

APPENDIX D
BP-SERIES WELL BORING LOGS
REMEDIAL INVESTIGATION REPORT
GROUNDWATER OPERABLE UNIT
Arizona Department of Environmental Quality
Broadway-Pantano Water Quality Assurance Revolving Fund Site
June 1, 2012

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LOG OF BORING BP-1

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

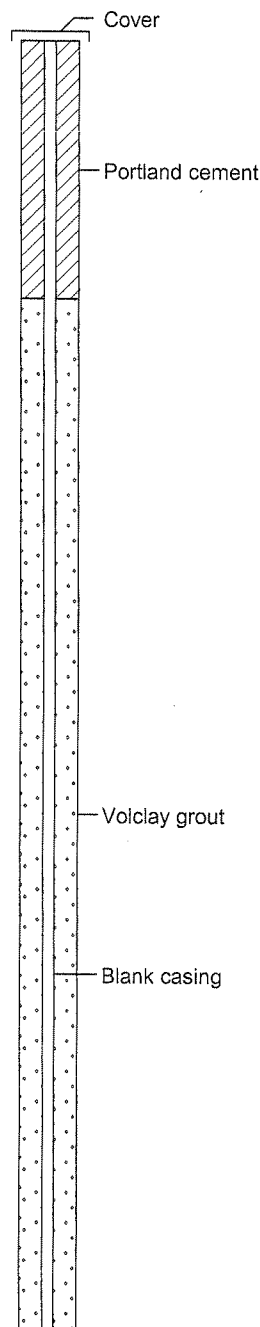
Start Date : January 3, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589345

1005 North Alamo

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			WELL GRADED GRAVELLY SILTY SAND (angular sand grains; fine grained subangular gravel ~ 25-30%; silty fines ~ 10-15%); grayish orange (10YR 7/4)
	SW		slight decrease in gradation; slight decrease in gravel to ~ 15% and silty fines to less than 5%
50			
	SP		POORLY GRADED SAND (medium grained sand; silty fines ~ 5-8%; no gravel); grayish orange (10YR 7/4); abundant muscovite
100			

Well: BP-1
Elev.: 2535.50



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LOG OF BORING BP-1

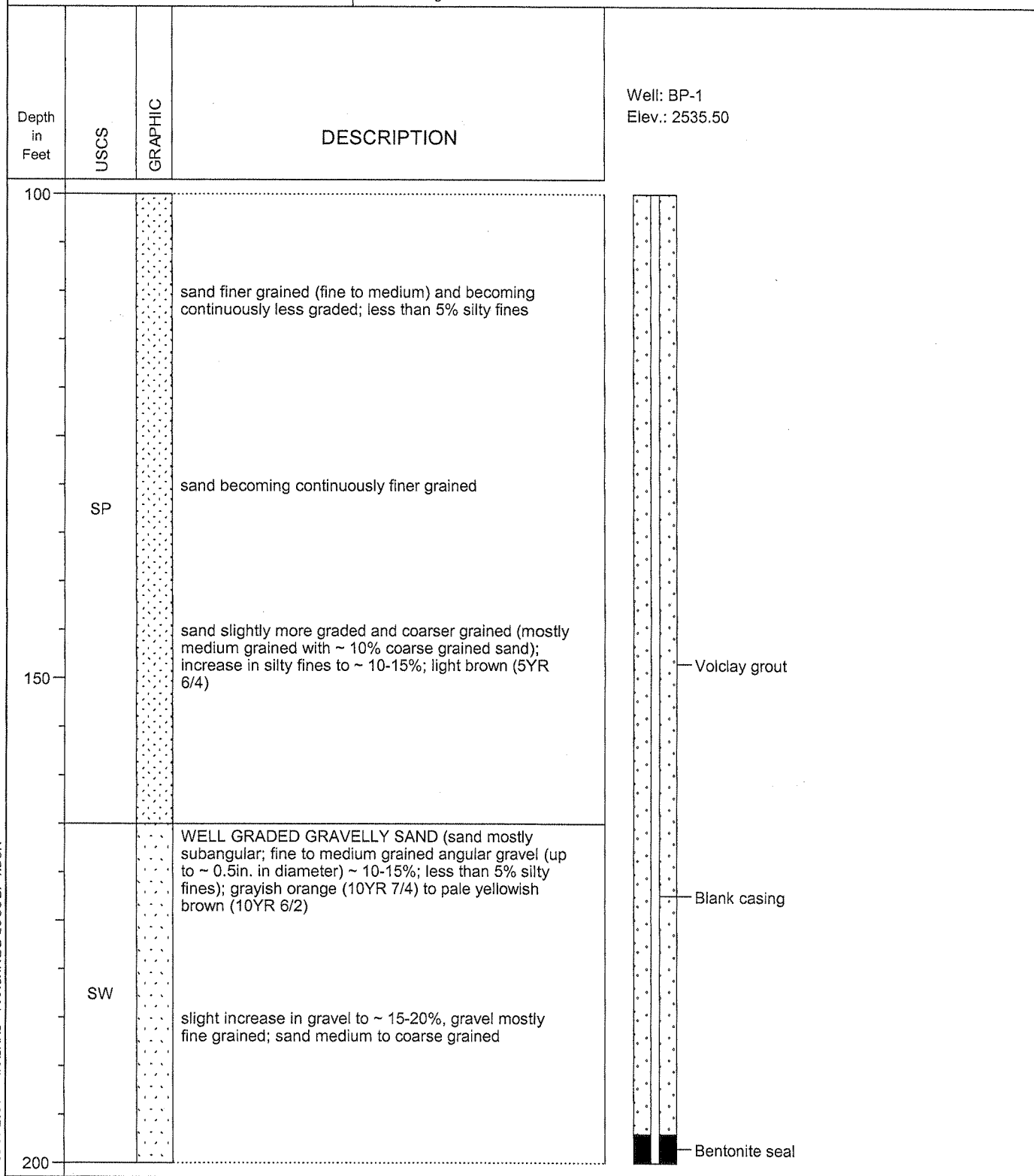
(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 3, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589345

1005 North Alamo



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LOG OF BORING BP-1

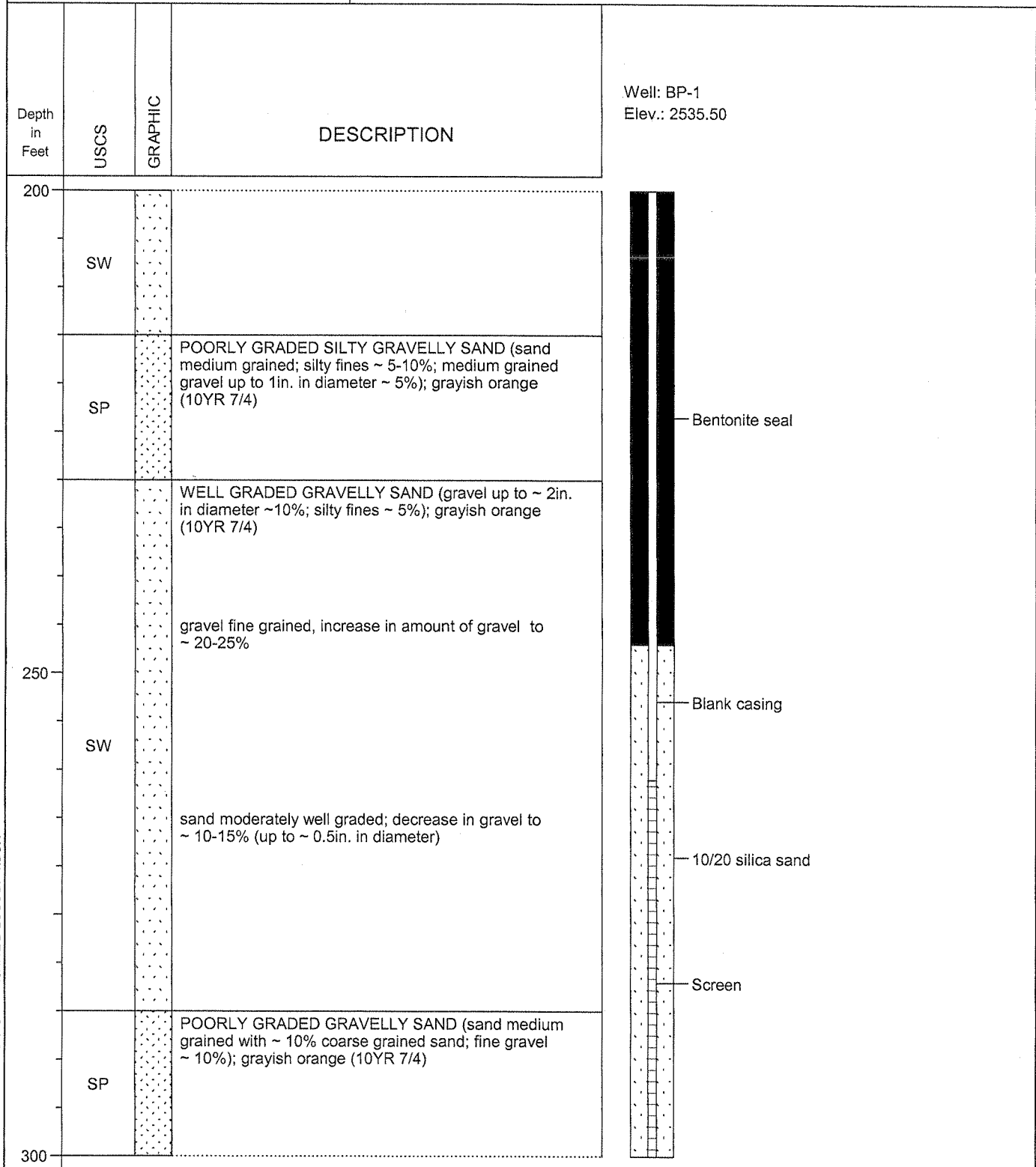
(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 3, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589345

1005 North Alamo



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LOG OF BORING BP-1



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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 3, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589345

1005 North Alamo

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	
300	SP		slight increase in gradation; increase in gravel to ~ 15%; increase in grain size of gravel to up to ~ 0.75in. in diameter	
			WELL GRADED GRAVELLY SAND (fine to medium grained gravel up to ~ 1in. in diameter ~15%; less than 5% silty fines); grayish orange (10YR 7/4)	▼
350	SW		sand coarser grained; slight increase in gravel to ~ 20%; slight increase in silty fines to ~ 5-10%; moderate yellowish brown (10YR 5/4)	10/20 silica sand Screen
			gravel up to ~ 1.5in. in diameter; decrease in silty fines to less than 5%; color difficult to distinguish due to variation of grain composition, generally pale yellowish brown (10YR 6/2); garnets present; visible crystals of muscovite, quartz and feldspar; gravel composed of fragmented dioritic gneiss	
400				

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LOG OF BORING BP-1

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 3, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

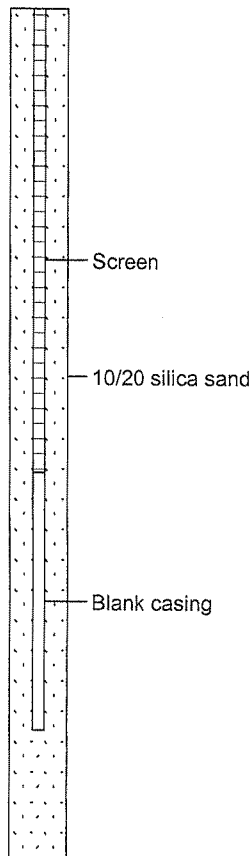
Slot Size : 0.020-inch
ADWR No. : 55-589345

1005 North Alamo

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-1
Elev.: 2535.50

400	SW		WELL GRADED GRAVELLY SAND TO WELL GRADED SANDY GRAVEL (gravel up to ~ 1.5in. in diameter; less than 5% silty fines); pale yellowish brown (10YR 6/2)
			increase in coarse grained gravel; abundant garnets
	SW/GW		
450			Boring BP-1 terminated at ~466 feet bgs.



Note: Moisture content not noted in descriptions due to injection of water for dust control during drilling.

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LOG OF BORING BP-2

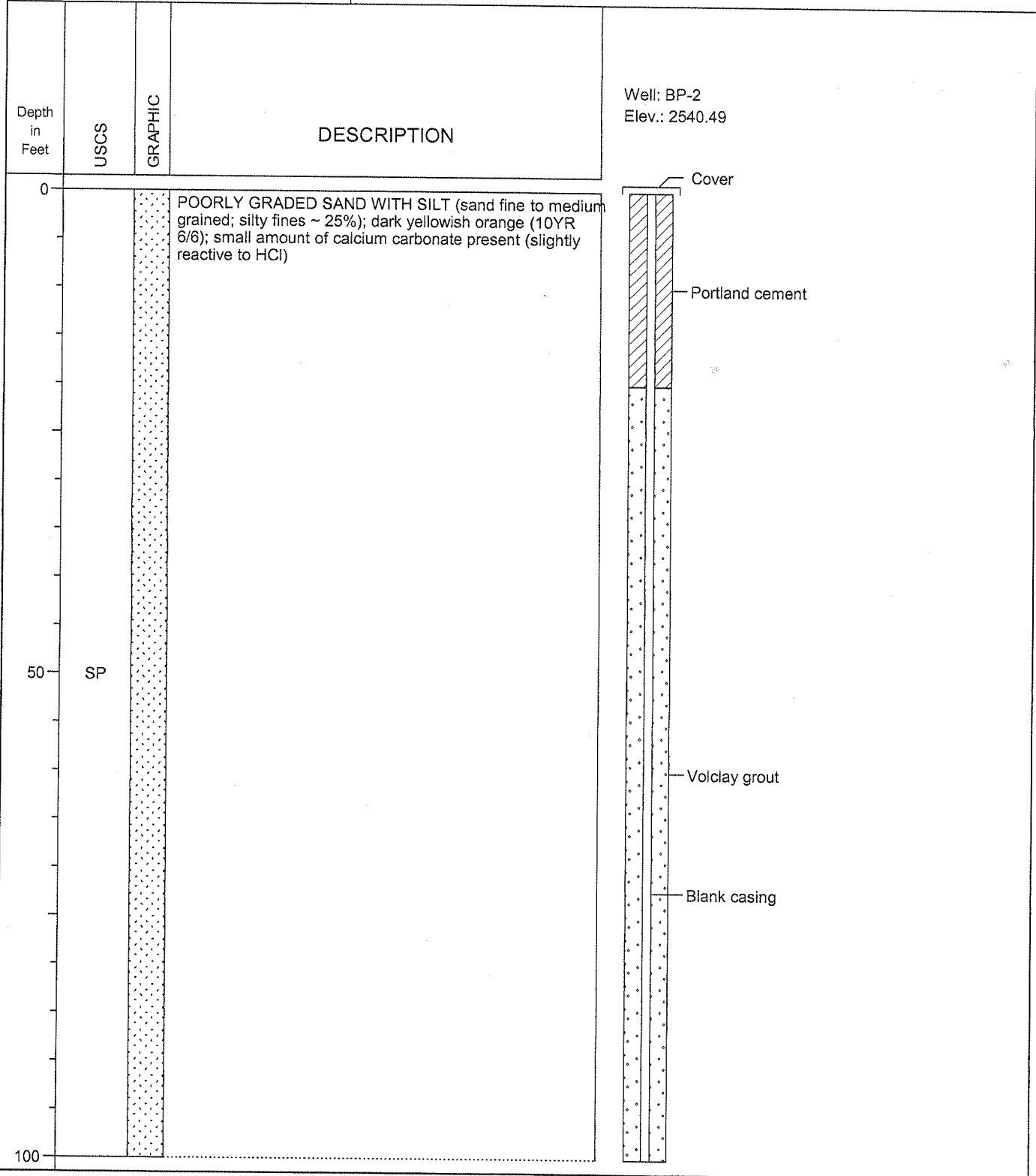
(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 6, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589349

6063 East Rosewood



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LOG OF BORING BP-2

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 6, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589349

6063 East Rosewood

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-2
Elev.: 2540.49

100			
	SP		grayish orange (10YR 7/4); no reaction to HCl
150	SW		WELL GRADED SAND (silty fines ~ 10-15%); moderate yellowish brown (10YR 5/4)
	SP		POORLY GRADED SAND (sand medium to coarse grained) fine grained gravel present (up to 0.5" in diameter)
200			



Volclay grout

Blank casing

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LOG OF BORING BP-2

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

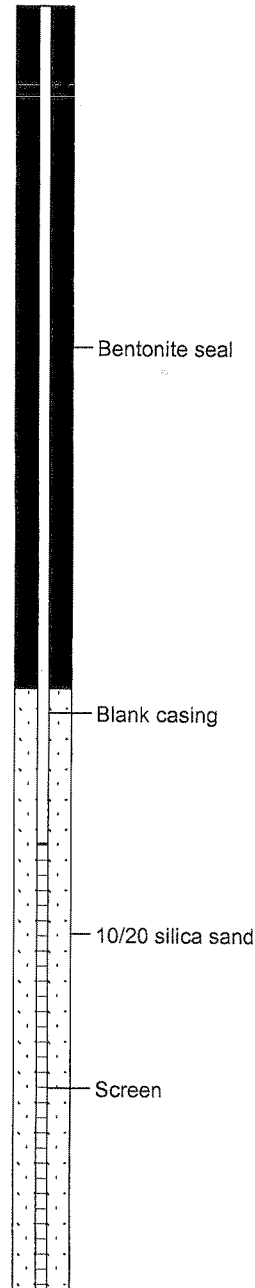
Start Date : December 6, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589349

6063 East Rosewood

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
200	SP		
250	GW		WELL GRADED GRAVEL WITH SAND (angular gravel up to 0.5" in diameter); grayish orange (10YR 7/4)
300	SW		WELL GRADED SAND; moderate yellowish brown (10YR 5/4)

Well: BP-2
Elev.: 2540.49



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LOG OF BORING BP-2

(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 6, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589349

6063 East Rosewood

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-2
Elev.: 2540.49

300

SW

fine to medium grained angular gravel present (up to 1" in diameter), likely of gneissic composition; silt ~ 10-15%

increase in silt fraction to ~ 25%

350

GP

POORLY GRADED GRAVEL (angular gravel ~ 0.25" in diameter); very pale orange (10YR 8/2)

400

10/20 silica sand

Screen

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LOG OF BORING BP-2

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

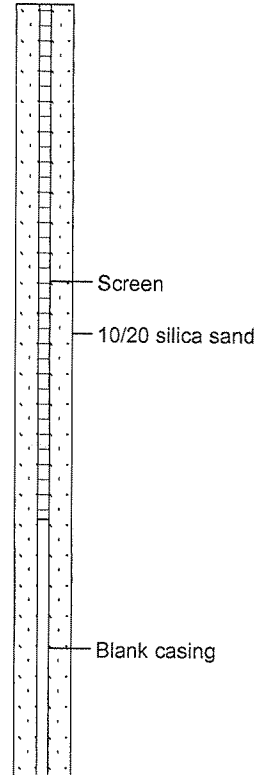
Start Date : December 6, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589349

6063 East Rosewood

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
400	GP		
	GW/SP		WELL GRADED SANDY GRAVEL TO POORLY GRADED GRAVELLY SAND (sand fine grained); gravel likely composed of a fragmented granitic schist or gneiss; garnets abundant
	SW		WELL GRADED SAND WITH GRAVEL (fine grained gravel up to 0.5" in diameter); garnets abundant gravel larger grained, up to 2" in diameter
450	GW		WELL GRADED GRAVEL WITH SAND; pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4) Boring BP-2 terminated at ~460 feet bgs.

Well: BP-2
Elev.: 2540.49



Note: Moisture content not noted in descriptions due to injection of water for dust control during drilling.

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LOG OF BORING BP-3

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 24, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589348

Sahuara Avenue

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-3
Elev.: 2533.41

0

WELL GRADED GRAVELLY, SILTY SAND; sand and gravel mostly subangular; ~10-15% gravel up to 0.75" in diameter; ~5-10% silty fines; grayish orange (10YR 7/4)

slight decrease in gravel; grayish orange (10YR 7/4) to light brown (5YR 6/4)

50

SW

decrease in silty fines to less than 5%; slight increase in gravel to ~15%; sand medium to coarse grained; grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2)

slight increase in silty fines; slight decrease in gravel; gravel up to ~1.25" in diameter; grayish orange (10YR 7/4) to light brown (5YR 6/4)

decrease in silty fines to less than 5%; slight increase in gravel to ~15%; grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2)

100

Cover

Portland cement

Volclay grout

Blank casing

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LOG OF BORING BP-3

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 24, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589348

Sahuara Avenue

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	
100				Well: BP-3 Elev.: 2533.41
			gravel no longer present; sand less well graded	
			~10% fine gravel present; sand well graded; pale yellowish brown (10YR 6/2)	
150	SW		slight increase in silty fines; pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4)	Volclay grout
				Blank casing
200				

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LOG OF BORING BP-3

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 24, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

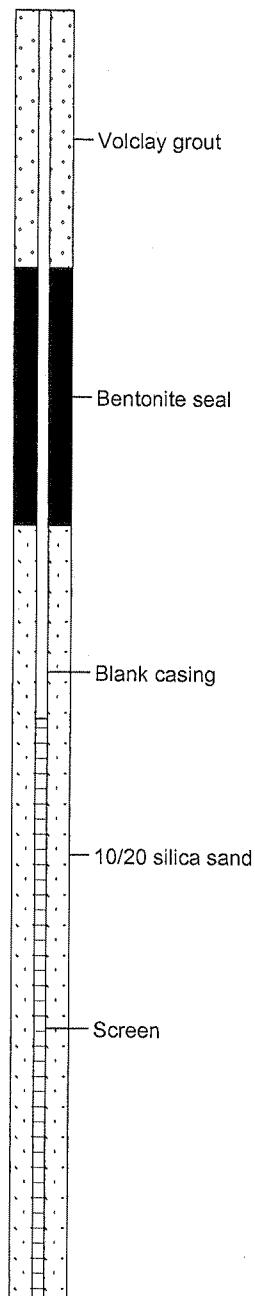
Slot Size : 0.020-inch
ADWR No. : 55-589348

Sahuara Avenue

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-3
Elev.: 2533.41

200	SW		
			POORLY GRADED SAND; sand medium grained; 5-10% silty fines; pale yellowish brown (10YR 6/2)
250			sand slightly more graded
	SP		
			sand finer grained and poorly graded
300			



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LOG OF BORING BP-3

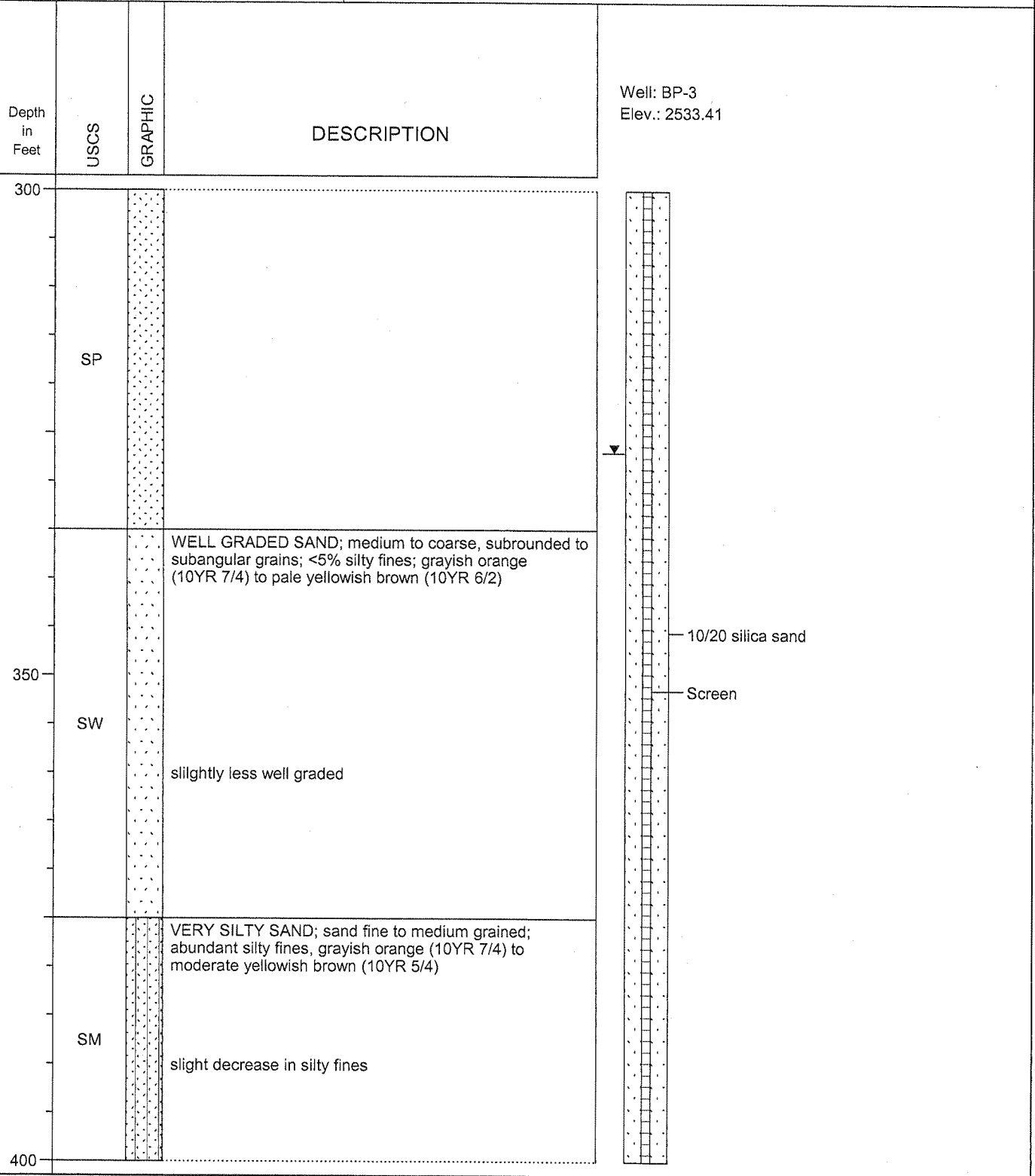
(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 24, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589348

Sahuara Avenue



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LOG OF BORING BP-3

(Page 5 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 24, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

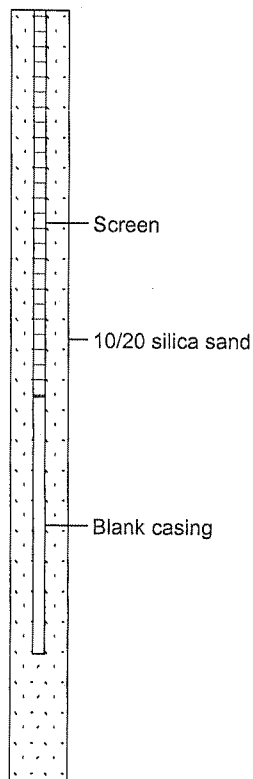
Slot Size : 0.020-inch
ADWR No. : 55-589348

Sahuara Avenue

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-3
Elev.: 2533.41

400			
	SM		continued decrease in silty fines; increase in sand grain size to medium to coarse
450			
			Boring BP-3 terminated at ~460' below surface grade.



Note:
Moisture content not noted as water was periodically
injected for dust control during drilling.

