poorly Graded Sand** Brown, medium to coarse sand, very moist
86–90					**Poorly Graded Sand** Brown, medium to coarse sand, very moist
91–95					**Poorly Graded Sand** Brown, medium to coarse sand, very moist
96–100					**Poorly Graded Sand** Brown, medium to coarse sand, very moist

Drilling Contractor: Yellow Jacket Drilling

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Date Checked:

Sheet: 2 of 3

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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-9A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 1/24/05 End Date/Time: 1/25/05 Logged By: JLB
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-9	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					**Sandy Clay** Gray-brown, medium stiff clay with medium sand and trace fine gravel
102					
103					
104					
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106					
107					
108					
109					
110					
111					
112					
113					
114					
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Drilling Contractor: Yellow Jacket Drilling

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Date Checked:

Sheet: 3 of 3

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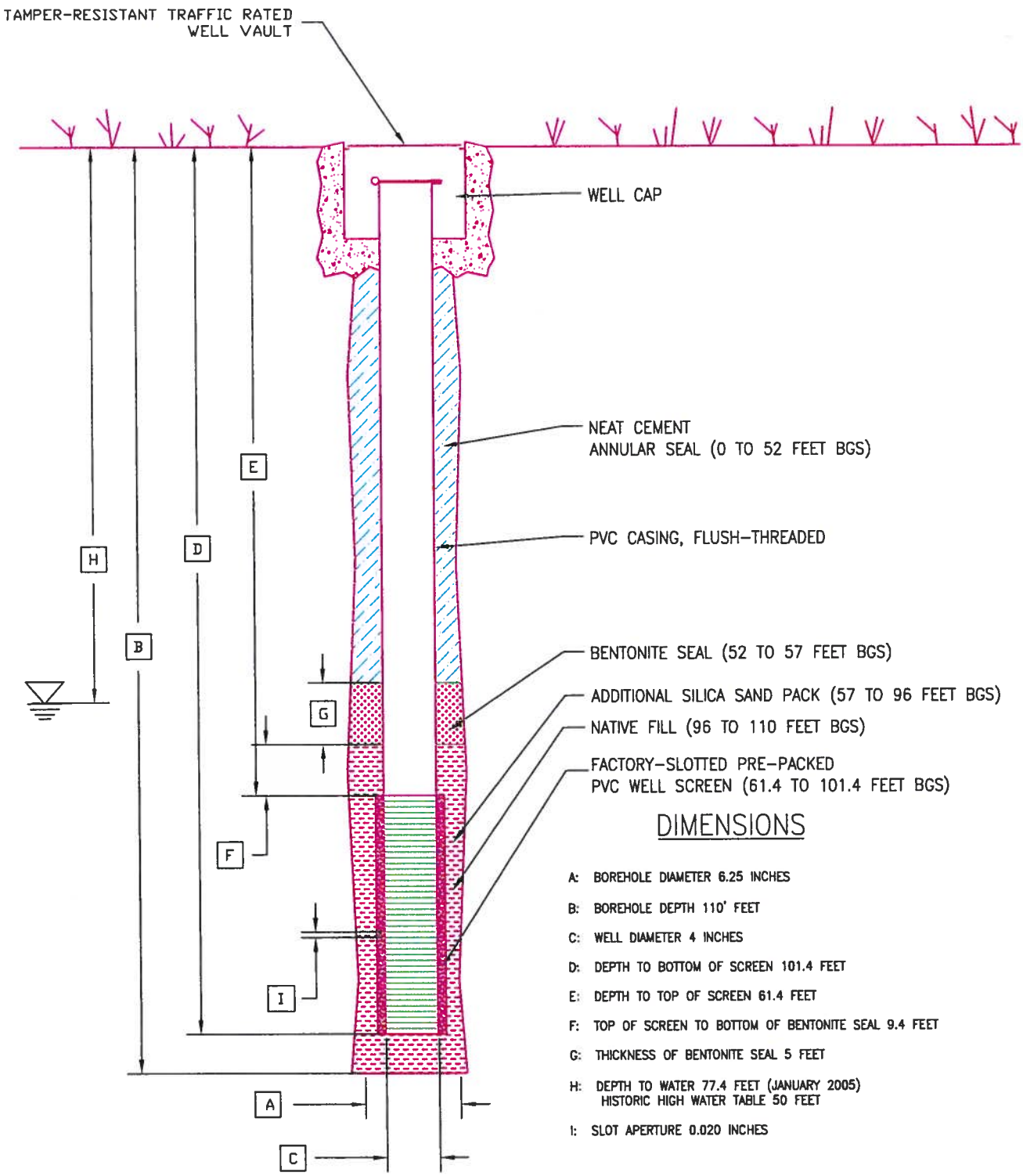

DIMENSIONS

A: BOREHOLE DIAMETER 6.25 INCHES

B: BOREHOLE DEPTH 110' FEET

C: WELL DIAMETER 4 INCHES

D: DEPTH TO BOTTOM OF SCREEN 101.4 FEET

E: DEPTH TO TOP OF SCREEN 61.4 FEET

F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 9.4 FEET

G: THICKNESS OF BENTONITE SEAL 5 FEET

H: DEPTH TO WATER 77.4 FEET (JANUARY 2005)
HISTORIC HIGH WATER TABLE 50 FEET

I: SLOT APERTURE 0.020 INCHES

TITLE: MONITOR WELL COMPLETION DIAGRAM MW-9

LOCATION: 20th AND FACTOR, YUMA

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED		FIGURE
DRAFTED	JLB	1
PROJECT	1303.015.03	
DATE	2/14/05	

GeoTrans, Inc.	Project No: 1303.015.03 Client: ADEQ Site: 20th and Factor WQARF	Borehole No: MW-10A ADWR ID: 55-203691 Start Date/Time: 1/27/05 End Date/Time: 1/28/05 Logged By: JLB
Site Map	Drilling Method: Hollow Stem Auger Borehole Diameter: 0	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–5					**Poorly Graded Sand** Light brown, fine to medium sand, moist with trace gravel
5–10					**Poorly Graded Sand** Light brown, fine to medium sand, moist
10–15					**Poorly Graded Sand** Light brown, fine to medium sand, moist
15–20					**Poorly Graded Sand** Light brown, fine to medium sand, moist
20–25					**Poorly Graded Sand** Light brown, fine to medium sand, moist, with trace clay
25–30					**Poorly Graded Sand** Light brown, fine to medium sand, moist with trace ~ 1% red-brown, medium stiff clay
30–35					**Poorly Graded Sand with Clay** Light brown, fine to medium sand, moist with 2% medium stiff clay
35–40					**Poorly Graded Sand with Clay** Light brown, fine to medium sand, moist with trace soft clay
40–45					**Poorly Graded Sand** Light brown, fine to medium sand, moist with trace soft clay
45–50					**Poorly Graded Sand** Light brown, fine to medium sand, moist with increasing soft clay

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 1 of 3

GeoTrans, Inc
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Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.015.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No:** MW-10A **Start Date/Time:** 1/27/05 **End Date/Time:** 1/28/05 **Logged By:** JLB
	Drilling Method: Hollow Stem Auger **Borehole Diameter:** 0	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54					**Poorly Graded Sand with Clay** Light brown, fine to medium sand, moist with 5% clay
55–59					**Clayey Sand** Light brown, fine to medium sand, moist with 20% light gray brown, stiff clay
60–64					**Sand and Clay** Light brown, cohesive sand and clay mix
65–69					**Sandy Clay** Light brown mix of sand and stiff clay
70–74					**Sandy Clay** Light brown, 70% soft, moist clay, 30% medium sand, moist
75–79					**Sandy Clay** Light brown, 70% medium stiff, moist clay, 30% medium sand, moist
80–84					**Sandy Clay** Light brown, 80% very soft clay, 20% sand with trace of fine gravel
85–89					**Sandy Silty Clay** Light brown, 80% very soft clay, 19% sand with 1% fine gravel
90–94					**Sandy Silty Clay** Light brown, 70% silty-clay, 30% sand, with trace gravel, very soft, saturated
95–99					**Sandy Silty Clay** Light brown, 70% silty-clay, 30% sand, with trace gravel, very soft, saturated
100					

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 2 of 3

GeoTrans, Inc
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Phoenix, Arizona 85034
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Site Map	**Project No:** 1303.015.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No:** MW-10A **Start Date/Time:** 1/27/05 **End Date/Time:** 1/28/05 **Logged By:** JLB
	Drilling Method: Hollow Stem Auger **Borehole Diameter:** 0	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** None

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					**Sandy Silty Clay** Light brown, 70% silty-clay, 30% sand, with trace gravel, very soft, saturated
102					
103					
104					
105					
106					
107					
108					
109					
110					
111					
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Drilling Contractor: Yellow Jacket Drilling

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Sheet: 3 of 3

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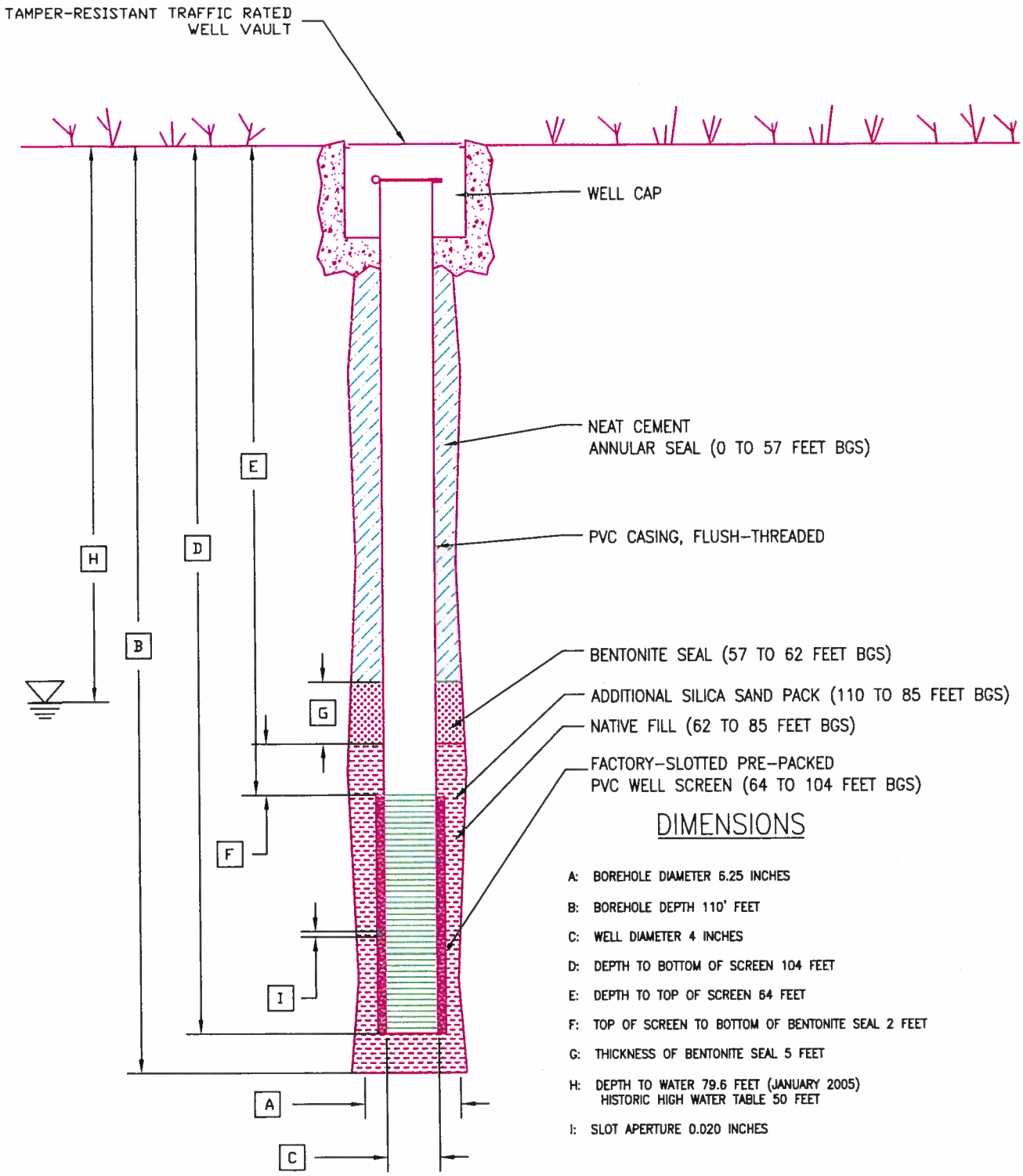

DIMENSIONS

A: BOREHOLE DIAMETER 6.25 INCHES

B: BOREHOLE DEPTH 110' FEET

C: WELL DIAMETER 4 INCHES

D: DEPTH TO BOTTOM OF SCREEN 104 FEET

E: DEPTH TO TOP OF SCREEN 64 FEET

F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 2 FEET

G: THICKNESS OF BENTONITE SEAL 5 FEET

H: DEPTH TO WATER 79.6 FEET (JANUARY 2005)
HISTORIC HIGH WATER TABLE 50 FEET

I: SLOT APERTURE 0.020 INCHES

TITLE: MONITOR WELL COMPLETION DIAGRAM MW-10			
LOCATION: 20th AND FACTOR, YUMA			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED		FIGURE
	DRAFTED	JLB	1
	PROJECT	1303.015.03	
	DATE	2/14/05	

	Project No: 1303.020.03.03	**Borehole No: MW-11A** **ADWR ID:** 55-902168
Site Map	**Client:** ADEQ **Site:** & 20th and Factor WQARF	**Start Date/Time:** 5/25/2005 **End Date/Time:** 5/26/2005 **Logged By:** Jennifer Barr
	Drilling Method: Hollow-stem Auger **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** Drill Cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
					Ground Surface
0–40					**SAND (SW)** Light brown, fine- to medium-grained sand, 70-80% sand, 20-30% clay, slightly moist, trace small to large rounded gravels.

Drilling Contractor: Yellow Jacket Drilling

Checked By: Mike Hilstrom

Date Checked: 1/5/2006

Sheet: 1 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
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Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.020.03.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-11A** **Start Date/Time:** 5/25/2005 **End Date/Time:** 5/26/2005 **Logged By:** Jennifer Barr
	Drilling Method: Hollow-stem Auger **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** Drill Cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
41					**SAND (SW)** Same as above.
42					
43					
44					
45					No gravels in cuttings. Drill bit at 45'.
46					
47					
48					
49					
50					Trace large gravels in cuttings. Drill bit at 50'.
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					Trace clay and no gravels in cuttings. Drill bit at 65'.
66					
67					
68					
69					
70					**CLAYEY SAND (SC) at 70'** Light brown, fine- to medium-grained sand, 70-80% sand, 20-30% clay, moist to very wet.
71					
72					
73					
74					
75					
76					
77					
78					**Groundwater encountered at 78'**
79					
80					

Drilling Contractor: Yellow Jacket Drilling

Checked By: Mike Hilstrom

Date Checked: 1/5/2006

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.020.03.03	Borehole No: MW-11A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 5/25/2005 End Date/Time: 5/26/2005 Logged By: Jennifer Barr
	Drilling Method: Hollow-stem Auger Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Drill Cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
81					**CLAYEY SAND (SC)** Same as above.
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					Damp, cuttings not saturated. Drill bit at 90'.
92					
93					
94					
95					
96					
97					
98					
99					
100					**SANDY CLAY s(CL) at 100'** Light brown to gray brown, medium- to coarse-grained sand, damp, stiff.
101					
102					
103					
104					
105					**Total Depth 105'**
106					
107					
108					
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119					
120					

Drilling Contractor: Yellow Jacket Drilling

Checked By: Mike Hilstrom

Date Checked: 1/5/2006

Sheet: 3 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-12A ADWR ID: 55-904512
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 03/28/06 End Date/Time: 03/29/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-stem Auger Borehole Diameter: 10.25"	Angle from Vertical: 0
	Surface Material: Gravel Landscape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
0					Ground Surface
1–5	5' bgs	0935	0.0		**@ 5' SILTY SAND (SM)** Light brown 7.5 YR 6/4, 60% Sand (90% fine sand, 10% medium sand) 40% -200 fines, non-plastic, dry, no odor,soft, no plasticy, no cementation. No blow count- hand dug to 5' bgs.
6–9	10' bgs	1030	0.0		**@ 10' SILTY SAND (SM)** As above. Collected Soil vapor sample @10'bgs. No blow count, Driller forgot.
10–14	15' bgs	1508	50.2		**@ 15' SILTY SAND (SM)** As above. Still dry, Slight odor, unfamiliar. Blows 10,20,35 Medium Dense.
15–19	20' bgs	1515	20.3		**@ 20' SILTY SAND (SM)** As Above. Slightly Moist. Blows 15,22,32 Medium Dense.
20–24	25' bgs	1520	4.5		**@ 25' SILTY SAND (SM)** As Above. Blows 13,17,31 Medium Dense.
25–29	30' bgs	1526	0.0		**@25.25' LEAN CLAY (CL)** Lean clay in shoe/cup. Brown 7.5 YR 5/4, medium plasticity, slightly moist, soft-slightly firm.
30–34	35' bgs	1532	0.0		**@30.00' SILTY SAND (SM)** As above, similar to 20'-25'. Still slightly moist, estimated ~8-12% moisture. Blows 8,11,15 Loose sand.
35–39	40' bgs	1540	0.0		**@35.00' WELL GRADED SAND WITH SILT (SW-SM)** Reddish yellow 7.5 YR 6/6, 80% Sand (35% fine sand, 35% medium sand, 20%coarse sand) 20% fines, mostly silt. trace of fine gravel sub-round as is coarse sand. Slightly moist but increased moisture ~15%. No odor. Blows 16,23,30 medium density.
40–44	45' bgs	1546	0.0		**@40.00' WELL GRADED SAND WITH SILT (SW-SM)** As Above except now ~ 5%fine gravel and moist. Blows 21, 50/5". Very dense sand. No odor
45–50	50' bgs	1628	0.0		**@45.00' SILTY SAND - SANDY SILT (SM-ML)** Pinkish grey 7.5 YR 6/2, ~ 50% fine sand and 50% fines mostly non-plastic silt. Trace cementation. Moist, no odor, medium-high cementation. Blows 25, 50/6", very dense sand/hard clay.

Drilling Contractor: Yellow Jacket Drilling

Checked By: Chris Gutmann

Date Checked: 6/28/06

Sheet: 1 of 3

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Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-12A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 03/28/06 End Date/Time: 03/29/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-stem Auger Borehole Diameter: 10.25"	Angle from Vertical: 0
	Surface Material: Gravel Landscape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54	55' bgs	1636	0.0		**@50.00' SILTY SAND (SM)** ~ 70% Sand and 30% Fines. Moist, no odor. Blows 20, 50/6", Very dense.
55					**@55.00' LEAN CLAY (CL)** ~ 6"-8" layer Lean Clay. Brown 7.5 YR 5/3. Moist, med-high plasticity. No odor. Blows 19, 50/"6, hard, dense.
56 57 58 59 60	60' bgs	1645	0.0		**@60.00' SILTY SAND (SM)** Pale Brown 7.5 YR 6/3, ~75% Sand (fine to medium sand) ~ 25% Fines, mostly non-plastic, trace ~ 5% clay. Moist-very moist, no odor. Blows 50/6" Very Dense.
61 62 63 64	65' bgs	1650	0.0		**@65.00' SILTY SAND (SM)** Two colors: Reddish yellow 7.5 YR 6/6 and Pinkish Grey 7.5 YR 6/2. Very moist, no odor. Blows 50/5", Very dense.
65 66 67 68 69	70' bgs	1700	0.0		**@70.00' SILTY SAND (SM)** As Above. Pinkish Grey 7.5 YR 6/2. Very moist.
70 71 72 73 74	75' bgs	0820	0.0		**@75.00' SILTY SAND (SM)** Light Brown 7.5 YR 6/3, ~ 80% Sand (fine to medium sand) ~ 20% Silt. Very moist, no odor, clast of cemented soil ~ 1/2 ". Blows 22, 50/6" Very dense.
75 76 77 78 79	80' bgs	0855	0.0		**@80.00' SILTY SAND (SM)** As Above. Slightly wet. Blows 32, 50/6". Water table 81'
80 81 82 83 84	85' bgs	0907	0.0		**@85.00' SILTY SAND (SM)** As Above. Wet-saturated. Blows 32, 50/6".
85 86 87 88 89	90' bgs	0917	0.0		**@90.00' SILTY SAND (SM)** As Above. Blows 37, 50/6".
90 91 92 93 94	95' bgs	0935	0.0		**@95.00' SILTY SAND (SM)** As Above. Trace fine gravel, sub round. Trace Clay. Blows 16,17,25.
95 96 97 98 99 100	100' bgs	0935	0.0		**@100.00' WELL GRADED SAND WITH SILT (SW- SM)** As Above. More coarse sand. Blows 5,6,50/6".

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/28/06

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GeoTrans, Inc.

Site Map

Project No: 1303.020.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-12A

Start Date/Time: 03/28/06

End Date/Time: 03/29/06

Logged By: Mike Hilstrom

Drilling Method: Hollow-stem Auger

Angle from Vertical: 0

Borehole Diameter: 10.25"

Surface Material: Gravel Landscape

Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101	105' bgs	0945	0.0		**@105.00' WELL GRADED SAND WITH SILT (SW-SM)** As Above. No Gravel. Blows 9,12,32.
106					**@108.00' WELL GRADED SAND WITH SILT (SW-SM)** As Above. Blows 9,11,15. End of Bore Hole.
108					**@108' TOTAL DEPTH OF BOREHOLE**
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Drilling Contractor: Yellow Jacket Drilling

Checked By: Chris Gutmann

Date Checked: 6/28/06

Sheet: 3 of 3

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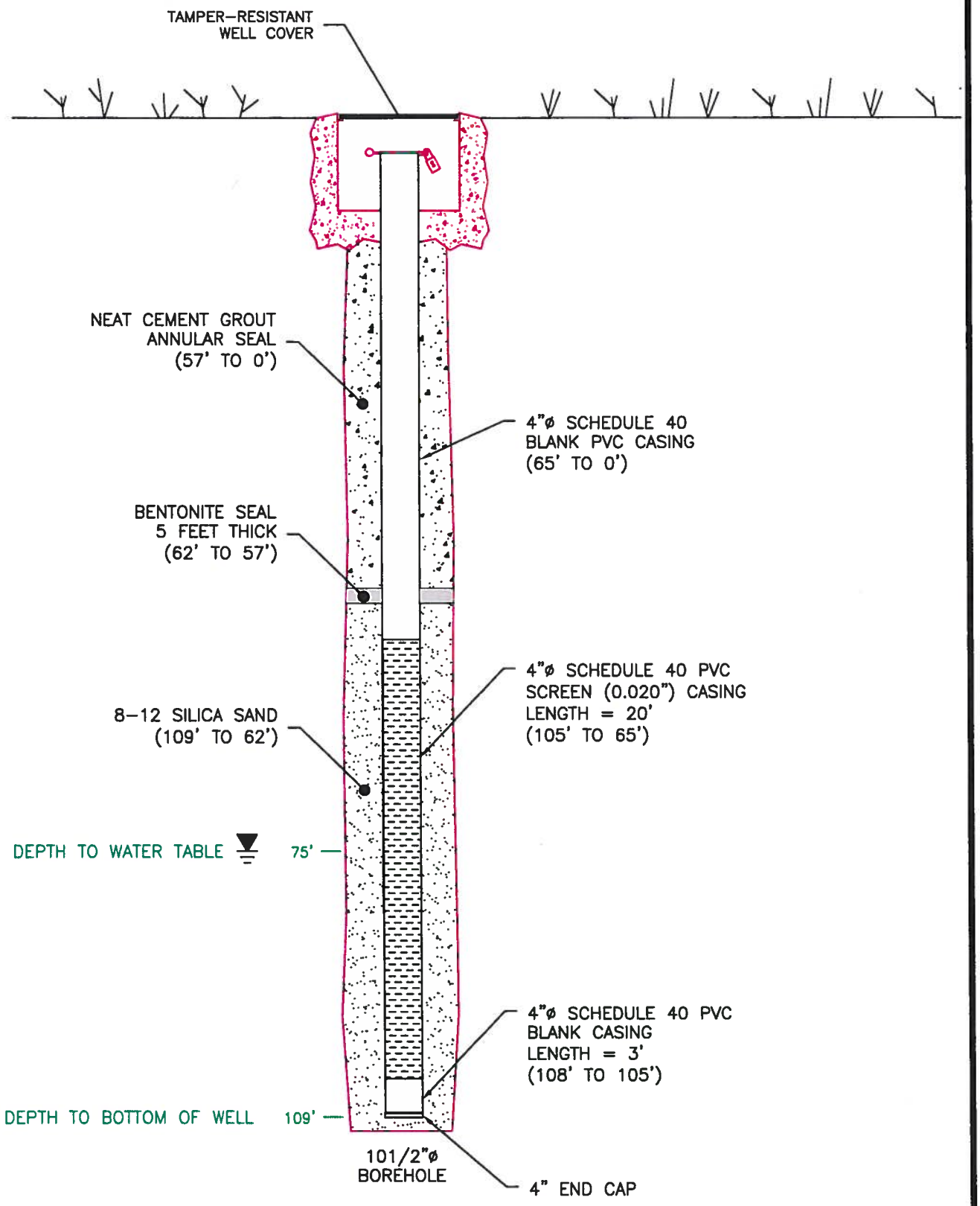


DIAGRAM NOT TO SCALE

TITLE:	WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-12
LOCATION:	YUMA - 20TH & FACTOR

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JZ	FIGURE
DRAFTED	PRP	C1
PROJECT	1303.020.03.02	
DATE	June 28, 2006	

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-12

ADWR Well 55# Boring No. X-Ref: 55-904512

Survey Coords:

Elevation Ground Level:

Job Number: 1303.020.03.01

Top of Casing: ~0.5' bgs

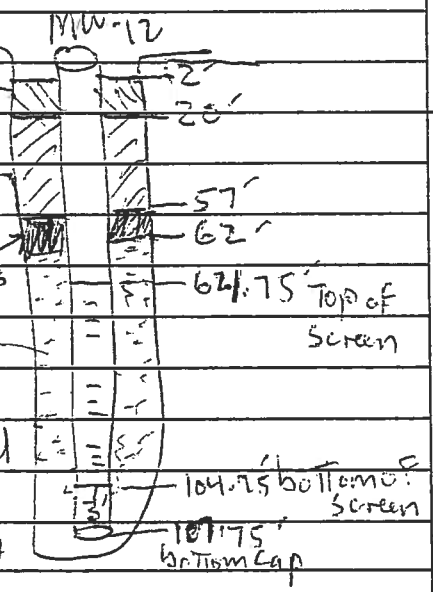
Drilling Summary:		Construction Time Log: Start	Finish			
Total Depth	109'	Task	Date	Time	Date	Time
Borehole Diameter	~10.25"	Drilling 0-70	3-28-6			
Casing Stick-Up	~(-10.5' Neg 0.5'	70-109	3-29-6			
Driller	Yellow Jacket Drilling					
Rig	BK-81HD					
Bit(s)	HSA 6.25" x 10.25"	Geophys. Logging				
Drilling Fluid 250 gals TAP water when below		Casing:				
Protective Casing	N/A	Casing:				
Comments: Used 108' of 4" PVC Total						
cut off 0.75' after install; After		Sand Pack:				
TOC is 0.5' bgs w/T.D. of 107.75' bgs		Filter Placement:				
4" Sch40 PVC 0.5 - 64.75' bgs		Cementing:				
0.020 slot 64.75' - 104.75		Development:				

Well Design & Specifications 3' Sump 104.75 - 107.75

Basis: Geologic Log X Geophysical Log _____

Casing String(s): C = Casing S = Screen

~~Well Development:~~



Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
-0.5 to 64.75	PVC (C1) 4" blank	
64.75 to 104.75	Sch40 (S1) 4" 0.020"	
104.75 - 107.75	Sump C2 4" blank	

Casing: C1	10' each Sch40 PVC 4"
64.75	x 6
	and 1x5' Sch40 4"
Screen: 40' S1	4 x 4" x ~~0.020 mil~~
	x 10' x 0.020" slots
	~~bottom~~ s.
Filter Pack:	
50lbs	8-12 Sand 36 bags
Grout Seal:	
Seal:	

Stabilization Test Data:

Time	pH	Spec. Cond. µs/m	Temp (C)

Site Name: 20th & Factory Yuma AZ

Location: 1921 S. Rail Ave City of Yuma R.O.W.

Supervised By: Mike Hilstrom

Date: 3-28-06 & 3-29-06

GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-13A ADWR ID: 55-904513
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 03/30/06 End Date/Time: 03/31/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-stem Auger Borehole Diameter: 10.25"	Angle from Vertical: 0
	Surface Material: Gravel Landscape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
0					Ground Surface
1–5	5' bgs	1310	0.0		**@5' POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)** Angular gravel. Light brown 10 YR 5/3. No odor, dry, nonplastic, firm.
6–9	10' bgs	1442	0.0		**@10' SILTY SAND (SM)** Light brown 7.5 YR 6/4. Moderate cementation, nonplastic, no odor, very dense. Blows 25,50/6.
10–14	15' bgs	1448	2.1		**@15' SANDY SILT (ML)** Orange yellow, 10 YR 5/6. No odor, no plasticity, no dilatancy, medium density. Blows 10,15,18.
15–20	20' bgs	1454	0.0		**@20' SILTY SAND (SM)** Light brown 10 YR 5/4. No odor, no plasticity, very dense. Blows 14,50/6.
21–24	25' bgs	1459	0.0		**@25' SANDY SILT (ML)** Light brown 10 YR 5/3. No odor, no plasticity. Blows 18,20,29.
25–29	30' bgs	1504	2.7		**@30' SILT (ML)** Light brown 7.5 YR 4/4. No odor, medium plasticity, high dilatancy. Blows 11,19,21.
30–34	35' bgs	1509	0.4		**@35' SILTY SAND (SM)** Trace gravel. Light brown 10 YR 5/3. Low dilatancy, no odor, no plasticity. Blows 19,50/6.
35–39	40' bgs	1515	0.0		**@40' SILTY SAND (SM)** Light brown 10 YR 5/3. Med-high cementation, very stiff, nonplastic, no odor. Blows 21,50/6/
40–44	45' bgs	1600	0.0		**@45' SILTY SAND (SM)** Light grey brown 10 YR 5/3. Slightly moist, no odor, low dilatancy. Blows 50/6.
45–50	50' bgs	1610	0.0		**@50' SILTY SAND (SM)** As above. Blows 50/6.

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/28/06

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Site Map	**Project No:** 1303.020.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No:** MW-13A **Start Date/Time:** 03/30/06 **End Date/Time:** 03/31/06 **Logged By:** Mike Hilstrom
	Drilling Method: Hollow-stem Auger **Borehole Diameter:** 10.25"	**Angle from Vertical:** 0
	Surface Material: Gravel Landscape	**Sampling Method:** 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51-54	55' bgs	1617			**@55' SILTY SAND (SM)** As above. Blows 50/5.
55-59	60' bgs	1624			**@60' SILTY SAND (SM)** As above with trace of gravel. Blows 50/6.
60-64	65' bgs	1630			**@65' SILTY SAND (SM)** As above. Blows 50/6.
65-69	70' bgs	1637			**@70' SILTY SAND (SM)** As above. High cementation. Blows 50/6.
70-74	75' bgs	0823			**@75' WELL GRADED SAND WITH GRAVEL** Very light grey. 75% Sand and 25% Fines. Very high cementation, slightly moist. Blows 11,50/6.
75-79	80' bgs	0925			**@80' SILTY SAND (SM** Light brown/grey. 80% Sand and 20% Fines. Slightly wet, slightly plastic, no odor. Blows 50/6.
80-84	85' bgs	0934	0.0		Water table 82' **@85' SILTY SAND (SM)** As above. No plasticity, no odor. Wet-saturated.
85-89	90' bgs	0942			**@90' SILTY SAND (SM)** As above. 75% Sand and 25% Fines. No odor. Blows 21,50/6.
90-94	95' bgs	0950			**@95' SILTY SAND (SM)** As above. Blows 15,16,25.
95-99	100' bgs	0957			**@100' SILTY SAND (SM)** As above. Blows 14,19,20.
100					

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/28/06

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GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-13A
Site Map	Client: ADEQ Site: 20th and FActor WQARF	Start Date/Time: 03/30/06 End Date/Time: 03/31/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-stem Auger Borehole Diameter: 10.25"	Angle from Vertical: 0
	Surface Material: Gravel Landscape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–104	105' bgs	1008			**@105' SILTY SAND (SM)** As above. Thin clay layer ~102'. Blows 12,12,15.
105					**@105' TOTAL DEPTH OF BOREHOLE**
106–150					

Drilling Contractor: Yellow Jacket Drilling

Checked By: Chris Gutmann

Date Checked: 6/28/06

Sheet: 3 of 3

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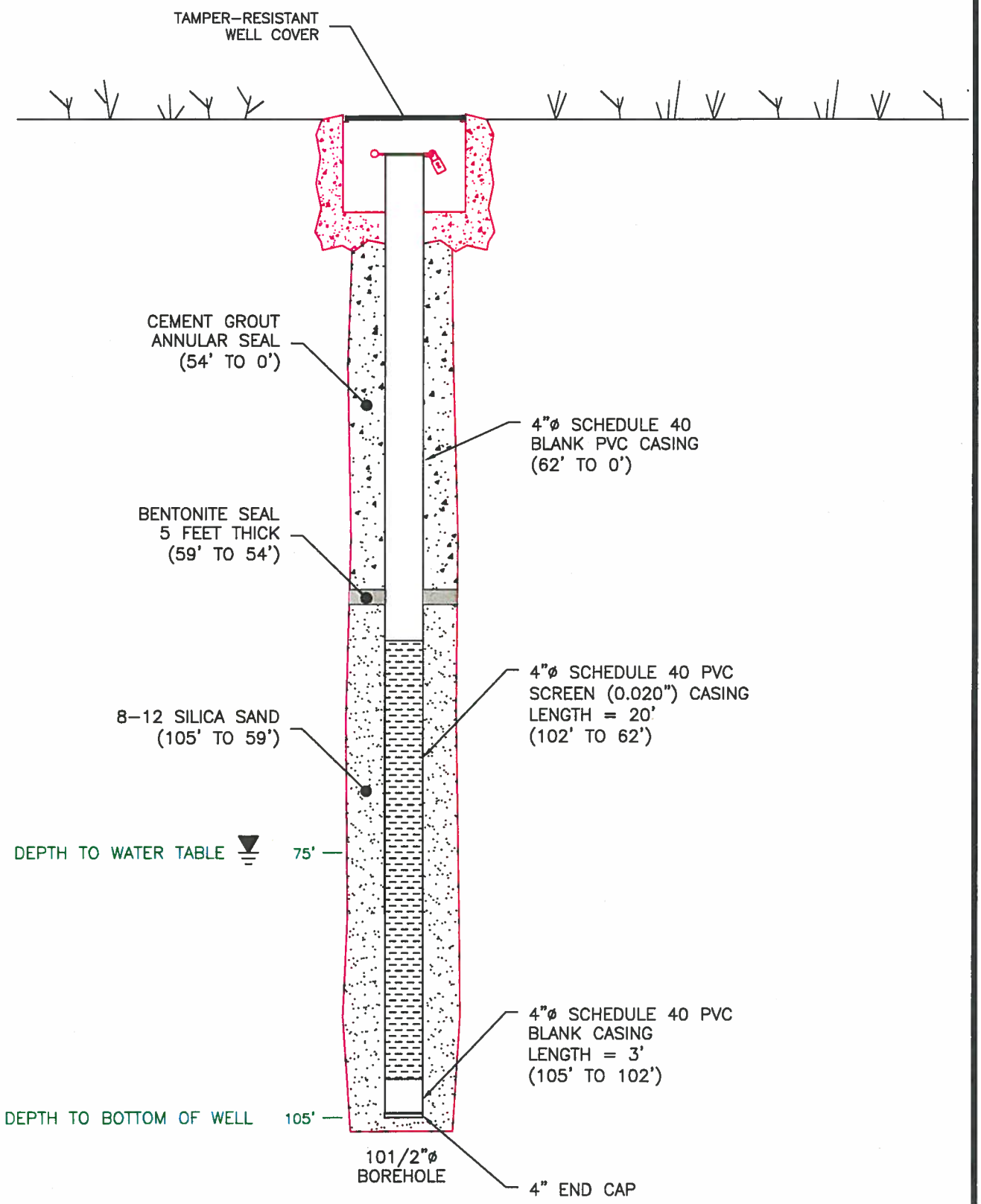


DIAGRAM NOT TO SCALE

TITLE:	WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-13
LOCATION:	YUMA - 20TH & FACTOR

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JZ
DRAFTED	PRP
PROJECT	1303.020.03.02
DATE	June 28, 2006

FIGURE C2

GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-13

APWF 55 # Boring No. X-Ref: 55-904513

Survey Coords:

Elevation Ground Level:

Job Number: 1303.020.03.01

Top of Casing: 0.5' bgs

Drilling Summary:	
Total Depth	105'
Borehole Diameter	10.25"
Casing Stick-Up	-NEG 0.5'
Driller	Yellow Jacket Drill
Rig	BK 81-HD
Bit(s)	HSA 6.25" X 10.25"
Drilling Fluid	Tap water when below Gw. ~80'
Protective Casing	
Comments:	3' blank Sump below Screen From 102'-105' bgs

Construction Time Log: Start / Finish				
Task	Date	Time	Date	Time
Drilling 0-70	3-30-6			
70-105	3-31-6			
Geophys. Logging				
Casing:				
Casing:				
Sand Pack:				
Filter Placement:				
Cementing:				
Development:				

Well Development: MW-13

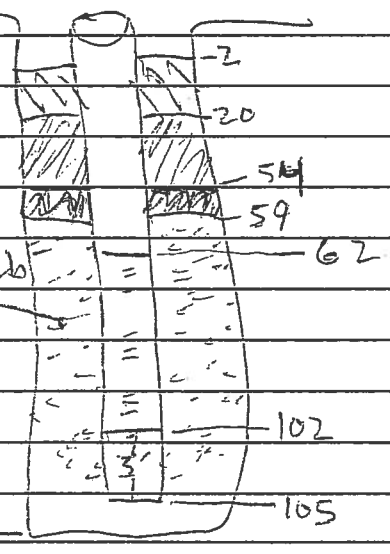
Well Design & Specifications

Basis: Geologic Log _____ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
0.5 to 62	4" PVC C1 Sch40	
62 to 102	0.020" S1 Slot	
102 - 105	4" PVC C2 Sch40	

Casing: 62' C1	0.5' - 62' 4" blank
C2 3'	102' - 105' 4" blank
	Sch 40 PVC
Screen: 40' S1	62' - 102' 0.020"
S2	4" Sch40 PVC SLOTTS
Filter Pack:	59 - 105
	4 1/x 50lb 8-12 Sand.
Grout Seal:	1 x 5gal 1/4" pellets & 2x 50lb med chips bentonite seal 54-59'
Seal:	Bentonite Grout 20'-54'
	Neat Cement 2'-20'



Stabilization Test Data:

Time	pH	Spec. Cond. µs/m	Temp (C)

Site Name: 20th Center

Location: 1830 S. 1st Ave Yuma AZ

Supervised By: Mike Hilstrom

Date: 3-

GeoTrans, Inc.		
Site Map	**Project No:** 1303.020.03 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No:** MW-14A **ADWR ID:** 55-904514 **Start Date/Time:** 4/5/06 **End Date/Time:** 4/6/06 **Logged By:** Mike Hilstrom
	Drilling Method: Hollow-stem Auger **Borehole Diameter:** 10.25"	**Angle from Vertical:** 0
	Surface Material: Gravel Landscape	**Sampling Method:** 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–5	5' bgs	1520			**@5' WELL GRADED SAND (SW)** Light brown, 10YR 5/4. 100% Sand (90% medium, 5% coarse, 5% fine). Very loose, low plasticity, very soft. No odor.
6–10	10' bgs	1655			**@ 10' WELL GRADED SAND (SW)** Light brown 7.5 YR 6/4. 90% Fine Sand and 10% Non-plastic fines. Dry, no odor. Blows 15,50/6.
11–15	15' bgs	Not sampled			
16–20	20' bgs	1700			**@ 20' LEAN CLAY (CL)** Brown 7.5 YR 4/3. 90% Clay, 10% Non-plastic fines, Trace fine sand. Medium-high plasticity, firm-hard consistency. Blows 15,17,22.
21–25	25' bgs	1705			**@ 25' SILTY SAND- SILT WITH SAND** Light brown 7.5 YR 6/3. 50% Fine sand and 50% Non-plastic fines. Very slightly moist, no odor. Blows 14,19,20.
26–30	30' bgs	1710			**@ 30' SILTY SAND WITH INTERBEDDED CLAY (SM-CL)** Silty sand: Light brown 7.5 YR 6/3. 85% Sand (90% fine sand, 10% medium sand) and 15% Non-plastic fines. 2 thin beds of clay ~1.5" thick. Clay: Brown 7.5 YR 5/3. Blows 22,50/6.
31–35	35' bgs	1714			**@ 35' LEAN CLAY (CL)** Brown 7.5 YR 4/3. 90% Clay and 10% Fine sand. Moist, soft-firm consistency, no odor. Blows 12,18,19.
36–40	40' bgs	1720	0.0		**@ 40' LEAN CLAY WITH SILT (CL)** Light brown 7.5 YR 6/4. 70% clay and 30% silt. Low-medium plasticity, firm consistency, no odor. Blows 13,17,19.
41–45	45' bgs	1740	0.0		**@45' LEAN CLAY (CL)** Brown 7.5 YR 5/4. 100% -Fines. Medium-high plasticity, soft-firm consistency, no odor, moist. Blows 12,20,25.
46–50	50' bgs	0750	0.0		**@ 50' SILT (ML)** Light grey 7.5 YR 7/1. 95% Fines. Very low plasticity, high cementation, hard consistancy. Blows 20,50/6.

