	leidos				LOG OF W	/ELL BOF	RING M	
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			By Metho Diame		•	Drilling Start Drilling Com Well Constru Static Water	pleted : 03/29/12 action : 09/11/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-1S Elev.: — Driveover	Well: MW-1 Elev.:	D - Driveover	Well Construction Information
0-13-2014 N:\rightarrow\rightarro	CRUSHED STONE/ BALLAST Clayey SILT with some gravel, moist, low-medium plasticity, dark brown (7.5 YR 3/3). Weathered SILTSTONE, some mica, gray (10 YR 6/2). 15': Bedrock becomes competent. 23'-24': Soft zone. 25': Color change to dark gray (5 YR 4/1).	ML SL			Sand Screen	▼	- Driveover 1 6" Well Plug - Concrete - Grout - Steel Casing Grout Flled - Bentonite - Upper - Sand	MW-1S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-1D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 44'-174' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 44'-174' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

	leidos				LOG OF V	VELL BOF	RING M	W-1S/1D (Page 2 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			By Metho Diame		ed : 03/28/12 pleted : 03/29/12 liction : 09/11/12 Level : MW-1S = 3.49 btoc : MW-1D = 7.10 btoc		
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-1S Elev.:	Well: MW-1 Elev.:	D	Well Construction Information
50 —	Hornfels (continued) 55': Some white banding is present. 65': Dark brown (7.5 YR 3/2) bands are visable in cuttings.							MW-1S WELL RISER
70 — 75 — 75 — 75 — 75 — 75 — 75 — 75 —		HF					– Upper – Sand	Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well developed via pumping and surging with a submersible pump.
90-	90': Color change to dark grey (7.5 YR 4/1).		,					Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones.
95 —	DIABASE, fine to medium grained, some quartz.	DI		0				with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

	leidos							(Page 3 of 6)
	Project Description GTAC Hoff VC Site Investigation	Lo Di		Method		ted : 03/28/12 ippleted : 03/29/12 uction : 09/11/12 r Level : MW-1S = 3.49 btoc		
	Project Number 2603100116.3030.303		lilling t	Diamet	ter : 10" air hamme : 6" air hammer	•	Static Wate	: MW-1D = 7.10 btoc
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-1S Elev.:	Well: MW- ² Elev.:	D	Well Construction Information
100-	Diabase (continued)		が終める	0				MW-1S WELL RISER : Material : PVC Diameter : 2" From : 0'-5'
105— - -	105': Large pieces of quartz present.							WELL SCREEN: Material: PVC Diameter: 2" From: 5'-30' Opening: 0.010 slot Sandpack: 4'-30' Seal: 1'-4'
110	110': Bedrock becomes very hard.							MW-1D OUTER CASING: Material: Steel Diameter: 6" From: 0'-40'
115 — - -	115': Becomes very fine grained, predominantly albite, quartz, and augite, black (5 YR 2.5/1).							Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 44'-174' Opening : 0.040" slot LOWER SCREEN
120-							Unner	Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot
125 — -		DI					—Upper —Sand	PID Readings = 0.0 ppm Deep Well: Well water was
130-								blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole.
135—	135': Rock becomes softer.							Shallow well developed via pumping and surging with a submersible pump.
140-			次分类分类分类分类分类分类分类分类分类分类分类分类分类分类分类分类分类分类分类	0				Bentonite slurry (Baroid Quick Grout) and bentonite chips we installed between the upper ar lower screens to isolate the screen zones.
145	143': Fracture present ~6". 145'-153': Some hornfels present in		以公共公共公					Screen sandpack constructed with US Silica Filpro # 2 gravel/sand.
	cuttings.		以然然					bgs = below ground surface btoc = below top of casing

	leidos				LOG OF W	VELL BOF	RING M	W-1S/1D (Page 4 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Driller : Duane Moyer Drilling Starte Logged By : Dimitri Quafisi Drilling Comp Drilling Method : Air Rotary Well Construe Drilling Diameter : 10" air hammer for casing Static Water I : 6" air hammer for wells					ed : 03/28/12 pleted : 03/29/12 action : 09/11/12	
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-1S Elev.:	Well: MW-1 Elev.:	D	Well Construction Information
150 - 155 - 150 -	Diabase (continued) 154': Bedrock becomes hard again.	DI					— Upper — Sand — Bentonite Slurry	MW-1S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-1D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

	leidos				LOG OF W	VELL BO	RING M	W-1S/1D (Page 5 of 6)	
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			Driller : Duane Moyer Drilling Started : 03/28/12 Logged By : Dimitri Quafisi Drilling Completed : 03/29/12 Drilling Method : Air Rotary Well Construction : 09/11/12 Drilling Diameter : 10" air hammer for casing Static Water Level : MW-1S = 3.4 : 6" air hammer for wells : MW-1D = 7.					
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-1S Elev.:	Well: MW-1 Elev.:	D	Well Construction Information	
200 – 2015 – 201	Diabase (continued)	DI		0			Bentonite Slurry Bentonite Sand Lower	MW-1S WELL RISER: Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN: Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-1D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 44'-174' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million	

7	leidos				LOG OF W	VELL BOF	RING M\	W-1S/1D (Page 6 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	Logged By : Dimitri Quafisi Drilling 0 Drilling Method : Air Rotary Well Col				Drilling Starte Drilling Comp Well Constru Static Water	oleted : 03/29/12 ction : 09/11/12
Depth in Feet	DESCRIPTION	uscs	GRAPHIC	Blown Yield (gpm)	Well: MW-1S Elev.:	Well: MW-1 Elev.:	D	Well Construction Information
250 255 260	Diabase (continued) 257'-260': Soft zone encountered.			0				MW-1S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-1D OUTER CASING : Material : Steel Diameter : 6"
265 — 270 —	- 279'-280': Soft zone encountered.	DI					— Sand — Lower	From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 44'-174' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 240'-300' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand.

	leidos				LOG OF W	ELL BORI	ING MV	V-2S/2D
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Driller : Duane Moyer Drilling Star Logged By : Dimitri Quafisi Drilling Con Drilling Method : Air Rotary Well Constr Drilling Diameter : 10" air hammer for casing Static Wate						leted : 04/04/12 ction : 09/13/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-2S Elev.:	Well: MW-2D Elev.:	Driveover	Well Construction Information
08-13-2014 N:\UOBS\GTAC-5\t1-Hoff \C\Monitoring Wells\Well Logs 2012\MW\zD-28.bor 10 -	(5 YR 5/3) and bluish gray (Gley 5/5B).	HF		0	2" Well Plug —Concrete —Bentonite		Grout Steel Casing Grout Filled Bentonite Sand Upper	MW-2S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010" slot Sandpack : 4'-30' Seal : 1'-4' MW-2D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-116.5' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 3 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