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LOG OF BORING BP-4

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 18, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589347

6056 East Baker Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-4
Elev.: 2547.31

0

SILTY SAND (sand fine to medium grained; small amount of angular gravel up to 0.25" in diameter); moderate yellowish brown (10YR 5/4)

SM

50

WELL GRADED SAND (trace amounts of rounded gravel up to 0.25" in diameter); grayish orange (10YR 7/4)

SW

SILTY SAND (sand medium grained; silty fines ~ 35-40%; no gravel)

SM

100

Cover

Portland cement

Volclay grout

Blank casing

SECOR INTERNATIONAL

Incorporated

LOG OF BORING BP-4

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 18, 2001

Slot Size : 0.020-inch

Drilling Company : WDC Exploration

ADWR No. : 55-589347

Drilling Method : ARCH

SECOR Rep on-site : Ed Vandegrift

Well Casing Diameter : 5-inch PVC

6056 East Baker Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-4
Elev.: 2547.31

100

SM

SP

POORLY GRADED CLEAN SAND (sand coarse grained); very pale orange (10YR 8/2)

WELL GRADED SAND (less than 5% silty fines); moderate yellowish brown (10YR 5/4)

SW

rounded gravel present, ~ 5%

150

SILTY SAND WITH GRAVEL (silty fines ~ 30%; angular gravel up to 1" in diameter ~ 20%); moderate yellowish brown (10YR 5/4)

SM

gravel no longer present; slight increase in silty fines to ~ 35%

200

Volclay grout

Blank casing

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LOG OF BORING BP-4

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

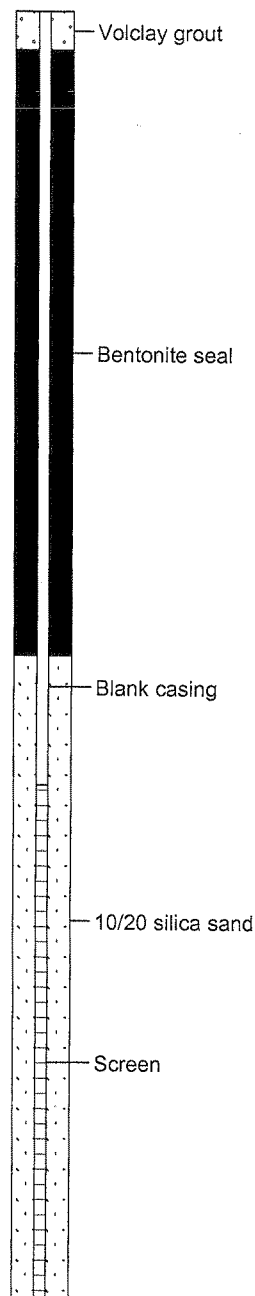
Start Date : December 18, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589347

6056 East Baker Street

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
200	SM		
	SP		POORLY GRADED SAND WITH SILT (sand fine to medium grained; silty fines ~ 10%); grayish orange (10YR 7/4)
250	GW		WELL GRADED GRAVEL WITH SAND (gravel up to 1" in diameter; sand ~ 15%; less than 5% silty fines); dark yellowish orange (10YR 6/6); gravel mostly composed of white quartz and mica
	SM		SILTY SAND (sand fine to medium grained; silty fines ~ 40%; no gravel present); moderate yellowish brown (10YR 5/4)
300	GW		WELL GRADED GRAVEL WITH SAND (gravel up to 1" in diameter; sand ~ 15%; less than 5% silty fines); dark yellowish orange (10YR 6/6); gravel mostly composed of white quartz and mica

Well: BP-4
Elev.: 2547.31



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LOG OF BORING BP-4

(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 18, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589347

6056 East Baker Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-4
Elev.: 2547.31

300

GW

SW

WELL GRADED SAND (less than 5% silty fines; no
gravel present); dark yellowish orange (10YR 6/6)

SILTY SAND (sand fine to medium grained; silty fines
~ 35-40%; no gravel present); pale yellowish brown
(10YR 6/2)

slight increase in silt fraction

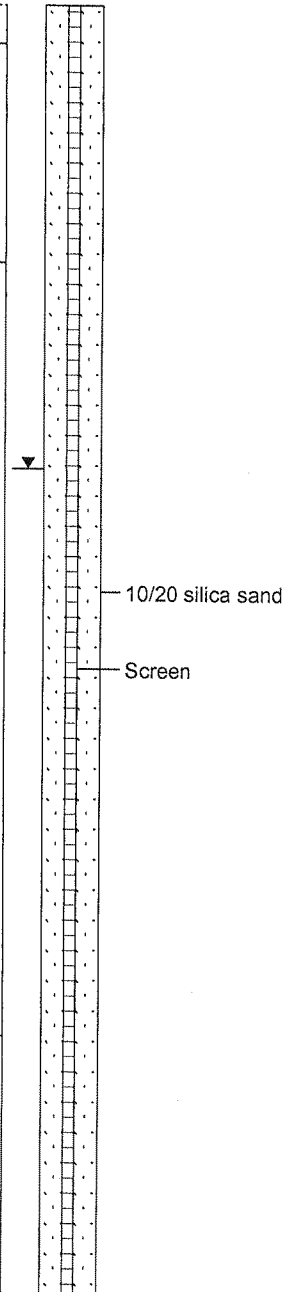
350

SM

SW

WELL GRADED GRAVELLY SAND (gravel up to 1" in
diameter; less than 5% silty fines); very pale orange
(10YR 8/2); gravel appears to be fragments of granitic
schist

400



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LOG OF BORING BP-4

(Page 5 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 18, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589347

6056 East Baker Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-4
Elev.: 2547.31

400

SW

SM

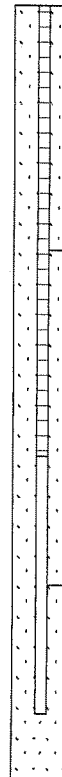
WELL GRADED SILTY SAND (silty fines ~ 35%); pale
yellowish brown (10YR 6/2)

WELL GRADED SAND WITH GRAVEL (gravel up to 2"
in diameter); pale yellowish brown (10YR 6/2)

SW

450

Boring BP-4 terminated at ~460 feet bgs.



Screen

10/20 silica sand

Blank casing

Note: Moisture content not noted in descriptions due to
injection of water for dust control during drilling.

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LOG OF BORING BP-5

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

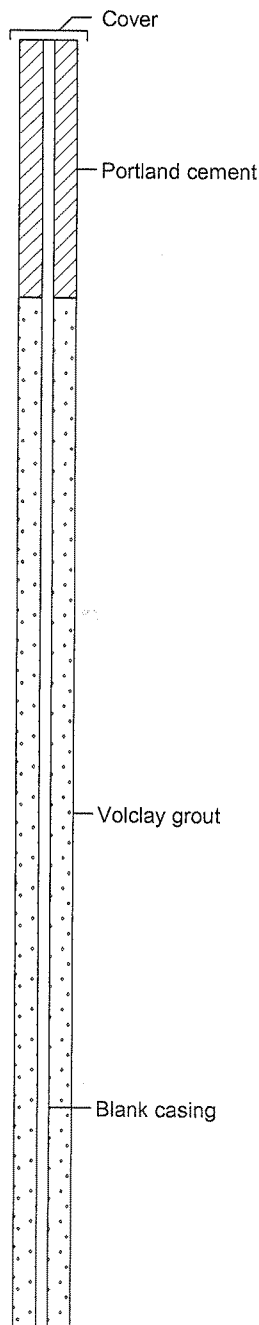
Start Date : January 10, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589346

6445 East Brian Kent

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			very hard, consolidated layer of caliche from approximately 3 to 6 feet below grade
	SM		SILTY SAND (sand moderately well graded; silty fines ~ 25%); grayish orange (10YR 7/4); small fragments of caliche still present
	SW		WELL GRADED SILTY GRAVELLY SAND (sand mostly medium and coarse grained; angular gravel up to ~ 0.5in. in diameter ~ 15%; silty fines ~ 10%); grayish orange (10YR 7/4)
	GW		WELL GRADED SANDY GRAVEL (fine grained, angular gravel [up to ~ 0.75in. in diameter]; sand coarse grained; silty fines less than 5%); color difficult to distinguish due to variation in mineral composition of gravel, most like pale yellowish brown (10YR 6/2)
			WELL GRADED SILTY GRAVELLY SAND (sand mostly medium and coarse grained; angular gravel up to ~ 0.5in. in diameter ~ 15%; silty fines ~ 10%); grayish orange (10YR 7/4)
50	SW		subangular to subrounded gravel up to ~ 1in. in diameter; increase in silty fines to ~ 15%; light brown (5YR 6/4)
			sand slightly less well graded; decrease in silty fines to ~ 5%; pale yellowish brown (10YR 6/2)
100	SP		POORLY GRADED SAND (subangular to subrounded, medium grained sand; less than 5% silty fines); grayish orange (10YR 7/4)

Well: BP-5
Elev.: 2570.38



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LOG OF BORING BP-5

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 10, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589346

6445 East Brian Kent

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-5
Elev.: 2570.38

100

SP

slight increase in gradation

sand finer grained; pale yellowish brown (10YR 6/2)

150

SW

WELL GRADED GRAVELLY SILTY SAND (sand grains subangular to subrounded; fine grained, angular to subangular gravel ~ 10%; silty fines ~ 5-10%); grayish orange (10YR 7/4)

increase in silty fine fraction to ~ 15%; gravel up to ~ 0.5in. in diameter; grayish orange (10YR 7/4) to light brown (5YR 6/4)

200

Volclay grout

Blank casing

**SECOR
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LOG OF BORING BP-5

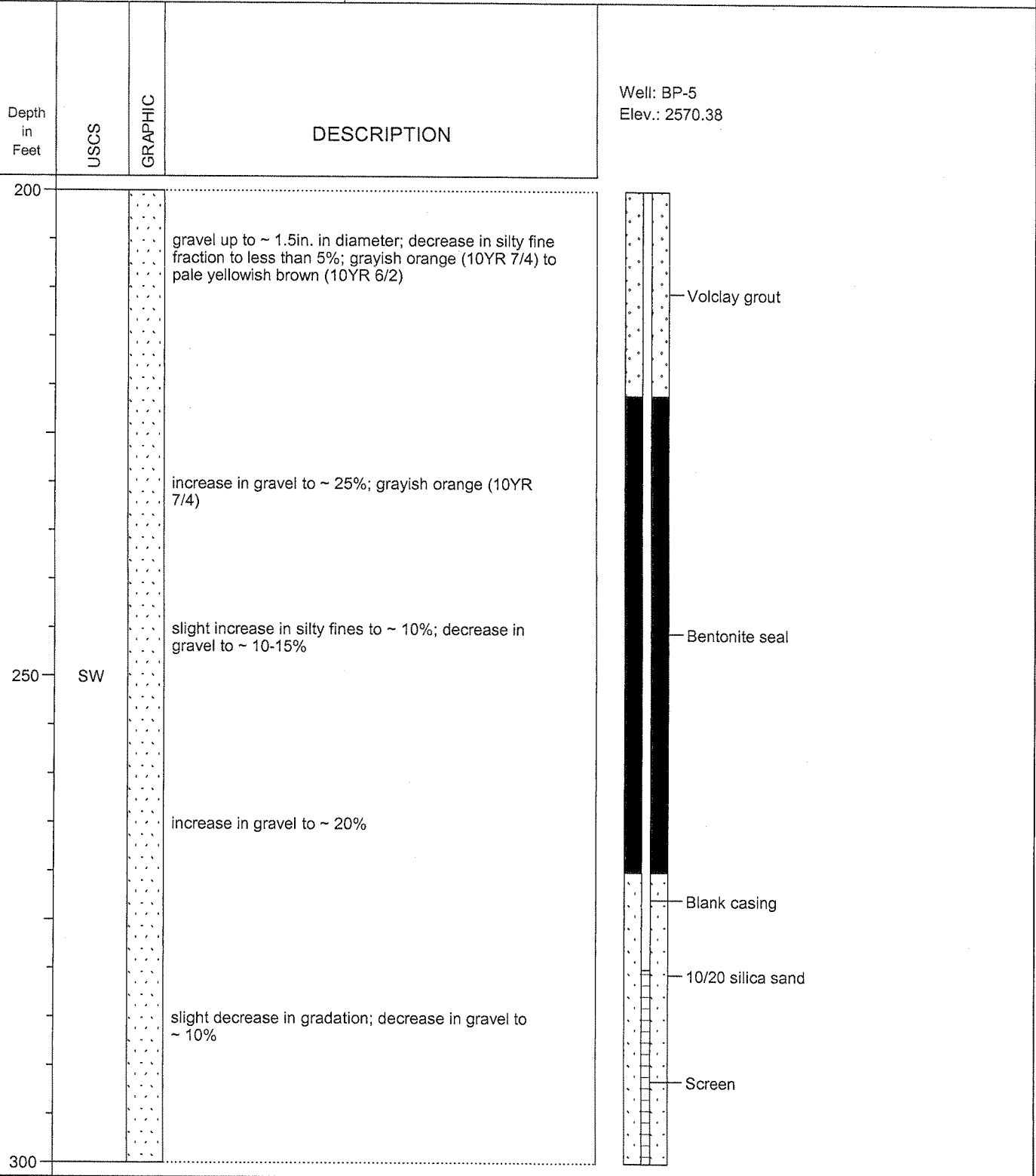
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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 10, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589346

6445 East Brian Kent



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LOG OF BORING BP-5

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : January 10, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589346

6445 East Brian Kent

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-5
Elev.: 2570.38

300

SW

POORLY GRADED GRAVELLY SILTY SAND
(subrounded, medium grained sand; subangular fine
grained gravel ~ 5-10%; silty fines ~ 5-10%; grayish
orange (10YR 7/4))

SP

350

SW

MODERATELY WELL GRADED GRAVELLY SAND
(sand coarser grained and mostly subangular;
subangular, fine grained gravel [up to ~ 0.75in. in
diameter] ~ 10%; less than 5% silty fines); pale
yellowish brown (10YR 6/2); slightly damp to damp*

GW/SW

WELL GRADED SANDY GRAVEL TO WELL GRADED
GRAVELLY SAND (subangular gravel up to ~ 1in. in
diameter; subrounded to rounded, medium to coarse
grained sand); pale yellowish brown (10YR 6/2);
moist*

SP

POORLY GRADED SILTY GRAVELLY SAND
(sand medium to coarse grained and subrounded to
rounded; silty fines ~ 10-15%; subrounded gravel up
to ~ 0.75in. in diameter ~ 10%; grayish orange (10YR
7/4) to pale yellowish brown (10YR 6/2); wet*

GW

WELL GRADED SANDY GRAVEL (gravel angular and
mostly coarse grained [up to ~ 2in. in diameter];
coarse grained sand ~ 10-15%)

SW

MODERATELY WELL GRADED GRAVELLY SAND
(sand subrounded to rounded; gravel angular and
mostly fine grained [up to ~ 0.5in. in diameter] ~ 20%;
less than 5% silty fines); pale yellowish brown (10YR
6/2)

400

10/20 silica sand

Screen

**SECOR
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LOG OF BORING BP-7

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 14, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589343

7034 East Kingston Drive

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-7
Elev.: 2579.35

0

SP

POORLY GRADED GRAVELLY SAND (sand medium to coarse grained and subrounded; gravel ~ 10-15% and subangular; less than 5% silt); moderate yellowish brown (10YR 5/4)

gravel no longer present; mostly medium grained sand

50

SW

WELL GRADED GRAVELLY SAND (appreciable amount of gravel, ~ 30%; less than 5% silt; mostly subangular grains); moderate yellowish brown (10YR 5/4)

slight decrease in gravel; slightly less well graded

SP

POORLY GRADED SAND (sand medium to coarse grained and mostly subrounded; less than 5% fine gravel and silt); moderate yellowish brown (10YR 5/4)

100

Cover

Portland cement

Volclay grout

Blank casing

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LOG OF BORING BP-7

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 14, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589343

7034 East Kingston Drive

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-7
Elev.: 2579.35

100

SP

fine gravel ~ 10-15%

150

gravel no longer present

Volclay grout

MODERATELY WELL GRADED GRAVELLY SAND
(gravel mostly fine grained, ~ 15%; less than 5% silt;
grains mostly subrounded); moderate yellowish
brown (10YR 5/4)

SW

gravel fine to medium grained

Blank casing

200

**SECOR
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LOG OF BORING BP-7

(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 14, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

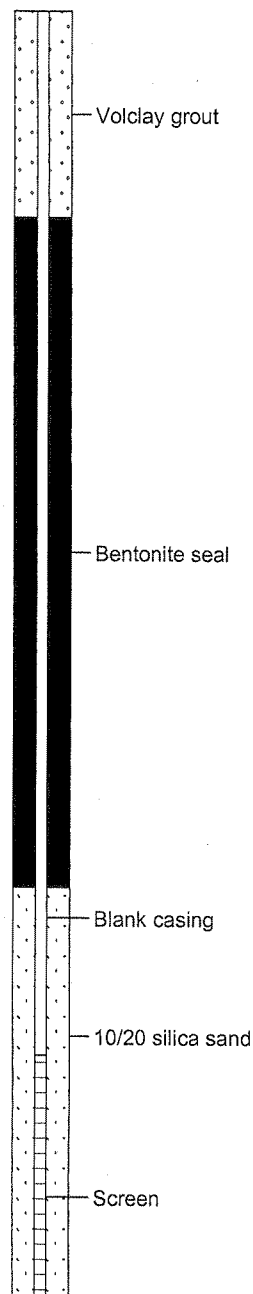
Slot Size : 0.020-inch
ADWR No. : 55-589343

7034 East Kingston Drive

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-7
Elev.: 2579.35

200	SW		
	SP		POORLY GRADED SAND (sand medium to coarse grained and mostly subrounded; less than 5% fine gravel and silt); moderate yellowish brown (10YR 5/4)
250	SW		WELL GRADED GRAVELLY SAND (fine grained gravel ~ 30-35%; less than 5% silt; subangular to subrounded grains); pale yellowish brown (10YR 6/2)
	SP		POORLY GRADED GRAVELLY SAND (sand medium to coarse grained; fine gravel ~ 10%; less than 5% silt; grains mostly subrounded); pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4)
300	SW		MODERATELY WELL GRADED GRAVELLY SAND (fine gravel ~ 10-12%; less than 5% silt; subangular to subrounded grains); grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2)



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LOG OF BORING BP-7

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 14, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

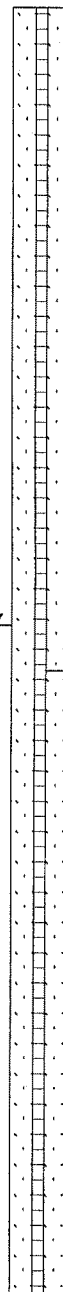
Slot Size : 0.020-inch
ADWR No. : 55-589343

7034 East Kingston Drive

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-7
Elev.: 2579.35

300	SW		
	SP		POORLY GRADED SAND (sand medium to coarse grained and mostly subrounded; less than 5% fine gravel and silt); grayish orange (10YR 7/4)
	SW		WELL GRADED GRAVELLY SAND (fine to medium grained gravel ~ 25-30%; less than 5% silt); pale yellowish brown (10YR 6/2)
	SM		SILTY SAND (appreciable amount of silt and moderate amount of clay present)
	GW		SANDY WELL GRADED GRAVEL (angular gravel; less than 5% silt); gneiss/schist fragments with garnets
350			
	SP		POORLY GRADED GRAVELLY SAND (sand coarse grained; gravel mostly fine grained, ~ 15-20%; silt ~ 5-8%; grains mostly subrounded); moderate yellowish brown (10YR 5/4); garnets abundant
			slight increase in silt, ~ 10-15%; sand medium to coarse grained and subangular; grayish orange (10YR 7/4)
400			



10/20 silica sand

Screen

**SECOR
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LOG OF BORING BP-7

(Page 5 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

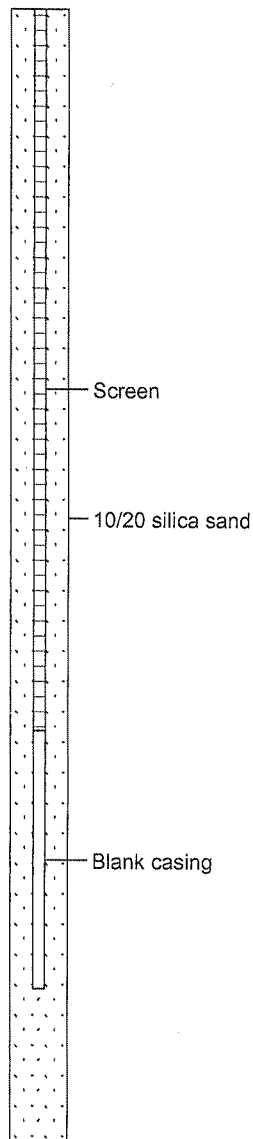
Start Date : December 14, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589343

7034 East Kingston Drive

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	
400	SP			
	SW/GW		WELL GRADED GRAVELLY SAND TO WELL GRADED SANDY GRAVEL (sand coarse grained; gravel fine grained; less than 5% silt; angular to subangular grains); grayish orange (10YR 7/4)	
			MODERATELY WELL GRADED GRAVELLY SAND (gravel up to 2in. in diameter, ~ 15%; less than 5% silt; angular to subangular grains); pale yellowish brown (10YR 6/2)	
450	SW		increase in gravel, ~ 30%	
			Boring BP-9 terminated at ~488 feet bgs.	
500				

Well: BP-7
Elev.: 2579.35



Note: Moisture content not noted in descriptions due to injection of water for dust control during drilling.

**SECOR
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LOG OF BORING BP-8

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : July 9, 2001
Drilling Company : WDC Exploration
Drilling Method : Stratex/ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-587095

7055 East Broadway Boulevard

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-8
Elev.: 2602.64

0

GP

Two layers of asphalt pavement (5-in thick total)
POORLY-GRADED GRAVEL WITH SAND
(coarse-grained sand, gravel to 2-cm diameter, trace
silt); pale yellowish brown (10YR 6/2); dry.

SW

WELL GRADED SAND (~5% coarse gravel to 2-cm
diameter); moderate brown (5YR 4/4); slightly damp.

50

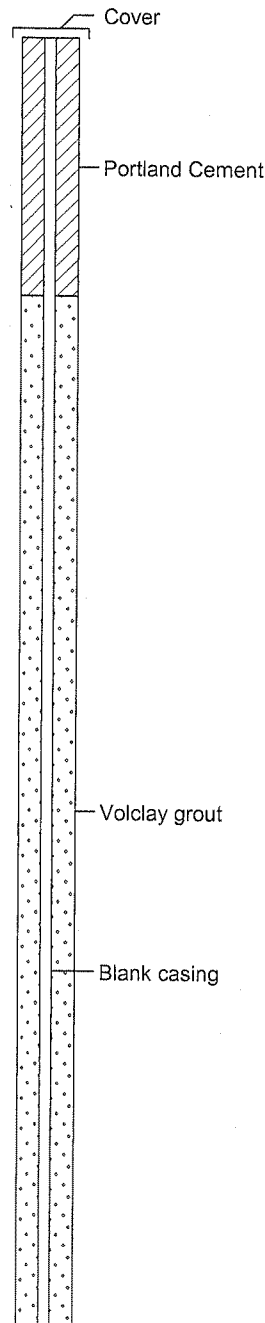
GP

POORLY-GRADED GRAVEL (~15% coarse-grained
sand with little to no fines); moderate yellowish brown
(10YR 5/4); dry to slightly damp; no odors.

SW

WELL GRADED SAND WITH GRAVEL (~25% gravel to
1-cm diameter); pale yellowish brown (10YR 6/2);
damp.

100



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LOG OF BORING BP-8

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : July 9, 2001
Drilling Company : WDC Exploration
Drilling Method : Stratex/ARCH

Slot Size : 0.020-inch
ADWR No. : 55-587095

7055 East Broadway Boulevard

SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-8
Elev.: 2602.64

100

SW

POORLY-GRADED SAND WITH GRAVEL (gravel to
1.5-cm diameter); pale yellowish brown (10YR 6/2);
dry.

decreasing gravel

gravel size to 0.6-cm diameter maximum

150

SP

slightly damp, increase in brown hue (10YR 6/2)

as above, dry to slightly damp

200

Volclay grout

Blank casing

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LOG OF BORING BP-8

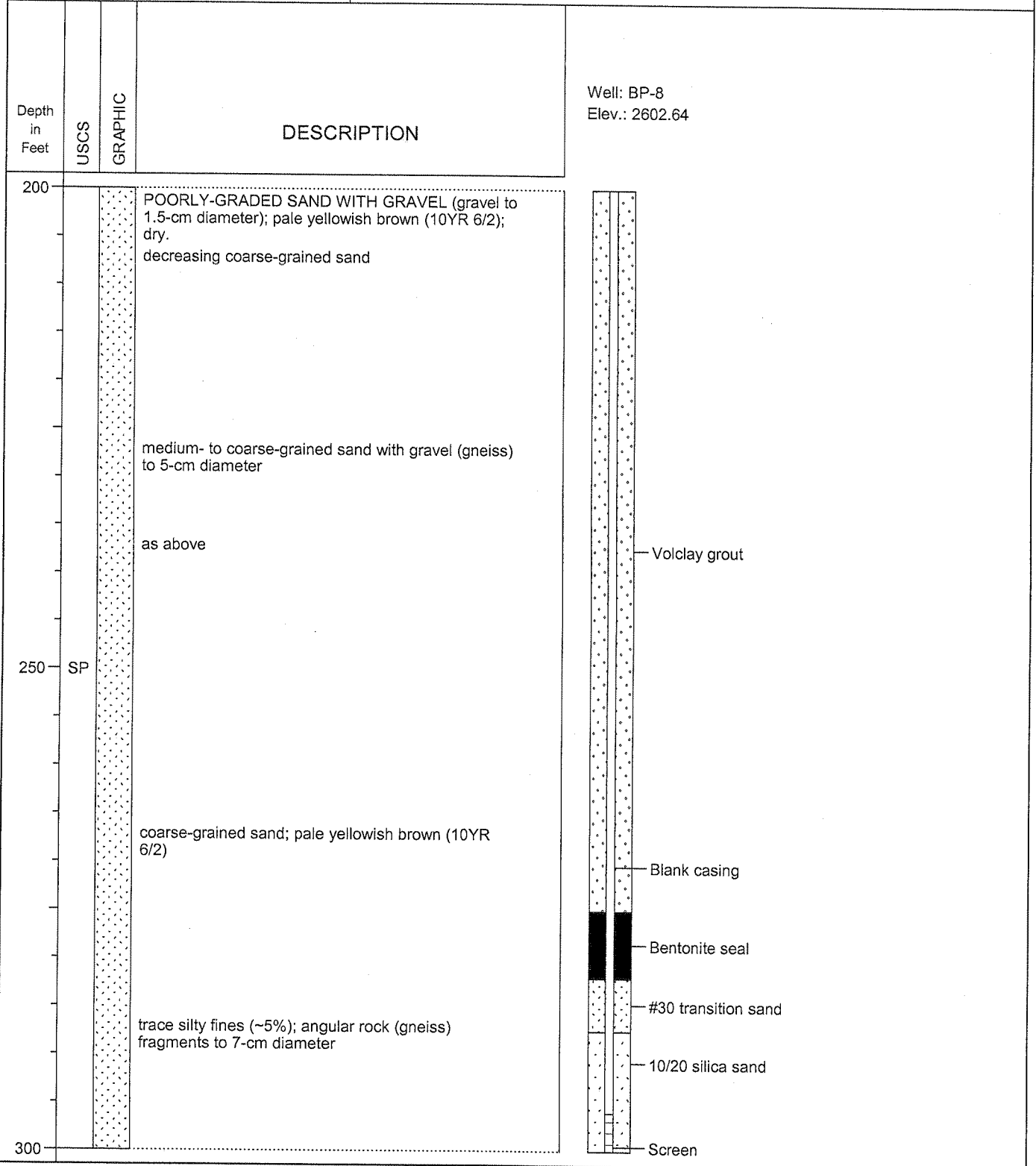
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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : July 9, 2001
Drilling Company : WDC Exploration
Drilling Method : Stratex/ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-587095