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/28/06

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GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-14A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 4/5/06 End Date/Time: 4/6/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-stem Auger Borehole Diameter: 10.25"	Angle from Vertical: 0
	Surface Material: Gravel Landscape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51-55	55' bgs	0757	0.0		**@55' SILTY SAND (SM)** Light brown 7.5 YR 6/3. 85% Sand (85% fine sand, 15% medium sand), 15% Fines (silt). Moist-very moist, loose, no cementation, no plasticity. Blows 18,17,30.
56-60	60' bgs	0812			**@ 60' WELL GRADED SANDS WITH FINE SUB-ROUNDED GRAVEL (SW)** Grey 7.5 YR 6/1. 80% Sand (40% fine sand, 30% medium sand, 30% coarse sand), 10% Fines (silt), and 10% Gravel (small sub-round 1/4" - 1/2"). Blows 15, 50/6.
61-65	65' bgs	0822	0.0		**@65' SILTY SAND (SM)** Pinkish grey 7.5 YR 6/2. 85% Sand (85% fine sand, 15% medium sand), 15% Fines (silt). Moist-very moist, no plasticity, no cementation. Blows 50/6. 5" of recovery.
66-70	70' bgs	0837			**@70' SANDY SILTS- SILTY SANDS (ML-SM)** Light brown 7.5 YR 6/3. 50% Silt and 50% Very fine sand. Moist-very moit. blows 20, 27, 30.
71-75	75' bgs	0845			**@75' SILTS (ML)** Light brown 7.5 YR 6/3. 75% Fines (silt) and 25% Very fine sand. Very moist. Blows 25,50/6. Recovered ~5". Water table 79'
76-80	80' bgs	0908			**@80' SILTY SAND (SM)** Light brown 7.5 YR 6/3. 80% Sand(mostly fine sand) and 20% Fines (mostly silt with some clay). Very slightly plastic, dense,wet. Blows 12,50/6. Recovered ~14".
81-85	85' bgs	0924			**@85' SILTY SAND (SM)** As above. Thin clay layer between 85' and 90'. Blows 50/5.
86-90	90' bgs	0933			**@90' SILTY SANDS (SM)** As above. Blows 20,50/6.
91-95	95' bgs	0940			**@95" SILTY SAND (SM)** As Above. No plasticity. Blows 50/6.
96-100	100' bgs	0948			**@100' SILTY SAND (SM)** As Above. Blows 10,12,8.

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/28/06

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GeoTrans, Inc.

Site Map

Project No: 1303.020.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-14A

Start Date/Time: 4/5/06

End Date/Time: 4/6/06

Logged By: Mike Hilstrom

Drilling Method: Hollow-stem Auger

Angle from Vertical: 0

Borehole Diameter: 10.25"

Surface Material: Gravel Landscape

Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–105	105' bgs	0958			**@ 105' SILTY SAND (SM)** As Above. Blows 50/6.
106–108	107.5	1004			**@107.5' SILTY SAND (SM)** As Above. Blows 21, 50/6.
109–110					**@108' TOTAL DEPTH OF BOREHOLE**
111–150					

Drilling Contractor: Yellow Jacket Drilling

Checked By: Chris Gutmann

Date Checked: 6/28/06

Sheet: 3 of 3

GeoTrans, Inc
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GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-14

ADWR 55# Boring No. X-Ref: 55-904514

Survey Coords:

Elevation Ground Level:

Job Number: 1303.020.03.01

Top of Casing:

Drilling Summary:		Construction Time Log: Start / Finish				
Total Depth bore hole	108.5' bgs	Task	Date	Time	Date	Time
Borehole Diameter	10.25"	Drilling 0-80	4-6-6			
Casing Stick-Up	-Neg 0.5' bgs	80-108	4-7-6			
Driller	Yellow Jacket Drill	up & 0-108				
Rig	BK-81 HD	w/wood Plug				
Bit(s)	HSA 6.25" x 10.25" x 5'	Geophys. Logging				
Drilling Fluid	TAP water when below ~78'	Casing:				
Protective Casing		Casing:				
Comments: Could not set well 1st Time down sampling 1st Time down - had to pull up & out all Auger & Pipe - Put wood Plug on bottom of Bit, Ream & Set well @ 108'						
		Sand Pack:				
		Filter Placement:				
		Cementing:				
		Development:				

Site Name: 20th & Factor Yuma, AZ

Location: 20th St S. side, W ~170' from Av Ave In Grand Landscape in front of Sun Equip Rentals.

Supervised By: Mike Hilstrom

Date: 4-6-6 & 4-7-06

Well Design & Specifications

Basis: Geologic Log _____ Geophysical Log _____

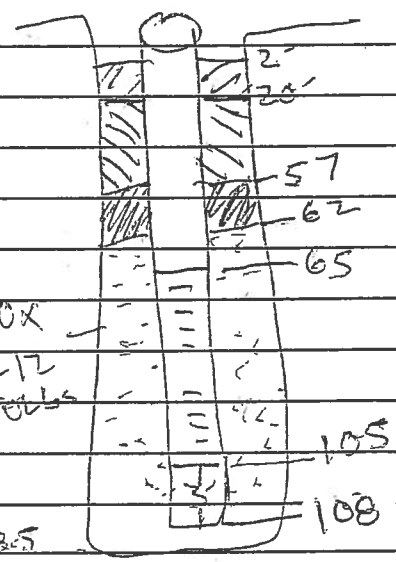
Casing String(s): C = Casing S = Screen

Depth (ft) bgs	String (C1, S1, etc.)	Elevation (ft)
0.5 to 65'	4" PVC C1 Sch40	
65 to 105	4" SLOTS1 0.020"	
105 - 108	4" PVC C2 Sch40	

Casing: C1	6x10' 4" blank &
	1x5' 4" blank
C2	1x3' 4" blank
Screen: S1	4x10' 4" slotted
	0.020"
Filter Pack:	50lbs x 40 sacks of 8-12 Sand
Grout Seal:	1x5gal Pellets & 2x50lb med bentonite chips 57-62'
Seal:	Bentonite Grout well DF 20-57'

Neat cement 2'-20'

Well Development: MW-14



Stabilization Test Data:

Time	pH	Spec. Cond. µs/m	Temp (C)

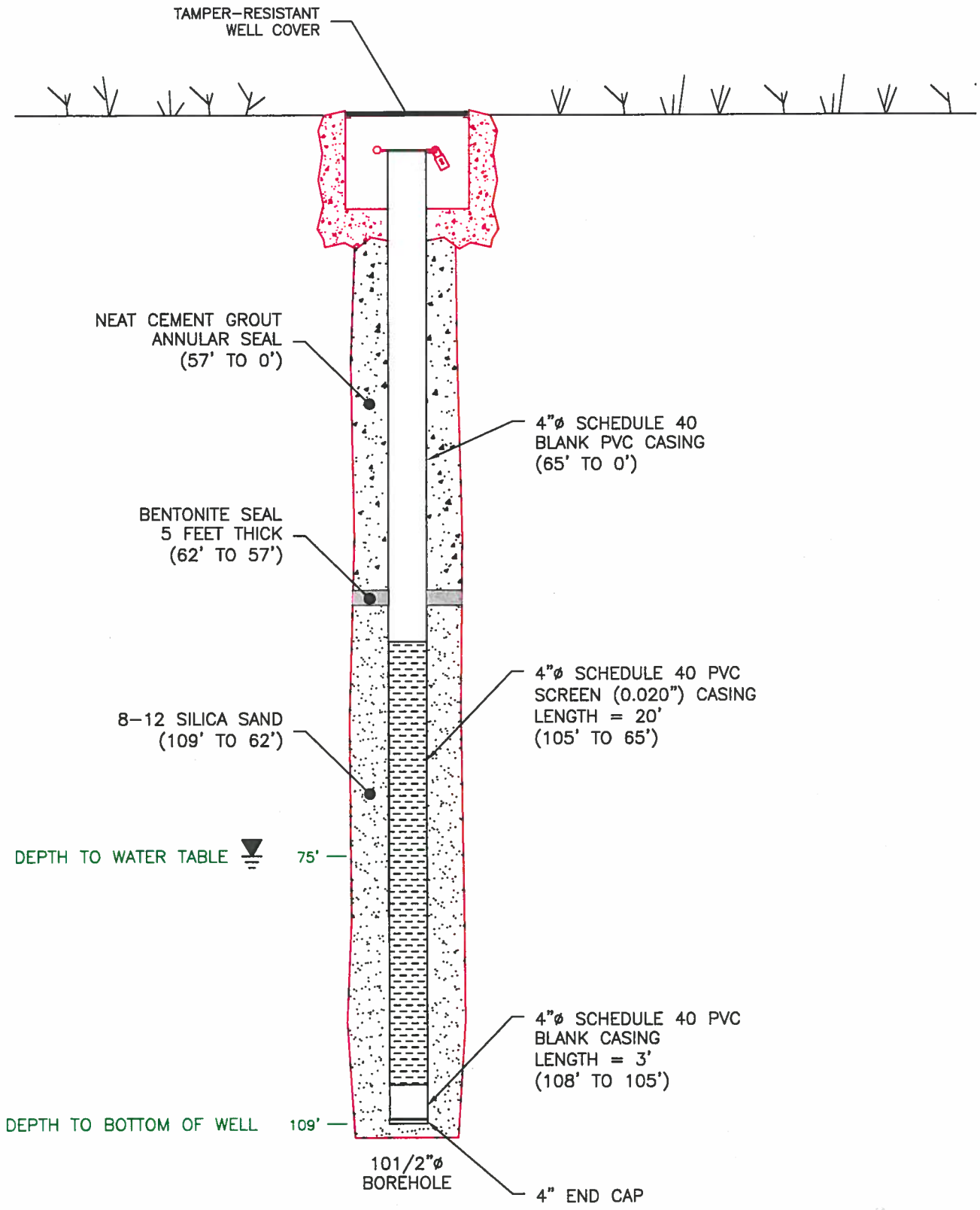


DIAGRAM NOT TO SCALE

TITLE:	WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-14
LOCATION:	YUMA - 20TH & FACTOR

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JZ	FIGURE
DRAFTED	PRP	C3
PROJECT	1303.020.03.02	
DATE	June 28, 2006	

GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-15A ADWR ID: 55-904515
Site Map	Client: ADEQ Site: 120th and Factor WQARF	Start Date/Time: 4/4/06 End Date/Time: 4/5/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-Stem Auger Borehole Diameter: 10.25"	Angle from Vertical:
	Surface Material: Gravel Landcape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–5	5' bgs	0830	0.0		**@5' SILT WITH SAND (ML)** Reddish Yellow 7.5 YR 6/8. 70% silt and 30% sand (fine). Dry, no odor, firm, no cementation.
6–9	10' bgs	1007	0.0		**@10' SILTY SAND (SM)** Light brown 7.5 YR 6/3. 80% sand and 20% fines. Dry, no odor, loose, no cementation.
10–14	15' bgs	1014	0.0		**@15' SILTY SAND (SM)** As above. Medium density. Blows 15,16,22.
15–20	20' bgs	1021	0.0		**@20' SILTY SAND (SM)** As above. Very dense. Blows 18,50/6.
21–24	25' bgs	1028	0.0		**@25' FAT CLAY (CH)** Brown 7.5 YR 4/4. 100% fine clay dominated. Moist-slightly moist, no odor, hard, very high plasticity, dense. Blows 14,21,25.
25–29	30' bgs	1037	0.0		**@30' CLAYEY SAND (SC)** Strong brown 7.5 YR 5/1. 60% sand and 40% fines. No odor medium plasticity, slightly moist. Blows 2/0,50/6.
30–33	35' bgs	1044	0.0		**@30.5' WELL SORTED SAND (SW)** Grey 7.5 YR 5/1. 90% sand and 10% fines. No odor.
34–35					**@35' LEAN CLAY (CL)** Brown 7.5 YR 5/3. 85% fines and 15% fine sand. Moist, soft, no odor, medium plasticity, stiff to very stiff. Blows 12,12,22.
36–38	40' bgs	1101	0.0		**@40' SILTY SAND (SM)** Trace fine gravels, sub-rounded. 85% sand and 15% fines. Loose, non-plastic, moist, no odor, medium density. Blows 14,20,21.
39–44	45' bgs	1111	0.0		**@45' SILTY SAND (SM)** As above with color bands Yellowish red 5YR 5/8. No odor, very dense. Blows 29,50/6.
45–50	50' bgs	1250			**@50' SILTY SAND (SM)** Very dense. Blows 50/6.

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/29/06

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Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.020.03	Borehole No: MW-15A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 4/4/06 End Date/Time: 4/5/06 Logged By: Mike Hilstrom
	Drilling Method: Hollow-Stem Auger Borehole Diameter: 10.25"	Angle from Vertical:
	Surface Material: Gravel Landcape	Sampling Method: 18" Split Spoon

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54	55' bgs	1258	0.0		**@55' SILTY SAND TO SANDY SILT (SM-ML)** 50% fine sand and 50% non-plastic fines. Very dense. Blows 50/5.
55 56 57 58 59	60' bgs	1310	0.0		**@60' SILTY SAND TO SANDY SILT (SM-ML)** As above. Very high cementation, very dense, dry to slightly moist, no odor. Blows 75/3.
60 61 62 63 64	65' bgs	1402			**@65' SILTY SAND TO SANDY SILT (SM-ML)** As above. No odor. Blows 50/6.
65 66 67 68 69	70' bgs	1413			**@70' SILTY SAND TO SANDY SILT (SM-ML)** As above. Moist to very moist, no odor, very high cementation, no plasticity. Blows 50/6.
70 71 72 73 74	75' bgs	1432			**@75' SILTY SAND (SM)** Trace of fine sub-angular to sub-round gravels. Very moist, very high cementation, no odor. Blows 50/6.
75 76 77 78 79	80' bgs	1441			**@80' SILTY SAND (SM)** As above. Very moist. Blows 50/6.
80 81 82 83 84	85' bgs	0816			**@85' SILTY SAND (SM)** Water table 82'. 80% sand and 20% fines. No plasticity, no odor, loose. Wet. Blows 50/6.
85 86 87 88 89	90' bgs	0821			**@90' SILTY SAND (SM)** As above. Blows 60/6.
90 91 92 93 94	95'bgs	0828			**@95' SILTY SAND (SM)** As above. Blows 50/6.
95 96 97 98					**@96' CLAY**
99 100					**@98' TOTAL DEPTH OF BOREHOLE**

Drilling Contractor: Yellow Jacket Drilling
Checked By: Chris Gutmann
Date Checked: 6/29/06

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GeoTrans, Inc.

MONITOR WELL CONSTRUCTION SUMMARY

Well No. MW-15

ADWR 55# Boring No. X-Ref: 55-904515

Survey Coords:

Elevation Ground Level:

Job Number: 1303.020.03.01

Top of Casing:

Drilling Summary:		Construction Time Log: Start		Finish		
Total Depth		Task	Date	Time	Date	Time
Borehole Diameter	10.25"	Drilling 0-80'	4-4-6			
Casing Stick-Up	0.5 bgs	80-98	4-5-6			
Driller	Yellow Jacket Drilling					
Rig	BK-81 HD					
Bit(s)	HSA 6.25" x 10.25" x 5" each	Geophys. Logging				
Drilling Fluid	TAP water when below GW ~80 bgs	Casing:				
Protective Casing		Casing:				
Comments: Sch 40 4" PVC						
		Sand Pack:				
		Filter Placement:				
		Cementing:				
		Development:				

Site Name: 20th & Factor

Location: 1965 S. 1st Ave Yuma AZ

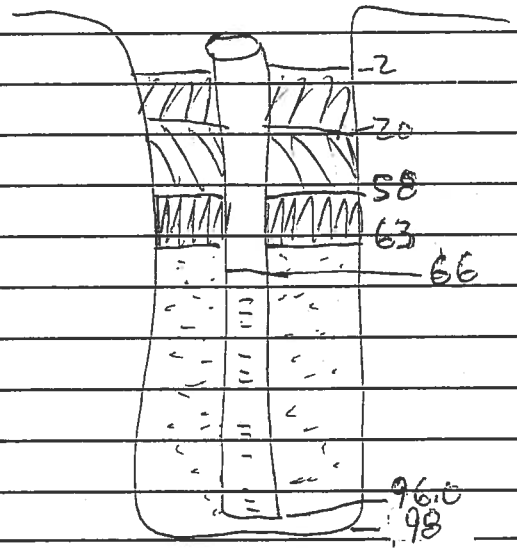
Well Design & Specifications

Basis: Geologic Log _____ Geophysical Log _____

Casing String(s): C = Casing S = Screen

Depth (ft)	String (C1, S1, etc.)	Elevation (ft)
0.5 to 66	Sch 40 C1 4" PVC	
66 to 96	0.020" S1 Slots	

Well Development:



Casing:	C1	0.5' - 66'
		Sch 40 PVC 4" Ø
Screen:	S1	0.020" Slotted PVC
30'		Sch 40 PVC 4" Ø
Filter Pack:		
50Lb		8-12 Sand 20 bags
Grout Seal:		Grout well DF
Seal:		Neat Cement

Stabilization Test Data:

Time	pH	Spec. Cond. µs/m	Temp (C)

Supervised By: Mike Hilstrom

Date:

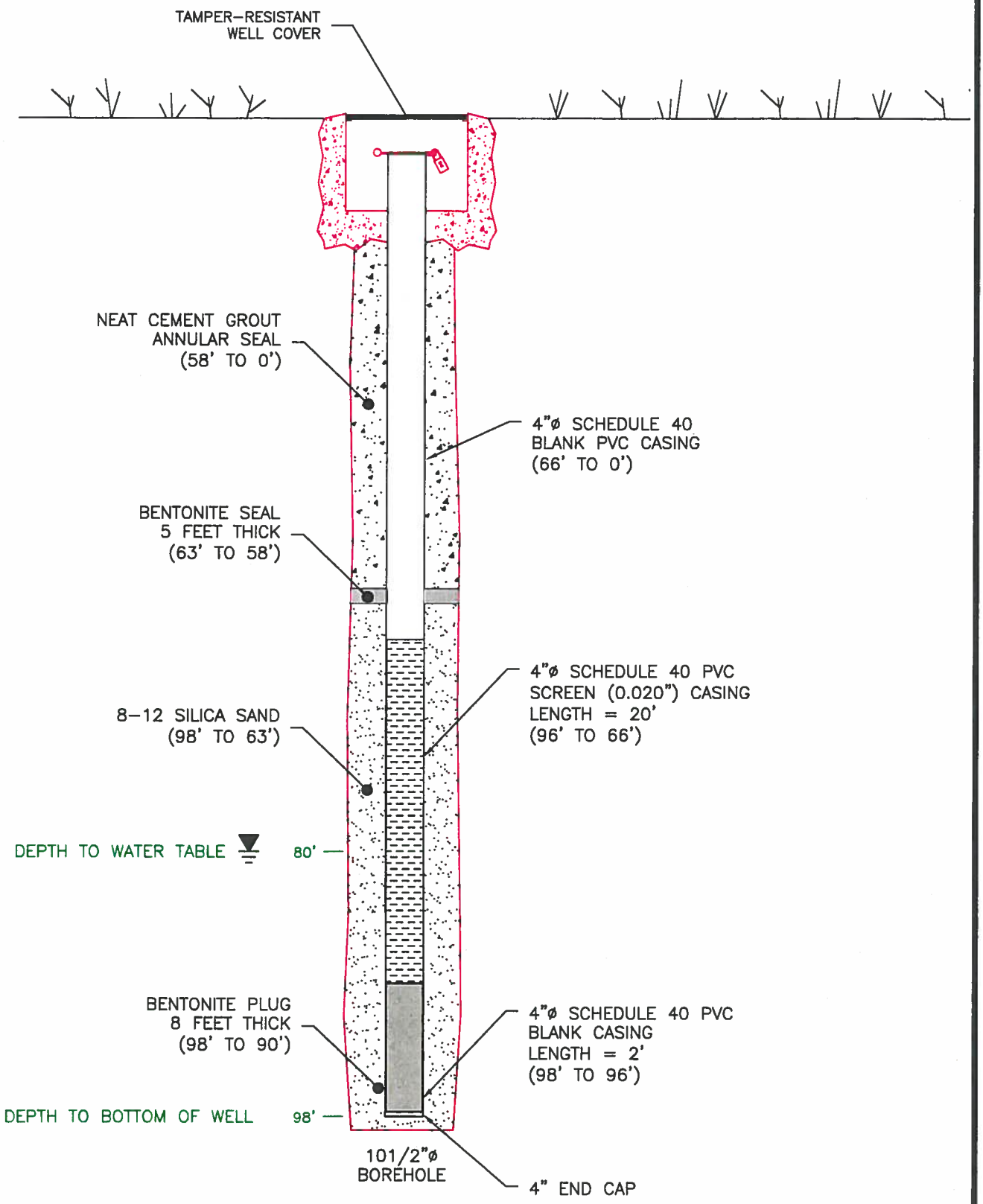


DIAGRAM NOT TO SCALE

TITLE: **WELL CONSTRUCTION DIAGRAM MONITOR WELL MW-15**

LOCATION: **YUMA - 20TH & FACTOR**

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JZ
DRAFTED	PRP
PROJECT	1303.020.03.02
DATE	June 28, 2006

FIGURE **C4**

MW-15

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD PARAMETER DATA SHEET

Project Name: YUMA WQARF SITE Recorded By: N. SEAVER

Project No.: 1303.020 Sampled By: N. SEAVER

Measuring Point Description: FROM TOP OF WELL CASING, NORTH SIDE

Measuring Point Elevation:

Purge Rate:

Date: 4/6/06 Instrument: QUANTA-G ; LEMOTTE 2020e

Time	pH	Conductivity (~~µS~~) mS	Temperature (° C)	DO (mg/l)	ORP (mv)	Turbidity (NTU)
0810	10.30	3.59	24.03	5.35	324	MUDDY BROWN
0920	10.45	3.70	25.71	9.83	321	LIGHT BROWN
0955	(8.48)	3.97	26.75	6.72	229	82.3
1000	(8.23)	3.92	28.40	6.85	213	71.5
1009	(7.61)	4.11	27.22	7.51	197	50.2
1021	(7.53)	4.06	28.53	6.93	215	31.5
1026	(7.75)	4.04	28.68	6.55	211	21.7
1033	(7.68)	4.03	28.72	6.56	231	20.4

Site Map	**Project No:** 1303.026.09.01 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-16A** **ADWR ID:** 55-908808 **Start Date/Time:** 4/15/08 **End Date/Time:** 4/18/08 **Logged By:** LG/BB
	Drilling Method: Sonic **Borehole Diameter:** 10"	**Angle from Vertical:** NA
	Surface Material: Asphalt	**Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–20					**Sand (SW)** Very pale brown, 10YR 7/4, dry, fine to medium grained
21–25					**Sand (SW)** Light yellowish brown, 10YR 6/4, dry, fine to medium grained, w/ clay nodules
26–35					**Sand (SW)** Very pale brown, 10YR 7/4, dry, fine to medium grained
36–40					**Sand (SP)** Very pale brown, 10YR 7/4, dry, very fine grained
41–45					**Sand (SP)** Very pale brown, 10YR 7/4, dry, very fine grained
46–50					**Sand (SW)** Light yellowish brown, 10YR 6/4, dry, fine to medium grained, w/ clay nodules

Drilling Contractor: Boart Longyear
Checked By: M. Oakley
Date Checked: 6/10/08

Sheet: 1 of 4

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Site Map	**Project No:** 1303.026.09.01 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-16A** **Start Date/Time:** 4/15/08 **End Date/Time:** 4/18/08 **Logged By:** LG/BB
	Drilling Method: Sonic **Borehole Diameter:** 10"	**Angle from Vertical:** NA
	Surface Material: Asphalt	**Sampling Method:** NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54					**Silty Sand w/ Gravel (SM)** Reddish yellow 7.5YR 6/6 to pinkish gray 7.5YR 6/2, moist, 50% fine grained sand, 30% silt, 20% gravel, lightly cemented, dry
55 56 57 58 59					**Silty Sand (SM)** Dark yellowish brown, 10YR 4/4, very moist, 80% very fine grained sand, 25% silt
60 61 62 63 64					**Silt (ML)** Brown, 7.5 YR 4/4, moist, stiff, some cementation
65 66 67 68 69					**Silty Clay (CL)** Brown, 7.5 YR 5/4, moist, 60% clay, 40% silt, medium plasticity
70 71 72 73 74					**Clay (CL)** Reddish brown, 5YR 4/4, moist, hard, low plasticity
75 76 77 78 79					**Clayey Sand (SC)** Yellowish brown, 10YR 5/4, moist, 75% fine grained sand, 25% clay
80 81 82 83 84					**Silty Sand (SM)** Light yellowish brown, 10YR 6/4, moist, 60% fine to medium grained sand, 40% silt
85 86 87 88 89					**Gravelly Sand (SW)** Light yellowish brown, 10YR 6/4, saturated, 75% fine to coarse grained sand, 25% fine, subrounded gravel
90 91 92 93 94					**Gravelly Sand (SW)** Dark yellowish brown, 10YR 4/4, saturated, 75% fine to coarse grained sand, 25% fine, subrounded gravel
95 96 97 98 99 100					**Gravelly Sand (SW)** Dark yellowish brown, 10YR 4/4, saturated, 75% fine to coarse grained sand, 25% fine to coarse, subrounded gravel, w/ trace silt

Drilling Contractor: Boart Longyear
Checked By: M. Oakley
Date Checked: 6/10/08

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Site Map	**Project No:** 1303.026.09.01 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-16A** **Start Date/Time:** 4/15/08 **End Date/Time:** 4/18/08 **Logged By:** LG/BB
	Drilling Method: Sonic **Borehole Diameter:** 10"	**Angle from Vertical:** NA
	Surface Material: Asphalt	**Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101-104					**Sandy Gravel (GW)** Dark yellowish brown, 10YR 5/4, moist, 75% fine to coarse, subrounded gravel, 25% fine to medium grained sand
105-125					**Sand (SW)** Dark yellowish brown, 10YR 5/4, saturated, fine to medium grained
126-129					**Sand (SW)** Dark yellowish brown, 10YR 5/4, saturated, fine to coarse grained sand, w/ some subangular gravel
130-134					**Sand (SW)** Dark yellowish brown, 10YR 5/4, saturated, fine to medium grained sand, w/ trace subangular gravel
135-139					**Clayey Sand (SC)** Yellowish brown, 10YR 6/6, moist, 60% fine to medium grained sand, 40% clay, moderate plasticity
140-144					**Sand (SW)** Dark yellowish brown, 10YR 5/4, saturated, fine to coarse grained
145-150					**Silty Sand (SM)** Dark yellowish brown, 10YR 5/4, saturated, 80% fine grained sand, 20% silt

Drilling Contractor: Boart Longyear
Checked By: M. Oakley
Date Checked: 6/10/08

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Site Map	**Project No:** 1303.026.09.01 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No: MW-16A** **Start Date/Time:** 4/15/08 **End Date/Time:** 4/18/08 **Logged By:** LG/BB
	Drilling Method: Sonic **Borehole Diameter:** 10"	**Angle from Vertical:** NA
	Surface Material: Asphalt	**Sampling Method:** NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151–155					**Sand (SW)** Dark yellowish brown, 10YR 5/4, moist, fine to coarse grained, w/ clay nodules
156–160					**Sand (SW)** Dark yellowish brown, 10YR 5/4, moist, fine to coarse grained
161–162					**Clayey Sand (SC)** Dark yellowish brown, 10YR 5/4, moist, 80% fine to medium grained sand, 20% clay
163–200					**End drilling at 162' bgs**

Drilling Contractor: Boart Longyear

Checked By: M. Oakley

Date Checked: 6/10/08

Sheet: 4 of 4

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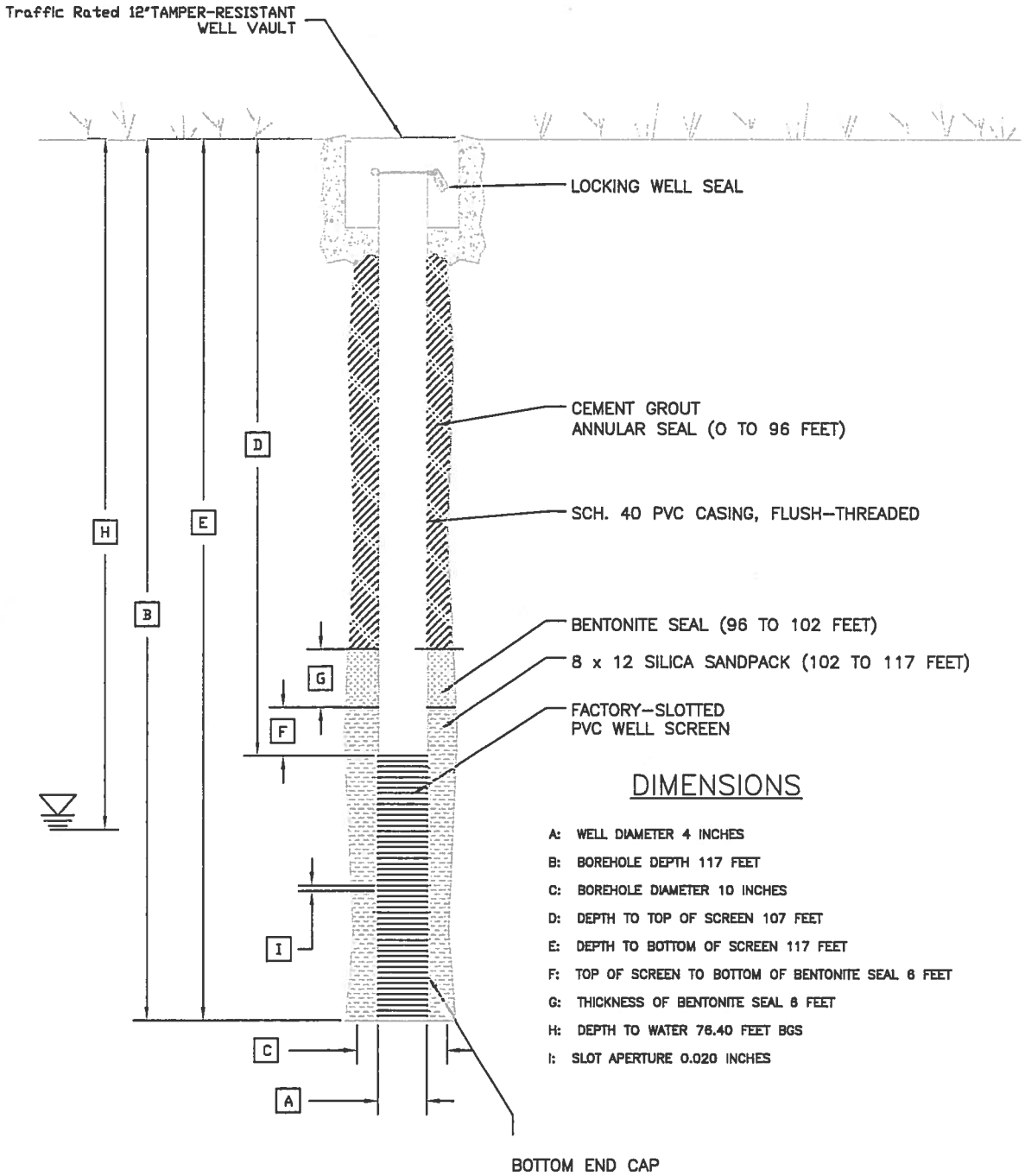

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 117 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 107 FEET
E: DEPTH TO BOTTOM OF SCREEN 117 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 6 FEET
G: THICKNESS OF BENTONITE SEAL 6 FEET
H: DEPTH TO WATER 76.40 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE: MW-16 WELL DIAGRAM 20TH AND FACTOR WQARF SITE			
LOCATION: YUMA, ARIZONA			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	LG	FIGURE
	DRAFTED	MB	B1
	PROJECT	1303.020	
	DATE	12/19/06	

Site Map	**Project No:** 1303.020 **Client:** ADEQ **Site:** 20th & Factor WQARF	**Borehole No:** MW-17A **ADWR ID:** 55-905870 **Start Date/Time:** 11/13/06 **End Date/Time:** 11/15/06 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 10	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–5	5				**Well-graded Sand (SW)** Very pale brown, dry, fine grained sand, trace fines
6–10	10				**Well-graded Sand (SW)** As above
11–15	15				**Well-graded Sand (SW)** As above
16–20	20				**Silty Sand - Sandy Silt (SM-ML)** Light yellow brown, fine grained sand with silt
21–25	25				**Poorly-graded Sand (SP)** Very pale brown, fine grained sand, some fines
26–30	30				**Poorly-graded Sand (SP)** As above
31–35	35				**Well-graded Sand (SW)** Light gray, dry, fine grained sand with weakly cemented sand nodules
36–40	40				**Poorly-graded Sand (SP)** Light gray, dry, fine to medium grained
41–45	45				**Poorly-graded Sand (SP)** As above
46–50	50				**Poorly-graded Sand (SP)** As above

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/18/06

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Phoenix, Arizona 85034
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GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-17A
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/13/06 End Date/Time: 11/15/06 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51-54	55				**Well-graded sand (SW)** Very pale brown, dry, fine grained
55-59	60				**Clayey Sand - Sandy Clay (SC-CL)** Pale brown, slightly moist
60-64	65				**Fat Clay (CH)** Pale brown, moist, sandy clay
65-69	70				**Poorly-graded Sand (SP)** Light gray, fine grained sand with silt
70-74	75				**Well-graded Sand (SW)** Pale brown, damp, fine grained
75-79	80				**Silty Sand - Sandy Silt (SM-ML)** Light gray, saturated
80-84	85				**Poorly-graded Sand (SP)** Very pale brown, saturated fine to medium grained
85-89	90				**Poorly-graded Sand (SP)** As above
90-94	95				**Clay (CL)** Brown, saturated, clay
95-98					
99-100					**Bottom of boring at 98 feet bgs**

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/18/06

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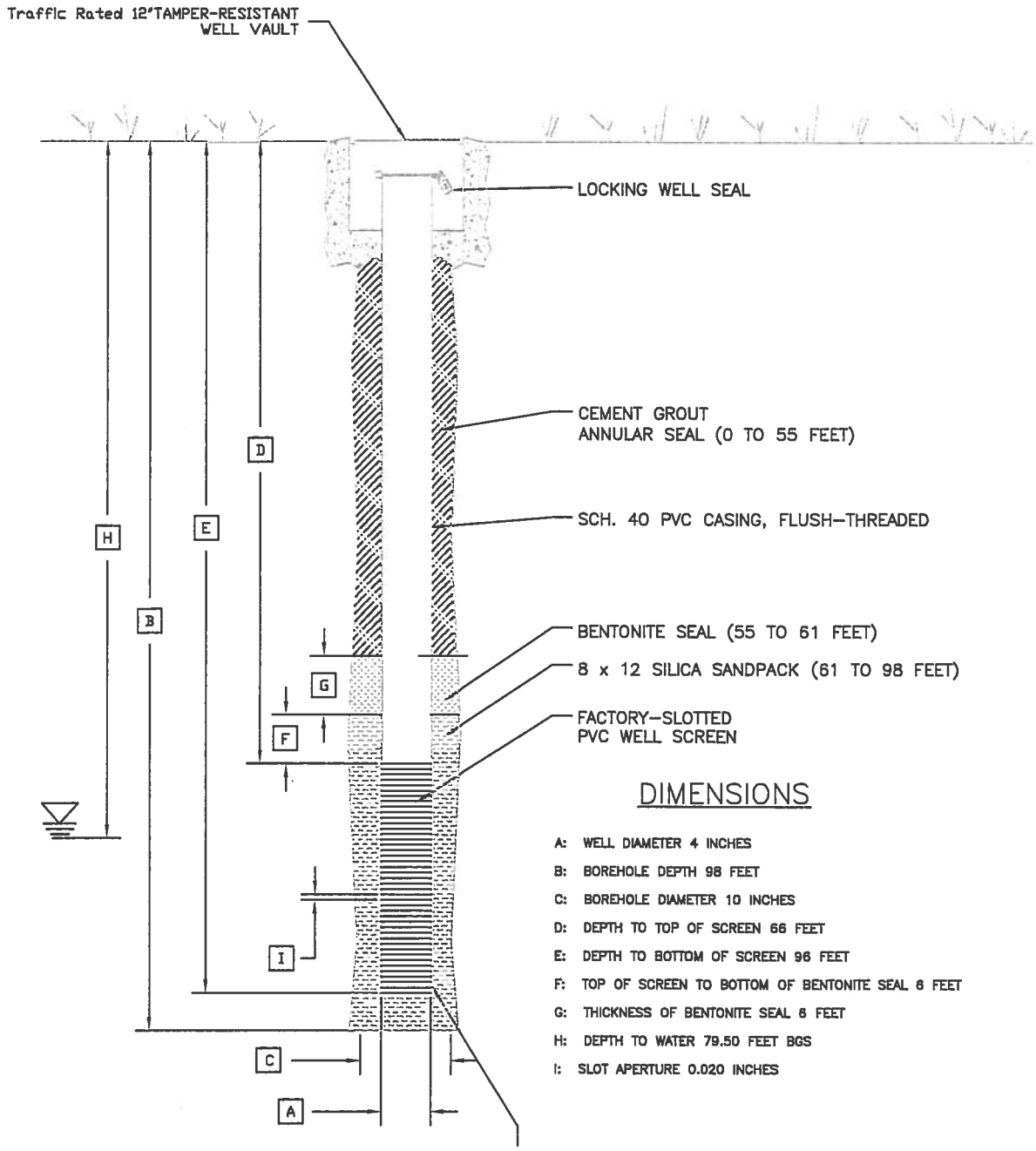

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 98 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 66 FEET
E: DEPTH TO BOTTOM OF SCREEN 96 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 6 FEET
G: THICKNESS OF BENTONITE SEAL 6 FEET
H: DEPTH TO WATER 79.50 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE: MW-17 WELL DIAGRAM 20TH AND FACTOR WQARF SITE			
LOCATION: YUMA, ARIZONA			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	LG	FIGURE
	DRAFTED	MB	B2
	PROJECT	1303.020	
	DATE	12/19/06	

GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-18A ADWR ID: 55-905871
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/10/06 End Date/Time: 11/13/06 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–5	5				**Poorly-graded Sand (SP)** Pale brown, dry, fine to medium grained
6–9	10				**Poorly-graded Sand (SP)** Becomes coarse grained with some gravel
10–14	15				**Poorly-graded Sand (SP)** Pale brown, dry, fine to medium grained
15–19	20				**Sandy Clay - Clayey Sand (CL-SC)** Light brown, dry, sandy clay
20–24	25				**Sandy Clay - Clayey Sand (CL-SC)** As above
25–29	30				**Poorly-graded Sand (SP)** Pale brown, dry, fine to medium grained
30–34	35				**Well-graded Sand (SW)** Light gray, dry, fine grained
35–39	40				**Poorly-graded Sand (SP)** Light gray, dry, fine to medium grained
40–44	45				**Poorly-graded Sand (SP)** As above
45–49	50				**Poorly-graded Sand (SP)** As above
50					

Drilling Contractor: PROSONIC Corporation

Checked By: L. Gardiner

Date Checked: 12/15/06

Sheet: 1 of 3

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Phoenix, Arizona 85034
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Site Map	**Project No:** 1303.020 **Client:** ADEQ **Site:** 20th & Factor WQARF	**Borehole No:** MW-18A **Start Date/Time:** 11/10/06 **End Date/Time:** 11/13/06 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 10	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51-54	55				**Poorly-graded Sand (SP)** As above
55-60	60				**Poorly-graded Sand (SP)** Light brown, slightly moist, fine grained sand with
61-64	65				**Poorly-graded Sand (SP)** Light gray, slightly moist, fine to medium grained
65-69	70				**Poorly-graded Sand (SP)** As above
70-74	75				**Poorly-graded Sand (SP)** Light gray, slightly moist, fine to medium grained
75-79	80				**Sandy Clay - Clayey Sand (CL-SC)** Light gray, damp, sandy clay
80-84	85				**Silty Sand - Sandy Silt (SM-ML)** Light gray, saturated, sandy silt
85-89	90				**Silty Sand - Sandy Silt (SM-ML)** As above
90-94	95				**Silty Sand - Sandy Silt (SM-ML)** As above
95-99	100				**Silty Sand - Sandy Silt (SM-ML)** Pale brown, saturated
100					

Drilling Contractor: PROSONIC Corporation
Checked By: L. Gardiner
Date Checked: 12/15/06

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GeoTrans, Inc.