,	leidos				LOG OF W	VELL BOI	RING M	W-2S/2D (Page 2 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dri		By Method Diame		ed : 04/03/12 pleted : 04/04/12 uction : 09/13/12 'Level : MW-2S = 9.22' btoc : MW-2D = 8.40' btoc		
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-2S Elev.:	Well: MW-2 Elev.:	2D	Well Construction Information
50 - 13-2014 N/JOBS/GTAC-5/1-Hoff VC/Monitoring Wells/Well Logs 2012/WW/2D-2S.bor 55 - 40 - 40 - 40 - 40 - 40 - 40 - 40 -	Hornfels (continued) 53': Small fracture.	HF		<1/2			—Sand —Upper	MW-2S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010" slot Sandpack : 4'-30' Seal : 1'-4' MW-2D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-116.5' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 3 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

	leidos				LOG OF V	VELL BOI	RING M	W-2S/2D
	1010.00							(Page 3 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303		iller ogged illing N	Metho		ed : 04/03/12 bleted : 04/04/12 ction : 09/13/12 Level : MW-2S = 9.22' btoc : MW-2D = 8.40' btoc		
Depth in Feet	DESCRIPTION	USCS	GRAPHIC	Blown Yield (gpm)	Well: MW-2S Elev.:	Well: MW-2 Elev.:	P.D	Well Construction Information
100 – 100 –	softest spot at 112'.	HF					— Sand — Upper	MW-2S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010" slot Sandpack : 4'-30' Seal : 1'-4' MW-2D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-116.5' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 46.5'-226' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 3 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute

	leidos				LOG OF W	VELL BOF	RING M	W-2S/2D		
	10100		(Page 4 of 6)							
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303		riller ogged rilling I	Metho		ed : 04/03/12 pleted : 04/04/12 uction : 09/13/12 Level : MW-2S = 9.22' btoc : MW-2D = 8.40' btoc				
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-2S Elev.:	Well: MW-2 Elev.:	D	Well Construction Information		
150 – 150 –	Hornfels (continued) 185': Some calcite visable. 200': Color change to very dark gray (5YR 3/1).	HF					- Bentonite Slurry	MW-2S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010" slot Sandpack : 4'-30' Seal : 1'-4' MW-2D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-116.5' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 3 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per milinute ppm = parts per million		

7	leidos				LOG OF W	VELL BO	RING M	W-2S/2D (Page 5 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			By Metho Diame		ed : 04/03/12 pleted : 04/04/12 uction : 09/13/12 Level : MW-2S = 9.22' btoc : MW-2D = 8.40' btoc		
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-2S Elev.:	Well: MW-2 Elev.:	2D	Well Construction Information
200 - 2015 - 201	Hornfels (continuted)	HF					—Sand —Lower	MW-2S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010" slot Sandpack : 4'-30' Seal : 1'-4' MW-2D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-116.5' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 3 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

	leidos				LOG OF W	VELL BOI	RING M\	W-2S/2D
	101010							(Page 6 of 6)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	iller gged illing I	Лetho		•	Drilling Starte Drilling Comp Well Constru Static Water	oleted : 04/04/12 ction : 09/13/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-2S Elev.:	Well: MW-2 Elev.:	D	Well Construction Information
250 — - - -	Hornfels (continued)	HF	,					MW-2S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN :
285 — 260 — 265 —	DIABASE, fine grained, feldspar and quartz rich, dark gray (10 YR 4/1).	DI		3			— Bentonite	Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010" slot Sandpack : 4'-30' Seal : 1'-4' MW-2D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-116.5' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 46.5'-40' UPPER SCREEN Material : PVC Diameter : 2" From : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 196'-226' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 3 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones.
300 – 2014 NYJOBS/GT/ 300 – 2014 NYJOBS/GT/	Well Completed at 300' bgs.			3				Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing gpm = gallons per minute ppm = parts per million

	leidos				LOG OF W	/ELL BORIN		S/3D (Page 1 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	riller ogged rilling I	Metho	•	2007 2007		
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-3S Elev.: — Driveover		veover	Well Construction Information
0- - - - 5-	CRUSHED STONE/ BALLAST Clayey SILT with some gravel, moist, low-medium plasticity, brown (7.5 YR 4/4).	ML			2" Well Plug Concrete Bentonite	Plu Plu	ncrete Mater Diam From Joints	eter : 2" : 0'-5' S : _ SCREEN :
10 —	Weathered SILTSTONE, some mica, gray (7.5 YR 4/4). 11': Bedrock becomes competent.						Mater	: 5'-30' : : 5', 15', 25' ing : 0.010 slot pack : 4'-30' : 1'-4' MW-3D ER CASING : rial : Steel
15— 15— - - - 20— -	15'-16': Fracture present. 20': Bedrock becomes very hard.				Sand Screen	— Gro	out Diam From Open LOW Mater eel Diam From Omen Onen Open Onen	: 0'-40' i: 0'-40' ER SCREEN: rial : PVC eter : 2" : 46.5'-106.5' ring : 0.020" slot ER SCREEN rial : PVC eter : 2" : 150.5'-210.5'
ogs 2013\text{MWW-3D-3S.lac.bor} 52 0	25': Color change to black (7.5 YR 2.5/1).	SL	<pre>4</pre>	1		Fill	PID F Deep out at outer yeild:	ES: Readings = 0.0 ppm Well: Well water was blown to 50' bgs to check/verify casing seal. Final blown <0.5 gpm. Open borehole developed using air from rig
08-13-2014 N:\text{OBS\GTAC-5\t1.Hoff VC\text{Monitoring Wells\Well Logs} 2013\text{\text{MW\text{-3D-3S\lac.bor}}}} 98-13-2014 N:\text{\text{OBS\GTAC-5\t1.Hoff VC\text{\text{Monitoring Wells\Well S\text{\text{Mells\Well}}}}} 99-2013\text{\text{\text{\text{MW\text{-3D-3S\lac.bor}}}} 90-2013\text{\text{\text{\text{\text{-3D-3S\lac.bor}}}} 90-2013\text{\text{\text{\text{-3D-3S\lac.bor}}}} 90-2013\text{\text{\text{-3D-3S\lac.bor}}} 90-2013\text{\text{\text{-3D-3S\lac.bor}}} 90-2013\text{\text{\text{-3D-3S\lac.bor}}} 90-2013\text{\text{\text{-3D-3S\lac.bor}}} 90-2013\text{\text{\text{-3D-3S\lac.bor}}} 90-2013\text{\text{\text{-3D-3S\lac.bor}}} 90-2013\text{\text{-3D-3S\lac.bor}}} 90-2013\text{	35': Color change to gray (7.5 YR 6/1).					Be	ntonite to lift boreh ntonite Bento betwee scree zones const	loose sediment from
4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1						Sa	scree pump	ow well and deep well ons were developed via ong and surging with a ersible pump.
08-13-2014 N:\J	50': Color change to black (7.5 YR 2.5/1).		1			Up	per ppm :	below ground surface = below top of casing = parts per million = gallons per minute