7055 East Broadway Boulevard



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LOG OF BORING BP-8

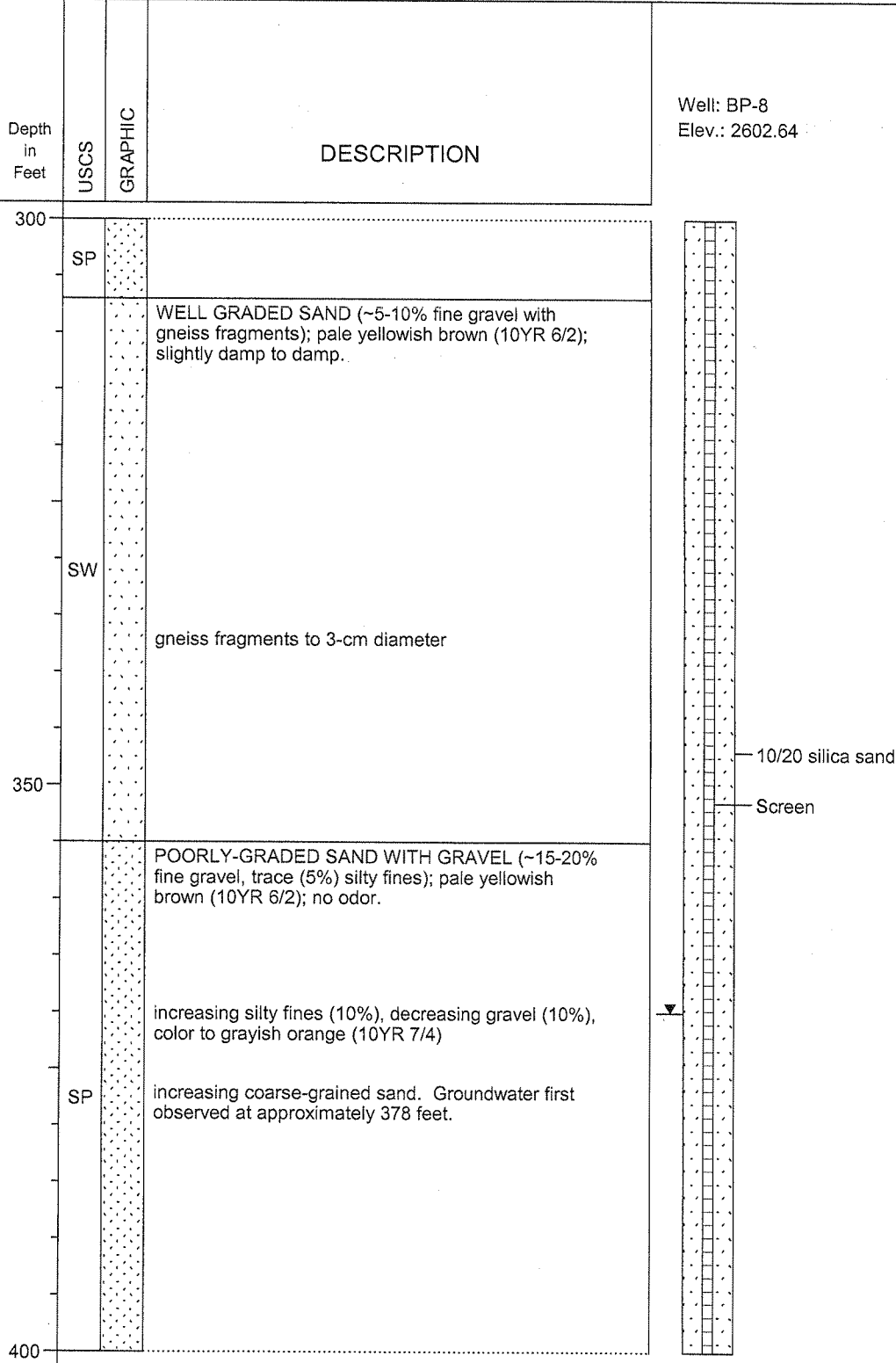
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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : July 9, 2001
Drilling Company : WDC Exploration
Drilling Method : Stratex/ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-587095

7055 East Broadway Boulevard



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LOG OF BORING BP-8

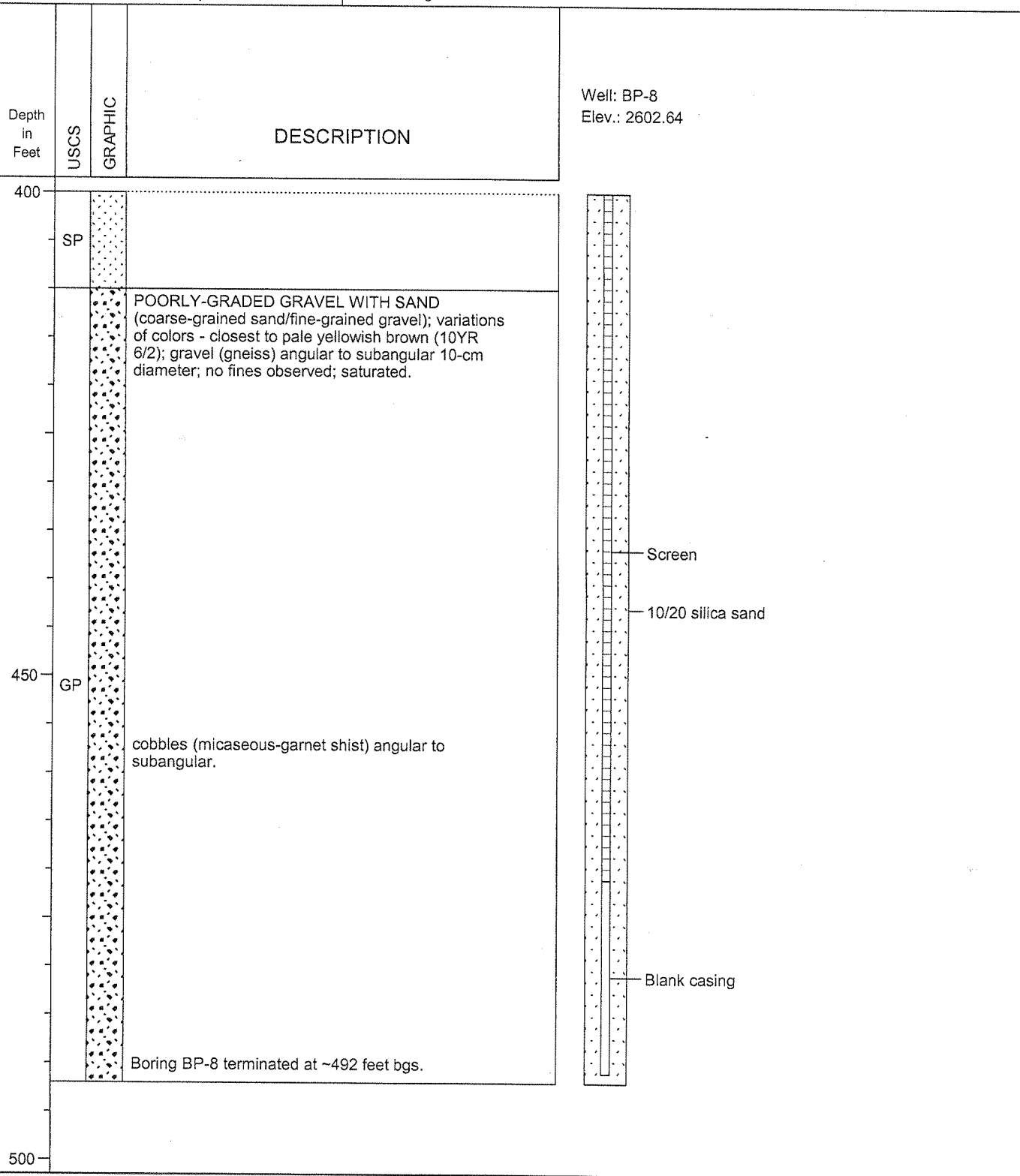
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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : July 9, 2001
Drilling Company : WDC Exploration
Drilling Method : Stratex/ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-587095

7055 East Broadway Boulevard



**SECOR
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LOG OF BORING BP-9

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 7, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

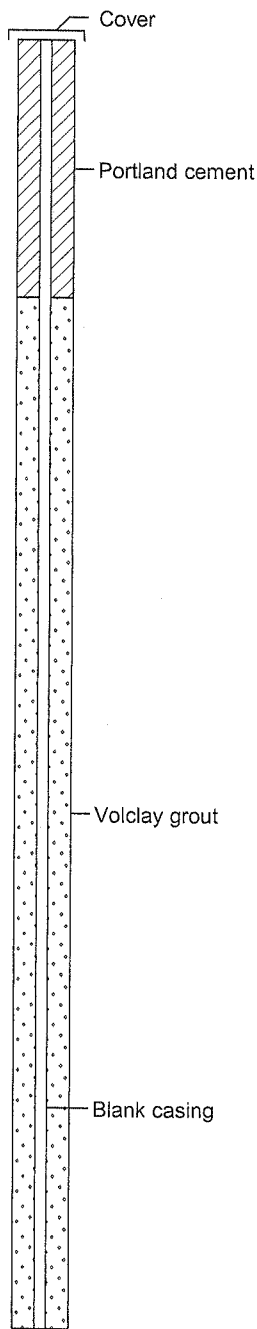
Slot Size : 0.020-inch
ADWR No. : 55-589342

7525 East Broadway Boulevard

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-9
Elev.: 2581.80

0			MODERATELY WELL GRADED GRAVELLY SAND (sand medium to coarse grained; fine grained gravel ~ 10%; silt ~ 5%; subangular to subrounded grains); moderate brown (5YR 4/4)
50	SW		increase in finer grained sand; grayish orange (10YR 7/4)
			increase in coarser grained sand; slight decrease in silt; light brown (5YR 6/4)
100	SP		POORLY GRADED SAND (sand mostly medium grained with small amount of fine and coarse grains; less than 5% gravel and silt; subrounded grains); light brown (5YR 6/4)



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LOG OF BORING BP-9

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 7, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589342

7525 East Broadway Boulevard

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-9
Elev.: 2581.80

100

SP

slight increase in silt; grayish orange (10YR 7/4)

SILTY SAND (sand medium to fine grained; fine
grained gravel less than 5%; silt ~ 10-15%); moderate
yellowish brown (10YR 5/4)

150

SM

slight decrease in silt; fine and medium grained gravel
less than 5% (up to ~ 1in. in diameter); increase in
coarser grained sand; light brown (5YR 6/4)

POORLY GRADED GRAVELLY SAND (sand medium to
coarse grained; fine to medium grained gravel ~ 5-7%
(up to ~ 1in. in diameter)); light brown (5YR 6/4)

SP

200

Volclay grout

Blank casing

**SECOR
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LOG OF BORING BP-9

(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 7, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

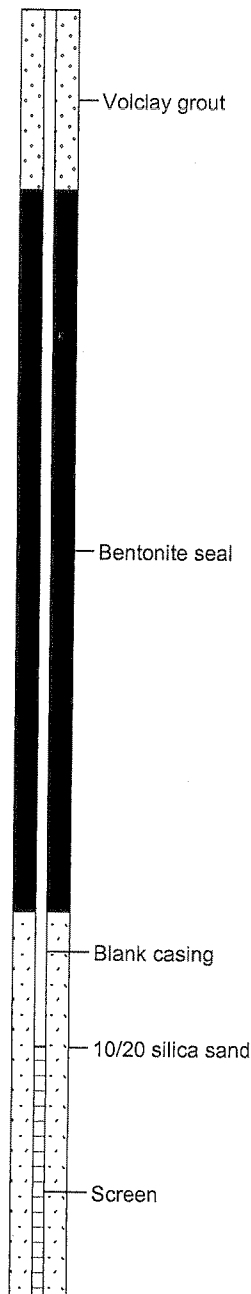
Slot Size : 0.020-inch
ADWR No. : 55-589342

7525 East Broadway Boulevard

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-9
Elev.: 2581.80

200			gravel no longer present; silt present (less than 5%); subrounded to rounded sand grains; moderate yellowish brown (10YR 5/4)
	SP		
			MODERATELY WELL GRADED GRAVELLY SAND (sand medium to coarse grained; fine gravel ~ 15%; less than 5% silt; subangular to subrounded grains); grayish orange (10YR 7/4)
250	SW		slight decrease in gravel; light brown (5YR 6/4)
			POORLY GRADED SAND (sand medium to coarse grained; less than 5% gravel and silt; subrounded to rounded grains); moderate yellowish brown (10YR 5/4)
	SP		sand fine to medium grained; grayish orange (10YR 7/4)
300			



LOG OF BORING BP-9

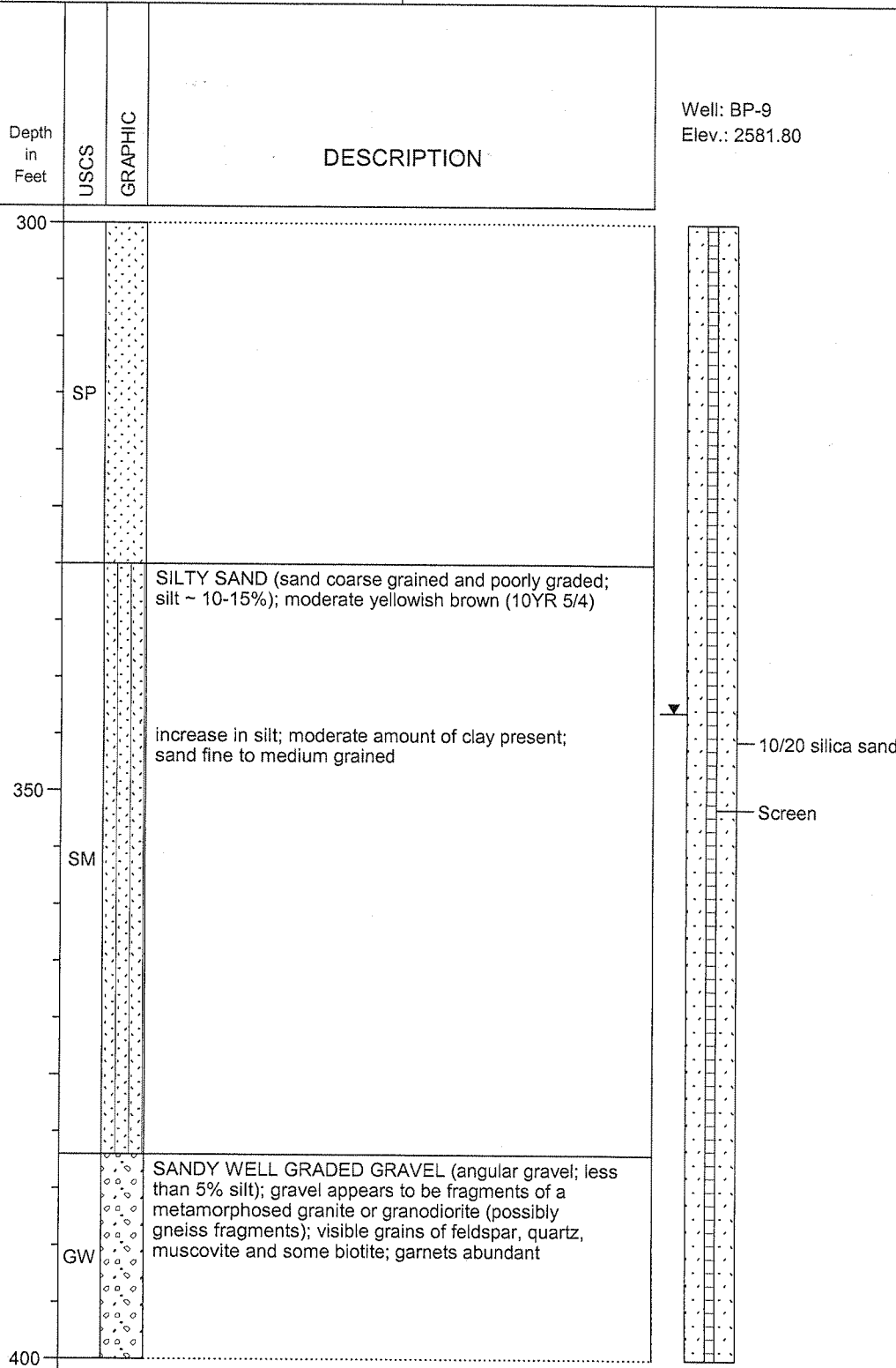
(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : December 7, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589342

7525 East Broadway Boulevard



<p>SECOR INTERNATIONAL Incorporated</p>	<p>LOG OF BORING BP-9</p> <p>(Page 5 of 5)</p>
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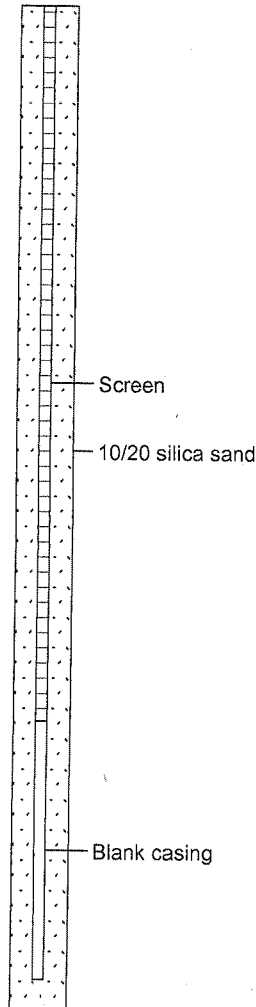
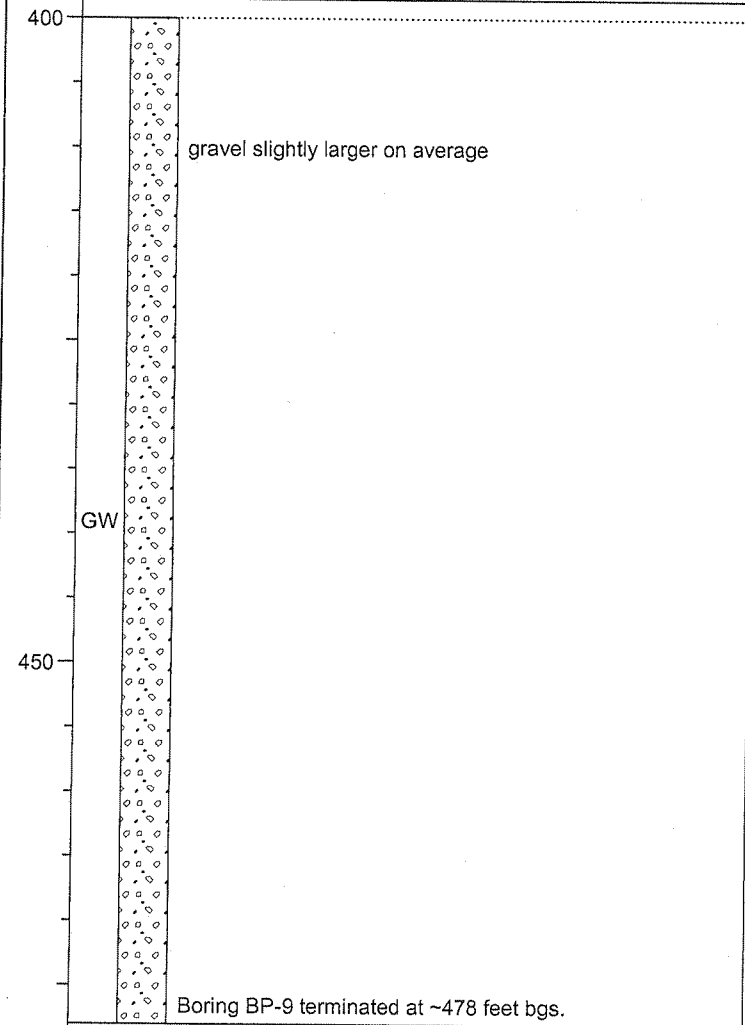
Arizona Department of Environmental Quality Broadway-Pantano WQARF Site	Start Date	: December 7, 2001	Slot Size	: 0.020-inch
	Drilling Company	: WDC Exploration	ADWR No.	: 55-589342
	Drilling Method	: ARCH		

Start Date : December 7, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

7525 East Broadway Boulevard

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-9
Elev.: 2581.80



Note: Moisture content not noted in descriptions due to injection of water for dust control during drilling.

**SECOR
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LOG OF BORING BP-10

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 28, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegriff
Well Casing Diameter : 5-inch PVC

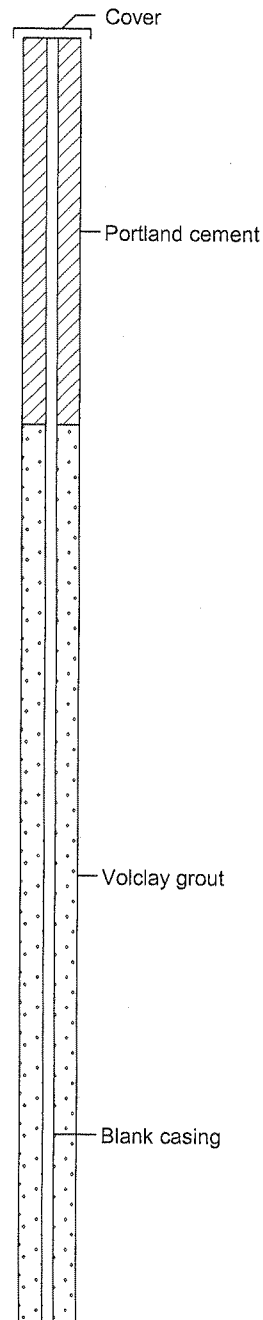
Slot Size : 0.020-inch
ADWR No. : 55-589341

7342 East Broadway Boulevard

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-10
Elev.: 2594.93

0			WELL GRADED SAND WITH SILT (silty fines ~ 20%); moderate brown (5YR 4/4)
50	SW		sand fine to medium grained; moderate yellowish brown (10YR 5/4)
			moderate reddish brown (10YR 4/6)
			moderate yellowish brown (10YR 5/4)
100			



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LOG OF BORING BP-10

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 28, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589341

7342 East Broadway Boulevard

Depth in Feet	USCS	GRAPHIC	DESCRIPTION	
100	SW			
	SW/SM		WELL GRADED SILTY SAND (silty fines ~ 35-40%); moderate yellowish brown (10YR 5/4)	
			trace amounts of angular fine gravel (up to 0.25" in diameter); grayish orange (10YR 7/4)	
150			WELL GRADED SAND WITH GRAVEL (angular, fine to medium grained gravel [up to 0.5" in diameter] ~ 30%); grayish orange (10YR 7/4)	
	SW		silty fines present, ~ 15-20%; coarse grained gravel (1-2" in diameter) also present	
	SW/SM		WELL GRADED SILTY SAND (silty fines ~ 40%; angular, fine to medium grained gravel [up to 1" in diameter] ~ 5-10%); moderate brown (5YR 4/4)	
200				

Well: BP-10
Elev.: 2594.93

Volclay grout

Blank casing

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LOG OF BORING BP-10

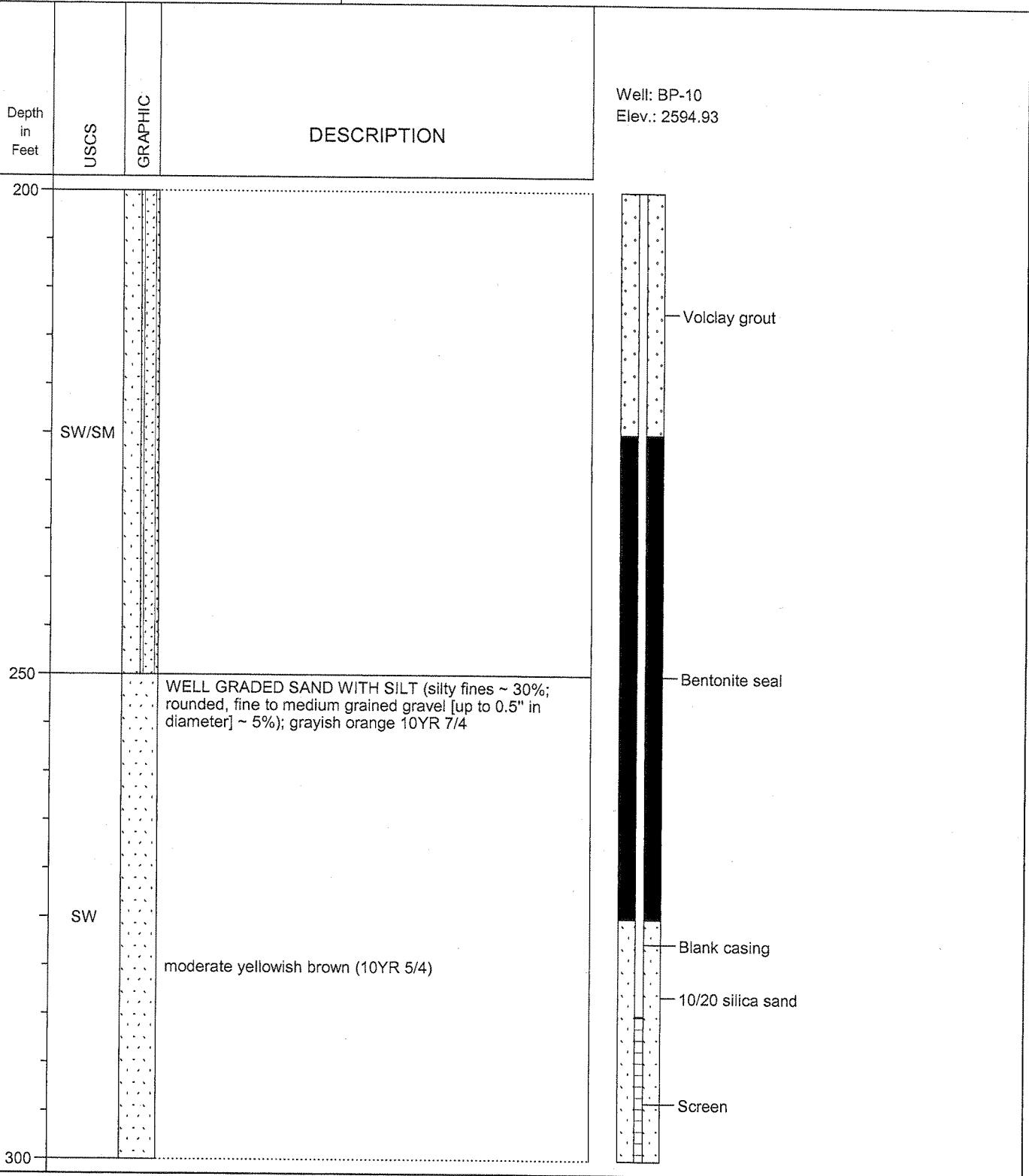
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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 28, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589341

7342 East Broadway Boulevard



**SECOR
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LOG OF BORING BP-10

(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 28, 2001

Slot Size : 0.020-inch

Drilling Company : WDC Exploration

ADWR No. : 55-589341

Drilling Method : ARCH

SECOR Rep on-site : Ed Vandegrift

Well Casing Diameter : 5-inch PVC

7342 East Broadway Boulevard

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-10
Elev.: 2594.93

300

SW

angular gravel up to 2" in diameter

SW/SM

WELL GRADED SILTY SAND (silty fines ~ 35-40%;
angular, fine grained gravel [up to 0.25" in diameter]
~5%); grayish orange (10YR 7/4)

350

SW

WELL GRADED SAND (silty fines ~ 10%; no gravel
present); moderate yellowish brown (10YR 5/4)

GW/SW

WELL GRADED SANDY GRAVEL TO WELL GRADED
GRAVELLY SAND (silty fines ~ 10%)

400

10/20 silica sand

Screen

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LOG OF BORING BP-10

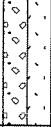

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Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

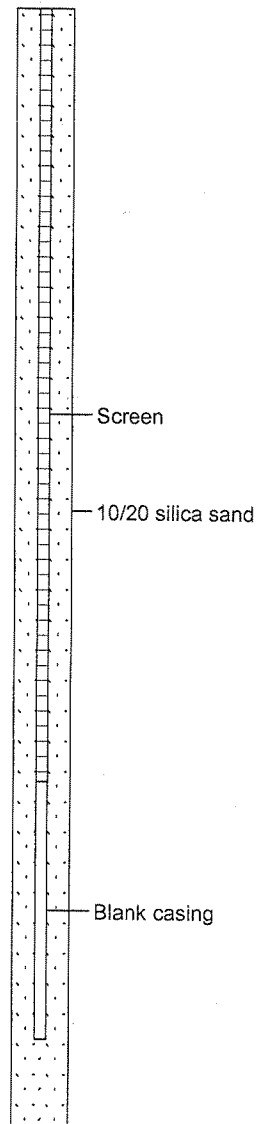
Start Date : November 28, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589341

7342 East Broadway Boulevard

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
400	GW/SW		
			WELL GRADED SANDY GRAVEL (angular, fine to medium grained gravel [up to 1" in diameter]; sand medium to coarse grained); pale yellowish brown (10YR 6/2)
450	GW		
			Boring BP-10 terminated at ~487 feet bgs.
500			

Well: BP-10
Elev.: 2594.93



Note: Moisture content not noted in descriptions due to injection of water for dust control during drilling.