Site Map

Project No: 1303.020

Client: ADEQ

Site: 20th & Factor WQARF

Borehole No: MW-18A

Start Date/Time: 11/10/06

End Date/Time: 11/13/06

Logged By: A. Gray

Drilling Method: Sonic

Angle from Vertical: 0

Borehole Diameter: 10

Surface Material: Asphalt

Sampling Method: N/A

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–104	105				**Silty Sand - Sandy Silt (SM-ML)** As above
105–106					
107					**Bottom of boring at 107 feet bgs**
108–110					
111–114					
115–119					
120–124					
125–129					
130–134					
135–139					
140–144					
145–149					
150					

Drilling Contractor: PROSONIC Corporation

Checked By: L. Gardiner

Date Checked: 12/15/06

Sheet: 3 of 3

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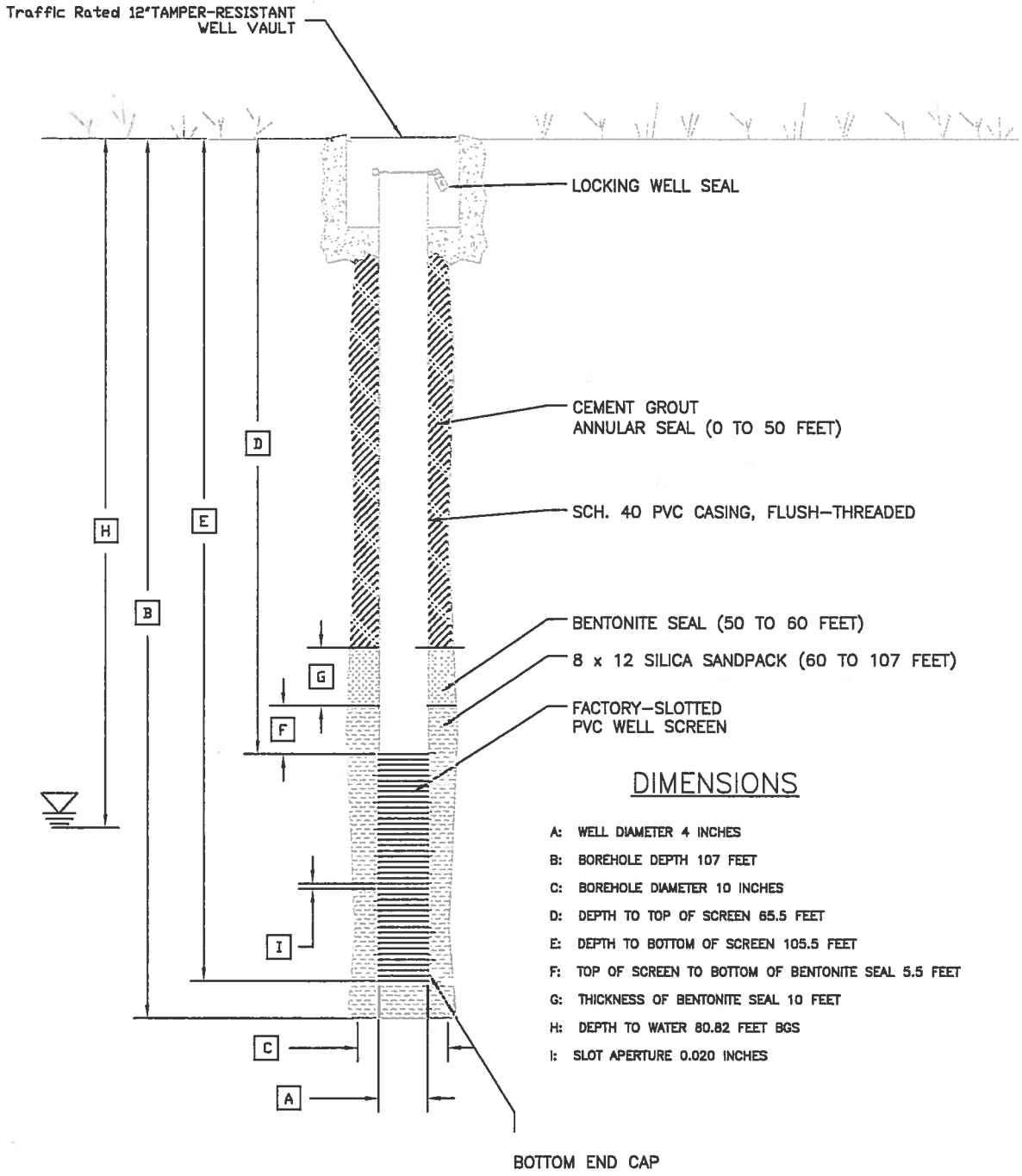

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 107 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 65.5 FEET
E: DEPTH TO BOTTOM OF SCREEN 105.5 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5.5 FEET
G: THICKNESS OF BENTONITE SEAL 10 FEET
H: DEPTH TO WATER 80.82 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE:	MW-18A WELL DIAGRAM 20TH AND FACTOR WQARF SITE		
LOCATION:	YUMA, ARIZONA		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	LG	FIGURE
	DRAFTED	MB	B3
	PROJECT	1303.020	
	DATE	12/19/06	

GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-19A ADWR ID: 55-905873
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/19/06 End Date/Time: 11/21/06 Logged By: M. Brennen
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5	5				**Poorly-graded Sand (SP)** Very pale brown, dry, fine to medium grained sand
6 7 8 9 10	10				**Poorly-graded Sand (SP)** As above
11 12 13 14 15	15				**Poorly-graded Sand (SP)** Becomes pale brown and fine grained
16 17 18 19 20	20				**Poorly-graded Sand (SP)** Brown, dry, fine to medium grained with trace nodules of clay
21 22 23 24 25	25				**Poorly-graded Sand (SP)** Becomes yellow brown
26 27 28 29 30	30				**Poorly-graded Sand (SP)** Light brown, dry, fine grained sand
31 32 33 34 35	35				**Poorly-graded Sand (SP)** As above
36 37 38 39 40	40				**Poorly-graded Sand (SP)** As above
41 42 43 44 45	45				**Poorly-graded Sand (SP)** Brown, dry, fine to medium grained sand with weakly cemented sand nodules
46 47 48 49 50	50				**Clay (CL)** Brown, slightly moist, moderate plasticity

Drilling Contractor: PROSONIC Corporation

Checked By: M. Oakley

Date Checked: 12/01/06

Sheet: 1 of 3

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GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-19A
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/19/06 End Date/Time: 11/21/06 Logged By: M. Brennen
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51 52 53 54	55				**Clay (CL)** As above
55 56 57 58 59 60	60				**Clayey Sand - Sandy Clay (CL-SC)** Light yellowish brown, slightly moist, clayey sand
61 62 63 64 65	65				**Poorly-graded Sand (SP)** Yellowish brown, dry, fine grained sand with trace silt
66 67 68 69 70	70				**Poorly-graded Sand (SP)** Pale brown, damp, fine to medium grained sand
71 72 73 74 75	75				**Poorly-graded Sand (SP)** Becomes yellowish brown
76 77 78 79 80	80				**Poorly-graded Sand (SP)** Brown, saturated, fine grained sand with trace weakly cemented sand nodules
81 82 83 84 85	85				**Poorly-graded Sand (SP)** Yellow brown, saturated, fine to medium grained sand
86 87 88 89 90	90				**Well-graded Sand (SW)** Brown, saturated, medium to coarse grained sand with trace fines
91 92 93 94 95	95				**Well-graded Sand (SW)** As above
96 97 98 99 100	100				**Poorly-graded Sand (SP)** Brown, saturated, fine to medium grained

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/01/06

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GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-19A
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/19/06 End Date/Time: 11/21/06 Logged By: M. Brennen
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101	105				Poorly-graded Sand (SP) As above
105					Bottom of the boring at 105 feet bgs

Drilling Contractor: PROSONIC Corporation

Checked By: M. Oakley

Date Checked: 12/01/06

Sheet: 3 of 3

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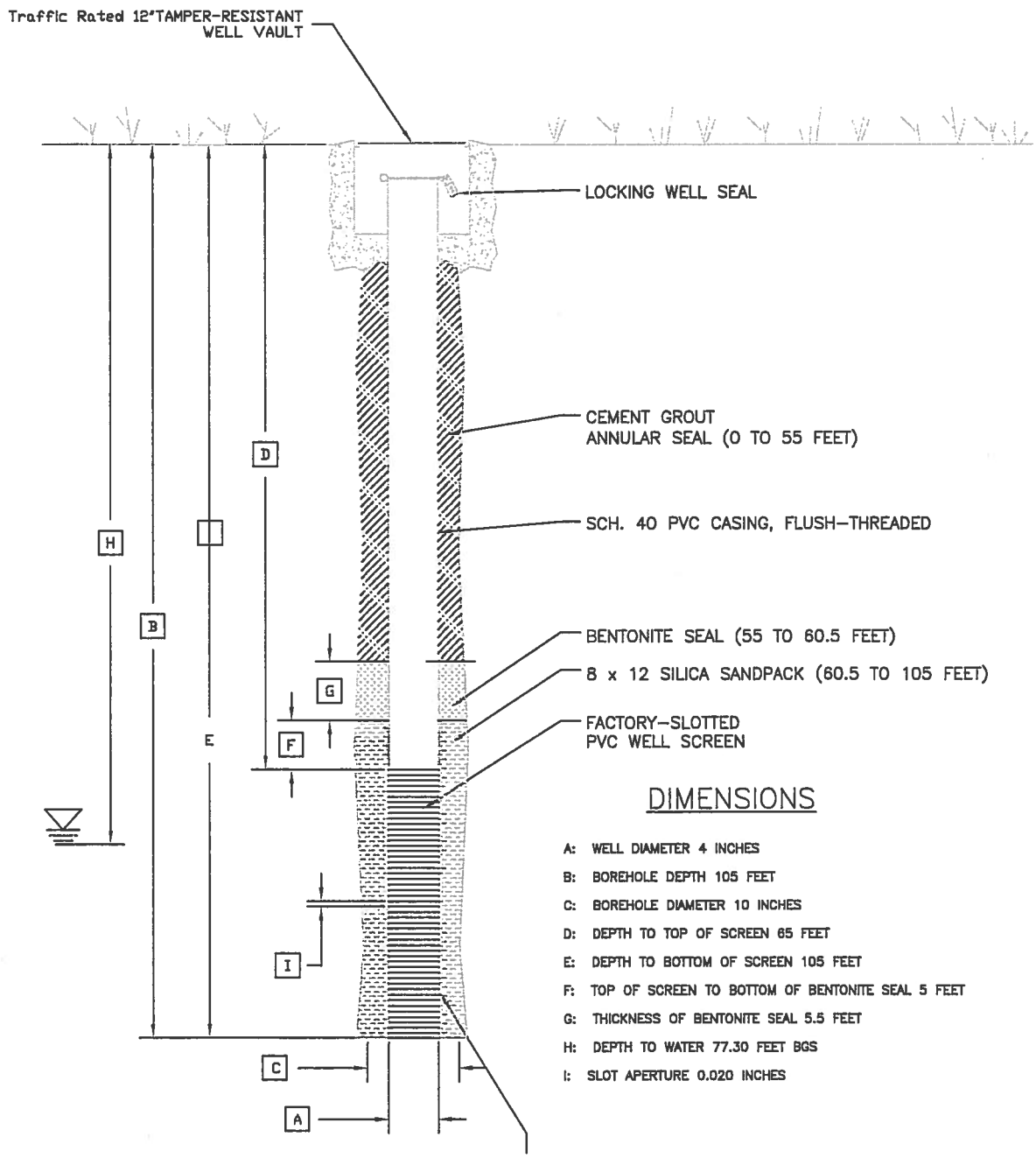

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 105 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 65 FEET
E: DEPTH TO BOTTOM OF SCREEN 105 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5 FEET
G: THICKNESS OF BENTONITE SEAL 5.5 FEET
H: DEPTH TO WATER 77.30 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE:	MW-19 WELL DIAGRAM 20TH AND FACTOR WQARF SITE		
LOCATION:	YUMA, ARIZONA		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	LG	FIGURE
	DRAFTED	MB	B5
	PROJECT	1303.020	
	DATE	12/19/06	

Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No:** MW-20A **ADWR ID:** 55-905865 **Start Date/Time:** 11/17/06 **End Date/Time:** 11/19/06 **Logged By:** M. Brennan
	Drilling Method: Sonic **Borehole Diameter:** 9.75 inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–5	5				**Poorly Graded Sand** Light yellowish brown, dry, fine to medium grained sand, no odor
6–10	10				**Poorly Graded Sand** Very pale brown, dry, fine to medium grained sand, no odor
11–15	15				**Poorly Graded Sand** becomes light yellowish brown
16–20	20				**Poorly Graded Sand** As above
21–25	25				**Poorly Graded Sand** becomes very pale brown
26–30	30				**Poorly Graded Sand** becomes light yellowish brown
31–35	35				**Clay** Pale borwn, slighty moist, clay, no cementation, high plasticity, no odor **Clayey Sand** Light yellowish brown, dry, clayey sand, no odor
36–40	40				**Silty Sand** Light yellowish brown, dry, silty fine grained sand, no odor
41–45	45				**Poorly Graded Sand** Light yellowish brown, dry, fine grained sand, no odor **Poorly Graded Sand** As above
46–50	50				**Poorly Graded Sand** Pale brown, dry, fine grained sand with some weakly cemented sand nodules

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/01/06

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Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** 20th and Factor WQARF	**Borehole No:** MW-20A **Start Date/Time:** 11/17/06 **End Date/Time:** 11/19/06 **Logged By:** M. Brennan
	Drilling Method: Sonic **Borehole Diameter:** 9.75 inches	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54 55	55				**Clay** Brown, moist, clay, no cementation, high plasticity, no odor
56 57 58 59 60	60				**Clayey Sand** Brown, slighty moist, clayey sand, no cementation, no plasticity, no odor
61 62 63 64 65	65				**Poorly Graded Sand** Light yellowish brown, dry, fine to medium grained sand, no odor
66 67 68 69 70	70				**Poorly Graded Sand** Brown, wet, fine to medium grained sand with some coarse grains, trace weakly cemented sand nodules, no odor
71 72 73 74 75	75				**Well Graded Sand** Yellowish brown, wet, fine to coarse grained sand, no odor
76 77 78 79 80	80				**Poorly Graded Sand** Brown, wet, fine to medium grained sand, wet, no odor
81 82 83 84 85	85				**Poorly Graded Sand** As above
86 87 88 89 90	90				**Well Graded Sand** Pale brown, wet, fine to coarse grained sand with trace fine, no odor
91 92 93 94 95	95				**Poorly Graded Sand** Brown, wet, fine to medium grained sand, no odor
96 97 98 99 100	100				**Poorly Graded Sand** As above

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/01/06

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-20A
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/17/06 End Date/Time: 11/19/06 Logged By: M. Brennan
	Drilling Method: Sonic Borehole Diameter: 9.75 inches	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–104	105				**Poorly Graded Sand** trace coarse grains
105–109					**Poorly Graded Sand** Brown, wet, fine to medium grained sand, trace clay, no odor
110–114					**Poorly Graded Sand** As above with trace gravel.
115–119					**Clay** Yellowish brown; wet; clay, no cementation, high plasticity, no odor
120–124					
125–129					
130–134					
135–139					
140–144					
145–149					
150					

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/01/06

Sheet: 3 of 3

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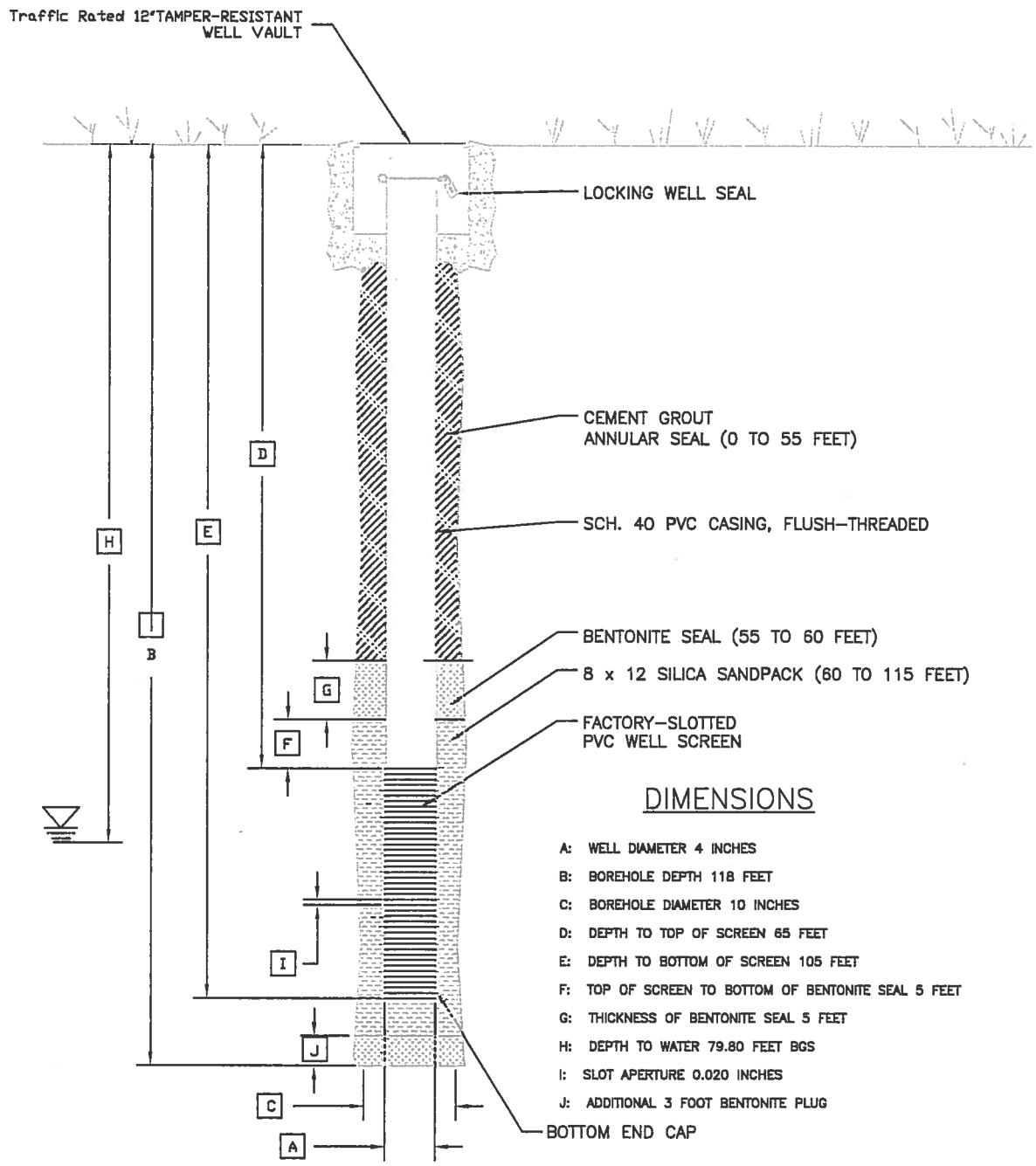

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 118 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 65 FEET
E: DEPTH TO BOTTOM OF SCREEN 105 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5 FEET
G: THICKNESS OF BENTONITE SEAL 5 FEET
H: DEPTH TO WATER 79.80 FEET BGS
I: SLOT APERTURE 0.020 INCHES
J: ADDITIONAL 3 FOOT BENTONITE PLUG

* NOT TO SCALE

TITLE:	MW-20 WELL DIAGRAM 20TH AND FACTOR WQARF SITE
LOCATION:	YUMA, ARIZONA

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	LG	FIGURE
DRAFTED	MB	B6
PROJECT	1303.020	
DATE	12/19/06	

Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** Yuma 20th & Factor WQARF	**Borehole No:** MW-21A **ADWR ID:** 55-906700 **Start Date/Time:** 5/1/07 **End Date/Time:** 5/3/07 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Concrete	**Sampling Method:** Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5	5	5/1/07 @ 0720	0.0		**Poorly Graded Sand (SP) and Asphalt** Pink (7.5 YR 7/3), medium grained, dry, weak cementation
6 7 8 9 10	10		0.0		**Clayey Sand (SC)** Light yellowish brown (10YR 6/4), dry, medium dense, moderatly cemented
11 12 13 14 15	15	5/1/07 @ 0745	0.1		**Poorly Graded Sand (SP)** 20% coarse, 60% medium, 20% fine grained sand, light yellowish brown (10 YR 6/4), dry, no cementaion
16 17 18 19 20	20		0.3		**Poorly Graded Sand (SP)** Medium grained, light gray (10YR 7/2), dry, no cementaion
21 22 23 24 25	25	5/1/07 @ 0835	0.9		**Poorly Graded Sand (SP)** Medium grained, light yellowish brown (10 YR 6/4), dry, no cementation
26 27 28 29 30	30		0.7		**Silty Sand (SM)** 50% sand, 50% silt, pale brown (10YR 7/3), dry losse, no cementation
31 32 33 34 35	35	5/1/07 @ 1020	0.4		**Clay (CL)** Brown (7.5 YR 5/4), moist, stiff
36 37 38 39 40	40	5/1/07 @ 1100	0.4		**Poorly Graded Sand (SP)** Fine grained, very pale brown (10 YR 7/3), dry, no cementation
41 42 43 44 45	45	5/1/07 @ 1130	0.6		
46 47 48 49 50	50		0.7		

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** Yuma 20th & Factor WQARF Site	**Borehole No: MW-21A** **Start Date/Time:** 5/1/07 **End Date/Time:** 5/3/07 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Concrete	**Sampling Method:** Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51 52 53 54 55	55	5/1/07 @ 1330	1.0		**Poorly Graded Sand (SP)** Fine grained, very pale brown (10 YR 7/3), dry, no cementation
56 57 58 59 60	60		0.4		**Poorly Graded Sand (SP)** Medium grained sand, very pale brown (10YR 7/3), dry, no cementation
61 62 63 64 65	65	5/1/07 @ 1400	0.5		**Poorly Graded Sand (SP)** Fine grained sand, very pale brown (10YR 7/3), dry, weak cementation
66 67 68 69 70	70	5/1/07 @ 1635	0.9		**Poorly Graded Sand (SP)** Medium grained, grayish brown (10YR 5/2), moist, no cementation
71 72 73 74 75	75	5/2/07 @ 0825	0.8		**Clayey Sand (SC)** 75% sand, 25% clay, grayish brown (10 YR 5/2), moist, medium dense, no cementation
76 77 78 79 80	80	5/2/07 @ 1000	0.7		
81 82 83 84 85	85		0.5		**Poorly Graded Sand (SP)** Medium grained sand, grayish brown (10 YR 5/2), moist, no cementaion.
86 87 88 89 90	90	5/2/07 @ 1230	0.9		**Clayey Sand (SC)** 70% medium sand, 30% clay, grayish brown (10 YR 5/30), moist, no cementation
91 92 93 94 95	95		0.4		**Clayey Sand (SC)** 75% fine sand, 25% clay, brown (10YR 5/3), moist, no cementation
96 97 98 99 100	100	5/2/07 @ 1335	0.2		**Clay (CL)** Brown (10YR 5/3), moist, stiff

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** Yuma 20th & Factor WQARF Site	**Borehole No:** MW-21A **Start Date/Time:** 5/1/07 **End Date/Time:** 5/3/07 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Concrete	**Sampling Method:** Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					Bottom of boring at 99 feet bgs
102					
103					
104					
105					
106					
107					
108					
109					
110					
111					
112					
113					
114					
115					
116					
117					
118					
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141					
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143					
144					
145					
146					
147					
148					
149					
150					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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CLIENT ADEQ
PROJECT 20th + Factory WQARF Site
DETAIL MW-21A

JOB NO. 1303.020.03.03
DATE CHECKED
CHECKED BY

PAGE
DATE
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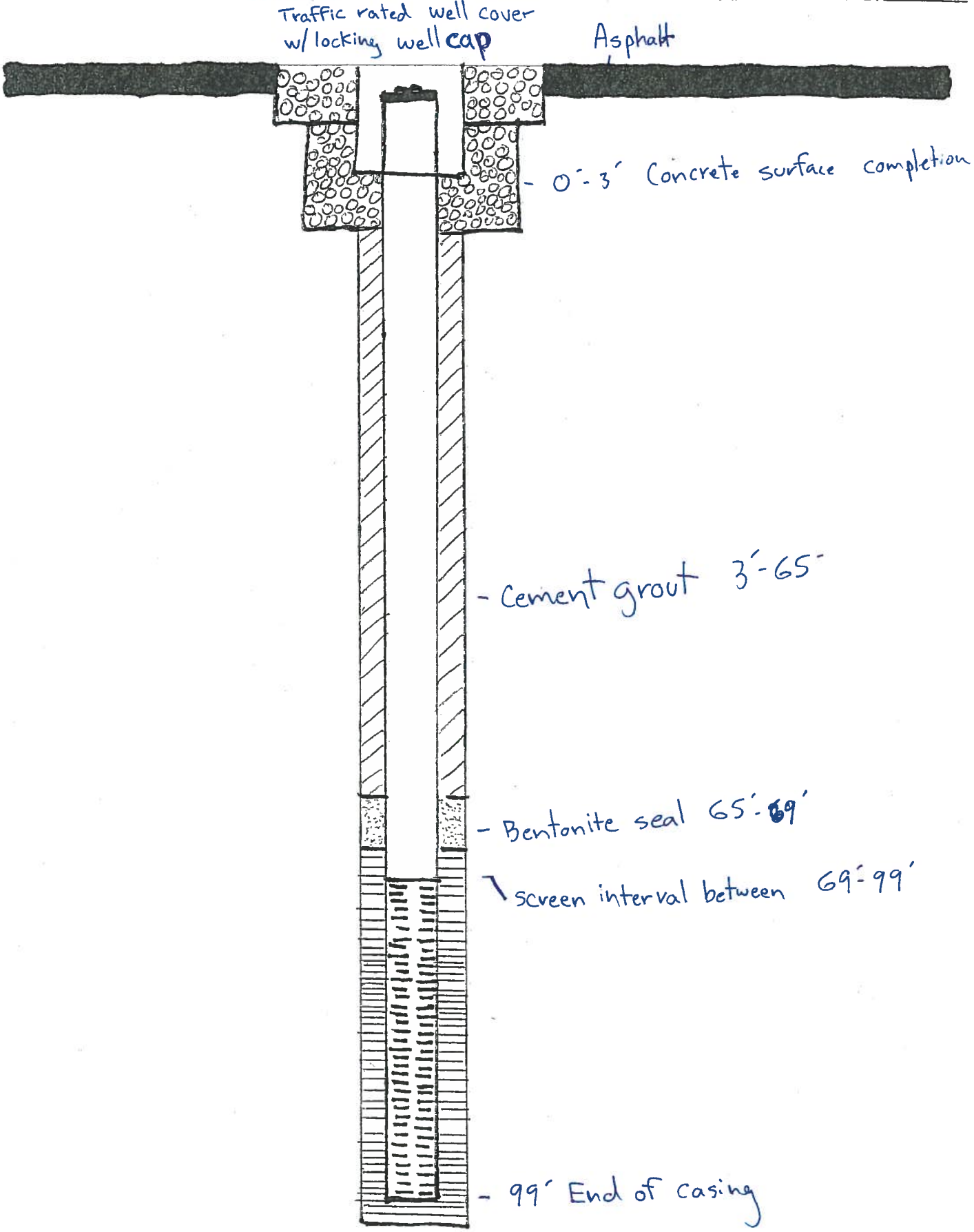
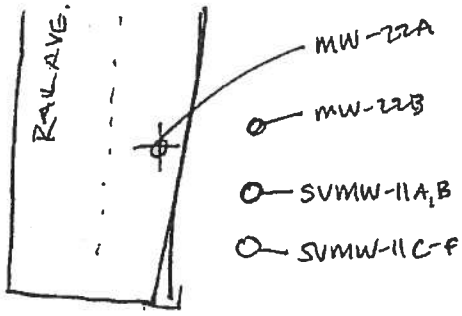


MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

A TETRA TECH COMPANY

PROJECT NAME: 20th & Factor	BORING NAME: MW-22A
PROJECT NUMBER: 1303.038.3.1.1	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: HSA	SHEET 1 OF
SAMPLING METHOD: NA	DRILLING START TIME: 0830 / FINISH TIME: 0900
	DATE: 2/23/11 / DATE: 2/24/11
SURFACE COVER CONDITIONS:	asphalt, concrete, dirt, gravel, etc.

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	
						1	SAND, FINE to MED GRAINED. DRY, UNCONSOLIDATED
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

TRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME: MW-22A
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	
						21	
						22	
						23	
						24	
						25	
						26	
						27	
						28	
						29	
						30	
						31	
						32	
						33	
						34	
						35	
						36	SAND W/ GRAVEL, FINE TO MED. GRAINED DRY. UNCONSOLIDATED
						37	
						38	
						39	

TRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME: MW-22A
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING
	START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	SAND FINE to MED. GRAINED, DRY UNCONSOLIDATED
						41	
						42	
						43	
						44	
						45	
						46	
						47	
						48	
						49	
						50	
						51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	

TRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME: MW-22A
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING
	START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	
						61	
						62	
						63	
						64	
						65	
						66	
						67	
						68	
						69	
						70	
						71	
						72	
						73	
						74	
						75	
						76	
						77	
						78	SAND FINE to MED GRAINED, MOIST, UNCONSOLIDATED
						79	

TRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME: MW-22A
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING
	START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

TRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						80	
						81	
						82	
						83	
						84	
						85	
						86	
						87	
						88	
						89	
						90	
						91	
						92	
						93	
						94	
						95	
						96	TD HOLE
						97	
						98	
						99	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client 20th & FACTOR

Well Number MW-22A

Date 2/25/11

Project Number 1303.038

Sampler(s) BYRON BADEN

Elevation of Measuring Point (MP) — ft. (a)

Elevation of Ground Surface — ft. (b)

Well Depth (below ground surface) 95 ft. (c)

Casing Inside Diameter 4 in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP 75.79 ft. (e)

Water Level Elevation (a-e) — ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= — ft.

Step 2: Cross-sectional Area of Casing, A=Π x d^2/576= — ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= — gal

(95 - 75.79) x 16 x 3 x 0.0408 = 37.6 G

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☐

Purging Apparatus: Type: 2" SUBMERSIBLE PUMP

Sampling Apparatus: Type: DISPOSABLE BAILER

Cleaning Methods SURGING & BAILING (BAILED 220gal)

FIELD OBSERVATIONS

Weather Conditions CLEAR, SUNNY ~65° F

Well Head Conditions GOOD

Comments SEE GROUNDWATER SAMPLING SHEET FOR MW-22A ON 2/25/2011 FOR PURGING FIELD MEASUREMENTS & SAMPLE INFO.

Project Name/Client 20th & FACTOR Well Number MW-22A Date 2/25/11

FIELD MEASUREMENTS						
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	Particulates/Odor/Clarity/Color

SEE G.W. SAMPLING SHEET FOR MW-22A ON 2/25/2011

Total Vol. Purged _____ (gal) Casing Vol. Purged _____

Final Water LevelAfterPurging_____ft.BelowMP;Time_____

Fate

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

Arizona Department of Water Resources
Information Management Unit
P.O. Box 33589 • Phoenix, Arizona 85067-3589
(602) 771-8627 • (800) 352-8488
www.water.az.gov

Well Driller Report and Well Log

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK

COPY

FILE NUMBER
C(8-23)33 AAD
WELL REGISTRATION NUMBER
55 - 911859
PERMIT NUMBER (IF ISSUED)

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:

NAME: YELLOW JACKET DRILLING SERVICES L L C	DWR LICENSE NUMBER: 78
ADDRESS: P.O. BOX 801	TELEPHONE NUMBER: 602-453-3252
CITY / STATE / ZIP: GILBERT, AZ, 85299-0801	FAX: 602453 3258

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: Arizona Department of Environmental Quality

MAILING ADDRESS: 400 West Congress, Suite 433

CITY / STATE / ZIP: Tucson, AZ, 85701

CONTACT PERSON NAME AND TITLE: Tina LePage Project Manager

TELEPHONE NUMBER: 520 628-6733

FAX:

WELL NAME (e.g., MW-1, PZ-3, lot 25 Well, Smith Well, etc.): MW-25A

Location of Well

WELL LOCATION ADDRESS (IF ANY): Yuma Row

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
8S	23W	33	NE 1/4	NE 1/4	SE 1/4

LATITUDE			LONGITUDE		
32 °	41 '	49.3 "N	114 °	37 '	05.4 "W

METHOD OF LATITUDE/LONGITUDE (CHECK ONE): USGS Quad Map; Conventional Survey; ✓ *GPS: Hand-Held; *GPS: Survey-Grade

LAND SURFACE ELEVATION AT WELL: 183' Feet Above Sea Level

METHOD OF ELEVATION (CHECK ONE): USGS Quad Map; Conventional Survey; ✓ *GPS: Hand-Held; *GPS: Survey-Grade

*IF GPS WAS USED, GEOGRAPHIC COORDINATE DATUM (CHECK ONE): ✓ NAD-83; Other (please specify)

COUNTY: Yuma

ASSESSOR'S PARCEL ID NUMBER (MOST RECENT): BOOK; MAP; PARCEL

SECTION 3. WELL CONSTRUCTION DETAILS

Drilling Method

CHECK ONE
- Air Rotary
- ✓ Bored or Augered
- Cable Tool
- Dual Rotary
- Mud Rotary
- Reverse Circulation
- Driven
- Jetted
- Air Percussion / Odex Tubing
- Other (please specify)

Method of Well Development

CHECK ONE
- Airlift
- ✓ Bail
- ✓ Surge Block
- Surge Pump
- ✓ Other (please specify) Pump

Method of Sealing at Reduction Points

CHECK ONE
- None
- Packed
- Swedged
- Welded
- Other (please specify) No reduction points

Condition of Well

CHECK ONE
- ✓ Capped
- Pump Installed

Construction Dates

DATE WELL CONSTRUCTION STARTED: 3-2-10

DATE WELL CONSTRUCTION COMPLETED: 3-4-10

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY: R. LeDuc

DATE: 4.5.10

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 911859

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILD) (attach additional page if needed)

Depth

DEPTH OF BORING: 100 Feet Below Land Surface

DEPTH OF COMPLETED WELL: 95 Feet Below Land Surface

Water Level Information

STATIC WATER LEVEL: 78 Feet Below Land Surface

DATE MEASURED: 3-3-10

TIME MEASURED:

IF FLOWING WELL, METHOD OF FLOW REGULATION: Valve Other:

Borehole

DEPTH FROM SURFACE FROM (feet)	TO (feet)	BOREHOLE DIAMETER (inches)
0	100	10

Installed Casing

DEPTH FROM SURFACE FROM (feet)	TO (feet)	OUTER (inches)	MATERIAL TYPE (T): STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	PERFORATION TYPE (T): BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	SLOT SIZE (inches)
0	65	4.5		✓			✓						
65	95	4.5		✓							✓		0.010

Installed Annular Material

DEPTH FROM SURFACE FROM (feet)	TO (feet)	ANNULAR MATERIAL TYPE (T): NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE: GROUT	CHIPS	PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	FILTER PACK: SAND	GRAVEL	SIZE
0	58				✓							
58	63						✓					
63	98									✓		8-12

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 911859

SECTION 5: GEOLOGIC LOG OF WELL

DEPTH FROM SURFACE FROM (feet)	TO (feet)	Description Describe material, grain size, color, etc.	Check (T) every interval where water was encountered (if known)
0	100	Sand w/ clay stringers	
		TD 100'	
		▽ 78'	

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 911859

SECTION 6. WELL SITE PLAN

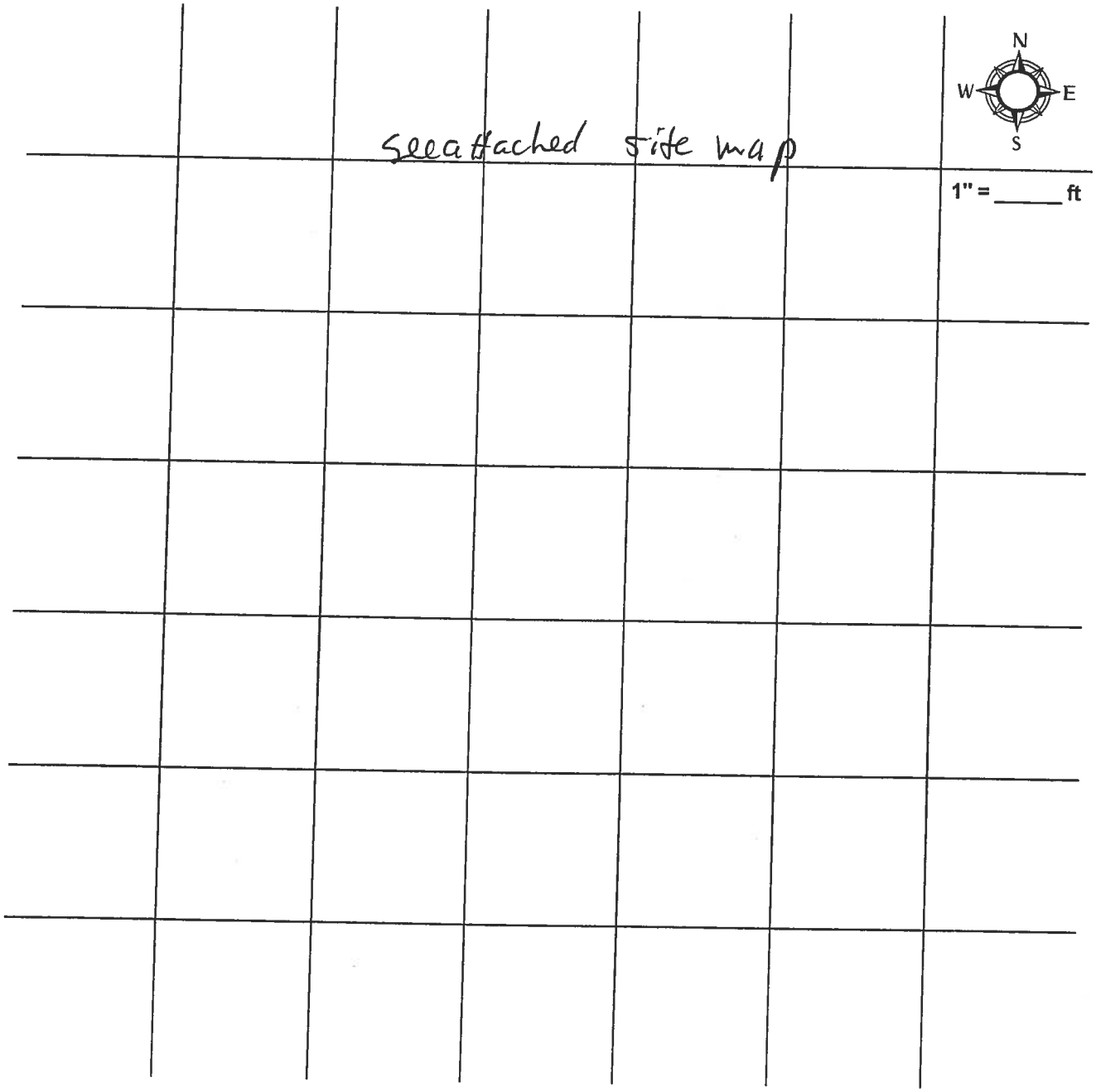
NAME OF WELL OWNER

Arizona Department of Environmental Quality

COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)

BOOK	MAP	PARCEL

- Please draw the following: (1) the boundaries of property on which the well was located; (2) the well location; (3) the locations of all septic tank systems and sewer systems on the property or within 100 feet of the well location, even if on neighboring properties; and (4) any permanent structures on the property that may aid in locating the well.
- Please indicate the distance between the well location and any septic tank system or sewer system.



WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client _____

Well Number MW-25A

Date 3/12/10

Project Number _____ Sampler(s) _____

Elevation of Measuring Point (MP) _____ ft. (a)

Elevation of Ground Surface _____ ft. (b)

Well Depth (below ground surface) 96.5 TOC ft. (c)

Casing Inside Diameter 4" in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP 83.5 ft. (e)

Water Level Elevation (a-e) _____ ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= 13 ft.