	leidos				LOG OF W	VELL BO	RING M	W-3S/3D (Page 2 of 5)	
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303				: Dimitri Quafisi Drillii : Air Rotary Well			9 Started : 03/26/12 g Completed : 03/27/12 construction : 06/26/13 Water Level : MW-3S = 5.21' btoc : MW-3D = 6.61' btoc	
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-3S Elev.:	Well: MW-(Elev.:	ВD	Well Construction Information	
13-2014 N:JOBS\GTAC-5\1-Hoff VC\Monitoring Wells\Well Logs 2013\MW-3D-3S\lac.\ 6 6 6 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Siltstone (continued) HORNFELS, black (7.5 YR 2.5/1). 75': Color change to very dark brown (7.5 YR 2.5/2). 80': Color change to black (5 YR 2.5/1). 93'-94': Soft zone. 95': Color change to gray (7.5 YR 6/1).	SL		· <1/2			— Sand — Upper	MW-3S WELL RISER: Material : PVC Diameter : 2" From : 0'-5' Joints : WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Joints : 5', 15', 25' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-3D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-106.5' Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2" From : 46.5'-210.5' Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2" From : 150.5'-210.5' Opening : 0.020" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute	

	leidos				LOG OF W	VELL BO	RING M	
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	iller gged illing N	Лetho		•	Drilling Starte Drilling Com Well Constru Static Water	pleted : 03/27/12 action : 06/26/13
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-3S Elev.:	Well: MW-0 Elev.:	3D	Well Construction Information
100 – - - - - - 105 – -	Hornfels (continued)			<1/2			— Upper	MW-3S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' Joints : : WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Joints : 5', 15', 25' Opening : 0.010 slot
110 –	110': Color change to gray (7.5 YR 6/1) and pink (2.5 YR 8/4). 120': Color change to black (5 YR 2.5/1).						— Sand	Sandpack
132-13-2014 N.J.OBS\GTAC-5\1-Hoff VC\Monitoring Wells\Well Logs 20.13\MW-3D-3S.lac.bor		HF					— Bentonite	NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump.
08-13-2014 N.W	150'-155': Slightly softer zone.						— Sand	bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

	leidos				LOG OF V	VELL BO	RING M\	W-3S/3D
	101403							(Page 4 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			By Metho Diame		•	Drilling Starte Drilling Comp Well Constru Static Water	oleted : 03/27/12 oction : 06/26/13
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-3S Elev.:	Well: MW-3 Elev.:	D	Well Construction Information
150-	Hornfels (continued)							MW-3S WELL RISER : Material : PVC Diameter : 2" From : 0'-5'
160 - 165 -	- 6/1) and pink (2.5 YR 8/4). `							Joints : WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Joints : 5', 15', 25' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-3D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-106.5' Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2" From : 150.5'-210.5' Opening : 0.020" slot Copening : 0.020" sl
08-13-2014 N:JOBS/GTAC-5/1-Hoff VC/Monitoring Wells/Well Logs 2013/MW-3D-3S.lac.bor	190': Rock becomes slightly harder.	HF					—Sand —Lower	NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

	leidos				LOG OF W	VELL BC	RING M	W-3S/3D (Page 5 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303				: Duane Moyer : Dimitri Quafisi d : Air Rotary ter : 10" air hammer : 6" air hammer		Drilling Start Drilling Com Well Constru Static Water	ed : 03/26/12 pleted : 03/27/12 action : 06/26/13
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-3S Elev.:	Well: MW- Elev.:	-3D	Well Construction Information
200 - 2015 - 2017 N.NOBS/GTAC-5/1-Hoff VC/Monitoring Wells/Well Logs 2013/WW-3D-3S/lac.bor 210 -	Hornfels (continued) Well Completed at 250' bgs.	HF		<1/2			—Lower —Sand —Bentonite —Sand	MW-3S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' Joints :: WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Joints : 5', 15', 25' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-3D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 46.5'-106.5' Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2" From : 46.5'-105.5' Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2" From : 150.5'-210.5' Opening : 0.020" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: <0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

	leidos						(Page 1 of 5)			
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr		By Metho Diame		: Duane Moyer Drilling Started : 03/30/12 : Zack Bentley Drilling Completed : 04/02/12 : Air Rotary Well Construction : 09/18/12 : 10" air hammer for casing Static Water Level : 13.90' btoc				
	2603100116.3030.303					: 6" air hammer for wells				
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-4D Elev.: — Driveover	Well Construction Information			
0- - -	CRUSHED STONE/BALLAST			0.5 1.0 1.5		6" Compression Plug Concrete	OUTER CASING : Material : Steel Diameter : 6" From : 0'-40'			
5-	SILTY CLAY, moist, dense, tight, very dark gray (7.5YR 3/1).	CL		2.5 3.0 345			Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2"			
- -	SILTSTONE, weathered, dark brown (7.5YR 3/3).		1 1 1 1 1 1 1 1 1 1 1 1				From : 88'-118' Opening : 0.040" slot LOWER SCREEN : Material : PVC Diameter : 2"			
10 - -	11': Bedrock becomes competent.		f f f f				From : 215'-245' Opening : 0.040" slot NOTES:			
15— - - -	15': Bedrock becomes very hard. Color change to dark gray (7.5YR 4/1).			-		- Grout	Deep Well: Well water was blown out 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole			
20 —		SL		-		Steel Casing	Bentonite slurry (Baroid Quick Grout) and bentointe chips were installed between the upper and lower screens to isolate the screen zones.			
25— - - -	25': Color changes to black (7.5YR 2.5/1).			-			Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing			
30-			1 1 1 1 1 1 1 1 1 1 1 1				ppm = parts per million gpm = gallons per minute			
35— -			1 1 1 1 1 1 1 1 1 1 1 1							
40-	Cuttings are spheriodal. HORNFELS, black (Gley 1 3/N).									
- - 45—		HF				Bentonite				
-			کر کر ہے کر	1						

	leidos					LOG OF WELL E	BORING MW-4D	
							(Page 2 of 5)	
	Project Description GTAC Hoff VC Site Investigation	Lo D	riller ogged rilling N	Metho		: Duane Moyer : Zack Bentley : Air Rotary	Drilling Started : 03/30/12 Drilling Completed : 04/02/12 Well Construction : 09/18/12	
	Project Number 2603100116.3030.303		rilling [Jiame	eter	: 10" air hammer for casing : 6" air hammer for wells	Static Water Level : 13.90' btoc	
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-4D Elev.:	Well Construction Information	
50 -			~				OUTER CASING : Material : Steel	
55 — 60 —	55': Calcite filled fractures. 60': Color change to dark gray (Gley 1 5/N).						Diameter 6" From 0'-40'	
- - 65 — - -						Bentonite	NOTES: Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole.	
70 — - - - 75 — -	75'-80': Soft zone encountered.	HF					Bentonite slurry (Baroid Quick Grout) and bentointe chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing	
80 — -			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				ppm = parts per million gpm = gallons per minute	
85 — -			(, , , , ,					
90 —								
- 95— -						Upper Sand		
- 100-			/ / / /					

