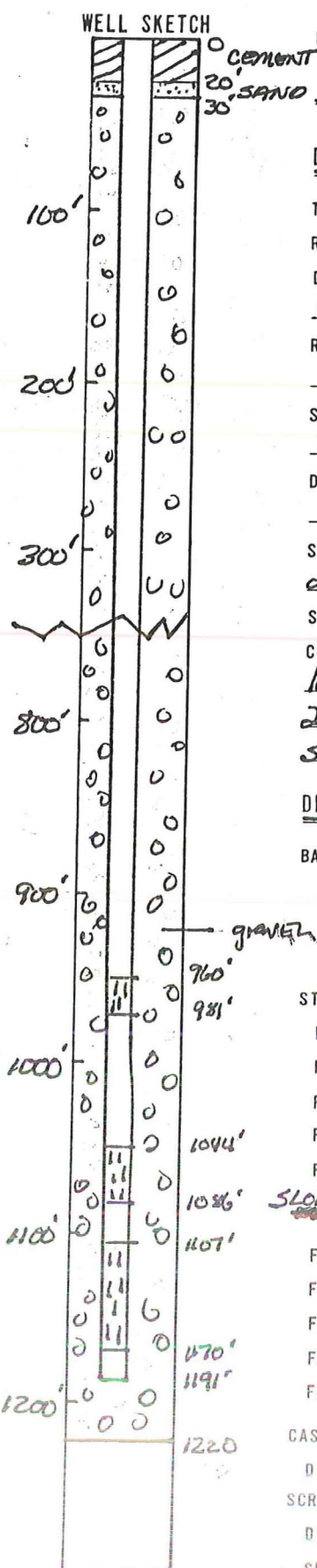




WELL NO. WW108 SHEET OF
 LOGGED BY GOMMEL, KAIRSCH PROJECT NO. 80-300-45
 DATE (S) ZWETGER, HUME PROJECT NAME
D'Angelo

ELEVATION
 GROUND LEVEL
 TOP OF CASING + 2' above ground surface

LOCATION OR COORDINATES T15S, R12W, 19ad



DRILLING SUMMARY

TOTAL DEPTH DRILLED 1220'
 ROTARY CORE
 DRILLING CONTRACTOR Layne Western Co. Inc.
 RIG (S) USED Gardner Denver 15
 SIZE (S) AND TYPE (S) OF BITES 12 1/4" milltooth
 DRILLING FLUID Baroid - Bentonite SAND

SAMPLING METHOD continuous grab at discharge, sample every 10'

COMMENTS (PROBLEMS, SHUTDOWNS, ETC)

lost h₂o to formation AT 739'
2' chain dropped downhole @ 972'
stuck tripping OUT AT 732' depth

DESIGN

BASIS DRILLER'S LOG
 GEOLOGIC LOG
 GEOPHYSICAL LOG
 COPIES ATTACHED YES NO

STEEL CASING STRING

FROM +2' TO 960'
 FROM 981' TO 1044'
 FROM 1086' TO 1107'
 FROM 1170' TO 1191'

FROM TO

SLOTTED CASING

FROM 960' TO 981'
 FROM 1044' TO 1086'
 FROM 1107' TO 1170'

FROM TO
 FROM TO

CASING STEEL PVC
 DIMENSIONS 2" ID threaded
 SCREEN
 DIMENSIONS 2" ID.
 SLOT SIZE

PACKERS
 CENTRALIZERS at 950', 990', 1090', 1180'
 SAND OR GRAVEL PACK 30' - 1220'
 CEMENT (MIX) DEPTH (S) 0' - 20'
sand 20' - 30'
 BENTONITE
 PELLETS
 SLURRY

DEVELOPMENT

TREME
 DEPTH
 TIME

TIME LOG

	START	FINISH	ELAPSED TIME	% OF TOTAL
DRILLING	9-27-80	10-10-80	14 days	
LOGGING	10-10-80	10-10-80	2 1/4 hrs	
CASING				
GRAVEL PACKING				
CEMENTING				
BENTONITE PELLETS SLURRY				
DEVELOPMENT				

MISCELLANEOUS

Mt. Gemmell 10-15 80

WW-10-8

LOCATION Whirlwind Valley (C-15-12) 190d.
 LOGGED BY Karen Amis, Lou Zweigart

PROJECT MX Water Account
 LOGGED BY [unclear]

LOC. or COORDS. <u>(C-15-12) 190d</u>	DRILLER <u>Jesse Lench, small Sangri 10</u>	START DATE <u>9-27-80</u>	FINISH DATE <u>10-10-80</u>
GROUND ELEV. <u>5280' - from topo map</u>	RIG <u>Gardner-Denver 2500</u>	TIME _____	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
TOTAL DEPTH <u>1220'</u>	BIT(S) <u>tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>bentonite mud</u>		