Step 2: Cross-sectional Area of Casing, A=Π x d^2/576= 0.0872 ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= 8.48 gal

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☒

Purging Apparatus: Type: Surge/bail and pump

Sampling Apparatus: Type: _____

Cleaning Methods _____

FIELD OBSERVATIONS

Weather Conditions Sunn 60's

Well Head Conditions Good New

Comments _____

Project Name/Client _____ Well Number MW-25A Date 3/12/10

Bailing well

FIELD MEASUREMENTS

Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	NTU / Particulates/Odor/Clarity/Color	TDS g/L	ORP
1214	—	~50	29.67	6.23	5.57	532	3.51	285
1307	5gpm	165	31.47	7.14	6.47	298	4.04	261
1313	5gpm	195	31.99	7.25	6.48	712	4.08	262
1320	5gpm	230	32.36	7.21	6.57	276	4.14	266
1329	5gpm	275	32.64	7.22	6.35	145	4.00	265
1339	5gpm	325	32.25	7.22	6.61	186	4.16	269
1348	5gpm	370	32.52	7.22	6.70	264	4.22	280
1358	5gpm	420	32.80	7.20	6.60	14.2	4.16	278
1407	5gpm	455	32.77	7.26	6.79	13.5	4.28	277

Total Vol. Purged 460 (gal) Casing Vol. Purged 54.25

Final Water Level After Purging 81.5 ft. Below MP; Time 1429

Fate of Purged Water Bunker tank

105 gal bailed pump rate 5gpm start time 1257

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 8" HSA	SHEET 1 OF 6
SAMPLING METHOD: N/A	DRILLING START TIME 1330 DATE 10/25/10; FINISH TIME 0950 DATE 10/26/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

G. ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	SAND (MED. GRAINED)
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 6" HSA	SHEET 2 OF 6
SAMPLING METHOD: N/A	DRILLING START TIME 1330 DATE 10/25/10; FINISH TIME 0950 DATE 10/26/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	SAND, MED. GRAINED
						21	BECOMES SLIGHTLY MOIST
						22	
						23	
						24	
						25	
						26	
						27	
						28	
						29	
						30	
						31	
						32	
						33	
						34	
						35	
						36	
						37	
						38	
						39	

GE ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FAcTor	BORING NAME: MW-26A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 6" HSA	SHEET 3 OF 5
SAMPLING METHOD: N/A	DRILLING START TIME 1330 DATE 10/25/10; FINISH TIME 0950 DATE 10/26
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	SAND, MED. GRAINED,
						41	SLIGHTLY MOIST
						42	
						43	
						44	
						45	
						46	
						47	CLAY, SANDY, SLIGHTLY MOIST
						48	
						49	SAND, MED. GRAINED, SLIGHTLY MOIST
						50	
						51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.
SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-26A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 6" HSA	SHEET 4 OF 8
SAMPLING METHOD: N/A	DRILLING START TIME 1330 DATE 10/25; FINISH TIME 0950 DATE 10/26
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						50	SAND, MED GRAINED, MOIST
						51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	
						60	
						61	
						62	
						63	
						64	
						65	
						66	
						67	
						68	
						69	

GE ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 6" HSA	SHEET 5 OF 6
SAMPLING METHOD: N/A	DRILLING START TIME 0850 DATE 10/25; FINISH TIME 0950 DATE 10/26
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						70	
						71	SAND, MED. GRAINED, MOIST
						72	
						73	
						74	
						75	
						76	▽ WATER @ 75.75' bgs
						77	SAND, MED. GRAINED, SATURATED
						78	
						79	
						80	
						81	
						82	
						83	
						84	
						85	
						86	
						87	
						88	
						89	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.
SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 6" HSA	SHEET 6 OF 6
SAMPLING METHOD: N/A	DRILLING START TIME 1330 DATE 10/25; FINISH TIME 0950 DATE 10/26
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						90	SAND, MED GRAINED, SATURATED
						91	
						92	
						93	
						94	
						95	TD BOREHOLE 95' bgs
						6	
						7	
						8	
						9	
						0	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

GE NS REPRESENTATIVE:

RILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client 20th & Factor ADEQ

Well Number MW-26A

Date 11/15/10

Project Number 1303.038

Sampler(s) BYRON BADEN

Elevation of Measuring Point (MP) — ft. (a)

Elevation of Ground Surface — ft. (b)

Well Depth (below ground surface) 95 ft. (c)

Casing Inside Diameter 4 in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP 75.43 ft. (e)

Water Level Elevation (a-e) — ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= — ft.

Step 2: Cross-sectional Area of Casing, A=Π x d^2/576= — ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= — gal

(95 - 75.43) x 16 x 3 x 0.0408 = 38.32 G

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☒

Purging Apparatus: Type: ~~SURGE~~ & SUBMERSIBLE PUMP (3")

Sampling Apparatus: Type: N/A

Cleaning Methods SURGE & BAIL

FIELD OBSERVATIONS

Weather Conditions SUNNY, CLEAR, ~75° F

Well Head Conditions GOOD

Comments

Project Name/Client 20th & FACTOR ADEQ Well Number MW-26A Date 11/15/10

FIELD MEASUREMENTS						
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	(NTUS) Particulates/Odor/Clarity/Color
1455	12	36	29.13	6.73	5.26	654
1457	8	58	29.05	7.33	5.19	165
1459	7	72	29.10	7.36	5.20	56.1
1501	7	86	29.17	7.42	5.21	20.6
1503	7	100	29.25	7.43	5.19	7.8
1505	7	114	29.24	7.44	5.21	40.2
1507	7	128	29.27	7.45	5.19	12.0

Total Vol. Purged ~135 (gal) Casing Vol. Purged _____

Final Water Level After Purging 75.43 ft. Below MP; Time 1530

Fate of Purged Water BAKER TANK

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

NONE TAKEN

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th St Factor	BORING NAME: MW-27A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: 6" HSA	SHEET 1 OF 5
SAMPLING METHOD: N/A	DRILLING START TIME 1245 DATE 10/27/10 — FINISH TIME 1400 DATE 10/28
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	
						1	SAND, MED GRAINED
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
			SVMW27A-10.0-101710			10	SOIL VAPOR SAMPLE
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.
SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: Zorn & Factor	BORING NAME: MW-27A
PROJECT NUMBER: 1303 038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 6" HSA	SHEET 2 OF 5
SAMPLING METHOD: N/A	DRILLING START TIME 1245 / FINISH TIME 1400
	DRILLING START DATE 10/27 / FINISH DATE 10/28
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	SAND MED. GRAINED
						21	
						22	
						23	
						24	
						25	
						26	
						27	
						28	
						29	
						30	
						31	
						32	
						33	
						34	
						35	
						36	
						37	
						38	
						39	

GE NS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-27A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA - AZ
DRILLING METHOD: 6" HSA	SHEET 3 OF 5
SAMPLING METHOD: N/A	DRILLING START TIME 1245 / FINISH TIME 1400
	DATE 10/27/10 / DATE 10/28
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	
							SAND MED. GRAINED
						41	
						42	
						43	
						44	
						45	
						46	
						47	
						48	
						49	
						50	
						51	
						52	
						53	
						54	
						55	SAND MED. GRAINED, MOIST
						56	
						57	
						58	
						59	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-27A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA AZ
DRILLING METHOD: 6" HSA	SHEET 4 OF 5
SAMPLING METHOD: N/A	DRILLING START TIME 1245 / FINISH TIME 1400
	DATE 10/27 / DATE 10/28

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	SAND MED. GRAINED, MOIST
						61	
						62	
						63	
						64	
						65	
						66	
						67	
						68	
						69	
						70	
						71	
						72	
						73	
						74	
						75	
						76	
						77	
						78	
						79	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-27A
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 6" HSA	SHEET 5 OF 5
SAMPLING METHOD: N/A	DRILLING START TIME 1245 / FINISH TIME 1400
	DATE 10/27 / DATE 10/28

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						80	SAND, MED GRAINED, SATURATED
						81	
						82	
						83	
						84	
						85	
						86	
						87	
						88	
						89	
						90	
						91	
						92	
						93	
						94	
						95	
						96	
						97	
						98	
						99	TD @ 100' bgs

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client 20th & FACTOR ADEQ

Well Number MW-27A

Date 11/16/10

Project Number 1303.038

Sampler(s) BYRON BADEN

Elevation of Measuring Point (MP) — ft. (a)

Elevation of Ground Surface — ft. (b)

Well Depth (below ground surface) — ft. (c)

Casing Inside Diameter 4 in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP 72.43 ft. (e)

Water Level Elevation (a-e) — ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= — ft.

Step 2: Cross-sectional Area of Casing, A=Π x d^2/576= — ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= — gal

(95 − 72.43) × 16 × 3 × 0.0408 = 44 G

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☒

Purging Apparatus: Type: 3" SUBMERSIBLE PUMP

Sampling Apparatus: Type: N/A

Cleaning Methods SURGE & BAIL

FIELD OBSERVATIONS

Weather Conditions SUNNY, CLEAR, ~70° F

Well Head Conditions GOOD

Comments

Project Name/Client 20th & Factor ADEQ Well Number MW-27A Date 11/16/10

FIELD MEASUREMENTS						
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	Particulates/Odor/Clarity/Color
1335	14	70	28.58	7.50	5.42	369
1538	14	112	28.85	7.42	5.50	278
1541	14	154	28.75	7.42	5.56	138
1544	14	196	28.85	7.39	5.60	55.8
1547	14	238	28.86	7.38	5.63	44.4
1550	14	270	28.88	7.37	5.65	30.0

Total Vol. Purged 300 (gal) Casing Vol. Purged

Final Water Level After Purging 72.45 ft. Below MP; Time 1615

Fate of Purged Water BAKER TANK

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

Not SAMPLED

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) Signatures(s)

GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-101
ADWR ID:

MW-101A
MW-101
not in 3 ring bind

Drilling Method: Hollow Stem Auger

Angle from

Borehole Diameter: 0

Surface Material:

Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–50					**Silty Sand** Light brown, loose to medium dense, non-plastic, predominately fine grained sand, trace to some silt, trace coarse sand in upper 35 feet, slightly damp to damp Sand becomes reddish brown

Drilling Contractor: Lalyne Christensen

Checked By:

Date Checked:

Sheet: 1 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-101
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 3/13/96 End Date/Time: 3/13/96 Logged By: GEC
	Drilling Method: Hollow Stem Auger Borehole Diameter: 0	Angle from Vertical: 0
	Surface Material:	Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51					Cuttings become slightly moist to moist
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
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64					
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97					
98					
99					
100					

Drilling Contractor: Lalyne Christensen

Checked By:

Date Checked:

Sheet: 2 of 2

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Well Construction Log

INDUSTRIAL COMPLIANCE

Well Location	Southern Pacific Transportation Co. Yuma Yard			**Well Name**	HP11/MW6
Drilling Company	Layne Environmental			**Project Name**	SPTCo Yuma
Drilling Method	Hollow Stem Auger	**Rig Type**	B-61	**Project Number**	03102163-03
Hole Diameter	10.25 in.	**Driller** Don K.	**Date** 1-21-94	**Logged By**	C. M. Charmley
Ground Elevation	NM	**Depth to Water**	57.5 feet bgs	**Total Depth**	72.5 feet bgs

Well Construction Specifics

Screen Placement	from 50.5 ft. to 70.5 ft.	Slot Size 0.010 inches	Diameter 4 inches	Completion Type:	
Blank Casing	from Surface to 50.5 ft.	Schedule 40	Diameter 4 inches	Aboveground ___	
Filter Pack	from 46.5 ft. to 72.5 ft.	Size 10-20	Type Colorado	At Grade X	
Bentonite Pellets	from 43.5 ft. to 46.5 ft.	Type Enviroplug chips	Size 1/4 inches	Hydrated X yes ___ no	
Cement/Bentonite	from Surface to 43.5 ft.	Size N/A	Percent Bentonite	minimum 3-5% by weight	

Sample Number	Recov.	Blows/ 6-inches	Depth Feet	Well Detail	Lithology	USCS Log	Sample Description	FID/PID (ppm)
N/R	N/A	N/A						
			1	Cement/ bentonite grout				
			2					
			3					
			4	Blank casing				
			5			SP	**SAND**: Light brown, fine grained, well-sorted. Silt <5%.	0.0
			6					
			7					
			8					
			9					
			10					0.0
			11					
			12					
			13					
			14					
			15				(Same as above)	0.0
			16					

Well Construction Log

INDUSTRIAL COMPLIANCE

Well Number	MW6	Project Number	03102163-03	Project Name	SPTCo Yuma

Sample Number	Recov.	Blows/ 6-inches	Depth Feet	Well Detail	Lithology	USCS Log	Sample Description	FID/PID (ppm)
N/R	N/A	N/A						
			18					
			19					
			20			SP	**SAND**: Light brown, fine grained, well-sorted. Silt <5%.	0.0
			21					
			22	Cement/ bentonite grout				
			23					
			24					
			25	Blank casing				0.0
			26					
			27					
			28					
			29					
			30				(Same as above)	0.0
			31					
			32					
			33					
			34					
			35					0.0
			36					
			37					
			38					
			39					

Well Construction Log

INDUSTRIAL COMPLIANCE

Well Number	MW6	Project Number	03102163-03	Project Name	SPTCo Yuma

Sample Number	Recov.	Blows/ 6-inches	Depth Feet	Well Detail	Lithology	USCS Log	Sample Description	FID/PID (ppm)
	NA	NA						
			40			SP	SAND: Light brown, fine grained, well-sorted.	0.0
			41	Blank casing				
			42					
			43					
			44					
			45	Bentonite seal				0.0
			46					
			47					
			48					
			49	Filter pack 10-20				
			50				(Same as above) Moderately moist.	0.0
			51	Slotted casing .010 inch				
			52					
			53					
			54					
			55					0.0
			56					
			57					
HP11							* Drove hydropunch from 57 to 59.5 feet bgs.	
			58			SW	GRAVELLY SAND: Medium brown, fine to medium grained. Gravels, subangular, 3-4 cm. Silt <5%. Very moist.	
			59					
			60					N/R
			61					

Well Construction Log

INDUSTRIAL COMPLIANCE

Well Number	MW6	Project Number	03102163-03	Project Name	SPTCo Yuma

Sample Number	Recov.	Blows/ 6-inches	Depth Feet	Well Detail	Lithology	USCS Log	Sample Description	FID/PID (ppm)
N/A	N/A	N/A						
			62					
			63					
			64					
			65			SW	**GRAVELLY SAND**: Medium brown, fine to medium grained. Gravels, subangular, 3-4 cm. Silt<5%. Very moist.	N/R
			66					
			67					
			68					
			69					
			70				(Same as above)	N/R
			71	Threaded end cap				
			72					
			73				Total Depth @ 72.5 feet bgs.	

Notes:

N/A - Not applicable

NM - Not measured

N/R - None recovered

bgs - Below ground surface

ERM-West, Inc.
9111 North Scottsdale Road
Suite 100
Scottsdale, Arizona 85250
(602) 990-9360
ERM

BOREHOLE LOG

Monitoring Well Number
MW-10

Project Number: 8010.11

Project Name: Union Pacific RR

Location: Yuma Yard

Contractor: Layne

Drilling Method: Hollow Stem Auger

Logged By: M. Freebury

Date(s): 04/09/98

Northing: 616875.8973

Easting: 434896.3961

Borehole Dia.: 11.00in

Ground Elevation: 191.51'

Top of Casing Elevation: 191.26'

Total Depth: 92.00'

Completed Depth: 90.50'

Well Construction

Blank Casing:
type: Steel dia: 4.00" fm: 0.0' to: 20.00'
type: PVC dia: 4.00" fm: 20.00' to: 60.00'

Screens:
type: Slotted size: 0.010" dia: 4.00" fm: 60.00' to: 90.00'

Depth (ft)	Graphic Log	USCS Code	Well Construction	Sample Recovery	Blow Counts	PID (ppm)	Description/Soil Classification
			BLANK CASING				
5		SP			6 6 8	0.0	SAND (SP): very pale brown (10YR 7/3), 70% fine, 30% silt, dry, medium dense, no odor, non-cohesive.
10							
15		SP			4 8 12	0.0	SAND (SP): same as above, no odor.
20							
25		SP			13 20 20	0.0	SAND (SP): same as above, slightly finer with 35% silt fraction, dense, no odor.
30							
35		SM			14 22 33	0.0	SAND (SM): pale brown (10YR 6/3), 50% fine, 40% silt, 10% medium, dry, dense, no odor, non-cohesive.

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Suite 108
Scottsdale, Arizona 85250
(602) 990-9360

BOREHOLE LOG

Monitoring Well Number
MW-10

Project Number: 8010.11

Project Name: Union Pacific RR

Location: Yuma Yard

Contractor: Layne

Drilling Method: Hollow Stem Auger

Logged By: M. Freebury

Date(s): 04/09/98

Northing: 616875.8973

Easting: 434896.3961

Borehole Dia.: 11.00in

Ground Elevation: 191.51'

Top of Casing Elevation: 191.26'

Total Depth: 92.00'

Completed Depth: 90.50'

Well Construction

Blank Casing:
type: Steel dia: 4.00" fm: 0.0' to: 20.00'
type: PVC dia: 4.00" fm: 20.00' to: 60.00'

Screens:
type: Slotted size: 0.010" dia: 4.00" fm: 60.00' to: 90.00'

Depth (ft)	Graphic Log	USCS Code	Well Construction	Sample Recovery	Blow Counts	PID (ppm)	Description/Soil Classification
45		ML		X	19 23 27		CLAYEY FINE SILT/SAND (ML): pale yellow (2.5Y 7/3), 60% fine, 10% medium, 20% silt, 10% clay, damp, moderately cohesive, very dense, no odor.
50							
55		SM		X	42 45 50	93	SILTY SAND (SM): very pale brown (10YR 7/3), 10% medium, 50% fine, 40% silt, damp to dry, non-cohesive, very dense, no odor.
60			SCREEN				
65		SP		X	44 55 50	1.0	SAND (SP): yellowish brown (10YR 5/8), significant lithological change from previous intervals, trace silt and fine sand, 50% medium, 50% coarse, trace gravel to 0.25", mineralization causing yellow/reddish pigmentation of sediment, damp near water level, but not saturated. Water level at 67 feet.
		SP					Sampling stopped at 65'. No sampling below water level at 67'. Small amount of gravel came off auger flights as drilling proceeded to 92', but cuttings remained predominately sand, very similiar to all previous intervals.
70							
75							

ERM-West, Inc.
8111 North Scottsdale Road
Suite 108
Scottsdale, Arizona 85253
(602) 990-6300

BOREHOLE LOG

Monitoring Well Number
MW-10

Project Number: 8010.11

Project Name: Union Pacific RR

Location: Yuma Yard

Contractor: Layne

Drilling Method: Hollow Stem Auger

Logged By: M. Freebury

Date(s): 04/09/98

Northing: 616875.8973

Easting: 434896.3961

Borehole Dia.: 11.00in

Ground Elevation: 191.51'

Top of Casing Elevation: 191.26'

Total Depth: 92.00'

Completed Depth: 90.50'

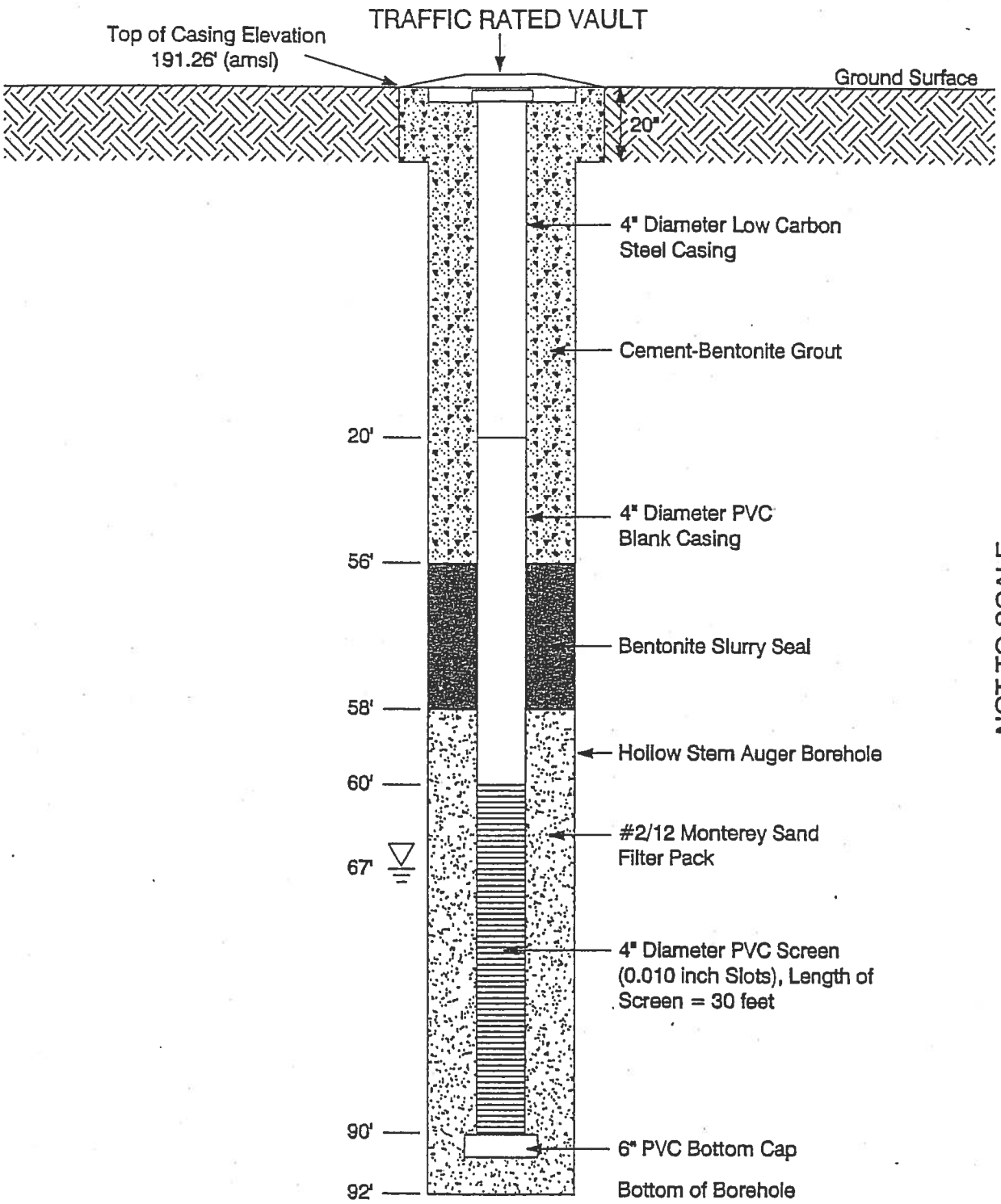
Well Construction

Blank Casing:
type: Steel dia: 4.00" fm: 0.0' to: 20.00'
type: PVC dia: 4.00" fm: 20.00' to: 60.00'

Screens:
type: Slotted size: 0.010" dia: 4.00" fm: 60.00' to: 90.00'

Depth (ft)	Graphic Log	USCS Code	Well Construction	Sample Recovery	Blow Counts	PID (ppm)	Description/Soil Classification
85							
90			6" PVC PIPE →				Total Depth of borehole at 92 feet.
95							
100							
105							
110							
115							

Project No. 8010.11
Date: 05/06/98
Drawn By: R. Olson
CAD File: G:\cad\dwg\8010\11\80101101



Monitoring Well MW-10 Design
Union Pacific Railroad,
Former UST System
Yuma, Arizona

ERM 05/98

ERM-West, Inc.
8111 North Scottsdale Road
Suite 108
Scottsdale, Arizona 85250
(602) 990-8350

BOREHOLE LOG

Monitoring Well Number
MW-11

Project Number: 8010.11

Project Name: Union Pacific RR

Location: Yuma Yard

Contractor: Layne

Drilling Method: Hollow Stem Auger

Logged By: M. Freebury

Date(s): 04/10/98

Northing: 616636.5202

Easting: 434895.2957

Borehole Dia.: 11.00in

Ground Elevation: 193.56'

Top of Casing Elevation: 192.77'

Total Depth: 92.00'

Completed Depth: 90.50'

Well Construction

Blank Casing:
type: Steel dia: 4.00" fm: 0.0' to: 20.00'
type: PVC dia: 4.00" fm: 20.00' to: 60.00'

Screens:
type:Slotted size: 0.010" dia: 4.00" fm: 60.00' to: 90.00'

Depth (ft)	Graphic Log	USCS Code	Well Construction	Sample Recovery	Blow Counts	PID (ppm)	Description/Soil Classification
			BLANK CASING				
5		SP			5 6 9	1.0	SAND (SP): very pale brown (10YR 7/3), 50% fine, 50% medium, trace silt (<5%), dry, non-cohesive, medium dense, no odor.
10							
15		SP			6 9 13	0.0	SAND (SP): same as above.
20							
25		SM			11 19 22		SILTY SAND (SM): very pale brown (10YR 7/3), same as above, but with 10% silt, 60% fine, 30% medium, no odor, dry, non-cohesive, dense.
30							
35		SM			11 14 16	0.0	SILTY SAND (SM): same as above.

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Suite 108
Scottsdale, Arizona 85250
(602) 990-8350

BOREHOLE LOG

Monitoring Well Number
MW-11

Project Number: 8010.11

Project Name: Union Pacific RR

Location: Yuma Yard

Contractor: Layne

Drilling Method: Hollow Stem Auger

Logged By: M. Freebury

Date(s): 04/10/98

Northing: 616636.5202

Easting: 434895.2957

Borehole Dia.: 11.00in

Ground Elevation: 193.56'

Top of Casing Elevation: 192.77'

Total Depth: 92.00'

Completed Depth: 90.50'

Well Construction

Blank Casing:
type: Steel dia: 4.00" fm: 0.0' to: 20.00'
type: PVC dia: 4.00" fm: 20.00' to: 60.00'

Screens:
type: Slotted size: 0.010" dia: 4.00" fm: 60.00' to: 90.00'

Depth (ft)	Graphic Log	USCS Code	Well Construction	Sample Recovery	Blow Counts	PID (ppm)	Description/Soil Classification
45		SM			22 43 45		SILTY SAND (SM): pale yellow (2.5Y 8/3), 10-15% silt, 50% fine, 40% medium, dry, non-cohesive, split spoon went through small (2") zone of calcified sediment, very dense.
50							
55		SM			32 35 50	0.0	SILTY SAND (SM): very pale brown (10YR 7/3), 20-30% silt, 60% fine, trace medium, non-cohesive, dry, no odor.
60			SCREEN				
65		SP			19 38 50		SAND (SP): very pale brown (10YR 7/3), <10% silt, 40% fine, 50% medium, very dense, non-cohesive, damp, no odor.
							Initial Water Level at 68 feet.
70		SP					Sampling stopped at 65', no sampling below water level at 68'.
75							

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Suite 105
Scottsdale, Arizona 85250
(602) 990-9350

ERM

BOREHOLE LOG

Monitoring Well Number
MW-11

Project Number: 8010.11

Project Name: Union Pacific RR

Location: Yuma Yard

Contractor: Layne

Drilling Method: Hollow Stem Auger

Logged By: M. Freebury

Date(s): 04/10/98

Northing: 616636.5202

Easting: 434895.2957

Borehole Dia.: 11.00in

Ground Elevation: 193.56'

Top of Casing Elevation: 192.77'

Total Depth: 92.00'

Completed Depth: 90.50'

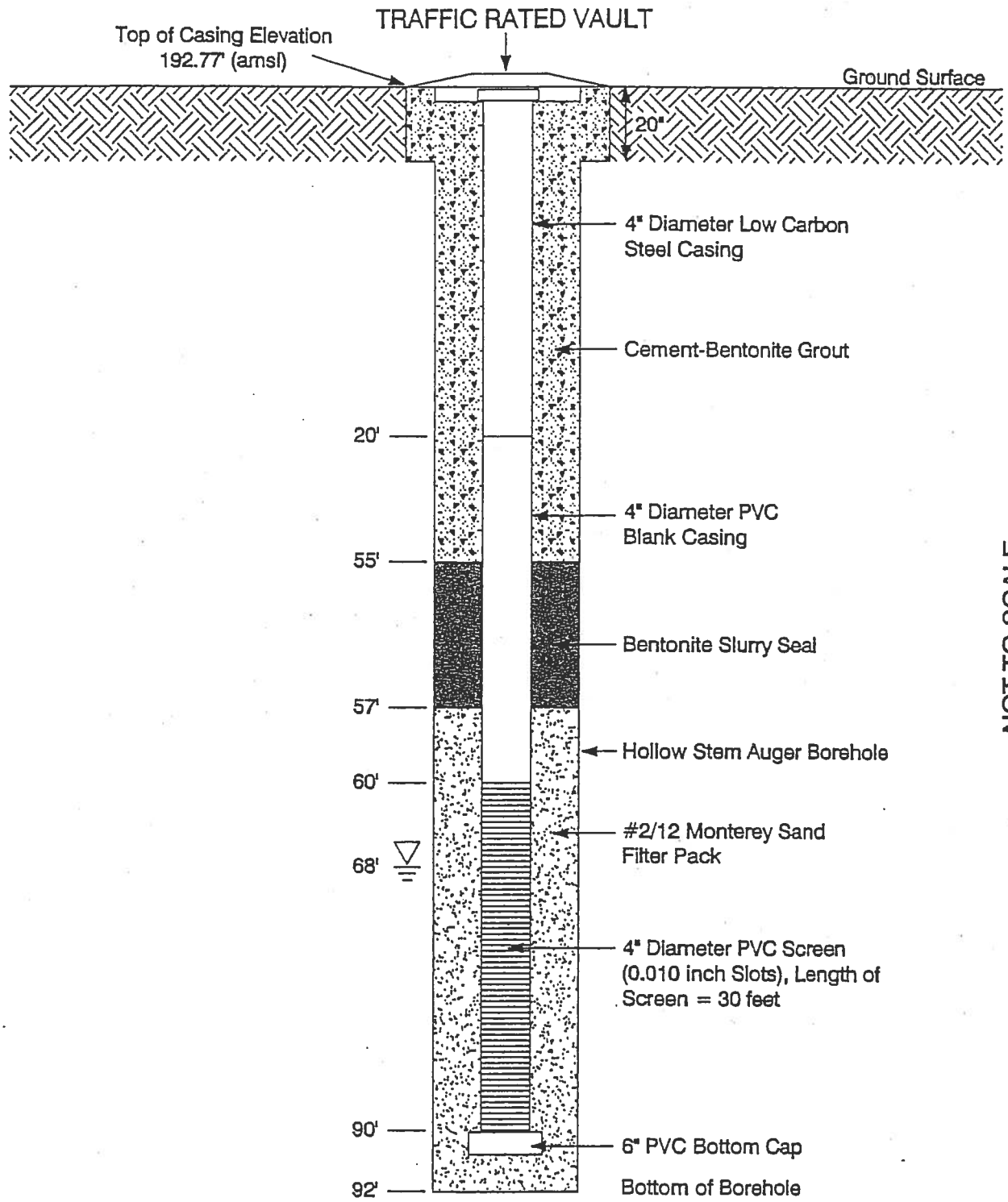
Well Construction

Blank Casing:
type: Steel dia: 4.00" fm: 0.0' to: 20.00'
type: PVC dia: 4.00" fm: 20.00' to: 60.00'

Screens:
type:Slotted size: 0.010" dia: 4.00" fm: 60.00' to: 90.00'

Depth (ft)	Graphic Log	USCS Code	Well Construction	Sample Recovery	Blow Counts	PID (ppm)	Description/Soil Classification
85							
90			6" PVC PIPE →				Total depth of borehole at 92 feet bgs.
95							
100							
105							
110							
115							

Project No. 8010.11
Date: 05/06/98
Drawn By: R. Olson
CAD File: G:\cad\dwg\8010\11\80101102



NOT TO SCALE

Monitoring Well MW-11 Design
Union Pacific Railroad,
Former UST System
Yuma, Arizona

ERM 05/98

GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-8B ADWR ID: 55-905867
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/01/06 End Date/Time: 11/07/06 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5	5				**Poorly-graded Sand (SP)** Brown, dry, fine to medium grained sand with trace gravel
6 7 8 9 10	10				**Poorly-graded Sand (SP)** As above
11 12 13 14 15	15				**Poorly-graded Sand (SP)** Light gray, dry, fine grained sand with trace gravel
16 17 18 19 20	20				**Poorly-graded Sand (SP)** As above
21 22 23 24 25	25				**Poorly-graded Sand (SP)** becomes pink
26 27 28 29 30	30				**Poorly-graded Sand (SP)** Pinkish gray, dry, fine grained sand in weakly cemented sand nodules
31 32 33 34 35	35				**Poorly-graded Sand (SP)** Pinkish gray, dry, fine grained sand with some weakly cemented sand nodules
36 37 38 39 40	40				**Poorly-graded Sand (SP)** As above
41 42 43 44 45	45				**Poorly-graded Sand (SP)** Very pale brown, dry, fine grained sand
46 47 48 49 50	50				**Poorly-graded Sand (SP)** Pinkish gray, dry, fine grained sand

Drilling Contractor: PROSONIC Corporation

Checked By: M. Oakley

Date Checked: 12/04/06

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** 20th & Factor WQARF	**Borehole No:** MW-8B **Start Date/Time:** 11/01/06 **End Date/Time:** 11/07/06 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 10	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51 52 53 54 55	55				**Poorly-graded Sand (SP)** Pinkish gray, dry, fine grained sand with weakly cemented sand nodules, trace gravel
56 57 58 59 60	60				**Poorly-graded Sand (SP)** As above
61 62 63 64 65	65				**Poorly-graded Sand (SP)** As above
66 67 68 69 70	70				**Poorly-graded Sand (SP)** As above
71 72 73 74 75	75				**Poorly-graded Sand (SP)** As above
76 77 78 79 80	80				**Poorly-graded Sand (SP)** Pinkish gray, fine to medium grained sand with weakly cemented sand nodules and trace gravel
81 82 83 84 85	85				**Poorly-graded Sand (SP)** Yellow brown, slighty moist, fine to medium grained sand
86 87 88 89 90	90				**Poorly-graded Sand (SP)** Pinkish gray, fine grained sand with weakly cemented sand nodules, trace clay lenses
91 92 93 94 95	95				**Clay (CL)** Light gray, slightly damp, silty clay with trace stringers of yellow clay, low plasticity
96 97 98 99 100	100				**Clayey Sand - Sandy Clay (SC-CL)** Light gray to pale brown, damp, sandy clay with trace lines of yellow clay, low plasticity

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/04/06

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Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** 20th & Factor WQARF	**Borehole No: MW-8B** **Start Date/Time:** 11/01/06 **End Date/Time:** 11/07/06 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 10	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101-105	105				**Clayey Sand - Sandy Clay (SC-CL)** Pale brown, saturated, clayey sand with trace clay stringers
106-110	110				**Poorly-graded Sand (SP)** Yellowish brown, saturated, fine to medium grained sand, trace clay
111-117	115				**Poorly-graded Sand (SP)** becomes pale brown and fine grained
118-150					**Bottom of the boring at 117 feet bgs**

Drilling Contractor: PROSONIC Corporation
Checked By: M. Oakley
Date Checked: 12/04/06

Sheet: 3 of 3

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Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.020 **Client:** ADEQ **Site:** 20th & Factor WQARF	**Borehole No:** MW-18B **ADWR ID:** 55-905869 **Start Date/Time:** 11/08/06 **End Date/Time:** 11/11/06 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 10	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5	5				**Poorly-graded Sand (SP)** Pale brown, dry, fine to medium grained
6 7 8 9 10	10				**Poorly-graded Sand (SP)** As above
11 12 13 14 15	15				**Sandy Clay - Clayey Sand (CL-SC)** Light brown, dry, sandy clay
16 17 18 19 20	20				**Sandy Clay - Clayey Sand (CL-SC)** As above
21 22 23 24 25	25				**Poorly-graded Sand (SP)** Light yellowish brown, dry, fine grained
26 27 28 29 30	30				**Poorly-graded Sand (SP)** Pale brown, dry, fine to medium grained sand
31 32 33 34 35	35				**Sandy Clay - Clayey Sand (CL-SC)** Light brown, dry, sandy clay
36 37 38 39 40	40				**Sandy Clay - Clayey Sand (CL-SC)** Becomes light gray
41 42 43 44 45	45				**Poorly-graded Sand (SP)** Pale brown, dry, fine grained
46 47 48 49 50	50				**Poorly-graded Sand (SP)** As above

Drilling Contractor: PROSONIC Corporation
Checked By: L. Gardiner
Date Checked: 12/15/06

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GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-18B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/08/06 End Date/Time: 11/11/06 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51-54	55				**Poorly-graded Sand (SP)** Light gray, dry, fine to medium grained
55-59	60				**Poorly-graded Sand (SP)** As Above
60-64	65				**Poorly-graded Sand (SP)** As Above
65-69	70				**Poorly-graded Sand (SP)** Becomes moist
70-74	75				**Poorly-graded Sand (SP)** Becomes damp
75-79	80				**Poorly-graded Sand (SP)** Becomes saturated
80-84	85				**Poorly-graded Sand (SP)** As above
85-89	90				**Sandy Clay - Clayey Sand (CL-SC)** Brown, saturated, sandy clay
90-94	95				**Sandy Clay - Clayey Sand (CL-SC)** As above
95-99	100				**Sandy Clay - Clayey Sand (CL-SC)** As above
100					

Drilling Contractor: PROSONIC Corporation
Checked By: L. Gardiner
Date Checked: 12/15/06

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GeoTrans, Inc.	Project No: 1303.020	Borehole No: MW-18B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/08/06 End Date/Time: 11/11/06 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 10	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: N/A

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–105	105				**Silty Sand (SM)** Pale brown, saturated, sandy silt
106–110	110				**Poorly-graded Sand (SP)** Light gray, saturated, fine to medium grained
111–115	115				**Poorly-graded Sand (SP)** As above
116–120	120				**Poorly-graded Sand (SP)** As above
121–125	125				**Poorly-graded Sand (SP)** As above
126–130	130				**Poorly-graded Sand (SP)** As above
131–135	135				**Silty Sand (SM)** Light gray, saturated, silty sand with weakly cemented sand nodules
136–140	140				**Silty Sand (SM)** Light gray, saturated
141–145	145				**Poorly-graded Sand (SP)** Light gray, saturated fine to coarse grained
146–148					
149–150					**Bottom of the boring at 148 feet bgs**

Drilling Contractor: PROSONIC Corporation
Checked By: L. Gardiner
Date Checked: 12/15/06
Sheet: 3 of 3

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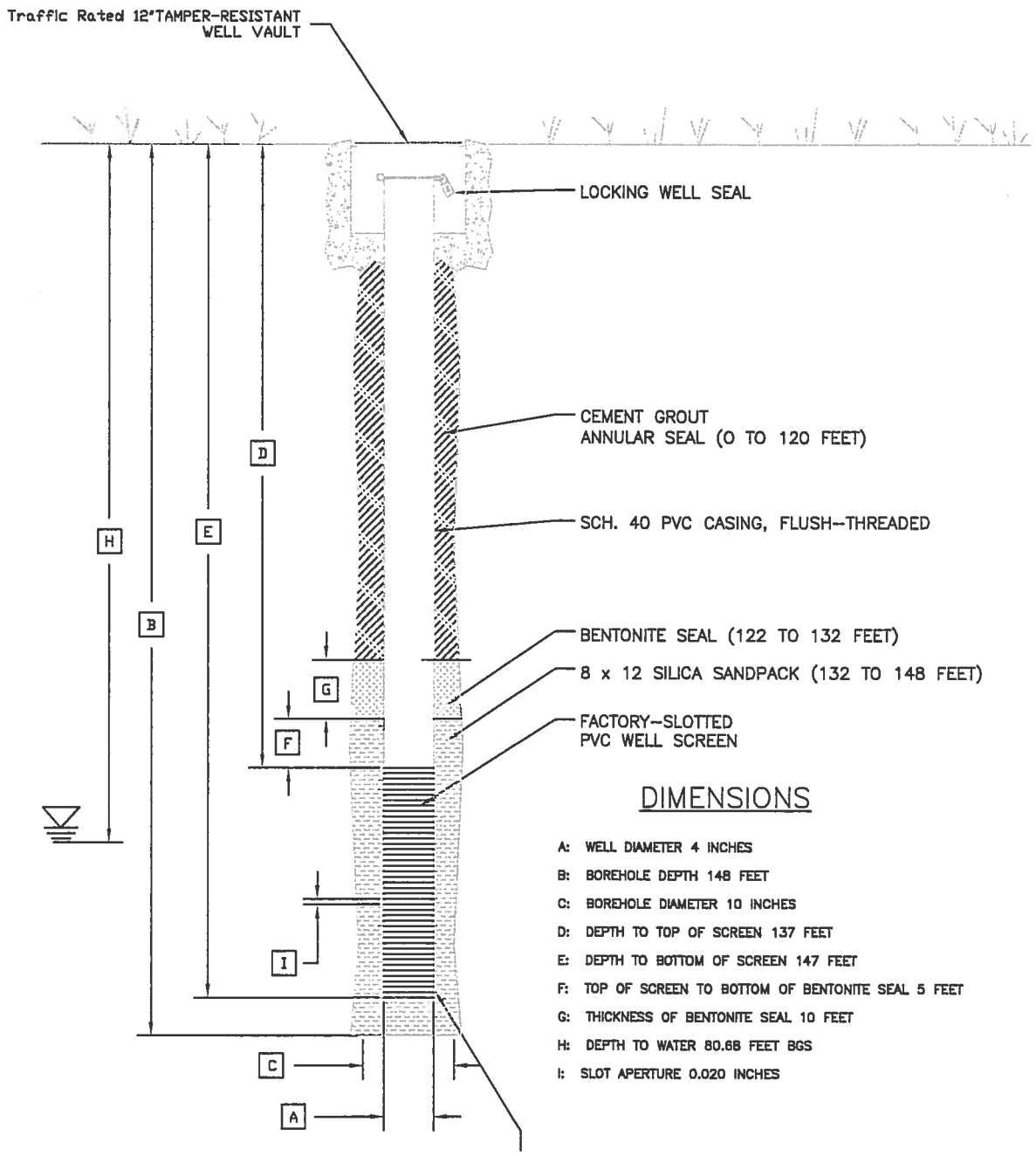