**SECOR
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LOG OF BORING BP-11

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : August 20, 2001

Slot Size : 0.020-inch

Drilling Company : THF

ADWR No. : 55-588207

Drilling Method : ARCH

SECOR Reps on-site : Keli Mandeville/Ed Vandegrift

Well Casing Diameter : 5-inch

Broadway South Landfill

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-11
Elev.: 2606.97

0

AB

Approximately 3 feet of soil cap covering landfill

LF

Landfill Material: newspaper bits, glass shards, wood fragments, plastic, gravel, soil

Approximate end of landfill material

WELL GRADED GRAVELLY SAND (medium to coarse grained sand; ~25% angular to sub-angular, fine to medium grained gravel; ~5% silt/clay); grayish orange (10YR 7/4); slightly damp; no odor

decreasing gravel; less damp

50

SW

gravel mostly fine grained; increasing brownish tint, light brown (5YR 5/6)

slight increase in brownish red color, moderate brown (5YR 4/4)

100

Cover

Blank Steel Casing

Portland Cement

Blank PVC Casing

Volclay Grout

SECOR INTERNATIONAL

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LOG OF BORING BP-11

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : August 20, 2001

Slot Size : 0.020-inch

Drilling Company : THF

ADWR No. : 55-588207

Drilling Method : ARCH

SECOR Reps on-site : Keli Mandeville/Ed Vandegrift

Broadway South Landfill

Well Casing Diameter : 5-inch

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-11
Elev.: 2606.97

100	SW		
	GW/SW		CLEAN, SANDY GRAVEL TO GRAVELLY SAND (medium to coarse grained sand; fine grained, angular gravel); quartz and feldspar visible in gravel, foliation observed in larger grains; definite color change, grayish orange (10YR 6/2); dry
			WELL GRADED GRAVELLY SAND (medium to coarse grained sand; ~5-7% fine grained, angular to subangular gravel); light brown (5YR 6/4); dry to slightly damp; no odor
			increasing dampness
150			decreasing gravel
	SW		
			slight increase in yellowish tint, pale yellowish brown (10YR 6/2)
			grains less well graded; no gravel or fines; decrease in yellowish tint, light brown (5YR 6/4)
200			



Volclay Grout

Blank PVC Casing

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LOG OF BORING BP-11

(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : August 20, 2001
Drilling Company : THF
Drilling Method : ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch

Slot Size : 0.020-inch
ADWR No. : 55-588207

Broadway South Landfill

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-11
Elev.: 2606.97

200

SW

~20-25% fine grained sand present; pale yellowish brown (10YR 6/2)

decrease in fine grained sand; ~5-7% silt/clay present; light brown (5YR 6/4)

250

SP

POORLY GRADED SAND (fine to medium grained sand; ~5% silt/clay); grayish orange (10YR 7/4); dry

increase in moisture to damp; light brown (5YR 6/4)

300

SW

WELL GRADED SAND (angular to subangular, medium to coarse grained sand); pale yellowish brown (10YR 6/2); dry

~10-15% silt/clay present; less brown in color, grayish orange (10YR 7/4)

decrease in coarse grained sand, increasing amount fine to medium grained sand

Volclay Grout

Blank PVC Casing

**SECOR
INTERNATIONAL**
Incorporated

LOG OF BORING BP-11

(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : August 20, 2001

Slot Size : 0.020-inch

Drilling Company : THF

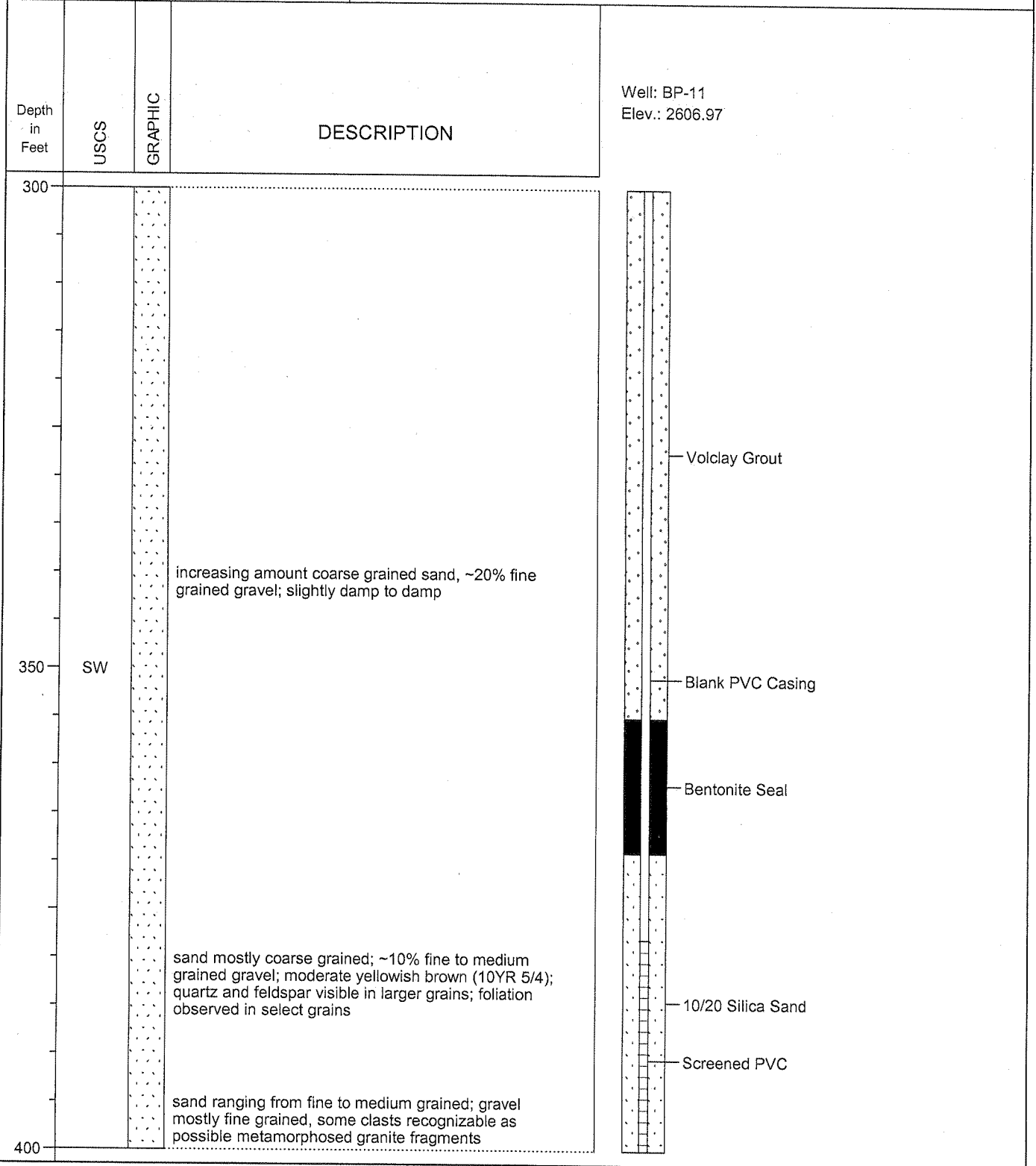
ADWR No. : 55-588207

Drilling Method : ARCH

SECOR Reps on-site : Keli Mandeville/Ed Vandegrift

Well Casing Diameter : 5-inch

Broadway South Landfill



**SECOR
INTERNATIONAL**
Incorporated

LOG OF BORING BP-11

(Page 5 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : August 20, 2001

Slot Size : 0.020-inch

Drilling Company : THF

ADWR No. : 55-588207

Drilling Method : ARCH

SECOR Reps on-site : Keli Mandeville/Ed Vandegrift

Broadway South Landfill

Well Casing Diameter : 5-inch

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-11
Elev.: 2606.97

400

SW

GC/SC

COARSE GRAINED, CLAYEY SAND TO FINE
GRAINED, CLAYEY GRAVEL; angular grains; wet;
moderate yellowish brown clay color (10YR 5/4);
color of sand and gravel not distinguishable due to
variation in mineral assemblage

450

GC

FINE GRAINED, CLAYEY GRAVEL WITH COARSE
GRAINED SAND; angular grains; wet; moderate
yellowish brown clay color (10YR 5/4); color of sand
and gravel grains not distinguishable due to variation
in mineral assemblage; quartz and feldspar visible in
small (~5mm) fragments of gneiss

CL

SANDY, SILTY CLAY; (medium grained sand ~10%);
moderate yellowish brown (10YR 5/4); wet

Boring BP-11 terminated at ~498 feet bgs.

Screened PVC

10/20 Silica Sand

Blank PVC Casing

**SECOR
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Incorporated

LOG OF BORING BP-15

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 16, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589338

6708 East 12th Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-15
Elev.: 2595.45

0

Thin layer of gravel and asphalt (~1.5 in. thick)

WELL GRADED GRAVELLY SAND (sand grains subangular to subrounded; fine to medium grained gravel ~ 7-8%; less than 5% silt); grayish orange (10YR 7/4); no odor; visible muscovite and quartz grains

SW

sand coarser grained and less well graded; increase in gravel to ~ 40%; color difficult to distinguish due to variation in grain composition - between pale yellowish brown (10YR 6/2) and grayish orange (10YR 7/4)

50

POORLY GRADED SAND (sand medium to coarse grained and mostly subrounded; less than 5% gravel and silt); grayish orange (10YR 7/4)

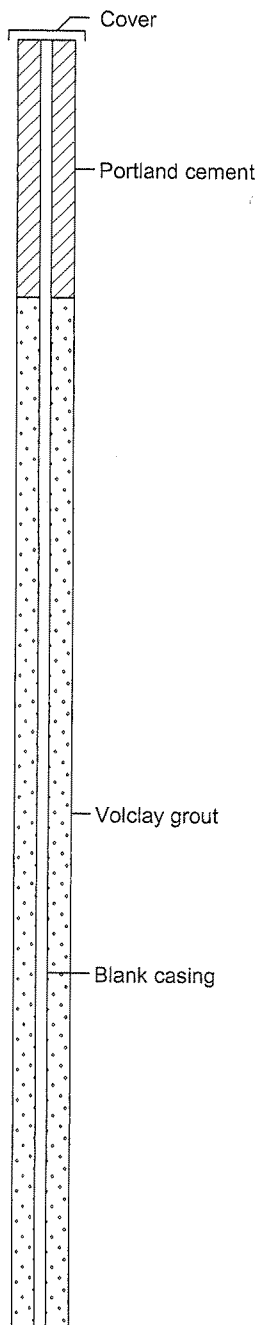
SP

sand slightly coarser grained; slight increase in gradation of grains

SW

FAIRLY WELL GRADED GRAVELLY SAND (subangular to subrounded grains; sand medium to coarse grained; fine to medium grained gravel ~ 25%; ~ 5% silt); grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2)

100



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LOG OF BORING BP-15

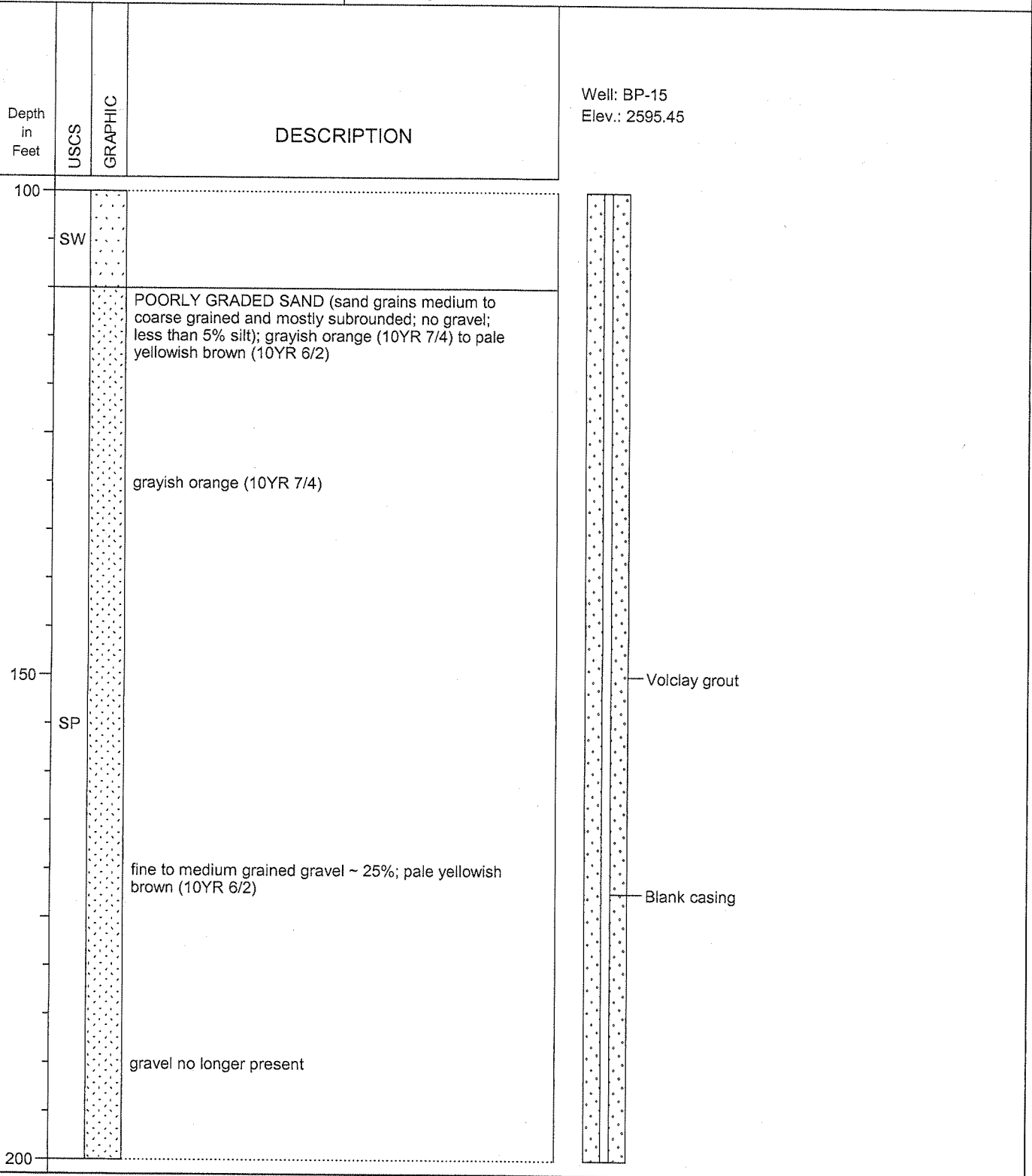
(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 16, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589338

6708 East 12th Street



**SECOR
INTERNATIONAL**
Incorporated

LOG OF BORING BP-15

(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 16, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589338

6708 East 12th Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-15
Elev.: 2595.45

200

fine grained gravel present, ~ 5%

sand grains subrounded to rounded; no gravel

250

SP

Volclay grout

Blank casing

Bentonite seal

10/20 silica sand

Screen

fine grained gravel present, less than 5%

300

**SECOR
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Incorporated

LOG OF BORING BP-15

(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 16, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589338

6708 East 12th Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-15
Elev.: 2595.45

300

SP

WELL GRADED GRAVELLY SAND (subangular to
subrounded grains; gravel mostly fine grained, ~
15-20%; less than 5% silt); grayish orange (10YR 7/4)

350

SW

gravel slightly larger grained

SP

POORLY GRADED GRAVELLY SAND (sand mostly
coarse grained; fine to medium grained gravel ~ 10%;
silt ~ 7-8%); grayish orange (10YR 7/4) to pale
yellowish brown (10YR 6/2)

400

10/20 silica sand

Screen

**SECOR
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Incorporated

LOG OF BORING BP-15

(Page 5 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : November 16, 2001
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Reps on-site : Keli Mandeville/Ed Vandegrift
Well Casing Diameter : 5-inch PVC

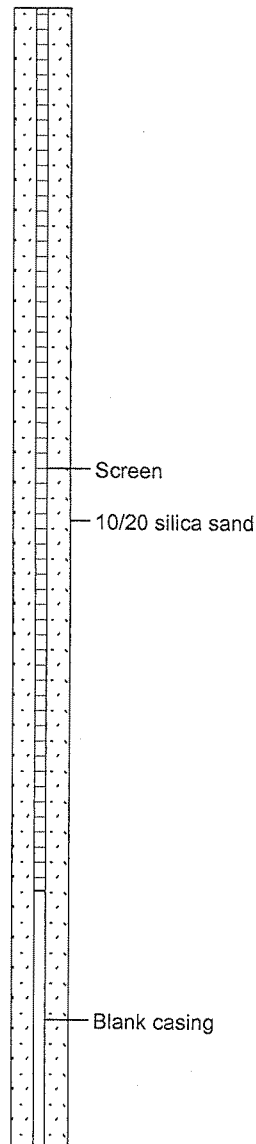
Slot Size : 0.020-inch
ADWR No. : 55-589338

6708 East 12th Street

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-15
Elev.: 2595.45

400	SP		
	GW		SILTY SANDY GRAVEL (gravel well graded and mostly subangular; sand medium to coarse grained; silt ~ 30%); pale yellowish brown (10YR 6/2)
			GRAVELLY SILTY SAND (sand poorly graded and mostly medium grained); pale yellowish brown (10YR 6/2); gravel appears to be mostly gneiss fragments
450	SM		
			Boring BP-15 terminated at ~ 488.5 feet bgs.



Note: Moisture content not noted in descriptions due to injection of water for dust control during drilling.

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LOG OF BORING BP-16

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

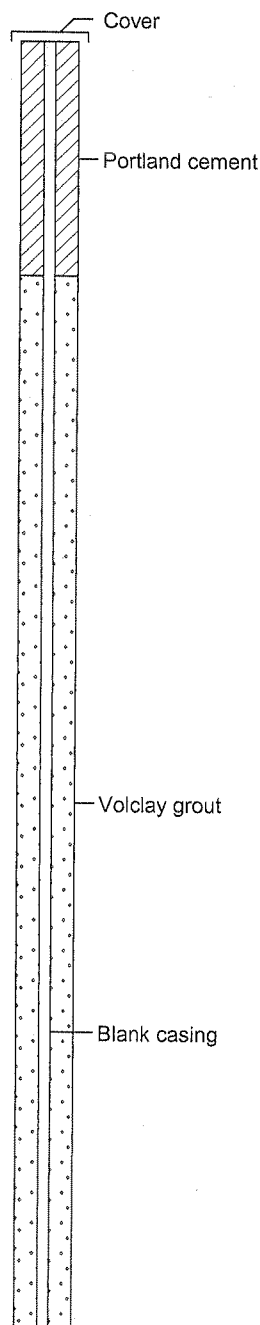
Start Date : June 17, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589337

Montego Drive

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			Sand, gravel and cobbles up to ~10" in diameter; hard caliche layer from approx. 3 to 5' below surface grade
10			
20			
30	SM		WELL GRADED SILTY, GRAVELLY SAND; sand and gravel mostly angular; ~15-20% gravel up to 0.5" in diameter; ~10-15% silty fines; moderate yellowish brown (10YR 5/4)
40			
50			
60			
70			
80	SW		gravel no longer present; increase in silty fines; sand less well graded
90			
100			
110			WELL GRADED GRAVELLY SAND; sand medium to coarse grained; ~20% fine gravel; subangular to angular gravel and sand grains; pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4)
			slight decrease in gravel
			slight increase in gravel
			20-25% gravel; ~5% silty fines; light brown (5YR 6/4)

Well: BP-16
Elev.: 2602.56



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LOG OF BORING BP-16

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 17, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589337

Montego Drive

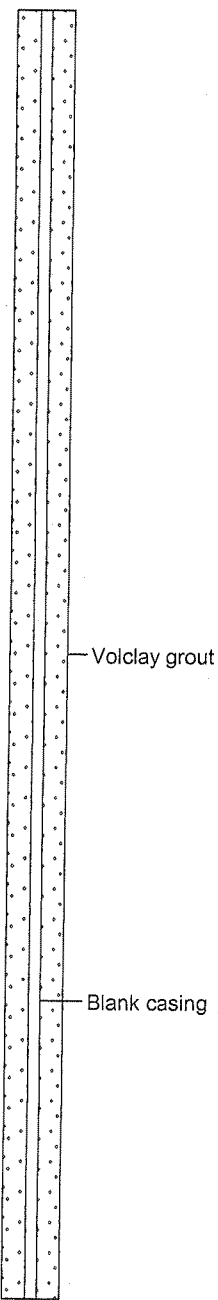
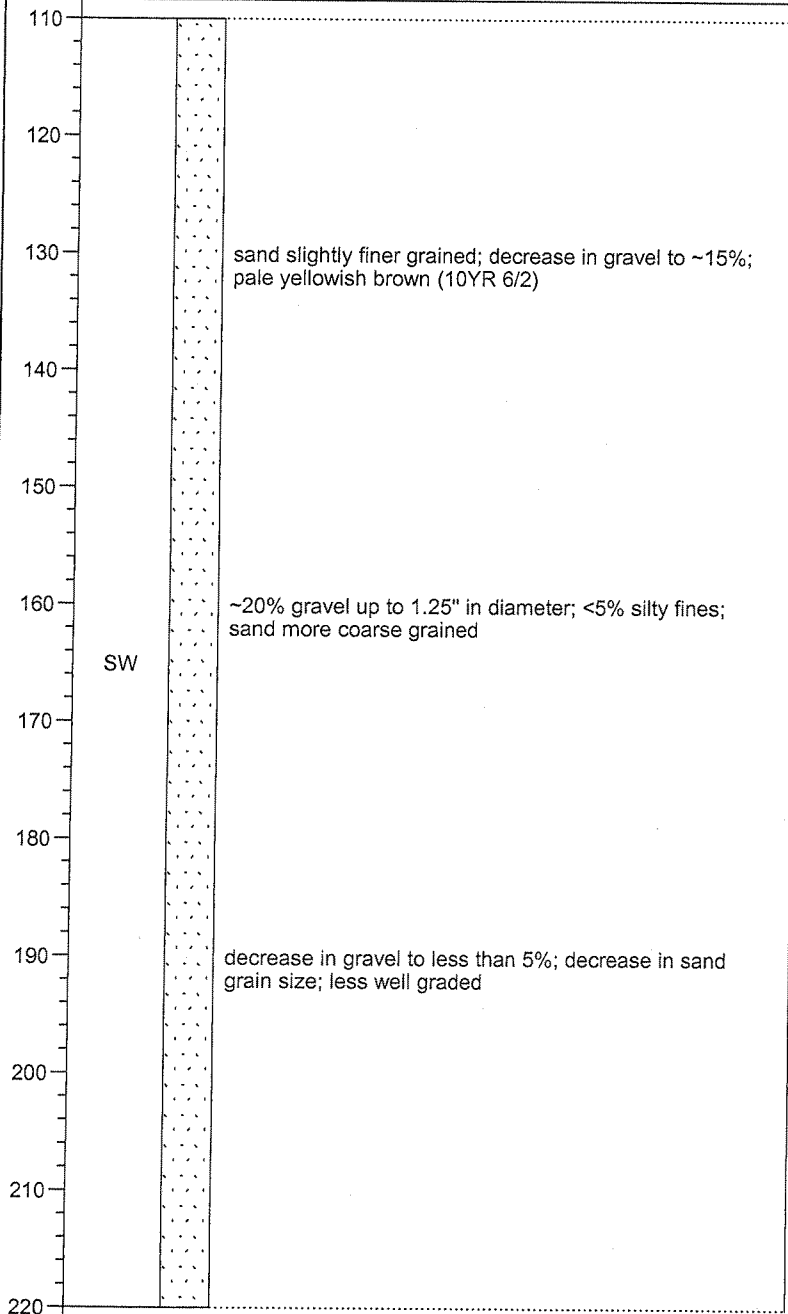
Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-16
Elev.: 2602.56



SECOR INTERNATIONAL

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LOG OF BORING BP-16

(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 17, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

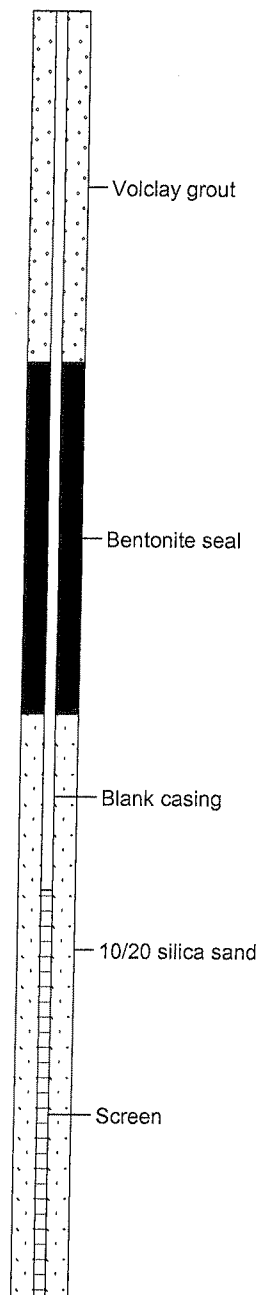
Slot Size : 0.020-inch
ADWR No. : 55-589337

Montego Drive

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-16
Elev.: 2602.56

220	SW		
230			WELL GRADED GRAVELLY SAND TO WELL GRADED SANDY GRAVEL; grains mostly subangular; sand mostly coarse grained; gravel up to 0.5" in diameter; <5% silty fines; pale yellowish brown (10YR 6/2)
240	SW/GW		
250			WELL GRADED SAND; sand medium to coarse grained; ~5% fine gravel; sand and gravel grains subrounded to subangular; <5% silty fines; pale yellowish brown (10YR 6/2)
260			
270			
280			sand slightly finer grained and less well graded; gravel no longer present
290	SW		
300			
310			sand well graded; ~5-7% fine gravel
320			
330			



SECOR INTERNATIONAL

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LOG OF BORING BP-16

(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 17, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-589337

Montego Drive

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-16
Elev.: 2602.56

330			
340			
350	SW		significant decrease in gradation of sand grains, close to being poorly graded; sand mostly medium grained and subrounded to rounded; < 5% fine gravel; silty fines no longer present
360			
370	SW/GW		WELL GRADED GRAVELLY SAND TO WELL GRADED SANDY GRAVEL; gravel subangular to subrounded and up to 1" in diameter; pale yellowish brown (10YR 6/2)
380	SW		WELL GRADED SAND; sand medium to coarse grained; ~5-7% fine gravel; sand and gravel grains subrounded to subangular; <5% silty fines; pale yellowish brown (10YR 6/2)
390			
400	SM/ML		SILTY SAND TO SANDY SILT; sand mostly fine grained; moderate yellowish brown (10YR 5/4)
410			
420	GW		WELL GRADED SILTY, SANDY GRAVEL; sand and gravel grains mostly subangular to angular; sand mostly medium to coarse grained; silty fines ~10%; abundant quartz and feldspar visible in gravel; minimal amount of small garnets present; grayish orange (10YR 7/4)
430			
440	SW		MODERATELY WELL GRADED SILTY SAND; sand fine to medium grained; grayish orange (10YR 7/4)

10/20 silica sand

Screen

SECOR INTERNATIONAL

Incorporated

LOG OF BORING BP-16

(Page 5 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : June 17, 2002
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

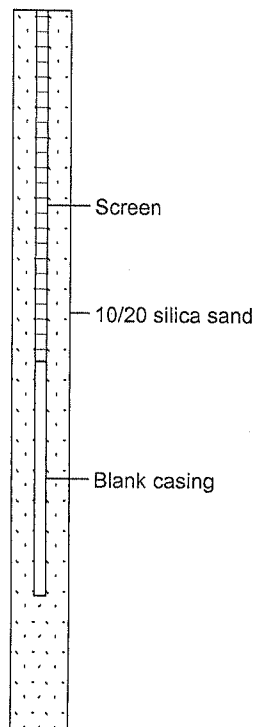
Slot Size : 0.020-inch
ADWR No. : 55-589337

Montego Drive

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
---------------------	------	---------	-------------

Well: BP-16
Elev.: 2602.56

440	SW		
450			WELL GRADED SILTY, SANDY GRAVEL; sand and gravel grains mostly subangular to angular; sand mostly medium to coarse grained; silty fines ~10%; abundant quartz and feldspar visible in gravel; minimal amount of small garnets present; grayish orange (10YR 7/4)
460			
470			decrease in silty fines to less than 5%; gravel up to ~1.5" in diameter; pale yellowish brown (10YR 6/2)
480	GW		
490			
500			Boring BP-16 terminated at ~501.5' below surface grade.