DEPTH	PENE. RATE	CIRC. RET/LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
0						GRAVEL - dark grey, dark brown (w) (10 YR 4/1 - 10 YR 3/3); 100% fine gravel up to 10 mm, carbonates > 90% and also trace rhyolite, poorly sorted, angular to subround, structureless, unconsolidated, strong acid reaction, non-uniform, moderate caliche. other data not applicable
10	30 min			GRAVEL		GRAVEL - dark grey to dark brown (w) (10 YR 4/1 - 10 YR 3/3) 100% fine gravel up to 20 mm > 90% carbonate, trace rhyolite, moderately sorted, very angular to subround, structureless, unconsolidated, strong acid reaction, uniform moderate caliche, other data not applicable
20	39 min			GRAVEL		GRAVEL - dark grey to black to dark brown (w) (10 YR 4/1 - 10 YR 2/1 - 10 YR 3/3) 100% fine gravel up to 20 mm, 100% carbonate, moderately sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, moderate caliche, other data not applicable
30	28 min			GRAVEL		SAME AS ABOVE (20'-30')
40	56 min			GRAVEL		SAME AS ABOVE (20'-30')
50	31 min			GRAVEL		GRAVEL - dark grey to black to dark brown (w) (10 YR 4/1 - 10 YR 2/1 - 10 YR 3/3) 100% fine gravel up to 10 mm, 100% carbonate, moderately sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, moderate caliche, other data not applicable
60	26 min			GRAVEL		SAME AS ABOVE (40'-50')
70	31 min			GRAVEL		GRAVEL - dark grey to black to dark brown (w) (10 YR 4/1 - 10 YR 2/1 - 10 YR 3/3) 100% fine gravel up to 5 mm, 100% carbonate, moderately sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, moderate caliche, other data not applicable
80	67 min			GRAVEL		SAME AS ABOVE (60'-70')

① minimal pore spaces noted to sand size or larger
 ② samples from 595' to bottom contain lost circulation material

WW-10-8

LOCATION Whirlwind Valley (C-15-12), 194d
 LOGGED BY Karen Knirsch, Lou Zweigert

PROJECT Ark Water Resource
 Well ID: 10-10-81

LOC. or COORDS. <u>(C-15-12) 194d</u>	DRILLER <u>Josse Leach, Ismail Sangri #0</u>	START DATE <u>9-27-80</u>	FINISH DATE <u>10-10-80</u>
GROUND ELEV. <u>5280' - from topogm</u>	RIG <u>Gardner - Denver 2500</u>	TIME _____	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
TOTAL DEPTH <u>1220</u>	BIT(S) <u>tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>bentonite mud</u>		

DEPTH	PENE. RATE	CIRC RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
50'	195 min			GRAVEL	90'	GRAVEL - dark grey - black - dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) 100% fine gravel up to 5mm 100% carbonate, moderately sorted, angular, to subround, structureless, unconsolidated, strong acid reaction, uniform; moderate caliche; other data not applicable
90'	136 min			GRAVEL	90'	GRAVEL - dark grey - black - dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) 100% fine gravel up to 5mm 100% carbonate, moderately sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, other data not applicable
100'	35 min			GRAVEL	100'	SAME AS ABOVE (90'-100')
110'	31 min			GRAVEL WITH TRACE SAND AND CLAY	110'	GRAVEL W/ TRACE SAND & CLAY - dark grey, black, dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) predominantly fine gravel to 20 mm, 100% carbonate, poorly sorted, angular to subround, structureless, nonplastic, unconsolidated, strong acid reaction, uniform, other data not started
120'	35 min			GRAVEL	120'	SAME AS ABOVE (110'-120')
130'	25 min			GRAVEL	130'	SAME AS ABOVE (130'-140')
140'	31 min			GRAVEL WITH TRACE SAND AND CLAY	140'	GRAVEL WITH TRACE SAND AND CLAY - dark grey - black, dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) fine gravel up to 20 mm, 100% carbonate, poorly sorted, angular to subround, structureless, nonplastic, unconsolidated, strong acid reaction, uniform, other data not started
150'	34 min			GRAVEL WITH TRACE SAND AND CLAY	150'	GRAVEL WITH TRACE SAND AND CLAY - dark grey - black - dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) predominantly fine gravel up to 20 mm, 100% carbonate, poorly sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, other data not started
160'						