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH 148 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN 137 FEET
E: DEPTH TO BOTTOM OF SCREEN 147 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5 FEET
G: THICKNESS OF BENTONITE SEAL 10 FEET
H: DEPTH TO WATER 80.68 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE: MW-18B WELL DIAGRAM 20TH AND FACTOR WQARF SITE			
LOCATION: YUMA, ARIZONA			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	LG	FIGURE
	DRAFTED	MB	B4
	PROJECT	1303.020	
	DATE	12/19/06	

Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** Yuma 20th & Factor WQARF Site	**Borehole No:** MW-21B **ADWR ID:** 55-906704 **Start Date/Time:** 4/26/07 **End Date/Time:** 4/30/07 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Concrete	**Sampling Method:** Continous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–5			0.3		**Poorly Graded Sand (SP)** 75% medium, 25% fine grained sand, pink (7.5YR 7/3), dry, no cementation
6–9	10		0.2		
10–14		4/27/07 @ 0820	0.1		
15–19	20		0.2		
20–24		4/27/07 @ 0835	0.6		
25–29	30		1.3		**Clayey Sand (SC)** 50% sand 50% silt, light gray (10YR 7/2), dry, no cementation
30–34		4/27/07 @ 1005	0.7		**Clay (CL)** Brown (10YR 5/3), slightly moist, very stiff
35–39	40	4/27/07 @ 1030	0.6		**Poorly Graded Sand (SP)** Fine grained, very pale brown (10YR 6/4), dry, moderate cementation
40–44		4/27/07 @ 1055	0.4		
45–49	50	4/27/07 @ 1130	0.7		
50					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 5/15/07

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Site Map	Project No: 1303.020.03.01 Client: ADEQ Site: Yuma 20th & Factor WQARF Site	Borehole No: MW-21B Start Date/Time: 4/26/07 End Date/Time: 4/30/07 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54		4/27/07 @ 1205	0.9		**Poorly Graded Sand (SP)** As Above
55–59	60		0.3		
60–64		4/27/07 @ 1340	0.2		**Poorly Graded Sand (SP)** 50% fine, 25% medium sand, 25% silt, light gray (10YR 7/2), moist, weak cementation
65–69	70		1.1		**Poorly Graded Sand, Gravel, Silt Mix (SM)** Pale brown (10YR 6/3), moist, moderate cementation
70–74		4/27/07 @ 1510	1.2		**Poorly Graded Sand (SP)** Fine grained sand, brown (10YR 5/3), moist, weak cementation
75–79	80		0.6		**Poorly Graded Sand (SP)** 50% fine, 50% medium grained sand, brown (10YR 5/3), moist, no cementation
80–84			0.6		**Poorly Graded Sand (SP)** 50% fine, 50% medium grained sand, brown (10YR 5/3), moist, weak cementation
85–89	90		1.3		
90–94			1.2		
95–99	100	4/27/07 @ 1625	0.5		**Sandy Clay (SC)** 80% clay, 20% sand, light yellowish brown (10YR 6/4), moist, stiff
100					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 5/15/07

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	Project No: 1303.020.03.01	**Borehole No: MW-21B**
Site Map	**Client:** ADEQ **Site:** Yuma 20th & Factor WQARF Site	**Start Date/Time:** 4/26/07 **End Date/Time:** 4/30/07 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Concrete	**Sampling Method:** Continous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101–103		4/28/07 @ 0910	0.0		**Poorly Graded Sand (SP)** Fine sand, brown (10YR 5/3), moist, no cementation
104–108	110	4/28/07 @ 1125	0.3		
109–113		4/28/07 @ 1225	0.1		
114–118	120		0.9		
119–123		4/28/07 @ 1445	0.2		
124–128	130		0.0		
129–133		4/28/07 @ 1545	0.1		**Poorly Graded Sand (SP)** Medium grained sand, brown (10YR 5/3), moist, no cementation
134–138	140		0.0		**Poorly Graded Sand (SP)** 50% fine, 35% medium grained sand, 15% silt, brown (10YR 5/3), moist, no cementation
139–143		4/28/07 @ 1650	0.0		**Silty Sand (SM)** Fine grained, brown (10YR 5/3), moist, no cementation
144–148	150		0.0		**Clayey Sand (SC)** 85% fine grained sand, 15% clay, brown (10YR 5/3), moist, no cementation
149–150					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 5/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21B
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF Site	Start Date/Time: 4/26/07 End Date/Time: 4/30/07 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151-154		4/28/07 @ 1805	0.2		**Poorly Graded Sand (SP)** Medium grained sand, brown (10YR 5/3), moist, no cementation
155-159	160		0.2		
160-164		4/29/07 @ 0855	0.1		**Poorly Graded Sand (SP)** Fine grained sand, brown (10YR 5/3), moist, no cementation
165-169	170		0.1		
170-174		4/29/07 @ 1025	0.4		
175-179	180		0.1		**Poorly Graded Sand (SP)** Medium grained sand, brown (10YR 5/3), moist, no cementation
180-184		4/29/07 @ 1145	0.0		**Well Graded Gravel, Sand, Clay Mix (GC)** Mostly brown (10YR 5/4), moist, no cementation
185-189	190		0.0		**Clayey Sand (SC)** Dark yellowish brown (10YR 4/4), moist, no cementation
190-194		4/29/07 @ 1340	0.2		**Clayey Sand (SC)** 70% sand, 30% clay, olive yellow (2.5 Y 6/6), moist, no cementation
195-199	200		0.0		
200					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 5/15/07

GeoTrans, Inc
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Site Map	**Project No:** 1303.020.03.01 **Client:** ADEQ **Site:** Yuma 20th & Factor WQARF Site	**Borehole No: MW-21B** **Start Date/Time:** 4/26/07 **End Date/Time:** 4/30/07 **Logged By:** A. Gray
	Drilling Method: Sonic **Borehole Diameter:** 8"	**Angle from Vertical:** 0
	Surface Material: Concrete	**Sampling Method:** Continous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201 202 203 204 205	205	4/29/07 @ 1455	0.1		**Poorly Graded Sand (SP)** Medium grained sand, brown (10YR 5/3), moist, no cementation
206 207 208 209 210	210				Bottom of boring at 205 feet bgs
211 212 213 214 215					
216 217 218 219 220					
221 222 223 224 225					
226 227 228 229 230					
231 232 233 234 235					
236 237 238 239 240					
241 242 243 244 245					
246 247 248 249 250					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 5/15/07

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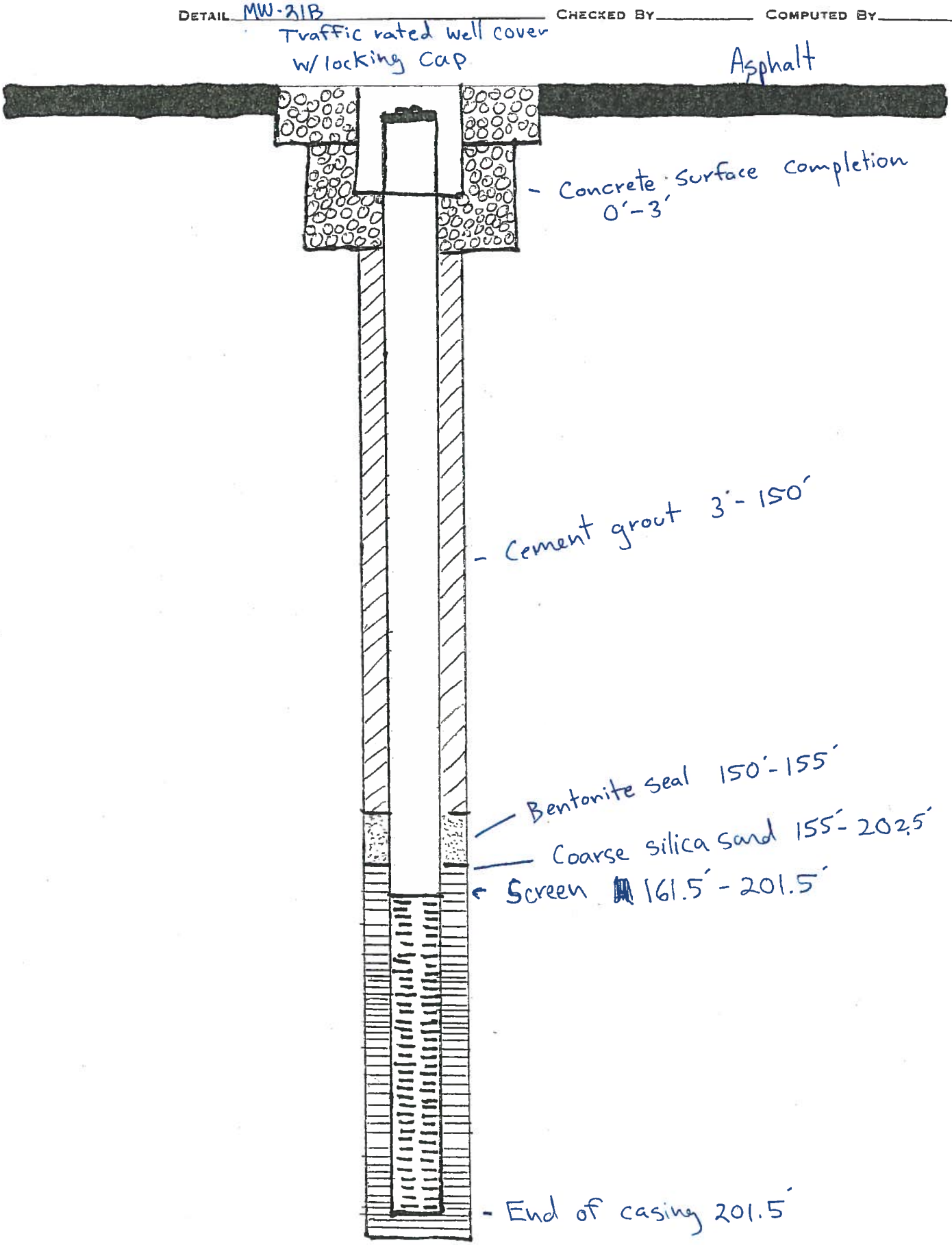
CLIENT ADEQ JOB NO. 1303.020.03 03 PAGE

PROJECT 20th + Fairfax WQARF Site DATE CHECKED DATE

DETAIL MW-21B CHECKED BY COMPUTED BY



GeoTrans, Inc.

Site Map

Project No: 1303.026.09.01

Client: ADEQ

Site: 20th & Factor WQARF

Borehole No: MW-22B
ADWR ID: 55-908037

Start Date/Time: 11/05/07

End Date/Time: 11/13/07

Logged By: AG

Drilling Method: Sonic

Angle from Vertical: 0

Borehole Diameter: 9"

Surface Material: Gravel

Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–10					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/4, 50% fine, 50% medium grained sand, loose, no cementation, dry
11–35					**Silty Sand (SM)** Light brown 7.5 YR 6/4, 50% silt, 50% fine grained sand, dry, loose, no cementation
35–36					**Well Graded Gravelly Sand (SW)** Reddish yellow 7.5 YR 6/6, 70% sand, 30% gravel, dry, loose
36–40					**Silty Sand (SM)** Light brown 7.5 YR 6/6, 80% fine sand, 20% silt, loose, dry, no cementation
40–50					**Well Graded Gravelly Sand (SW)** Light brown 7.5 YR 6/4, 80% sand, 20% gravel, loose, dry, no cementation

Drilling Contractor: Boart Longyear

Checked By: LG

Date Checked: 12/17/07

Sheet: 1 of 4

GeoTrans, Inc
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-22B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/05/07 End Date/Time: 11/13/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9"	Angle from Vertical: 0
	Surface Material: Gravel	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/4, 50% fine, 50% medium grained sand, dry, loose, no cementation
55 56 57 58 59					**Silty Sand (SM)** Light brown 7.5 YR 6/4, 75% medium grained sand, 25% silt, loose, dry, slight cementation
60 61 62 63 64					**Silty sand (SM)** Pinkish gray 7.5 YR 6/2, 70% fine grained sand, 30% silt, loose, dry, no cementation
65 66 67 68 69					**Poorly Graded Sand (SP)** Pinkish gray 7.5 YR 6/3, 90% fine grained sand, 10% silt, loose, moist
70 71 72 73 74					
75 76 77 78 79					**Poorly Graded Sand with Silt (SP)** Light brown 7.5 YR 6/2, 90% fine grained sand, 10% silt, loose, moist
80 81 82 83 84					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/3, medium grained sub-angular sand, loose, wet
85 86 87 88 89					
90 91 92 93 94					
95 96 97 98 99					
100					

Drilling Contractor: Boart Longyear
Checked By: LG
Date Checked: 12/17/07

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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-22B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/05/07 End Date/Time: 11/13/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9"	Angle from Vertical: 0
	Surface Material: Gravel	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–109					
110–142					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/3 80% fine to medium grained sand, 20% fines, loose, wet
142–144					**Clay (CL)** Brown 7.5 YR 5/3, clay, stiff, moist
144–150					**Poorly Graded Sand (SP)** Light Brown 7.5 YR 6/3, 85% medium to fine sand, 15% fines, looset, wet

Drilling Contractor: Boart Longyear

Checked By: LG

Date Checked: 12/17/07

Sheet: 3 of 4

GeoTrans, Inc
4801 East Washington Street, Suite 260
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-22B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/05/07 End Date/Time: 11/13/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9"	Angle from Vertical: 0
	Surface Material: Gravel	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151–154					**Silty Clay (CL)** Light brown 7.5 YR 6/3, 60% clay, 40% silt, loose, wet
155					**Silty Clay (CL)** Light brown 7.5 YR 6/3, 80% clay, 20% silt, stiff, moist
156–160					**Silty Sand (SM)** Light brown 7.5 YR 6/3, 75% fine to medium grained sand, 25% silt
161–164					**Clay with Silt (CL)** Light brown 7.5 YR 6/3, clay with 10% silt, stiff, moist
165					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/3 poorly graded fine sand with 10% silt, loose, wet, no cementation
166–170					**Silty Sand (SM)** Light brown 7.5 YR 6/3, 50% fine sand, 50% silt and clay, wet, loose, no cemetation
171–175					**Clay (CL)** Red brown 5 YR 4/4, clay with white nodules and gray ribbons
176–180					**Silty Sand (SM)** Light brown 7.5 YR 6/3, 70% fine sand with 30% silt, well cemented in places, wet
181–200					

Drilling Contractor: Boart Longyear

Checked By: LG

Date Checked: 12/17/07

Sheet: 4 of 4

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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: HI-MW23B ADWR ID: 55-908038
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/14/07 End Date/Time: 11/28/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9'	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
0					Ground Surface
1–9					**Poorly Graded Sand (SP)** Light Brown 7.5 YR 6/3, dry, subangular
10–14					**Sand with Silt (SM)** Light Brown 7.5 YR 6/3, dry, subangular, <10% Silt
15–19					**Well Graded Silty Sand (SM)** Yellowish brown 10 YR 5/3, slightly moist, subangular, 70% sand, 30% silt. Silty clay lens from 16' to 16.5'
20–32					**Silty Sand (SM)** Light yellowish brown 2.5 YR 6/3, dry, subangular, 70% sand, 30% silt
33–35					**Clay (CL)** Strong brown, 7.5 YR 4/6, hard, with interbedded fine sand lenses
36–43					**Silty Clay(CL)** Brown 7.5 YR 4/3, 60% clay, 40% silt, low plasticity
44–45					**Clayey Silt (ML)** Light brown 10 YR 5/4, 80% silt, 20% clay
46–50					**Clayey Silt (ML)** Yellowish brown 10 YR 5/4, 50% clay, 50% silt

Drilling Contractor: Boart Longyear

Checked By: LG

Date Checked: 12/17/07

Sheet: 1 of 4

GeoTrans, Inc
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: HI-MW23B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/14/07 End Date/Time: 11/28/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9'	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54					**Clay (CL)** Yellowish 10 YR 5/4, moist, very stiff, medium plasticity
55–59					**Silty Sand (SM)** Pale brown 10 YR 6/3, moist, medium dense, some caliche, 60% sand, 40% silt
60–64					**Silty Sand (SM)** Pale brown 10 YR 6/3, dry, loose, subrounded, some gravel at 61 feet, 70% sand, 30% silt
65–69					**Poorly Graded Sand (SP)** Light gray 2.5 YR 7/2, dry, loose, subangular, some gravel <10%
70–74					**Poorly Graded Sand (SP)** Light gray 2.5 YR 7/2, dry, fine grained sand, loose, silt <10%
75–79					**Silty Sand (SM)** Light yellowish brown 2.5 YR 6/3, very moist, dense, fine grained sand, 60% sand, 40% silt
80–94					**Poorly Graded Sand (SP)** Light yellowish brown 2.5 YR 6/3, wet, fine grained sand, loose
95–100					**Poorly Graded Sand (SP)** Fine to mediumsand, light yellowish brown, 2.5 Y 6/3, wet, loose

Drilling Contractor: Boart Longyear
Checked By: LG
Date Checked: 12/17/07

GeoTrans, Inc
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: HI-MW23B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/14/07 End Date/Time: 11/28/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9'	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101					
102					
103					
104					
105					**Poorly Graded Silty Sand (SM)** Light yellowish brown 2.5 YR 6/4, wet, loose, fine to medium grained sand, 20% silt, becomes siltier towards bottom of interval
106					
107					
108					
109					
110					**Poorly Graded Sitly Sand (SM)** Fine sand with silt, pale brown 10 Y 6/3, wet, loose, 15% silt, 85% sand
111					
112					
113					
114					
115					**Silty Sand (SM)** Pale brown 10 YR 6/3, wet, loose, 20% silt, 80% sand
116					
117					
118					
119					
120					**Silty Sand (SM)** Light yellowish brown 10 YR 6/3, wet, loose, 40% silt, 60% sand
121					
122					
123					**Poorly Graded Sand (SP)** Pale brown 10 YR 6/3, fine grained sand, wet, loose
124					
125					**Sandy Silt with Trace Clay (MH)** Brown 7.5 YR 5/3, wet to saturated, medium dense, 75% silt, 25% sand, trace clay
126					
127					
128					
129					
130					
131					
132					**Poorly Graded Sand with Trace Silt and Gravel (SP)** Light yellowish brown, 10 YR 6/4, wet, poorly graded, subrounded, trace silt and gravel
133					
134					
135					
136					**Clay (CL)** Pale brown, 10 YR 6/3, moist, with <10% silt, low plasticity
137					
138					
139					**Sandy Clay (CL)** Pale brown 10 YR 6/3, dry, very stiff 60% clay, 40% sand
140					
141					**Poorly Graded Sand (SP)** Light yellowish brown, 10 YR 6/4, wet, loose
142					
143					
144					
145					**Silty Sand (SM)** Pale brown, 10 YR 6/3, 70% sand, 30% silt, wet
146					
147					
148					
149					
150					

Drilling Contractor: Boart Longyear

Checked By: LG

Date Checked: 12/17/07

Sheet: 3 of 4

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Phoenix, Arizona 85034
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: HI-MW23B
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 11/14/07 End Date/Time: 11/28/07 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9'	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151–159					**Poorly Graded Sand (SP)** Yellowish brown, 10 YR 5/4, wet, subangular, with trace silt
160–161					**Clay (CL)** Brown 10 YR 5/3, dry, hard, med plasticity
162–164					**Poorly Graded Sand (SP)** Brown, 10 YR 5/3, fine grained sand, trace silt, wet, loose
165–169					**Clay (CL)** Brown 7.5 YR 5/4, moist, stiff
170–185					**Silty Sand (SM)** Grayish brown, 10 YR 5/2, 80% fine sand, 20% silt moist, loose, no cementation
186–200					

Drilling Contractor: Boart Longyear

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Date Checked: 12/17/07

Sheet: 4 of 4

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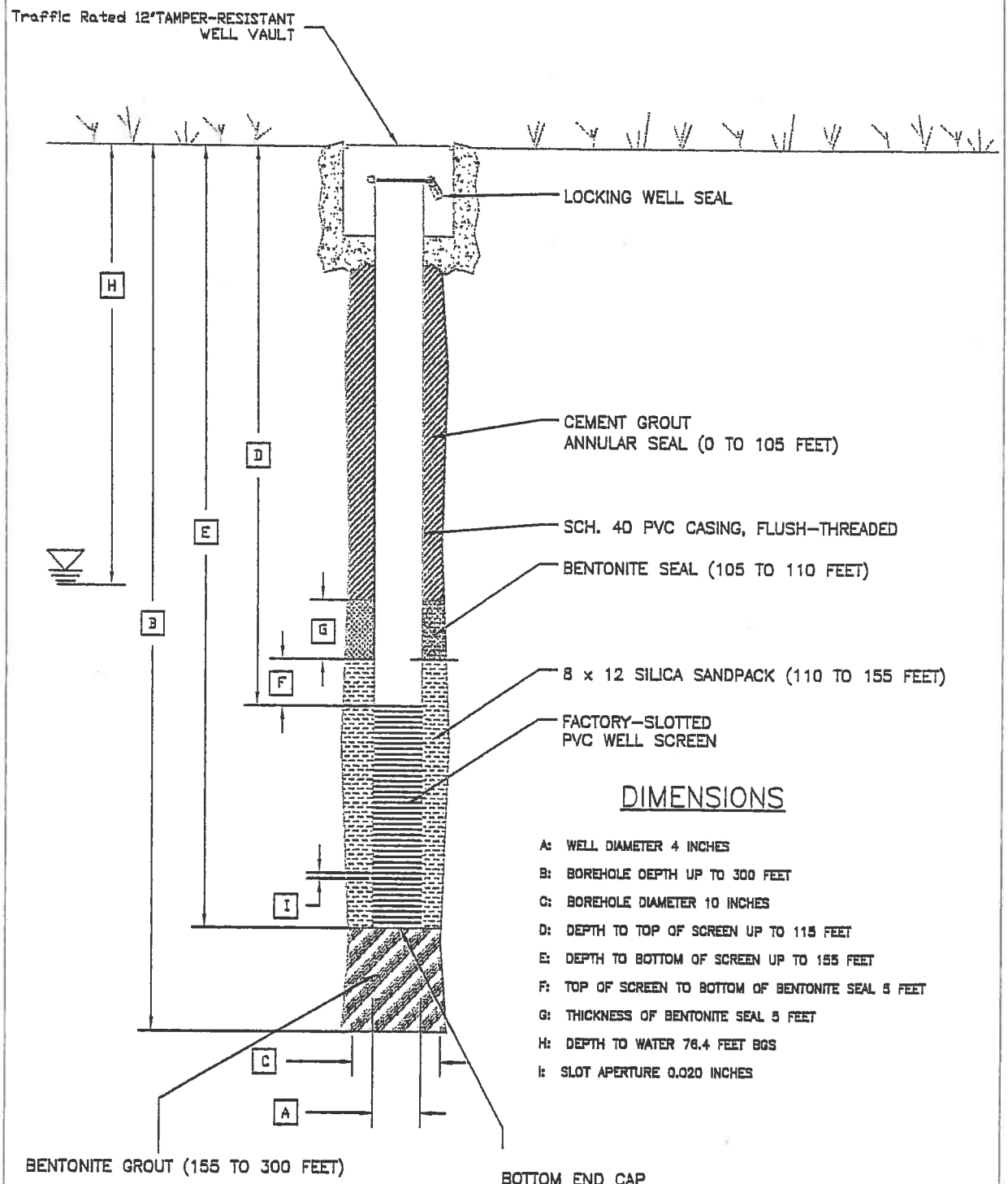

DIMENSIONS

A: WELL DIAMETER 4 INCHES
B: BOREHOLE DEPTH UP TO 300 FEET
C: BOREHOLE DIAMETER 10 INCHES
D: DEPTH TO TOP OF SCREEN UP TO 115 FEET
E: DEPTH TO BOTTOM OF SCREEN UP TO 155 FEET
F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5 FEET
G: THICKNESS OF BENTONITE SEAL 5 FEET
H: DEPTH TO WATER 76.4 FEET BGS
I: SLOT APERTURE 0.020 INCHES

* NOT TO SCALE

TITLE: MW-23B WELL DIAGRAM (GENERIC)
20TH AND FACTOR WQARF SITE

LOCATION: YUMA, ARIZONA

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JR
DRAFTED	TG
PROJECT	1303.028
DATE	09/14/07

FIGURE 1

GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-24B ADWR ID:
Site Map	Client: ADEQ Site: 20th & Factor WQARF Site	Start Date/Time: 01/07/08 @ 0930 End Date/Time: 01/14/08 @ 1445 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 9" 0-120' 8" 120-170	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–5					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/4, fine sand, well sorted, no cementation, dry
6–9					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/4, 50% medium, 50% fine grained sand, well sorted, no cementation, dry
10–15					**Silty Sand (SM)** Light brown 7.5 YR 6/4, 75% fine sand, 25% silt, no cementation, dry
16–19					
20–24					**Clay (CL)** Reddish brown 5 YR 5/4, clay, stiff, slightly moist
25–30					**Sandy Silt (ML)** Light brown 7.5 YR 6/4, 75% silt 25% fine sand, loose, dry
31–34					
35–40					**Sandy Silt (ML)** Light brown 7.5 YR 6/4, 75% silt 25% fine sand, loose, dry, some cementation
41–45					
46–49					
50					

Drilling Contractor: Boart Longyear
Checked By: L. Gardiner
Date Checked: 1/29/2008

GeoTrans, Inc
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-24B
Site Map	Client: ADEQ Site: 20th & Factor WQARF Site	Start Date/Time: 01/07/08 @ 0930 End Date/Time: 01/14/08 @ 1445 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 9" 0-120' 8" 120-170	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–59					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/4, fine sand, loose, dry, some cementation
60–62					**Clay (CL)** Yellowish Brown 10 YR 5/8, clay, stiff, slightly moist
63–69					**Sandy Silt (SM)** Light brown 7.5 YR 6/4, 75% silt, 25% fine sand, loose, dry, some cementation
70–74					**Sandy Silt (ML)** Light brown 7.5 YR 6/4, 50% silt, 50% fine sand, loose, slightly moist, some cementation
75–79					**Sandy Silt (ML)** Light brown 7.5 YR 6/3, 70% silt, 30% fine sand, moist
80–89					**Sandy Silt (ML)** Light brown 7.5 YR 6/3, 80% silt, 20% fine sand, wet
90–94					**Clay (CL)** Brown 7.5 YR 5/4 clay, stiff, interbedded with silty sand as above, wet
95–100					**Sandy Silt (ML)** Light brown 7.5 YR 6/3, 80% silt, 20% fine sand, wet, no cementation

Drilling Contractor: Boart Longyear
Checked By: L. Gardiner
Date Checked: 1/29/2008

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-24B
Site Map	Client: ADEQ Site: 20th & Factor WQARF Site	Start Date/Time: 01/07/08 @ 0930 End Date/Time: 01/14/08 @ 1445 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 9" 0-120' 8" 120-170	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101 102 103 104					**Sandy Silt (ML)** Light brown 7.5 YR 6/3, 70% silt, 30% fine sand, wet, no cementation
105 106 107 108 109					**Sandy Silt (ML)** Light brown 7.5 YR 6/3, 50% silt, 50% fine sand, wet, no cementation
110 111 112 113 114					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/3, 60% fine grained sand, 40% medium, wet, no cementation
115 116 117 118 119					**Poorly Graded Sand (SP)** Light brown 7.5 YR 6/3, 60% medium grained sand, 40% fine, wet, no cementation
120 121 122 123 124					**Sandy Silt (ML)** Pale brown 10 YR 6/3, 70% silt, 30% fine sand, wet no cementation
125 126 127 128 129					**Sandy Silt (ML)** Pale brown 10 YR 6/3, 80% silt, 20% fine sand, wet, no cementation
130 131 132 133 134					**Sandy Silt (ML)** Pale brown 10 YR 6/3, 70% silt, 30% medium to fine sand, wet, no cementation
135 136 137 138 139					**Sandy Silt (ML)** Pale brown 10 YR 6/3, 70% silt, 30% medium to fine sand, wet, some cementation
140 141 142 143 144					**Clay (CL)** Reddish brown 5 YR 5/4, stiff, moist, white nodules present
145 146 147 148 149 150					**Sandy Silt (ML)** Pale brown 10 YR 6/3, 70% silt, 30% fine sand, wet, no cementation

Drilling Contractor: Boart Longyear

Checked By: L. Gardiner

Date Checked: 1/29/2008

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Site Map	Project No: 1303.026.09.01 Client: ADEQ Site: 20th & Factor WQARF Site	Borehole No: MW-24B Start Date/Time: 01/07/08 @ 0930 End Date/Time: 01/14/08 @ 1445 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 9" 0-120' 8" 120-170	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
151					
152					
153					
154					
155					
156					
157					
158					
159					
160					**Silty Clay (CL)** Pale brown 10 YR 6/3, moist, white nodules present
161					
162					**Clay (CL)** Light yellowish brown 10 YR 6/4, stiff
163					
164					
165					
166					
167					**Sandy Silt (ML)** Pale brown (10 YR 6/3), 70% silt, 30% fine sand, wet, no cementation
168					
169					
170					
171					
172					
173					
174					
175					
176					
177					
178					
179					
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188					
189					
190					
191					
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193					
194					
195					
196					
197					
198					
199					
200					

Drilling Contractor: Boart Longyear
Checked By: L. Gardiner
Date Checked: 1/29/2008

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GeoTrans, Inc.
A TETRA TECH COMPANY

4801 E Washington St
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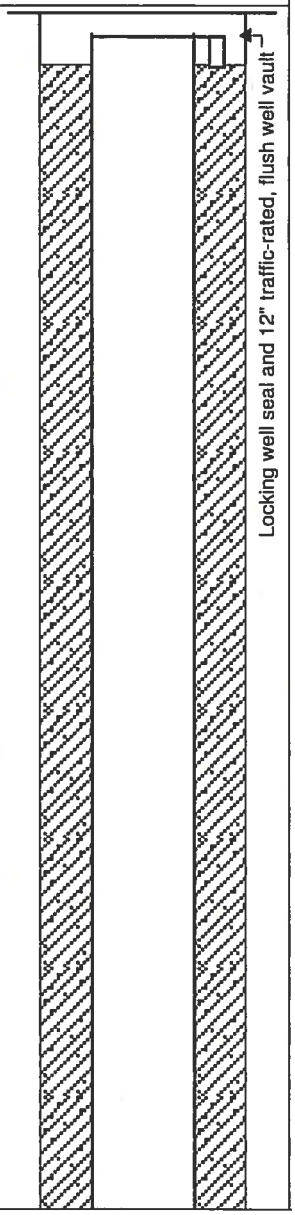
Phoenix, AZ 85034
(602) 682-3320

Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments	Well Construction
			Straight drill to 60' bgs (no samples taken)	
1.0				
2.0				
3.0				
4.0				
5.0				
6.0				
7.0				
8.0				
9.0				
10.0				
11.0				
12.0				
13.0				
14.0				
15.0				
16.0				
17.0				
18.0				
19.0				
20.0				

Date Compiled: 6/2/2010

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4801 E Washington St
Suite 260
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(602) 682-3320

Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments	Well Construction
			Straight drill to 60' bgs (no samples taken)	
21.0				
22.0				Bentonite cement grout annular seal
23.0				
24.0				
25.0				
26.0				
27.0				
28.0				
29.0				
30.0				
31.0				
32.0				Schedule 40 PVC casing
33.0				
34.0				
35.0				
36.0				
37.0				
38.0				
39.0				
40.0				

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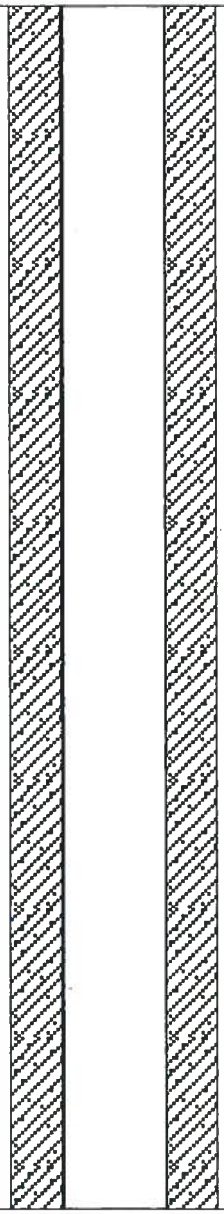
Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments	Well Construction
			Straight drill to 60' bgs (no samples taken)	
41.0				
42.0				
43.0				
44.0				
45.0				
46.0				
47.0				
48.0				
49.0				
50.0				
51.0				
52.0				
53.0				
54.0				
55.0				
56.0				
57.0				
58.0				
59.0				
60.0				



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Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments	Well Construction
	SW		**Well Graded Sand** fine to medium grained sand, weak cementation	
61.0				
62.0				
63.0			**Recovery complications; straight drill to 80' bgs.**	
64.0				
65.0				
66.0				
67.0				
68.0				
69.0				
70.0				
71.0				
72.0				
73.0				
74.0				
75.0				
76.0				
77.0				
78.0				
79.0				
80.0				

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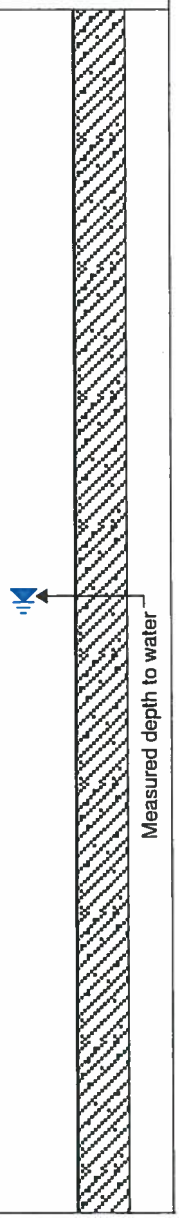
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments
81.0 – 85.0	SP		**Poorly Graded Sand** 100% medium grained sand, 7.5YR 7/4 pink, moist, weak cementation
85.0 – 90.0	SP		**Poorly Graded Sand** 100% fine grained sand, 7.5YR 6/3 light brown, moist, weak cementation
90.0 – 100.0	SW		**Well Graded Sand** 50% medium grained sand, 30% fine grained sand, 20% coarse grained sand, 7.5YR 6/4 light brown, moist, weak cementation

Well Construction



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Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments	Well Construction
101.0 102.0 103.0 104.0 105.0	SW		**Well Graded Sand** 70% medium grained sand, 30% fine grained sand, 7.5YR 7/4 pink, moist, weak cementation	
106.0 107.0 108.0 109.0 110.0	SW		**Well Graded Sand** 70% medium grained sand, 30% fine grained sand, 7.5YR 6/2 pinkish grey, moist, weak cementation	
111.0 112.0 113.0 114.0 115.0	SW		**Well Graded Sand** 70% fine grained sand, 30% medium grained sand, 7.5YR 6/2 pinkish grey, moist, weak cementation	
116.0 117.0 118.0 119.0 120.0	SW		**Well Graded Sand** 90% medium grained sand, 10% fine grained sand, 7.5YR 6/3 light brown, moist, weak cementation	

Date Compiled: 6/2/2010

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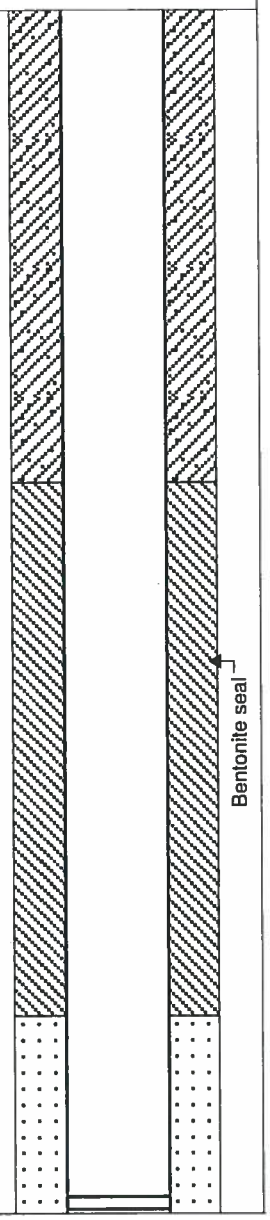
Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments
121.0			
122.0			
123.0			
124.0			
125.0			
126.0			
127.0			
128.0			
129.0			
130.0	CL		**Clay with Trace Sand** 95% clay, 5% fine grained sand, 7.5YR 7/3 pink, moist, moderate cementation
131.0	CL		**Gravelly Clay with Trace Sand** 65% clay, 30% gravel, 5% fine grained sand, 7.5YR 7/3 pink, moist, weak cementation
132.0			
133.0	CL		**Clay** 100% clay, 7.5YR 6/3 light brown, moist, moderate cementation
134.0	GC		**Clayey Gravel with Trace Sand** 60% gravel, 35% clay, 5% fine grained sand, 7.5YR 6/3 light brown, moist, weak cementation
135.0	CL		**Sandy Clay** 80% clay, 20% fine grained sand, 7.5YR 6/3 light brown, moist, weak cementation
136.0	SW		**Well Graded Sand** 50% fine grained sand, 50% medium grained sand, 7.5 YR 7/3 pink, moist, weak cementation
137.0			
138.0			
139.0			
140.0			

Well Construction



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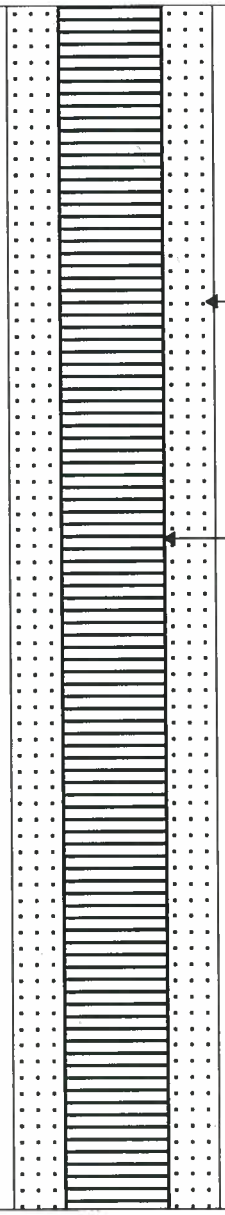
Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek
Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments	Well Construction
141.0	SW		**Well Graded Sand with Gravel** 40% fine grained sand, 20% medium grained sand, 20% coarse grained sand, 15% gravel, 7.5YR 6/2 pinkish grey, moist, weak cementation	
142.0				
143.0			**Recovery complications; straight drill to 163' bgs.**	
144.0				
145.0				Silica sandpack
146.0				
147.0				
148.0				
149.0				Factory-slotted PVC well screen (slot aperture 0.020 inches)
150.0				
151.0				
152.0				
153.0				
154.0				
155.0				
156.0				
157.0				
158.0				
159.0				
160.0				



Date Compiled: 6/2/2010

GeoTrans, Inc.
A TETRA TECH COMPANY

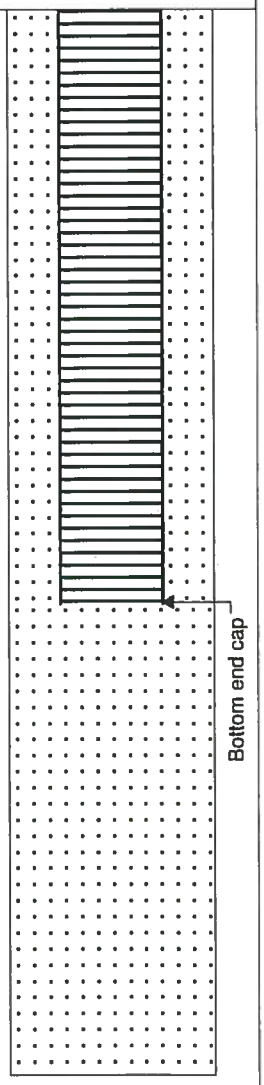
4801 E Washington St
Suite 260
Phoenix, AZ 85034
(602) 682-3320

Project Name: WQARF 20th & Factor Ave.
Project Number: 117-1303.036.02
Client: ADEQ
Location: Yuma, AZ
Drill Date: 3/8-12/2010
Reviewed By: Jasenka Zbozinek

Well ID: MW-25B
Drill Method: Mud Rotary
Angle From Vertical: NA
Sample Method: 18" Split Spoon
Logged By: Tyson Glock
Driller: Yellow Jacket

Depth (ft.)	USCS Symbol	Lithology	Description and Comments
161.0			
162.0			
163.0			**Recovery complications; suspected gravelly clay at 163' bgs.**
164.0			
165.0	SP		**Poorly Graded Sand** 100% fine sand, 7.5YR 6/4 light brown, moist, weak cementation
166.0			
167.0			**Recovery complications; straight drill to 178' bgs.**
168.0			
169.0			
170.0			
171.0			
172.0			
173.0			
174.0			
175.0			
176.0			
177.0			
178.0			**Total borehole depth: 178' bgs**
179.0			
180.0			

Well Construction



Date Compiled: 6/2/2010

WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client _____

Well Number MW-25B

Date 3/12/10

Project Number _____ Sampler(s) _____

Elevation of Measuring Point (MP) _____ ft. (a)

Elevation of Ground Surface _____ ft. (b)

Well Depth (below ground surface) 169' 10" ft. (c)

Casing Inside Diameter 4 in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP _____ ft. (e)

Water Level Elevation (a-e) _____ ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= _____ ft.