7	leidos					LOG OF WELL E		
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Di	riller ogged rilling N	Metho		: Duane Moyer : Zack Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	(Page 3 of 5) Drilling Started : 03/30/12 Drilling Completed : 04/02/12 Well Construction : 09/18/12 Static Water Level : 13.90' btoc	
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-4D Elev.:	Well Construction Information	
100 — - - - 105 — - - - 110 —	Hornfels (continued) 109': Fracture encountered.					Upper	OUTER CASING Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 88'-118' Opening : 0.040" slot LOWER SCREEN : Material : PVC Diameter : 2" From : 2" From : 2" From : 215'-245' Opening : 0.040" slot	
115—	113': Fracture encountered.				4	Sand	NOTES: Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite slurry (Baroid Quick Grout) and bentointe chips were installed	
- - - 125 — -		HF					between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface	
130 — - - -							btoc = below top of casing ppm = parts per million gpm = gallons per minute	
- 135 — - -						Bentonite Slurry		
140 — - - -								
145 — - - - - 150 —								

	leidos						(Page 4 of 5)		
	Project Description GTAC Hoff VC Site Investigation	Lo Dr		By Metho		: Duane Moyer : Zack Bentley : Air Rotary : 10" air hammer for casing	Drilling Started : 03/30/12 Drilling Completed : 04/02/12 Well Construction : 09/18/12 Static Water Level : 13.90' btoc		
	Project Number 2603100116.3030.303			Jiai iio		: 6" air hammer for wells	Cidio Wales 2010.		
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-4D Elev.:	Well Construction Information		
150 —	DIABASE, fine grained, feldspar and quartz rich.						OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 88'-118' Opening : 0.040" slot LOWER SCREEN : Material : PVC Diameter : 2" Material : PVC Diameter : 2"		
165 —							From : 215'-245' Opening : 0.040" slot NOTES: Deep Well: Well water was blown out 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole		
170 — - - - 175 — - -	170': Chlorite filled fractures.	DI				Bentonite Slurry	Bentonite slurry (Baroid Quick Grout) and bentointe chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing		
- 180 — - -							ppm = parts per million gpm = gallons per minute		
- 185— - -									
190 — -									
- 195—									

7	leidos					LOG OF WELL E		
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Di	riller ogged rilling I	Metho		: Duane Moyer : Zack Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	(Page 5 of 5) Drilling Started : 03/30/12 Drilling Completed : 04/02/12 Well Construction : 09/18/12 Static Water Level : 13.90' btoc	
Depth in Feet	DESCRIPTION	NSCS	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-4D Elev.:	Well Construction Information	
200-	Diabase (continued)					Bentonite Slurry	OUTER CASING Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 88'-118' Opening : 0.040" slot LOWER SCREEN : Material : PVC	
210— - - - - 215—	215': Becomes very fine grained, predominantly augite, black (5 YR 2.5/1).						Diameter : 2" From : 215'-245' Opening : 0.040" slot NOTES: Deep Well: Well water was blown out a 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open	
220-		DI					borehole was developed using air from rig to lift loose sediment from borehole. Bentonite slurry (Baroid Quick Grout) and bentointe chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US	
230-						Lower	Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute	
235—						Sand		
240 — - - - 245 —	240': Becomes fine grained, felspar and quartz rich.							
- - 250	250': Well completed at 250' bgs.		(2) (2) (2) (2) (2) (2) (2) (2) (2) (2)		4			

	leidos				LOG OF WELL BOI	RING MW-5S/5D
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	iller ogged illing I	Metho		(Page 1 of 5) Drilling Started : 04/05/12 Drilling Completed : 04/06/12 Well Construction : 09/14/12 Static Water Level : MW-5S = 13.71' btoc : MW-5D = 15.53' btoc
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-5S Elev.: — Driveover	Well Construction Information
0- - - - 5-	Clayey SILT with some gravel, moist, low-medium plasticity, dark red (10 YR 3/1).	ML			2" Well Plug Concrete Bentonite	G" Well Plug — Concrete Muterial Diameter From U"-55 WELL RISER U"-57 WELL SCREEN Material Diameter Umaterial Diameter Umateri
10— 10— 15— 20— 20—	Weathered HORNFELS, some mica, very dark gray (5 YR 3/1).				Sand Screen	Sandpack
35 — 35. bor 30.12/WW-5D-55. bor 30.12/WW-5D-5	30': Some red color alterations can be seen in cuttings.	HF				NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 8 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump.
98-13-2014 N\\JOBS\GTAC-5\11+\0ff\VC\Monitoring\Wells\Well\s\Well\squares						Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. Grout bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

	leidos				LOG OF W	VELL BO	RING M\	
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	iller gged illing I	Лetho		for casing	Drilling Starte Drilling Comp Well Constru Static Water	oleted : 04/06/12 ction : 09/14/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-5S Elev.:	Well: MW- Elev.:	5D	Well Construction Information
50—	57'-58': Soft zone. 66'-68': Fracture encountered.			2			— Bentonite — Grout — Sand	MW-5S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-5D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 137.5'-187.5' Opening : 0.040" slot
08-13-2014 N:\UOBS\GTAC-5\t1+hoff VC\Monitoring Wells\Well Logs 2012\MW-5D-5S.bor	80': Color change to very dark gray (5 YR 3/1). 90': Calcite chips from fracture deposits visable in cuttings.	HF		4			—Upper —Bentonite Slurry	NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 8 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

-	leidos				LOG OF W	VELL BOF	RING M	W-5S/5D
								(Page 3 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number			By Metho Diame			Drilling Starte Drilling Comp Well Constru Static Water	pleted : 04/06/12 action : 09/14/12
	Project Number 2603100116.3030.303				: 6" air hammer t			: MW-5D = 15.53' btoc
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-5S Elev.:	Well: MW-5I Elev.:	D	Well Construction Information
105 – 115 –	144'-146': Soft zone encountered.	HF		5			- Bentonite Slurry	MW-5S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-5D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 137.5'-187.5' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 8 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = parts per million

	leidos				LOG OF V	VELL BO	RING M	W-5S/5D
	icidos							(Page 4 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr		By Metho	ter : 10" air hamme	r for casing	Drilling Start Drilling Com Well Constru Static Water	pleted : 04/06/12 uction : 09/14/12
	2603100116.3030.303				: 6" air hammer	for wells		: MW-5D = 15.53' btoc
Depth in Feet	DESCRIPTION	USCS	GRAPHIC	Blown Yield (gpm)	Well: MW-5S Elev.:	Well: MW-5 Elev.:	D	Well Construction Information
150 - 155 - 166 - 175 -	154'-156': Soft zone encountered. 169'-172': Soft zone encountered. 177'-178': Small fracture. 180': Color change to black (7.5 Yr 2.5/1).	HF		8			—Sand —Lower	MW-5S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-5D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN: Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 137.5'-187.5' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 8 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