LOCATION Whirlwind Valley (6-15-12) 19ad
 LOGGED BY Karen Knirsch, Lou Zweigart

PROJECT MX Water Resources
 Valley Ent Drilling FY 80, 81

LOC. or COORDS. (6-15-12) 19ad
 GROUND ELEV. 5286' - from topography
 TOTAL DEPTH 1220'
 BOREHOLE DIAM. 12 1/4"
 DRILLER Ismail Sangri (no)
Jesse Lench
 RIG Gardner Denver 2500
 BIT(S) tricone
 FLUID bentonite mud
 START DATE 9-27-80 FINISH DATE 10-10-80
 TIME _____
 GEOPHYS. LOG YES NO
 HOW LEFT _____

DEPTH	PENE. RATE	CIRC RET LOSS	AIRLIFT O (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
160'	52 min			GRAVEL WITH TRACE SAND AND CLAY	160'	GRAVEL WITH TRACE SAND AND CLAY - dark grey - black-dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) predominately gravel up to 10 mm with gravel grading to smaller size than (150'-165'), 100% carbonate poorly sorted, angular to subround, structureless, non plastic, unconsolidated, strong HCL reaction, uniform, other data not stated
170'	55 min			GRAVEL AND SAND	170'	GRAVEL AND SAND - dark grey, black, brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3) predominately gravel up to 10 mm, 100% carbonate, poorly sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, other data not applicable
180'	70 min			GRAVEL AND SAND	180'	GRAVEL AND SAND - dark grey - black-dark brown (w) (10YR 4/1 - 10YR 2/1 - 10YR 3/3), 50% gravel, 35% coarse sand, 10% medium sand, 5% clay, 100% carbonate, poorly sorted, angular to subround, structureless, slightly plastic, unconsolidated, strong acid reaction, uniform
190'	30 min			GRAVEL AND SAND	190'	SAME AS ABOVE (180' - 190')
200'	40 min			GRAVEL AND SAND	200'	GRAVEL AND SAND - dark brown, dark grey (w) (10YR 4/1 - 10YR 3/3), 50% fine gravel to 2mm, 50% coarse sand, 100% carbonate, poorly sorted, angular to subround, structureless, unconsolidated, strong acid reaction, other data not applicable
210'	40 min			GRAVEL AND SAND	210'	GRAVEL AND SAND - dark brown, dark grey (w) (10YR 4/1 - 10YR 3/3), 50% fine gravel to 2mm, 10% coarse sand, 100% carbonate, poorly sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, other data not applicable
220'	35 min			SAND WITH GRAVEL	220'	SAND WITH GRAVEL - dark brown, dark grey (w) (10YR 4/1 - 10YR 3/3), 75% medium to coarse sand, 25% fine gravel, 100% carbonate, poorly sorted, angular to subround, structureless, unconsolidated, strong acid reaction, uniform, other data not applicable
230'	30 min			SAND AND GRAVEL	230'	SAND AND GRAVEL - black, dark grey, and brown (w) (7.5YR 2/0 - 7.5YR 3/3 - 7.5YR 4/4), 95% coarse sand and fine gravel, 5% clay, medium sand, subround, angular to subround, structureless, non plastic, unconsolidated, strong acid reaction, uniform, other data not stated
240'						

WW-10-3

LOCATION Whirlwind Valley (C-15-12) 19ad.
LOGGED BY Karen Knirsch Ltd Environmental

PROJECT MX Water Resources
Valley Fill Drilling FY80, R1

LOC. or COORDS. <u>(C-15-12) 19ad</u>	DRILLER <u>Ismail Samir, Jesse Lench</u>	START DATE <u>9-27-80</u>	FINISH DATE <u>10-10-80</u>
GROUND ELEV. <u>5280' - from top map</u>	RIG <u>Gardner Denver 2500</u>	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
TOTAL DEPTH <u>1220'</u>	BIT(S) <u>tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>bentonite mud</u>		

DEPTH	PENE. RATE	CIRC RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
240'	35 min			SAND AND GRAVEL	240'	SAND AND GRAVEL - black, dark grey, and brown (w) (7.5 YR 2/0 - 7.5 YR 3/3 - 7.5 YR 4/4) 95% fine gravel and coarse sand, 5% clay, and fine sand, 100% carbonate, poorly sorted, angular to subround, structureless, non-plastic, * unconsolidated, strong acid reaction, uniform
250'	38 min			SAND WITH SOME GRAVEL	250'	SAND WITH SOME GRAVEL - black, strong brown (w) (2.5 YR 2.5/0 - 7.5 1/5/6) 80% coarse, medium, and fine sand, 10% fine gravel up to 2mm, and 10% clay sand is carbonate and volcanic, angular to subround, structureless, nonplastic, * unconsolidated, weak reaction to HCL (clay), nonuniform
260'	110 min			SAND	260'	SAME AS ABOVE (250'-260')
270'	55 min			SAND	270'	SAND - black, brown (w) (2.5 YR 2.5/0 - 10 YR 4/6) predominantly sand (coarse, medium, and fine) with trace gravel and clay, poorly sorted, angular to subround, structureless, nonplastic, * unconsolidated, weak acid reaction, non-uniform
280'	52 min			SAND	280'	SAME AS ABOVE (270'-280')
290'	58 min			SAND	290'	SAME AS ABOVE (280'-290')
300'	70 min			SAND	300'	SAND - black, brown (w) (7.5 YR 2/0 - 7.5 YR 4/4) 70% coarse and fine sand, 10% clay, 100% volcanic, poorly sorted, angular to subround, structureless, nonplastic, * unconsolidated, strong acid reaction, good name, non-uniform
310'	21 min			SAND	310'	SAME AS ABOVE (300'-310')