Step 2: Cross-sectional Area of Casing, $A=\Pi \times d^2/576=$ 0.0872 ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= _____ gal 56

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☐

Purging Apparatus: Type: _____

Sampling Apparatus: Type: _____

Cleaning Methods _____

FIELD OBSERVATIONS

Weather Conditions Sunny 60's

Well Head Conditions New

Comments _____

Project Name/Client _____ Well Number MW-25B Date 3/12/10

FIELD MEASUREMENTS								
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	NTU Particulates/Odor/Clarity/Color	TDS g/L	ORP
1718	10gpm	305	32.2	7.12	4.87	794	3.12	118
1724	10gpm	365	31.63	7.38	4.82	400	3.08	176
1730	10gpm	425	31.53	7.40	4.88	302	3.12	168
1737	10gpm	495	31.38	7.39	4.88	230	3.12	180
1831	10gpm	660	30.62	7.19	4.86	199	3.11	165
1840	10gpm	750	30.91	7.16	4.86	180	3.11	139
1850	10gpm	850	30.88	7.19	4.89	149	3.13	150
1900	10gpm	950	30.39	7.29	4.86	149	3.11	171
2007	10gpm	1150	30.30	7.14	4.84	130	3.09	157

Total Vol. Purged _____ (gal) Casing Vol. Purged _____

Final Water Level After Purging _____ ft. Below MP; Time _____

FateofPurgedWater

Bailed 185 gal flow rate 10 Start time 1705
continue time 1815
Break @ 1740
Break @ 1917 continue @ 1943

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

Project Name/Client _____ Well Number MW-25B Date 3/12/10

FIELD MEASUREMENTS								
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	NTU	TDS g/L	ORS
						Particulates/Odor/Clarity/Color		
2025	10gpm	1,330	30.26	7.13	4.87	112	3.09	151
2037	10gpm	1,450	29.95	7.28	4.87	103	3.12	187

Total Vol. Purged 1450 (gal) Casing Vol. Purged _____

Final Water Level After Purging 81.5 ft. Below MP; Time _____

Fate of Purged Water _____

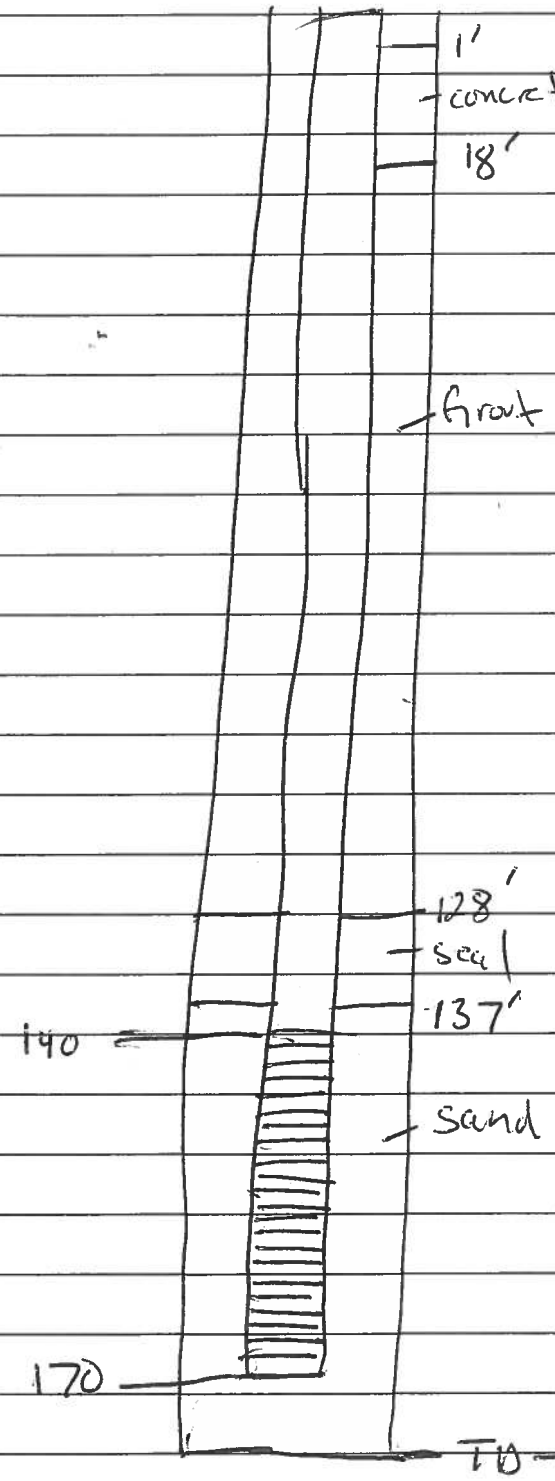
SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

spacers ||||



Sand
~~||||~~ ~~||||~~ ~~||||~~ ~~||||~~
~~||||~~

Bentonite pelets (5 gal)
||||

Grout
1 ½ = 1 batch
~~1½ batch~~
Batches ~~||||~~ |

GeoTrans, Inc.
A TETRA TECH COMPANY

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Foster WARF	BORING NAME: MW-25B
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD: 0-47 Air rotary casing drilling; 47- Mud rotary drilling	SHEET OF
SAMPLING METHOD:	DRILLING START TIME: 3/8/10 1545 — FINISH TIME: — START DATE: — FINISH DATE:
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
SS	2 2	6 6			SW	60	Well Graded Sand, (fine to medium), weakly cementation
	10					1	
	11						
	11					2	During drilling from 60 to 80 feet drillers observed mostly sand with some clay.
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						70	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						79	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME:
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
SS	15	6/6			PG	8 0	Poorly Graded Sand, 7.5YR Pink 7/4,
SS	50	2/0					100% medium sand, Moist, weakly cemented
						1	
						2	
							Some clay seen in cuttings by
						3	drillers. In cuttings there is
							a Clayey sand w/ some gravel not sure
						4	of depth
SS	50+	6/6			PG	8 5	Poorly Graded Sand, 7.5YR light Brown 6/3
						6	100% fine sand, Moist, weakly cemented
						7	
						8	
						9	
							with trace gravel
	50+	6/4			WG	9 0	Well graded sand, 7.5YR light brown 6/4
							30% fine, 50% medium, 20% large, Moist,
						1	weakly cemented
							Note: Chunck of 100% clay in sample
						2	1" of gravelly clay mixed with
	10	6/6			WG		drill mud @ bottom of sample
	17	6/4				3	
	45	6					Well Graded sand, 7.5YR light brown 6/4
						4	30% fine, 50% medium, 20% large, moist,
							weakly cemented
	10	6/6			WG	9 5	Well graded sand, 7.5YR light brown 6/4,
	50	3/0				6	30% fine, 50% medium, 20% large, moist, weakly
							cemented
						7	
						8	
						9 9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME:
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING START TIME / FINISH TIME
SAMPLING METHOD:	
	DATE / DATE
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
	17 50	6/6 2/1			WG	10 0	Well graded sand, 7.5YR pink 7/4, 30% fine, 70% medium, moist, weakly cemented
						1	
						2	
						3	
						4	
	17 50	6 3			WG	10 5	Well graded sand, 7.5YR pinkish Grey 6/ 30% fine, 70% medium, moist, weakly cemen
						6	
						7	
						8	
						9	
	15 50	6 4			WG	11 0	Well graded sand, 7.5YR pinkish Grey 6/2 70% fine, 30% medium, moist, weakly cemented
						1	
						2	
						3	
						4	
	12 50	6 1	5		WG	11 5	Well Graded sand, 7.5YR light brown 6/3, 10% fine, 90% medium, moist, weakly cemented
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME:
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

7.5YR Pink 7/

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
	17	6/6			CL	13 0	Clay w/ trace sand, 96% clay 4% sa
	50	4/3					moist, moderatly cemented,
5 blows	8	6/4				1	Gravelly, Clay w/ trace sand, 7.5 YR Pink 7/
	25	6/0					30% Gravel, 66% clay, 4% sand, moist, weakly cemented
5 blows	50	1/0				2	" "
	5	6/6			CL		Clay, 100% clay, 7.5YR light brown 6/3, moist
	25	6/6				3	moderatly cemented with some sand
5 blows for 6 1/2	50	1/1			GC		Clayey Gravel, 7.5YR light brown 6/3, Gravel
	15	6/6				4	60%, 35% clay, 5% sand, moist, weakly cemented
	50	6/6			CL		Clay with sand, 7.5 YR light brown 6/3, 80% clay 20% sand
	6	6/6			WG	135	moist, weakly cemented
	6	6/1					Well graded sand, 7.5YR pink 7/3, 50% fine, 50% med
	15	6/0				6	moist, weakly cemented
	15	6/4					
	50	3/0				7	" "
						8	
						9	
	25	6/6				14 0	Sand with some gravel, 7.5YR pinkish gray 6/
	50	3/3					85% sand, 15% gravel, moist, weakly cemented
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME:	BORING NAME:
PROJECT NUMBER:	PROJECT LOCATION:
DRILLING METHOD:	SHEET OF
	DRILLING START / FINISH
SAMPLING METHOD:	TIME / TIME
	DATE / DATE
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

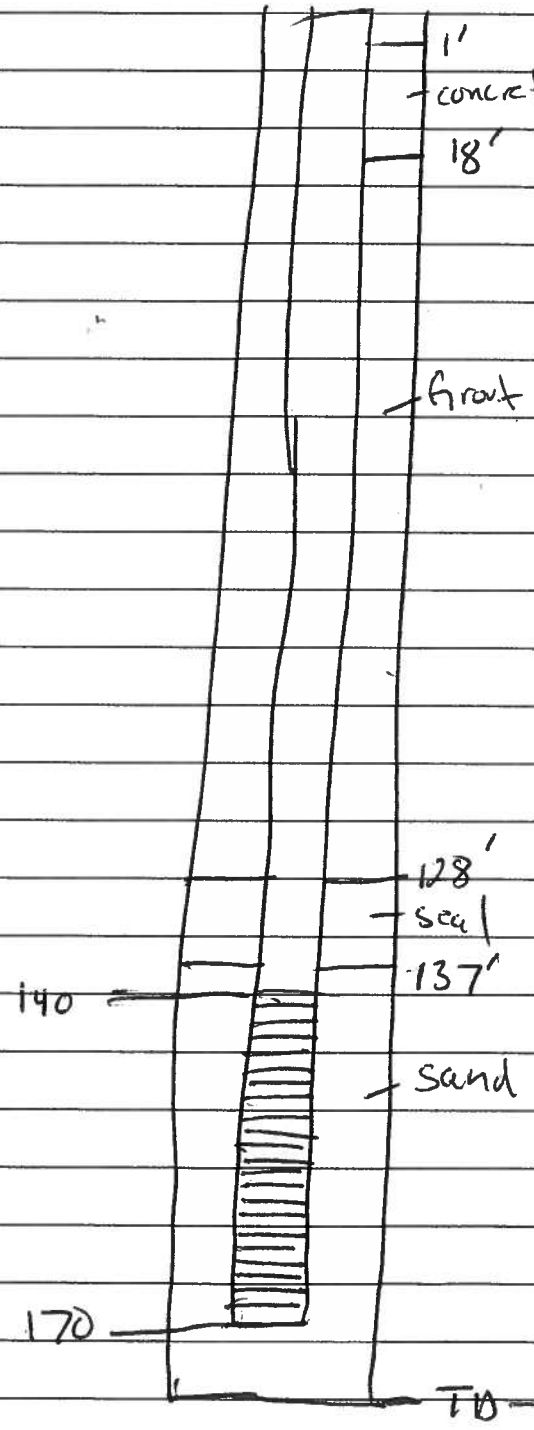
DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	
						1	
						2	
						3	Ran into some gravelly clay. It was less than 1' thick.
						4	
		6 6			SG	1 6 5	Poorly graded sand, 7.5YR light brown 6/4, 100% fine sand, moist, weakly cemented
		6 1					
	50	2 0				6	
						7	
						8	
						9	
						0	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

~~IIII~~,
spacers III



Sand
~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~
~~IIII~~

Bentonite pelets (5gal)
IIII

Grout
1 ½ = 1 batch
~~1½ batch~~
Batches ~~IIII~~ I

GeoTrans, Inc.
A TETRA TECH COMPANY

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 1 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	SAND, MEDIUM GRAINED, DRY
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

GE ...NS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: MUD ROTARY	SHEET 2 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	SAND, MEDIUM GRAINED
						21	
						22	
						23	
						24	
						25	
						26	
						27	
						28	
						29	
						30	
						31	
						32	
						33	
						34	
						35	
						36	
						37	
						38	
						39	

GE ...NS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACADE	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 3 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	SAND, MEDIUM GRAINED
						41	
						42	
						43	
						44	
						45	
						46	
						47	
						48	
						49	
						50	
						51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	

GE ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. — A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 4 OF 9
SAMPLING METHOD: N/A	DRILLING — START TIME 1400, DATE 11/18/10; FINISH TIME 0915, DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GE INS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	SAND, MEDIUM GRAINED
						61	
						62	
						63	
						64	
						65	
						66	
						67	
						68	
						69	
						70	
						71	
						72	
						73	
						74	
						75	
						76	
						77	
						78	
						79	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 5 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						80	SAND, MEDIUM GRAINED
						81	
						82	
						83	
						84	
						85	
						86	
						87	
						88	
						89	
						90	
						91	
						92	
						93	
						94	
						95	
						96	
						97	
						98	
						99	

GE ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: MUD Rotary	SHEET 6 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						100	SAND, MEDIUM GRAINED
						101	
						102	
						103	
						104	
						105	
						106	
						107	
						108	
						109	
						110	
						111	
						112	
						113	
						114	
						115	
						116	
						117	
						118	
						119	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 7 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						120	SAND, MEDIUM GRAINED
						121	
						122	
						123	
						124	
						125	
						126	
						127	
						128	
						129	
						130	DRILLING SLOWS & BEGINS to CHATTER. POSSIBLE INDICATION OF CLAY LAYER.
						131	
						132	
						133	
						134	
						135	
						136	CHATTER STOPS. DRILLING RESUMES NORMAL SPEED.
						137	SAND
						138	
						139	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26B
PROJECT NUMBER: 1303.058	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 8 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/18/10; FINISH TIME 0915 DATE 11/19/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						140	SAND
						141	
						142	
						143	
						144	
						145	
						146	
						147	
						148	
						149	
						150	
						151	
						152	
						153	
						154	
						155	
						156	
						157	
						158	
						159	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-26B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 9 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1400 DATE 11/10/10; FINISH TIME 0915 DATE 11/9/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						160	SAND
						161	
						162	
						163	TD HOLE @ 163' bgs.
						164	
						165	
						166	
						167	
						168	
						169	
						170	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client 20th & FACTOR ADEQ

Well Number MW-26B

Date 11/15/10 11/16/10

Project Number 1303.038

Sampler(s) BYRON BADEN

Elevation of Measuring Point (MP) — ft. (a)

Elevation of Ground Surface — ft. (b)

Well Depth (below ground surface) 160 ft. (c)

Casing Inside Diameter 4 in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP 76.73 ft. (e)

Water Level Elevation (a-e) — ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= — ft.

Step 2: Cross-sectional Area of Casing, A=Π x d^2/576= — ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= — gal

(160-76.73) x 16 x 3 x 0.0408 = 163 G

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☒

Purging Apparatus: Type: 3" SUBMERSIBLE PUMP

Sampling Apparatus: Type: N/A

Cleaning Methods SURGING & BAILING

FIELD OBSERVATIONS

Weather Conditions CLEAR, SUNNY, ~75°F

Well Head Conditions GOOD

Comments SURGED & BAILED ON 11/15/10. COMPLETED WELL DEVELOPMENT ON 11/16/10

Project Name/Client 20th & Factor ADEQ Well Number MW-26B Date 11/15/10 11/16/10

FIELD MEASUREMENTS						
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	(NTU) Particulates/Odor/Clarity/Color
0806	13	200	24.93	7.34	5.09	800+
0813	13	320	25.74	7.34	5.06	800+
0818	13	375	25.45	7.31	5.08	800+
0822	13	450	26.41	7.30	5.08	655
0828	13	500	26.28	7.30	5.09	328

Total Vol. Purged 500 (gal) Casing Vol. Purged _____

Final Water Level After Purging 75.39 ft. Below MP; Time 0900

Fate of Purged Water BAKER TANK

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

NONE TAKEN

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: MUD ROTARY	SHEET 1 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	SAND, MEDIUM GRAINED, DRY
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

GE ...NS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Pacific	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: Mud Rotary	SHEET 2 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1600 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	SAND, MEDIUM GRAINED
						21	
						22	
						23	
						24	
						25	
						26	
						27	
						28	
						29	
						30	
						31	
						32	
						33	
						34	
						35	
						36	
						37	
						38	
						39	

GE NS REPRESENTATIVE:

RILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 3 OF 3
SAMPLING METHOD: N/A	DRILLING START TIME 1000 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	SAND, MEDIUM GRAINED
						41	
						42	
						43	
						44	
						45	
						46	
						47	
						48	
						49	
						50	
						51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	

GE ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 4 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	SAND, MEDIUM GRAINED
						61	
						62	
						63	
						64	
						65	
						66	
						67	
						68	
						69	
						70	
						71	
						72	
						73	
						74	
						75	
						76	
						77	
						78	
						79	

GE ...NS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: MUD ROTARY	SHEET 5 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 / FINISH TIME 1500
	DRILLING START DATE 11/4/10 / FINISH DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						80	SAND, MEDIUM GRAINED
						81	
						82	
						83	
						84	
						85	
						86	
						87	
						88	
						89	
						90	
						91	
						92	
						93	
						94	
						95	
						96	
						97	
						98	
						99	

GE ANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 6 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						100	SAND, MEDIUM GRAINED
						101	
						102	
						103	
						104	
						105	
						106	
						107	
						108	
						109	
						110	
						111	
						112	
						113	
						114	
						115	
						116	
						117	
						118	
						119	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: MUD ROTARY	SHEET 7 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						120	SAND, MEDIUM GRAINED
						121	
						122	
						123	
						124	
						125	
						126	
						127	
						128	
						129	
						130	
						131	DRILL BEGINS to CHATTER. MAY INDICATE CLAY LAYER.
						132	
						133	
						134	DRILL STOPS CHATTERING SAND
						135	
						136	
						137	
						138	
						139	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: MUD ROTARY	SHEET 8 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 / FINISH TIME 1500
	DATE 11/4/10 / DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						140	SAND, MEDIUM GRAINED
						141	
						142	
						143	
						144	
						145	
						146	
						147	
						148	
						149	
						150	
						151	
						152	
						153	
						154	
						155	
						156	
						157	
						158	
						159	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: MW-27B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: MUD ROTARY	SHEET 9 OF 9
SAMPLING METHOD: N/A	DRILLING START TIME 1000 DATE 11/4/10; FINISH TIME 1500 DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						160	SAND, MEDIUM GRAINED
						161	
						162	
						163	
						164	
						165	TD HOLE @ 165 bgs.
						166	
						167	
						168	
						169	
						170	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

GEOLOGIST/ENGINEER REPRESENTATIVE:

DRILLING CONTRACTOR:

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

WELL SAMPLING / DEVELOPMENT RECORD

GeoTrans, Inc. A TETRA TECH COMPANY

Project Name/Client 20th & FACTOR ADEQ

Well Number MW-27B

Date 11/16/10

Project Number 1303.038

Sampler(s) BYRON BADEN

Elevation of Measuring Point (MP) — ft. (a)

Elevation of Ground Surface — ft. (b)

Well Depth (below ground surface) — ft. (c)

Casing Inside Diameter 4 in. (d)

CALCULATION OF CASING VOLUME

Depth of Water Below MP 73.79 ft. (e)

Water Level Elevation (a-e) — ft. (f)

Step 1: Height of Water in Well, H= f - (b-c)= — ft.

Step 2: Cross-sectional Area of Casing, $A=\Pi \times d^2/576=$ — ft^2

Step 3: Volume of Water in Casing, V=A x H x 7.48= — gal

(160 − 73.79) × 16 × 3 × 0.0408 = 168.8 G

Sampling/Development System (check one) Dedicated ☐ Non-dedicated ☐

Purging Apparatus: Type: 3" SUBMERSIBLE PUMP

Sampling Apparatus: Type: N/A

Cleaning Methods SURGE & BAIL

FIELD OBSERVATIONS

Weather Conditions SUNNY, CLEAR, ~70° F

Well Head Conditions GOOD

Comments

Project Name/Client 20th & Factor ADEQ Well Number MW-27B Date 11/16/10

FIELD MEASUREMENTS						
Time	Pump Rate (gpm)	Cumulative Vol. Removed (gal)	Temp (°C)	pH	Spec. Cond. (umhos/cm at 25° C)	(NTU) Particulates/Odor/Clarity/Color
1202	14	100	28.02	7.44	4.04	800+
1206	14	156	28.84	7.36	4.06	800+
1209	14	188	28.72	7.28	4.11	509
1212	14	220	29.10	7.28	4.18	540
1215	14	262	29.10	7.28	4.19	409
1218	14	304	28.98	7.29	4.22	359

Total Vol. Purged 340 (gal) Casing Vol. Purged _____

Final Water Level After Purging ~~[illegible]~~ 76.82 ft. Below MP; Time 1230

Fate of Purged Water BAKER TANK

SAMPLE INVENTORY

Label	Time	Number of Bottles	Analysis	F	P	Remarks

NOT SAMPLED

F = Filtered (Y,N) P = Preservative (Type)

Sampler(s) _____ Signatures(s) _____

GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-102 ADWR ID: MW-102B(1+2)
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/4/96 End Date/Time: 11/5/96 Logged By: GEC
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-102	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–45					**Sand** Light brown, loose to medium dense, non-plastic, predominantly fine grained sand, slightly damp
45–50					**Clayey Sand** Light brown, loose to medium dense, some medium to high plasticity clay, sand portion predominately fine grained, poorly graded, slightly damp to damp

Drilling Contractor: Layne Christensen

Checked By:

Date Checked:

Sheet: 1 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-102B(1&2)
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/4/96 End Date/Time: 11/5/96 Logged By: GEC
	Drilling Method: Hollow Stem Auger Borehole Diameter: MW-102	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–65					
66–80					**Sand** Light brown, loose to medium dense, non-plastic, predominately fine grained sand, slightly damp to damp GROUNDWATER At 72' bgs.
81–100					**Sand** Light brown, loose to medium dense, non-plastic, predominately fine grained sand, wet. Trace coarse sand, trace brown high plasticity clay

Drilling Contractor: Layne Christensen

Checked By:

Date Checked:

Sheet: 2 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-102B(1&2)

Start Date/Time: 11/4/96

End Date/Time: 11/5/96

Logged By: GEC

Drilling Method: Hollow Stem Auger

Angle from Vertical: 0

Borehole Diameter: MW-102

Surface Material: Asphalt

Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					
102					
103					
104					
105					
106					
107					
108					
109					
110					
111					
112					
113					
114					
115					
116					
117					
118					
119					
120					
121					
122					
123					
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138					
139					
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141					
142					
143					
144					
145					
146					
147					
148					
149					
150					

Drilling Contractor: Layne Christensen

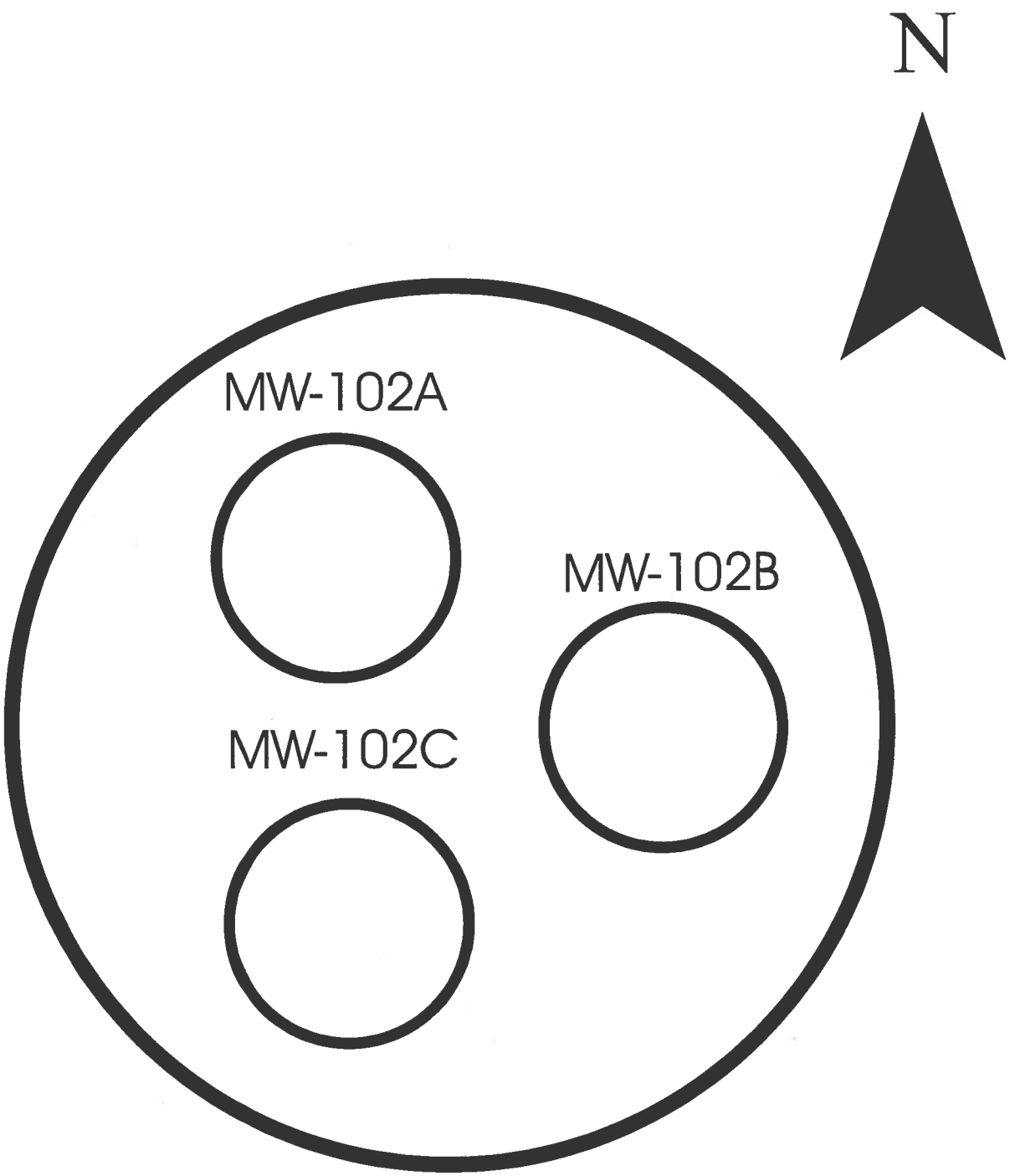
Checked By:

Date Checked:

Sheet: 3 of 3

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

FILENAME



TITLE	Top View of Nested Wells MW-102A, MW-102B, MW-103C		
LOCATION	Yuma, 20th and Factor		
GeoTrans, Inc. A JETRA TECH COMPANY	CHECKED		FIGURE
	DRAFTED	BNM	1
	PROJECT	1303.011	
	DATE	6/18/2004	

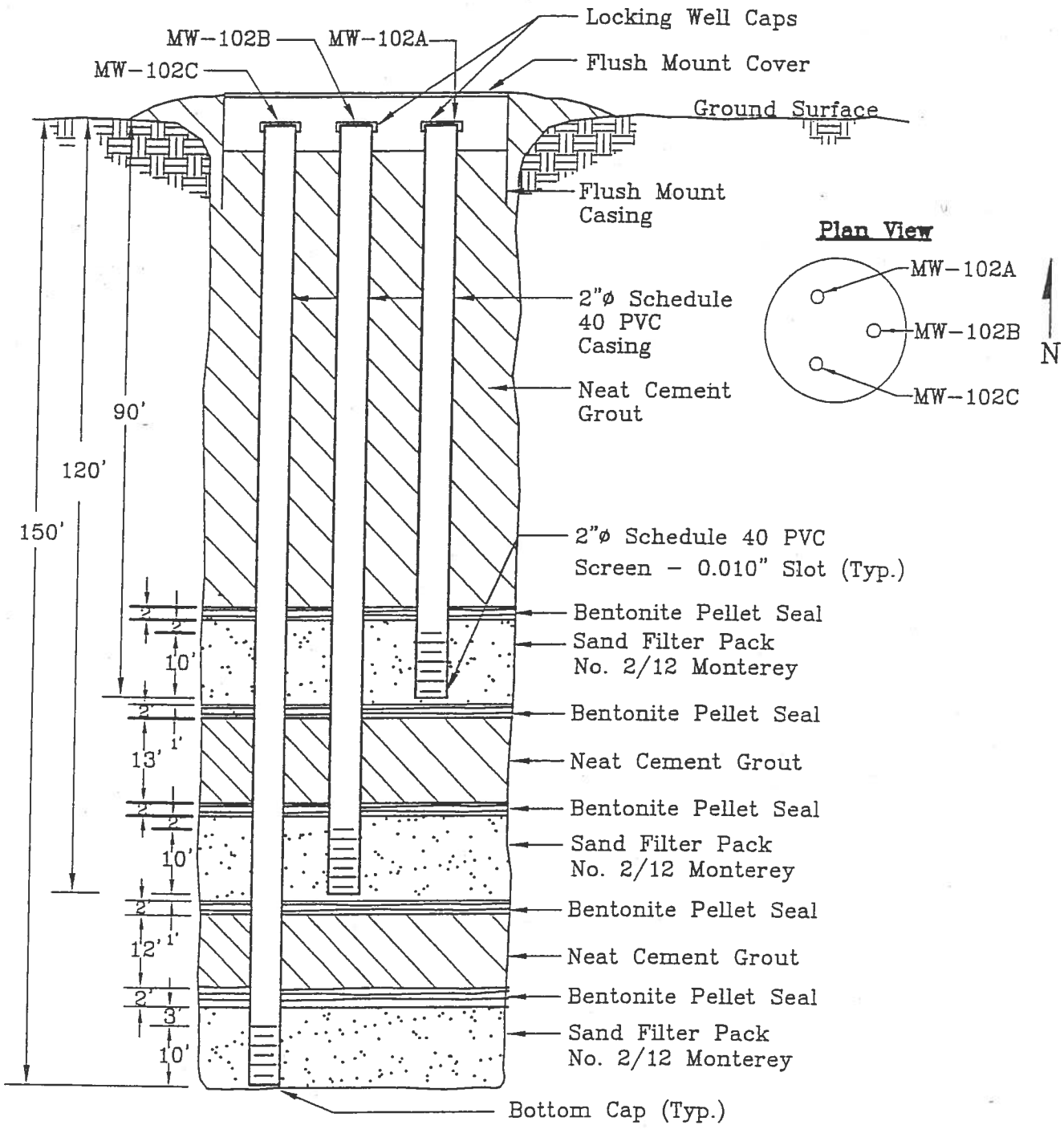


FIGURE 2. NESTED WELL CONSTRUCTION DIAGRAM
Houston International Ltd. Site
655 East 20th Street
Yuma, Arizona

Project No. 96-0016

Geotechnical and Environmental Consultants, Inc.

GeoTrans, Inc.

Site Map

Project No: 1303.011

Client: ADEQ

Site: 20th and Factor

Borehole No: MW-103B
ADWR ID: 55-201457

Start Date/Time: 01-27-04

End Date/Time: 02-04-04

Logged By: Chris Gutmann

Drilling Method: Mud Rotary

Angle from Vertical: 0

Borehole Diameter: 9 in.

Surface Material: Asphalt

Sampling Method: None; cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4	5				**SAND** Fine, loose, yellowish brown, poorly graded
5 6 7 8 9	10				
10 11 12 13 14	15				
15 16 17 18 19	20				
20 21 22 23 24	25				
25 26 27 28 29	30				
30 31 32 33 34	35				
35 36 37 38 39	40				
40 41 42 43 44	45				
45 46 47 48 49	50				
50					

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103B
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54	55				
55–58	60				
59–62	65				
63–66	70				
67–70	75				**SAND** Fine to coarse, light olive brown, well graded
71–74	80				**SAND WITH GRAVEL** Fine to coarse, well graded (95%) with up to 5% fine gravel in cuttings stream (<0.5 cm dia.)
75–78	85				
79–82	90				
83–86	95				
87–90	100				**SAND** Fine to coarse, brown, no visible gravel
91–100					

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

Sheet: 2 of 7

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
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GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103B
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101-104	105				
105-109	110				
110-114	115				
115-119	120				
120-124	125				
125-129	130				
130-134	135				
135-139	140				**GRAVELLY SAND** Well graded, fine to coarse sand with 10-15% fine gravel
140-144	145				**CLAYEY SAND WITH GRAVEL** Well graded, fine to coarse sand (60%); clay (20-30%); fine gravel (5-10%)
145-149	150				
150					

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103B
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151-155	155				**GRAVELLY SAND** Fine to coarse, well graded sand (70%); fine gravel(30%)
156-160	160				**SAND** Fine to medium sand
161-165	165				**GRAVELLY SAND** Fine gravel in sand, drill chattered.
166-170	170				**CLAY AND SAND** sand fine to medium (50%); clay (50%)
171-175	175				**SAND** Fine to coarse, well graded
176-180	180				**GRAVELLY SAND** Fine gravel in mud-stream, drill chattered
181-185	185				**SAND** Fine to coarse, well graded **GRAVELLY SAND** Sand is fine to coarse (50%); gravel (50%) 0.5 to 1.5 inches
186-190	190				**SAND** Fine to medium, well graded
191-195	195				
196-200	200				**SAND** Fine to coarse

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

Site Map	**Project No:** 1303.011 **Client:** ADEQ **Site:** 20th and Factor	**Borehole No:** MW-103B **Start Date/Time:** 01-27-04 **End Date/Time:** 02-04-04 **Logged By:** Chris Gutmann
	Drilling Method: Mud Rotary **Borehole Diameter:** 9 in.	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** None; cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201-204	205				
205-209	210				
210-214	215				
215-220	220				**CLAYEY SAND** Fine to medium, well graded sand, driller reports clay in mud stream
221-224	225				**SAND** Fine to medium, well graded, loose
225-229	230				
230-234	235				
235-239	240				**SILTY SAND** Sand is fine to coarse (90%); silt (10%)
240-244	245				**SAND** Fine to medium
245-249	250				**SAND** Medium, uniform
250					

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103B
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
251–254	255				
255–259	260				**SAND** Medium, uniform, olive brown
260–264	265				**SAND** Fine to medium, grayish brown
265–269	270				
270–274	275				
275–279	280				**SAND** Medium to coarse, wet (maybe ground gravel?)
280–284	285				
285–289	290				
290–294	295				**SAND** Fine to medium
295–299	300				
300					

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

Sheet: 6 of 7

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103B
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
301–305	305				**SAND WITH SILT** Fine to medium
306–310	310				**SAND** Fine to medium, brownish gray
311–315	315				
316–320	320				**GRAVELLY SAND** Fine to coarse sand (60%); fine gravel (40%)
321–325	325				**SAND** Fine to medium, driller reports clay layer (1-2 ft thick)
326–330	330				**SAND** Fine, grayish brown
331–334					
335–339					
340–344					
345–349					
350					

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

GeoTrans, Inc
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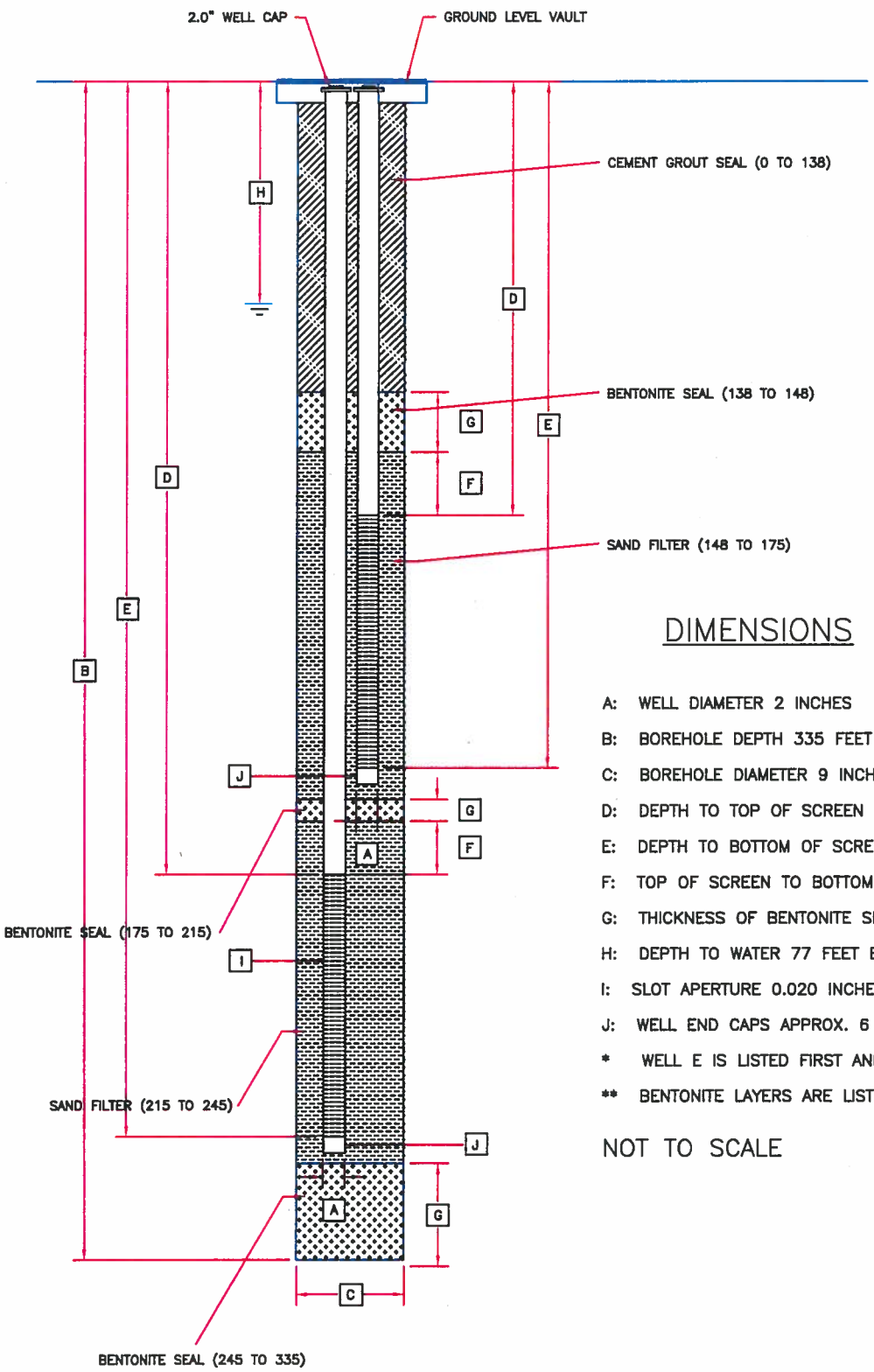

DIMENSIONS

A: WELL DIAMETER 2 INCHES

B: BOREHOLE DEPTH 335 FEET

C: BOREHOLE DIAMETER 9 INCHES

D: DEPTH TO TOP OF SCREEN 220 AND 150 FEET*

E: DEPTH TO BOTTOM OF SCREEN 240 AND 170 FEET*

F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5 AND 12 FEET*

G: THICKNESS OF BENTONITE SEAL 90, 40 AND 10 FEET**

H: DEPTH TO WATER 77 FEET BGS

I: SLOT APERTURE 0.020 INCHES

J: WELL END CAPS APPROX. 6 INCHES

* WELL E IS LISTED FIRST AND WELL D IS LISTED SECOND

** BENTONITE LAYERS ARE LISTED FROM DEEPEST TO SHALLOWEST

NOT TO SCALE

TITLE:	MW-103D,E WELL DIAGRAM 20TH AND FACTOR WQARF SITE		
LOCATION:	YUMA, ARIZONA		
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	JZ	FIGURE
	DRAFTED	JLB	1
	PROJECT	1303.011	
	DATE	06/01/04	

GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-104B
ADWR ID: 55-205754

Start Date/Time: 11/28/04

End Date/Time: 12/3/04

Logged By: JLB

Drilling Method: Speedstar CH-50K Mud Rotary Rig **Angle from Vertical:** 0

Borehole Diameter: 14.75 inches

Surface Material: Native Material **Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–50					**Poorly Graded Sand** Yellow-brown, fine to medium sand, with trace coarse sand and clay