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	Project Description GTAC Hoff VC Site Investigation Project Number 603100116.3030.303	Lo Dr	iller ogged illing N	/letho		r for casing	Drilling Starte Drilling Comp Well Constru Static Water	ed : 04/05/12 pleted : 04/06/12 uction : 09/14/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-5S Elev.:	Well: MW Elev.:	<i>J-</i> 5D	Well Construction Information
2404 NNOBS/GTAC-5/140ft/	3'-241': Soft zone encountered.	HF.		8			—— Bentonite	MW-5S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-5D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 53'-93' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 137.5'-187.5' Opening : 0.040" slot NOTES: PID Readings = 0.0 ppm Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 8 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = patlons per minute

	leidos					LOG OF WELL BOR	(Page 1 of 1)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303		Driller Logged By Drilling Method Drilling Diameter			: Zachary Bentley Dril : Air Rotary We	1
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-4S Elev.: — Driveover	Well Construction Information
0- 5- 10- 20-	6.5': bedrock becomes competent.	HF		0.0		2" Compression Plus Concrete Bentonite Sand Screen	WELL RISER : PVC Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Joints : 5', 15', 25' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' NOTES: Shallow well is developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

	leidos				LOG OF WELL BORI	NG MW-7S/7D
	ieidos					(Page 1 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Driller Logged By Drilling Method Drilling Diame			: Zachary Bentley D : Air Rotary W	rilling Started : 04/09/12 rilling Completed : 04/10/12 Vell Construction : 09/17/12 tatic Water Level : MW-7S = 3.39' btoc : MW-7D = 0.65' btoc
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)		Well Construction Information
5-	Weathered SILTSTONE, mica rich, dark reddish brown (10 YR 2.5/2). 5': Bedrock becomes competent.	SL			Plug P	Well MW-7S WELL RISER
15-	HORNFELS, some interfingered siltstone, black (7.5 YR 2.5/1). 20': Color changes to black (7.5 YR 2.5/1) and gray (10 Yr 6/1).					MW-7D OUTER CASING: Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 85'-155' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 85'-150' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 180'-210' Opening : 0.040" slot Casing
08-13-2014 N:JOBS\GTAC-5\1-Hoff VC\Monitoring Wells\Well Logs 2012\MW-7D-7S.bor	28': Rock becomes very hard.	HF				Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

-	leidos				LOG OF W	VELL BOF	RING M	W-7S/7D
	iciaos							(Page 2 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			By Metho Diame	·	r for casing	Drilling Starte Drilling Comp Well Constru Static Water	pleted : 04/10/12 action : 09/17/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-7S Elev.:	Well: MW-7I Elev.:	D	Well Construction Information
98-13-2014 N:\\DBS\\GTAC-5\t1-Hoff\\C\Monitoring\\Wells\\Well\\TD-7\S\\borday\\Pi\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Hornfels (continued) 52': Color change to light grayish olive (10Y - 5GY 6/2). 60': Color change to dark gray (5YR 4/1). 70': Color changes back to grayish olive (10Y - 5GY 4/2).	<u>σ</u>	9				-Grout -Bentonite -Sand -Upper	MW-7S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-7D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 85'-155' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 85'-155' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 180'-210' Opening : 0.040" slot NOTES: Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = parts per million gpm = gallons per minute

1	leidos				LOG OF W	VELL BOF	RING M	W-7S/7D
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr		By Methoo Diame		r for casing	Drilling Start Drilling Com Well Constru Static Water	pleted : 04/10/12 uction : 09/17/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-7S Elev.:	Well: MW-7 Elev.:	D	Well Construction Information
140ff VC/Monitoring Wells/Well Logs 2012/MWV-7D-7S.bor 110	Hornfels (continued) 108': Soft zone encountered.	HF		1			– Sand – Upper	MW-7S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-7D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 85'-155' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 180'-210' Opening : 0.040" slot NOTES: Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

Project Description Driller : Duane Moyer Drilling Started : 04	
Project Description Driller : Duane Moyer Drilling Started : 04 GTAC Hoff VC Logged By : Zachary Bentley Drilling Completed : 04	ge 4 of 5)
Site Investigation Drilling Method : Air Rotary Well Construction : 09 Project Number Drilling Diameter : 10" air hammer for casing Static Water Level : M	04/09/12 04/10/12 09/17/12 MW-7S = 3.39' btoc MW-7D = 0.65' btoc
	l Construction nformation
Hornfels (continued) Sand Upper WELL SIRE Material Diameter From Opening Sandpack Material Diameter From Opening Diameter From Opening LOWER SCR Material Diameter From Opening NOTES: Deep Welt. Diameter From Opening Notes Sand Lower 180 Sand Lower 185 Deep Welt. Shallow well Diameter From Opening Diameter From Opening Diameter From Opening Diameter From Opening Lower Scr Material Diameter From Opening Diameter From Diameter From Opening Diameter From Diameter From Opening Diameter From Dorello Material Diameter From Diameter From Diameter From Dorello Material Diameter From	MW-7S ER :

	leidos				LOG OF W	VELL BOF	RING M	W-7S/7D
	101403							(Page 5 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	riller ogged rilling N	/letho		r for casing	Drilling Starte Drilling Comp Well Constru Static Water	pleted : 04/10/12 action : 09/17/12
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	Blown Yield (gpm)	Well: MW-7S Elev.:	Well: MW-7 Elev.:	D	Well Construction Information
200 - 200 - 2015	Hornfels (continued) 206'-207': Soft zone encountered. 215': Dark gray banding visable in cuttings (7.5 YR 4/1).	D HF		3			—Sand —Lower —Bentonite	MW-7S WELL RISER : Material : PVC Diameter : 2" From : 0'-5' WELL SCREEN : Material : PVC Diameter : 2" From : 5'-30' Opening : 0.010 slot Sandpack : 4'-30' Seal : 1'-4' MW-7D OUTER CASING : Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN: Material : PVC Diameter : 2" From : 85'-155' Opening : 0.040" slot LOWER SCREEN Material : PVC Diameter : 2" From : 180'-210' Opening : 0.040" slot NOTES: Deep Well: Well water was blown out at 50' bgs to check/verify outer casing seal. Final blown yeild: 4 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Shallow well is developed via pumping and surging with a submersible pump. Bentonite slurry (Baroid Quick Grout) and bentonite chips were installed between the upper and
08-13-2014 N3JOBS/GTAC-571-H0ff/VC/V	Well Completed at 250' bgs.			4				lower screens to isolate the screen zones. Screen sandpack constructed with US Silica Filpro # 2 gravel/sand. bgs = below ground surface btoc = below top of casing ppm = parts per million gpm = gallons per minute