WV-10-8

5

LOCATION Whirlwind Valley (C-15-12) 19ad
 LOGGED BY Karen Kinnison, Lot 2, McLean

PROJECT MX Water Resources
 Valley Fill Drilling FY 80, 21

LOC. or COORDS. (C-15-12) 19ad	DRILLER T. Small Sam. Lab, Jesse Lynch	START DATE 9-27-80	FINISH DATE 10-10-80
GROUND ELEV. 5280' - from topo map	RIG Gardner Denver 2500	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
TOTAL DEPTH 1220'	BIT(S) tricone	HOW LEFT _____	
BOREHOLE DIAM. 12 1/4"	FLUID bentonite mud		

DEPTH	PENE. RATE	CIRC. RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
320'	22 min			SAND	320'	SAND - black, brown (w) (7.5 YR 2/0 - 7.5 YR 4/1) 90% coarse and fine sand, 10% clay 100% volcanic, poorly sorted, angular to subround, structureless, nonplastic, * unconsolidated, clay strong acid reaction, sand none, non uniform
330'	16 min			SAND	330'	SAND - black, brown (w) (7.5 YR 2/0 - 7.5 YR 4/1) 70% coarse and fine sand, 30% clay 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, * unconsolidated, clay has strong reaction to HCl, sand none, non uniform
340'	25 min			SAND	340'	SAME AS ABOVE (330'-340')
350'	21 min			SAND AND CLAY	350'	SAND AND CLAY - black, brown (w) (7.5 YR 2/0 - 7.5 YR 4/1) 50% coarse and fine sand, 50% clay sand is 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, * unconsolidated, clay has strong reaction to HCl, sand none, non uniform
360'	26 min			SAND AND CLAY	360'	SAME AS ABOVE (350'-360')
370'	27 min			SAND AND CLAY	370'	SAME AS ABOVE (360'-370')
380'	13 min			SAND AND CLAY	380'	SAND AND CLAY - black, brown (w) (7.5 YR 2/0 - 7.5 YR 4/1) 50% coarse and fine sand, 50% clay sand is 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, * unconsolidated, clay has strong HCl reaction, sand none, non uniform
390'	28 min			SAND AND CLAY	390'	SAME AS ABOVE (380'-390')

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LOC. or COORDS. (C-15-12) 19nd
 GROUND ELEV. 5286 - from top map
 TOTAL DEPTH 1220
 BOREHOLE DIAM. 12 1/4"

DRILLER J. Small Sanghvi, Jesse Lench
 RIG Gardner Denver 2500
 BIT(S) tricone
 FLUID bentonite mud

START DATE 9-27-80 FINISH DATE 10-10-80
 TIME _____
 GEOPHYS. LOG YES NO
 HOW LEFT _____

LOCATION Whirlwind Valley (C-15-12) 19nd
 LOGGED BY Lois Weigand, Karen Knirsch

PROJECT MX Water Resources
Valley Hill Drilling FY80,81

DEPTH	PENE. RATE	CIRC RET LOSS	AIRLIFT O (ppm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
400'				SAND AND CLAY		SAND AND CLAY - black, brown (vr) (7.5 YR 2/0 - 7.5 YR 4/4) 50% coarse and fine sand, 50% clay, 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, * unconsolidated, clay has strong reaction to HCl, sand none, nonuniform
410'	33 min			SAND AND CLAY		SAME AS ABOVE (400'-410')
420'	26 min			SAND AND CLAY		SAME AS ABOVE (410'-420')
430'	22 min			SAND AND CLAY		SAME AS ABOVE (420'-430')
440'	73 min			SAND AND CLAY		SAND AND CLAY - black, brown (vr) (7.5 YR 2/0 - 7.5 YR 4/4) 50% coarse and fine sand, 50% clay, 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, * unconsolidated, clay has strong reaction to HCl, sand none, nonuniform
450'	72 min			SAND AND CLAY		SAME AS ABOVE (440'-450')
460'	75 min			SAND AND CLAY		SAME AS ABOVE (450'-460')
470'	69 min			SAND AND CLAY		SAND AND CLAY - black, brown (vr) (7.5 YR 2/0 - 7.5 YR 4/4) 50% coarse and fine sand, 50% clay, 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, * unconsolidated, clay has strong reaction to HCl, sand none, nonuniform
480'	20 min			SAND AND CLAY		SAME AS ABOVE (470'-480')