Note:
Moisture content not noted in descriptions as water was periodically injected for dust control during drilling.

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LOG OF BORING BP-19

(Page 1 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

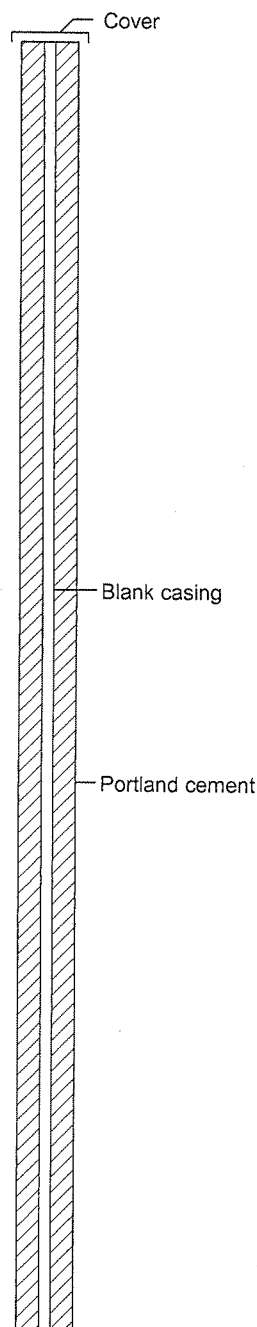
Start Date : February 10, 2003
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-596237

7001 East Hawthorne Street

Depth in Feet	USCS	GRAPHIC	DESCRIPTION
0			
	SW		WELL GRADED GRAVELLY SAND; gravel up to 2" in diameter ~10-15%, mostly subrounded; sand subrounded to subangular; trace amount of silty fines; light brown (5YR 6/4) grayish orange (10YR 7/4)
50	SW/SP		sand less well graded and mostly fine to medium grained; decrease in gravel to less than 5%; no silt
	SW		sand well graded; subangular gravel up to 0.5" in diameter ~5%; trace amount of silty fines
100			

Well: BP-19
Elev.: 2545.44



SECOR INTERNATIONAL

Incorporated

LOG OF BORING BP-19

(Page 2 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : February 10, 2003
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-596237

7001 East Hawthorne Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-19
Elev.: 2545.44

100

light brown (5YR 6/4)

grayish orange (10YR 7/4); slight increase in gravel
fraction to ~10-15%; no silt

150

SW

sand less well graded; decrease in gravel to less than
5%

Blank casing

Portland cement

200

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LOG OF BORING BP-19

(Page 3 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : February 10, 2003
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-596237

7001 East Hawthorne Street

Depth
in
Feet

USCS

GRAPHIC

DESCRIPTION

Well: BP-19
Elev.: 2545.44

200

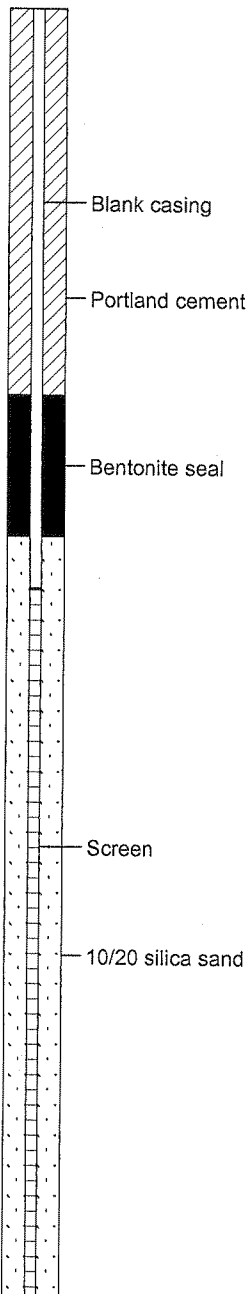
250

SW

increase in gravel to ~10-15%; grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2); small garnets abundant, ~0.5-1mm in diameter

grayish orange (10YR 7/4)

300



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LOG OF BORING BP-19

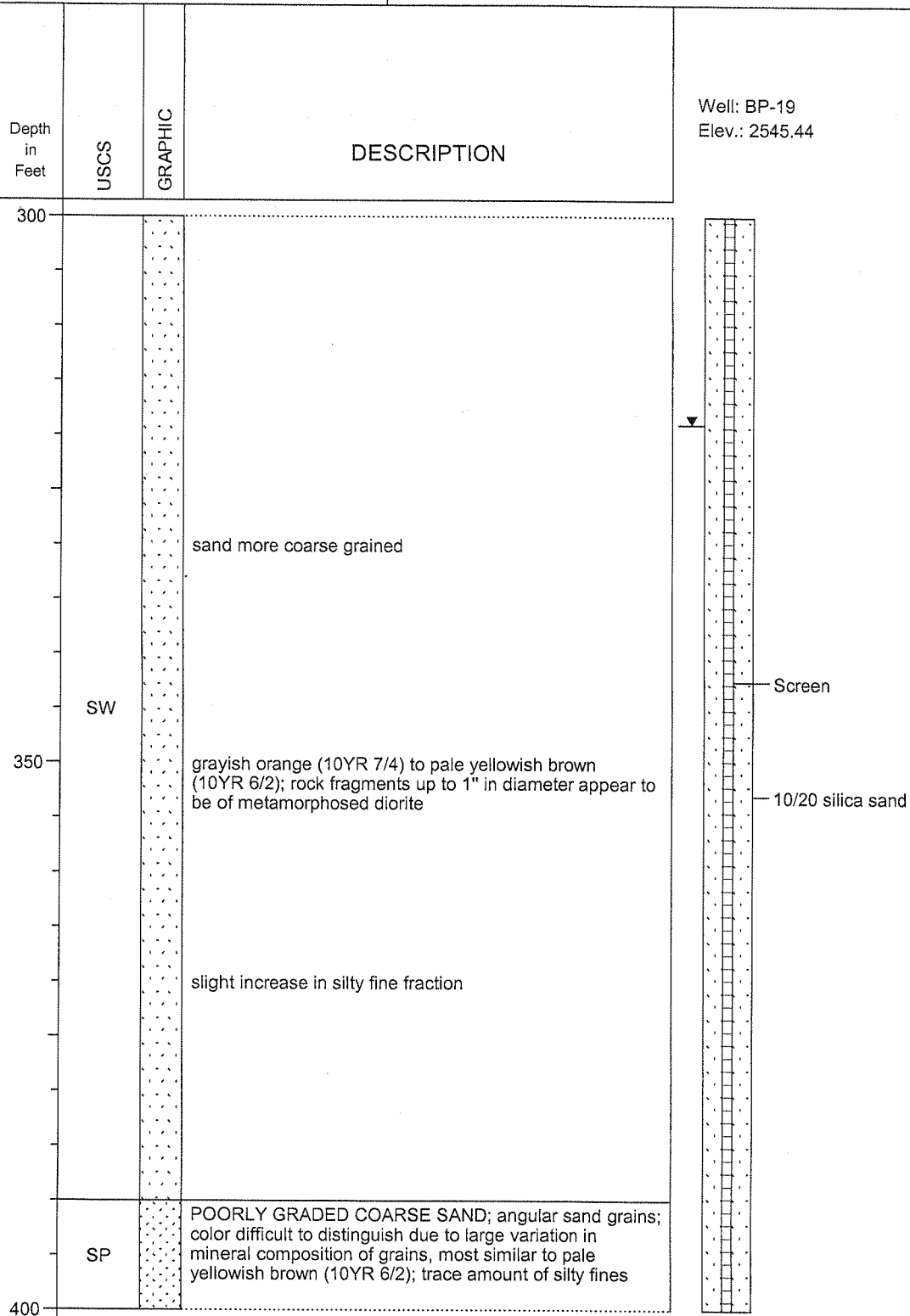
(Page 4 of 5)

Arizona Department of Environmental Quality
Broadway-Pantano WQARF Site

Start Date : February 10, 2003
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

Slot Size : 0.020-inch
ADWR No. : 55-596237

7001 East Hawthorne Street



Incorporated

(Page 5 of 5)

Start Date : February 10, 2003
Drilling Company : WDC Exploration
Drilling Method : ARCH
SECOR Rep on-site : Keli Mandeville
Well Casing Diameter : 5-inch PVC

7001 East Hawthorne Street

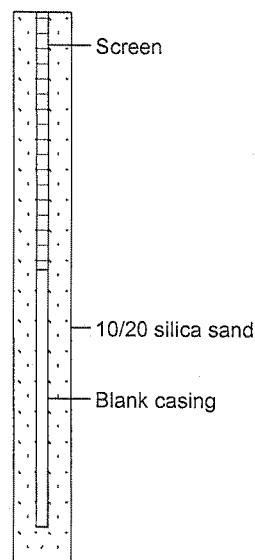
Depth in Feet	USCS	GRAPHIC	DESCRIPTION
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Well: BP-19
Elev.: 2545.44

400

SP

Boring BP-19 terminated at ~443' below surface grade.



Note:
Moisture content not noted as water was periodically injected for dust control during drilling.

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06-01-2004



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description			
0						Ground Surface		0	
2		SM	40	60	0	SILTY SAND very pale orange (10 YR 8/2), very angular to angular sands, well graded, fine to coarse sands up to 10 mm, gneiss and quartz clasts with some muscovite, no cementation	20	2	
4								4	
6								6	
8								8	
10								10	
12		SW	0	20	80	GRAVELLY SAND very pale orange sands (10 YR 8/2), white and gray clasts, very angular to angular, well graded, fine sand to fine gravel up to 25 mm, chert, quartz, gneiss, and muscovite, no cementation		12	
14								14	
16								16	
18								18	
20								20	
22		SC	20	80	0	CLAYEY SAND pale yellowish brown (10 YR 6/2), angular to subangular sands, moderately graded, fine to medium sands, granite, gneiss, quartz, no plasticity, no cementation	60	22	
24								24	
26								26	
28								28	
30								30	
32								32	
34								34	
36								36	
38								38	
40								40	
42		SW	0	100	0	CLEAN SAND very pale orange (10 YR 8/2), subangular to subrounded, moderately graded, fine to coarse sands up to 5 mm, granite, chert, quartz, gneiss, no cementation	48	42	
44								44	
46								46	
48								48	
50								50	

6" Steel Sleeve ASTM 53B

Neat Cement (Type III)

5" Sch 80 PVC - Blank

Bentonite Slurry

Drilled By: Layne Christensen Company

Hole Size: 10.5"

Drill Method: Casing Advance - Becker Hammer

Datum:

Drill Date: 8/11/2005 to 8/22/05

Page: 1 of 10



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details								
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description											
52		SW	0	100	0	CLEAN SAND very pale orange (10 YR 8/2), subangular to subrounded, moderately graded, fine to coarse sands up to 5 mm, granite, chert, quartz, gneiss, no cementation	48	52	 Bentonite Slurry 5" Sch 80 PVC - Blank								
54		SC	20	80	0	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, poorly graded, mostly fine to medium sands, granite, quartz, muscovite, gneiss, low plasticity, light reaction to HCl.	55	54									
56								SC/SM		80	20	0	SILTY SANDY CLAY pale yellowish brown (10 YR 6/2), subangular to angular sands, poorly graded sands, fine to medium grained, quartz and muscovite, moderate plasticity, no cementation	56			
58														60	40	0	increase in sand size to coarse grained and increase in percent sands
60	62																
62		64	40	0	increase in sand size to coarse grained and increase in percent sands	62											
64						66	40	0		increase in sand size to coarse grained and increase in percent sands	64						
66											68	40	0	increase in sand size to coarse grained and increase in percent sands	66		
68	70														40	0	increase in sand size to coarse grained and increase in percent sands
70		72	40	0	increase in sand size to coarse grained and increase in percent sands												
72						74	40	0		increase in sand size to coarse grained and increase in percent sands							
74											76	40	0	increase in sand size to coarse grained and increase in percent sands			
76	78														40	0	increase in sand size to coarse grained and increase in percent sands
78		80	40	0	increase in sand size to coarse grained and increase in percent sands												
80						82	40	0		increase in sand size to coarse grained and increase in percent sands							
82											84	40	0	increase in sand size to coarse grained and increase in percent sands			
84	86														40	0	increase in sand size to coarse grained and increase in percent sands
86		88	40	0	increase in sand size to coarse grained and increase in percent sands												
88						90	40	0		increase in sand size to coarse grained and increase in percent sands							
90											92	40	0	increase in sand size to coarse grained and increase in percent sands			
92	94														40	0	increase in sand size to coarse grained and increase in percent sands
94		96	40	0	increase in sand size to coarse grained and increase in percent sands												
96						98	40	0		increase in sand size to coarse grained and increase in percent sands							
98											100	40	0	increase in sand size to coarse grained and increase in percent sands			
100																	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20


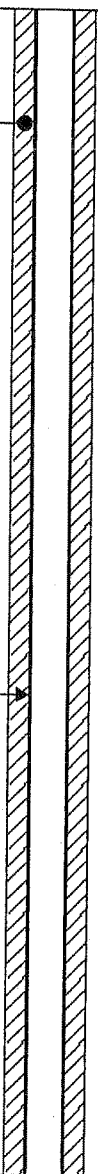


Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details		
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description					
102		SC	20	80	0	CLAYEY SAND pale yellowish brown (10YR 6/2), subangular to subrounded, moderately graded, fine to coarse sand up to 5 mm, granite, quartz, muscovite, gneiss, low plasticity, light reaction to HCl.	55	102			
104						104					
106						106					
108						108					
110						110					
112						33		112			
114								114			
116								116			
118								118			
120								120			
122		SC/GC	30	70	0		slight increase in clay content				122
124											124
126											126
128											128
130											130
132											132
134											134
136											136
138											138
140											140
142		SC/GC	30	50	20		GRAVELLY CLAYEY SAND pale brown (5 YR 5/2), angular to subangular, well graded, fine sands to fine gravels up to 25 mm, quartz, gneiss, muscovite, biotite, moderate plasticity, no cementation.				142
144											144
146											146
148											148
150											150

Drilled By: Layne Christensen Company	Hole Size: 10.5"
Drill Method: Casing Advance - Becker Hammer	Datum:
Drill Date: 8/11/2005 to 8/22/05	Page: 3 of 10

Drilled By: Layne Christensen Company

Hole Size: 10.5"

Drill Method: Casing Advance - Becker Hammer

Datum:

Drill Date: 8/11/2005 to 8/22/05

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE

Depth	Symbol	Lithology	% fines	% sand	% gravel	Description	Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
152		GC	20	20	60	CLAYEY SANDY GRAVEL pale yellowish brown (10 YR 6/2), very angular to angular, well graded, fine sands to coarse gravel up to 70 mm, gneiss, quartz, biotite, possible feldspar, low plasticity, no cementation	33	152	
154								154	
156								156	
158								158	
160								160	
162						increase in gravel size, appearance of cobbles up to 120 mm, and decrease in percent fines. Cobbles are Catalina gneiss.		162	
164								164	
166								166	
168								168	
170			20	40	40		27	170	
172								172	
174								174	
176								176	
178								178	
180						fewer cobbles and gravel, smaller sand size		180	
182								182	
184								184	
186								186	
188								188	
190			10	40	50	angular to subangular grains	28	190	
192								192	
194								194	
196								196	
198								198	
200								200	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE

Depth	Symbol	Lithology	% fines	% sand	% gravel	Description	Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
202		GC	10	40	50	CLAYEY SANDY GRAVEL pale yellowish brown (10 YR 6/2), angular to subangular, well graded, fine sands to coarse gravel, gneiss, quartzite, no cementation, fewer fines, fewer cobbles than previous depths.	28	202	
204								204	
206								206	
208								208	
210								210	
212		SP	10	70	20	SILTY GRAVELLY SAND WITH COBBLES pale yellowish brown (10 YR 6/2), angular gravels, subrounded sands, poorly graded sands, mostly coarse grained clasts up to 150 mm, gneiss gravels and cobbles, quartz sands, some feldspar in sands, no cementation.	20	212	
214								214	
216								216	
218								218	
220								220	
222								222	
224								224	
226								226	
228								228	
230								230	
232								232	
234								234	
236								236	
238								238	
240								240	
242								242	
244								244	
246								246	
248								248	
250								250	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description			
252		GW	0	40	60	CLEAN SANDY GRAVEL multi-colored sands and gravels, angular to subangular gravels, subangular to subrounded sands, well graded, coarse sand to coarse gravel up to 30 mm, gneiss, schist, quartz, no cementation.	48	252	10/20 Colorado Silica Sand
254								254	
256								256	
258								258	
260		SM/GM	60	20	20	GRAVELLY SANDY SILT pale yellowish brown silts (10 YR 6/2), multicolored gravels, subangular to subrounded, poorly graded, silt to fine sands with fine gravels up to 12 mm, gneiss schist, and quartz clasts, no cementation		260	
262								262	
264								264	
266								266	
268								268	
270		GW	0	40	60	CLEAN SANDY GRAVEL multi-colored sands and gravels, angular to subangular gravels, subangular to subrounded sands, well graded, coarse sand to coarse gravel up to 30 mm, gneiss, schist, quartz, no cementation.		270	
272								272	
274								274	5" Sch 80 PVC - 0.020 Slot Screen
276								276	
278								278	
280		SW	0	70	30	CLEAN GRAVELLY SAND multi-colored sands and gravels, angular to subangular gravels, subangular to subrounded sands, well graded, coarse sand to coarse gravel up to 30 mm, gneiss, schist, quartz, no cementation		280	
282								282	
284								284	
286								286	
288								288	
290								290	
292								292	
294								294	
296								296	
298								298	
300								300	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE						Penetration Rate (ft/hr)	Depth (feet bis)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description		
302		SC/GC	20	60	20	GRAVELLY CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded sands, angular gravels, well graded, gravels up to 50 mm, gneiss quartz, and schist clasts, low plasticity, no cementation.	17	
304								
306								
308								
310		SP	5	80	15	CLEAN GRAVELLY SAND multi-colored sands and gravels, angular to subangular gravels, subangular to subrounded sands, well graded, coarse sand to coarse gravel up to 30 mm, gneiss, schist, quartz, trace silt and clay, no cementation.	24	10/20 Colorado Silica Sand
312								
314								
316								
318		SW	10	70	20	GRAVELLY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded sand and gravel, well graded, coarse gravel up to 70 mm, quartz, gneiss, and schist clasts, slickenslides noted, no cementation.		325' on 8/22/2005
320								
322								
324								
326								5" Sch 80 PVC - 0.020 Slot Screen
328								
330								
332								
334								
336								
338								
340								
342		SC	35	60	5	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, fine to coarse sand, well graded, quartz, quartzite, and gneiss clasts, no plasticity, no cementation.	54	
344								
346								
348								
350								

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details	
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description				
352		SC	35	60	5	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, fine to coarse sand, well graded, quartz, quartzite, and gneiss clasts, no plasticity, no cementation	46	352		10/20 Colorado Silica Sand
354								354		
356								356		
358								358		
360		SW	<5	70	25	CLEAN GRAVELLY SAND light brown sand (10 YR 8/3), dark gray with light gray speckles for gneiss, subangular to subrounded, fine grained sand and gravel, well graded, quartz and gneiss clasts, no plasticity, no cementation.	42	360		
362								362		
364								364		
366								366		
368								368		
370								370		
372								372		
374								374		
376		SP	10	80	10	POORLY GRADED SAND light brown (10 YR 8/3), subangular to subrounded, gravel is subangular, fine sand, trace silt, trace fine gravels, quartz and gneiss clasts, no plasticity, no cementation.	37	376		
378								378		
380								380		
382								382		
384								384		
386								386		
388								388		
390								390		
392		SW	<5	55	40	CLEAN GRAVELLY SAND light brown (10 YR 8/3), subangular to subrounded, fine sand to coarse gravel, well graded, quartz and gneiss clasts, no plasticity, no cementation.	75	392		
394								394		
396								396		
398								398		
400								400		

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description			
402		SW	<5	55	40	CLEAN GRAVELLY SAND light brown (10 YR 8/3), subangular to subrounded, fine sand to coarse gravel, well graded, quartz and gneiss clasts, cobbles to 110 mm, no plasticity, no cementation.	60	402	
404								404	
406								406	
408								408	
410								410	
412			<5	65	30		50	412	
414								414	
416								416	
418								418	
420								420	
422						subrounded gneiss cobbles up to 100 mm	12	422	
424								424	
426								426	
428								428	
430								430	
432			<5	55	40		31	432	
434								434	
436								436	
438								438	
440								440	
442							20	442	
444								444	
446								446	
448								448	
450								450	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-20

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details	
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description				
452		GW	0	60	40	CLEAN GRAVELLY SAND dark gray with light gray speckles, subangular to subrounded, medium sand to coarse gravel, well graded, gneiss and quartz clasts, no plasticity, no cementation, cobbles up to 200 mm present.	40	452	 Stainless Steel Threaded End Cap	
454								454		
456								456		
458								458		
460								460		
462							33	462		
464								464		
466								466		
468								468		
470								470		
472								472		
474								474		
476								476		
478								478		
480								480		
482								482		
484								484		
486								486		
488								488		
490								490		
492								492		
494								494		
496								496		
498								498		
500								500		

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/11/2005 to 8/22/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description			
0						Ground Surface		0	
2		SM	40	60	0	SILTY SAND very pale orange (10 YR 8/2), subangular to subrounded grains, well graded, fine to coarse sands, granite and quartz clasts, no plasticity, no cementation.	60	2	
4								4	
6								6	
8								8	
10								10	
12						color change to brownish yellow (10 YR 6/8)	150	12	
14								14	
16								16	
18								18	
20								20	
22		SW	10	60	30	GRAVELLY SAND pale yellowish brown (10 YR 6/2), angular to subrounded gravels up to 55 mm, well graded, fine to coarse sands, gneiss and quartz clasts, no plasticity, no cementation	100	22	
24								24	
26								26	
28								28	
30								30	
32			10	50	40			32	
34								34	
36								36	
38								38	
40								40	
42			15	50	35		120	42	
44								44	
46								46	
48								48	
50								50	

Drilled By: Layne Christensen Company

Hole Size: 10.5"

Drill Method: Casing Advance - Becker Hammer

Datum:

Drill Date: 8/23/2005 to 8/26/05

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE						Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description		
52		SW	<5	90	<5	CLEAN SAND brownish yellow (10 YR 6/8), subangular to subrounded, well graded, fine to coarse sands, quartz and gneiss clasts, no plasticity, no cementation.	75	Bentonite Slurry
54								
56								
58								
60								
62		SW/GW	10	55	35	GRAVELLY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, well graded, fine to coarse sands, quartz and gneiss clasts, gravel up to 40 mm, no plasticity, no cementation.		
64								
66								
68								
70								
72		SW	5	85	10	WELL GRADED CLEAN SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, well graded, fine to coarse sands, quartz and gneiss clasts, no plasticity, no cementation		
74								
76								
78								
80								
82		SC	40	55	5	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded grains, sand and clay mixtures, quartz grains, low plasticity, no cementation.		
84								
86								
88								
90								
92		SW	<5	70	25	GRAVELLY SAND pale yellow brown (10 YR 6/2), angular to subrounded particles, well graded, fine to coarse sand, quartz and gneiss clasts, no plasticity, no cementation.		5" Sch 80 PVC - Blank
94								
96								
98								
100								

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details					
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description								
102		SC	40	55	5	CLAYEY SAND pale yellowish brown (10YR 6/2), subangular to subrounded, sand and clay mixtures, quartz grains, low plasticity, no cementation.	66	102						
104								104						
106								106						
108								108						
110								110						
112		SC/SW	30	45	25	CLAYEY SAND/GRAVELLY SAND pale yellowish brown (10 YR 6/2), angular to subrounded, well graded, fine to coarse grained, gneiss and quartz clasts, cobbles up to 240 mm, low plasticity, no cementation.	75	112						
114								114						
116								116						
118								118						
120								120						
122		SC	40	50	10	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, well graded, fine to coarse sands, quartz and gneiss clasts, low plasticity, no cementation.	60	122						
124								124						
126								126						
128								128						
130								130						
132					45	50		5			132			
134											134			
136											136			
138											138			
140											140			
142											142			
144											144			
146											146			
148											148			
150											150			

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

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Drilled By: Layne Christensen Company

Hole Size: 10.5"

Drill Method: Casing Advance - Becker Hammer

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Drill Date: 8/23/2005 to 8/26/05

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URS Corporation
7720 N. 16th Street, Suite 100
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Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE

Depth	Symbol	Lithology	% fines	% sand	% gravel	Description	Penetration Rate (ft/hr)	Depth (feet bis)	Well Completion Details
152		SC/SP				CLAYEY SAND/GRAVELLY SAND pale yellowish brown (10 YR 6/2), angular to subrounded, poorly graded - missing intermediate sizes, gneiss and quartz clasts, no plasticity, no cementation.	66	152	Bentonite Slurry
154								154	
156								156	
158								158	
160								160	
162		SC	40	50	10	CLAYEY SAND WITH GRAVEL pale yellowish brown (10 YR 6/2), angular to subrounded, well graded, fine to coarse sands, quartz and gneiss clasts, no plasticity, no cementation.		162	
164								164	
166								166	
168								168	
170								170	
172			35	50	15		60	172	5" Sch 80 PVC - Blank
174								174	
176								176	
178								178	
180		SC/SW	25	50	25	CLAYEY SAND/GRAVELLY SAND pale yellowish brown (10 YR 6/2), angular to subangular, well graded, fine to coarse grained, gneiss and quartz clasts, no plasticity, no cementation.	42	180	
182								182	
184								184	
186								186	
188								188	
190								190	
192			30	45	25		50	192	
194								194	
196								196	
198								198	
200								200	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

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URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21


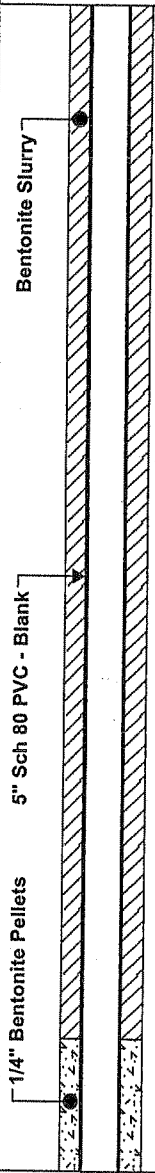
Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description			
202		sc	35	60	5	CLAYEY SAND pale yellowish brown (10 YR 6/2), angular to subrounded gravel, well graded fine to coarse sand, gneiss and quartz clasts, low plasticity, no cementation.	46	202	
204						204			
206						206			
208						208			
210						210			
212						35	212		
214							214		
216							216		
218							218		
220							220		
222	54	40	55	5	slightly more fines	222			
224						224			
226						226			
228						228			
230						230			
232	100	40	55	10		232			
234						234			
236						236			
238						238			
240						240			
242	54	35	60	5	slightly more sand, gravel up to 90 mm.	242			
244						244			
246						246			
248						248			
250						250			

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

Page: 5 of 10



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE

Depth	Symbol	Lithology	% fines	% sand	% gravel	Description	Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
252		SC	35	60	5	CLAYEY SAND pale yellowish brown (10 YR 6/2), angular to subrounded gravel, well graded fine to coarse sand, gneiss and quartz clasts, low plasticity, no cementation.	46	252	
254								254	
256								256	
258								258	
260		SC/SW	30	45	25	CLAYEY SAND/GRAVELLY SAND pale yellowish brown (10 YR 6/2), angular to subrounded, well graded, fine to coarse sand, gneiss and quartz clasts, low plasticity, no cementation.	60	260	10/20 Colorado Silica Sand
262								262	
264								264	
266								266	
268								268	5" Sch 80 PVC - 0.020 Slot Screen
270								270	
272							40	272	
274								274	
276								276	
278								278	
280								280	
282								282	
284		SC	45	50	5	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded sand, well graded, fine to coarse sand, gneiss and quartz clasts, low plasticity, no cementation.	54	284	
286								286	
288								288	
290								290	
292			40	50	10	slightly more gravel	60	292	
294								294	
296								296	
298								298	
300								300	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

Page: 6 of 10



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE

Depth	Symbol	Lithology	% fines	% sand	% gravel	Description	Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
302		sc	40	50	10	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded sand, well graded, fine to coarse sand, gneiss and quartz clasts, low plasticity, no cementation.	60	302	
304								304	
306								306	
308								308	
310								310	
312			45	50	5	slightly less gravel	54	312	
314								314	
316								316	
318								318	
320								320	
322							60	322	
324								324	
326								326	
328								328	
330								330	
332			30	60	10		75	332	
334								334	
336								336	
338								338	
340								340	
342							100	342	
344								344	
346								346	
348								348	
350								350	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

Page: 7 of 10



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details	
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description				
352		SC	30	60	10	CLAYEY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded sand, well graded, fine to coarse sand, gneiss and quartz clasts, low plasticity, no cementation.	100	352		
354		SC/SW	25	50	25		CLAYEY SAND/GRAVELLY SAND pale yellowish brown (10 YR 6/2), subangular to subrounded, well graded fine to coarse sand, quartz and gneiss clasts, no plasticity, no cementation.	75		354
356										356
358										358
360	360									
362	362									
364	364									
366	GW	0	10	90	CLEAN GRAVEL WITH TRACE SAND multicolored clasts (most white/gray and black), subangular to subrounded, well graded fine to coarse gravels with coarse sand, gravels up to 60 mm, gneiss and quartz clasts, no cementation.	60	366			
368							368			
370							370			
372							372			
374	GP	0	30	70	SANDY GRAVEL multicolored clasts (most white/gray and black), subangular to subrounded, poorly graded fine to coarse gravels with coarse sand, gneiss and quartz clasts, trace cobbles up to 100 mm, no cementation.	60	374			
376							376			
378							378			
380							380			
382							382			
384							384			
386							386			
388							388			
390							390			
392							392			
394	394									
396	396									
398	398									
400	400									

Drilled By: Layne Christensen Company

Hole Size: 10.5"

Drill Method: Casing Advance - Becker Hammer

Datum:

Drill Date: 8/23/2005 to 8/26/05

Page: 8 of 10



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE							Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
Depth	Symbol	Lithology	% fines	% sand	% gravel	Description			
402		SW	0	70	30	GRAVELLY SAND multicolored sand and gravels, subangular to subrounded, well graded coarse sand with fine gravels up to 30 mm, quartz and gneiss clasts, no cementation.	85	402	
404		GP	0	40	60	SANDY GRAVEL WITH COBBLES multicolored clasts (most white/gray and black), subangular to subrounded, poorly graded fine to coarse gravels with coarse sand, gneiss and quartz clasts, trace cobbles up to 80 mm, no cementation.		404	
406								406	
408								408	
410	410								
412	412								
414	414								
416	416								
418		SW	0	70	30	GRAVELLY SAND WITH COBBLES multicolored sands and gravels, angular to subrounded, well graded, coarse sand to coarse gravel with some cobbles up to 100 mm, gneiss and quartz clasts (more mafic than previous), no cementation.	418		
420							420		
422							422		
424							424		
426	426								
428	428								
430	430								
432	432								
434	434								
436	436								
438	438								
440	440								
442	442								
444	444								
446	446								
448	448								
450	450								

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

Page: 9 of 10



URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, Arizona

Log of Borehole: BP-21

Project No.: 23444449

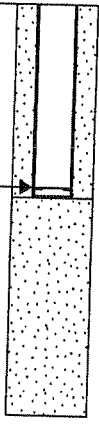
Project: Broadway N. Landfill

Client: City of Tucson Environmental Services

Project Manager: Chris Courtney, R.G.

Logged by: Chris Courtney, R.G. and Mike Makerov

SUBSURFACE PROFILE

Depth	Symbol	Lithology	% fines	% sand	% gravel	Description	Penetration Rate (ft/hr)	Depth (feet bls)	Well Completion Details
452		SW	0	70	30	GRAVELLY SAND WITH COBBLES multicolored sands and gravels, angular to subrounded, well graded, coarse sand to coarse gravel with some cobbles up to 100 mm, gneiss and quartz clasts (more mafic than previous), no cementation.	40	452	 Stainless Steel Threaded End Cap
454								454	
456								456	
458								458	
460								460	
462							30	462	
464								464	
466								466	
468								468	
470								470	
472								472	
474								474	
476								476	
478								478	
480								480	
482								482	
484								484	
486								486	
488								488	
490								490	
492								492	
494								494	
496								496	
498								498	
500								500	

Drilled By: Layne Christensen Company

Drill Method: Casing Advance - Becker Hammer

Drill Date: 8/23/2005 to 8/26/05

Hole Size: 10.5"

Datum:

Page: 10 of 10

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 1 OF 14



SECOR

DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06
 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 403.70 5/5/06 BOREHOLE DEPTH (ft): 458.0
 STATIC DTW (ft): WELL DEPTH (ft): 458.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: K. Harker CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
			Fill Material consists of silt, clay, sand, and gravel, Boring post hole dug to approx. 2.5 feet bgs							Above ground dog house vault with 1 inch and 4 inch PVC caps
5		SC	CLAYEY SAND WITH GRAVEL; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; dense; dry; no odor; none cementation; subangular; well graded; 55% sand, 30% clay, 15% fine to coarse (5-35mm), subangular gravel Medium dense; slight odor		1633 - soil			3.2	5	
10			Loose; 55% sand, 30% fine (5-15mm), subangular gravel, 15% clay, trace of trash - glass, wood, plastic		1641 - soil			3.5	10	4 inch schedule 80 PVC, Blank Casing with cement grout
15		SM	SILTY SAND WITH GRAVEL; SM; 10YR 2/2 dark yellowish brown; fine to coarse-grained; non plastic; loose; dry; strong odor; none cementation; subangular; well graded; 40% sand, 25% silt, 25% (5-35mm), subangular gravel, 10% trash-glass, plastic, wood, metal		1647 - soil			6.8	15	
20			15% trash - glass pieces, wood fragments, plastic, paper, trace of clay		1650 - soil			11.3	20	
25		SC	CLAYEY SAND WITH GRAVEL; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; medium dense; dry; slight odor; none cementation; subangular; well graded; 40% sand, 35% fine (5-15mm), subangular gravel, 25% clay		1700 - soil			7.8	25	1 inch schedule 80 PVC, Blank Casing with cement grout
30			40% sand, 30% clay, 20% fine (5-15mm), subangular gravel		1706 - soil			12.0	30	
					1710 - soil					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 2 OF 14




SECOR

DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06
 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone


NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 403.70 5/5/06 BOREHOLE DEPTH (ft): 458.0
 STATIC DTW (ft): WELL DEPTH (ft): 458.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: K. Harker CHECKED BY: C. Pollock



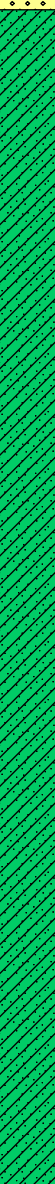






GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SM	SILTY SAND ; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; slight odor; none cementation; subangular; poorly graded; 85% sand, 15% silt, trace of fine (5 mm), subangular gravel and clay		- soil			5.5		
40		SM	CLAYEY SAND WITH GRAVEL ; SM; 5YR 4/4 brown; fine to coarse-grained; low plasticity; medium dense to loose; dry; slight odor; none cementation; subangular; well graded; 55% sand, 30% fine (5-10mm), subangular gravel, 15% clay		1713 - soil			3.7	40	4 inch schedule 80 PVC, Blank Casing with cement grout
45		SW	SAND WITH GRAVEL ; SW; 5YR 5/6 light brown; fine to coarse-grained; loose; dry; slight odor; none cementation; subangular; well graded; 75% sand, 25% fine (5-10mm), subrounded gravel, trace of silt		1755 - soil			1.6	45	
50		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; medium dense to loose; dry; slight odor; none cementation; subangular; well graded; 60% sand, 20% clay, 20% fine to coarse (5-40mm), subrounded gravel		1800 - soil			6.9	50	
55		SM	SILTY SAND WITH GRAVEL ; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; no odor; none cementation; subangular; well graded; 50% sand, 30% fine (5-7mm), subangular gravel, 20% silt, trace of clay		1805 - soil			4.4	55	1 inch schedule 80 PVC, Blank Casing with cement grout
60			45% sand, 40% fine (5-7mm), subangular gravel, 15% silt, trace of clay		1812 - soil			3.8	60	
65			SILTY SAND ; 5YR 5/6 light brown; fine to medium-grained; poorly graded; 60% sand, 40% silt, trace of fine (5 mm), subrounded gravel		1814 - soil			4.2	65	
					1820					

PROJECT: Broadway South Landfill		WELL / PROBEHOLE / BOREHOLE NO:		 SECOR
LOCATION: Broadway Boulevard and Prudence Road		BP-22 PAGE 3 OF 14		
PROJECT NUMBER: 18OT.20401.06				
DRILLING: STARTED 5/2/06	COMPLETED: 5/11/06	NORTHING (ft):		EASTING (ft):
INSTALLATION: STARTED 5/2/06	COMPLETED: 5/11/06	LATITUDE:		LONGITUDE:
DRILLING COMPANY: Layne Christensen Company		GROUND ELEV (ft):		TOC ELEV (ft):
DRILLING EQUIPMENT: Becker Hammer		INITIAL DTW (ft): 403.70 5/5/06		BOREHOLE DEPTH (ft): 458.0
DRILLING METHOD: Percussion-Hammer		STATIC DTW (ft):		WELL DEPTH (ft): 458.0
SAMPLING EQUIPMENT: Cyclone		WELL CASING DIAMETER (in): 1.4		BOREHOLE DIAMETER (in): 10 3/4
		LOGGED BY: K. Harker		CHECKED BY: C. Pollock

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; loose; dry; slight odor; none cementation; subangular; well graded; 60% sand, 30% clay, 10% fine (5-10mm), subangular gravel		- soil			6.8		
75			Non plastic; no odor; 70% sand, 15% clay, 15% fine to coarse (5-25mm), subangular gravel, trace of silt		1828 - soil			5.8	75	4 inch schedule 80 PVC, Blank Casing with cement grout
80			Low plasticity; 50% sand, 30% fine to cobbles (5-75mm), subangular gravel, 20% clay		1830 - soil			4.1	80	
85			CLAYEY SAND ; 5YR 5/6 light brown; fine to medium-grained; low plasticity; loose; dry; no odor; none cementation; subangular; poorly graded; 80% sand, 20% clay, trace of fine (5-10mm), subrounded gravel		0931 - soil			7.0	85	
90			WITH GRAVEL ; 5YR 4/4 brown; medium plasticity; medium dense to loose; 70% sand, 15% clay, 15% fine to coarse (5-40mm), subrounded gravel		0936 - soil			1.2	90	
95			CLAYEY SAND ; fine to coarse-grained; low plasticity; loose; well graded; 85% sand, 15% clay, trace of fine (5-7mm), subangular gravel		0942 - soil			1.7	95	1 inch schedule 80 PVC, Blank Casing with cement grout
100			WITH GRAVEL ; 60% sand, 20% clay, 20% fine to coarse (5-20mm), subangular gravel		0945 - soil			0.7	100	
					0951					

PROJECT: Broadway South Landfill		WELL / PROBEHOLE / BOREHOLE NO:		 SECOR
LOCATION: Broadway Boulevard and Prudence Road		BP-22 PAGE 4 OF 14		
PROJECT NUMBER: 18OT.20401.06				
DRILLING: STARTED 5/2/06	COMPLETED: 5/11/06	NORTHING (ft):		EASTING (ft):
INSTALLATION: STARTED 5/2/06	COMPLETED: 5/11/06	LATITUDE:		LONGITUDE:
DRILLING COMPANY: Layne Christensen Company		GROUND ELEV (ft):		TOC ELEV (ft):
DRILLING EQUIPMENT: Becker Hammer		INITIAL DTW (ft): 403.70 5/5/06		BOREHOLE DEPTH (ft): 458.0
DRILLING METHOD: Percussion-Hammer		STATIC DTW (ft):		WELL DEPTH (ft): 458.0
SAMPLING EQUIPMENT: Cyclone		WELL CASING DIAMETER (in): 1.4		BOREHOLE DIAMETER (in): 10 3/4
		LOGGED BY: K. Harker		CHECKED BY: C. Pollock

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SW	SAND WITH GRAVEL; SW; 10YR 7/4 grayish orange; fine to coarse-grained; loose; dry; no odor; none cementation; subangular; well graded; 85% sand, 15% fine to coarse (5-25mm), subrounded gravel, trace of silt		- soil			2.2		
110		SC	CLAYEY SAND WITH GRAVEL; SC; 5YR 4/4 brown; fine to medium-grained; low plasticity; medium dense to loose; dry; no odor; none cementation; subangular; well graded; 45% sand, 30% fine to coarse (5-40mm), subrounded gravel, 25% clay		1004 - soil			0.0	110	4 inch schedule 80 PVC, Blank Casing with cement grout
115			CLAYEY SAND; fine to coarse-grained; loose; 80% sand, 20% clay, trace of fine (5-7mm), subangular gravel		1009 - soil			0.9	115	
120			WITH GRAVEL; 50% sand, 35% fine (5-15mm), subangular to subrounded gravel, 15% clay		1013 - soil			2.7	120	
125			CLAYEY SAND; fine to medium-grained; subrounded; poorly graded; 80% sand, 20% clay, trace of fine (5-7mm), subrounded gravel and silt		1017 - soil			1.6	125	
130			WITH GRAVEL; fine to coarse-grained; medium plasticity; medium dense to loose; well graded; 45% sand, 35% fine to coarse (5-45mm), subangular to subrounded gravel, 20% clay		1026 - soil			1.2	130	1 inch schedule 80 PVC, Blank Casing with cement grout
135			Low plasticity; loose; 70% sand, 15% clay, 15% fine to coarse (5-20mm), subrounded gravel		1044 - soil			5.1	135	
					1053					



SECOR

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 5 OF 14

DRILLING: STARTED **5/2/06** COMPLETED: **5/11/06**
 INSTALLATION: STARTED **5/2/06** COMPLETED: **5/11/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **403.70 5/5/06** BOREHOLE DEPTH (ft): **458.0**
 STATIC DTW (ft): WELL DEPTH (ft): **458.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **K. Harker** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
		SC	Medium plasticity; 50% sand, 30% fine to coarse (5-20mm), subangular gravel, 20% clay		- soil			4.1		
145			45% sand, 35% clay, 20% fine to coarse (5-20mm), subangular to subrounded gravel		1100 - soil			4.2	145	4 inch schedule 80 PVC, Blank Casing with cement grout
150			Low plasticity; 65% sand, 20% clay, 15% fine to coarse (5-20mm), subangular gravel		1117 - soil			4.0	150	
155			Poorly graded; 60% sand, 30% clay, 10% fine (5-15mm), subrounded gravel		1124 - soil			3.5	155	1 inch schedule 80 PVC, Blank Casing with cement grout
160			Fine to medium-grained; 60% sand, 30% clay, 10% finr (5-10mm), subrounded gravel		1133 - soil			5.8	160	
165			Fine to coarse-grained; well graded; 55% sand, 30% fine to coarse (5/10mm), subangular gravel, 15% clay, trace of silt		1146 - soil			4.9	165	4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
170		SM	SILTY SAND WITH GRAVEL ; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; no odor; none cementation; subangular; well graded; 50% sand, 30% fine to coarse (5-20mm), subrounded gravel, 20% silt, trace of clay		1157 - soil			5.7	170	1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
					1204					

PROJECT: Broadway South Landfill
 LOCATION: Broadway Boulevard and Prudence Road
 PROJECT NUMBER: 18OT.20401.06

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 6 OF 14



SECOR

DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06
 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 403.70 5/5/06 BOREHOLE DEPTH (ft): 458.0
 STATIC DTW (ft): WELL DEPTH (ft): 458.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: K. Harker CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SM	65% sand, 20% silt, 15% fine to coarse (5-20mm), subrounded gravel		- soil			2.9		
180			55% sand, 30% fine to coarse (5-20mm), subrounded gravel, 15% silt		1234 - soil			4.1	180	4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
185			SILTY SAND ; fine to medium-grained; poorly graded; 80% sand, 20% silt, trace of fine (5-10mm), subrounded gravel and clay		1310 - soil			2.8	185	1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
190		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to medium-grained; medium plasticity; medium dense to loose; dry; no odor; none cementation; subrounded; poorly graded; 55% sand, 35% clay, 10% fine (5-10mm), subrounded to rounded gravel, trace of silt		1323 - soil			1.8	190	
195		SM	SILTY SAND WITH GRAVEL ; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; no odor; none cementation; subangular; well graded; 50% sand, 30% fine (5-7mm), subangular gravel, 20% silt, trace of clay		1342 - soil			4.1	195	1 inch and 4 inch schedule 80 PVC, Blank Casing with filter sand 8-12
200		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; loose; dry; no odor; none cementation; subrounded; poorly graded; 50% sand, 35% clay, 15% fine to coarse (10-30mm), subrounded to rounded gravel		1350 - soil			1.8	200	1 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12 1 inch PVC end plug, filter sand 8-12
205			Subangular; well graded; 50% sand, 30% clay, 20% fine (5-15mm), subangular to subrounded gravel		1416 - soil			3.9	205	
					1430					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED **5/2/06** COMPLETED: **5/11/06**
 INSTALLATION: STARTED **5/2/06** COMPLETED: **5/11/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **403.70 5/5/06** BOREHOLE DEPTH (ft): **458.0**
 STATIC DTW (ft): WELL DEPTH (ft): **458.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **K. Harker** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; loose; dry; no odor; none cementation; subangular; well graded; 45% sand, 30% fine (5-15mm), subangular gravel, 25% clay		- soil			0.7		filter sand 8-12
250			75% sand, 15% clay, 10% fine (5-15mm), subangular gravel		1535 - soil			1.4	250	1 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12
255			CLAYEY SAND ; medium plasticity; medium dense to loose; 70% sand, 30% clay, trace of fine (5 mm), subangular gravel		1548 - soil			2.3	255	1 inch PVC end plug, filter sand 8-12
260			WITH GRAVEL ; low plasticity; 55% sand, 25% fine (5-10mm), subangular gravel, 20% clay		1601 - soil			0.9	260	4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
265		SM	SILTY SAND WITH GRAVEL ; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; no odor; none cementation; subangular; well graded; 65% sand, 20% silt, 15% fine (5-10mm), subangular gravel		1612 - soil			5.1	265	
270			Fine (5-15mm), subrounded gravel		1628 - soil			5.2	270	
275			65% sand, 20% fine (5-15mm), subrounded gravel, 15% silt		1640 - soil			5.7	275	1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
					1700					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 9 OF 14



SECOR

DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06
 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **403.70 5/5/06** BOREHOLE DEPTH (ft): **458.0**
 STATIC DTW (ft): WELL DEPTH (ft): **458.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **K. Harker** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SW	SAND ; SW; 5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; none cementation; subrounded; well graded; trace of fine (5 mm), subrounded gravel and silt		- soil			7.9		
285		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; loose; dry; no odor; none cementation; subangular; well graded; 50% sand, 35% clay, 15% fine (5-10mm), subrounded gravel		1715 - soil			5.5	285	4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
290			5YR 6/4 light brown; fine to medium-grained; low plasticity; 70% sand, 15% clay, 15% fine (5-10mm), subrounded gravel		1727 - soil			6.3	290	1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
295			5YR 4/4 brown; fine to coarse-grained; 50% sand, 35% clay, 15% fine (5-10mm), subangular gravel		1735 - soil			6.9	295	1 inch and 4 inch schedule 80 PVC, Blank Casing with filter sand 8-12
300		GP-GM	GRAVEL WITH SAND AND SILT ; GP-GM; 5YR 6/4 light brown; fine-grained; non plastic; loose; dry; no odor; none cementation; subangular; poorly graded; 70% gravel, 20% fine to coarse-grained sand, 10% silt		1751 - soil			5.4	300	1 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12
305		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; dense; dry; no odor; none cementation; subangular; well graded; 55% sand, 30% clay, 15% fine to coarse (5-20mm), subangular gravel		1030 - soil			6.2	305	1 inch PVC end plug, filter sand 8-12
310			Low plasticity; 50% sand, 30% clay, 20% fine (5-10mm), subangular gravel		1042 - soil			5.2	310	
					1105					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 10 OF 14



SECOR

DRILLING: STARTED **5/2/06** COMPLETED: **5/11/06**
 INSTALLATION: STARTED **5/2/06** COMPLETED: **5/11/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **403.70 5/5/06** BOREHOLE DEPTH (ft): **458.0**
 STATIC DTW (ft): WELL DEPTH (ft): **458.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **K. Harker** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SC	Medium plasticity; subrounded; 45% sand, 40% clay, 15% fine (5-10mm), subangular gravel		- soil			5.8		
320					1121 - soil			4.5	320	
			Low plasticity; subangular; 50% sand, 30% clay, 20% fine to coarse (5-20mm), subangular gravel							
325		SM	SILTY SAND ; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; no odor; none cementation; subrounded; well graded; 75% sand, 25% silt, trace of fine (5 mm), subrounded gravel and clay		1131 - soil			7.0	325	
330		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; dense; dry; no odor; none cementation; subangular; well graded; 60% sand, 25% clay, 15% fine (5-10mm), subangular sand		1219 - soil			5.3	330	
335					1224 - soil			4.4	335	
			CLAYEY SAND ; subrounded; 60% sand, 40% clay, trace of fine (5-10mm), subangular gravel							
340		SW	SAND WITH GRAVEL ; SW; 5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; none cementation; subangular; well graded; 70% sand, 30% fine (5-7mm), subangular gravel, trace of clay		1251 - soil			4.3	340	
345		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; loose; dry; no odor; none cementation; subangular; well graded; 55% sand, 35% clay, 10% fine (5-10mm), subangular sand		1308 - soil			4.4	345	
					1325					

4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06
 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 403.70 5/5/06 BOREHOLE DEPTH (ft): 458.0
 STATIC DTW (ft): WELL DEPTH (ft): 458.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: K. Harker CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SW	SAND WITH GRAVEL; SW; 5YR 7/2 grayish orange pink; fine to coarse-grained; loose; dry; no odor; none cementation; subrounded; well graded; 80% sand, 20% fine (5-10mm), subrounded gravel, trace of clay		- soil			3.1		
355		SM	SILTY SAND WITH GRAVEL; SM; 5YR 6/4 light brown; fine to coarse-grained; non plastic; loose; dry; no odor; none cementation; subangular; well graded; 60% sand, 30% silt, 10% fine (5-15mm), subrounded gravel, trace of clay		1405 - soil			2.6	355	
360		SC	CLAYEY SAND WITH GRAVEL; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; loose; dry; no odor; none cementation; subangular; well graded; 40% sand, 35% clay, 25% fine to coarse (5-20mm), subangular to subrounded gravel		1431 - soil			4.6	360	
365			Subrounded; 55% sand, 25% fine to coarse (5-20mm), subangular gravel, 20% clay		1442 - soil			4.2	365	
370		SW	SAND WITH GRAVEL; SW; 5YR 7/2 grayish orange pink; fine to coarse-grained; loose; dry; no odor; none cementation; subangular; well graded; 75% sand, 25% fine to coarse (5-20mm), subangular to angular gravel, trace of clay		1451 - soil			3.3	370	
375		SC	CLAYEY SAND WITH GRAVEL; SC; 5YR 6/4 - 4/4 light brown to brown; fine to coarse-grained; medium plasticity; medium dense to loose; moist; no odor; none cementation; subangular; well graded; 45% sand, 30% fine to coarse (5-20mm), subangular gravel, 25% clay		1457 - soil			2.3	375	
380			5YR 4/4 brown; saturated; 60% sand, 25% clay, 15% fine to coarse (5-20mm), subangular gravel		1530 - soil			2.5	380	
					1610					