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 1 of 6

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GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-104B

Start Date/Time: 11/28/04

End Date/Time: 12/3/04

Logged By: JLB

Drilling Method: Speedstar CH-50K Mud Rotary Rig **Angle from Vertical:** 0

Borehole Diameter: 14.75 inches

Surface Material: Native Material **Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51					
52					
53					
54					
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98					
99					
100					

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 2 of 6

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104B
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					
102					
103					
104					
105					
106					
107					
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111					
112					
113					
114					
115					
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148					
149					
150					

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 3 of 6

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104B
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
151					
152					
153					
154					
155					
156					
157					
158					
159					
160					
161					
162					
163					
164					
165					
166					
167					
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193					
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195					
196					
197					
198					
199					
200					

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 4 of 6

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-104B

Start Date/Time: 11/28/04

End Date/Time: 12/3/04

Logged By: JLB

Drilling Method: Speedstar CH-50K Mud Rotary Rig **Angle from Vertical:** 0

Borehole Diameter: 14.75 inches

Surface Material: Native Material **Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201					
202					
203					
204					
205					
206					
207					
208					
209					
210					
211					
212					
213					
214					
215					
216					
217					
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250					

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 5 of 6

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104B
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
251					
252					
253					
254					
255					
256					
257					
258					
259					
260					
261					
262					
263					
264					
265					
266					
267					
268					
269					
270					
271					
272					
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297					
298					
299					
300					

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 6 of 6

GeoTrans, Inc
4801 East Washington Street, Suite 260
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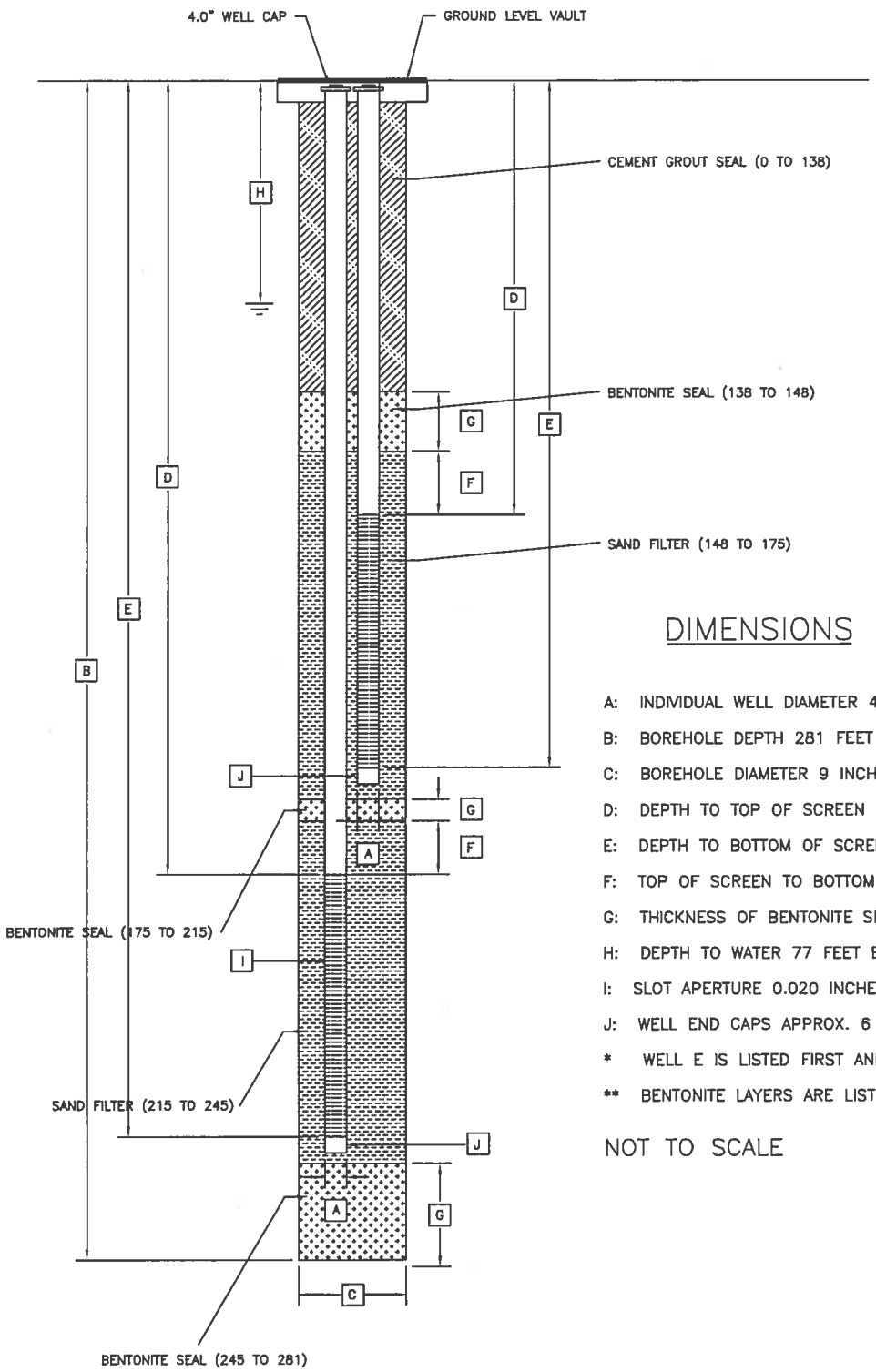
Voice: 602-682-3320 Fax: 602-682-3318



DIMENSIONS

A: INDIVIDUAL WELL DIAMETER 4 INCHES

B: BOREHOLE DEPTH 281 FEET

C: BOREHOLE DIAMETER 9 INCHES

D: DEPTH TO TOP OF SCREEN 220 AND 150 FEET*

E: DEPTH TO BOTTOM OF SCREEN 240 AND 170 FEET*

F: TOP OF SCREEN TO BOTTOM OF BENTONITE SEAL 5 AND 12 FEET*

G: THICKNESS OF BENTONITE SEAL 36, 40 AND 10 FEET**

H: DEPTH TO WATER 77 FEET BGS

I: SLOT APERTURE 0.020 INCHES

J: WELL END CAPS APPROX. 6 INCHES

* WELL E IS LISTED FIRST AND WELL D IS LISTED SECOND

** BENTONITE LAYERS ARE LISTED FROM DEEPEST TO SHALLOWEST

NOT TO SCALE

TITLE: MW-104D, E WELL DIAGRAM 20TH AND FACTOR WQARF SITE			
LOCATION: YUMA, ARIZONA			
GeoTrans, Inc. A TETRA TECH COMPANY	CHECKED	JZ	FIGURE
	DRAFTED	JLB	1
	PROJECT	13D3.011	
	DATE	06/01/04	

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: EW-1 ADWR ID:
Site Map	Client: ADEQ Site: Yuma, AZ	Start Date/Time: 1/8/08 - 0830 End Date/Time: 1/8/08 - 1530 Logged By: TG/LG
	Drilling Method: Mud Rotary Borehole Diameter: EW-1	Angle from Vertical:
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
					Ground Surface
0–9					**Well Graded Sand (SW)** Yellowish Brown 10 YR 5/6
10–14					**Poorly Graded Sand (SP)** Yellowish brown 10 YR 5/4, fine to medium sand
15–19					**Poorly Graded Sand w/ Silt (SP)** Light yellowish brown10 YR 6/4
20–24					**Silt w/ Sand (ML)** Light yellowish brown 10 YR 6/4
25–29					**Poorly Graded Sand w/ Silt (SP)** Light yellowish brown 10 YR 6/4
30–34					**Poorly Graded Sand (SP)** Pale brown 10 YR, 6/3
35–39					**Well Graded Sand (SW)** Light yellowish brown 10 YR 6/4
40–50					**Well Graded Sand (SW)** Light yellowish brown 10 YR 6/4, fine to coarse sand

Drilling Contractor: Yellow Jacket

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 1 of 4

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: EW-1
Site Map	Client: ADEQ Site: Yuma, AZ	Start Date/Time: 1/8/08 - 0830 End Date/Time: 1/8/08 - 1530 Logged By: TG/LG
	Drilling Method: Mud Rotary Borehole Diameter: EW-1	Angle from Vertical:
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–54					
55–69					**Well Graded Sand w/ Silt (SW)** Pale brown 10 YR 6/3, fine to coarse sand
70–74					**Poorly Sorted Sand w/ Silt (SP)** Pale brown 10 YR 6/3, fine to medium sand
75–79					**Poorly Sorted Sand w/ Silt (SP)** Pale brown 10 YR 6/3, fine sand
80–100					**Poorly Graded Sand (SP)** Pale brown 10 YR 6/3, fine to medium sand

Drilling Contractor: Yellow Jacket

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 2 of 4

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: EW-1
Site Map	Client: ADEQ Site: Yuma, AZ	Start Date/Time: 1/8/08 - 0830 End Date/Time: 1/8/08 - 1530 Logged By: TG/LG
	Drilling Method: Mud Rotary Borehole Diameter: EW-1	Angle from Vertical:
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					**Silty Sand (SM)** Pale brown 10 YR 6/3
102					
103					
104					
105					**Silty Sand (SM)** Light yellowish brown10 YR 6/4
106					
107					
108					
109					
110					**Silty Sand (SM)** Pale brown 10 YR 6/3
111					
112					
113					
114					
115					
116					
117					
118					
119					
120					**Silty Sand (SM)** Light yellowish brown10 YR 6/4
121					
122					
123					
124					
125					**Sandy Silt (ML)** Yellowish brown 10 YR 5/4
126					
127					
128					
129					
130					**Sandy Silt (ML)** Pale brown 10 YR 6/3
131					
132					
133					
134					
135					
136					
137					
138					
139					
140					**Well Graded Sand (SW)** Pale brown 10 YR 6/3, coarse sand, some silt
141					
142					
143					
144					
145					
146					
147					
148					
149					
150					

Drilling Contractor: Yellow Jacket
Checked By: L.G.
Date Checked: 2/20/08

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: EW-1
Site Map	Client: ADEQ Site: Yuma, AZ	Start Date/Time: 1/8/08 - 0830 End Date/Time: 1/8/08 - 1530 Logged By: TG/LG
	Drilling Method: Mud Rotary Borehole Diameter: EW-1	Angle from Vertical:
	Surface Material: Asphalt	Sampling Method:

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151–154					**Clayey Sand (SC)** Yellowish brown 10 YR 5/4, 70% fine to coarse sand, 30% clay
155–159					**Clayey Sand (SC)** Pale brown 10 YR 6/3, 80% fine to coarse sand, 20% clay
160–164					**Well Graded Sand (SW)** Pale brown 10 YR 6/3, fine to medium sand w/ trace silt
165–169					**Poorly Graded Sand (SP)** Pale brown 10 YR 6/3, fine to medium sand
170					**Bottom of boring at 170 bgs**
171–174					
175–179					
180–184					
185–189					
190–194					
195–199					
200					

Drilling Contractor: Yellow Jacket
Checked By: L.G.
Date Checked: 2/20/08

Sheet: 4 of 4

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-8C ADWR ID: 55-906702
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 03/27/07 End Date/Time: 04/11/07 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5	5				**Poorly Graded Sand (SP)** Yellowish brown (10 YR 5/6), moist, weakly cemented
6 7 8 9 10	10		2.9		**Poorly Graded Sand (SP)** Light yellowish brown (10 YR 6/4), medium grained sand, dry, weakly cemented
11 12 13 14 15	15	3/27/07 @ 0945	0.6		**Poorly Graded Sand (SP)** Very pale brown (10 YR 7/3), fine grained sand, dry, weakly cemented
16 17 18 19 20	20				
21 22 23 24 25	25		0.6		
26 27 28 29 30	30	3/27/07 @ 1120	0.6		**Poorly Graded Sand (SP)** Very pale brown (10 YR 8/2), fine grained sand, moderate cementation
31 32 33 34 35	35		0.6		
36 37 38 39 40	40		0.5		**Poorly Graded Sand (SP)** Pale brown (10 YR 6/3), well graded (50% fines, 45% medium, 5% coarse) sand, dry, weakly cemented
41 42 43 44 45	45	3/27/07 @ 1450	0.5		**Poorly Graded Sand (SP)** Very pale brown (10 YR 8/2), fine grained, dry, weakly cemented
46 47 48 49 50	50	3/28/07 @ 0825	0.3		

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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Phoenix, Arizona 85034
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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-8C
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 03/27/07 End Date/Time: 04/11/07 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51 52 53 54	55		0.3		**Poorly Graded Sand (SP)** As above
55 56 57 58 59	60		0.3		
60 61 62 63 64	65		1.1		
65 66 67 68 69	70		1.3		
70 71 72 73 74	75		1.2		**Poorly Graded Sand (SP)** Brown (10 YR 5/4), fine grained sand, moist, weakly cemented
75 76 77 78 79	80		1.9		**Sandy Clay (CL)** Brown (10 YR 5/3), 75% clay, 25% sand, moist
80 81 82 83 84	85		1.9		**Clayey Sand (SC)** Brownish yellow (10 YR 6/6), 50% clay, 50% sand, moist, weakly cemented
85 86 87 88 89	90	3/28/07 @ 1115	11.1		**Silty Sand (SM)** Pale brown (10 YR 6/3), 50% sand (10% med, 40% fine), 50% silt, moist, weak cementation
90 91 92 93 94	95		2.6		**Clay (CL)** Yellowish brown (10 YR 5/4), very stiff, moist
95 96 97 98 99	100		0.7		**Silty Sand (SM)** Light brown (7.5 YR 6/3), 50% fine, 50% silt, moist, weak cementation
100					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.

Site Map

Project No: 1303.020.03.01

Client: ADEQ

Site: 20th & Factor WQARF

Borehole No: MW-8C

Start Date/Time: 03/27/07

End Date/Time: 04/11/07

Logged By: A. Gray

Drilling Method: Sonic

Angle from Vertical: 0

Borehole Diameter: 8"

Surface Material: Concrete

Sampling Method: Continuous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–104	105	3/28/07 @ 1700	9.6		**Poorly Graded Sand (SP)** Dark yellowish brown (10 YR 4/4), 50% fine, 50% medium grained sand, wet, weak cementation
105–109	110		12.4		
110–114	115	3/28/07 @ 0830	21.1		
115–119	120		0.5		**Poorly Graded Sand (SP)** Yellowish brown (10 YR 5/4), moist, no cementation
120–124	125	4/3/07 @ 0735	1.6		
125–129	130				**Clay (CL)** Light yellowish brown (10YR 6/4), moist, mod-strong cementation, very stiff
130–134	135	4/3/07 @ 1245			**Sandy Clay (SC-CL)** Yellowish brown (10YR 5/4), wet, soft, weak cementation
135					**Poorly Graded Sand (SP)** Light yellow brown (2.5 YR 6/4), fine grained sand, moist, weak cementation
136–139	140				**Well Graded Sand (SW)** Brown (10 YR 5/3), 5% gravel, 95% sand (15% coarse, 40% med 40% fine grained sand), wet, weak cementation
140–144	145	4/3/07 @ 1430			
145–149	150				**Clay (CL)** Pale brown (10 YR 6/3), very stiff, moist
150					

Drilling Contractor: WDC

Checked By: L. Gardiner

Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-8C
Site Map	Client: ADEQ Site: 20th & Factor WQARF	Start Date/Time: 03/27/07 End Date/Time: 04/11/07 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151-152					
153-154	155	4/3/07 @ 1655			**Poorly Graded Sand (SP)** Light yellow brown (2.5 YR 6/4), fine sand, moist, weak cementation
155-157	160		1.9		**Clay (CL)** Light yellowish brown (10YR 6/4), moist, very stiff
158-160	165	4/4/07 @ 0845	0.8		
161-165	170		1.4		**Clayey Silt (ML)** Pale brown (10 YR 6/3), medium stiff, moist
166-170	175	4/4/07 @ 1215	0.9		
171-175	180		0.3		**Silty Sand (SM)** Brown (10 YR 5/3), 50%fine sand, 50% silt, loose, moist, weak cementation, interbedded thin clay layers
176-180	185	4/4/07 @ 1510	0.5		
181-185	190		1.5		**Silty Sand (SM)** Light yellowish brown (10 YR 6/4), 60%fine sand, 40% silt, loose, moist, weak cementation
186-190	195	4/5/07 @ 0845	1.9		**Sandy Silt (ML)** Yellowish brown (10 YR 5/4), 50% silt, 45% sand, 5% gravel, loose, wet, weak cementation
191-195	200		0.7		**Clayey Sand (SC)** Yellowish brown (10 YR 5/4), 50% fine sand, 50% clay, very stiff, moist
196-200					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-8C
Site Map	Client: ADEQ Site: 20th & Factor WQARF Site	Start Date/Time: 03/27/07 End Date/Time: 04/11/07 Logged By: A. Gray
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201–204	205	4/5/07 @ 1115	0.6		**Silty Sand (SM)** Yellowish brown (10 YR 5/4), 50% fine sand, 50% silt, wet, weak cementation
205–209	210		0.5		**Poorly Graded Sand (SP)** Light brownish gray (10 YR 6/2), fine grained sand, wet, weak cementation
210–214	215	4/5/07 @ 1455	1.0		**Poorly Graded Sand (SP)** Light brownish gray (10 YR 5/2), medium grained sand, wet, weak cementation
215–219	220		0.6		**Poorly Graded Sand (SP)** Grayish brown (10 YR 5/2), fine grained sand, wet, weak cementation
220–224	225		1.1		**Poorly Graded Sand (SP)** Dark grayish brown (10 YR 4/2), medium grained sand, wet, weak cementation
225–250					**Bottom of boring at 225 feet bgs**

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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CLIENT ADEQ
PROJECT 20th + Harbor WQARF Site
DETAIL MW-8C

JOB NO. 1303.070.03 03
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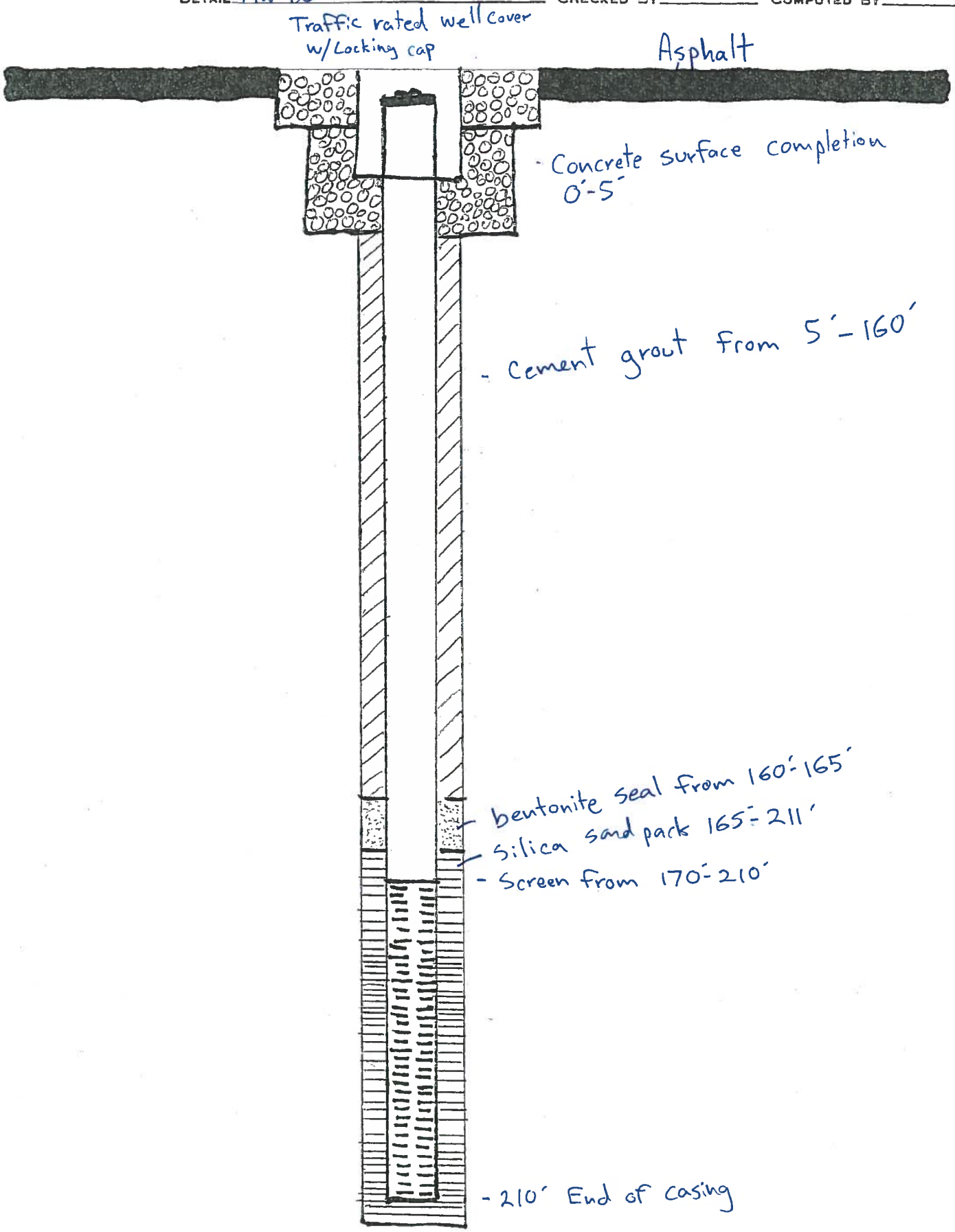

GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-17C ADWR ID: 55-907658
Site Map	Client: ADEQ Site: 20th & Farctor WQARF	Start Date/Time: 08/28/07 1200 End Date/Time: 09/06/07 1500 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9"	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Coring

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
0					Ground Surface
1 2 3 4	5'				**Poorly graded sand (SP)** Very pale brown (10YR 8/4), fine grained, dry, no cementation
5 6 7 8 9	10'	08/28/07 1200			
10 11 12 13 14	15'				
15 16 17 18 19	20'				
20 21 22 23 24	25'	08/28/07 1330			
25 26 27 28 29	30'				**Poorly Graded Sand (SP)** Very pale brown (10YR 7/4), 80% fine grained, 20% medium grained sand, dry, no cementation
30 31 32 33 34	35'				**Sandy Clay (CL)** Very pale brown (10YR 7/4), sandy clay ,75% clay, 25% fine sand, dry, no cementation
35 36 37 38 39	40'				**Poorly Graded Sand (SP)** Light gray (10YR 7/2), fine grained, dry, no cementation
40 41 42 43 44	45'				
45 46 47 48 49	50'	08/28/07 1600			
50					

Drilling Contractor: Boart Longyear
Checked By: Larry Gardiner
Date Checked: 09/10/07

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Site Map	**Project No:** 1303.026.09.01 **Client:** ADEQ **Site:** 20th & Farctor WQARF	**Borehole No:** MW-17C **Start Date/Time:** 08/28/07 1200 **End Date/Time:** 09/06/07 1500 **Logged By:** AG
	Drilling Method: Sonic **Borehole Diameter:** 9"	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** Sonic Coring

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51–54	55'				
55–58	60'	08/28/07 1700			
59–62	65'				
63–66	70'	08/29/07 0800			
67–70	75'				
71–74	80'				**Sand with Clay (SP)** Brownish yellow (10YR 6/6), 90% fine sand, 10% clay, some cementation
75–78	85'				**Silty Sand (SM)** Light gray (10YR 7/2), 25% silt, 75% fine sand, wet, no cementation
79–82	90'				**Clayey Sand (SC)** Light gray (10YR 6/2), 35% clay, 65% fine sand, wet, no cementation
83–86	95'	08/29/07 1200			
87–90	100'				
91–100					

Drilling Contractor: Boart Longyear
Checked By: Larry Gardiner
Date Checked: 09/10/07

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Site Map	**Project No:** 1303.026.09.01 **Client:** ADEQ **Site:** 20th & Farctor WQARF	**Borehole No:** MW-17C **Start Date/Time:** 08/28/07 1200 **End Date/Time:** 09/06/07 1500 **Logged By:** AG
	Drilling Method: Sonic **Borehole Diameter:** 9"	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** Sonic Coring

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101–104	105'	08/29/07 1610			**Poorly Graded Sand (SP)** Pinkish gray (7.5YR 6/2), fine grained, wet, no cementation
105–109	110'				
110–114	115'	08/30/07 1020			**Clayey Sand (SC)** Pinkish gray (7.5YR 6/2), 30% clay, 70% fine sand, wet, no cementation
115–119	120'				**Poorly Graded Sand (SP)** Pinkish gray (7.5YR 6/2), fine grained (SP), wet, no cementation
120–124	125'	08/30/07 1240			**Sandy Clay (CL)** Brown (7.5 5/2), 65% clay,35% fine sand, wet, no cementation
125–129	130'				**Silty Sand (SM)** Light brownish gray (10YR 6/2), silty sand (SM), 15% silt, 85% fine sand, wet, no cementation
130–134	135'	08/30/07 1400			
135–139	140'				**Poorly Graded Sand (SP)** Light brownish gray (10YR 6/2), fine grained, wet, no cementation
140–144	145'	08/30/07 1650			**Sandy Clay (CL)** Light brownish gray (10YR 6/2), 60% clay, 40% fine sand, wet, no cementation
145–150	150'				**Poorly Graded Sand (SP)** Light brownish gray (10YR 6/2), fine grained sand, wet, no cementation

Drilling Contractor: Boart Longyear
Checked By: Larry Gardiner
Date Checked: 09/10/07

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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-17C
Site Map	Client: ADEQ Site: 20th & Farctor WQARF	Start Date/Time: 08/28/07 1200 End Date/Time: 09/06/07 1500 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9"	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Coring

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151 152 153 154 155	155'	08/31/07 1030			
156 157 158 159 160	160'				**Clay (CL)** Brown (10YR 5/2), stiff, moist
161 162 163 164	165'	08/31/07 1130			
165 166 167 168 169 170	170'				**Clayey Sand (SC)** Brownish yellow (10YR 6/6), 20% clay, 80% sand, wet, no cementation
171 172 173 174	175'	08/31/07 1305			
175 176 177 178 179	180'				**Poorly Graded Sand (SP)** Brownish yellow (10YR 6/6), fine grained sand, wet, no cementation
180 181 182 183 184	185'	09/04/07 0900			**Poorly Graded Sand (SP)** Light brownish gray (10YR 6/2), fine grained sand , wet, no cementation, white nodules
185 186 187 188 189 190	190'				**Clayey Sand (SC)** Light brownish gray (10YR 6/2), 30% clay, 70% fine sand, wet, no cementation
191 192 193 194	195'	09/04/07 1230			
195 196 197 198 199 200	200'				**Silty Clay (CL)** Brown (10YR 5/2), 50% silt, 50% clay, no cementation, wet

Drilling Contractor: Boart Longyear
Checked By: Larry Gardiner
Date Checked: 09/10/07

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GeoTrans, Inc.	Project No: 1303.026.09.01	Borehole No: MW-17C
Site Map	Client: ADEQ Site: 20th & Farctor WQARF	Start Date/Time: 08/28/07 1200 End Date/Time: 09/06/07 1500 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: 9"	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: Sonic Coring

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201	205'	09/04/07 1600			
202					
203					
204					
205					
206					
207	210'				End of boring at 207 feet bgs
208					
209					
210					
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Drilling Contractor: Boart Longyear
Checked By: Larry Gardiner
Date Checked: 09/10/07

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GeoTrans, Inc.

Site Map

Project No: 1303.020.03.01

Client: ADEQ

Site: Yuma 20th & Factor WQARF

Borehole No: MW-21C
ADWR ID: 55-906703

Start Date/Time: 4/12

End Date/Time: 4/26

Logged By: A. Gray & M. Brennan

Drilling Method: Sonic

Angle from Vertical: 0

Borehole Diameter: 8"

Surface Material: Concrete

Sampling Method: Continuous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
0					Ground Surface
1–4	5		0.0		**Poorly Graded Sand (SP)** Medium grained, pink (7.5YR 7/3), dry, weak cementation
5–9	10	4/12/07 @ 0940	0.0		
10–14	15	4/12/07 @ 1050	0.0		
15–19	20		0.4		**Poorly Graded Sand (SP)** Medium grained, pink (7.5YR 7/4), moist, weak cementation
20–24	25	4/12/07 @ 1105	1.0		**Poorly Graded Sand (SP)** Fine grained, pinkish white (7.5YR 7/2), dry, weak cementation
25–29	30		0.6		**Poorly Graded Sand (SP)** Fine grained, pinkish white (7.5 8/2), dry, weak cementation
30–34	35	4/12/07 @ 1135	0.0		**Clay (CL)** Brown (7.5YR 5/4), moist, stiff
35–39	40	4/12/07 @ 1440	0.4		**Poorly Graded Sand (SP)** Fine grained, brown (7.5YR 5/2), moist, moderate cementation
40–44	45	4/12/07 @ 1500	0.7		**Poorly Graded Sand (SP)** Fine grained, pinkish white (7.5YR 7/2), dry, weak cementation
45–49	50		0.6		
50					

Drilling Contractor: WDC

Checked By: L. Gardiner

Date Checked: 05/15/07

Sheet: 1 of 7

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21C
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF	Start Date/Time: 4/12 End Date/Time: 4/26 Logged By: A. Gray & M. Brennan
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51 52 53 54 55	55	4/12/07 @ 1520	1.1		**Poorly Graded Sand (SP)** As Above
56 57 58 59 60	60	4/12/07 @ 1540	0.4		
61 62 63 64 65	65		0.5		**Poorly Graded Sand (SP)** Fine grained,brown (10YR 5/3), moist, weak cementation
66 67 68 69 70	70	4/12/07 @ 1625	0.7		**Silty Sand (SM)** 70% fine sand, 30% silt, light gray (10YR 7/2), dry, weak cementation
71 72 73 74 75	75		0.9		
76 77 78 79 80	80	4/12/07 @ 1700	1.2		**Poorly Graded Sand (SP)** Fine grained, very pale brown (10YR 7/3), moist, weak cementation
81 82 83 84 85	85		0.9		
86 87 88 89 90	90	4/12/07 @ 1740	0.8		
91 92 93 94 95	95	4/13/07 @ 1640	0.0		**Poorly Graded Sand (SP)** Pale brown (10YR 6/3), moist, no cementation
96 97 98 99 100	100		0.0		**Poorly Graded Sand (SP)** Brown (10YR 5/3), wet, no cementation

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21C
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF	Start Date/Time: 4/12 End Date/Time: 4/26 Logged By: A. Gray & M. Brennan
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101 102 103 104 105	105	4/14/07 @ 0930	0.3		**Silty Sand (SM)** Brown (10YR 6/3), damp, no cementation
106 107 108 109 110	110		0.1		**Clay (CL)** Brown (10YR 5/3), moist, very stiff, with very pale brown (10YR 8/2), nodules
111 112 113 114 115	115	4/14/07 @ 1133	0.0		**Poorly Graded Sand (SP)** Brown (10YR4/3), wet, no cementation
116 117 118 119 120	120		0.7		**Poorly Graded Sand (SP)** Brown (10YR 5/3), moist, no cementation
121 122 123 124 125	125	4/14/07 @ 1430	0.5		
126 127 128 129 130	130		0.0		
131 132 133 134 135	135	4/15/07 @ 0900	0.0		
136 137 138 139 140	140		0.0		**Well Graded Sand with Gravel and Clay (SW)** Brown (10YR 4/3), moist, no cementation, very pale brown (10YR 8/3) clay
141 142 143 144 145	145	4/15/07 @ 1100	0.0		**Poorly Graded Sand (SP)** Brown (10YR 4/3), wet, no cementation
146 147 148 149 150	150		0.1		**Poorly Graded Sand (SP) with Clay Nodules** Brown (10YR 5/3), moist, no cementation

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21C
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF	Start Date/Time: 4/12 End Date/Time: 4/26 Logged By: A. Gray & M. Brennan
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151-155	155	4/15/07 @ 1350	0.2		**Well Graded Sand with Gravel and Clay Nodules (SW)** Brown (10 YR 5/3), moist, moderate cementation
155-160	160		0.1		
160-165	165	4/15/07 @ 1615	0.0		**Poorly Graded Sand with Clay Nodules (SP)** Yellowish brown (10YR 5/4), moist, no cementation,
165-170	170		0.0		**Silty Sand (SM)** Brown (7.5YR 5/3), moist, no cementation
170-175	175	4/16/07 @ 1030	0.0		**Clayey Sand (SC)** Brown (10YR 5/3), moist, no cementation, with very pale brown (10YR 8/3)
175-180	180		0.0		**Clay (CL)** Light yellowish brown (10YR 6/4), moist, very stiff
180-185	185	4/16/07 @ 1325	0.0		
185-190	190		0.2		**Sandy Clay (CL)** 60% clay, 40% fine sand, light olive brown (2.5Y 5/4), moist, no cementation
190-195	195	4/16/07 @ 1640	0.1		**Silty Sand (SM)** 60% fine sand, 40% silt (2.5YR 5/4), light olive brown, moist, no cementation
195-200	200		0.0		**Poorly Graded Sand (SP)** 75% fine, 25% medium grained sand, pale brown (10 YR 6/3), wet, no cementation

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21C
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF	Start Date/Time: 4/12 End Date/Time: 4/26 Logged By: A. Gray & M. Brennan
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201 202 203 204 205	205	4/17/07 @ 1255	0.2		**Poorly Graded Sand (SP)** As Above
206 207 208 209 210 211	210		0.5		**Clayey Sand (SC)** Fine grained sand, dark grayish brown (10YR 5/2) moist, no cementation
212 213 214 215	215	4/17/07 @ 1457	2.7		**Poorly Graded Sand (SP)** Fine grained, grayish brown (2.5 YR 5/2) moist, no cementation
216 217 218 219 220	220		0.0		
221 222 223 224 225	225	4/17/07 @ 1725	0.0		
226 227 228 229 230	230		1.2		**Sandy Clay (CL)** 75% clay 25% fine sand, grayish brown (10YR 5/2), moist, weak cementation
231 232 233 234 235	235	4/18/07 @ 0855	0.5		**Poorly Graded Sand (SP)** Fine grained, grayish brown (10YR 4/2), moist, moderate cementation
236 237 238 239 240	240		0.4		
241 242 243 244 245	245	4/18/07 @ 1140	0.2		
246 247 248 249 250	250		0.3		

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21C
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF	Start Date/Time: 4/12 End Date/Time: 4/26 Logged By: A. Gray & M. Brennan
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
251 252 253 254 255	255	4/18/07 @ 1815	0.2		**Poorly Graded Sand (SP)** As Above
256 257 258 259 260	260		0.1		
261 262 263 264 265	265	4/19/07 @ 1015	0.1		
266 267 268 269 270	270		0.0		**Poorly Graded Sand (SP)** Medium grained, dark grayish brown (10YR 4/2), moist, moderate cementation
271 272 273 274 275	275	4/19/07 @ 1200	0.2		**Poorly Graded Sand (SP)** 50% fine, 50% medium grained sand, dark grayish brown (10YR 4/2), moist, moderate cementation
276 277 278 279 280	280		0.2		
281 282 283 284 285	285	4/24/07 @ 1415	0.3		
286 287 288 289 290	290		0.1		
291 292 293 294 295	295	4/24/07 @ 1720	0.0		
296 297 298 299 300	300		0.3		

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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GeoTrans, Inc.	Project No: 1303.020.03.01	Borehole No: MW-21C
Site Map	Client: ADEQ Site: Yuma 20th & Factor WQARF	Start Date/Time: 4/12 End Date/Time: 4/26 Logged By: A. Gray & M. Brennan
	Drilling Method: Sonic Borehole Diameter: 8"	Angle from Vertical: 0
	Surface Material: Concrete	Sampling Method: Continuous Core

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
301-304	305	4/25/07 @ 0715	0.1		**Poorly Graded Sand (SP)** Fine grained, dark grayish brown, (10YR 4/2), moist, moderate cementation
305-309	310		0.0		
310-314	315	4/25/07 @ 0800	0.0		**Poorly Graded Sand (SP)** Fine grained, dark grayish brown, (10 YR 4/2), moist, no cementation
315-319	320		0.2		
320-324	325	4/25/07 @ 0950	0.0		
325-329	330				Bottom of boring at 325 feet bgs
330-334	335				
335-339	340				
340-344	345				
345-349	350				
350					

Drilling Contractor: WDC
Checked By: L. Gardiner
Date Checked: 05/15/07

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CLIENT ADEQ
PROJECT 20th + Harrison WQARF Site
DETAIL MW-21C

JOB NO. 1303.020.03.03
DATE CHECKED
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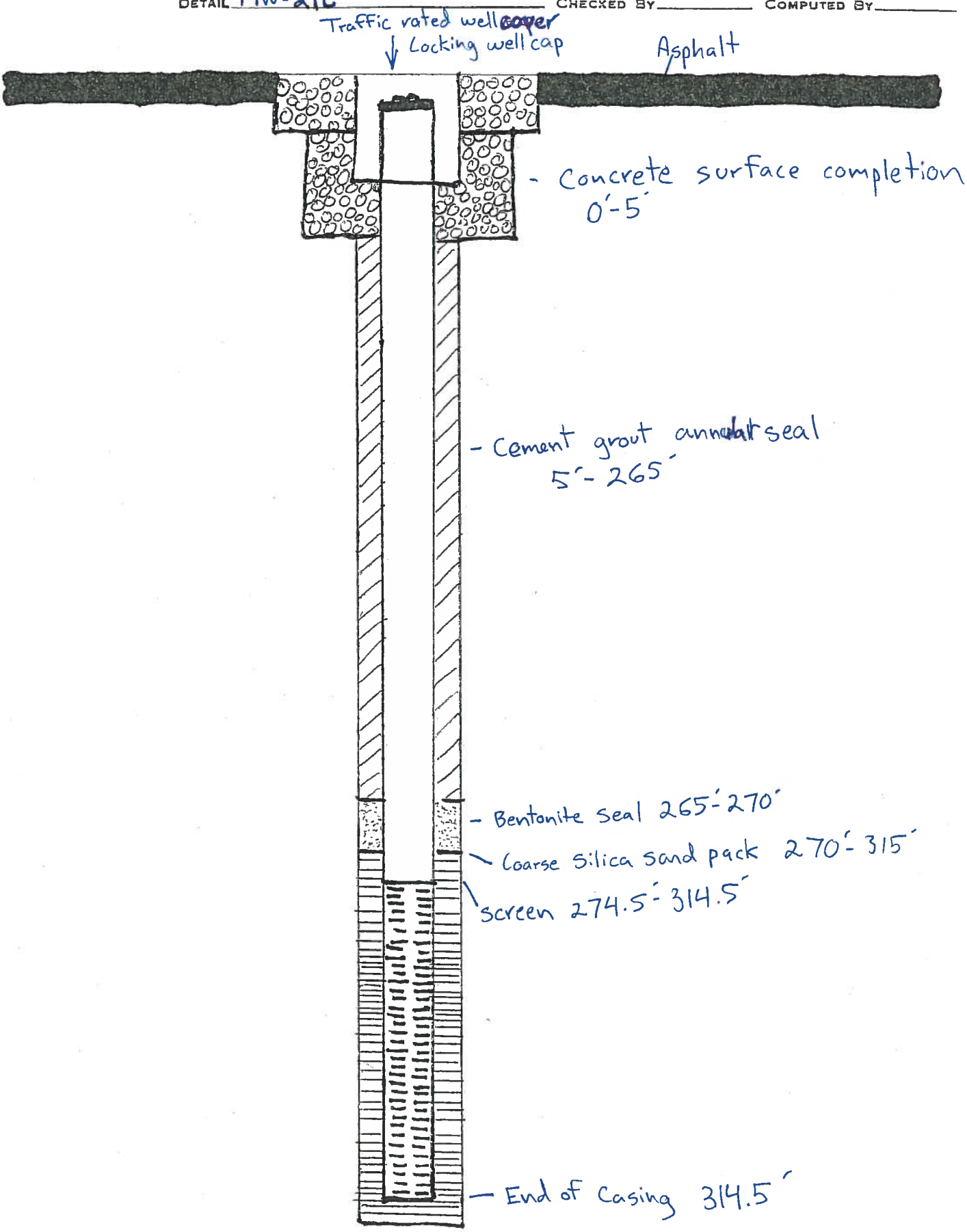

GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103C ADWR ID: 55-201457
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1 2 3 4 5	5				**SAND** Fine, loose, yellowish brown, poorly graded
6 7 8 9 10	10				
11 12 13 14 15	15				
16 17 18 19 20	20				
21 22 23 24 25	25				
26 27 28 29 30	30				
31 32 33 34 35	35				
36 37 38 39 40	40				
41 42 43 44 45	45				
46 47 48 49 50	50				

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

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GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103C
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51-54	55				
55-59	60				
60-64	65				
65-69	70				
70-74	75				**SAND** Fine to coarse, light olive brown, well graded
75-79	80				**SAND WITH GRAVEL** Fine to coarse, well graded (95%) with up to 5% fine gravel in cuttings stream (<0.5 cm dia.)
80-84	85				
85-89	90				
90-94	95				
95-99	100				**SAND** Fine to coarse, brown, no visible gravel
100					

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

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GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103C
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–104	105				
105–109	110				
110–114	115				
115–119	120				
120–124	125				
125–129	130				
130–134	135				
135–139	140				**GRAVELLY SAND** Well graded, fine to coarse sand with 10-15% fine gravel
140–144	145				**CLAYEY SAND WITH GRAVEL** Well graded, fine to coarse sand (60%); clay (20-30%); fine gravel (5-10%)
145–149	150				
150					

Drilling Contractor: Yellow Jacket

Checked By: Jasenka Zbozinek

Date Checked: 05-11-04

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GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103C
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151-155	155				**GRAVELLY SAND** Fine to coarse, well graded sand (70%); fine gravel(30%)
156-160	160				**SAND** Fine to medium sand
161-165	165				**GRAVELLY SAND** Fine gravel in sand, drill chattered.
166-170	170				**CLAY AND SAND** sand fine to medium (50%); clay (50%)
171-175	175				**SAND** Fine to coarse, well graded
176-180	180				**GRAVELLY SAND** Fine gravel in mud-stream, drill chattered
181-185	185				**SAND** Fine to coarse, well graded **GRAVELLY SAND** Sand is fine to coarse (50%); gravel (50%) 0.5 to 1.5 inches
186-190	190				**SAND** Fine to medium, well graded
191-195	195				
196-200	200				**SAND** Fine to coarse

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

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Site Map	**Project No:** 1303.011 **Client:** ADEQ **Site:** 20th and Factor	**Borehole No:** MW-103C **Start Date/Time:** 01-27-04 **End Date/Time:** 02-04-04 **Logged By:** Chris Gutmann
	Drilling Method: Mud Rotary **Borehole Diameter:** 9 in.	**Angle from Vertical:** 0
	Surface Material: Asphalt	**Sampling Method:** None; cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201 202 203 204 205 206 207 208 209 210 211 212 213 214	205				
	210				
	215				
215 216 217 218 219	220				**CLAYEY SAND** Fine to medium, well graded sand, driller reports clay in mud stream
220 221 222 223 224	225				**SAND** Fine to medium, well graded, loose
225 226 227 228 229	230				
230 231 232 233 234	235				
235 236 237 238 239	240				**SILTY SAND** Sand is fine to coarse (90%); silt (10%)
240 241 242 243 244	245				**SAND** Fine to medium
245 246 247 248 249 250	250				**SAND** Medium, uniform

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

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GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103C
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
251 252 253 254	255				
255 256 257 258 259	260				**SAND** Medium, uniform, olive brown
260 261 262 263 264	265				**SAND** Fine to medium, grayish brown
265 266 267 268 269	270				
270 271 272 273 274	275				
275 276 277 278 279	280				**SAND** Medium to coarse, wet (maybe ground gravel?)
280 281 282 283 284	285				
285 286 287 288 289	290				
290 291 292 293 294	295				**SAND** Fine to medium
295 296 297 298 299	300				
300					

Drilling Contractor: Yellow Jacket
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GeoTrans, Inc.	Project No: 1303.011	Borehole No: MW-103C
Site Map	Client: ADEQ Site: 20th and Factor	Start Date/Time: 01-27-04 End Date/Time: 02-04-04 Logged By: Chris Gutmann
	Drilling Method: Mud Rotary Borehole Diameter: 9 in.	Angle from Vertical: 0
	Surface Material: Asphalt	Sampling Method: None; cuttings

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
301–305	305				**SAND WITH SILT** Fine to medium
305–315	310				**SAND** Fine to medium, brownish gray
	315				
315–320	320				**GRAVELLY SAND** Fine to coarse sand (60%); fine gravel (40%)
320–325	325				**SAND** Fine to medium, driller reports clay layer (1-2 ft thick)
325–330	330				**SAND** Fine, grayish brown
330–350					

Drilling Contractor: Yellow Jacket
Checked By: Jasenka Zbozinek
Date Checked: 05-11-04

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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104C ADWR ID: 55-205754
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lthology	Description and Comments
0					Ground Surface
1–50					**Poorly Graded Sand** Yellow-brown, fine to medium sand, with trace coarse sand and clay

Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 1 of 6

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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104C
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51					
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Drilling Contractor: Yellow Jacket Drilling

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Date Checked:

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GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-104C

Start Date/Time: 11/28/04

End Date/Time: 12/3/04

Logged By: JLB

Drilling Method: Speedstar CH-50K Mud Rotary Rig **Angle from Vertical:** 0

Borehole Diameter: 14.75 inches

Surface Material: Native Material **Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
101					
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Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104C
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
151					
152					
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Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

Sheet: 4 of 6

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GeoTrans, Inc.