LOCATION Whirlwind Valley (C-15-12) 19ad
 LOGGED BY Lori Zweigart, Karen Knirsch

PROJECT Old Water Reservoir
 Full Division FV8081

LOC. or COORDS. (C-15-12) 19ad

DRILLER T. Small King Inc.
Jesse Leach

GROUND ELEV. 5285' - from topo map

TOTAL DEPTH 1220'

BOREHOLE DIAM. 12 1/4"

RIG Gardner Denver 2500

BIT(S) tricone

FLUID bentonite mud

START DATE 9-27-81 FINISH DATE 10-10-80

TIME _____

GEOPHYS. LOG YES NO

HOW LEFT _____

DEPTH	PENE RATE	CIRC RET	LOSS	AIRLIFT G (ppm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
480'	18 min				SAND AND CLAY	480	SAND AND CLAY - black, brown (w) (7.5 YR 2/10 - 7.5 YR 4/14) 50% coarse and fine sand, 50% clay, 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, *unconsolidated, clay has strong reaction to HCL, sand none, nonuniform
490'	24 min				SAND AND CLAY	490	SAME AS ABOVE (480'-490')
500'	20 min				SAND AND CLAY	500	SAME AS ABOVE (490'-500')
510'	21 min				SAND AND CLAY	510	SAND AND CLAY - black, brown (w) (7.5 YR 2/10 - 7.5 YR 4/14) 50% coarse and fine sand, 50% clay, 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, *unconsolidated, clay has strong reaction to HCL, sand none, nonuniform
520'	23 min				SANDY CLAY	520	SANDY CLAY - black, brown (w) (7.5 YR 2/10 - 7.5 YR 4/14) 60% clay, 40% sand, 100% volcanic, poorly sorted, angular to subround, structureless, slightly plastic, unconsolidated, clay has strong reaction to HCL, sand none, other data not stated
530'	24 min				SANDY CLAY	530	SAME AS ABOVE (520'-530')
540'	30 min				SANDY CLAY	540	SANDY CLAY - black, brown (w) (7.5 YR 2/10 - 7.5 YR 5/14) 50% clay, 40% coarse and fine sand, 100% volcanic, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, non uniform, other data not stated
550'	34 min				SANDY CLAY	550	SAME AS ABOVE (540'-550')

LOCATION Whirlwind Valley (c-15-12) 19ad
 LOGGED BY Lou Ewiggart, Ron Kniesch

PROJECT MX Water Resources
 Valley Fill Drilling FY 80, 81

WHI TO S

LOC. or COORDS. <u>(c-15-12) 19ad</u>	DRILLER <u>Ismail Sangino,</u> <u>Jesse Lenh</u>	START DATE <u>9-27-80</u>	FINISH DATE <u>10-10-80</u>
GROUND ELEV. <u>5280' - from topo map</u>	RIG <u>Gardner Denver 2509</u>	TIME _____	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
TOTAL DEPTH <u>1220'</u>	BIT(S) <u>tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>ben tonite mud</u>		

DEPTH	PENE. RATE	CIRC RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
560'	32 min			SANDY CLAY	560'	SANDY CLAY - black, brown(w) (7.5 YR 2/0 - 7.5 YR 5/4), 60% clay, 40% sand, 100% volcanic, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, non uniform
570'	48 min			SANDY CLAY	570'	SAME AS ABOVE (560'-570')
580'	59 min			SANDY CLAY	580'	SAME AS ABOVE (570'-580')
590'	57 min			SANDY CLAY	590'	SANDY CLAY - black, brown(w) (7.5 YR 2/0 - 7.5 YR 5/4), 60% clay, 40% sand, 100% volcanic, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, non uniform
600'	99 min			SANDY CLAY	600'	SANDY CLAY - dark grayish brown, black(w) (10 YR 4/2 - 10 YR 2/1), 65% clay, 15% coarse sand, 17% fine sand, 100% volcanic, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, non uniform
610'	98 min			SANDY CLAY	610'	SAME AS ABOVE (600'-610')
620'	75 min			SANDY CLAY	620'	SAME AS ABOVE (610'-620')
630'	70 min			SANDY CLAY	630'	SANDY CLAY - dark grayish brown, black(w) (10 YR 4/2 - 10 YR 2/1), 65% clay, 15% coarse sand, 17% fine sand, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, non uniform
640'						