4 inch schedule 80 PVC, Blank Casing with filter sand 8-12

4 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: **STARTED 5/2/06 COMPLETED: 5/11/06**
 INSTALLATION: **STARTED 5/2/06 COMPLETED: 5/11/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **403.70 5/5/06** BOREHOLE DEPTH (ft): **458.0**
 STATIC DTW (ft): WELL DEPTH (ft): **458.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **K. Harker** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SC	50% sand, 25% clay, 25% fine to coarse (5-20mm), subangular gravel		- soil			2.5		
390		GW-GC	GRAVEL WITH SAND AND CLAY; GW-GC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; dense; saturated; no odor; none cementation; subangular; well graded; 40% gravel, 30% fine to coarse-grained sand, 30% clay		1616 - soil			2.5	390	
395		SC	CLAYEY SAND WITH GRAVEL; SC; 5YR 4/4 brown; fine to coarse-grained; medium plasticity; medium dense; wet; no odor; none cementation; subangular; well graded; 50% sand, 25% clay, 25% fine (5-10mm), subangular gravel		1655 - soil			1.9	395	
400			Saturated; 60% sand, 20% clay, 20% fine (5-10mm), subangular gravel		1754 - soil			8.7	400	
405			45% sand, 35% fine (5-10mm), subangular gravel, 20% clay		1815 - soil			6.8	405	
410			50% sand, 30% fine to coarse (5-25mm), subangular to subrounded gravel, 20% clay		1830 - soil			6.1	410	
415		SW	SAND WITH GRAVEL; SW; 5YR 6/4 light brown; fine to coarse-grained; loose; saturated; no odor; none cementation; subangular; well graded; 65% sand, 35% fine to coarse (5-25mm), subangular gravel, trace of clay		0936 - soil			6.4	415	
					0942					

4 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-22 PAGE 13 OF 14




SECOR


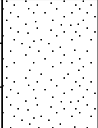
DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06
 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 403.70 5/5/06 BOREHOLE DEPTH (ft): 458.0
 STATIC DTW (ft): WELL DEPTH (ft): 458.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: K. Harker CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SC	CLAYEY SAND WITH GRAVEL ; SC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; medium dense; saturated; no odor; none cementation; subangular; well graded; 60% sand, 20% clay, 20% fine to cobbles (5-110mm), subangular gravel		- soil			7.2		
425			70% sand, 15% clay, 15% fine to coarse (5-30mm), subangular gravel		1000 - soil			6.4	425	
430		SW-SC	SAND WITH GRAVEL AND CLAY ; SW-SC; 5YR 4/4 brown; fine to coarse-grained; low plasticity; loose; wet; no odor; none cementation; subangular; well graded; 60% sand, 30% fine (5-15mm), subangular gravel, 10% clay		1048 - soil			6.0	430	
435					1059 - soil			5.9	435	
440		SW	SAND WITH GRAVEL ; SW; 5YR 6/4 light brown; fine to coarse-grained; loose; wet; no odor; none cementation; subangular; well graded; 60% sand, 40% fine to coarse (5-40mm), subangular gravel, trace of silt		1117 - soil			6.8	440	
445			Fine to cobbles (5-110mm), subangular gravel		1124 - soil			5.8	445	4 inch schedule 80 PVC, Blank Casing with filter sand 8-12
450					1136 - soil			5.8	450	4 inch PVC end plug, filter sand 8-12
					1248					

PROJECT: Broadway South Landfill		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: Broadway Boulevard and Prudence Road			
PROJECT NUMBER: 18OT.20401.06		BP-22 PAGE 14 OF 14	
DRILLING: STARTED 5/2/06 COMPLETED: 5/11/06 INSTALLATION: STARTED 5/2/06 COMPLETED: 5/11/06 DRILLING COMPANY: Layne Christensen Company DRILLING EQUIPMENT: Becker Hammer DRILLING METHOD: Percussion-Hammer SAMPLING EQUIPMENT: Cyclone		NORTHING (ft): LATITUDE: GROUND ELEV (ft): INITIAL DTW (ft): 403.70 5/5/06 STATIC DTW (ft): WELL CASING DIAMETER (in): 1.4 LOGGED BY: K. Harker	
		EASTING (ft): LONGITUDE: TOC ELEV (ft): BOREHOLE DEPTH (ft): 458.0 WELL DEPTH (ft): 458.0 BOREHOLE DIAMETER (in): 10 3/4 CHECKED BY: C. Pollock	

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SW	SAND ; 5YR 4/4 brown; saturated; subrounded; trace of fine (5 mm), subangular gravel and clay		- soil			5.2		
			Hole terminated at 458 feet.							
460									460	
465									465	
470									470	
475									475	
480									480	
485									485	

PROJECT: Broadway South Landfill
 LOCATION: Broadway Boulevard and Prudence Road
 PROJECT NUMBER: 18OT.20401.06

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0
 STATIC DTW (ft): WELL DEPTH (ft): 455.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Fill Material consists of well graded sand with gravel, Boring post hole dug to approx. 3 feet bgs							Above ground dog house vault with 1 inch and 4 inch PVC caps
5		SW	SAND WITH GRAVEL ; SW; loose; dry; well graded; trace of cobbles and fines		- soil			3.1	5	
10		SP	SAND ; SP; fine-grained; poorly graded; debris waste		- soil			6.7	10	4 inch schedule 80 PVC, Blank Casing with cement grout
15					- soil			19.4	15	
20					- soil			16.7	20	
25		SW	SAND WITH GRAVEL ; SW; light brown; fine to coarse-grained; loose; dry; subrounded; well graded; 30% medium-grained sand		- soil			9.4	25	1 inch schedule 80 PVC, Blank Casing with cement grout
30					- soil			3.5	30	
					-					

PROJECT: Broadway South Landfill
 LOCATION: Broadway Boulevard and Prudence Road
 PROJECT NUMBER: 18OT.20401.06

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 2 OF 14



SECOR

DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0
 STATIC DTW (ft): WELL DEPTH (ft): 455.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SW	Some fines		- soil			7.9		
40					- soil			6.7	40	4 inch schedule 80 PVC, Blank Casing with cement grout
45		SW	SAND ; SW; tan; fine to coarse-grained; 30% fine-grained sand, trace of fine gravel		- soil			4.7	45	
50					- soil			3.5	50	
55					- soil			4.5	55	
60					- soil			6.7	60	1 inch schedule 80 PVC, Blank Casing with cement grout
65					- soil			9.3	65	
					-					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 3 OF 14



SECOR

DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0
 STATIC DTW (ft): WELL DEPTH (ft): 455.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction	
		SP	SAND ; SP; light brown; fine to coarse-grained; dry; poorly graded; 50% medium-grained sand, trace of fine gravel and fines		- soil			7.0		 4 inch schedule 80 PVC, Blank Casing with cement grout	
75					- soil			7.6	75		
80					- soil			4.0	80		
85					- soil	Tan; 40% fine-grained sand, trace of fines		4.3	85		
90		SW	SAND ; SW; light brown; fine to coarse-grained; dry; well graded; 30% fine-grained sand with fines, trace of fine gravel		- soil			6.0	90	 1 inch schedule 80 PVC, Blank Casing with cement grout	
95					- soil			6.9	95		
					- soil						
100					- soil			7.0	100		
					-						

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 4 OF 14



SECOR

DRILLING: STARTED **4/25/06** COMPLETED: **5/2/06**
 INSTALLATION: STARTED **4/25/06** COMPLETED: **5/2/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **358.00 4/27/06** BOREHOLE DEPTH (ft): **455.0**
 STATIC DTW (ft): WELL DEPTH (ft): **455.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **D. Fischer** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
		SW	SAND ; light brown; fine to coarse-grained; loose; dry; well graded; 30% fine-grained sand with fines, trace of fine gravel		- soil			6.4		
110					- soil			17.4	110	
115					- soil			6.8	115	
120					- soil			8.0	120	
		SW	SAND WITH GRAVEL ; SW; fine to coarse-grained; loose; dry; trace of fines		- soil			5.4	125	
130					- soil			6.2	130	
135					- soil			5.1	135	
					-					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 5 OF 14



SECOR

DRILLING: STARTED **4/25/06** COMPLETED: **5/2/06**
 INSTALLATION: STARTED **4/25/06** COMPLETED: **5/2/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
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 STATIC DTW (ft): WELL DEPTH (ft): **455.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **D. Fischer** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
145		SW	SAND ; fine to coarse-grained; loose; dry; 30% fine-grained sand with fines, trace of fine gravel		- soil			8.2		
					- soil			7.1	145	
150					- soil			6.5	150	
155					- soil			6.7	155	
160					- soil			7.6	160	
165		SP	SAND ; SP; tan; fine-grained; loose; dry; poorly graded		- soil			4.9	165	
170					- soil			9.2	170	

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 6 OF 14

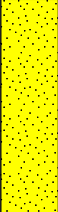

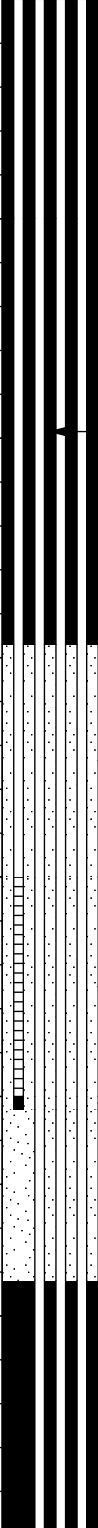















SECOR







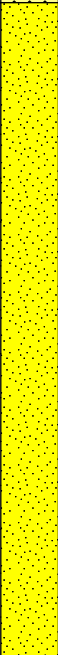






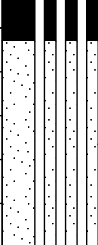


DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0
 STATIC DTW (ft): WELL DEPTH (ft): 455.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SP	SAND ; tan; fine-grained; loose; dry; poorly graded		- soil			5.2		 <p>4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal</p> <p>1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal</p> <p>1 inch and 4 inch schedule 80 PVC, Blank Casing with filter sand 8-12</p> <p>1 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12</p> <p>1 inch PVC end plug, filter sand 8-12</p>
180		SW	SAND ; SW; light brown; fine to coarse-grained; loose; dry; well graded; 30% medium-grained sand		- soil			6.1	180	
185					- soil			4.4	185	
190					- soil			6.7	190	
195					- soil			5.6	195	
200					- soil			4.6	200	
205		GW	GRAVEL WITH SAND ; GW; loose; dry; well graded; 40% coarse (1/2" to 2" diameter), subangular to angular gravel, fine sand to coarse gravel		- soil			3.7	205	
					-					

PROJECT: Broadway South Landfill LOCATION: Broadway Boulevard and Prudence Road PROJECT NUMBER: 18OT.20401.06		WELL / PROBEHOLE / BOREHOLE NO: <div style="text-align: center; font-size: 1.2em; font-weight: bold;">BP-23</div> PAGE 7 OF 14		 SECOR
DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06 DRILLING COMPANY: Layne Christensen Company DRILLING EQUIPMENT: Becker Hammer DRILLING METHOD: Percussion-Hammer SAMPLING EQUIPMENT: Cyclone		NORTHING (ft): LATITUDE: GROUND ELEV (ft): INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0 STATIC DTW (ft): WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4 LOGGED BY: D. Fischer CHECKED BY: C. Pollock		

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
215		SW	SAND ; SW; light brown; loose; dry; subangular; well graded; 25% medium-grained sand with fines, trace of fine to coarse (to 2' diameter) gravel		- soil			7.3		
					- soil			6.4	215	
220					- soil			6.1	220	
225					- soil			5.1	225	
230		SP	SAND ; SP; light brown; medium-grained; loose; dry; subangular; poorly graded		- soil					
					- soil			6.6	230	
235					- soil			9.8	235	
240					- soil			7.9	240	
			Tan; fine to coarse-grained; 50% medium-grained sand, trace of fines		-					
					-					

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 8 OF 14



SECOR

DRILLING: STARTED **4/25/06** COMPLETED: **5/2/06**
 INSTALLATION: STARTED **4/25/06** COMPLETED: **5/2/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **358.00 4/27/06** BOREHOLE DEPTH (ft): **455.0**
 STATIC DTW (ft): WELL DEPTH (ft): **455.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **D. Fischer** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
		SP	SAND ; SP; tan; fine to coarse-grained; loose; dry; subangular; poorly graded; 50% medium-grained sand, trace of fines and subrounded gravel		- soil			6.0		filter sand 8-12
250					- soil			8.5	250	1 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12 1 inch PVC end plug, filter sand 8-12
255					- soil			12.4	255	
260					- soil			7.5	260	4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
265					- soil			8.3	265	
270					- soil			7.7	270	
275					- soil			7.0	275	1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
					-					

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 9 OF 14



SECOR

DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0
 STATIC DTW (ft): WELL DEPTH (ft): 455.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SP	SAND ; SP; tan; fine to coarse-grained; loose; dry; subangular; poorly graded; 50% medium-grained sand, trace of fines		- soil			7.9		
285					- soil			13.6	285	4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
290					- soil			6.8	290	1 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal
295					- soil			9.2	295	1 inch and 4 inch schedule 80 PVC, Blank Casing with filter sand 8-12
300					- soil			8.1	300	1 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12 1 inch PVC end plug, filter sand 8-12
305					- soil			7.1	305	
310					- soil			5.1	310	
					-					

PROJECT: Broadway South Landfill
 LOCATION: Broadway Boulevard and Prudence Road
 PROJECT NUMBER: 18OT.20401.06

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 10 OF 14



SECOR

DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0
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 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SP	SAND ; SP; tan; fine to coarse-grained; loose; dry; subangular; poorly graded; 50% medium-grained sand, trace of fines		- soil			6.2		
320					- soil			7.8	320	
325					- soil			12.0	325	
330					- soil			5.3	330	
335			Tan; medium-grained; dry		- soil			8.1	335	
340					- soil			8.0	340	
345			Fine to coarse-grained; dry; 50% medium-grained sand, trace of fines and fine gravel		- soil			8.9	345	
					-					4 inch schedule 80 PVC, Blank Casing with filter sand

4 inch schedule 80 PVC, Blank Casing with bentonite 3/8" chip and 1/4" pellet seal

PROJECT: **Broadway South Landfill**
 LOCATION: **Broadway Boulevard and Prudence Road**
 PROJECT NUMBER: **18OT.20401.06**

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 11 OF 14



SECOR

DRILLING: STARTED **4/25/06** COMPLETED: **5/2/06**
 INSTALLATION: STARTED **4/25/06** COMPLETED: **5/2/06**
 DRILLING COMPANY: **Layne Christensen Company**
 DRILLING EQUIPMENT: **Becker Hammer**
 DRILLING METHOD: **Percussion-Hammer**
 SAMPLING EQUIPMENT: **Cyclone**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **358.00 4/27/06** BOREHOLE DEPTH (ft): **455.0**
 STATIC DTW (ft): WELL DEPTH (ft): **455.0**
 WELL CASING DIAMETER (in): **1.4** BOREHOLE DIAMETER (in): **10 3/4**
 LOGGED BY: **D. Fischer** CHECKED BY: **C. Pollock**

GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
		SP	SAND ; SP; tan; fine to coarse-grained; loose; dry; subangular; poorly graded; 50% medium-grained sand, trace of fines and fine gravel		- soil			11.1		8-12
355					- soil			9.8	355	
360			Moist; 40% coarse-grained sand, trace of fines and fine gravel		- soil			10.7	360	
365					- soil			5.2	365	
370					- soil			2.4	370	4 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12
375					- soil			3.1	375	
380					- soil			3.5	380	
					-					

PROJECT: Broadway South Landfill
 LOCATION: Broadway Boulevard and Prudence Road
 PROJECT NUMBER: 18OT.20401.06

WELL / PROBEHOLE / BOREHOLE NO:

BP-23 PAGE 12 OF 14

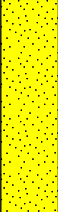

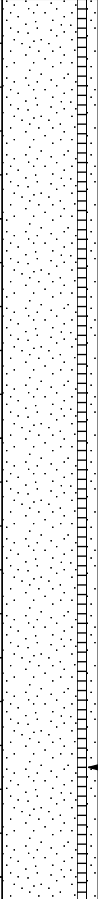





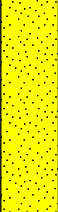





SECOR

DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06
 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06
 DRILLING COMPANY: Layne Christensen Company
 DRILLING EQUIPMENT: Becker Hammer
 DRILLING METHOD: Percussion-Hammer
 SAMPLING EQUIPMENT: Cyclone

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
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 STATIC DTW (ft): WELL DEPTH (ft): 455.0
 WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4
 LOGGED BY: D. Fischer CHECKED BY: C. Pollock


GEO FORM 304 BORING LOGS BSDP-1, BSDP-2, BSDP-3, BSDP-4, BP-22, AND BP-23.GPJ SECOR INTL.GDT 10/23/06

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
390		SP	SAND ; SP; tan; fine to coarse-grained; loose; saturated; subangular; poorly graded; 50% medium-grained sand, trace of fines and fine gravel		- soil			3.5		 4 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12
395					- soil			2.7	390	
400					- soil			2.8	395	
405		GW	GRAVEL ; GW; tan; fine to coarse-grained; loose; saturated; subrounded; well graded; 70% fine (to 3" diameter) gravel, trace of coarse-grained sand		- soil			2.7	400	
410					- soil			2.0	405	
415		SP	SAND ; SP; tan; fine to coarse-grained; loose; saturated; subangular; poorly graded; 40% coarse-grained sand		- soil			2.3	410	
			WITH GRAVEL ; medium to coarse-grained; fine to coarse gravel		- soil			3.9	415	
					-					

PROJECT: Broadway South Landfill		WELL / PROBEHOLE / BOREHOLE NO:	
LOCATION: Broadway Boulevard and Prudence Road		BP-23	
PROJECT NUMBER: 18OT.20401.06		PAGE 13 OF 14	
DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06 DRILLING COMPANY: Layne Christensen Company DRILLING EQUIPMENT: Becker Hammer DRILLING METHOD: Percussion-Hammer SAMPLING EQUIPMENT: Cyclone		NORTHING (ft): LATITUDE: GROUND ELEV (ft): INITIAL DTW (ft): 358.00 4/27/06 STATIC DTW (ft): WELL CASING DIAMETER (in): 1.4 LOGGED BY: D. Fischer	
		EASTING (ft): LONGITUDE: TOC ELEV (ft): BOREHOLE DEPTH (ft): 455.0 WELL DEPTH (ft): 455.0 BOREHOLE DIAMETER (in): 10 3/4 CHECKED BY: C. Pollock	

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			NO RECOVERY		-			NR		
425					-			NR	425	
430		SW	SAND; SW; brown; fine to coarse-grained; medium dense; saturated; subangular; well graded; 30% coarse-grained sand, trace of fines and fine to coarse (to 3" diameter) gravel		-			-	430	4 inch schedule 80 PVC, 0.02 inch slotted casing, filter sand 8-12
435					-			-	435	
440					-			-	440	
445					-			-	445	4 inch schedule 80 PVC, Blank Casing with filter sand 8-12
450					-			-	450	4 inch PVC end plug, filter sand 8-12
					-					

Hole terminated at 455 feet.

PROJECT: Broadway South Landfill LOCATION: Broadway Boulevard and Prudence Road PROJECT NUMBER: 18OT.20401.06		WELL / PROBEHOLE / BOREHOLE NO: <div style="text-align: center;">BP-23</div> PAGE 14 OF 14		 SECOR
DRILLING: STARTED 4/25/06 COMPLETED: 5/2/06 INSTALLATION: STARTED 4/25/06 COMPLETED: 5/2/06 DRILLING COMPANY: Layne Christensen Company DRILLING EQUIPMENT: Becker Hammer DRILLING METHOD: Percussion-Hammer SAMPLING EQUIPMENT: Cyclone		NORTHING (ft): LATITUDE: GROUND ELEV (ft): INITIAL DTW (ft): 358.00 4/27/06 BOREHOLE DEPTH (ft): 455.0 STATIC DTW (ft): WELL CASING DIAMETER (in): 1.4 BOREHOLE DIAMETER (in): 10 3/4 LOGGED BY: D. Fischer CHECKED BY: C. Pollock		

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID Method	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
460					-			-	460	
465									465	
470									470	
475									475	
480									480	
485									485	

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

BP-24A PAGE 1 OF 4



SECOR

DRILLING: STARTED **12/5/07** COMPLETED: **12/7/07**
 INSTALLATION: STARTED **12/7/07** COMPLETED: **12/12/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 12/6/07** WELL DEPTH (ft): **355.0**
 STATIC DTW (ft): **336.45 12/13/07** BOREHOLE DEPTH (ft): **358.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
5		SW-SM	Asphalt							
10			SAND WITH SILT AND GRAVEL ; SW-SM; 5YR 4/6 yellowish red; fine to coarse-grained; loose; moist; no odor; no staining; subrounded; well graded; Approx. 50% sand, 30% gravel, 10% cobbles, 10% silt		1131 12/5/07			0.0	10	Neat Cement
15			7.5YR 6/6 reddish yellow; Approx. 60% sand, 30% gravel, 10% silt		1317 ---			0.0	20	
20			Note: All lithologic descriptions are based on visual examination of drill cuttings		1329 ---			0.0	30	
25					1348 ---			0.0	40	
30					1354 ---			0.0	50	Blank 5" SCH. 80 PVC
35					1443 ---			0.0	60	Bentonite Grout
40					1451 ---			0.0	70	
45			7.5YR 6/4 light brown		1542 ---			0.0	80	
50		SW-SM	SAND WITH SILT ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subrounded; well graded; Approx. 80% sand, 10% gravel, 10% silt		1554 ---			0.0	90	
55					1632				95	

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

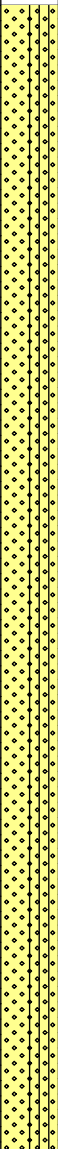


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SECOR

DRILLING: STARTED **12/5/07** COMPLETED: **12/7/07**
 INSTALLATION: STARTED **12/7/07** COMPLETED: **12/12/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 12/6/07** WELL DEPTH (ft): **355.0**
 STATIC DTW (ft): **336.45 12/13/07** BOREHOLE DEPTH (ft): **358.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
105		SW-SM SW-SM	SAND WITH SILT ; SW-SM; 10YR 5/4 yellowish brown; fine to coarse-grained; loose; dry; no odor; no staining; subrounded; well graded; Approx. 80% sand, 10% gravel, 10% silt		---			0.0	105	 Blank 5" SCH. 80 PVC Bentonite Grout
110				1648 ---		0.0	110			
115								115		
120				1740 ---		0.3	120			
125								125		
130				1751 ---		0.4	130			
135								135		
140				0811 12/6/07		0.3	140			
145								145		
150				0817 ---		0.5	150			
155						155				
160		0858 ---		0.0	160					
165						165				
170		0909 ---		0.6	170					
175						175				
180		SW-SC	SAND WITH CLAY AND GRAVEL ; SW-SC; 7.5YR 5/4 brown; fine to coarse-grained; loose; moist; no odor; no staining; subrounded; well graded; Approx. 70% sand, 20% gravel, 10% clay		0946 ---		1.1	180		
185								185		
190				0955 ---		1.5	190			
195								195		
1033										

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED **12/5/07** COMPLETED: **12/7/07**
 INSTALLATION: STARTED **12/7/07** COMPLETED: **12/12/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 12/6/07** WELL DEPTH (ft): **355.0**
 STATIC DTW (ft): **336.45 12/13/07** BOREHOLE DEPTH (ft): **358.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
		SW-SC	SAND WITH CLAY AND GRAVEL ; SW-SM; as above		---			0.0		
205		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 80% sand, 10% gravel, 10% silt Moist		1046 ---		0.1	205		
210		SW-SM							210	
215									215	
220						1120 ---		0.1	220	
225									225	
230						1129 ---		0.3	230	
235									235	
240						1318 ---		0.0	240	
245									245	
250				1340 ---		0.0	250	Blank 5" SCH. 80 PVC		
255										
260				1435 ---		0.0	260	Bentonite Grout		
265		SM	SILTY SAND ; SM; 10YR 6/4 light yellowish brown; fine to medium-grained; loose; dry; no odor; no staining; subangular; poorly graded; Approx. 80% sand, 20% silt		1454 ---		0.0	265		
270								270		
275		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/3 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 80% sand, 10% silt, 10% gravel		1550 ---		0.0	275		
280								280		
285								285		
290					1606 ---		0.0	290		
295								295		
					1702					

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED **12/5/07** COMPLETED: **12/7/07**
 INSTALLATION: STARTED **12/7/07** COMPLETED: **12/12/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 12/6/07** WELL DEPTH (ft): **355.0**
 STATIC DTW (ft): **336.45 12/13/07** BOREHOLE DEPTH (ft): **358.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
305		SW-SM SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; as above		---			0.3	305	Bentonite Grout 8-12 Sand
310		GP	GRAVEL WITH SAND ; GP; 7.5YR 6/4 light brown; fine-grained; loose; dry; no odor; no staining; subangular; poorly graded; Approx. 75% gravel, 20% sand, 5% silt		1730 ---			0.0	310	Bentonite TR30 Pellets
315									315	
320					0841 12/7/07			0.2	320	Blank 5" SCH. 80 PVC
325		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 5/4 brown; fine to coarse-grained; loose; moist; subrounded; well graded; Approx. 50% sand, 30% gravel, 20% silt		0910 ---			0.3	325	
330									330	
335			First encounter of groundwater						335	8-12 Sand
340			Dry; Approx. 80% sand, 10% gravel, 10% silt		1016 ---			0.5	340	0.020 Slotted 5" SCH. 80 PVC
345									345	
350					1041 ---			0.2	350	
355			Moist; Approx. 50% sand, 30% gravel, 20% silt						355	
360			Hole terminated at 358 feet.		1105 ---			0.1	360	
365									365	
370									370	
375									375	
380									380	
385									385	
390									390	
395									395	

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED **11/26/07** COMPLETED: **11/29/07**
 INSTALLATION: STARTED **11/29/07** COMPLETED: **12/4/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 11/28/07** WELL DEPTH (ft): **405.0**
 STATIC DTW (ft): **335.02 12/6/07** BOREHOLE DEPTH (ft): **414.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction	
5		SW-SM	Asphalt SAND WITH SILT AND GRAVEL ; SW-SM; 5YR 4/6 yellowish red; fine to coarse-grained; loose; moist; no odor; no staining; subrounded; well graded; Approx. 50% sand, 30% gravel, 10% cobbles, 10% silt Note: All lithologic descriptions are based on visual examination of drill cuttings		0821 11/27/07			0.0	10	Neat Cement	
15		SM	SILTY SAND WITH GRAVEL ; SM; 5YR 4/6 yellowish red; fine to medium-grained; loose; dry; no odor; no staining; subrounded; poorly graded; Approx. 55% sand, 30% silt, 15% gravel		1006 ---			0.0	20		
25						1014 ---			0.0	30	
30				Approx. 70% sand, 15% gravel, 15% silt		1058 ---			0.1	40	
45		SM	SILTY SAND ; SM; 7.5YR 6/4 light brown; fine to medium-grained; loose; dry; no odor; no staining; subrounded; poorly graded; Approx. 70% sand, 25% silt, 5% gravel		1108 ---			0.0	50	Blank 5" SCH. 80 PVC	
55						1126 ---			0.0	60	Bentonite Grout
65		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 70% sand, 15% gravel, 15% silt		1133 ---			0.2	70		
75						1149 ---			0.1	80	
85						1153 ---			0.0	90	
95						1213					

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:


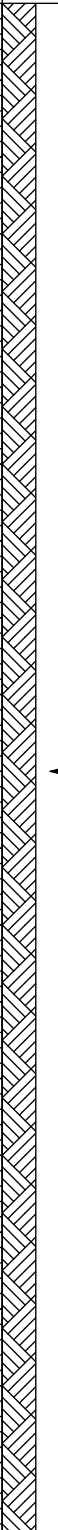
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SECOR