Site Map

Project No: 1303.015.03

Client: ADEQ

Site: 20th and Factor WQARF

Borehole No: MW-104C

Start Date/Time: 11/28/04

End Date/Time: 12/3/04

Logged By: JLB

Drilling Method: Speedstar CH-50K Mud Rotary Rig **Angle from Vertical:** 0

Borehole Diameter: 14.75 inches

Surface Material: Native Material **Sampling Method:** NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201					
202					
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Drilling Contractor: Yellow Jacket Drilling

Checked By:

Date Checked:

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GeoTrans, Inc.	Project No: 1303.015.03	Borehole No: MW-104C
Site Map	Client: ADEQ Site: 20th and Factor WQARF	Start Date/Time: 11/28/04 End Date/Time: 12/3/04 Logged By: JLB
	Drilling Method: Speedstar CH-50K Mud Rotary Rig Borehole Diameter: 14.75 inches	Angle from Vertical: 0
	Surface Material: Native Material	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
251					
252					
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Drilling Contractor: Yellow Jacket Drilling

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Date Checked:

Sheet: 6 of 6

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GeoTrans, Inc.

Site Map

Project No: 1303.026.09.04

Client: ADEQ

Site: 20th & Factor WQARF Site

Borehole No: PZ-1 A, B, C
ADWR ID: 55-908373

Start Date/Time: 01/29/08 - 1500

End Date/Time: 02/04/08 - 1730

Logged By: A.G.

Drilling Method: Sonic

Angle from Vertical: NA

Borehole Diameter: PZ-1

Surface Material: Asphalt

Sampling Method: NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–27					**Poorly Sorted Sand (SP)** Pale brown 10YR 6/3, fine grained, loose, dry
28–29					**Clay (CL)** Pale brown 10YR 6/3, hard
30–45					**Sandy Silt (ML)** Pale brown 10YR 6/3, 70% silt, 30% fine sand, some cementation
46–50					**Sandy Silt (ML)** Pale brown 10YR 6/3, 50% silt, 50% fine sand, no cementation

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 1 of 5

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GeoTrans, Inc.

Site Map

Project No: 1303.026.09.04

Client: ADEQ

Site: 20th & Factor WQARF Site

Borehole No: PZ-1 A, B, C

Start Date/Time: 01/29/08 - 1500

End Date/Time: 02/04/08 - 1730

Logged By: A.G.

Drilling Method: Sonic

Angle from Vertical: NA

Borehole Diameter: PZ-1

Surface Material: Asphalt

Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
51–54					**Sandy Silt (ML)** Pale brown 10YR 6/3, 70% silt, 30% fine sand, no cementation
55–69					**Sandy Silt (ML)** Pale brown 10YR 6/3, 50% silt, 50% fine sand, no cementation
70–79					**Sandy Silt (ML)** Pale brown 10YR 6/3, 50% silt, 50% fine sand
80–89					**Silty Sand (SM)** Brown 7.5YR 5/3, 85% fine sand, 15% silt, wet, no cementation
90–94					**Poorly Sorted Sand (SP)** Brown 7.5YR 5/3, 50% fine sand, 50% medium sand, wet, no cementation
95–97					**Poorly Sorted Sand (SP)** Brown 7.5YR 5/3, fine sand, wet, no cementation
98–100					**Clay (CL)** Reddish brown, 5YR 4/3, stiff, non-plastic, moist

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 2 of 5

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GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: PZ-1 A, B, C
Site Map	Client: ADEQ Site: 20th & Factor WQARF Site	Start Date/Time: 01/29/08 - 1500 End Date/Time: 02/04/08 - 1730 Logged By: A.G.
	Drilling Method: Sonic Borehole Diameter: PZ-1	Angle from Vertical: NA
	Surface Material: Asphalt	Sampling Method: NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–104					**Silt (ML)** Pale brown, 10 YR 6/3, slight cementation, slightly moist
105–124					**Poorly Sorted Sand (SP)** Brown, 7.5 YR 5/3, fine sand, wet, no cementation
123–125					**Clayey Silt (ML)** Brown 7.5YR 5/3, 70% silt, 30% clay
125–129					**Clayey Silt (ML)** Brown 7.5YR 5/3, 50% silt, 50% clay
129–130					**Poorly Sorted Sand (SP)** Brown 7.5YR 5/3, fine sand
130–144					**Poorly Sorted Sand (SP)** Brown 7.5YR 5/3, 70% fine sand, 30% medium sand
144–146					**Clayey Sand (SC)** Brown 7.5YR 5/3, 80% fine sand, 20% clay
146–150					**Silty Clay (CL)** Brown 7.5YR 5/2, 70% clay, 30% silt, non-plastic, hard, slightly moist

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 3 of 5

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: PZ-1 A, B, C
Site Map	Client: ADEQ Site: 20th & Factor WQARF Site	Start Date/Time: 01/29/08 - 1500 End Date/Time: 02/04/08 - 1730 Logged By: A.G.
	Drilling Method: Sonic Borehole Diameter: PZ-1	Angle from Vertical: NA
	Surface Material: Asphalt	Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
151-154					**Sandy Silt (ML)** Brown 7.5YR 5/3, 70% silt, 30% fine sand, wet, no cementation
155-159					
160-164					**Silty Clay (CL)** Reddish brown, 5YR 4/4
165-168					
169-170					**Silt (ML)** Brown 7.5YR 5/3
171-174					**Sandy Silt (ML)** Brown 7.5YR 5/3, 50% silt, 50% fine sand
175-179					**Clayey Silt (ML)** Brown 7.5YR 5/3, 50% silt, 50% clay
180-184					**Sandy Silt (ML)** Brown 7.5YR 5/3, 70% silt, 30% fine sand, white clay nodules
185-189					**Silty Sand (SM)** Brown 7.5YR 5/3, 30% silt, 70% fine sand
190-194					**Silty Sand (SM)** Brown 7.5YR 5/3, 30% silt, 70% fine sand, some strong cementation
195-200					**Silty Sand (SM)** Brown 7.5YR 5/3, 30% silt, 70% fine sand, no cementation

Drilling Contractor: Boart Longyear
Checked By: L.G.
Date Checked: 2/20/08

GeoTrans, Inc
4801 East Washington Street, Suite 260
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GeoTrans, Inc.

Site Map

Project No: 1303.026.09.04

Client: ADEQ

Site: 20th & Factor WQARF Site

Borehole No: PZ-1 A, B, C

Start Date/Time: 01/29/08 - 1500

End Date/Time: 02/04/08 - 1730

Logged By: A.G.

Drilling Method: Sonic

Angle from Vertical: NA

Borehole Diameter: PZ-1

Surface Material: Asphalt

Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201					Silty Sand (SM) Brown 7.5YR 5/3, 85% fine sand, 15% silt
202					
203					
204					
205					Bottom of boring at 200 bgs
206					
207					
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Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 5 of 5

GeoTrans, Inc
4801 East Washington Street, Suite 260
Phoenix, Arizona 85034
Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: PZ-2 A, B, C ADWR ID: 55-908375
Site Map	Client: ADEQ Site: Yuma, AZ	Start Date/Time: 01/21/08 - 1000 End Date/Time: 01/25/08 - 1520 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: PZ-2 A, B, C	Angle from Vertical: NA
	Surface Material: Asphalt	Sampling Method: NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lthology	Description and Comments
					Ground Surface
0–50					**Poorly Graded Sand (SP)** Pale brown 10 YR 6/3, fine grained poorly sorted sand, loose, dry
30–40					**Silty Sand (SM)** Pale brown 10 YR 6/3 fine grained poorly sorted sand, 85% fine sand, 15% silt, loose, dry, no cementation
40–45					**Silt (ML)** Light Gray 7.5 YR 7/1, loose, dry, no cementation
45–50					**Poorly Graded Sand (SP)** Very pale brown 10 YR 7/3, fine grained sand w/ trace silt, loose, dry, no cementation

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 1 of 5

GeoTrans, Inc
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Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.	Project No: 1303.026.09.04	Borehole No: PZ-2 A, B, C
Site Map	Client: ADEQ Site: Yuma, AZ	Start Date/Time: 01/21/08 - 1000 End Date/Time: 01/25/08 - 1520 Logged By: AG
	Drilling Method: Sonic Borehole Diameter: PZ-2 A, B, C	Angle from Vertical: NA
	Surface Material: Asphalt	Sampling Method: NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
51–59					
60–61					**Poorly Graded Sand (SP)** Pale brown 7.5 YR 6/3, 75% fine grained, 25% medium grained
62–64					**Sandy Silt (ML)** Pale brown 7.5 YR 6/3, 75% silt, 25% fine sand, weakly cemented, dry
65–69					**Sandy Clay (CL)** hard, yellowish brown 10 YR 5/8, 75% clay, 25% fine sand
70–79					**Silty Sand (SM)** Pale brown 7.5 YR 6/3, 85% fine sand, 15% silt, loose, dry, some weak cementation
80–84					**Clayey Sand (SC)** Light yellowish brown 10 YR 6/4, 70% fine sand, 30% clay, loose, wet, no cementation
85–89					**Poorly Graded Sand (SP)** Brown 7.5 YR 5/4, fine sand, wet, no cementation
90–92					**Sandy Silt (ML)** Brown 7.5 YR 5/4, 50% silt, 50% fine sand, wet, no cementation
93–97					**Clay (CL)** Brownish yellow 10 YR 6/6, stiff, moist
98–100					**Silt (ML)** Brown 7.5 YR 5/3, wet, no cementation

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 2 of 5

GeoTrans, Inc
4801 East Washington Street, Suite 260
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GeoTrans, Inc.

Site Map

Project No: 1303.026.09.04

Client: ADEQ

Site: Yuma, AZ

Borehole No: PZ-2 A, B, C

Start Date/Time: 01/21/08 - 1000

End Date/Time: 01/25/08 - 1520

Logged By: AG

Drilling Method: Sonic

Angle from Vertical: NA

Borehole Diameter: PZ-2 A, B, C

Surface Material: Asphalt

Sampling Method: NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
101–139					**Poorly Graded Sand (SP)** Brown 7.5 YR 5/3, wet, no cementation
140–144					**Poorly Graded Sand (SP)** Brown 7.5 YR 5/3, 70% fine sand, 30% medium sand, wet, no cementation
145–150					**Silty Sand (SM)** Brown 7.5 YR 5/3, 70% fine sand, 30% silt, wet, no cementation

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 3 of 5

GeoTrans, Inc
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GeoTrans, Inc.

Site Map

Project No: 1303.026.09.04

Client: ADEQ

Site: Yuma, AZ

Borehole No: PZ-2 A, B, C

Start Date/Time: 01/21/08 - 1000

End Date/Time: 01/25/08 - 1520

Logged By: AG

Drilling Method: Sonic

Angle from Vertical: NA

Borehole Diameter: PZ-2 A, B, C

Surface Material: Asphalt

Sampling Method: NA

Depth	Sample Characteristics: DEPTH (FEET)	TIME	PID (ppm)	Lithologic Characteristics: Lithology	Description and Comments
151–154					**Sandy Silt (ML)** Brown 7.5 YR 5/3, 70% silt, 30% fine sand, wet, no cementation
155–159					**Sandy Silt (ML)** Brown 7.5 YR 5/3, 50% silt, 50% fine sand, wet, no cementation
160–163					**Clay w/ Silt (CL)** Brown 7.5 YR 5/3, low plasticity, stiff, slightly moist
164–169					**Sandy Silt (ML)** Brown 7.5 YR 5/3, 50% silt, 50% fine sand, wet, no cementation
170					**Poorly Graded Sand (SP)** Brown 7.5 YR 5/3, 90% fine sand, 10% silt, wet, no cementation
171–179					**Clay w/ Silt (CL)** Brown 7.5 YR 5/3, low plasticity, stiff, slightly moist, contains white nodules
180–194					**Sandy Silt (ML)** Brown 7.5 YR 5/3, 70% silt, 30% fine sand, wet, no cementation
195–200					**Sandy Silt (ML)** Brown 7.5 YR 5/3, 70% silt, 30% fine sand, wet, no cementation, contains clay nodules

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 4 of 5

GeoTrans, Inc
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Voice: 602-682-3320 Fax: 602-682-3318

GeoTrans, Inc.

Site Map

Project No: 1303.026.09.04

Client: ADEQ

Site: Yuma, AZ

Borehole No: PZ-2 A, B, C

Start Date/Time: 01/21/08 - 1000

End Date/Time: 01/25/08 - 1520

Logged By: AG

Drilling Method: Sonic

Angle from Vertical: NA

Borehole Diameter: PZ-2 A, B, C

Surface Material: Asphalt

Sampling Method: NA

Depth	Sample Characteristics			Lithologic Characteristics	
	DEPTH (FEET)	TIME	PID (ppm)	Lithology	Description and Comments
201					Bottom of boring at 201 bgs
202					
203					
204					
205					
206					
207					
208					
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210					
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214					
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250					

Drilling Contractor: Boart Longyear

Checked By: L.G.

Date Checked: 2/20/08

Sheet: 5 of 5

GeoTrans, Inc
4801 East Washington Street, Suite 260
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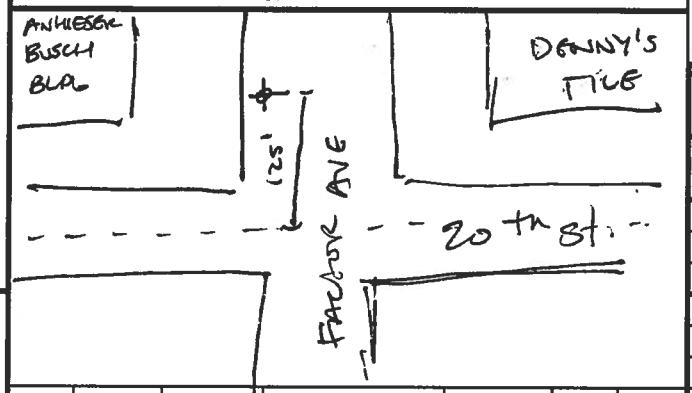
MAP OF BORING LOCATION:



GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

SVWM18 A-F

PROJECT NAME: 20th & FACTOR	BORING NAME: SVWM-18A-F ~~MW-22~~
PROJECT NUMBER: 1303.038.2.1	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: HSA	SHEET 1 OF
SAMPLING METHOD: N/A	DRILLING START TIME 1545 DATE 2/21/11; FINISH TIME 0900 DATE 2/22/11

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	
							CLAY, moist, plastic w/ some sand
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-18A-F
PROJECT NUMBER: 1303.038.2.1	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: HSA	SHEET 2 OF
SAMPLING METHOD: N/A	DRILLING START TIME / FINISH TIME / DATE / DATE
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	
							SAND, MEDIUM to COARSE GRAINED
						21	MOIST, NO ODOR, NO CEMENTATION
						22	
						23	
							SAND, MEDIUM to COARSE GRAINED
						24	DRY, NO ODOR, NO CEMENTATION
						25	
						26	
						27	
						28	
						29	
						30	
						31	
						32	
						33	
						34	
						35	
						36	
						37	
						38	
						39	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: SVMW-18A-F
PROJECT NUMBER: 1303.038.2.1	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: HSA	SHEET 3 OF
	DRILLING START TIME / FINISH TIME
SAMPLING METHOD: N/A	DATE / DATE
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	
						41	
						42	
						43	
						44	
						45	SAND W/ GRAVEL, MOIST, NO CEMENTATION FINE TO MED. GRAINED
						46	
						47	
						48	
						49	
						50	SAND, FINE TO MED. GRAINED, MOIST
						51	
						52	
						53	
						54	
						55	
						56	
						57	
						58	
						59	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & FACTOR	BORING NAME: SVMW-18A-F
PROJECT NUMBER: 1303.038.2.1	PROJECT LOCATION: YUMA, AZ
DRILLING METHOD: HSA	SHEET OF
	DRILLING START TIME 1545 / FINISH TIME 0900
SAMPLING METHOD: N/A	DATE 2/21/11 / DATE 2/22/11
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

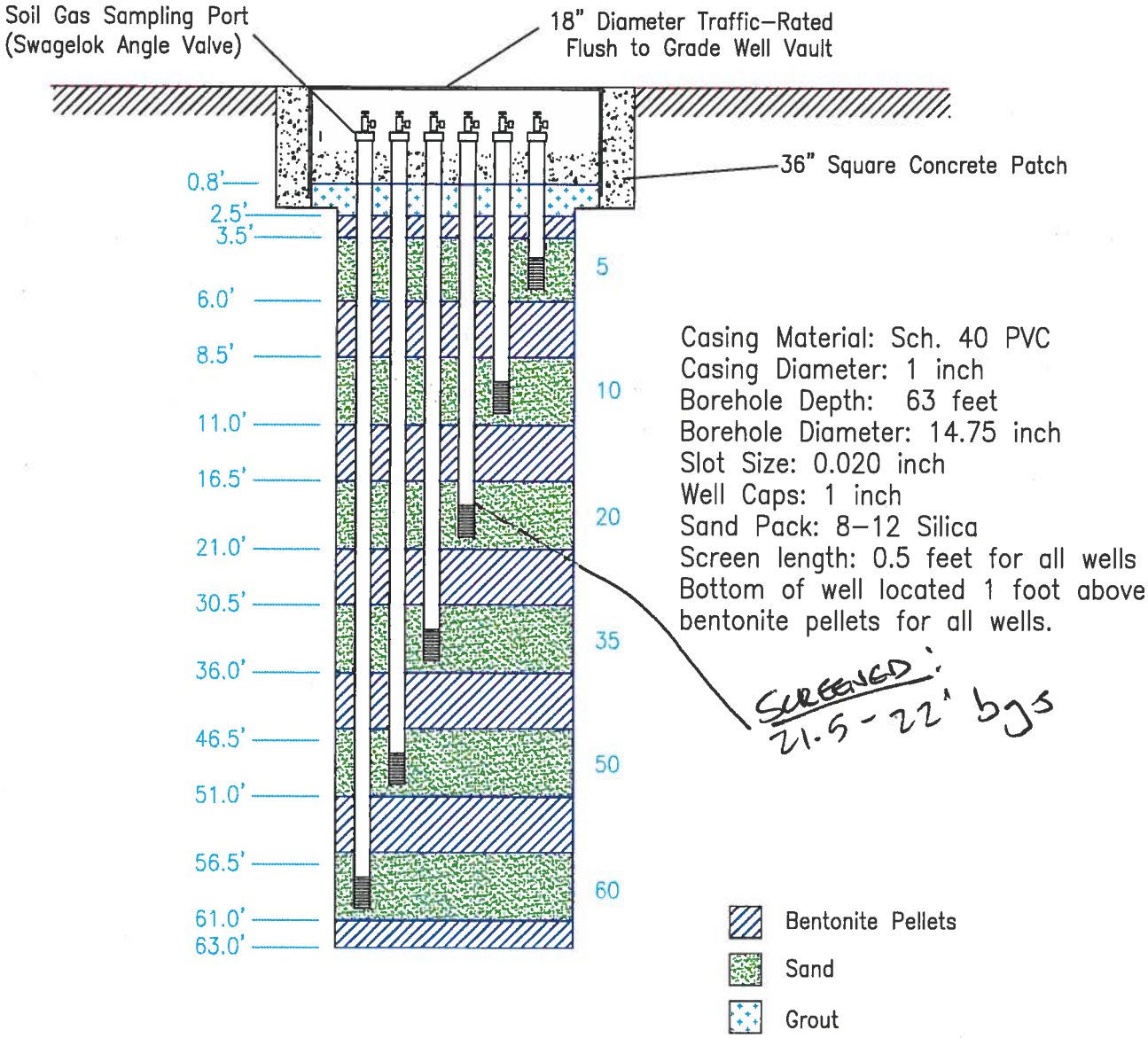
GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	
						61	
						62	TD HOLE @ 63.0' bgs
						63	
						64	
						65	
						66	
						67	
						68	
						69	
						70	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)



NOT TO SCALE

TITLE:	WELL CONSTRUCTION DIAGRAM FOR SIX–NESTED SVMWS
LOCATION:	20TH AND FACTOR WQARF SITE, YUMA, ARIZONA

GeoTrans, Inc. A TETRA TECH COMPANY

CHECKED	JZ/MO
DRAFTED	TLG
PROJECT	1303.038
DATE	7/19/10

FIGURE 2

YUMA, AZ 2/22/11

0730 BB & YJ ONSITE. STAGE DRILL MATERIALS

1030 RESUME DRILLING.

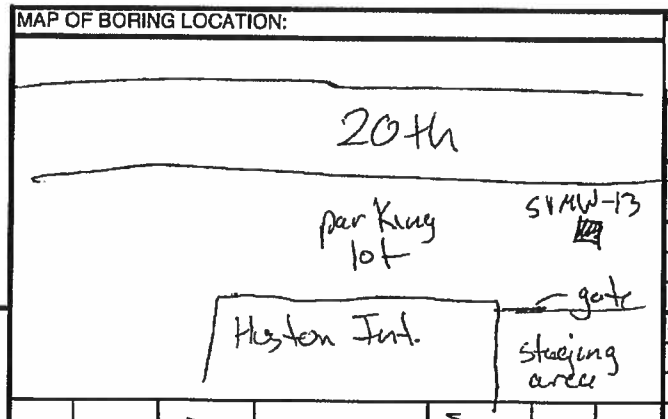
900 TD SVMW-18A-F @ 63' bgs.

915 BEGIN INSTALLING WELL

BAGS OF: BENTONITE: 1
SAND:

* TALKING W/ DENNY OF DENNY'S TIRE: HE MENTIONED THE REASON THE ROAD IS SWOLLEN @ 20th & FACTOR IS DUE to HYDRATED CLAYS. IN 1st 20' bgs. HYDRATED VIA RECHARGE FROM RETENTION POND BETWEEN ANHEUSER-BUSCH(A-B) PARKING LOT & FACTOR AVE. DENNY ALSO MENTIONED A-B BLDG. HAS BEEN REBUILT 3 TIMES DUE to CLAY SWELLING.

MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

A TETRA TECH COMPANY

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-13A,B
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA 10"	SHEET 1 OF 1
SAMPLING METHOD: N/A	DRILLING START TIME: 11:15 DATE: 11/1/10; FINISH TIME: 11:34 DATE: 11/1/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

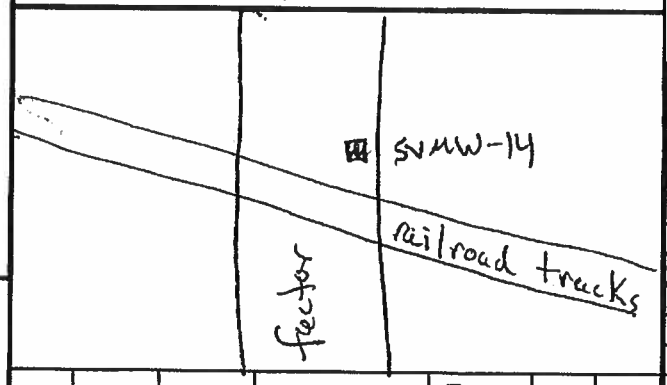
DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	Well Graded Sand, Medium grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	TD ~ 13'
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

A TETRA TECH COMPANY

PROJECT NAME: 28th & factor	BORING NAME: SVMW-14 A,B,C,D,E,F
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA 10"	SHEET 1 OF 4
SAMPLING METHOD: N/A	DRILLING START TIME 1418 DATE 11/1/10; FINISH TIME 1508 DATE 11/1/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	Well Graded Sand, Medium ~~coarse~~ gravel
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Foster	BORING NAME: SMMW-14
PROJECT NUMBER: 1303.030	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA 10"	SHEET 2 OF 4
SAMPLING METHOD: N/A	DRILLING START TIME 1418 / FINISH TIME 1508
	DRILLING START DATE 11/1/10 / FINISH DATE 11/1/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	Well graded sand, medium ~~[illegible]~~ grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						30	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						39	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Fracter	BORING NAME: SVMW-14
PROJECT NUMBER: 1303038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 3 OF 4
SAMPLING METHOD: NA	DRILLING START TIME 1410 DATE 11/1/10; FINISH TIME 1508 DATE 11/1/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

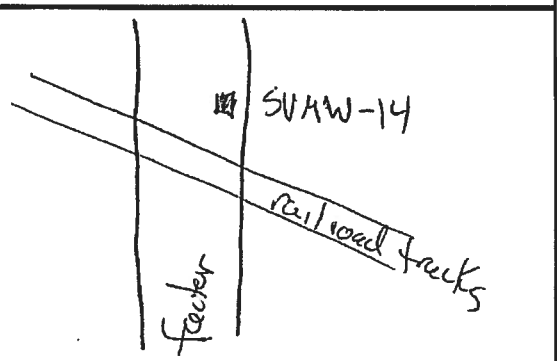
DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	Well graded sand, medium grained
						1	
						2	Run into cobbles
						3	
						4	
						5	
						6	Cemented sand layered w/ regular sand
						7	
						8	
						9	
						50	
						1	
						2	
						3	
						4	
						5	Continue to have sand with layers that ~~[illegible]~~ feel like cemented sand when drilled through
						6	
						7	
						8	
						59	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-14
PROJECT NUMBER: 1303038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 4 OF 4
SAMPLING METHOD: NA	DRILLING START TIME 1410 DATE 11/1/10; FINISH TIME 1500 DATE 11/1/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

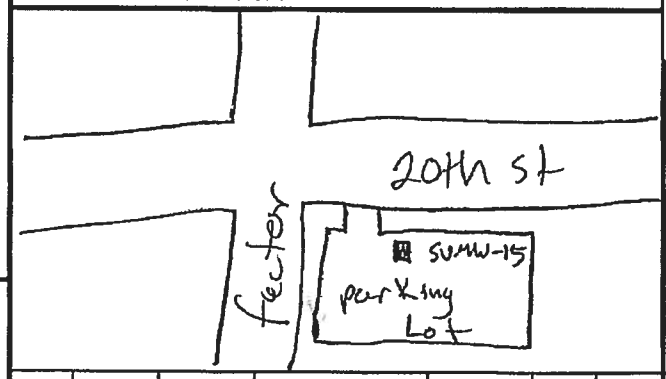
DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	Regular sand with possible layers of gravel along depth, moist
						1	
						2	
						3	
						4	
						65	Cemented sand, moist
						6	
						7	
						8	
						9	TD ~70'
						700	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:



GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SUMW-15 ABCDEF
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA 10"	SHEET 1 OF 1
SAMPLING METHOD: N/A	DRILLING START TIME 1112/10 DATE 1510 / FINISH TIME 11/2/10 DATE 1600
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	Well graded Sand, fine-~~medium~~ grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	Well graded Sand, fine grained, moist
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	Driller felt auger that he guessed was clay. No noticeably change in cuttings
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-15
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: ~~AD~~ HSA 10"	SHEET 2 OF 4
SAMPLING METHOD: NA	DRILLING START TIME 1510 / FINISH TIME 1600
	DRILLING START DATE 11/2/10 / FINISH DATE 11/2/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						30	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-15
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA 10"	SHEET 3 OF 4
SAMPLING METHOD: NA	DRILLING START TIME 1510 DATE 11/12/10; FINISH TIME 1600 DATE 11/12/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

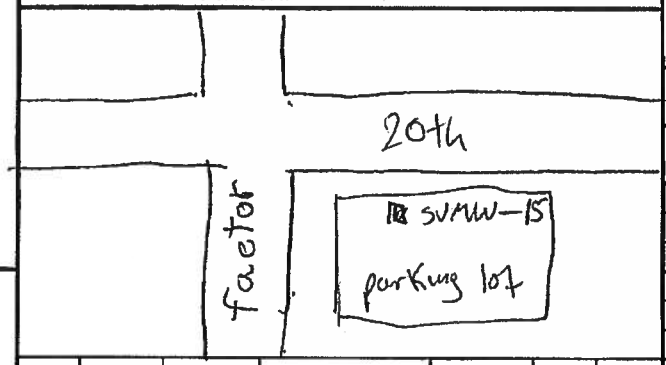
DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	Well Graded Sand
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						50	
						1	
						2	Gravel layer
						3	Sand
						4	Gravel layer
						5	Sand
						6	Gravel
						7	
						8	G. Cobbles
						9	Gravel

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-15
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA 10"	SHEET 4 OF 4
SAMPLING METHOD:	DRILLING START TIME: 1510 DATE: 11/2/10 — FINISH TIME: 1600 DATE: 11/2/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

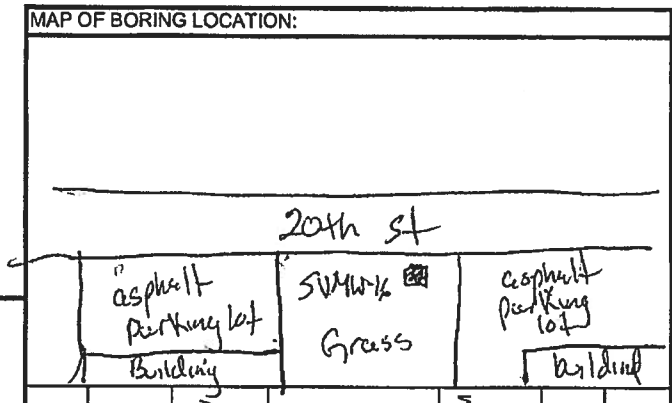
SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	Sand w/ gravel layers
						1	
						2	
						3	
						4	
						5	Well graded sand, fine
						6	[redacted]
						7	
						8	[redacted]
						9	[redacted]
						70	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

928-373-5000
#2057

MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-16 A,B,C,D,E,F
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 1 OF 4
SAMPLING METHOD: NA	DRILLING — START TIME: 1310 DATE: 11/3/10; FINISH TIME: 1415 DATE: 11/3/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	Well graded sandy fine grained moist
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. — A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-16
PROJECT NUMBER: 1303.039	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 3 OF 4
SAMPLING METHOD: N/A	DRILLING START TIME: 1310 DATE: 11/3/10 — FINISH TIME: 1415 DATE: 11/3/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	Well graded sand, fine grained, moist
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						30	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						39	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Fredfer	BORING NAME: SVMW-16ABCDEF
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 3 OF 4
	DRILLING
	START / FINISH
SAMPLING METHOD: N/A	TIME: 1310 / TIME: 1415
	DATE: 11/3/10 / DATE: 11/3/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	Well graded sand, fine grained, moist
						1	
						2	Driller felt cemented sand.
						3	Well greeded sand, fine greind, most
						4	
						5	
						6	~~Driller felt~~ Gravel layer
						7	Well Graded sand, fine greined, moist
						8	
						9	
						50	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-16
PROJECT NUMBER: 1303.0301	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 4 OF 4
	DRILLING START TIME: 1310 DATE: 11/3/10
SAMPLING METHOD: N/A	DRILLING FINISH TIME: 1415 DATE: 11/3/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

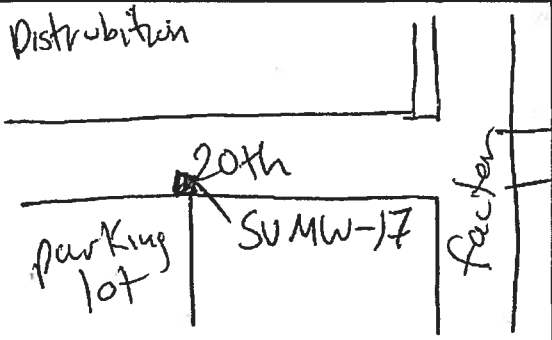
SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	Well graded, sand, fine grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						70	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

s. Olden

MAP OF BORING LOCATION:



GeoTrans, Inc. — FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-17ABCDEF
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 1 OF 3
SAMPLING METHOD: NA	DRILLING START TIME 0812 DATE 11/4/10; FINISH TIME 0940 DATE 11/4/10

SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	Well Graded Sand, fine grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	Well graded sand, fine grained
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-17
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 2 OF 3
	DRILLING
	START / FINISH
SAMPLING METHOD: NA	TIME START: 0812 / TIME FINISH: 0848
	DATE START: 11/4/10 / DATE FINISH: 11/4/10
SURFACE COVER CONDITIONS:	asphalt, concrete, dirt, gravel, etc.

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	ize.4 graded sand, fine grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						30	
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						39	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. — A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Fourter	BORING NAME: SVMW-17
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: 10" HSA	SHEET 3 OF 3
SAMPLING METHOD: NA	DRILLING — START: TIME 0812, DATE 11/4/10 — FINISH: TIME 0848, DATE 11/4/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	
						1	
						2	Driller felt layer harder than regular sand. Not sure what it was
						3	
						4	
						5	~~Sandy Gravel~~ Gravelly Sand
						6	
						7	~~Driller felt a layer harder than sand. Not sure what layer was~~
						8	
						9	
						50	~~Sand Gravel~~
						1	
						2	
						3	
						4	
						5	Sand with Gravel
						6	
						7	
						8	
						59	

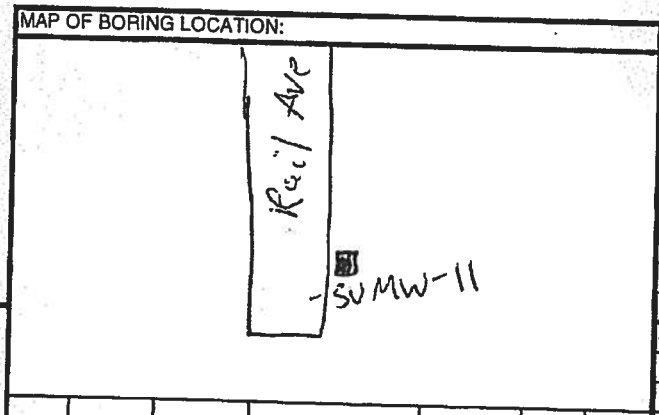
ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

60' – 70' 60'-65 Sand w/some gravel

65 – 70 Well graded sand, fine gravel

MAP OF BORING LOCATION:



GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-11 SDEF
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA	SHEET 1 OF 4
SAMPLING METHOD: N/A	DRILLING START TIME 0800 DATE 11/5/10; FINISH TIME 0846 DATE 11/5/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						0	Well graded sand, fine grained
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
						12	
						13	
						14	
						15	
						16	
						17	
						18	
						19	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & factor	BORING NAME: SVMW-11
PROJECT NUMBER: 1303.032	PROJECT LOCATION: Yuma AZ
DRILLING METHOD: 10" HSA	SHEET 2 OF 4
	DRILLING 7
SAMPLING METHOD: N/A	START TIME 0800 / FINISH TIME 0846
	START DATE 11/5/10 / FINISH DATE 11/5/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						20	Well graded sand/fine gravel
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						30	
						1	
						2	
						3	
						4	
						5	
						6	Gravel/Cobbles
						7	
						8	
						39	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-11
PROJECT NUMBER: 1303.038	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA	SHEET 3 OF 4
SAMPLING METHOD: NA	DRILLING START TIME: 0800 DATE: 4/5/10 / FINISH TIME: 0846 DATE: 4/5/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						40	Well graded sand, fine grained
						1	
						2	
						3	
						4	
						5	Gravel layers ~~[illegible]~~ mixed in w/ sand layers
						6	
						7	
						8	
						9	
						50	Well graded sand, fine grained
						1	
						2	
						3	
						4	
						5	Intermittent gravel layers
						6	
						7	
						8	
						59	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)

MAP OF BORING LOCATION:

GeoTrans, Inc. A TETRA TECH COMPANY

FIELD DRILLING LOG

PROJECT NAME: 20th & Factor	BORING NAME: SVMW-11
PROJECT NUMBER: 1303.030	PROJECT LOCATION: Yuma, AZ
DRILLING METHOD: HSA	SHEET 4 OF 4
SAMPLING METHOD: NA	DRILLING START TIME: 0800 DATE: 11/5/10 FINISH TIME: 0846 DATE: 11/5/10
SURFACE COVER CONDITIONS: asphalt, concrete, dirt, gravel, etc.	

GEOTRANS REPRESENTATIVE:

DRILLING CONTRACTOR:

SAMPLE TYPE	BLOW COUNTS/ 0.5 FT	INCHES RECOVERED/ INCHES DRIVEN	SAMPLE ID	PID/FID/OVM READING (ppmV)	USCS SYMBOL	DEPTH IN FEET (BGS)	SOIL/ROCK SAMPLE DESCRIPTIONS
						60	Well graded sand, fine grained
						1	
						2	
						3	
						64	Gravel layer in sand
						5	Well Graded sand, fine grained
						6	
						7	Cemented sand
						8	
						9	
						70	
							TD.
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	

ASTM DESC: group name (grain type & size, grading, plasticity), consistency, cementation, angularity, color (staining), moisture cont., odor, etc.

SAMPLE TYPES: split spoon (SS), continuous core (CC), grab (G), solid barrel (SB)