W 14 - 2 - 078

LOCATION Whirlwind Valley (C-15-12) 19ad.
 LOGGED BY Lotus Weimer, Karen Knirsch

PROJECT MX Water Resources
Kelly Hill Drilling FY80, 81

LOC. or COORDS. <u>(C-15-12) 19ad</u>	DRILLER <u>Ismail Sarguna, Jose Lench</u>	DATE <u>9-27-81</u>	START <u>10-10-81</u>	FINISH <u>10-10-81</u>
GROUND ELEV. <u>5200' - from top map</u>	RIG <u>Gardner Denver 2500</u>	TIME _____	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
TOTAL DEPTH <u>1220'</u>	BIT(S) <u>tricone</u>	HOW LEFT _____		
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>bentonite mud</u>			

DEPTH	PENE. RATE	CIRC. RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
640'	41 min			SANDY CLAY		SANDY CLAY - dark grayish brown, black (w) (10YR 4/2 - 10YR 2/1), 65% clay, 18% coarse sand, 17% fine sand, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, nonuniform, other data not stated
650'	40 min			SANDY CLAY		SAME AS ABOVE (640'-650')
660'	60 min			SANDY CLAY		SAME AS ABOVE (650'-660')
670'	45 min			SANDY CLAY		SANDY CLAY - dark grayish brown, black (w) (10YR 4/2 - 10YR 2/1), 65% clay, 18% coarse sand, 17% fine sand, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, nonuniform, other data not stated
680'	44 min			SANDY CLAY		SAME AS ABOVE (670'-680')
690'	45 min			SANDY CLAY		SAME AS ABOVE (680'-690')
700'	45 min			SANDY CLAY		SAME AS ABOVE (690'-700')
710'	52 min			SANDY CLAY		SANDY CLAY - dark grayish brown (w) (10YR 4/2 - 10YR 2/1), 65% clay, 18% coarse sand, 17% fine sand, poorly sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, nonuniform, other data not stated

NW-10-8

LOCATION Whirlwind Valley (C-15-12) 19ad
 LOGGED BY Karen Knitsch, Lou Zwickert

PROJECT MX Water Resources
 Valley Fill Drilling FY80, 81

LOC. or COORDS. <u>(C-15-12) 19ad</u>	DRILLER <u>Ismail Sangrillo</u> <u>Jesse Lench</u>	START DATE <u>9-27-80</u>	FINISH DATE <u>10-10-80</u>
GROUND ELEV. <u>5280' - from topo map</u>	RIG <u>Gardner Denver 2500</u>	TIME _____	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
TOTAL DEPTH <u>1220'</u>	BIT(S) <u>Tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>bentonite mud</u>		

DEPTH	PENE. RATE	CIRC. RET. LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
720'	39 min			720' SANDY CLAY		SANDY-CLAY - dark grayish brown, black (w), (10YR 4/2 - 10YR 3/1), 65% clay, 18% coarse sand, 17% fine sand, 100% volcanic, poorly sorted, angular to subangular, structureless, plastic, unconsolidated, clay has strong reaction to HCL, sand none, non uniform
730'				730' SANDY CLAY		SAME AS ABOVE (720'-730')
740'	53 min			740' SANDY CLAY		SANDY CLAY - pale brown (w) (10YR 6/3), 70% clay, 30% fine to medium sand, 100% volcanic, moderately sorted, angular to subangular, structureless, no plastic, unconsolidated, no reaction to HCL, uniform, sample contains lost circulation material
750'	50 min			750' SANDY CLAY		SAME AS ABOVE (740'-750')
760'	106 min			760' SANDY CLAY		SAME AS ABOVE (750'-760')
770'	100 min			770' SANDY CLAY		SANDY CLAY - pale brown (w) (10YR 6/3), 80% clay, 20% fine to medium sand, moderately sorted, angular to subangular, structureless, no plastic, unconsolidated, no reaction to HCL, uniform, sample contains lost circulation material, other data not stated
780'	70 min			780' CLAY		CLAY - pale brown (w) (10YR 5/2) > 95% clay, < 2% sandy, structureless, plastic, unconsolidated, weak reaction to HCL, uniform, sample contains lost circulation material, other data not stated
790'	55 min			790' CLAY		CLAY - pale brown (w) (10YR 6/3), 90% clay, 10% fine to medium sand, moderately sorted, angular to subangular, structureless, plastic, unconsolidated, strong reaction to HCL, uniform, sample contains lost circulation material
799'	133 min			799' CLAY		CLAY - pale brown (w) (10YR 6/3), 90% clay, 10% fine to medium sand, moderately sorted, angular to subangular, structureless, plastic, unconsolidated, strong reaction to HCL, uniform, sample contains lost circulation material
7A'				7A' CLAY		CLAY - pale brown (w) (10YR 6/3), 90% clay, 10% fine to medium sand, moderately sorted, angular to subangular, structureless, plastic, unconsolidated, strong reaction to HCL, uniform, sample contains lost circulation material