	leidos					LOG OF WELL BO	RING MW-8D (Page 1 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo Dr	_	By Method Diamete		: Dimitri Quafisi I : Air Rotary \	Drilling Started : 04/08/13 Drilling Completed : 04/10/13 Well Construction : 06/25/13 Static Water Level : MW-8D = 14' bgs
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-8D Elev.:	Well Construction Information
0- - - - - 5- -	CRUSHED STONE\BALLAST			0.0 3.0 4.0 3.0 2.0 0.0		6" Well Plug Concrete	WELL CASING Material Diameter From Corout UPPER SCREEN Material Material Material Material Material Material Diameter Material Diameter Material Diameter Material Diameter Material Diameter Material Material Material Material Material Material Material Material Diameter Material
10 — 	Weathered HORNFELS, some with mica, moist, dark gray (7.5 YR 4/1). \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			0.0			Material : PVC Diameter : 2" From : 176.5'-246.5' Opening : 0.020" slot
28-13-2014 N:\UOBS\GTAC-5\1\-hoff VC\Monitoring Wells\Well Logs 2013\MW\-8D.bor	15.5': Fracture. 19': Calcite filled fracture. 22': Color change to black (7.5 YR 2.5/1). 23': Intermixed black and gray (7.5 YR 6/1) hornfels zone. 24'-26': Fracture zone. 29'-30': Water yeilding aproximately 1 gpm.	HF			1	→ Grout → Steel Casing Sand Filled	Deep Well: Well water was blown out at 45' bgs to check/verify outer casing seal. Final blown yeild: 0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casingÿ ppm = parts per million gpm = gallons per minute
08-13-2014 N:\UOBS\GTAC-5\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	45': Color change to black (7.5 YR 2.5/1).				0	Sand Upper	

	leidos					LOG OF WELL E	(Page 2 of 5)
	Project Description GTAC Hoff VC Site Investigation	Lo Dr	Driller Logged By Drilling Method			: Duane Moyer : Dimitri Quafisi : Air Rotary	Drilling Started : 04/08/13 Drilling Completed : 04/10/13 Well Construction : 06/25/13
	Project Number 2603100116.3030.303	Dr	rilling E	Diamete	er	: 10" air hammer for casing : 6" air hammer for wells	Static Water Level : MW-8D = 14' bgs
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-8D Elev.:	Well Construction Information
50 —	Hornfels (continued)		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				WELL CASING : Material : Steel Diameter : 6"
55 — - - - - - 60 —							Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 44.1'-119.1' Opening : 0.020" slot LOWER SCREEN : Material : PVC Diameter : 2" From : 176.5'-246.5' Opening : 0.020" slot
- 65 — - - - 70 —	65': Varying color gray (7.5 YR 6/1), light brown (7.5 YR 6/3) and black (7.5YR 2.5/1).						NOTES: Deep Well: Well water was blown out a 45' bgs to check/verify outer casing seal. Final blown yeild: 0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole Bentonite chips were installed between
75— - - 75— - - 80—		HF				Sand Upper	the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casingÿ
- 00			/ / /				ppm = parts per million gpm = gallons per minute
- 0 <i>F</i>	83'-83.5': Mineral filled fracture.		/ / /				
85 — - -	85': Blown yield 0 gpm.						
90— - - -							
95— - -							

						LOG OF WELL BORI	NG MW-8D
	leidos						(Page 3 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303			By Method Diamete		: Dimitri Quafisi Drilli : Air Rotary Well	ng Started : 04/08/13 ng Completed : 04/10/13 Construction : 06/25/13 c Water Level : MW-8D = 14' bgs
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-8D Elev.:	Well Construction Information
100 – 100 –	130': Interfingering hornfels.	HF DI		<u>ā. </u>	0.5	———Bentonite	WELL CASING Material : Steel Diameter : 6" From : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 44.1'-119.1' Opening : 0.020" slot LOWER SCREEN : Material : PVC Diameter : 2" From : 176.5'-246.5' Opening : 0.020" slot NOTES: Deep Well: Well water was blown out at 45' bgs to check/verify outer casing seal. Final blown yeild: 0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casingÿ ppm = parts per million gpm = gallons per minute
150 -	148'-153': Fracture zone.		が決定が				

	leidos					LOG OF WELL BO	ORING MW-8D
	ieidos						(Page 4 of 5)
	Project Description GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Lo D	Driller Logged By Drilling Method Drilling Diameter			: Duane Moyer : Dimitri Quafisi : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	Drilling Started : 04/08/13 Drilling Completed : 04/10/13 Well Construction : 06/25/13 Static Water Level : MW-8D = 14' bgs
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-8D Elev.:	Well Construction Information
150 — 155 — 165 — 165 — 175 — 185 — 175 — 175 — 175 — 185 — 185 — 190 — 195 — 200 —	Diabase (continued) 170': Blown yield is approximatley 0.5 gpm. 185': Bedrock becomes very hard, drilling slows to 0.5'/min. 189'-203': Fracture zone.						WELL CASING Material : Steel Diameter : 6" From : 0'-40' Grout : 0'-40' UPPER SCREEN : Material : PVC Diameter : 2" From : 0.020" slot LOWER SCREEN : Material : PVC Diameter : 2" From : 176.5'-246.5' Opening : 0.020" slot NOTES: Deep Well: Well water was blown out at 45' bgs to check/verify outer casing seal. Final blown yeild: 0.5 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Bentonite chips were installed between the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro #2 gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump. bgs = below ground surface btoc = below top of casingiy ppm = parts per million gpm = gallons per minute

08-13-2014 N:\JOBS\GTAC-5\1-Hoff VC\Monitoring Wells\Well Logs 2013\MW-8D.bor

	Project Description GTAC Hoff VC					: Duane Moyer	(Page 5 of 5) Drilling Started : 04/08/13
	GTAC Hoff VC Site Investigation Project Number 2603100116.3030.303	Dr		By Method Diamete		: Dimitri Quafisi : Air Rotary : 10" air hammer for casing	Drilling Completed : 04/10/13 Well Construction : 06/25/13 Static Water Level : MW-8D = 14' bgs
Depth in Feet	2603100116.3030.303 DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	: 6" air hammer for wells Well: MW-8D Elev.:	Well Construction Information
200-	Diabase (continued)			<u>ш</u>			WELL CASING
210-							Material : PVC Diameter : 2" From : 176.5'-246.5' Opening : 0.020" slot
215— - - -							NOTES: Deep Well: Well water was blown out 45' bgs to check/verify outer casing seal. Final blown yeild: 0.5 gpm. Oper borehole was developed using air fror rig to lift loose sediment from borehole
220 — - - - - 225 —		DI				Lower	Bentonite chips were installed betwee the upper and lower screens to isolate the screen zones. Screen sandpack was constructed with US Silica Filpro gravel/sand. Shallow well and deep well screens were developed via pumping and surging with a submersible pump.
230-							bgs = below ground surface btoc = below top of casingÿ ppm = parts per million gpm = gallons per minute
235—							
240 — - - -							
245							