DRILLING: STARTED **11/26/07** COMPLETED: **11/29/07**
 INSTALLATION: STARTED **11/29/07** COMPLETED: **12/4/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 11/28/07** WELL DEPTH (ft): **405.0**
 STATIC DTW (ft): **335.02 12/6/07** BOREHOLE DEPTH (ft): **414.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction	
105		SW-SM SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 70% sand, 15% gravel, 15% silt		---			0.5	105	 Blank 5" SCH. 80 PVC Bentonite Grout	
110				1219 ---		0.5	110				
115								115			
120				1422 ---		0.1	120				
125								125			
130				1427 ---		0.0	130				
135								135			
140				1445 ---		0.5	140				
145								145			
150				1449 ---		1.3	150				
155								155			
160				1507 ---		0.0	160				
165								165			
170				1512 ---		0.0	170				
175								175			
180		1539 ---		0.0	180						
185						185					
190		1545 ---		0.2	190						
195						195					
					1604						

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

BP-24B PAGE 3 OF 5



DRILLING: STARTED **11/26/07** COMPLETED: **11/29/07**
 INSTALLATION: STARTED **11/29/07** COMPLETED: **12/4/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 11/28/07** WELL DEPTH (ft): **405.0**
 STATIC DTW (ft): **335.02 12/6/07** BOREHOLE DEPTH (ft): **414.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
205		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 70% sand, 15% gravel, 15% silt		---			0.0	205	
210		SW-SM			1611			0.0	210	
215		SM		SILTY SAND ; SM; 7.5YR 6/4 light brown; fine-grained; loose; dry; no odor; no staining; subangular; poorly graded; Approx. 80% sand, 20% silt		1655		0.1	220	
220									225	
225		SW-SM			SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 70% sand, 15% gravel, 15% silt		1702		0.2	
230							235			
235							240			
240							245			
245							250			
250						0.3	250	Blank 5" SCH. 80 PVC	255	
255	SM	SILTY SAND ; SM; 7.5YR 6/4 light brown; fine to medium-grained; loose; dry; no odor; no staining; subangular; poorly graded; Approx. 70% sand, 25% silt, 5% gravel		0856	11/28/07	0.3	260	Bentonite Grout	265	
260							270			
265							275			
270							280			
275	SW-SM		SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 60% sand, 30% gravel, 10% silt		0936		0.1	280		285
280							290			
285							295			
290										
295										

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

BP-24B PAGE 4 OF 5



DRILLING: STARTED **11/26/07** COMPLETED: **11/29/07**
 INSTALLATION: STARTED **11/29/07** COMPLETED: **12/4/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 11/28/07** WELL DEPTH (ft): **405.0**
 STATIC DTW (ft): **335.02 12/6/07** BOREHOLE DEPTH (ft): **414.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

GEO FORM 304 BP-24 CLUSTER.GPJ SECOR INTL.GDT 3/18/08

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
305		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; as above		---			0.2	305	
310		GP	GRAVEL WITH SAND ; GP; 7.5YR 6/4 light brown; fine to coarse-grained; loose; dry; no odor; no staining; angular; poorly graded; Cuttings appear to be approx. 60% sand-sized, 40% gravel-sized; granitic cobbles predominate		1033			0.3	310	
315					---				315	
320					1117			0.0	320	Blank 5" SCH. 80 PVC
325					---				325	
330					1138			0.1	330	Bentonite Grout
335		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; moist; no odor; no staining; subrounded; well graded; Approx. 70% sand, 20% gravel, 10% silt		1321			0.1	335	
340					---				340	
345		GP-GM	GRAVEL WITH SAND AND SILT ; GP-GM; 7.5YR 6/4 light brown; loose; moist; no odor; no staining; angular; poorly graded; Cuttings appear to be approx. 70% sand-sized, 15% silt, 15% gravel; granitic cobbles predominate		1337			0.0	345	
350					---				350	
355					1453			0.0	355	
360			Wet		---				360	
365		SP-SC	CLAYEY SAND ; SP-SC; 7.5YR 6/4 light brown; medium to coarse-grained; loose; wet; subangular; poorly graded; Approx. 60% sand, 40% clay		1524			0.3	365	8-12 Sand
370					---				370	Bentonite TR30 Pellets
375					1610			0.1	375	
380		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 7.5YR 6/4 light brown; fine to coarse-grained; loose; wet; angular; well graded; Approx. 70% sand, 20% gravel, 10% silt		---				380	
385					1656			0.1	385	8-12 Sand
390					---				390	
395		GP	GRAVEL WITH SAND ; GP; see below		0844				395	0.020 Slotted 5" SCH. 80 PVC

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

BP-24B PAGE 5 OF 5



SECOR

DRILLING: STARTED **11/26/07** COMPLETED: **11/29/07**
 INSTALLATION: STARTED **11/29/07** COMPLETED: **12/4/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **Shovel, scoop sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **335 11/28/07** WELL DEPTH (ft): **405.0**
 STATIC DTW (ft): **335.02 12/6/07** BOREHOLE DEPTH (ft): **414.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
405		GP	GRAVEL WITH SAND ; GP; fine-grained; loose; wet; no odor; no staining; angular; poorly graded; Approx. 70% gravel, 30% sand. color ranges from white to black		11/29/07				405	
410		GP			0939				410	
415		Hole terminated at 414 feet.								
420									420	
425									425	
430									430	
435									435	
440									440	
445									445	
450									450	
455									455	
460									460	
465									465	
470									470	
475									475	
480									480	
485									485	
490									490	
495									495	

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

BP-24C PAGE 1 OF 5



DRILLING: STARTED **11/5/07** COMPLETED: **11/15/07**
 INSTALLATION: STARTED **11/19/07** COMPLETED: **11/21/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **SimulProbe sampler, shovel, sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **345 11/7/07** WELL DEPTH (ft): **460.0**
 STATIC DTW (ft): **335.64 11/26/07** BOREHOLE DEPTH (ft): **462.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
5		SW-SM	Asphalt SAND WITH SILT AND GRAVEL ; SW-SM; 5YR 4/6 yellowish red; fine to coarse-grained; loose; moist; no odor; no staining; subrounded; well graded; Approx. 50% sand, 35% gravel, 10% silt, & 5% cobbles		1443 11/5/07			0.3	5	
10					0943 11/6/07			0.1	10	Neat Cement
15			Note: All lithologic descriptions are based on visual examination of drill cuttings						15	
20			Dry; Approx. 60% fine to coarse sand, 30% fine gravel, 10% silt. subangular to subrounded		0951 ---			0.6	20	
25									25	
30					1014 ---			0.6	30	
35									35	
40					1021 ---			0.7	40	
45									45	
50			10YR 6/6 brownish yellow		1100 ---			0.0	50	Blank 5" SCH. 80 PVC
55									55	
60					1121 ---			0.1	60	Bentonite Grout
65									65	
70					1223 ---			0.0	70	
75									75	
80			Subangular; Approx. 60% fine to coarse sand, 20% gravel, 20% silt		1229 ---			0.3	80	
85									85	
90					1248 ---			0.0	90	
95									95	
					1441					

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

BP-24C PAGE 2 OF 5



SECOR

DRILLING: STARTED **11/5/07** COMPLETED: **11/15/07**
 INSTALLATION: STARTED **11/19/07** COMPLETED: **11/21/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **SimulProbe sampler, shovel, sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **345 11/7/07** WELL DEPTH (ft): **460.0**
 STATIC DTW (ft): **335.64 11/26/07** BOREHOLE DEPTH (ft): **462.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
105		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 5YR 4/6 yellowish red; fine to coarse-grained; loose; moist; no odor; no staining; subrounded; well graded; Approx. 50% sand, 35% gravel, 10% silt, & 5% cobbles		---			0.1	105	
110		SW-SM	Approx. 60% fine to coarse sand, 30% fine gravel, 10% silt		1449 ---			0.2	110	
115									115	
120					1456 ---			1.8	120	
125									125	
130					1519 ---			0.0	130	
135									135	
140					1531 ---			0.0	140	
145									145	
150			Approx. 75% fine to coarse sand, 20% silt, 5% fine gravel		1602 ---			0.2	150	Blank 5" SCH. 80 PVC
155									155	
160					1612 ---			1.3	160	Bentonite Grout
165									165	
170					1624 ---			0.0	170	
175									175	
180			10YR 6/4 light yellowish brown; Approx. 60% fine to coarse sand, 30% gravel, 10% silt		1632 ---			0.9	180	
185									185	
190			5YR 6/6 reddish yellow		0839 11/7/07			0.2	190	
195									195	
					0847					

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED **11/5/07** COMPLETED: **11/15/07**
 INSTALLATION: STARTED **11/19/07** COMPLETED: **11/21/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **SimulProbe sampler, shovel, sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **345 11/7/07** WELL DEPTH (ft): **460.0**
 STATIC DTW (ft): **335.64 11/26/07** BOREHOLE DEPTH (ft): **462.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
205		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; as above		---			0.8	205	
210		SW-SM	SILTY SAND ; SM; 10YR 6/4 light yellowish brown; fine to medium-grained; loose; dry; no odor; no staining; subrounded; poorly graded; Approx. 70% fine to medium sand, 30% silt		0902			1.0	210	
215		SM			---				215	
220					0908			2.2	220	
225		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 10YR 6/4 light yellowish brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 60% fine to coarse sand, 20% gravel, 20% silt		0918			1.6	225	
230					---				230	
235					0927			2.8	235	
240					---				240	
245					0946			0.0	245	
250					---				250	Blank 5" SCH. 80 PVC
255		SM	SILTY SAND ; SM; 5YR 6/4 light reddish brown; fine to medium-grained; loose; dry; no odor; no staining; subrounded; poorly graded; Approx. 70% fine to medium sand, 30% silt		1005			1.0	255	
260					---				260	Bentonite Grout
265		SW-SM	SAND WITH SILT AND GRAVEL ; SW-SM; 10YR 6/4 light yellowish brown; fine to coarse-grained; loose; dry; no odor; no staining; subangular; well graded; Approx. 70% fine to coarse sand, 20% fine gravel, 10% silt		1016			0.8	265	
270					---				270	
275					1033			0.8	275	
280					---				280	
285					1041			0.6	285	
290					---				290	
295					1103				295	

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED **11/5/07** COMPLETED: **11/15/07**
 INSTALLATION: STARTED **11/19/07** COMPLETED: **11/21/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **SimulProbe sampler, shovel, sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **345 11/7/07** WELL DEPTH (ft): **460.0**
 STATIC DTW (ft): **335.64 11/26/07** BOREHOLE DEPTH (ft): **462.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

NEO FORM 304 BP-24 CLUSTER.GPJ SECOR INTL.GDT 3/18/08

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction	
305		GP	GRAVEL WITH SAND ; GP; 5YR 6/4 light reddish brown; loose; dry; no odor; no staining; subangular; poorly graded; Appears as approx. 60% sand, 40% gravel. Coarse and hard gravel layer, drilling slow, angular chips		---			0.6	305		
310					1136			1.6	310		
315					---						315
320					1349			0.5	320		
325					---						325
330					1621			0.3	330		
335					---						335
340					1654			1.2	340		
345					---						345
350						Wet; Cuttings are moist, likely first encounter of groundwater		1749			
355			10YR 6/4 light yellowish brown; medium-grained; loose; wet; angular; poorly graded; Approx. 80% fine gravel, 20% fine sand		1850				355		
360	GM		SILTY GRAVEL WITH SAND ; GM; 10YR 6/3 pale brown; medium-grained; dense; wet; no odor; no staining; subrounded; poorly graded; Approx. 50% fine gravel, 30% fine sand, 20% silt		BP24B-355	1.5	54	0.1	355		
365					1051			0.0	365		
370					11/9/07				370		
375	SP-SM		SAND WITH SILT AND GRAVEL ; SP-SM; 10YR 6/3 pale brown; medium to coarse-grained; medium dense; wet; no odor; no staining; subrounded; poorly graded; Approx. 70% medium to coarse sand, 15% fine to fine gravel, 15% silt		1455	1.5	6	0.0	375		
380					BP24B-375		8			380	
385					1615			0.0	385		
390					---					390	
395					1430			.5	32	0.3	395
			Gravel/cobbles present		BP24B-395						
					11/12/07						

GEO FORM 304 BP-24 CLUSTER.GPJ SECOR INTL.GDT 3/18/08

PROJECT: **Broadway-Pantano WQARF Site**
 LOCATION: **Green Hills Ave. between 5th St. & Baker**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

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DRILLING: STARTED **11/5/07** COMPLETED: **11/15/07**
 INSTALLATION: STARTED **11/19/07** COMPLETED: **11/21/07**
 DRILLING COMPANY: **WDC**
 DRILLING EQUIPMENT: **Star 30K**
 DRILLING METHOD: **ARCH**
 SAMPLING EQUIPMENT: **SimulProbe sampler, shovel, sieve**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): **345 11/7/07** WELL DEPTH (ft): **460.0**
 STATIC DTW (ft): **335.64 11/26/07** BOREHOLE DEPTH (ft): **462.0**
 WELL CASING DIAMETER (in): **5** BOREHOLE DIAMETER (in): **10**
 LOGGED BY: **M Newton** CHECKED BY: **C Pollock**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
405		SP-SM	SAND WITH SILT AND GRAVEL ; SP-SM; 10YR 6/3 pale brown; medium to coarse-grained; medium dense; wet; no odor; no staining; subrounded; poorly graded; Approx. 70% medium to coarse sand, 15% fine to fine gravel, 15% silt		1556			0.0	405	
410		SP-SM			---				410	
415		SC	CLAYEY SAND WITH GRAVEL ; SC; 10YR 7/3 pale brown; coarse-grained; dense; wet; no odor; no staining; subrounded; poorly graded; Approx. 40% coarse sand, 30% fine to medium gravel, 30% clay		2010		8	0.1	415	Bentonite Grout
420					BP24B-415	1	33		420	
425					0910			0.3	425	Bentonite TR30 Pellets
430					11/13/07				430	
435		GP	GRAVEL WITH SAND ; GP; very dense; wet; no odor; no staining; subangular; poorly graded; Granitic; approx. 80% gravel, 20% sand No recovery		1205	.5	30		435	Blank 5" SCH. 80 PVC
440					BP24B-435				440	
445					1403			0.2	445	8-12 Sand
450					---				450	
455			No recovery		1810	.5	37		455	0.020 Slotted 5" SCH. 80 PVC
460					BP24B-455				460	
465			Hole terminated at 462 feet.		1059			0.2	465	
470					11/15/07				470	
475									475	
480									480	
485									485	
490									490	
495									495	

PROJECT: **Broadway Pantano WQARF Site**
 LOCATION: **North Center Drive**
 PROJECT NUMBER: **18OT.20401.08**

WELL / PROBEHOLE / BOREHOLE NO:

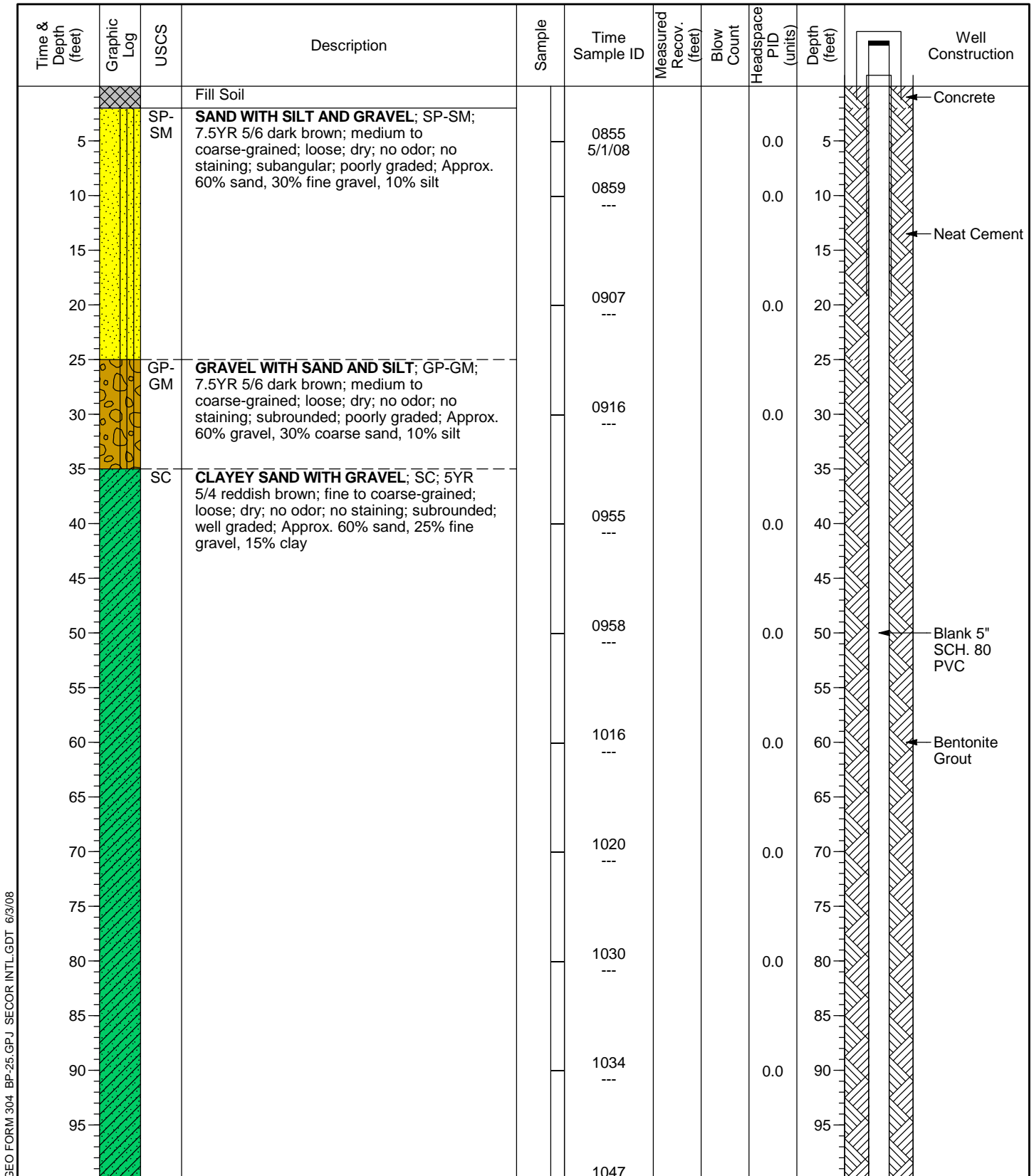
BP-25 PAGE 1 OF 4




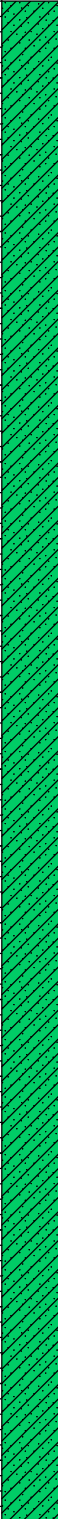
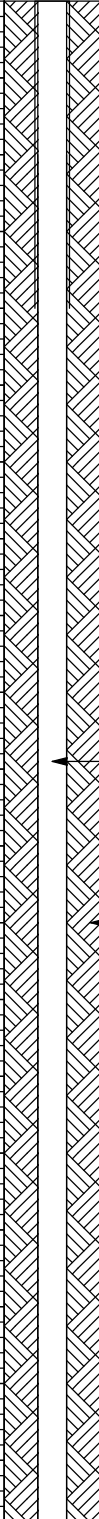
SECOR

DRILLING: **STARTED 5/1/08 COMPLETED: 5/2/08**
 INSTALLATION: **STARTED 5/5/08 COMPLETED: 5/9/08**
 DRILLING COMPANY: **Yellow Jacket Drilling**
 DRILLING EQUIPMENT: **Speedstar 50K**
 DRILLING METHOD: **Air Rotary Casing Hammer**
 SAMPLING EQUIPMENT: **Shovel, split-barrel sampler**

NORTHING (ft):
 LATITUDE:
 GROUND ELEV (ft):
 INITIAL DTW (ft): **325 5/1/08**
 STATIC DTW (ft): **311.84 5/9/08**
 WELL CASING DIAMETER (in): **5**
 LOGGED BY: **M Newton**
 EASTING (ft):
 LONGITUDE:
 TOC ELEV (ft):
 BOREHOLE DEPTH (ft): **380.0**
 WELL DEPTH (ft): **375.0**
 BOREHOLE DIAMETER (in): **10**
 CHECKED BY: **CRP**



PROJECT: Broadway Pantano WQARF Site LOCATION: North Center Drive PROJECT NUMBER: 18OT.20401.08		WELL / PROBEHOLE / BOREHOLE NO: <div style="text-align: center;">BP-25</div> PAGE 2 OF 4		 SECOR
DRILLING: STARTED 5/1/08 COMPLETED: 5/2/08 INSTALLATION: STARTED 5/5/08 COMPLETED: 5/9/08 DRILLING COMPANY: Yellow Jacket Drilling DRILLING EQUIPMENT: Speedstar 50K DRILLING METHOD: Air Rotary Casing Hammer SAMPLING EQUIPMENT: Shovel, split-barrel sampler		NORTHING (ft): LATITUDE: GROUND ELEV (ft): INITIAL DTW (ft): 325 5/1/08 STATIC DTW (ft): 311.84 5/9/08 WELL CASING DIAMETER (in): 5 LOGGED BY: M Newton		EASTING (ft): LONGITUDE: TOC ELEV (ft): BOREHOLE DEPTH (ft): 380.0 WELL DEPTH (ft): 375.0 BOREHOLE DIAMETER (in): 10 CHECKED BY: CRP

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P.D (units)	Depth (feet)	Well Construction
105		SC			---			0.0	105	 <div>Blank 5" SCH. 80 PVC</div> <div>Bentonite Grout</div>
110				1051			0.2	110		
115								115		
120				1106			0.0	120		
125								125		
130				1108			0.0	130		
135								135		
140				1126			0.0	140		
145								145		
150				1130			0.0	150		
155								155		
160				1139			0.0	160		
165						165				
170		1143			0.0	170				
175						175				
180		1151			0.0	180				
185						185				
190		1156			0.0	190				
195						195				
					1205					

PROJECT: Broadway Pantano WQARF Site
 LOCATION: North Center Drive
 PROJECT NUMBER: 18OT.20401.08

WELL / PROBEHOLE / BOREHOLE NO:

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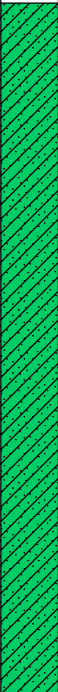
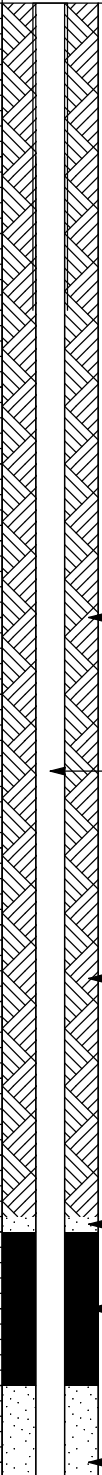
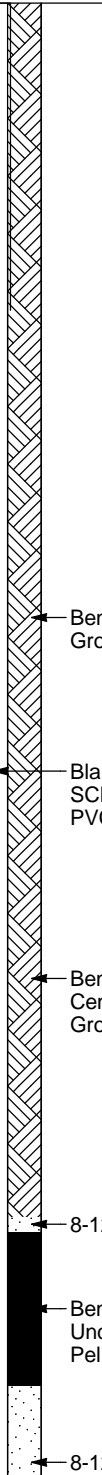


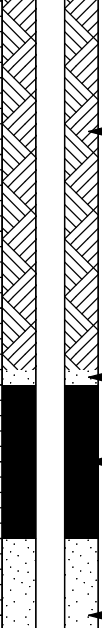



SECOR

DRILLING: STARTED 5/1/08 COMPLETED: 5/2/08
 INSTALLATION: STARTED 5/5/08 COMPLETED: 5/9/08
 DRILLING COMPANY: Yellow Jacket Drilling
 DRILLING EQUIPMENT: Speedstar 50K
 DRILLING METHOD: Air Rotary Casing Hammer
 SAMPLING EQUIPMENT: Shovel, split-barrel sampler

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 325 5/1/08 BOREHOLE DEPTH (ft): 380.0
 STATIC DTW (ft): 311.84 5/9/08 WELL DEPTH (ft): 375.0
 WELL CASING DIAMETER (in): 5 BOREHOLE DIAMETER (in): 10
 LOGGED BY: M Newton CHECKED BY: CRP

GEO FORM 304 BP-25.GPJ SECOR INTL.GDT 6/3/08

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
205		SC			---			0.0	205	
210					1210		0.0	210		
215					---			215		
220					1222		0.1	220		
225					---			225		
230		1226		0.0	230					
235		GP	SAND WITH CLAY AND GRAVEL ; SP-SC; 7.5YR 5/4 brown; medium to coarse-grained; dense; dry; no odor; no staining; subangular; poorly graded; Approx. 50% sand, 40% fine to coarse gravel, 10% clay		---			0.0	240	Bentonite Grout
245					1243		0.0	250	Blank 5" SCH. 80 PVC	
250					---			255		
255					1432		0.0	260	Bentonite/Cement Grout	
260					---			265		
265		SC	GRAVEL WITH SAND ; GP; 7.5YR 5/4 brown; medium to coarse-grained; very dense; moist; no odor; no staining; subangular; poorly graded; Approx. 80% gravel, 20% medium to coarse sand		1437			0.0	270	
270					---			275		
275					1455		0.0	280	8-12 Sand	
280					---			285	Bentonite Uncoated Pellets	
285					1511		0.1	290	8-12 Sand	
290		GP-GC	CLAYEY SAND WITH GRAVEL ; SC; 7.5YR 5/4 brown; fine to coarse-grained; dense; dry; no odor; no staining; subangular; well graded; Approx. 60% sand, 25% fine gravel, 15% clay		---				295	
295					1539					

PROJECT: Broadway Pantano WQARF Site
 LOCATION: North Center Drive
 PROJECT NUMBER: 18OT.20401.08

WELL / PROBEHOLE / BOREHOLE NO:

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SECOR

DRILLING: STARTED 5/1/08 COMPLETED: 5/2/08
 INSTALLATION: STARTED 5/5/08 COMPLETED: 5/9/08
 DRILLING COMPANY: Yellow Jacket Drilling
 DRILLING EQUIPMENT: Speedstar 50K
 DRILLING METHOD: Air Rotary Casing Hammer
 SAMPLING EQUIPMENT: Shovel, split-barrel sampler

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 GROUND ELEV (ft): TOC ELEV (ft):
 INITIAL DTW (ft): 325 5/1/08 BOREHOLE DEPTH (ft): 380.0
 STATIC DTW (ft): 311.84 5/9/08 WELL DEPTH (ft): 375.0
 WELL CASING DIAMETER (in): 5 BOREHOLE DIAMETER (in): 10
 LOGGED BY: M Newton CHECKED BY: CRP

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace P/D (units)	Depth (feet)	Well Construction
305		GP-GC			---			0.0	305	
310					1551 ---			0.0	310	
315									315	
320					1612 ---			0.0	320	
325									325	
330					1649 ---			0.0	330	
335					0755 BP-25-335	.5	NA		335	
340					1420 5/2/08			0.1	340	
345									345	
350					1426 ---			0.0	350	
355									355	
360					1444 ---			0.0	360	
365									365	
370					1450 ---			0.0	370	
375									375	
380			Hole terminated at 381.5 feet.		1050 BP-25-380	.25	NA	0.0	380	
385									385	
390									390	
395									395	