LOCATION Whirlwind Valley (C-15-12) 19ad
 LOGGED BY Karen Sumpster, Ed Zwinger, Mike Bennett
 PROJECT - MX Water Resources
Valley Fill Drilling FY80, 81

LOC. or COORDS. <u>(C-15-12) 19ad</u>	DRILLER <u>José I. Sanchino</u> <u>Jesse Lynch</u>	START DATE <u>1-27-80</u>	FINISH DATE <u>10-10-81</u>
GROUND ELEV. <u>5280' - from topo map</u>	RIG <u>Gardner Denver 2500</u>	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
TOTAL DEPTH <u>1220'</u>	BIT(S) <u>tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>12 1/4"</u>	FLUID <u>barite mud</u>		

DEPTH	PENE. RATE	CIRC RET	AIRLIFT LOSS Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
800'	65 min			SANDY CLAY	800'	SANDY CLAY - pale brown (W) (10YR 6/3) 80% clay, 10% medium sand, 10% fine sand, moderate sorted, subangular to subround, structureless, plastic, sticky, unconsolidated, sand and clay react strongly with HCL, uniform, sample contains bit circular material, other data not set
810'	40 min			SANDY CLAY	810'	SAME AS ABOVE (800'-810')
820'	72 min			SANDY CLAY	820'	SAME AS ABOVE (810'-820')
830'	45 min			SANDY CLAY	827'	Formation change at (827') SANDY CLAY - pale brown (W) (10YR 6/3), 80% clay, 10% medium sand, 10% fine sand, moderately sorted, subangular to round, structureless, plastic, sticky, same sand is weakly consolidated, sand and clay react strongly with HCL, uniform, (830'-840') has more cemented sand, sample contains lost circulation material, other data not set
840'	49 min			SANDY CLAY	840'	SANDY CLAY - pale brown (W) (10YR 6/3) 80% clay, 10% medium sand, 10% fine sand, moderately sorted, subangular to subround, structureless, plastic, sticky, unconsolidated, sand and clay react strongly with HCL, uniform, sample contains lost circulation material, other data not set
850'	48 min			SANDY CLAY	850'	SANDY CLAY - pale brown (W) (10YR 6/3) 80% clay, 10% medium sand, 10% fine sand, moderately sorted, subangular to subround, structureless, plastic, sticky, unconsolidated, sand and clay react strongly with HCL, uniform, sample contains lost circulation material, other data not set
860'	45 min			SANDY CLAY	860'	SAME AS ABOVE (850'-860')
870'	62 min			SANDY CLAY	870'	SAME AS ABOVE (860'-870')

LOCATION Whirlwind Valley (C-15-12) 190'
 LOGGED BY Max Water Resources

PROJECT MX Water Resources
Valley Fill Drilling FY80, 81

WV-10-2

LOC. or COORDS. <u>4-15-12 ad</u>	DRILLER <u>T. Small Sangria</u> <u>Jesse Lench</u>	START DATE <u>7-27-80</u>	FINISH DATE <u>10-10-80</u>
GROUND ELEV. <u>5280' - from topo map</u>	RIG <u>Garner Denver 2500</u>	TIME _____	GEOPHYS. LOG <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
TOTAL DEPTH <u>1320</u>	BIT(S) <u>tricone</u>	HOW LEFT _____	
BOREHOLE DIAM. <u>10 1/4"</u>	FLUID <u>brackish mud</u>		