	leidos					LOG OF WELL BO	ORING MW-9D
	icidos						(Page 1 of 5)
	GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303			By Method Diamete		: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/16/14 Static Water Level : 16' bgs on 5/14/14
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-9D Elev.:	Well Construction Information
0- - - - - 5-	CLAY, organic rich soil, very high plasticity, moist.	CL		0.0 0.0 0.0 0.0 0.0		6" Well Plug Concrete	WELL CASING : Material : Steel Diameter : 6" From : 0'-38' UPPER SCREEN : Material : PVC Diameter : 2"
10-	Weathered SILTSTONE, dark reddish brown (2.5 YR 3/3). 7': Bedrock becomes competent.	01					From : 43.5'-103.5' Opening : 0.020" slot LOWER SCREEN : Material : PVC Diameter : 2" From : 139.5'-189.5' Opening : 0.020" slot
15 — - - - -		SL				Sand 	NOTES: Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 50 gpm. Open borehole was developed using air
20-	HORNFELS, some interfingered siltstone, dark reddish brown (2.5YR 3/3).					Steel Casing	from rig to lift loose sediment from borehole. Individual wells screens developed via pumping and surging on 7/01/14 with submersible pump. Bentonite pellets (3/8") were used to
28-13-2014 N:\u00abs\\GTAC-5\t1-\toff\\VC\Wonitoring\\Wells\\Well\\U00abs\\GTAC-5\t1-\toff\\VC\Wonitoring\\Wells\\Wells\\U00abs\U00abs\\U00abs\U00abs\U00abs\U	36': Calcite chips in cuttings.	HF	#F	1	Bentonite	construct bentonite seals. Sandpacks constructed using US Silica Filpro #2 gravel/sand. bgs = below ground surface ppm = parts per million gpm = gallons per minute	
N:JOBS/GTAC-5/			, , , , ,			Sand	
08-13-2014			ر کر ر کر بر کر			Upper Screen	

	leidos						(Page 2 of 5)
	GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303			By Method Diameto		: Duane Moyer Drilling Started : Zachary Bentley Drilling Completed : Air Rotary Well Construction : 10" air hammer for casing Static Water Leve : 6" air hammer for wells	: 6/16/14
Depth in Feet	DESCRIPTION	USCS	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-9D Elev.:	Vell Construction Information
50 — - - - 55 —	HORNFELS (continued)					WELL CA Material Diameter From UPPER S Material Diameter From	: Steel : 6" : 0'-38' CREEN : : PVC : 2"
- - 60 — -						From Opening LOWER S Material Diameter From Opening	: 43.5'-103.5' : 0.020" slot SCREEN : : PVC : 2" : 139.5'-189.5' : 0.020" slot
65 — -	65': Color change to very dusky red (10R 2.5/2). Pyrite in cuttings.					check/ver	r was blown out at 43' bgs t ify outer casing seal. Final d: 50 gpm.
70 —						from rig to borehole. developed	ehole was developed using lift loose sediment from Individual wells screens d via pumping and surging of ith submersible pump.
- 75 — - -		HF				Sand construct construct gravel/san	
- 80 <i>-</i> - -	80': Color change to black (10R 2.5/1), some calcite in cuttings. Pyrite in cuttings.					ppm = pa	ow ground surface rts per million llons per minute
- 85 — - -							
90 - - - -	90'-100': Soft zone. No water.				2		
95 -							

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,,	leidos					LOG OF WELL BO	ORING MW-9D
							(Page 3 of 5)
Mo ^a	GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303		Driller Logged By Drilling Method Drilling Diameter			: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/16/14 Static Water Level : 16' bgs on 5/14/14
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-9D Elev.:	Well Construction Information
100 - 100 -	- HORNFELS (continued)	HF		3	12	——Sand ——Sand ——Lower Screen	WELL CASING : Material : Steel Diameter : 6" From : 0'-38' UPPER SCREEN : Material : PVC Diameter : 2" From : 43.5'-103.5' Opening : 0.020" slot LOWER SCREEN : Material : PVC Diameter : 2" From : 139.5'-189.5' Opening : 0.020" slot NOTES: Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 50 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Individual wells screens developed via pumping and surging on 7/01/14 with submersible pump. Bentonite pellets (3/8") were used to construct bentonite seals. Sandpacks constructed using US Silica Filpro #2 gravel/sand. bgs = below ground surface ppm = parts per million gpm = gallons per minute

7	leidos					LOG OF WELL BORING MW-9D
Mor	GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303			By Method Diamete	er	(Page 4 of 5) : Duane Moyer Drilling Started : 5/12/14 : Zachary Bentley Drilling Completed : 5/13/14 : Air Rotary Well Construction : 6/16/14 : 10" air hammer for casing Static Water Level : 16' bgs on 5/14/14 : 6" air hammer for wells
Depth in Feet	DESCRIPTION HORNFELS (continued)	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-9D Elev.: Well Construction Information WELL CASING:
198-13-2014 N:JOBS/GTAC-5/1-Hoff VCMonitoring Wells/Well Logs 2014/MW-9D.bor	HORNFELS (continued) 155': Fracture. 163': Fracture.	HF			44 44	WELL CASING Material Steel Diameter 6" From 0'-38' UPPER SCREEN Material PVC Diameter 2' From 43.5'-103.5' Opening 0.020" slot LOWER SCREEN Material PVC Diameter 2" From 139.5'-189.5' Opening 0.020" slot NOTES: Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 50 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Individual wells screens developed via pumping and surging on 7/01/14 with submersible pump. Bentonite pellets (3/8") were used to constructed using US Silica Filpro #2 gravel/sand. bgs = below ground surface ppm = parts per million gpm = gallons per minute
700 – 200 –			/ / / /			Bentonite

50	leidos					LOG OF WELL B	
<u>Mo</u>	GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303			By Method Diamete		: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	(Page 5 of 5) Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/16/14 Static Water Level : 16' bgs on 5/14/14
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-9D Elev.:	Well Construction Information
200 - 200 -	HORNFELS (continued) 208': Fracture. Well Completed to 220' bgs.	HF			50	Sand	WELL CASING Material Diameter From O'-38' UPPER SCREEN Material Diameter E'' From Waterial Double SCREEN Material Diameter Diamet

7	leidos					LOG OF WELL BORING MW-10D
	GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303			By Method Diamete		(Page 1 of 5) Drilling Started : 5/12/14 Zachary Bentley Drilling Completed : 5/13/14 Air Rotary Well Construction : 6/17/14 10" air hammer for casing Static Water Level : 29.25' bgs on 5/14/1 6" air hammer for wells
Depth in Feet	DESCRIPTION	USCS	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-10D Elev.: Well Construction Information
0— 5—	CLAY, organic rich soil, high plasticity, moist. SILTSTONE, weathered, very brittle, small cuttings, very dusky red (10R \(\)3/2). HORNFELS, dusky red (10R 3/2).	SL		0.0 0.0 0.0 0.0 0.0		6" Well Plug Concrete WELL CASING: Material: Steel Diameter: 6" From: 0'-38' UPPER SCREEN: Material: PVC Diameter: 2" From: 40.5'-110.5' Opening: 0.020" slot LOWER SCREEN Material: PVC Diameter: 2" From: 170.5'-200.5' Opening: 0.020" slot NOTES:
		HF				Sand Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 60 gpm. Open borehole was developed using from rig to lift loose sediment from borehole. Individual well screens developed via pumping and surging of 6/30/14 with submersible pump. Bentonite pellets (3/8") were used to construct betonite seals. Sandpacks constructed using US Silica Filpro #2 gravel/sand. Bridging of bentonite at 35'-40' bgs during well screen installation resulte in complications during completion of the upper screen sandpack to 40' bgs
35 — - - - - - - 40 —	33': Some calcite in cuttings					Bentonite bgs = below ground surface ppm = parts per million gpm = gallons per million Bentonite
45 — - - - - - - - 50 —						Upper Open Void