DEPTH	PENE RATE	CIRC RET	AIRLIFT LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
850'	40 min				SANDY CLAY		SANDY CLAY - pale brown (w) (10YR 6/3) 75% clay, 15% medium sand, 10% fine sand, moderately sorted, subangular to subround, structureless, plastic, sticky, unconsolidated, some sand compacted, sand and clay react strongly with HCl, uniform, sample has lost circulation material, other data not stated
890'	91 min				SANDY CLAY		SANDY CLAY - pale brown (w) (10YR 6/3) 60% clay, 40% medium sand, well sorted, subangular to subround, structureless, slightly plastic, sticky, unconsolidated, sand and clay react strongly with HCl, sample has lost circulation material, uniform, other data not stated
900'	48 min				CLAY		CLAY - pale brown, black (w) (10YR 6/3 - 10YR 2/1) > 90% clay, < 10% fine to medium sand, 100% volcanic, moderately sorted, angular to subround, structureless, plastic, unconsolidated, clay has strong acid reaction, sand none, moderate, uniform, sample has lost circulation material, other data not stated
910'					CLAY		SAME AS ABOVE (900'-910')
	57 min				CLAY		CLAY - pale brown, black (w) (10YR 6/3 - 10YR 2/1) > 90% clay, < 10% fine to medium sand, moderately sorted, angular to subround, structureless, plastic, unconsolidated, clay is moderately compacted, clay has strong acid reaction, sand none, moderate, uniform, sample has lost circulation material, other data not stated
	47 min				CLAY		SAME AS ABOVE (920'-930')
	38 min				CLAY		CLAY - pale brown, black (w) (10YR 6/3 - 10YR 2/1) > 90% clay, < 10% fine to medium sand, moderately sorted, angular to subround, structureless, plastic, unconsolidated, clay is moderately compacted, clay has strong acid reaction, sand none, moderate, uniform, sample has lost circulation material, other data not stated
	45 min				CLAY		SAME AS ABOVE (940'-950')
	56 min				CLAY		CLAY - pale brown, black (w) (10YR 6/3 - 10YR 2/1) > 90% clay, < 10% fine to medium sand, moderately sorted, angular to subround, structureless, plastic, unconsolidated, clay is moderately compacted, clay has strong acid reaction, sand none, moderate, uniform, sample has lost circulation material, other data not stated

LOC. or COORDS. C-15-11 Mad
 GROUND ELEV. 5280' - from top of map
 TOTAL DEPTH 1220'
 BOREHOLE DIAM. 12 1/4"

DRILLER Ismael Sengul
Jesse Wench
 RIG Gardner Denver 2500
 BIT(S) tricone
 FLUID benzene mud

START DATE 7-27-80 FINISH DATE 10-10-80
 TIME _____
 GEOPHYS. LOG YES NO
 HOW LEFT _____

LOCATION Whirlwind Valley (C-15-12) 1960'
 LOGGED BY Lou Ann D'Angelo, Mary Hume

PROJECT MAX Water Resources
Valley Fill Drilling FY82, 81

DEPTH	PENE RATE	CIRC RET LOSS	AIRLIFT Q (gpm)	MATERIAL	SYM-BOL	DESCRIPTION and COMMENTS
160'	65 min			SANDY CLAY	160	SANDY CLAY - pale brown, black (w) (10YR 4/3 - 10YR 2/1), 75% clay, 25% fine to med. sand, poorly sorted angular to subround, strong cohesion, plastic, unconsolidated, clay is moderately calcareous, clay has strong and weak reaction to HCL, uniform sample has lost circulation material other data not started
970'	161 min			SAND	970	SAND - black, reddish brown (10YR 2/2 - 10R 3/6), 60-70% medium to coarse sand, 20-25% fine sand, 2% silt/clay, 75% volcanic, 20% lithic fragments, 5% herb, poorly sorted, subangular to subround, structureless, unconsolidated, no HCL reaction, nonuniform sample has lost circulation material other data not available
950'	35 min			SILTY CLAY SAND	950	SILTY CLAY SAND - black, reddish brown (10YR 2/0 - 10R 3/6), 40% medium sand, 30% fine sand, 20% silt and clay, 10% volcanic, 30% lithic fragments, 1% herb, poorly sorted, subangular to subround, structureless, nonplastic, nonsticky, unconsolidated, weak reaction to HCL, nonuniform sample has lost circulation material
940'	30 min			SILTY SAND	940	SILTY SAND - black, reddish yellow (10YR 2/1, 7.5YR 4/5), 40% medium sand, 35% fine sand, 20% silt and clay, 40% lithic fragments, 25% volcanic, 25% quartz, poorly sorted, subangular to subround, structureless, nonplastic, nonsticky, unconsolidated, weak reaction to HCL, nonuniform sample has lost circulation material
1000'	35 min			SILTY SAND	1000	SAME AS ABOVE (990'-1000') except strong reaction to HCL
1020'	28 min			SILTY SAND	1020	SILTY SAND - black, reddish yellow (10YR 2/1, 7.5YR 4/5), 40% medium sand, 30% fine sand, 20% silt and clay, 40% lithic fragments, 25% volcanic, 25% quartz, poorly sorted, subangular to subround, structureless, nonplastic, nonsticky, unconsolidated, weak reaction to HCL, nonuniform sample has lost circulation material
1030'	33 min			SILTY SAND	1030	SAME AS ABOVE (1010'-1020') except strong reaction to HCL
1050'	32 min			SILTY SAND	1050	SILTY SAND - black, reddish yellow (10YR 2/1, 7.5YR 4/5), 40% medium sand, 30% fine sand, 20% silt and clay, 40% lithic fragments, 25% volcanic, 25% quartz, poorly sorted, subangular to subround, structureless, nonplastic, nonsticky, unconsolidated, weak reaction to HCL, nonuniform sample has lost circulation material