	leidos					LOG OF WELL BO	ORING MW-10D (Page 2 of 5)
	GTAC Hoff VC New Hanover Township ntgomery County, Pennsylvania Project Number 01604.TM.100116.3030.0303	Lo Di	Driller Logged By Drilling Method Drilling Diameter			: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/17/14 Static Water Level : 29.25' bgs on 5/14/14
Depth in Feet	DESCRIPTION	USCS	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-10D Elev.:	Well Construction Information
50 - 55 - 60 - 65 - 70 - 95 - 90 - 95 - 100 - 95 - 95 - 95 - 95 - 95 - 95 - 95 -	HORNFELS (continued) 55': Color change to reddish black (10R 2.5/1) 69': Color change to very dark gray (GLEY1 N 3/) 90': Color change to dark greenish gray (GLEY1 10Y 4/1), pyrite in cuttings. 96': Color change to bluish black (GLEY2 3/5 B), soft zone, some calcite in cuttings, moist.	<u>1</u> HF				—— Upper —— Sand	WELL CASING : Material : Steel Diameter : 6" From : 0'-38' UPPER SCREEN: Material : PVC Diameter : 2" From : 40.5'-110.5' Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2' From : 170.5'-200.5' Opening : 0.020" slot NOTES: Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 60 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Individual well screens developed via pumping and surging on 6/30/14 with submersible pump. Bentonite pellets (3/8") were used to construct betonite seals. Sandpacks constructed using US Silica Filpro #2 gravel/sand. Bridging of bentonite at 35'-40' bgs during well screen installation resulted in complications during completion of the upper screen sandpack to 40' bgs. bgs = below ground surface ppm = parts per million gpm = gallons per million

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	leidos					LOG OF WELL BO	ORING MW-10D					
	iciaes			(Page 3 of 5)								
Mor 30	GTAC Hoff VC New Hanover Township tgomery County, Pennsylvania Project Number 1604.TM.100116.3030.0303	ania Driller Logged By Drilling Method Drilling Diamet				: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/17/14 Static Water Level : 29.25' bgs on 5/14/14					
Depth in Feet	DESCRIPTION	nscs	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-10D Elev.:	Well Construction Information					
100-	HORNFELS (continued) 107': Fracture				>0.5	Upper Sand	WELL CASING: Material: Steel Diameter: 6" From: 0'-38' UPPER SCREEN: Material: PVC Diameter: 2" From: 40.5'-110.5' Opening: 0.020" slot LOWER SCREEN Material: PVC Diameter: 2" From: 170.5'-200.5' Opening: 0.020" slot NOTES: Well water was blown out at 43' bgs to					
120 — 125 — 130 — 130 —	135': Color change to bluish black (GLEY2 2.5/5 PB) 145': Color change to black (5YR 2.5/1).	HF			1.5	——Bentonite	check/verify outer casing seal. Final blown yeild: 60 gpm. Open borehole was developed using air from rig to lift loose sediment from borehole. Individual well screens developed via pumping and surging on 6/30/14 with submersible pump. Bentonite pellets (3/8") were used to construct betonite seals. Sandpacks constructed using US Silica Filpro #2 gravel/sand. Bridging of bentonite at 35'-40' bgs during well screen installation resulted in complications during completion of the upper screen sandpack to 40' bgs. bgs = below ground surface ppm = parts per million gpm = gallons per million					
150-												

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leidos		LOG OF WELL B	ORING MW-10D (Page 4 of 5)
GTAC Hoff VC New Hanover Township Montgomery County, Pennsylvania Project Number 301604.TM.100116.3030.0303	Driller Logged By Drilling Method Drilling Diameter	: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/17/14 Static Water Level : 29.25' bgs on 5/14/14
Depth in DESCRIPTION Feet	USCS GRAPHIC PID Reading (ppm) Blown Yeild (gpm)	Well: MW-10D Elev.:	Well Construction Information
HORNFELS (continued) 155 — HORNFELS (continued) 155 — 155': Soft zone. 160 — 160': Color change to very dusky red (2.5YR 2.5/2), calcite and pyrite in cuttings.		Bentonite	WELL CASING: Material: Steel Diameter: 6" From: 0'-38' UPPER SCREEN: Material: PVC Diameter: 2" From: 40.5'-110.5' Opening: 0.020" slot LOWER SCREEN Material: PVC Diameter: 2" From: 170.5'-200.5' Opening: 0.020" slot NOTES: Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 60 gpm.
170— 175— 180— 185— 190— 195—	HF 5	SandLower	from rig to lift loose sediment from borehole. Individual well screens developed via pumping and surging on 6/30/14 with submersible pump. Bentonite pellets (3/8") were used to construct betonite seals. Sandpacks constructed using US Silica Filpro #2 gravel/sand. Bridging of bentonite at 35'-40' bgs during well screen installation resulted in complications during completion of the upper screen sandpack to 40' bgs. bgs = below ground surface ppm = parts per million gpm = gallons per million
198': Fracture.	60		

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7	leidos					LOG OF WELL B	ORING MW-10D	
	GTAC Hoff VC			By Method Diamet		: Duane Moyer : Zachary Bentley : Air Rotary : 10" air hammer for casing : 6" air hammer for wells	(Page 5 of 5) Drilling Started : 5/12/14 Drilling Completed : 5/13/14 Well Construction : 6/17/14 Static Water Level : 29.25' bgs on 5/14/14	
Depth in Feet	DESCRIPTION	USCS	GRAPHIC	PID Reading (ppm)	Blown Yeild (gpm)	Well: MW-10D Elev.:	Well Construction Information	
200-	HORNFELS (continued)	HF			60	Lower Sand	WELL CASING : Material : Steel Diameter : 6" From : 0'-38' UPPER SCREEN: Material : PVC Diameter : 2" From : 40.5'-110.5'	
210-	Well Completed to 207' bgs.						Opening : 0.020" slot LOWER SCREEN Material : PVC Diameter : 2" From : 170.5'-200.5' Opening : 0.020" slot	
215— - - -							Well water was blown out at 43' bgs to check/verify outer casing seal. Final blown yeild: 60 gpm. Open borehole was developed using air from rig to lift loose sediment from	
220 — - - - - 225 —							borehole. Individual well screens developed via pumping and surging on 6/30/14 with submersible pump. Bentonite pellets (3/8") were used to construct betonite seals. Sandpacks	
230—							constructed using US Silica Filpro #2 gravel/sand. Bridging of bentonite at 35'-40' bgs during well screen installation resulted in complications during completion of the upper screen sandpack to 40' bgs.	
235—							bgs = below ground surface ppm = parts per million gpm = gallons per million	
240-								
245— - - - - 250—								